

Medical Terminology

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Inside

*The Language of
Health Care*

Marjorie Canfield Willis

Second Edition



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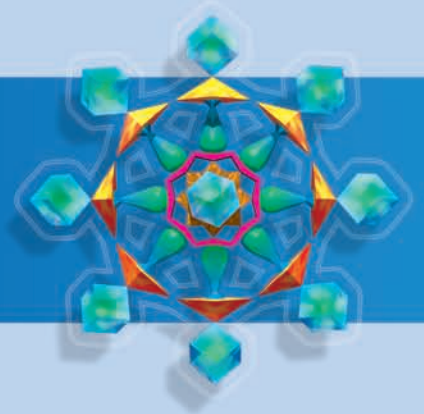


LIPPINCOTT WILLIAMS & WILKINS

Medical Terminology

The Language of Health Care

Second Edition



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Health Care*

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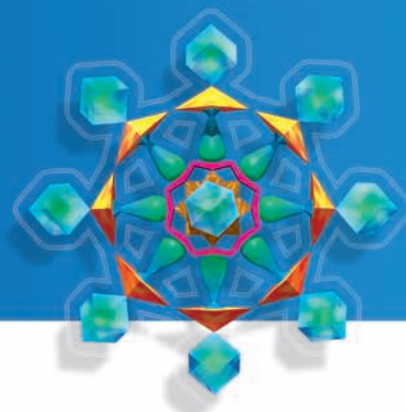
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Dedicated to the students and faculty of the
School of Allied Health Professions
Orange Coast College
Costa Mesa, California

Preface



The second edition of *Medical Terminology: The Language of Health Care* continues in its design to provide a framework for building a medical vocabulary, using an applied approach. Emphasis is on understanding basic medical terms and learning how they are used in documenting and reporting patient care procedures. Practical applications are provided by exercises and medical record analyses in each chapter. The goal is to develop a basic “working” knowledge of the language of health care to serve as a basis for individual expansion.

Text Overview

Chapter 1 identifies the need for the personal commitment that is required to develop a basic knowledge of medical language. Included are methods of time management, techniques for making use of the senses to reinforce memory, and preparation and use of flash cards.

Chapter 2 starts with the origin of medical language, then introduces basic term components (prefixes, suffixes, and a selected number of combining forms) illustrating how these structures are combined to form medical terms. Rules of pronunciation, spelling, and formation of singular and plural forms are included. Medical word components covered in this chapter are used repeatedly throughout the book.

Chapter 3 examines the evolution of the physician in medicine and identifies fields of medical practice, including scopes of practice and the expansion of allied health professions.

Chapter 4 establishes the basis for the application of learning medical terms covered throughout the text by introducing common forms, formats, abbreviations, symbols, and methods of documenting patient care. This enables the student to understand basic communication between professionals, including physician’s orders and prescriptions. The content of this chapter is reinforced in medical record analyses in succeeding chapters.

Periodic review of Chapters 2 and 4 is essential for successful use of this book. Term components first encountered in these chapters are revisited in subsequent chapters to reinforce memory of common term components.

Chapters 5 through 17 cover terms related to the body systems. In each chapter, basic anatomical terms are outlined, additional combining forms related to the system are identified, and common terms and abbreviations related to symptoms, diagnoses, tests, procedures, surgeries, and therapies are identified. Practice exercises at the end of each chapter are designed to reinforce the memory of basic term components by repetitive word structure analysis. Answers to practice exercises are included in Appendix D.

Another feature of Chapters 5 through 17 is the medical record analysis. Each analysis requires reading a particular medical record and answering questions specific to each. Knowledge of Chapter 4 is a prerequisite for understanding questions presented in the medical record analyses.

New to This Edition

- Full color throughout
- Updated photographs of pathologies and images illustrating the latest in health care technology
- Additions and clarifications of pertinent terms
- Elimination of the possessive form of 's in all eponyms to match standardization initiated in medical dictionaries, e.g., Alzheimer disease, Kaposi sarcoma, and Cushing syndrome
- Current information regarding medical abbreviations and symbols deemed error prone
- Practice exercises now include a guided system of term analysis, addition of mini medical records, and anatomical labeling exercises

BONUS CD-ROM

The CD-ROM that accompanies this text provides a wealth of fun and interactive activities for learning reinforcement:

- A pronunciation glossary with audio pronunciations
- Spelling bees to help recognize and correctly spell terms
- Labeling exercises to reinforce and test knowledge of medical terms and anatomy
- Games in which terms or components are matched with definitions
- Scored and unscored section and chapter quizzes for knowledge assessment
- Interactive medical record exercises

ADDITIONAL BONUS: QUICK STUDY REFERENCE CARD

The laminated **Quick Study Reference** packaged with this textbook provides a portable study resource that includes key rules for learning medical terms and a summary list of term components with definitions. This invaluable tool facilitates “on the go” learning of critical information.

Other Special Features



Ancient Artifacts provide historical information about the origins of selected medical terms. More than 50 ancient artifacts are sprinkled in the margins throughout the text.

Appendix A summarizes medical term components (prefixes, suffixes, and combining forms) in two lists: (a) term component to English definition and (b) English definition to term component.

Appendix B provides a glossary of abbreviations and symbols.

Appendix C lists commonly prescribed drugs, including therapeutic classifications.

Appendix D includes answers to the practice exercises.

Answers to medical record analyses are provided in the CD-ROM packaged with the book.

Acknowledgments



I am so proud of the success of this text and hope the second edition will continue to play an important role in teaching medical terminology.

I want to thank the dedicated staff of Lippincott Williams & Wilkins who have combined their many talents to prepare this revision. In addition to those who are appropriately recognized on the copyright page, I especially want to thank my editor, John Goucher. His help was instrumental in the revision and the development of the many ancillaries. We will all benefit from the additional resources that enhance the original text.

I continue to enjoy the support of my colleagues at Orange Coast College and many others from professional and technical areas. Particularly, I'd like to acknowledge: Kevin Ballinger, Walt Banoczi, Dan Farrell, Fredra Kodama, Ann McClanahan, Eleanor Huang, Linda Harloe, Chrysty Hodson, Richard Reed, MD, Brian Coyne, MD, and Michael J. Deimling, RPh, PhD.

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I have enjoyed an incredible relationship with my students, and it is their feedback that has been incorporated in several of the clarifications and additions to this revision. Since the textbook was published, I have found myself responding to an even larger audience of students—all with the same need to learn and grow in the knowledge of the language of health care. I thank all these students and appreciate the fact that my book has played a part in their learning success.

Last to recognize is my family, who have been steadfast in their caring. I thank them with hugs and kisses: XXOO.

M.C.W.

Medical Terminology: The Language of Health Care

Second Edition

Marjorie Canfield Willis

USER'S GUIDE

Medical Terminology: The Language of Health Care, Second Edition

is not just a textbook, it is a complete learning resource that will help you to understand important information and master medical terminology. To achieve this, the author and publisher have included features and tools throughout the text to help you work through the material presented. Please take a few moments to look through this User's Guide, which will introduce you to the features that will enhance your learning experience.

System Overviews give a review of the anatomy and physiology in order to better understand the medical terminology in the chapter.

Musculoskeletal System Overview

The musculoskeletal system provides support and gives shape to the body. The skeleton gives structure to the body by providing a framework of bones and cartilage. Also, the bones store calcium and other minerals and produce certain blood cells within the bone marrow (Figs. 6.1 to 6.4).

The muscles cover the bones where they hinge (articulate) and supply the forces that make movement possible. They also provide a protective covering for internal organs and produce body heat (Figs. 6.5 and 6.6).

Anatomical Terms Related to Bones (Figs. 6.1 to 6.4)

Term	Meaning
appendicular skeleton ap'en-dik'yū-lār	bones of shoulder, pelvis, and upper and lower extremities
axial skeleton ak'sē-āl	bones of skull, vertebral column, chest, and hyoid bone (U-shaped bone lying at the base of the tongue); refer to Figure 6.4 for abbreviated identification and numbering of cervical, thoracic, and lumbar vertebrae
bone	specialized connective tissue composed of osteocytes (bone cells) forming the skeleton
TYPES OF BONE TISSUE	
compact bone	tightly solid, strong bone tissue resistant to bending
spongy (cancellous) bone spūn'jē kan'sē-lūs	mesh-like bone tissue containing marrow and fine branching canals through which blood vessels run

Word Tables outline anatomical terms clearly and concisely with term, pronunciation, and meaning.

Chapter 6

Musculoskeletal System

Objectives at the beginning of each chapter outline the skills you must know by the end of the chapter.

OBJECTIVES

After completion of this chapter you will be able to

- Define common combining forms used in relation to the musculoskeletal system
- Describe the basic functions of the musculoskeletal system
- Define the basic anatomical terms referring to the musculoskeletal system
- Describe the anatomical position
- List the planes of the body
- Define positional and directional terms
- Define the terms related to body movements
- Define common symptomatic and diagnostic terms related to the musculoskeletal system
- List common diagnostic tests and procedures related to the musculoskeletal system
- Identify common operative terms referring to the musculoskeletal system
- Identify common therapeutic terms including drug classifications related to the muscu-

Ancient Artifacts boxes in the margins provide historical background for commonly used terms.



ELBOW. Many terms referring to the elbow are based on the L-shape formed at the joint. This is the basis of the "el" of elbow. It is also the root of the Latin term ulna. An "ell" was an old measure of length, particularly of cloth, being the amount from the elbow (or shoulder) to the fingers, which was a convenient way of rapidly measuring lengths. Boga was a bending or a bow.

Musculoskeletal System Overview

The musculoskeletal system provides support and gives shape to the body. The skeleton gives structure to the body by providing a framework of bones and cartilage. Also, the bones store calcium and other minerals and produce certain blood cells within the bone marrow (Figs. 6.1 to 6.4).

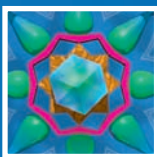
The muscles cover the bones where they hinge (articulate) and supply the forces that make movement possible. They also provide a protective covering for internal organs and produce body heat (Figs. 6.5 and 6.6).

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bone	specialized connective tissue composed of osteocytes (bone cells) forming the skeleton
TYPES OF BONE TISSUE	

they never used the word in the modern meaning of the bony framework of the body. The first recorded use of the modern term in English occurred in 1578.

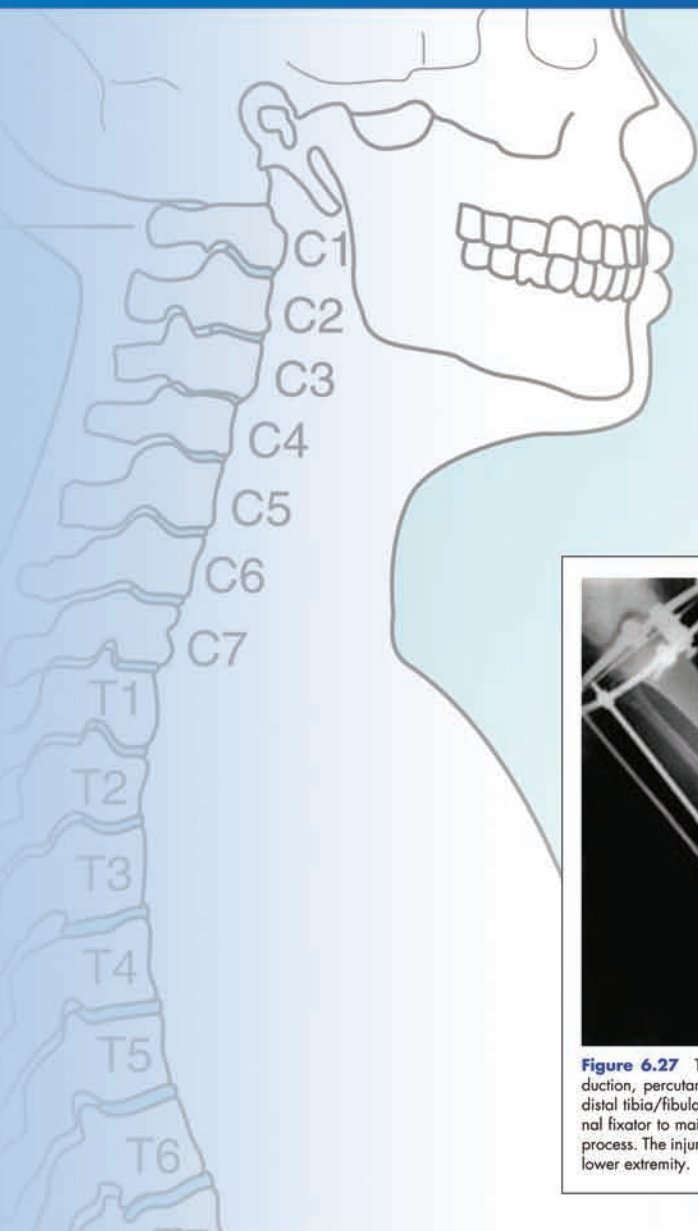
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The Language of Health Care

Second Edition

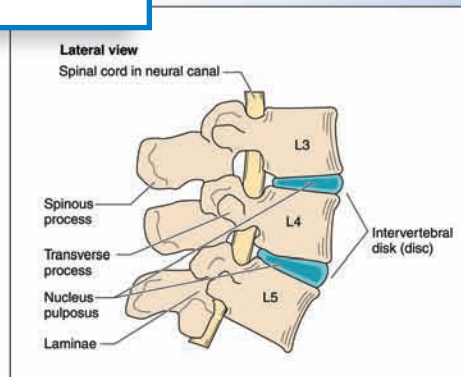


Examples of orthoses: back, knee, and wrist.

Numerous illustrations, photographs, radiographs, micrographs, and images help to illustrate medical terminology and promote greater understanding.



Figure 6.27 This radiograph, taken after closed reduction, percutaneous fixation of an open comminuted distal tibia/fibula fracture, shows placement of an external fixator to maintain pin placement during the healing process. The injury was the result of a gunshot to the right lower extremity.

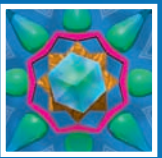


Summaries of Acronyms/Abbreviations

appear at the end of each chapter.

Summary of Chapter 6 Acronyms/Abbreviations

A	.....anterior	MRI	.....magnetic resonance imaging
AKA	.....above-knee amputation	NSAID	.....nonsteroidal anti-inflammatory
AP	.....anterior-posterior	OA	.....osteoarthritis
BKA	.....below-knee amputation	ORIF	.....open reduction, internal fixation
CAT	.....computed axial tomography	P	.....posterior
CT	.....computed tomography	PT	.....physical therapy
DEXA	.....dual-energy x-ray absorptiometry	RA	.....rheumatoid arthritis
DJD	.....degenerative joint disease	ROM	.....range of motion
EMG	.....electromyogram	Tx	.....traction
Fx	.....fracture	x-ray	.....radiography



- 30. _____ means = smooth muscle tumor
- 31. _____ = inflaming of bone
- 32. _____ = slipping of a vertebra
- 33. _____ = a ray of a joint
- 34. _____ = incision into bone
- 35. _____ = inflammation of the ends of the long bones
- 36. _____ = protruding to the neck
- 37. _____ = pain = distal femur tumor
- 38. _____ = tumor of cartilage
- 39. _____ = procedure for separation of a joint
- 40. _____ = repair or reconstruction of bone

For each of the following, circle the combining form that corresponds to the meaning given:

- 41. cartilage: crania, cervix, chondrio
- 42. vertebrae: arthro, spondylo, lambo
- 43. bone marrow: myo, myelo, mastoid
- 44. neck: thoracic, cratic, cervico
- 45. joint: arthro, arthro, arthro
- 46. chest: thoracic, cervico, spondylo
- 47. muscle: myo, myelo, loto
- 48. rib: crania, chondrio, crania

Write the correct medical term for each of the following:

- 49. basal curvature of the spine _____
- 50. bone tumor _____
- 51. prating sound made by movement of vertebra bones _____
- 52. cancer for bony metastasis _____
- 53. plane that divides the body into right and left portions _____
- 54. application of a pulling force to a fractured or dislocated joint to maintain proper position during healing _____

- 55. arthritis caused by hyperkalemia _____
- 56. a partial dislocation _____
- 57. toward the beginning of a structure _____
- 58. osteomata in children _____
- 59. physician specializing in x-ray technology _____

Match the following terms related to muscles with their meanings:

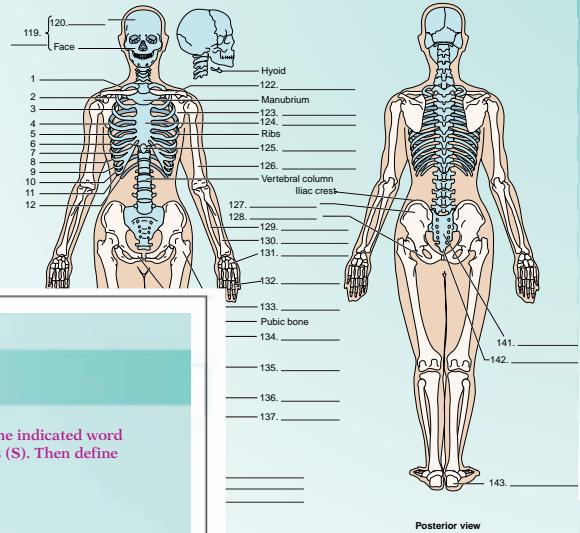
- 60. _____ atrophy a. uncontrolled, stiff, and awkward muscle contractions
- 61. _____ tetanus b. slowly muscle
- 62. _____ spasm c. involuntary muscle contraction
- 63. _____ rigidity d. prolonged, continuous muscle contraction
- 64. _____ spastic e. stiff muscle
- 65. _____ hypertrophy f. rhythmic muscle movement
- 66. _____ flaccid g. increase in the size of a muscle
- 67. _____ tetany h. shivering of muscle tissue

Briefly describe the difference between the following terms:

- 68. arthrograms/arthroscopy _____
- 69. chondriomyoma/hydrorhinorrhea _____
- 70. osteoarthritis/rheumatoid arthritis _____
- 71. osteomata/osteosarcoma _____
- 72. osteomyelitis _____
- 73. closed reduction, external fixation of a Pottus reduction, internal fixation of a P. _____
- 74. myelo/spondylo _____

Write in the missing anatomical terms on the blank lines in the following illustrations.

119-143.



Numerous Practice Exercises
 reinforce learning and retention.

PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

EXAMPLE

hypertrophy

 P / R / S
 hyper/troph/y
 P R S

DEFINITION: above or excessive/nourishment or development/condition or process of

- 1. thoracic _____

Chapter 6 • Musculoskeletal System 191

CENTRAL MEDICAL CENTER
 111 Medical Center Drive • Centre City, PA 16801-1234 • PHONE: (814) 123-4567 • FAX: (814) 123-8999

X-RAY REPORT

LUMBOSACRAL SPINE:
 Multiple views reveal no evidence of fracture. There is slight lumbar spondylosis with disk slight height and minimal bulging. The disc spaces appear maintained except for slight narrowing at L4-L5 and L5-S1. There is also a grade II spondylolisthesis of L5 on S1 and evidence of spondylolysis at L5 on the left. There is also slight dextrocurvature in the lumbar region and slight increased lordosis in the lumbosacral region. The bony architecture is unremarkable except for abnormality between the articulating facets at L5-S1. The M joints appear unremarkable. Incidentally noted are slight osteoarthritic changes involving both hips.

CONCLUSION:

1. Slight lumbar spondylosis with hypertrophic lipping and slight narrowing of the L4-L5 and L5-S1 disc spaces. Mild osteoarthritic disease. If clinically indicated, CT of the lumbosacral spine may prove helpful in further evaluation.
2. Grade I spondylolisthesis of L5 on S1 with evidence of spondylolysis at L5 on the left.
3. Slight dextrocurvature in the lumbar region and slight increased lordosis in the lumbosacral region.

M. Volz, M.D.
 M. Volz, M.D.

MVB:
 Dr. 09/19/2008
 T. 10:20:08AM

X-RAY REPORT: PT. NAME: DORN, JAY F. ID NO: 83-451991 APT. PHYS: T. EIGHT, M.D.

Medical Record 6.3

MEDICAL RECORD 6.3

Jay Dorn, a retired construction worker, has had intermittent back pain for the last 2 months. When he began also having shooting pains in his legs, he went to his doctor at Central Medical Center. After a physical examination, Mr. Dorn underwent a series of back x-rays.

Directions

Read Medical Record 6.3 for Jay Dorn (page 191) and answer the following questions. This record is the radiographic report dictated by Dr. Mary Volz, the radiographer, after studying Mr. Dorn's x-rays and later transcribed for the record.

QUESTIONS ABOUT MEDICAL RECORD 6.3

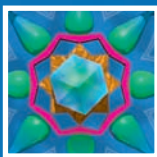
Write your answers in the spaces provided.

- 1. Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:
 eburation _____

Medical Records and Exercises in every chapter will help you to apply medical terminology and build critical thinking skills.

Does the report state how many x-rays were taken?
 _____ no _____ yes If yes, how many?

- 3. In your own words, not using medical terminology, describe the three diagnoses Dr. Volz makes.



USER'S GUIDE

Medical Terminology: The Language of Health Care

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Laminated Quick Review Guide is a great reference tool with Term Basics, and a comprehensive list of commonly used term components and their meanings.

- (1) A combining vowel is used to join root to root as well as root to a suffix beginning with a consonant. e.g., cardi/o/gram.
- (2) A combining vowel is not used before a suffix that begins with a vowel. e.g., cardi/o/edema.
- (3) If the root ends in a vowel and the suffix begins with the same vowel, drop the final vowel from the root and do not use a combining vowel. e.g., cardi/o/edema.
- (4) Most often, a combining vowel is inserted between two roots when the second root begins with a vowel. e.g., cardi/o/angiography.
- (5) Occasionally, when a prefix ends in a vowel and the root begins with a vowel, the final vowel is dropped from the prefix. e.g., post-/heraldic.

acous/o	hearing
acr/o	extremity or topmost
-acousis	hearing condition
ad-	to, toward, or near
aden/o	gland
adip/o	fat
adren/o	adrenal gland
aer/o	air or gas
-al	pertaining to
albumin/o	protein
-algia	pain
allo-	other
alveol/o	alveolus (air sac)
ambi-	both
an-	without
ana-	up, apart
an/o	anus
andr/o	male
angi/o	vessel
anky/o	rooked or stiff
ante-	before
anti-	against or opposed to
aort/o	aorta
appendic/o	appendix
aque/o	water
-ar	pertaining to
-arche	beginning
arteri/o	artery
arthr/o	joint, articulation
articul/o	joint
-ary	pertaining to
-ase	enzyme
-asthenia	weakness
ather/o	fatty paste
-ation	process
atri/o	atrium
audi/o	hearing
aur/i	ear
auto-	self
bacteri/o	bacteria
balan/o	glans penis
bi-	two or both
bil/i	bile
-blast	germ or bud
blast/o	germ or bud
blephar/o	eyelid
brachi/o	arm
brady-	slow
branch/o	branchus (airway)
branchi/o	branchus (airway)
bronchial/o	bronchiole (little airway)
bucc/o	cheek
capn/o	carbon dioxide
carb/o	carbon dioxide
carcin/o	cancer

-census	punctate for aspiration
cephal/o	head
cerebell/o	cerebellum (little brain)
cerebr/o	cerebrum (largest part of brain)
cerumin/o	wax
cervic/o	neck or cervix
cheil/o	lip
chir/o	hand
chol/e	bile
chondr/o	cartilage (gristle)
chrom/o	color
chromat/o	color
chyl/o	juice
circum-	around
-cis/o	cut
col/o	colon
colon/o	colon
colp/o	vagina (sheath)
con-	together or with
conjunctiv/o	conjunctiva (to join together)
contra-	against or opposed to
corne/o	cornea
coron/o	circle or crown
cost/o	rib
crani/o	skull
crin/o	to secrete
cutane/o	skin
cyan/o	blue
cyst/o	bladder or sac
cyt/o	cell
dacry/o	tear
dactyl/o	digit (finger or toe)
de-	from, down, or not
dent/i	teeth
derm/o	skin
dermat/o	skin
-desis	binding
dextr/o	right, or on the right side
dia-	across or through
diaphor/o	profuse sweat
dips/o	thirst
dis-	separate from or apart
doch/o	d
duoden/o	duodenum
-dymia	d
dys-	painful, difficult
-e	e
e-	e
-eal	e
ec-	e
-ecclasis	exp
ecto-	e
-ectomy	e
-emesis	e

heart	-emia	blood condition
down	en-	within
ing or hernia	encephal/o	entire brain
abdomen	endo-	within
	enter/o	small intestine
	epi-	upon
	epididym/o	epididymis
	episi/o	vulva (covering)
	erythr/o	red
	esophag/o	esophagus
	esthesi/o	sensation
	eu-	good or normal
	ex-	out or away
	exo-	outside
	extra-	outside
	fasci/o	fascia (a band)
	femor/o	femur
	fibr/o	fiber
	gangli/o	ganglion (knot)
	gastr/o	stomach
	-gen	origin or production
	gen/o	origin or production
	ger/o	old age
	-genesis	origin or production
	gingiv/o	gums
	gli/o	glue
	glomerul/o	glomerulus (little ball)
	gloss/o	tongue
	glott/o	opening
	gluc/o	sugar
	glyc/o	sugar
	glycos/o	sugar
	gnos/o	knowing
	-gram	record
	-graph	instrument for recording
	-graphy	process of recording
	gynec/o	woman
	hem/o	blood
	hemat/o	blood
	hemi-	half
	hepat/o, hepatic/o	liver
	herni/o	hernia
	hetero-	different
	hidr/o	sweat
	hist-	history

Term Basics

Most medical terms have three basic components: **root**, **suffix**, and **prefix**.

The **root** is the **foundation** or **subject** of the term. All medical terms have one or more roots.

The **suffix** is the term **ending** that modifies and gives essential meaning to the root. All terms have a suffix.

The **prefix** is a term **beginning** used only when needed to further modify the root or roots. Not all medical terms have a prefix.

A **combining vowel** (usually **o** or **i**) connects a root to another root or to a suffix (term ending). A combining vowel is not used if the suffix begins with a vowel, but is retained when the suffix begins with a consonant.

A **combining form** is a **root plus** a combining vowel. Remembering combining forms makes it easy to form and spell medical terms.

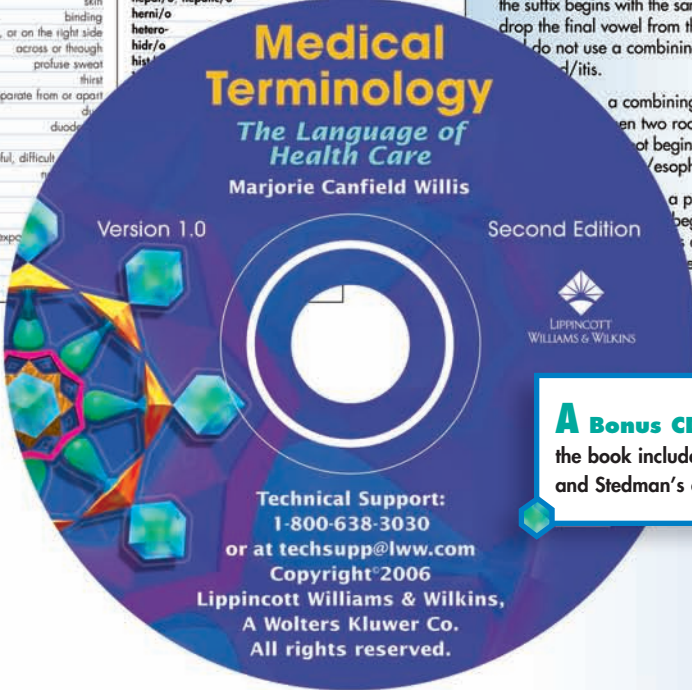
Most medical terms can be defined by determining the meaning of the **suffix** first, then the **prefix** (if present), then the **root** or **roots**. Consult a good medical dictionary for the meaning of terms that are exceptions to this general rule.

Rules for Forming and Spelling Medical Terms

- 1 A combining vowel is used to join root to root as well as root to any suffix beginning with a consonant, e.g., electr/o/cardi/o/gram.
- 2 A combining vowel is not used before a suffix that begins with a vowel, e.g., vas/ectomy.
- 3 If the root ends in a vowel and the suffix begins with the same vowel, drop the final vowel from the root and do not use a combining vowel, e.g., cardi/o/edema.

A combining vowel is used to join two roots even when the second root begins with a vowel, e.g., gastroesophageal.

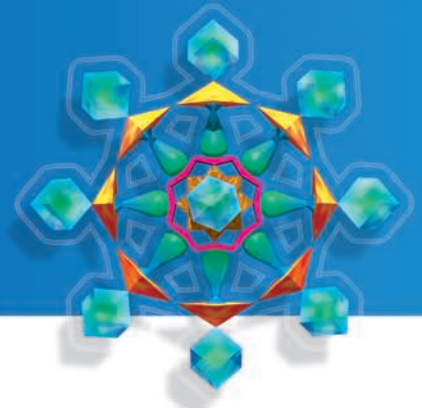
A prefix ends with a vowel and the root begins with a vowel, e.g., cardi/o/edema.



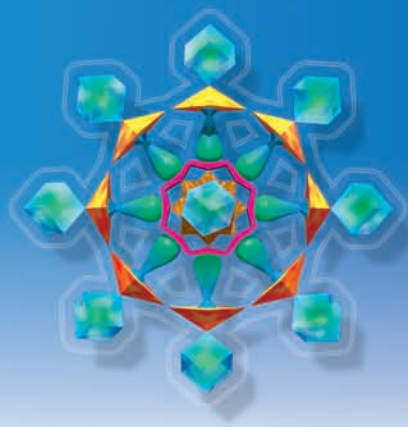
A Bonus CD-ROM packaged with the book includes assessment exercises and Stedman's audio pronunciations.

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Contents



Preface	ix
Acknowledgments.....	xi
User's Guide	xiii
1 Building a Medical Vocabulary: Getting Started.....	1
2 Basic Term Components	9
3 Fields of Medical Practice	38
4 The Medical Record	54
5 Integumentary System	107
6 Musculoskeletal System	144
7 Cardiovascular System	192
8 Blood and Lymph Systems	241
9 Respiratory System.....	269
10 Nervous System	310
11 Endocrine System	358
12 Eye	386
13 Ear	415
14 Gastrointestinal System	437
15 Urinary System	482
16 Male Reproductive System	509
17 Female Reproductive System	535
APPENDICES	
A Glossary of Prefixes, Suffixes, and Combining Forms	585
B Abbreviations and Symbols	591
C Commonly Prescribed Drugs	594
D Answers to Practice Exercises.....	604
Figure Credits	627
Index	631



Building a Medical Vocabulary: Getting Started

OBJECTIVES

After completion of this chapter you will be able to

- ◆ Make a personal commitment to learn medical terminology
- ◆ Describe methods of study time management
- ◆ Explain the value of positive thinking in the learning process
- ◆ Choose a relaxing environment in which to study
- ◆ Explain how a healthy diet and regular exercise are beneficial to learning
- ◆ Use all senses to reinforce memory
- ◆ Prepare and use flash cards
- ◆ List suggested study tips
- ◆ Identify the learning tools that best fit your individual style

Personal Aspects of Successful Learning

To begin learning medical terminology, organize your study time and examine methods for efficient memorization. Consider the following personal aspects of successful learning.

COMMITMENT

Personal commitment is key to developing a solid knowledge of medical language. A strong pledge and lots of practice are necessary to memorize the basic building blocks of medical terms. Make that promise now!

TIME MANAGEMENT

Effective time management is essential. Other activities will always compete with the time available for study. Once committed to your goal, you must outline a reasonable plan for completion. Follow the study path this text and your instructor provide, and incorporate the necessary study time into your personal schedule.

Set aside *prime time* for study. Prime time is time during the day or evening when you feel most alert and at your finest, and it is when learning is best accomplished. Identify your personal prime time, and try your best to allot a concentrated block of it for memory work.

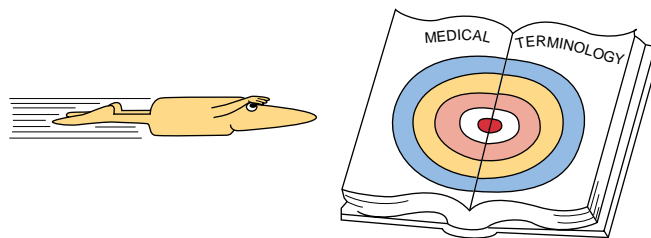


Figure 1.1 Focus on goals and plan for success.

The most common time-management problem is procrastination—putting tasks off until later. If you suffer from this affliction, you will need to act to curb this ineffective habit pattern and keep yourself on target. When you catch yourself procrastinating, focus immediately on the positive aspects of your commitment and the learning goals you have set. Try easing your way in by dividing studies into small segments you can reasonably complete. Take time to notice what you have accomplished, and reward yourself periodically for a job well done! Focus on your goals and the many rewards of accomplishment (Fig. 1.1).

ATTITUDE

Positive thinking is vital for effective learning. Feeling confident stems from positive thoughts. Negative thoughts always lead to defeat. Replace all negative thoughts with “can do” affirmatives that make confident thoughts a habit. A positive approach will help you to stay balanced when you encounter the inevitable hurdles and problems of life. Concentrate on what is “good”!

RELAXATION

Mental relaxation is indispensable for successful learning. The tension resulting from fear of failure or any other cause makes learning difficult or impossible. Give yourself a comfortable, relaxing atmosphere for studying. Consider listening to music you enjoy and find relaxing.

FITNESS

Regular, moderate exercise has been proven to reduce stress. Include it in your overall plan for successful learning. A healthy diet also provides the “fuel power” necessary for mental stamina.

Learning Tools

Part of setting the stage for learning is laying out effective tools and identifying the method of approach that meets one’s individual needs. Sort out the following suggestions, and customize the ones that work best for you.

USING YOUR GOOD SENSES

When learning, the brain reinforces and retains facts as a result of interaction with the senses. The senses form mental images that are the basis for thought. We see (visual sense), we hear (auditory sense), we feel (kinesthetic sense), and, to a lesser degree, we taste (gustatory sense) and smell (olfactory sense).

An effective memory depends on intricate processes that recall mental images of sights, sounds, feelings, tastes, and smells. For this reason, try to include as

many senses as possible in the process of reinforcing learning. Remember the three basics:

SEE IT	For visual reinforcement
SAY IT	For auditory reinforcement
WRITE IT	For kinesthetic reinforcement

FLASH CARDS FOR PREFIXES, SUFFIXES, AND COMBINING FORMS

Make a 3 × 5" card for each prefix, suffix, and combining form listed in Chapter 2. Write each component on the front and its meaning on the back. Include a sample word or a drawing depicting the component to reinforce your visual sense (Fig. 1.2).

Use cards with different colors for each category, e.g., prefixes on blue cards, suffixes on green cards, and combining forms on pink cards. You can use pens of different colors for special emphasis, such as the prefix (blue card) in blue ink and the meaning on the reverse in red ink. Choose colors that are most pleasing to your visual and kinesthetic senses.

Also, within a category you can make distinctions; e.g., use green cards for all suffixes, but use different colors when writing meanings to indicate the types of suffixes [symptomatic suffixes (blue ink), diagnostic suffixes (green ink), operative/surgical suffixes (red ink), and general suffixes (black ink)]. These are just suggestions. Be as creative as you wish, and use colors that you find most pleasing or eye-catching.

Organizing Flash Cards

Punch a hole in the top of each flash card, and loop each card through a key chain or ring holder to make a "rotary file." This method keeps groups of cards together and prevents them from becoming lost or scattered. Within this file, you can group associated cards for components related to color, size, position, direction, etc.

Frugal Flash Cards

Preparing flash cards for each prefix, suffix, and combining form in Chapter 2 is well worth your effort and will pay off in memory reinforcement. Continue to make flash cards for each combining form added in Chapters 5 to 17.

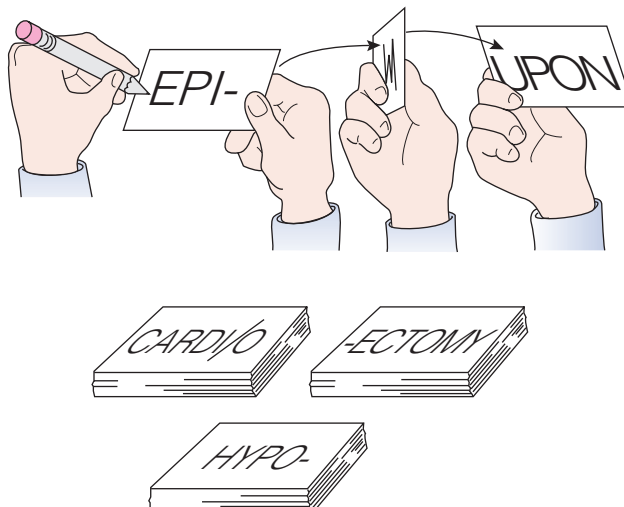


Figure 1.2 Preparing flash cards.



Figure 1.3 Using the frugal flash card.

Also include abbreviations, symbols, and terms found throughout the text; however, if your stack of flash cards has become cumbersome, you may want to try the frugal flash card, so named because it consolidates paper and is inexpensive.

Fold a piece of $8\frac{1}{2} \times 11$ " lined paper in half lengthwise. Write the word component, symbol, or term on the first line of the first column and its definition on the same line in the second column. Skip a line and write the next word component, symbol, or term with its definition on the same line in the second column. Continue listing terms with corresponding definitions until you reach the bottom. Then fold the paper at the lengthwise crease so that the word component, symbol, or term is listed on one side and the definition appears on the same line on the other side. This lets you flip from one side to the other, "flashing" and reinforcing the meanings of the terms. Use the other side of the paper in the same way (Fig. 1.3).

Snatching Moments

Carry your flash cards with you at all times. During most days, there are times when you can snatch a moment to use your flash cards. You will feel less stress when waiting in a line or for an appointment if you know that you can use that time for study (Fig. 1.4).

Remember to use your good senses:

- | | |
|----------|--|
| SEE IT | Employ your visual sense by making and repeatedly reviewing flash cards. |
| SAY IT | Pronounce each component out loud three times as you flash each card to reinforce your auditory sense. |
| WRITE IT | Make each flash card by hand using pleasant colored paper and ink to satisfy your kinesthetic sense. |

DON'T HESITATE TO ANNOTATE!

Annotating simply refers to making notes as you read. Learning and reading research indicates that students retain information best after reflecting on what they've read and physically making notes with a pen or pencil that organize the material, clarify questions, and link new information to old. It is not enough to highlight or underline. As you read each chapter, and during lecture on related material, make notes in the

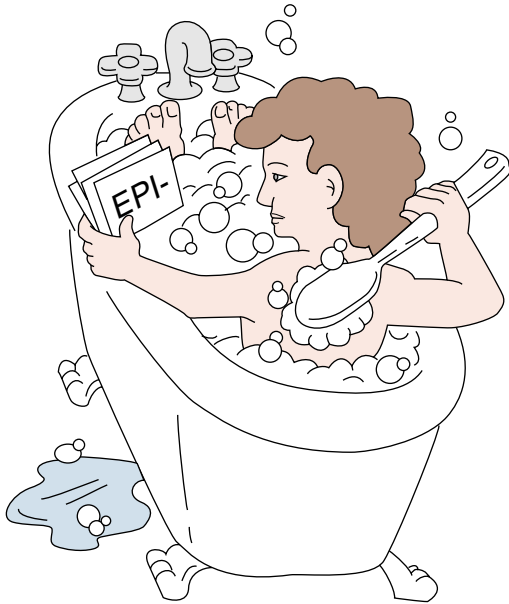


Figure 1.4 Snatching moments.

margins and look carefully at every new term or definition you encounter. Draw lines to separate the component parts of key terms, and write out their meanings.

MNEMONICS CAN HELP

Mnemonics, referring to any device for aiding memory, is named for the goddess of memory in Greek mythology. Mnemonic techniques link things to be remembered with clues for their recall using the stimulus of images, sounds, smell, touch, etc. Consider the following applications:

Draw pictures of word components for reinforcement. Often the most absurd associations can help you to remember. It does not matter if they make sense to no one but you (Fig. 1.5).

Make up rhymes or stories that help to differentiate between meanings. For example, “peri-,” the prefix meaning *around*, is often confused with “para-,” the prefix meaning *alongside of*. Use the two components in a sentence to compare their meanings; e.g., I sat “para” (**alongside of**) Sarah on the merry “peri” go-**around**.

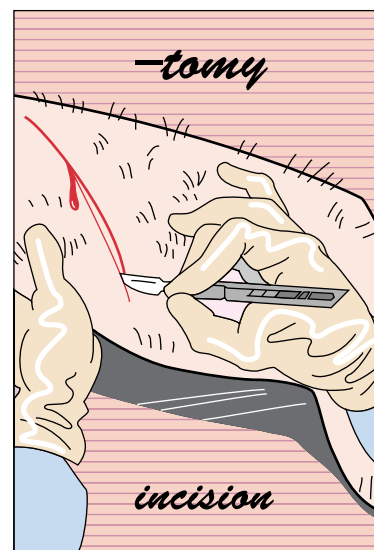
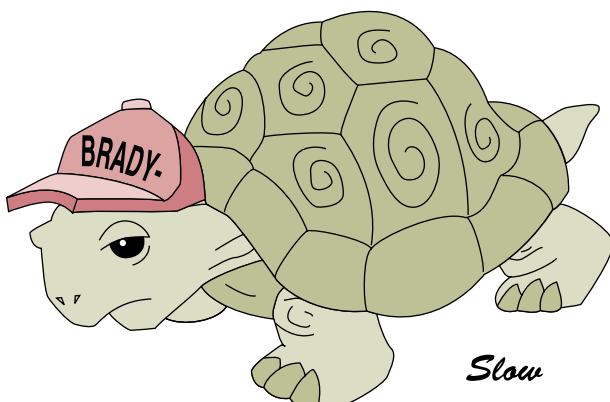


Figure 1.5 Draw pictures of word components for reinforcement.

Make up songs and rhythms to help remember facts. Take a song you are familiar with like “Row, row, row, your boat” and insert words with definitions that are in tune with the song.

Other Study Tips

Give yourself a memory drill by listing word components, symbols, or terms on one side of a paper and then filling in the definitions from memory. Write corrections in red ink. List the incorrectly defined components on a separate paper, and repeat the drill. Repeat this process until you have identified a list of those most continually found incorrect. Spend additional time on those troublesome terms.

Tape record lectures, and listen to pronunciations included in the CD-ROM that accompanies the text.

Find a study “buddy” or group from class. Compare notes, study techniques, quiz each other, and enjoy healthy competition.

Take advantage of the many fun and interactive learning activities this text provides in the CD-ROM, including:

- A pronunciation glossary with audio pronunciations
- Spelling bees to help you recognize and correctly spell terms
- Labeling exercises to reinforce and test your knowledge of medical terms and anatomy
- Games in which you match terms or components with definitions
- Scored and unscored chapter quizzes for knowledge assessment
- Interactive medical record exercises

Let your imagination be your guide. Be creative and make learning fun!



PRACTICE EXERCISES

1. Name the personal aspect that is key to developing a solid knowledge of medical language. _____

2. Identify your personal prime time. _____
3. Identify at least three methods for confronting procrastination. _____

4. How can a positive attitude help you with learning? _____

5. Give an example of a positive affirmation. _____

6. List at least three ways you can provide a relaxed environment in which to study.

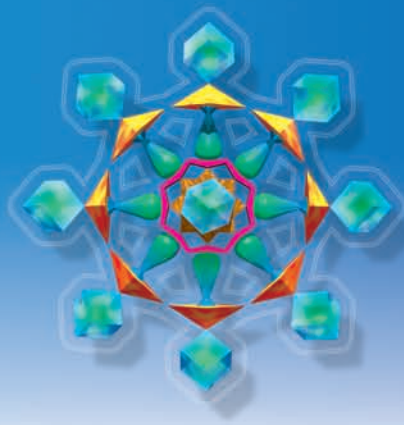
7. How can a healthy diet and regular exercise help you learn? _____

8. List the three basic sensory rules for memorizing facts. _____

9. Describe the usefulness of preparing flash cards. _____

10. Explain what it means to annotate text material. _____

11. Identify at least three other study tips described in Chapter 1. _____



Basic Term Components

OBJECTIVES

After completion of this chapter you will be able to

- ◆ Describe the origin of medical language
- ◆ Analyze the component parts of a medical term
- ◆ List basic prefixes, suffixes, and combining forms
- ◆ Use basic prefixes, suffixes, and combining forms to build medical terms
- ◆ Explain common rules for proper medical term formation, pronunciation, and spelling

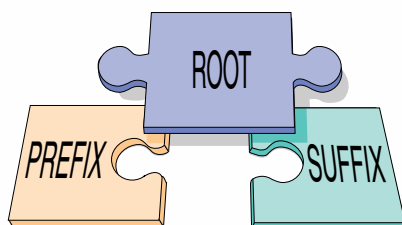
Most medical terms stem from Greek or Latin origins. These date to the founding of modern medicine by the Greeks and the influence of Latin when it was the universal language in the Western world. Other languages, such as German and French, have also influenced medical terms, and many new terms are derived from English, which is considered the universal language. Most terms related to diagnosis and surgery have Greek origin, and most anatomical terms can be traced to Latin.

Once you learn the basic medical term structure and memorize the most common term components (prefixes, suffixes, and combining forms), you can get the meaning of most medical terms by defining their parts. Those mysterious words, which are almost frightening at first, will soon no longer be a concern. You will analyze each term with your newly acquired knowledge and the help of a good medical dictionary.

This chapter lists common prefixes, suffixes, and a selected number of common combining forms. More combining forms and other pertinent prefixes and suffixes will be added in following chapters as you learn terms related to the body systems. The basic rules for proper medical term formation, pronunciation, and spelling are also presented here.

The key to success in building a medical vocabulary is the groundwork you do now by making flash cards and memorizing the basic term components in this chapter. The work will pay big dividends if you do.

Analysis of Term Components



Most medical terms have three components: root, suffix, and prefix.

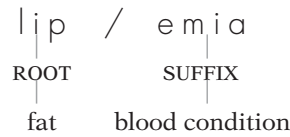


ETYMOLOGY.

The Greek root etymon refers to that which is true or genuine. Etymology is the study of the origin and development of words from the source language, original meaning, and history of usage.

ROOT AND SUFFIX

Each term is formed by combining at least one root, the foundation or subject of the word, and a suffix, the ending that modifies and gives essential meaning to the root. For example, in lipemia,

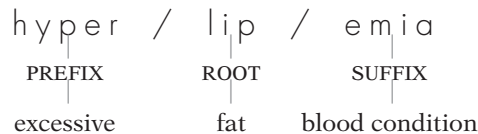


Lip (fat), the root, is the subject. It is modified by the suffix (emia) to indicate a condition of fat in the blood. Note that each component is dependent on the other to express meaning.

Note: lipemia is synonymous with lipidemia (formed from lip, oid, and emia)

PREFIX

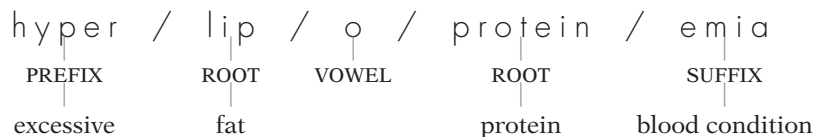
The prefix is a word structure placed at the beginning of a term when needed to further modify the root or roots. For example, in hyperlipemia



The addition of the prefix, hyper, modifies the root to denote excessive fat in the blood.

ADDITIONAL ROOTS

Often a medical term is formed of two or more roots. For example, in hyperlipoproteinemia



In this term, the additional root, protein (joined to lip by the vowel “o”), further defines the word to indicate an excessive amount of fat and protein in the blood.

COMBINING VOWELS AND COMBINING FORMS

When a medical term has more than one root, each is joined by a vowel, usually an o. As shown in the term hyperlip/o/protein/emia, the o links the two roots and fosters easier pronunciation. This vowel is known as a *combining vowel*; o is the most common combining vowel (i is the second most common) and is used so frequently to join root to root or root to suffix that it is routinely attached to the root and presented as a *combining form*:



This text lists combining forms for easier term formation and analysis.

QUICK REVIEW

Complete the following sentences:

1. Most medical terms have three basic parts: the _____, _____, and _____.
2. The root is the _____ of the term.
3. The _____ is the word ending that modifies and gives essential meaning to the root.
4. The _____ is a word structure at the beginning of a term that further modifies the root.
5. Often a medical term is formed of _____ or more roots.
6. When a medical term has more than one root, it is joined together by a _____ (usually an _____).
7. A combining form is a _____ with a _____ attached.

QUICK REVIEW ANSWERS

- | | | |
|--------------------------|-----------------------|----------------|
| 1. root, suffix, prefix | 4. prefix | 7. root, vowel |
| 2. foundation or subject | 5. two | |
| 3. suffix | 6. combining vowel, o | |

Required Activity

Using the guidelines found in Chapter 1 (see “Flash Cards for Prefixes, Suffixes, and Combining Forms”, page 3), prepare flash cards for the basic term components listed in this chapter: prefixes (pages 20–22), combining forms (pages 23–25), and suffixes (pages 25–28). Memorize them in preparation for analysis of medical term formations, spelling considerations, and rules of pronunciation.

Rules for Forming and Spelling Medical Terms

Memorizing and spelling basic medical word components are the first steps for learning how to form medical terms. The next step is to construct the words using the following rules:

1. A combining vowel is used to join root to root as well as root to any suffix beginning with a consonant:

e|lectr	+	cardi	+	-gram
ROOT		ROOT		SUFFIX
electric		heart		record

electr/o/cardio/gram

electrocardiogram (ELECTRICAL RECORD OF THE HEART)

2. A combining vowel is *not* used before a suffix that begins with a vowel:

v a s	+	e c t o m y
R O O T		S U F F I X
vessel		excision

v a s / e c t o m y

v a s e c t o m y (EXCISION OF A VESSEL)

3. If the root ends in a vowel and the suffix begins with the same vowel, drop the final vowel from the root and do not use a combining vowel:

c a r d i	+	i t i s
R O O T		S U F F I X
heart		inflammation

c a r d / i t i s

c a r d i t i s (INFLAMMATION OF THE HEART)

4. Most often, a combining vowel is inserted between two roots even when the second root begins with a vowel:

c a r d i	+	e s o p h a g	+	e a l
R O O T		R O O T		S U F F I X
heart		esophagus		pertaining to

c a r d i / o / e s o p h a g e a l

c a r d i o e s o p h a g e a l (PERTAINING TO THE HEART AND ESOPHAGUS)

5. Occasionally, when a prefix ends in a vowel and the root begins with a vowel, the final vowel is dropped from the prefix:

p a r a	+	e n t e r	+	a l
P R E F I X		R O O T		S U F F I X
alongside of		intestine		pertaining to

p a r / e n t e r / a l

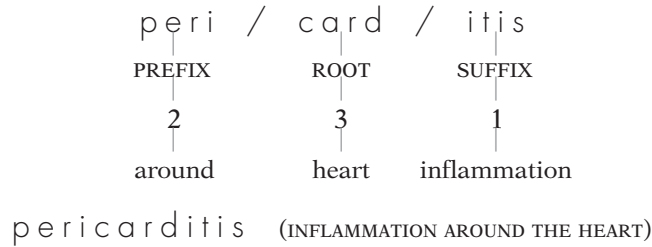
p a r e n t e r a l (PERTAINING TO ALONGSIDE OF THE INTESTINE)

Breaking down and defining the components in a term often clues you to its meaning. Frequently, however, you must consult a medical dictionary to obtain a precise definition. Take a moment to look up *parenteral*, so you understand the complete meaning.

Note: There are many exceptions to these rules. Follow the basic guidelines, but be prepared to accept exceptions as you encounter them. Rely on your medical dictionary for additional guidance.

Defining Medical Terms Through Word Structure Analysis

You can usually define a term by interpreting the suffix first, then the prefix (if present), then the succeeding root or roots. For example, in pericarditis,



You sense the basic meaning of this term by understanding its components; however, the dictionary clarifies that the term refers to inflammation of the pericardium, the sac that encloses the heart.

Note: Beginning students often have difficulty differentiating between prefixes and roots (or combining forms) because the root appears first in a medical term when a prefix is not used. It is important to memorize the most common prefixes so that you can tell the difference. Also, keep in mind that a prefix is only used as needed to further modify the root or roots.

QUICK REVIEW

1. A combining vowel is used to join root to root as well as root to any suffix beginning with a consonant.
2. A combining vowel is not used before a suffix that begins with a vowel.
3. If the root ends in a vowel and the suffix begins with the same vowel, drop the final vowel from the root and do not use a combining vowel.
4. Most often, a combining vowel is inserted between two roots even when the second root begins with a vowel.
5. Occasionally, when a prefix ends in a vowel and the root begins with a vowel, the final vowel is dropped from the prefix.

Identify which of the rules listed above were applied when forming the following terms:

1. angi + -ectasis = angi/ectasis _____
2. hemat + -logy = hemato/logy _____
3. oste + -ectomy = ost/ectomy _____
4. electr + encephal + -gram = electro/encephalo/gram _____
5. para- + umbilic + -al = par/umbilic/al _____
6. vas + -ectomy = vas/ectomy _____
7. arteri + -itis = arter/itis _____
8. gastr + enter + -cele = gastro/entero/cele _____
9. gastr + -tomy = gastro/tomy _____
10. hypo + ox + -ia = hyp/ox/ia _____

QUICK REVIEW ANSWERS

- | | | |
|---------|---------|----------|
| 1. 2 | 5. 5, 2 | 9. 1 |
| 2. 1 | 6. 2 | 10. 5, 2 |
| 3. 3 | 7. 3 | |
| 4. 4, 1 | 8. 4, 1 | |

Formation of Medical Terms

Most medical terms build from the root. Prefixes and suffixes are attached to the root to modify its meaning. Often two or more roots are linked before being modified. The following are examples of the various patterns of medical term formation using the root *cardi* (heart) as a base. Note the rules used for forming each term.

Root/Suffix

cardi/ac
 HEART PERTAINING TO
 (pertaining to the heart)

Prefix/Root/Suffix

epi/card/ium
 UPON HEART TISSUE
 (tissue upon the heart, i.e., external lining of the heart)

Prefix/Prefix/Root/Suffix

sub/endo/card/ial
 BENEATH WITHIN HEART PERTAINING TO
 (pertaining to beneath and within the heart)

Root/Combining Vowel/Suffix

cardi/o/logy
 HEART STUDY OF
 (study of the heart)

Root/Combining Vowel/Root/Suffix

cardi/o/pulmon/ary
 HEART LUNG PERTAINING TO
 (pertaining to the heart and lungs)

Root/Combining Vowel/Suffix (symptomatic)

cardi/o/dynia
 HEART PAIN
 (pain in the heart)

Root/Combining Vowel/Suffix (diagnostic)

cardi/o/rrhexis
 HEART RUPTURE
 (a rupture of the heart)

Root/Combining Vowel/Suffix (operative)

cardi / o / rrrhaphy
 HEART SUTURE
 (a suture of the heart)

A FEW EXCEPTIONS

As noted above, most medical terms are formed by the combination of a root or roots modified by suffixes and prefixes. Occasionally, terms are formed by a root alone or a combination of roots.

EXAMPLES

duct
 ROOT
 to lead

ovi / duct
 ROOT ROOT
 egg to lead

Oviduct refers to the uterine tube.

Sometimes, you will find a term formed from the combination of a prefix and a suffix.

EXAMPLE

meta / stasis
 PREFIX SUFFIX
 beyond, after, stop or stand
 or change

Metastasis refers to the spread of a disease, such as cancer, from one location to another.

QUICK REVIEW

Analyze the following terms by separating each component, and then define the individual elements:

1. gastric _____
2. epigastric _____
3. gastrocardiac _____
4. epigastralgia _____
5. gastroscopy _____
6. epigastrocele _____
7. gastrotomy _____
8. epigastrorrhaphy _____

QUICK REVIEW ANSWERS

1. gastr/ic pertaining to the stomach
2. epi/gastr/ic pertaining to upon the stomach
3. gastr/o/cardi/ac or gastro/cardi/ac pertaining to the stomach and heart
4. epi/gastr/algia pain upon the stomach
5. gastr/o/scopy or gastro/scopy examination of the stomach
6. epi/gastr/o/cele or epi/gastro/cele pouching or hernia upon the stomach
7. gastr/o/tomy or gastro/tomy incision in the stomach
8. epi/gastr/o/rrhaphy or epi/gastro/rrhaphy suture upon the stomach

Spelling Medical Terms

Correct spelling of medical terms is crucial for communication among health care professionals. Careless spelling causes misunderstandings that can have serious consequences. The following are some of the pitfalls to avoid.

1. Some words sound exactly the same but are spelled differently and have different meanings. Context is the clue to spelling. For example,

i l e u m (PART OF THE INTESTINE)	i l i u m (PART OF THE HIP BONE)
s i t o l o g y (STUDY OF FOOD)	c y t o l o g y (STUDY OF CELLS)

2. Other words sound similar but are spelled differently and have different meanings. For example,

a b d u c t i o n (TO DRAW AWAY FROM)	a d d u c t i o n (TO DRAW TOWARD)
h e p a t o m a (LIVER TUMOR)	h e m a t o m a (BLOOD TUMOR)
a p h a g i a (INABILITY TO SWALLOW)	a p h a s i a (INABILITY TO SPEAK)

3. When letters are silent in a term, they risk being omitted when spelling the word. For example,

pt has a “t” sound if found at the beginning of a term [e.g., pterygium, but both the “p” and “t” are pronounced when found within a term [e.g., nephroptosis (nef-rop-tō’sis)]

ph has an “f” sound (e.g., diaphragm)

ps has an “s” sound (e.g., psychology)

4. Some words have more than one accepted spelling. For example,

o r t h o p e d i c ORTHOPAEDIC (BRITISH)
l e u k o c y t e LEUCOCYTE (BRITISH)

5. Some combining forms have the same meaning but different origins that compete for usage. For example, there are three combining forms referring to the uterus:

hyster/o (GREEK)

metr/o (GREEK)

uter/o (LATIN)

ACCEPTABLE TERM FORMATIONS

As you learn medical terms, you can have fun experimenting with creating words, such as glyco (sweet) + cardio (heart) = sweetheart! However, in the real medical world, the word is formed when the term is coined. Often there seems to be no reason why a particular word form became acceptable. That is why you should check your medical dictionary when in doubt about the spelling, formation, or precise meaning.

Rules of Pronunciation

When you first learn to pronounce medical terms, the task can seem insurmountable. The first time you open your mouth to say a term is a tense moment for those who want to get it right! The best preparation is to study the basic rules of pronunciation, repeat the words after hearing them pronounced on the CD-ROM accompanying this text and/or after your instructor has said them, and try to keep the company of others who use medical language. There is nothing like the validation you get from the fact that no one laughed or snarled at you when you said something “medical” for the very first time! Your confidence will build with every word you use.

Following are some helpful shortcuts:

Shortcuts to Pronunciation	
Consonant	Example
c (before a, o, u) = k	cavity colon cure
c (before e, i) = s	cephalic cirrhosis
ch = k	cholesterol
g (before a, o, u) = g	gallstone gonad gurney
g (before e, i) = j	generic giant
ph = f	phase
pn = n	pneumonia
ps = s	psychology
pt = t	ptosis pterygium

Consonant	Example
rh = r	rhythm
rrh = r	hemorrhoid
x = z (as first letter)	xerosis

THE PHONETIC SYSTEM

Phonetic spelling for pronunciation of most medical terms in this text is in parentheses below the term (beginning with Chapter 3). The phonetic system used is basic and has only a few standard rules. The macron and breve are the two diacritical marks used. The macron (¯) is placed over vowels that have a long sound:

ā	day
ē	be
ī	kite
ō	no
ū	unit

The breve (˘) is placed over vowels that have a short sound:

ă	alone
ĕ	ever
ĭ	pit
ŏ	ton
ŭ	sun

The primary accent (´) is placed after the syllable that is stressed when saying the word. Monosyllables do not have a stress mark. Other syllables are separated by hyphens.

QUICK REVIEW

1. The *pt* in *pterygium* has a/an ____ sound.
2. The *ch* in the word *chronic* has a/an ____ sound.
3. The *c* in the word *cirrhosis* has a/an ____ sound.
4. The *x* in *xerosis* has a/an ____ sound.
5. The *g* in *genital* has a/an ____ sound.
6. The *pn* in *pneumatic* has a/an ____ sound.

QUICK REVIEW ANSWERS

- | | |
|------|------|
| 1. t | 4. z |
| 2. k | 5. j |
| 3. s | 6. n |

Singular and Plural Forms

Most often, plurals are formed by adding -s or -es to the end of a singular form. The following are common exceptions.

Singular		Plural	
ENDING	EXAMPLE	ENDING	EXAMPLE
-a	vertebra	-ae	vertebrae
-is	diagnosis	-es	diagnoses
-ma	condyloma	-mata	condylomata
-on	phenomenon	-a	phenomena
-um	bacterium	-a	bacteria
-us ^a	fungus	-i	fungi
-ax	thorax	-aces	thoraces
-ex	apex	-ices	apices
-ix	appendix	-ices	appendices
-y	myopathy	-ies	myopathies

^aViruses and sinuses are not exceptions.

QUICK REVIEW

Convert the following singular forms to plural:

1. bulla _____
2. speculum _____
3. fungus _____
4. stoma _____
5. anomaly _____
6. prognosis _____

QUICK REVIEW ANSWERS

1. bullae
2. specula
3. fungi
4. stomata
5. anomalies
6. prognoses

Common Prefixes

A list of commonly used prefixes organized within categories follows. A hyphen is placed after each prefix to indicate its link at the beginning of a medical term. Each includes a term example. Appendix A and the Quick Study Reference include a summary list of prefixes in alphabetical order.

Prefix	Meaning	Example
NEGATION		
a-, an-	without	aphonia (<i>without</i> voice or sound) anaerobic (pertaining to <i>without</i> air)
anti-, contra-	against or opposed to	anticoagulant (<i>against</i> clotting) contraception (<i>opposed</i> to becoming pregnant)
de-	from, down, or not	decapitate [separation of the head (<i>caput</i>) <i>from</i> the body]
POSITION/DIRECTION		
ab-	away from	abnormal (pertaining to <i>away from</i> normal)
ad-	to, toward, or near	adhesion (<i>to</i> stick to)
circum-, peri-	around	circumvascular (pertaining to <i>around</i> a vessel) periosteum (pertaining to <i>around</i> bone)
dia-, trans-	across or through	dialysis [dissolution <i>across</i> or <i>through</i> (a membrane)] transmission (to send <i>across</i> or <i>through</i>)
e-, ec-, ex-	out or away	edentia (condition of teeth <i>out</i>) [dent/o=teeth] eccentric (pertaining to <i>away from</i> center) excise (to cut <i>out</i>) [cis/o=to cut]
ecto-, exo-, extra-	outside	ectopic (pertaining to a place <i>outside</i>) exocrine (denoting secretion <i>outside</i>) extravascular (pertaining to <i>outside</i> a vessel)
en-, endo-, intra-	within	encapsulate (<i>within</i> little box) endoscope (instrument for examination <i>within</i>) intra-dermal (pertaining to <i>within</i> skin)

Prefix	Meaning	Example
epi-	upon	epidermal (pertaining to <i>upon</i> the skin)
inter-	between	intercostal (pertaining to <i>between</i> the ribs) [cost/o=rib]
meso-	middle	mesomorphic (pertaining to <i>middle</i> form)
meta-	beyond, after, or change	metastasis [<i>beyond</i> stopping or standing (spread of disease from one part of the body to another)] metamorphosis (condition of <i>change</i> in form)
para-	alongside of or abnormal	paramedic (pertaining to <i>alongside of</i> medicine) paranoia (condition of <i>abnormal</i> thinking)
retro-	backward or behind	retrograde (going <i>backward</i>)
sub-, infra-	below or under	infraumbilical (pertaining to <i>below</i> the navel) [umbilic/o=navel] sublingual (pertaining to <i>under</i> the tongue) [lingu/o=tongue]
QUANTITY OR MEASUREMENT		
bi-	two or both	bilateral (pertaining to <i>two or both</i> sides)
hemi-, semi-	half	hemicephalic (pertaining to <i>half</i> of the head) semilunar (pertaining to <i>half</i> moon) [luna=moon]
hyper-	above or excessive	hyperlipemia (<i>excessive</i> fat in blood)
hypo-	below or deficient	hypothermia (condition of <i>below</i> normal temperature) [therm/o=heat]
macro-	large or long	macrocyte (<i>large</i> cell)
micro-	small	microlith (<i>small</i> stone)
mono-, uni-	one	monochromatic (pertaining to <i>one</i> color) [chromat/o=color] unilateral (pertaining to <i>one</i> side)
oligo-	few or deficient	oliguria (condition of <i>deficient</i> urine)
pan-	all	panacea (a cure- <i>all</i>)

Prefix	Meaning	Example
poly-, multi-	many	polyphobia (condition of <i>many</i> fears) multicellular (pertaining to <i>many</i> cells)
quadri-	four	quadriplegia (paralysis of all <i>four</i> limbs)
super-, supra-	above or excessive	suprarenal (pertaining to <i>above</i> the kidney) supernumerary [<i>excessive</i> numbers (too many to count)]
tri-	three	triangle (<i>three</i> angles)
ultra-	beyond or excessive	ultrasonic (pertaining to <i>beyond</i> sound)
TIME		
ante-, pre-, pro-	before	antepartum (<i>before</i> labor) premature (<i>before</i> ripe) prognosis [<i>before</i> knowing (prediction of course and outcome of a disease)]
brady-	slow	bradycardia (condition of <i>slow</i> heart)
tachy-	fast	tachycardia (condition of <i>fast</i> heart)
post-	after or behind	postoperative [<i>after</i> operation (surgery)]
re-	again or back	reactivate (to make active <i>again</i>)
GENERAL		
con-, syn-, sym-	together or with	syndactylism (webbing <i>together</i> of toes or fingers) [dactyl/o= finger or toe] symbiosis (presence of life <i>together</i>) [bio=life] congenital (pertaining to being born <i>with</i>)
dys-	painful, difficult, or faulty	dysphonia [condition of <i>difficult</i> voice or sound (hoarseness)]
eu-	good or normal	eugenic (pertaining to <i>good</i> production)
neo-	new	neoplasia [<i>a new</i> (abnormal) formation]

Common Combining Forms

Following are selected combining forms (roots with combining vowels attached) to give you a start toward building medical terms. Additional combining forms are introduced at the beginning of Chapters 5 to 17 on body systems. Each is presented with a slash between the root and the combining vowel along with a term example. Appendix A and the Quick Study Reference include a summary list of combining forms in alphabetical order.

Combining Forms		
Combining Form	Meaning	Example
abdomin/o	abdomen	abdominal (pertaining to <i>abdomen</i>)
lapar/o		laparotomy (incision into the <i>abdomen</i>)
acr/o	extremity or topmost	acrodynia (pain in an <i>extremity</i>) acrophobia [exaggerated fear of <i>topmost</i> places (heights)]
aden/o	gland	adenoma (<i>gland</i> tumor)
aer/o	air or gas	aerobic (pertaining to <i>air</i>)
angi/o	vessel	angioplasty (surgical repair of a blood <i>vessel</i>)
vas/o		vasectomy (excision of a <i>vessel</i>)
vascul/o		vascular (pertaining to a <i>vessel</i>)
carcin/o	cancer	carcinogenic (pertaining to production of <i>cancer</i>)
cardi/o	heart	cardiologist (one who specializes in treatment of the <i>heart</i>)
cephal/o	head	cephalic (pertaining to the <i>head</i>)
cyan/o	blue	cyanotic (pertaining to <i>blue</i>)
cyt/o	cell	cytology (study of <i>cells</i>)
derm/o	skin	dermal (pertaining to the <i>skin</i>)
dermat/o		dermatology (study of the <i>skin</i>)
cutane/o		cutaneous (pertaining to the <i>skin</i>)
dextr/o	right or on the right side	dextrocardia (condition of the heart <i>on the right side</i>)
erythr/o	red	erythrocyte (<i>red</i> cell)
fibr/o	fiber	fibroma (<i>fiber</i> tumor)
gastr/o	stomach	gastric (pertaining to the <i>stomach</i>)
gen/o	origin or production	osteogenic (pertaining to <i>origin or production</i> in bone)



CANCER.

Cancer is Latin for crab. The word is derived from the Greek word *karkinos* that was used by Hippocrates and other early writers and also means crab. Some authorities say the word was used because it describes the appearance of the disease; i.e., just as the crab's feet extend in all directions from its body, so can the disease extend in the human. Other authorities relate the term to the obstinacy of a crab in pursuing prey.

Combining Form	Meaning	Example
gluc/o	sugar	glucogenesis (origin or production of <i>sugar</i>)
glucos/o		glucose (<i>sugar</i>)
glyc/o		glycolysis (breakdown or dissolution of <i>sugar</i>)
hem/o	blood	hemogram (record of <i>blood</i>)
hemat/o		hematology (study of <i>blood</i>)
hepat/o	liver	hepatoma (tumor of the <i>liver</i>)
hydr/o	water	hydrophobia (exaggerated fear of <i>water</i>)
leuk/o	white	leukocyte (<i>white</i> cell)
lip/o	fat	lipoid (resembling <i>fat</i>)
lith/o	stone	lithiasis (formation or presence of a <i>stone</i>)
melan/o	black	melanoma (<i>black</i> tumor)
morph/o	form	morphology (study of <i>form</i>)
nas/o	nose	nasal (pertaining to the <i>nose</i>)
rhin/o		rhinitis (inflammation of the <i>nose</i>)
necr/o	death	necrocytosis (condition or increase of cell <i>death</i>)
or/o	mouth	oral (pertaining to the <i>mouth</i>)
orth/o	straight, normal, or correct	orthostatic (pertaining to standing <i>straight</i>)
oste/o	bone	osteal (pertaining to <i>bone</i>)
path/o	disease	pathology (study of <i>disease</i>)
ped/o	child or foot	pediatrics (treatment of <i>child</i>) pedal (pertaining to the <i>foot</i>)
phob/o	exaggerated fear or sensitivity	hydrophobia (<i>exaggerated</i> fear of water) photophobia (<i>sensitivity</i> to light)
phon/o	voice or sound	phonic (pertaining to <i>voice</i> or sound)
plas/o	formation	dysplasia (condition of faulty <i>formation</i>)
pod/o	foot	podiatry (treatment of the <i>foot</i>)
psych/o	mind	psychology (study of the <i>mind</i>)
py/o	pus	pyopoesis (formation of <i>pus</i>)
ren/o	kidney	renal (pertaining to the <i>kidney</i>)
nephr/o		nephrosis (condition of the <i>kidney</i>)

Combining Form	Meaning	Example
scler/o	hard	sclerosis (a condition of <i>hardness</i>)
sinistr/o	left or on the left side	sinistropedal (pertaining to the <i>left</i> foot)
son/o	sound	sonometer (an instrument to measure <i>sound</i>)
sten/o	narrow	stenosis (a condition of <i>narrow</i>)
therm/o	heat	thermometer (instrument for measuring <i>heat</i>)
tox/o	poison	toxemia (<i>poison</i> in blood)
toxic/o		toxicology (study of <i>poison</i>)
troph/o	nourishment or development	trophocyte (a cell that provides <i>nourishment</i>) hypertrophy (condition of excessive <i>development</i>)
ur/o	urine	urology (study of <i>urine</i>)
urin/o		urinary (pertaining to <i>urine</i>)



TOXIN. The Greek root *toxicon* means arrow poison and is derived from the word for the archer's bow. The Greeks often used darts and arrows coated with a poisonous substance.

Common Suffixes

Suffixes are endings that modify the root. They give the root essential meaning by forming a noun, verb, or adjective.

There are two types of suffixes: simple and compound. Simple suffixes form basic terms. For example, *ic* (pertaining to), a simple suffix, combined with the root *gastr* (stomach) forms the term *gastric* (pertaining to the stomach). Compound suffixes are formed by a combination of basic term components. For example, the root *tom* (to cut) combined with the simple suffix *y* (denoting a process of) forms the compound suffix *tomy* (incision); the compound suffix *ectomy* (excision or removal) is formed by a combination of the prefix *ec* (out) with the root *tom* (to cut) and the simple suffix *y* (a process of). Compound suffixes are added to the roots to provide a specific meaning. For example, *hyster* (a root meaning uterus) combined with *ectomy* forms *hysterectomy* (excision of the uterus). Noting the differences between simple and compound suffixes will help you analyze medical terms.

Suffixes in this text are divided into four categories:

- Symptomatic suffixes, which describe the evidence of illness
- Diagnostic suffixes, which provide the name of a medical condition
- Operative (surgical) suffixes, which describe a surgical treatment
- General suffixes, which have general application

Commonly used suffixes follow in alphabetical order except for groups with the same meaning. A hyphen is placed before each to indicate their link at the end of a term.

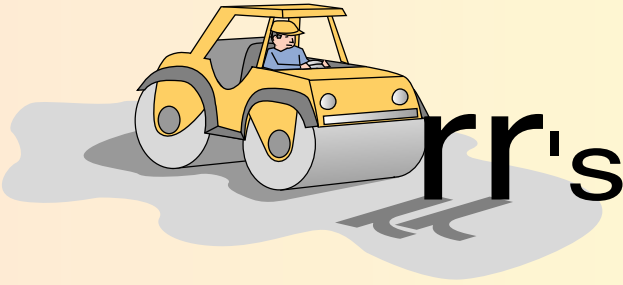
Appendix A and the Quick Study Reference include a summary list of suffixes in alphabetical order.

Suffix	Meaning	Example
SYMPTOMATIC SUFFIXES (WORD ENDINGS THAT DESCRIBE EVIDENCE OF ILLNESS)		
-algia	pain	cephalalgia [<i>pain</i> in the head (headache)]
-dynia		cephalodynia [<i>pain</i> in the head (headache)]
-genesis	origin or production	pathogenesis (<i>origin or production</i> of disease)
-lysis	breaking down or dissolution	hemolysis (<i>breakdown</i> of blood)
-megaly	enlargement	hepatomegaly (<i>enlargement</i> of the liver)
-oid	resembling	lipoid (<i>resembling</i> fat)
-penia	abnormal reduction	leukopenia [<i>abnormal reduction</i> of white (blood cells)]
-rrhea	discharge	rhinorrhea (runny <i>discharge</i> from nose)
-spasm	involuntary contraction	vasospasm (<i>involuntary contraction</i> of a blood vessel)
DIAGNOSTIC SUFFIXES (WORD ENDINGS THAT DESCRIBE A CONDITION OR DISEASE)		
-cele	pouching or hernia	gastrocele (<i>pouching</i> of the stomach)
-ectasis	expansion or dilation	angiectasis (<i>expansion or dilation</i> of a blood vessel)
-emia	blood condition	hyperlipemia (<i>blood condition</i> of excessive fat)
-iasis	formation or presence of	lithiasis (<i>formation or presence</i> of a stone or stones)
-itis	inflammation	hepatitis (<i>inflammation</i> of the liver)
-malacia	softening	osteomalacia (<i>softening</i> of bone)
-oma	tumor	carcinoma (cancer <i>tumor</i>)
-osis	condition or increase	sclerosis (<i>condition</i> of hard) leukocytosis (<i>increase</i> of white cells)
-phil	attraction for	basophil (cell with an <i>attraction</i> for basic dyes)
-philia		pneumophilia (condition that has an <i>attraction</i> for the lungs)

Suffix	Meaning	Example
-ptosis	falling or downward displacement	gastroptosis (<i>downward displacement</i> of the stomach)
-rrhage	to burst forth (usually blood)	hemorrhage (<i>to burst forth</i> blood)
-rrhagia		
-rrhexis	rupture	hepatorrhesis (<i>rupture</i> of the liver)
OPERATIVE SUFFIXES [WORD ENDINGS THAT DESCRIBE A SURGICAL (OPERATIVE) TREATMENT]		
-centesis	puncture for aspiration	abdominocentesis (<i>puncture for aspiration</i> of the abdomen)
-desis	binding	arthrodesis (<i>binding</i> together of a joint) [arthr/o=joint]
-ectomy	excision or removal	nephrectomy (<i>excision or removal</i> of a kidney)
-pexy	suspension or fixation	gastropexy [<i>fixation</i> of the stomach (to the abdominal wall)]
-plasty	surgical repair or reconstruction	rhinoplasty (<i>surgical repair</i> of the nose)
-rrhaphy	suture	osteorrhaphy (<i>suture</i> of bone)
-tomy	incision	laparotomy (<i>incision</i> into the abdomen)
-stomy	creation of an opening	gastrostomy (<i>creation of an opening</i> in the stomach)
-tripsy	crushing	lithotripsy (<i>crushing</i> of stone)
GENERAL SUFFIXES (SUFFIXES THAT HAVE GENERAL APPLICATIONS)		
<i>Noun Endings (suffixes that form a noun when combined with a root)</i>		
-e	noun marker	erythrocyte (a red blood cell)
-ia	condition of	phobia (<i>condition of</i> an exaggerated fear or sensitivity)
-ism		alcoholism (<i>condition of</i> alcohol abuse)
-ium	structure or tissue	epigastrium [<i>structure</i> upon the stomach (region in the abdomen)] pericardium [<i>tissue</i> around the heart (sac enclosing the heart)]
-ation	condition or process of	starvation (<i>condition or process of</i> starving)
-y		adenopathy (<i>condition or process of</i> gland disease)

Suffix	Meaning	Example
<i>Adjective Endings (suffixes that mean "pertaining to" and form an adjective when combined with a root)</i>		
-ac		cardiac (<i>pertaining to the heart</i>)
-al		pedal (<i>pertaining to the foot</i>)
-ar		glandular (<i>pertaining to a gland</i>)
-ary		pulmonary (<i>pertaining to the lung</i>)
-eal		esophageal (<i>pertaining to the esophagus</i>)
-ic		toxic (<i>pertaining to poison</i>)
-ous		fibrous (<i>pertaining to fiber</i>)
-tic		cyanotic (<i>pertaining to blue</i>)
<i>Diminutive Endings (suffixes meaning "small")</i>		
-icle		ventricle (<i>small belly or pouch</i>)
-ole		bronchiole (<i>small airway</i>)
-ula		macula (<i>small spot</i>)
-ule		pustule (<i>small pimple</i>)
<i>Other General Suffixes</i>		
-gram	record	sonogram (<i>record of sound</i>)
-graph	instrument for recording	sonograph (<i>instrument for recording sound</i>)
-graphy	process of recording	sonography (<i>process of recording sound</i>)
-iatrics	treatment	pediatrics (<i>treatment of children</i>)
-iatry		psychiatry (<i>treatment of the mind</i>)
-logy	study of	cytology (<i>study of cells</i>)
-logist	one who specializes in the study or treatment of	psychologist (<i>one who specializes in the study or treatment of the mind</i>)
-ist	one who specializes in	pharmacist (<i>one who specializes in drugs</i>)
-meter	instrument for measuring	spirometer (<i>instrument for measuring breathing</i>) [spir/o = breathing]
-metry	process of measuring	spirometry (<i>process of measuring breathing</i>)
-poiesis	formation	hemopoiesis (<i>formation of blood</i>)
-scope	instrument for examination	endoscope (<i>instrument for examination within</i>)
-scopy	examination	endoscopy (<i>examination within</i>)
-stasis	stop or stand	hemostasis (<i>stop blood</i>) orthostasis (<i>stand straight</i>)

Don't Be Rolled Over by the



We have the Greeks to thank for the suffixes with **double rr's**. Take a careful look at each so that you will spell them correctly in a term!

Suffix	Meaning	Example
-rrhea	discharge	pyorrh ea —a discharge of pus
-rrhage or -rrhagia	to burst forth (usually blood)	hemorrhage—a bursting forth of blood menorrhagia—a bursting forth of blood during menstruation
-rrhexis	rupture	angiorrh exis — rupture of a vessel
-rrhaphy	suture	nephorrh aphy — suture of the kidney

Also note that each component also has an h and -rrhaphy has two!



PRACTICE EXERCISES

For the following words, draw a line or lines to separate prefixes, roots, combining forms, and suffixes. Then define the word according to the meaning of: **P=prefix; R=root; CF=combining form; S=suffix.**

EXAMPLE

hyperlipemia

_____/_____/_____
P R S

hyper/lip/emia

P R S

DEFINITION: above or excessive/fat/blood condition

1. pancytopenia

_____/_____/_____
P CF S

DEFINITION: _____

2. leukemia

_____/_____
R S

DEFINITION: _____

3. toxoid

_____/_____
R S

DEFINITION: _____

4. mesomorphic

_____/_____/_____
P R S

DEFINITION: _____

5. acrodynia

_____/_____
CF S

DEFINITION: _____

6. metastasis

_____/_____
P S

DEFINITION: _____

7. ultrasonography

_____ / _____ / _____
 P CF S

DEFINITION: _____

8. tachycardia

_____ / _____ / _____
 P R S

DEFINITION: _____

9. pyopoesis

_____ / _____
 CF S

DEFINITION: _____

10. adenitis

_____ / _____
 R S

DEFINITION: _____

11. macrocephalous

_____ / _____ / _____
 P R S

DEFINITION: _____

12. paracentesis

_____ / _____
 P S

DEFINITION: _____

13. microlithiasis

_____ / _____ / _____
 P R S

DEFINITION: _____

14. orthopedic

_____ / _____ / _____
 CF R S

DEFINITION: _____

15. angiomegaly

_____ / _____
 CF S

DEFINITION: _____

16. psychiatry

_____ / _____
 R S

DEFINITION: _____

17. carcinogenesis

_____ / _____
CF S

DEFINITION: _____

18. nephrologist

_____ / _____
CF S

DEFINITION: _____

19. rhinostenosis

_____ / _____ / _____
CF R S

DEFINITION: _____

20. hypohydration

_____ / _____ / _____
P R S

DEFINITION: _____

21. aerogastralgia

_____ / _____ / _____
CF R S

DEFINITION: _____

22. fibroma

_____ / _____
R S

DEFINITION: _____

23. necrophilia

_____ / _____
CF S

DEFINITION: _____

24. sclerosis

_____ / _____
R S

DEFINITION: _____

25. hemolysis

_____ / _____
CF S

DEFINITION: _____

26. acrophobia

_____ / _____ / _____
CF R S

DEFINITION: _____

27. cytometer

_____ / _____
CF S

DEFINITION: _____

28. cyanotic

_____ / _____
CF S

DEFINITION: _____

29. extravascular

_____ / _____ / _____
P R S

DEFINITION: _____

30. hypertrophy

_____ / _____ / _____
P R S

DEFINITION: _____

Write in the appropriate prefix to complete the following terms:

31. _____ nasal = *above* the nose

- a. para b. peri c. supra d. infra e. sub

32. _____ activate = make active *again*

- a. de b. retro c. pro d. re e. hyper

33. _____ operative = *before* surgery

- a. intra b. post c. pre d. peri e. circum

34. _____ hydrated = *not* watered

- a. anti b. de c. ec d. dys e. contra

35. _____ dermal = *across or through* the skin

- a. ecto b. endo c. intra d. epi e. trans

36. _____ acute = *excessively* severe

- a. sub b. hypo c. super d. oligo e. pan

37. _____ umbilical = *below or under* the navel

- a. hyper b. infra c. peri d. para e. pre

38. _____ cardia = *outside* the heart

- a. exo b. endo c. retro d. para e. peri

39. _____ phonia = *difficult* voice

- a. ab b. dys c. a d. eu e. para

40. _____ duction = to turn *away from*

- a. ad b. ab c. ecto d. pro e. ante

41. _____ phylaxis = to guard *before*

- a. retro b. pro c. post d. peri e. anti

42. _____ vascular = *around* a blood vessel
 a. intra b. inter c. para d. circum e. endo
43. _____ plegia = *half* paralysis
 a. quadri b. peri c. hemi d. bi e. mono

Match the following:

- | | |
|---------------------------------|-----------|
| 44. _____ away from | a. retro- |
| 45. _____ between | b. peri- |
| 46. _____ alongside of | c. anti- |
| 47. _____ around | d. ecto- |
| 48. _____ behind | e. dia- |
| 49. _____ within | f. ab- |
| 50. _____ against or opposed to | g. inter- |
| 51. _____ without | h. para- |
| 52. _____ outside | i. an- |
| 53. _____ across or through | j. intra- |

Give the meaning of the following prefixes:

- | | |
|------------------|-------------------|
| 54. poly- _____ | 60. bi- _____ |
| 55. hypo- _____ | 61. quadri- _____ |
| 56. oligo- _____ | 62. semi- _____ |
| 57. mono- _____ | 63. infra- _____ |
| 58. pan- _____ | 64. hyper- _____ |
| 59. ultra- _____ | |

Match the following:

- | | |
|------------------|-----------|
| 65. _____ before | a. brady- |
| 66. _____ after | b. re- |
| 67. _____ fast | c. ante- |
| 68. _____ slow | d. post- |
| 69. _____ again | e. tachy- |

Circle the correct meaning for the following term components:

70. a-
a. double b. both c. two d. without e. against
71. pod/o
a. child b. foot c. voice d. sound e. pus
72. or/o
a. lip b. nourishment c. gland d. mouth e. normal
73. neo-
a. birth b. death c. origin d. new e. disease
74. -plasty
a. surgical repair b. cancer c. tumor d. excision e. incision
75. -ation
a. measure b. disease c. tissue d. pain e. process
76. -tripsy
a. nourishment b. poison c. crushing d. incision e. stone
77. -ectasis
a. blood condition b. formation of c. expansion d. rupture e. discharge
78. dextr/o
a. hard b. straight c. right d. left e. long

Match the following:

- | | |
|-----------------|--------------|
| 79. _____ black | a. tri- |
| 80. _____ three | b. leuk/o |
| 81. _____ red | c. cyan/o |
| 82. _____ four | d. dextr/o |
| 83. _____ white | e. uni- |
| 84. _____ one | f. melan/o |
| 85. _____ blue | g. quadri- |
| 86. _____ two | h. sinistr/o |
| 87. _____ few | i. oligo- |
| 88. _____ right | j. erythr/o |
| 89. _____ left | k. bi- |

Circle the appropriate suffix for each of the following meanings:

- 90. record
 a. -meter b. -metry c. -gram d. -graph e. graphy
- 91. condition or increase
 a. -itis b. -iasis c. -osis d. -ium e. -ous
- 92. excision
 a. -tomy b. -stomy c. -ectomy d. -centesis e. cele
- 93. pertaining to
 a. -ia b. -ar c. -ism d. -ium e. -icle
- 94. rupture
 a. -rrhagia b. -rrhea c. -rrhagia d. -rrhexis e. -megaly
- 95. small
 a. -ous b. -eal c. -ula d. -ia e. -ary
- 96. condition of
 a. -ism b. -ium c. -ule d. -ic e. al

Match the following terms related to the kidney with the definitions listed below:

nephrolysis	nephrostomy	nephroptosis	nephrotomy
nephritis	nephropexy	nephroma	nephrocele
nephrogenous	nephrolithiasis	nephrorrhaphy	nephrectomy

- 97. inflammation of the kidney _____
- 98. dissolution or breakdown of the kidney _____
- 99. incision in the kidney _____
- 100. developing from the kidney _____
- 101. surgical fixation of the kidney _____
- 102. creation of an opening in the kidney _____
- 103. excision of the kidney _____
- 104. presence of kidney stones _____
- 105. kidney tumor _____
- 106. hernia of the kidney _____
- 107. suture of the kidney _____
- 108. downward displacement of the kidney _____

Circle the operative term in each of the following lists:

109. a. nephroptosis b. hemolysis c. angiectasis d. colostomy
 e. necrosis
110. a. vasorrhaphy b. hematoma c. gastrocele d. endoscope
 e. cardiorrhexis
111. a. morphologic b. adenolysis c. abdominocentesis d. osteomalacia
 e. polyrrhea

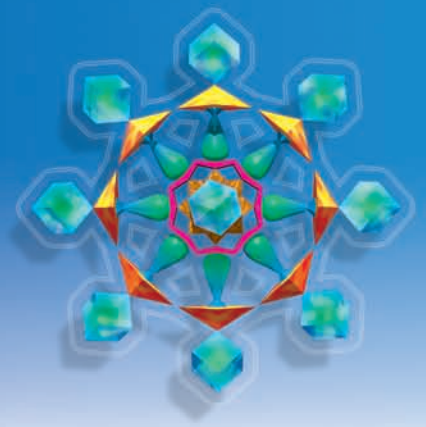
Fill in the blanks for the following regarding singular/plural forms:

112. An ovum is an egg produced by an ovary. There are two _____ in the female that produce eggs or _____.
113. The spread of cancer to a distant organ is called metastasis. The spread of cancer to more than one organ is _____.
114. A verruca is a wart. The term for several warts is _____.
115. Condylomata are genital warts. One genital wart is a _____.
116. Indices is a plural form of _____.
117. A thrombus is a clot. Several clots are termed _____.

Circle the correct spelling:

118. a. nephoraphy b. nephorrapy c. nephrorrhaphy d. nephorrhapy
119. a. abdominoscopy b. abdemenoscopi c. abdomenscopy d. abdominoschope
120. a. perrycardium b. pericardium c. periocardium d. parcardium

Fields of Medical Practice



OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define combining forms used in naming medical specialties
- ◆ Trace the evolution of medicine
- ◆ Identify the purpose of the American Board of Medical Specialties
- ◆ Define diplomate and fellow
- ◆ Describe the scope of medical practice for the medical specialties recognized by the American Board of Medical Specialties
- ◆ Identify other medical practitioners with the title of doctor and list their scope of practice
- ◆ List titles of other health professionals

Combining Forms

Combining Form	Meaning	Example
cardi/o	heart	cardiology kar-dē-ol'ō-jē
chir/o	hand	chiropractic kī-rō-prak'tik
crin/o	to secrete	endocrinology en'dō-kri-nol'ō-jē
dent/i	teeth	dentist den'tist
dermat/o	skin	dermatology der-mă-tol'ō-jē
enter/o	small intestine	gastroenterology gas'trō-en-ter-ol'ō-jē
esthesi/o	sensation	anesthesiology an'es-thē-zē-ol'ō-jē
gastr/o	stomach	gastroenterology gas'trō-en-ter-ol'ō-jē

Combining Form	Meaning	Example
gen/o	origin or production	gene jĕn
ger/o	old age	geriatric jer-ĕ-at'rik
gynec/o	woman	gynecology gĭ-nĕ-kol'ō-jĕ
hemat/o	blood	hematology hĕ'mă-tol'ō-jĕ
immun/o	safe	immunology im'yū-nol'ō-jĕ
laryng/o	voicebox	otolaryngology ō'tō-lar-ing-gol'ō-jĕ
nephr/o	kidney	nephrology ne-frol'ō-jĕ
neur/o	nerve	neurologist noo-rol'ō-jist
obstetr/o	midwife	obstetric ob-stet'rik
onc/o	tumor	oncology ong-kol'ō-jĕ
ophthalm/o	eye	ophthalmology of-thal-mol'ō-jĕ
opt/o	eye	optometry op-tom'ĕ-trĕ
orth/o	straight, normal, or correct	orthopedics ōr-thō-pĕ'diks
ot/o	ear	otolaryngologist ō'tō-lar-ing-gol'ō-jist
path/o	disease	pathologist pa-thol'ō-jist
ped/o	child or foot	pediatrics pĕ-dĕ-at'riks orthopedics ōr-thō-pĕ'diks
physi/o	physical	physiatrist fiz-ĭ'ă-trist
plas/o	formation	plastic surgery plas'tik ser'jer-ĕ
pod/o	foot	podiatry pō-dĭ'ă-trĕ
psych/o	mind	psychiatry sĭ-kĭ'ă-trĕ

Combining Form	Meaning	Example
radi/o	x-ray	radiology rā-dē-ol'ō-jē
vascul/o	vessel	vascular vas'kyu-lār

The Evolution of Medicine

Today's practice of medicine evolved from the customs of ancient times. Care for the *patient* (one who suffers) was often given by priests who gave homage to mythological gods and performed rituals designed to appease those gods to rid the body of disease.

Hippocrates, the ancient Greek physician who lived about 400 B.C., is known as the "Father of Medicine." He was the first to attempt to separate medicine from myth, and his writings include the first rational documentation of disease. He also wrote the Hippocratic Oath, which was the standard of medical ethics for physicians in his day and is the basis of modern ethical codes (Fig. 3.1).

Curiosity about the body and the causes of disease led to the study of anatomy and physiology and the art of healing practiced by medieval physicians. Scientific progress led to the development of surgery, pharmacy, pathology, and other aspects of medicine. Hospitals were built to care for the sick and dying, and universities were established to study disease (Fig. 3.2).

Medieval methods have evolved into the modern sophisticated health care system that provides comprehensive care. Physicians have branched out into many specialties of medicine and have been joined by a team of other health care professionals with highly developed training and skills.

The Physician

Today, health care is delivered by a complicated system involving many types of professionals. The most prominent professional responsible for meeting the medical needs of the patient is the physician, also called a medical doctor (Fig. 3.3).



HIPPOCRATES.

Born on the island of Cos about 400 B.C. and known as the founder of medicine, this Greek physician created the art and science of medicine and removed it from the realm of superstition and magic. Our medical terminology really begins with Hippocrates because he was the first to write terms.



Figure 3.1 Hippocrates.



Figure 3.2 Three photographs of Hostel-Dieu, Beaune, France, a medieval hospital founded in 1443; it is now a museum. **A.** Entrance. **B.** Grand salle (“great room”—combination hospital ward and church). **C.** Bedsides.



HOSPITAL.

Hospital is derived from the Latin word meaning guest house. The words hospital, hospice, host, hostel, and hotel have the same origin but now have different meanings. It is unknown where special institutions for sick people originated. The Romans had military hospitals by 100 A.D. Christian hospitals seem to have originated from the tradition of a guest house for travelers. In 6th century France, an institution for the sick was called *hostel Dieu* (God’s hotel). Most hospitals were run by religious orders whose members devoted themselves to the care of the sick. In the 19th century, hospitals became centers for treating disease for all classes of society, and they operated for both profit and nonprofit.

The Doctor of Medicine (M.D.) degree is earned by successfully completing medical school. To practice medicine, however, the graduate with an M.D. must be licensed. The license to practice medicine is granted after the applicant passes a specified medical licensing examination and meets any other requirements established by the medical board in the state where the applicant wants to practice.

The Doctor of Osteopathic Medicine (D.O.) is a medical practitioner similar to an M.D. but with a traditional emphasis on the role of the musculoskeletal system in



Figure 3.3 Luke Fildes’ *The Doctor*.

maintaining function and balance in the body. Osteopathic physicians are trained at osteopathic colleges and are often affiliated with osteopathic hospitals. The licensing requirements for the osteopath are also similar to the M.D. and are established by medical boards in each state.

American Board of Medical Specialties

The licensed physician in the past was often both physician and surgeon. Today, with the rapid expansion of technology and the greater knowledge required to be proficient in treating patients, physicians have entered various nonsurgical and surgical specialty areas.



PHYSICIAN.

Physician is derived from a Greek word for natural or according to the laws of nature. In ancient Greece, natural science, which included biology and medicine, was concerned with speculation about the origin and existence of things. *Physic*, in the sense of drug, especially a laxative made from herbs and natural sources, has the same origin. The teaching of medicine came under the general heading of *physicus*, and practitioners were called physicians.

With increasing medical specialties, standards and monitoring of specialty practices were required. The American Board of Medical Specialties (ABMS) was founded in 1933 for this purpose. The 24 individual specialty boards recognized by ABMS have established criteria for specific training after medical school (3 to 7 years depending on the specialty). After the specialty training (called a residency or fellowship), the physician gains eligibility to take the specified board examination. A physician who has completed specialty requirements and passed the board examination is designated “board certified” and referred to as a “diplomate” (e.g., Joan Jones, M.D., Diplomate, American Board of Family Practice). A board’s standards extend beyond the usual requirement for licensure.

Other organizations, such as the American College of Physicians (ACP) and the American College of Surgeons (ACS), recognize members who have met set published criteria for standards of distinction. These include Fellow of the American College of Physicians (F.A.C.P.) and Fellow of the American College of Surgeons (F.A.C.S.) (Fig. 3.4).

ABMS-approved specialty boards of the United States follow:

American Board of Allergy and Immunology

American Board of Anesthesiology



Figure 3.4 The early days of surgery and anesthesiology. Thomas Eakins’ *The Agnew Clinic*.

American Board of Colon and Rectal Surgery
 American Board of Dermatology
 American Board of Emergency Medicine
 American Board of Family Practice
 American Board of Internal Medicine
 American Board of Medical Genetics
 American Board of Neurological Surgery
 American Board of Nuclear Medicine
 American Board of Obstetrics and Gynecology
 American Board of Ophthalmology
 American Board of Orthopaedic Surgery
 American Board of Otolaryngology
 American Board of Pathology
 American Board of Pediatrics
 American Board of Physical Medicine and Rehabilitation
 American Board of Plastic Surgery
 American Board of Preventive Medicine
 American Board of Psychiatry and Neurology
 American Board of Radiology
 American Board of Surgery
 American Board of Thoracic Surgery
 American Board of Urology

Each specialty or subspecialty has its own scope of practice as follows. All earn the M.D. or D.O. degree. Ph.D. degrees are accepted by a few specialties/subspecialties, e.g., medical genetics, public health.

Special note: The American Osteopathic Association (AOA) also provides certification of osteopaths who have expertise in the following approved specialty and subspecialty areas: anesthesiology, dermatology, emergency medicine, family practice, internal medicine, neurology and psychiatry, neuromusculoskeletal medicine, nuclear medicine, obstetrics and gynecology, ophthalmology and otolaryngology, orthopedic surgery, pathology, pediatrics, preventive medicine, proctology, radiology, rehabilitation medicine, and surgery.

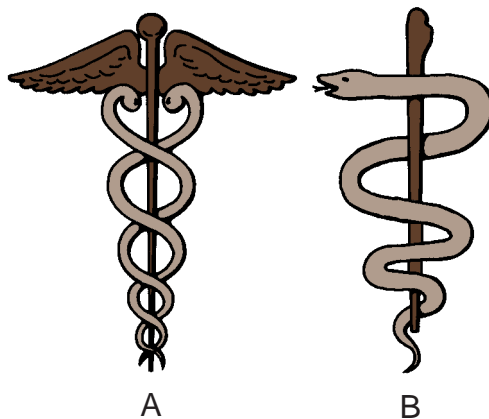


Figure 3.5 The caduceus. **A.** Staff of Mercury. **B.** Rod of Aesculapius.



CADUCEUS.

The word for the staff of Mercury, an emblem in Greek mythology represented by two serpents twined around a staff, is the most common symbol of the medical profession. From earliest history, serpents have been symbols of wisdom and health and objects of worship. They appear as regular shrine equipment and were involved in ancient healing rituals. The significance of the caduceus for the medical profession is said to lie in the fact that the serpent symbolizes healing—some say because of its long life, others because the annual shedding of its skin suggests a renewal of youth and health, others because of its keen eyesight. The earliest representation of serpent and staff was the rod of Aesculapius, the god of medicine, which shows a single serpent twining around a rod or stick. Some argue that it is the true symbol of the medical profession (Fig. 3.5).

**ANESTHESIA.**

Anesthesia is a condition in which there is an absence of sensation [an (without)/esthesio (sensation)/ia (condition)]. The inhalation of various vapors to produce a sort of intoxication or stupefaction is an ancient practice. By the 14th century, methods of inducing sleep for surgical operations included the inhalation of hemlock, mandrake, and lettuce. Other attempts to produce anesthesia included the use of snow and ice. Interest in chemistry at the end of the 18th century resulted in the investigation of various chemicals that could be used for inhalation anesthesia. Early anesthetics included nitrous oxide, ether, and chloroform.

Physicians' Specialty Fields of Medical Practice

Specialty and Specialist	Scope of Practice
allergy and immunology al'er-jē and im'yū-nol'ō-jē	diagnosis, treatment, and prevention of allergic diseases, including asthma, and diagnosis, management, and therapy of immunologic diseases, e.g., autoimmune disorders
allergist/immunologist	
anesthesiology an'es-thē-zē-ol'ō-jē	comprehensive medical management and anesthetic care before, during, and after surgery and long-term pain management and critical care related to cardiac and respiratory emergencies
anesthesiologist	
colon and rectal surgery	diagnosis, medical care, and surgical treatment of conditions related to the small intestine, colon, and rectum
colon and rectal surgeon	
dermatology der-mă-tol'ō-jē	medical and surgical treatment of disorders of the skin and its appendages, e.g., hair, nails, including cosmetic care
dermatologist	
emergency medicine	prehospital emergency medical care of acutely ill or injured patients; most commonly rendered in an emergency department of a hospital or a free-standing urgent care facility
emergency physician	
family practice	comprehensive general medical care of individuals of all ages and their families, with emphasis on disease prevention and health promotion
family physician	
internal medicine	nonsurgical care centered around prevention, diagnosis, and treatment of diseases of adults
internist	

COMMON SUBSPECIALTIES OF INTERNAL MEDICINE

cardiology kar-de-ol'ō-jē (cardiovascular disease)	diagnosis and management of conditions related to the heart and blood vessels
cardiologist	
endocrinology en'dō-kri-nol'ō-jē	diagnosis and management of diseases of the endocrine glands, e.g., diabetes, obesity, thyroid dysfunction
endocrinologist	

Specialty and Specialist	Scope of Practice
gastroenterology gas'trō-en-ter-ol'ō-jē gastroenterologist	diagnosis and management of conditions related to the digestive system
geriatric medicine geriatrician jer-ē-ă-trish'ŭn	diagnosis and medical management of conditions affecting the elderly; also a subspecialty of family practice
hematology hē-mă-tol'ō-jē hematologist	diagnosis and treatment of blood disorders
nephrology ne-frol'ō-jē nephrologist	nonsurgical treatment of kidney disorders
oncology ong-kol'ō-jē oncologist	treatment of tumors and cancer
rheumatology rū-mă-tol'ō-jē rheumatologist	treatment of arthritis and related disorders
medical genetics jě-net'iks geneticist jě-net'i-sist	diagnosis, treatment, and prevention of genetic (inherited) disorders; includes research, laboratory testing, and counseling
neurology nū-rol'ō-jē neurologist	nonsurgical treatment of diseases of the nervous system
neurological surgery neurosurgeon	surgical and nonsurgical treatment of diseases of the nervous system and supportive structures, including blood vessels
nuclear medicine nuclear medicine physician	use of radioactive substances to diagnose and treat disease; a dual specialty in other fields such as radiology, internal medicine, neurology, and cardiology is common
obstetrics and gynecology (OB/GYN) obstetrics ob-stet'riks obstetrician ob-stě-trish'ŭn	care and treatment of mother and fetus throughout pregnancy, childbirth, and immediate postpartum period



SURGEON. The Greek word *chirurgion*

(*chiro*, the hand; *urgeon*, to work) refers to one who works with the hands. The earliest conception of surgery was that diseases of an external nature were suitable for treatment by manual operations, as opposed to internal conditions that were treated with drugs, etc. The name surgeon has been in English since the 14th century. There was no distinction between barbers and surgeons until 1745 when the barbers and surgeons of London were separated and given individual charters.

Specialty and Specialist	Scope of Practice
gynecology gī-ně-kol'ō-jē gynecologist	medical and surgical treatment of disorders of the female reproductive and urinary system
ophthalmology of-thal-mol'ō-jē ophthalmologist	medical and surgical treatment of the eye, including vision care and services
orthopedic surgery ōr-thō-pē'dik orthopedic surgeon orthopedist (orthopaedist)	medical, surgical, and rehabilitative treatment of disorders of the musculoskeletal system, including the bones, joints, muscles, ligaments, tendons, and nerves
otolaryngology ō'tō-lar-ing-gol'ō-jē otolaryngologist ō'tō-lar-ing-gol'ō-jist ENT (ear, nose, throat) physician	medical and surgical treatment of diseases and disorders of the ear, nose, throat, and adjoining structures of the head and neck
pathology pa-thol'ō-jē pathologist	study of disease emphasizing examination of tissue for diagnosis, e.g., biopsy, autopsy
pediatrics pē-dē-at'riks pediatrician	comprehensive medical care of infants, children, and adolescents, with emphasis on disease prevention and healthful physical and mental development
physical medicine and rehabilitation psychiatry fi-zī'ă-trē physiatrist fiz-ī'ă-trist	treatment of patients suffering from neuromusculoskeletal disorders caused by illness or injury, e.g., stroke, spinal cord injury
plastic surgery plastic surgeon	surgery for restoration, repair, or reconstruction of body structures, e.g., body contouring, skin grafting
preventive medicine	medical care that focuses on prevention of disease and health maintenance; specialty areas include: aerospace medicine, occupational medicine, public health, and general preventive medicine
psychiatry sī-kī'ă-trē psychiatrist	diagnosis, treatment, and prevention of mental, emotional, and behavioral disorders

Specialty and Specialist	Scope of Practice
radiology rā-dē-ol'ō-jē	use of ionizing and nonionizing imaging modalities, including x-ray, radionuclides, magnetic resonance, and ultrasound, to diagnose disease, or in therapies that involve imaging guidance; primary fields include diagnostic radiology, radiation oncology, and radiation physics
radiologist	
surgery	treatment of diseases and trauma requiring an operation;—subspecialty areas include vascular, pediatric, hand, and critical care surgery
general surgeon	
thoracic surgery thō-ras'ik	treatment of diseases, deformities, and trauma requiring an operation within the chest, including the heart and lungs
thoracic surgeon	
urology yū-rol'ō-jē	surgical and nonsurgical treatment of the male urinary and reproductive system and the female urinary system
urologist	

Other Fields of Medical Practice

Many other medical specialists are called doctors, even though they do not have an M.D. or D.O. degree. They have graduated from a college of podiatry, chiropractic, optometry, or dentistry and are licensed to practice. Because they commonly provide health care services in hospitals and/or medical clinics, you need a basic knowledge of their scope of practice.

Degree	Field of Practice	Scope of Practice
doctor of chiropractic medicine (D.C.)	chiropractic medicine kī-rō-prak'tik chiropractor kī-rō-prak'tor	treatment centered on manipulation of the spine to maintain function and balance in the body (chir/o = hand; prattein = to do)
doctor of dental surgery (D.D.S.)	oral surgery oral surgeon	treatment of dental disorders requiring surgery (or/o = mouth; dent/i = teeth)
doctor of podiatric medicine (D.P.M.) pō-dī'ă-trik	podiatry pō-dī'ă-trē podiatrist	diagnosis and treatment (including surgery) of disorders of the foot
doctor of optometry (O.D.)	optometry op-tom'ě-trē optometrist op-tom'ě-trist	diagnosis and nonsurgical treatment of the eye, including vision care and services

Degree	Field of Practice	Scope of Practice
doctor of psychology (Psy.D. or Ph.D.)	psychology	counsel of patients with mental or emotional disorders
sī-kol'ō-jist	sī-kol'ō-jē clinical psychologist sī-kol'ō-jist	

Other Health Care Professions

As a result of the major advances in health care technology, various licensed and non-licensed allied health professionals with specialized training and skill have emerged to meet the increasing needs of the population. They are integral to today's health care team. The following is a list of professions for which formal training is available.

acupuncturist	massage therapist
anesthesiologist assistant	medical assistant
art therapist	medical coding specialist
athletic trainer	medical illustrator
audiologist	medical laboratory technician
cardiovascular technologist	medical technologist
clinical exercise specialist	medical transcriptionist
clinical laboratory scientist	medical unit coordinator (unit clerk/ secretary or ward clerk/secretary)
cytogenetic technologist	mental health counselor
cytotechnologist	mobility specialist
dental assistant	music therapist
dental hygienist	nephrology technician
dental laboratory technologist	nuclear medicine technologist
diagnostic medical sonographer	nurse, licensed vocational or practical
diagnostic molecular scientist	nurse, registered
dialysis technician	nurse anesthetist
dietetic technician	nurse assistant
dietitian/nutritionist	nurse midwife
electrocardiography technician	nurse practitioner
electroencephalographic technologist	nutrition care technologist
electroneurodiagnostic technologist	occupational therapist
emergency medical technician	occupational therapy assistant
fitness therapist	operating room technician
genetic counselor	ophthalmic dispensing optician
geriatric home aide	ophthalmic laboratory technician/ technologist
gerontologist	optician
health and fitness specialist	orthoptist
health information administrator	orthotist/prosthetist
health information technician	paramedic
histotechnician/histologic technician	pathologist assistant
home health aide	perfusionist
kinesiotherapy	
marriage and family counselor/therapist	



NURSE.

Derived from the Latin word *nutrix*, a nurse, from *nutrire*, to suckle or nourish, originally described one who suckled or cared for an infant, and by extension, now describes one who cares for any sick or helpless person.

pharmacist	recreational therapist
pharmacologist	rehabilitation counselor
pharmacy technician/assistant	rehabilitation technologist
phlebotomy technician/phlebotomist	respiratory therapist
physical therapist	specialist in blood bank technology
physical therapist assistant	speech-language pathologist
physician assistant	speech therapist
polysomnographic technologist	surgeon assistant
psychiatric technician	surgical technologist
radiation therapy technologist/ radiation therapist	therapeutic recreation specialist
radiologic technologist/radiographer	veterinarian
	veterinary assistant

Summary of Chapter 3 Acronyms/Abbreviations

ABMS.....American Board of Medical Specialties	D.O......Doctor of Osteopathic Medicine
ACP.....American College of Physicians	ENT.....ear, nose, throat
ACS.....American College of Surgeons	M.D......Doctor of Medicine
AOA.....American Osteopathic Association	OB/GYN.....obstetrics and gynecology
D.C......Doctor of Chiropractic Medicine	O.D......Doctor of Optometry
D.D.S......Doctor of Dental Surgery	Ph.D......Doctor of Psychology
D.P.M......Doctor of Podiatric Medicine	

8. urologist

_____ / _____
CF S

DEFINITION: _____

9. neurology

_____ / _____
CF S

DEFINITION: _____

10. psychologist

_____ / _____
CF S

DEFINITION: _____

11. osteopathy

_____ / _____ / _____
CF R S

DEFINITION: _____

12. ophthalmologist

_____ / _____
CF S

DEFINITION: _____

13. obstetric

_____ / _____
R S

DEFINITION: _____

14. anesthesiology

_____ / _____ / _____
P CF S

DEFINITION: _____

15. cardiology

_____ / _____
CF S

DEFINITION: _____

16. dermatology

_____ / _____
CF S

DEFINITION: _____

17. pediatrics

_____ / _____
R S

DEFINITION: _____

37. _____ psychologist p. rehabilitation specialist
 38. _____ geriatrics q. manipulates the spine

Write the full medical term for the following abbreviations:

39. OB/GYN _____
 40. D.D.S. _____
 41. ENT _____
 42. ABMS _____
 43. O.D. _____
 44. F.A.C.S. _____
 45. ACP _____
 46. D.C. _____
 47. D.P.M. _____
 48. D.O. _____

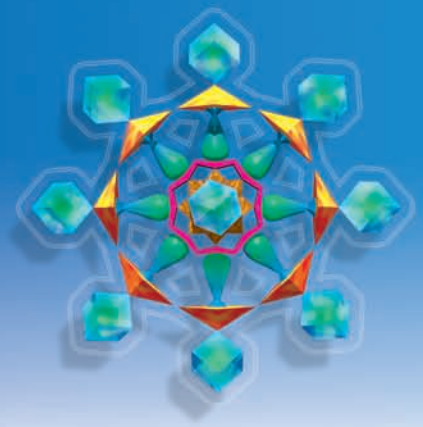
49–53. From the following list, identify the five specialists who perform surgery:

- | | | |
|-----------------|------------------|--------------------|
| gynecologist | cardiologist | gastroenterologist |
| neurologist | otolaryngologist | orthopaedist |
| allergist | rheumatologist | nephrologist |
| ophthalmologist | geneticist | endocrinologist |
| internist | pediatrician | urologist |

Match the type of school with the degree it grants:

54. _____ dental a. Ph.D.
 55. _____ graduate b. O.D.
 56. _____ podiatric c. D.D.S.
 57. _____ medical d. D.O.
 58. _____ chiropractic e. D.P.M.
 59. _____ optometric f. D.C.
 60. _____ osteopathic g. M.D.

The Medical Record



OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define basic terms and abbreviations used in documenting a history and physical
- ◆ Explain the concept of problem oriented medical record keeping and common format for documenting SOAP progress notes
- ◆ Identify common hospital records and patient care abbreviations
- ◆ Recognize types of diagnostic imaging modalities
- ◆ Define common terms related to disease
- ◆ Define common pharmacological terms
- ◆ Recognize abbreviations and symbols deemed error prone
- ◆ Define the symbols used in documenting a prescription or physician's order
- ◆ Record military date and time
- ◆ Follow legal guidelines when making corrections to a medical record entry
- ◆ Explain the terms used in documenting a medical history and physical record

Common Records Used in Documenting Care of a Patient

To put your knowledge of medical terminology to practical use, you need to see how this language is used in everyday communication about patients. Learning the common abbreviations, symbols, forms, and formats used in recording patient care will help you comprehend medical record documentation.

HISTORY AND PHYSICAL

The record that serves as a cornerstone for patient care is the *history and physical*. It documents the patient's medical history and findings from the physical examination. It is usually the first document generated when a patient presents for care, most often recorded at the time of a new patient visit (Fig. 4.1), or as part of a consultation (Fig. 4.2).

Subjective information is obtained from the patient and documented in the patient *history*, starting with the *chief complaint* (the reason for seeking care) along with the *history of present illness* (indicating duration and severity of the complaint) and any other symptoms that the patient is experiencing. Information about the patient's past *medical history*, *family history*, *social history*, and *occupational history* is then noted. The history is complete after documenting the patient's answers to questions related to the *review of systems*, which is intended to uncover any other significant evidence of disease.



CHART. The word originates from the Latin

charta, a kind of paper made from papyrus. Charta came to mean any leaf or thin sheet of fine paper on which graphic illustrations were made. In medicine, the chart most often refers to patient record documentations.

Once subjective data have been recorded, the provider begins a physical examination to obtain *objective information*, facts that can be seen or detected by testing. Signs, or objective evidence of disease, are documented, and selected diagnostic tests are performed or ordered when further evaluation is necessary.

The *impression, diagnosis, or assessment* is made after evaluation of all subjective and objective data, including the results of the physical examination and diagnostic test findings. R/O (rule out) is the abbreviation used to indicate a differential diagnosis when two or more possible diagnoses are in question. Further tests are then necessary to rule out or eliminate these possibilities and verify the final diagnosis.

Final notations include the provider's *plan*, also called a *recommendation or disposition*, which outlines strategies designed to remedy the patient's condition.

Further documentation in the form of *progress notes* is made as care continues.

Most often, physicians are required to submit a current history and physical before admitting a patient to the hospital. When the patient is to have surgery, this report is often called a "preoperative" history and physical (see Figure 4.6).

Following are common terms and abbreviations used in documenting a history and physical examination.

Abbreviation	Meaning/Explanation
H & P	History and Physical documentation of patient history and physical examination findings
Hx	History record of subjective information regarding the patient's personal medical history, including past injuries, illnesses, operations, defects, and habits
<i>subjective information</i>	<i>information obtained from the patient including his or her personal perceptions</i>
CC	Chief Complaint
c/o	complains of patient's description of what brought him or her to the doctor or hospital; it is usually brief and is often documented in the patient's own words indicated within quotes For example: CC: left lower back pain; patient states, "I feel like I swallowed a stick and it got stuck in my back"
HPI (PI)	History of Present Illness (Present Illness) amplification of the chief complaint recording details of the duration and severity of the condition (how long the patient has had the complaint and how bad it is) For example: HPI: the patient has had left lower back pain for the past 2 weeks since slipping on a rug and landing on her left side; the pain worsens after sitting upright for any extended period but gradually subsides after lying in a supine position

Abbreviation	Meaning/Explanation
Sx	<p>symptom</p> <p>subjective evidence (from the patient) that indicates an abnormality</p>
PMH (PH)	<p>Past Medical History (Past History)</p> <p>a record of information about the patient's past illnesses starting with childhood, including surgical operations, injuries, physical defects, medications, and allergies</p>
UCHD	<p>usual childhood diseases</p> <p>an abbreviation used to note that the patient had the "usual" or commonly contracted illnesses during childhood (e.g., measles, chickenpox, mumps)</p>
NKA	<p>no known allergies</p>
NKDA	<p>no known drug allergies</p>
FH	<p>Family History</p> <p>state of health of immediate family members</p> <p>A & W alive and well</p> <p>L & W living and well</p> <p>For example:</p> <p>FH: father, age 92, L & W; mother, age 91, died, stroke</p>
SH	<p>Social History</p> <p>a record of the patient's recreational interests, hobbies, and use of tobacco and drugs, including alcohol</p> <p>For example:</p> <p>SH: plays tennis twice/wk; tobacco—none; alcohol—drinks 1–2 beers per day</p>
OH	<p>Occupational History</p> <p>a record of work habits that may involve work-related risks</p> <p>For example:</p> <p>OH: the patient has been employed as a heavy equipment operator for the past 6 years</p>
ROS (SR)	<p>Review Of Systems (Systems Review)</p> <p>a documentation of the patient's response to questions organized by a head-to-toe review of the function of all body systems (note: this review allows evaluation of other symptoms that may not have been mentioned)</p>

Abbreviation	Meaning/Explanation
<i>objective information</i>	<i>facts and observations noted</i>
PE (Px)	Physical Examination documentation of a physical examination of a patient, including notations of positive and negative objective findings
HEENT	head, eyes, ears, nose, throat
NAD	no acute distress, no appreciable disease
PERRLA	pupils equal, round, and reactive to light and accommodation
WNL	within normal limits
Dx	Diagnosis
IMP	Impression
A	Assessment identification of a disease or condition after evaluation of the patient's history, symptoms, signs, and results of laboratory tests and diagnostic procedures
R/O	Rule Out used to indicate a <i>differential diagnosis</i> when one or more diagnoses are suspect; each possible diagnosis is outlined and either verified or eliminated after further testing is performed For example: Diagnosis: R/O pancreatitis R/O gastroenteritis this indicates that either of these two diagnoses is suspected and further testing is required to verify or eliminate one or both possibilities
P	Plan (also referred to as recommendation or disposition) outline of the treatment plan designed to remedy the patient's condition, which includes instructions to the patient, orders for medications, diagnostic tests, or therapies

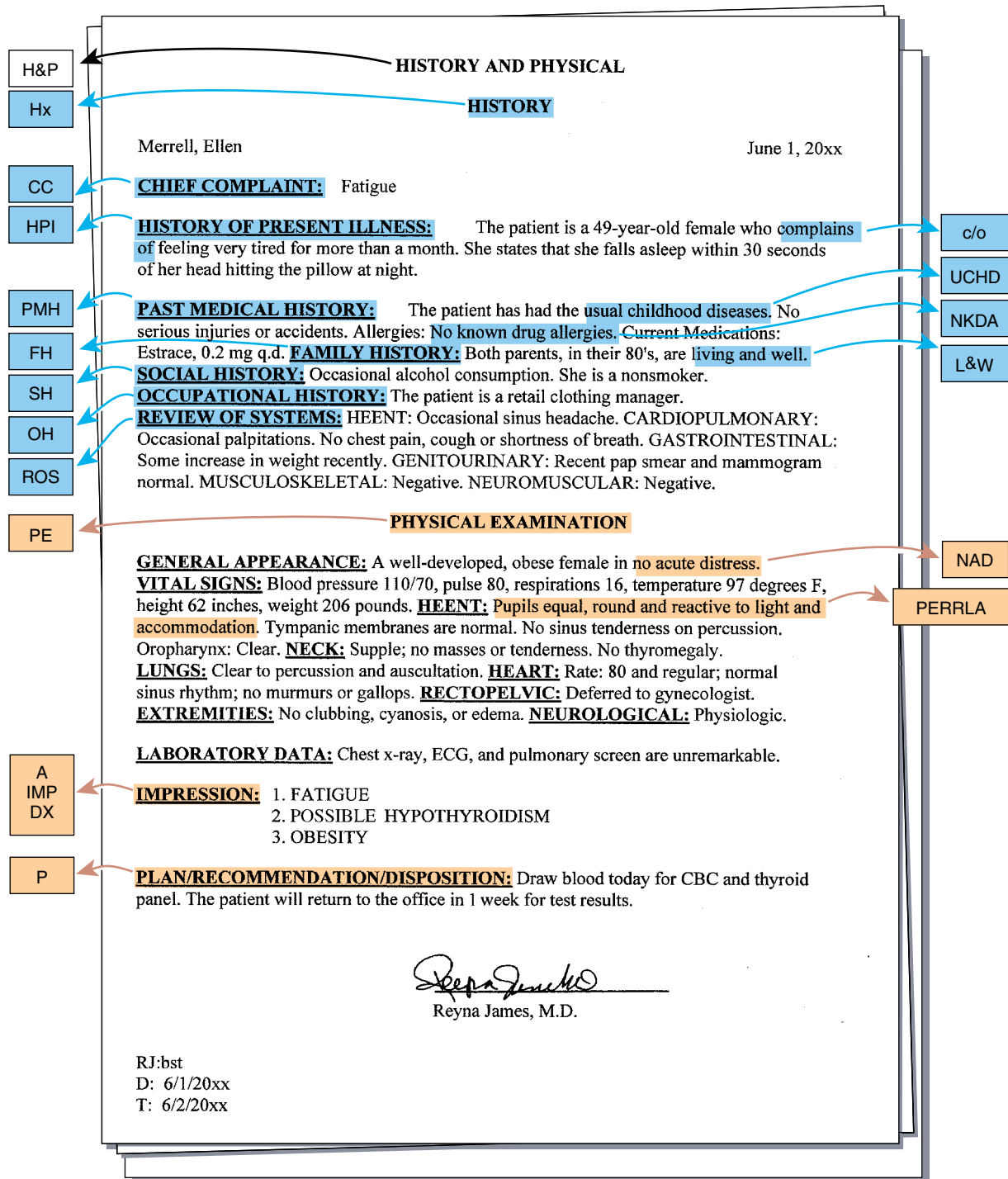


Figure 4.1 History and physical.

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Patient: Perron, Carleen**DATE: February 17, 20xx**

Referring Physician: C. Camarillo, M.D.

CONSULTATION

REASON FOR CONSULTATION: This 28-year-old white female presents with a one week history of upper respiratory infection (URI), sinusitis, and some periorbital headaches in recent weeks. She also has expectorated yellow-green mucus occasionally and has had a history of tonsillitis.

MEDICATIONS: None. **ALLERGIES:** No known allergies (NKA). **SURGERIES:** None. **HOSPITALIZATIONS:** None.

PAST MEDICAL HISTORY/REVIEW OF SYSTEMS: **Cardiopulmonary:** There is no history of angina, dyspnea, hemoptysis, emphysema, asthma, chronic obstructive pulmonary disease (COPD), hypertension, or heart murmurs. **Cardiovascular:** There is no history of high blood pressure. **Renal:** There is no history of dysuria, polyuria, nocturia, hematuria, or cystoliths. **Gastrointestinal:** There is no history of gallbladder disease, hepatitis, pancreatitis, or colitis. **Musculoskeletal:** There is no history of arthritis. **Endocrine:** There is no history of diabetes. **Hematologic:** There is no history of anemia, blood transfusion, or easy bruising. **Gynecological:** The patient states her menses are regular, and the start of her last menstrual cycle occurred 15 days ago.

FAMILY HISTORY: The patient states her maternal grandmother has diabetes.

SOCIAL HISTORY: The patient is single and has no children. She denies smoking tobacco. She denies drinking alcoholic beverages. She denies taking drugs.

CHILDHOOD DISEASES: The patient has had the usual childhood diseases.

OTOLARYNGOLOGIC EXAMINATION: **Otосcopy:** Tympanic membranes (TMs) are dull and slightly congested. **Sinuses:** There is maxillary fullness. **Rhinoscopic examination** reveals mild nasoseptal deviation (NSD). **Pharynx:** There is moderate inflammation; no exudates. **Oropharynx:** No masses. **Nasopharynx:** No masses. **Larynx:** Clear. **Neck:** Supple. **Cervical Adenopathy:** There is mild adenopathy.

IMPRESSION:

1. MAXILLARY SINUSITIS.
2. PHARYNGITIS.
3. CHRONIC TONSILLITIS.

DISPOSITION:

1. Warm salt water gargle (WSWG).
2. Ery-Tab 333, #24, 1 t.i.d. p.c.
3. Robitussin.
4. Return to office (RTO) in one week.


 PATRICK RODDEN, M.D.

JR:ti

D: 2/17/20xx

T: 2/18/20xx 9:50 a.m.

Figure 4.2 History and physical documented as part of a consultation for a patient with an upper respiratory infection.

PROBLEM-ORIENTED MEDICAL RECORD

The problem-oriented medical record (POMR) is a method of record keeping introduced in the 1960s. It is a highly organized approach that encourages a precise method of documenting the logical thought processes of health care professionals. Data are organized so that information can be accessed readily at a glance, with a focus on the patient's health problem. The use of POMR and its adaptations has grown in many areas of medicine. The approach is often used in medical schools, hospitals, clinics, and private practices (Fig. 4.3).

The central concept is a medical record in which all information is linked to specific problems. The record has four sections:

- *Database* patient's history, physical examinations, and diagnostic test results; from the database, the problem is identified and a plan is developed to address it
- *Problem list* directory of the patient's problems; each problem is listed and often assigned a number; problems include
 1. a specific diagnosis
 2. a sign or symptom
 3. an abnormal diagnostic test result
 4. any other problem that may influence health or well-being

Once identified, each problem is evaluated, and a plan for treating it is written. When a problem is resolved, a notation is made to show its resolution, but the problem remains on the summary list. The original problem list is maintained in the record so that personnel can easily orient themselves to the patient's prior medical history.

- *Initial plan* the strategy employed to resolve each problem is listed. There are three subdivisions:
 1. *Diagnostic plan* orders are given for specific diagnostic testing to confirm suspicions
 2. *Therapeutic plan* goals for therapy are specified
 3. *Patient education* instructions communicated to the patient are notated

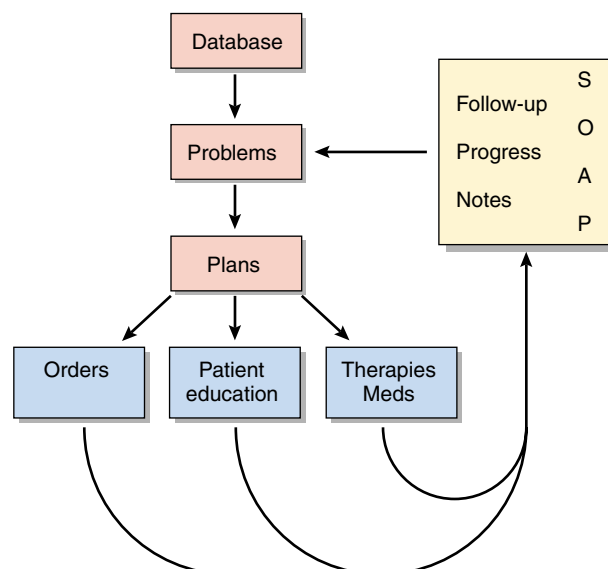


Figure 4.3 Problem-oriented medical record (POMR) diagram.

- *Progress notes* documentations of the progress concerning each problem are organized using the SOAP format (Figs. 4.4 and 4.5).

S—subjective	that which the patient describes
O—objective	observable information, e.g., test results, blood pressure readings
A—assessment	patient’s progress and evaluation of the plan’s effectiveness (note: any new problem identified is added to the problem list, and a separate plan for its treatment is recorded)
P—plan	decision to proceed or alter the plan strategy

The SOAP method of documenting a patient’s progress appears to be the most popular adaptation to the entire system, and it is commonly utilized with or without assigning a number to the problem.

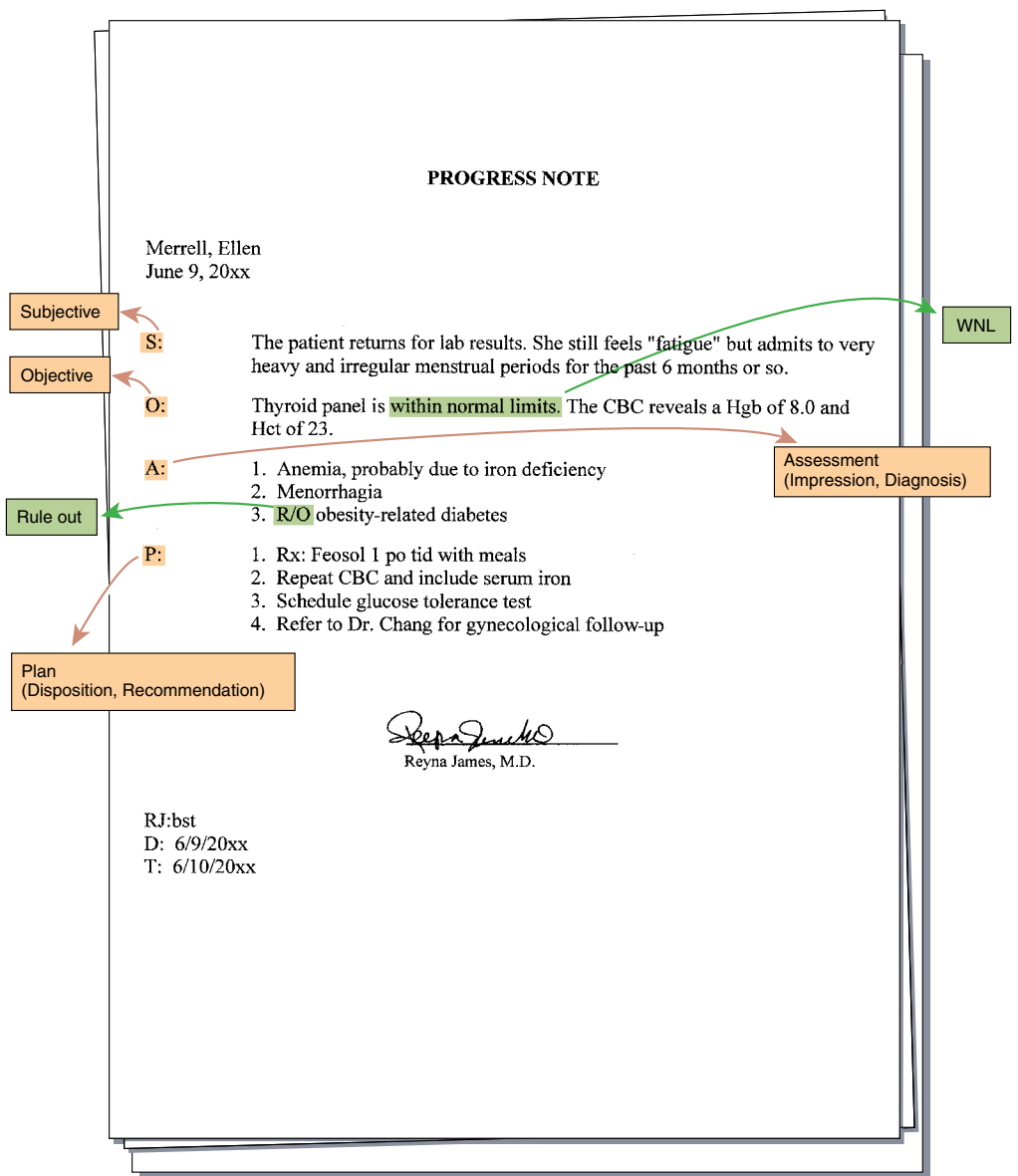


Figure 4.4 Progress note using SOAP format, representing follow-up visit after history and physical recorded in Figure 4.1.

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PROGRESS NOTES

Patient: PERRON, CARLEEN

03/30/20xx

- S:** The patient presents with a sore throat × 2 weeks.
- O:** Sinus exam: Maxillary and frontal congestion. Hypopharynx/adenoids: No inflammation.
- A:** Recurrent pharyngitis/sinusitis × 2 weeks.
- P:**
- 1) Ceftin 250 mg, #21, 1 t.i.d. p.o. p.c.
 - 2) Entex LA, #30, 1 b.i.d. p.o.
 - 3) Warm salt water gargle.


PATRICK RODDEN, M.D.

05/25/20xx

- S:** Recurrent sore throat every month.
- O:** Recurrent tonsillitis, cryptic tonsillitis. Sinus exam: Maxillary and frontal congestion. Neck: Supple; no masses. Hypopharynx/Adenoids: No inflammation. Paranasal Sinus X-ray: Bilateral frontal and maxillary sinusitis.
- A:** Recurrent tonsillitis, 8-10 times per year. Chronic maxillary and frontal sinusitis.
- P:**
- 1) Tonsillectomy discussed with the patient. The risks of general and local anesthesia, as well as the surgical procedure, were discussed with the patient. The consent form was signed.
 - 2) An admitting order was given to the patient for CBC, UA, and basic metabolic panel to be done one day prior to being admitted.
 - 3) Ceftin 250 mg, #21, 1 t.i.d. p.o. p.c.
 - 4) Entex LA, #30, 1 b.i.d. p.o.
 - 5) Flonase nasal inhaler, 2 sprays each nostril b.i.d.
 - 6) Warm salt water gargle.


PATRICK RODDEN, M.D.

Figure 4.5 SOAP progress notes following consultation of a patient with an upper respiratory infection (Fig. 4.2).

HOSPITAL RECORDS

The *history and physical* is usually the first document entered into the patient's hospital record on admission. *Physician's orders* list the directives for care prescribed by the doctor attending the patient. The *nurse's notes* and *physician's progress* notes chronicle the care throughout the patient's stay, and *ancillary reports* note the various procedures and therapies, including *diagnostic tests* and *pathology reports*. In a difficult case, a specialist may be called in by the attending physician, and a *consultation report* is filed. If a surgical remedy is indicated, a narrative *operative report* is required of the primary surgeon. The anesthesiologist, who is in charge of life support during surgery, must file the *anesthesiologist's report*. The final document, which is recorded at the time of discharge from the hospital, is the *discharge summary*.

The following are descriptions of common forms used in documenting the care of a hospital patient.

history and physical	documentation of the patient's recent medical history and results of a physical examination required before hospital admission (e.g., before admission for surgery) (Fig. 4.6)
consent form	document signed by the patient or legal guardian giving permission for medical or surgical care
informed consent	consent of a patient after being informed of the risks and benefits of a procedure and alternatives—often required by law when a reasonable risk is involved (e.g., surgery)
physician's orders	a record of all orders directed by the attending physician (Fig. 4.7)
diagnostic tests/laboratory reports	records of results of various tests and procedures used in evaluating and treating a patient (e.g., laboratory tests, x-rays) (Fig. 4.8)
nurse's notes	documentation of patient care by the nursing staff (note: flow sheets and graphs are often used to display recordings of vital signs and other monitored procedures) (Fig. 4.9)
physician's progress notes	physician's daily account of patient's response to treatment, including results of tests, assessment, and future treatment plans (Fig. 4.10)
ancillary reports	miscellaneous records of procedures or therapies provided during a patient's care (e.g., physical therapy, respiratory therapy)
consultation report	report filed by a specialist asked by the attending physician to evaluate a difficult case; note: a patient may also see another physician in consultation as an outpatient (in a medical office or clinic)

operative report (op report)	surgeon's detailed account of the operation including the method of incision, technique, instruments used, types of sutures, method of closure, and the patient's responses during the procedure and at the time of transfer to recovery (Fig. 4.11)
pathology report	report of the findings of a pathologist after the study of tissue (e.g., a biopsy) (Fig. 4.12)
anesthesiologist's report	anesthesiologist's or anesthesiologist's report of the details of anesthesia during surgery, including the drugs used, dose and time given, and records indicating monitoring of the patient's vital status throughout the procedure
discharge summary, clinical resume, clinical summary, discharge abstract	four terms that describe an outline summary of the patient's hospital care, including date of admission, diagnosis, course of treatment, final diagnosis, and date of discharge (Fig. 4.13)

The sample medical records in Figures 4.6 to 4.13 chronicle the hospital care of Carleen Perron, a 28-year-old woman who was seen in consultation by Dr. Patrick Rodden, an ENT specialist, who recommended a surgical remedy for the repeated infections she has had over the past 6 months.



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PREOPERATIVE HISTORY AND PHYSICAL**HISTORY****DATE OF ADMISSION:** June 3, 20xx**HISTORY OF PRESENT ILLNESS:**

The patient is a 28-year-old white female with a chief complaint of frequent, recurrent, suppurative tonsillitis. She has had some eight infections over the last 6 months and is admitted at this time for elective tonsillectomy. The surgery has been discussed with the patient and family, including risks and complications. The patient's internist is C. Camarillo, M.D.

MEDICATIONS: None.**ALLERGIES:** None known.**PAST SURGICAL HISTORY:** None.**PAST MEDICAL HISTORY:** UCHD (usual childhood diseases).

REVIEW OF SYSTEMS: **CARDIOVASCULAR:** No high blood pressure, heart murmurs, or shortness of breath. **PULMONARY:** No chronic lung disease; no asthma. **GASTRO-INTESTINAL:** No hepatitis. **RENAL HISTORY:** Negative for infections. **ENDOCRINE:** No diabetes or thyroid disease. **MUSCULOSKELETAL:** Negative for arthritis. **HEMATOLOGIC:** No history of anemia or bleeding tendencies.

FAMILY HISTORY: Grandmother has history of diabetes.**GYNECOLOGICAL HISTORY:** Regular menses.**SOCIAL HISTORY:** The patient is a nonsmoker. Alcohol use was denied, and drug use was denied.

(continued)

P. Rodden MD
PATRICK RODDEN, M.D.

JR:bst

D: 6/1/20xx

T: 6/2/20xx

HISTORY AND PHYSICAL
Page 1

PT. NAME: PERRON, CARLEEN
ID NO: 672894017
ROOM NO:
ATT. PHYS: PATRICK RODDEN, M.D.

Figure 4.6 Preoperative history and physical. A documentation of a patient's presurgical history and physical, dictated and transcribed for the hospital record before admission.

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PREOPERATIVE HISTORY AND PHYSICAL

PHYSICAL EXAMINATION

VITAL SIGNS: Afebrile, alert, oriented, normotensive. Blood Pressure: 124/80. Pulse: 84. Respirations: 18.

HEENT: PERRLA (pupils equal, round, and reactive to light and accommodation). Tympanic membranes are clear. Light reflex is present. No sinus tenderness on percussion. Oropharynx: Clear. Hypertrophic tonsils. No exudates. Nasopharynx: No masses. Larynx: Clear.

NECK: Supple; no masses or tenderness. No cervical adenopathy.

LUNGS: Clear to percussion and auscultation.

HEART: Rate: 84 and regular; normal sinus rhythm; no murmurs or gallops.

RECTOPELVIC: Deferred.

EXTREMITIES: No peripheral edema. No ecchymoses.

NEUROLOGICAL: Physiologically intact.

IMPRESSION: Chronic, recurrent tonsillitis. The patient is admitted for an elective tonsillectomy.


PATRICK RODDEN, M.D.

JR:bst
D: 6/1/20xx
T: 6/2/20xx

HISTORY AND PHYSICAL
PAGE 2

PT. NAME: PERRON, CARLEEN
ID NO: 672894017
ROOM NO:
ATT. PHYS: PATRICK RODDEN, M.D.

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PHYSICIAN'S ORDERS FOR: PREOPERATIVE ADMITTING ORDERS	PAGE 1 OF 1
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A THERAPEUTICALLY EQUIVALENT PRODUCT, WHICH HAS BEEN APPROVED BY THE PHARMACY AND THERAPEUTICS COMMITTEE OF THE MEDICAL STAFF, MAY BE DISPENSED AND ADMINISTERED UNLESS OTHERWISE SPECIFIED.
PHYSICIAN: CROSS OUT ANY ORDERS WHICH DO NOT APPLY.

DOCTOR: PLEASE STATE PERTINENT CLINICAL INFORMATION WHEN ORDERING RADIOLOGY PROCEDURES.

DATE	TIME	<input checked="" type="checkbox"/> Same Day Surgery (Admit to Observation if overnight stay req'd)	<input type="checkbox"/> Regular Inpatient Admission
06/02/20xx			

ADMIT DATE: JUNE 3, 20xx

ADMIT TO: Surgical Admit Unit _____ or _____
(date) (specific unit) (date)

PATIENT'S NAME: PERRON, CARLEEN ALLERGIES: NKA

DIET: NPO SURGEON: PATRICK RODDEN, M.D.

SURGERY CONSENT TO READ: TONSILLECTOMY

DATE AND TIME OF SURGERY: JUNE 3, 20xx at 9 a.m.

DATE TESTS TO BE DONE: JUNE 2, 20xx

TESTS: (Check box for desired tests)

- HGB CBC Basic metabolic panel PT
- HCT UA Comp metabolic panel PTT
- Other _____
- Group, Type, and Screen
- Prepare: _____ units Autologous Red Blood Cells (packed cells)
- Crossmatch: _____ units Directed Red Blood Cells (packed cells)
- _____ units Red Blood Cells (packed cells)
- ECG
- CHEST FILM Reason for x-ray; R/O active cardiopulmonary disease
- OTHER X-RAY _____
Reason for x-ray: _____

OTHER:

MEDICATIONS: Pre-Meds by Anesthesia

P. Rodden MD
Physician's Signature

PERRON, CARLEEN	6/3/20xx
DOB 07/20/20xx	F284
672894017	
Rodden, Patrick MD	

PHYSICIAN'S ORDERS

Figure 4.7 Preoperative surgical admitting orders. A form completed by the admitting physician that is forwarded to the hospital before the date of surgery.

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DOCTOR: PLEASE STATE PERTINENT CLINICAL INFORMATION WHEN ORDERING RADIOLOGY PROCEDURES

WRITE WITH BALLPOINT INK PEN; PRESS HARD

DATE	TIME	
6/3/xx	0800	T. O. Dr Rodden / G. Glen RN
		Consent for tonsillectomy
		<i>[Signature: T. Rodden MD]</i>
		noted P Carson RN 6/3/xx 0800
		<i>[Signature: P Carson RN]</i> 6-3-xx 0830

6/3/20xx
 F 284
 SURG 312

 PERRON, CARLEEN
 DOB 07/20/xx
 672894017
 Rodden, Patrick MD

WRITE WITH BALLPOINT INK PEN; PRESS HARD

DATE	TIME	
6/3/xx	10 ⁰⁰	Anesthesia post-op care
		1) mask O ₂ @ 6 L/min
		2) VS per PAK routine
		3) Demerol 20-40 mg IV q 5-15 min prn
		4) Droperidol 0.6-1.2 mg IV q 15-30 min prn
		5) maybe DC'd when awake & VS stable 4 h
		noted 6-3-xx <i>[Signature: Robert Jung, MD]</i>
		P Carson RN 10 ¹⁰

6/3/20xx
 F 284
 SURG 312

 PERRON, CARLEEN
 DOB 07/20/xx
 672894017
 Rodden, Patrick MD

PHYSICIAN'S ORDERS

Figure 4.7 Continued. Physician's orders. Orders written by the anesthesiologist and surgeon and noted by the nursing staff during the patient's surgical care.

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DOCTOR: PLEASE STATE PERTINENT CLINICAL INFORMATION WHEN ORDERING RADIOLOGY PROCEDURES

WRITE WITH BALLPOINT INK PEN; PRESS HARD

DATE	TIME	
6-3-xx	10 ⁰⁰	POST-OP 1) NS q 4h x 4 then q 2h x 4, then q 4h 2) bed rest & BRP when alert 3) continue IV's 80cc/hr 5% D/2 NS until taking fluids well 4) tylenol elixir & Cod. #11 top q 4h po prn pain 5) Aleve 50mg 1m q 4h Venetrol 50mg prn Swel-pai 6) Ice & liquids at bedside & encourage RRodden MD noted W.Cliff, R.N. 6-3-xx 1130 Mj 6/3/xx 1146

PERRON, CARLEEN 6/3/20xx
 F 284
 DOB 07/20/xx
 672894017 SURG 312
 Rodden, Patrick MD

WRITE WITH BALLPOINT INK PEN; PRESS HARD

DATE	TIME	
6-3-xx	12 ³⁰	1) full liquids requiring soft diet 2) admit 3) Dalmane 15mg po qhs prn sleep MRX prn RRodden MD noted W.Cliff R.N. 12:30 Mj 6/3/xx 1230

PERRON, CARLEEN 6/3/20xx
 F 284
 DOB 07/20/xx
 672894017 SURG 312
 Rodden, Patrick MD

PHYSICIAN'S ORDERS

Figure 4.7 Continued.

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LABORATORY REPORT

June 2, 20xx 3 p.m.

Collect: 6/2/xx at 1500 (BLOOD)
Service: 6/2/xx at 145028Y F - PERRON, CARLEEN
PATRICK RODDEN, M.D.**CHEMISTRY**

141	SODIUM	(135 - 145)	MMOL/L
3.7	POTASSIUM	(3.5 - 5.0)	MMOL/L
109	CHLORIDE	(100 - 110)	MMOL/L
29	CARBON DIOXIDE	(24 - 32)	MMOL/L
88	GLUCOSE	(65 - 110)	MG/DL
0.8	CREATININE	(0.4 - 1.5)	MG/DL
14	BUN [†]	(7 - 22)	MG/DL

HEMATOLOGY

	<<CBC>>		
11.8*	WBC	(4.8 - 10.8)	1000/CUMM
4.1*	RBC	(4.20 - 5.40)	MIL/CUMM
12.9	HGB	(12.0 - 16.0)	G/DL
37.7	HCT	(37.0 - 47.0)	%
91.5	MCV	(80 - 100)	CU MICRON
31.0	MCH	(27 - 31)	MCMCG
34.1	MCHC	(32 - 37)	G/DL
12.8	RDW	(11.5 - 14.5)	RBC INDEX
253	PLT	(150 - 400)	1000/CUMM
20.1	LYM%	(14 - 51)	%
7.5	MONO%	(1 - 11)	%
70.2	NEUTRO%	(35 - 74)	%
1.5	EOS%	(0 - 6)	%
0.7	BASO%	(0 - 2)	%
2.3	LYM#	(1.5 - 4.0)	1000/CUMM
0.8	MONO#	(0.2 - 0.9)	1000/CUMM
7.9*	NEUTRO#	(1.0 - 7.0)	1000/CUMM
0.2	EOS#	(0 - 0.7)	1000/CUMM
0.1	BASO#	(0 - 0.2)	1000/CUMM

(continued)

LABORATORY REPORT**PATIENT: PERRON, CARLEEN****672894017****Figure 4.8** Diagnostic tests/laboratory reports. Reporting forms with results of blood and urine studies ordered before surgery.

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LABORATORY REPORT

June 2, 20xx 3 p.m.

URINALYSIS

Collect: 6/2/xx at 1500 (URINE)
 Service: 6/2/xx at 1450

28Y F - PERRON, CARLEEN
 PATRICK RODDEN, M.D.

<<BASIC URINALYSIS>> SPECIFIC GRAVITY

1.024			
HAZY	APPEARANCE		
YELLOW	COLOR		
5.0	PH		
NEGATIVE	PROTEIN		
NEGATIVE	GLUCOSE		GM/DL
NEGATIVE	KETONE		
NORMAL	UROBILINOGEN	(0.1 - 1.0)	MG/DL
NEGATIVE	BLOOD		
NEGATIVE	LEUKOCYTES	(NEGATIVE)	
NEGATIVE	NITRITE	(NEGATIVE)	

<<MICROSCOPIC URINALYSIS>>

NONE	RBC	/HPF
0-3	WBC	/HPF
10-15	EPITHELIAL CELLS	/HPF
NONE	MUCUS	/HPF
3+	BACTERIA	/HPF
NONE	CASTS	/HPF
NONE	CRYSTALS	/HPF

LABORATORY REPORT

PATIENT: PERRON, CARLEEN

672894017

Figure 4.8 Continued.

DATE	TIME	REMARKS
6/3/XX	0615	Admitted & oriented to room 312. In no acute distress. VS stable. Airborne NPO maintained. Condition stable. K. Brown RN
6/3/XX	0800	To OR via gurney - awake & oriented accompanied by her mother - condition stable. K. Brown RN
6/3/XX	1110	Returned from PAR drowsy but arouses easily. Skin warm & dry. Color pink - VS stable - Throat dry unable to take sips of water very well - no nausea - C/o severe sore throat medicated x7 with 1M pain medication with desired effect - mother very supportive & remains @ bedside - Using a bed pan but unable to urinate - IV infusing well. K. Brown RN

CENTRAL MEDICAL CENTER
 PATIENT'S PROGRESS NOTES
 GENERAL CARE & TREATMENT

PT. NAME: PERRON, CARLEEN
 ID NO: 672894017
 ROOM NO: 312
 ATT. PHYS: PATRICK RODDEN, M.D.

Figure 4.9 Nurse's notes. A recording by the nursing staff of the patient's progress made during general care and treatment.

DATE	TIME	REMARKS
6/3/xx	10 ⁰⁵	op note Chronic recurrent tonsillitis Procedure: Tonsillectomy Surgeon: P. Rodden MD Anesthesiologist: Robert Jeng MD Procedure tolerated well P Rodden MD
6/3/xx	12 ²⁰	post op check VS stable C/o pain & poor p.o. fluid intake Will keep pt overnight for observation Plan to DC in am P Rodden MD
6/4/xx	08 ⁰⁰	Doing much better - no bleeding taking liquids freely DC'd on fluids Given Rx for Tylenol. RTO in 48h P. Rodden MD

CENTRAL MEDICAL CENTER
PHYSICIAN'S PROGRESS NOTES

PT. NAME: PERRON, CARLEEN
ID NO: 672894017
ROOM NO: 312
ATT. PHYS: PATRICK RODDEN, M.D.

Figure 4.10 Physician's progress notes. Physician's notations of the patient's progress throughout care.

CENTRAL MEDICAL CENTER

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OPERATIVE REPORT

DATE OF OPERATION: June 3, 20xx.

PREOPERATIVE DIAGNOSIS: Chronic tonsillitis.

POSTOPERATIVE DIAGNOSIS: Frequent, recurrent tonsillitis.

SURGEON: Patrick Rodden, M.D.

ASSISTANT SURGEON: None

ANESTHESIOLOGIST: Robert Jung, M.D.

ANESTHESIA: General.

SURGERY PERFORMED: Tonsillectomy.

DESCRIPTION OF OPERATION: After general anesthesia induction, with intubation, the McGivor mouth gag and tongue retractor were utilized for exposure of the oropharynx. Local anesthetic consisting of 6 cc of 0.5% Xylocaine with 1:100,000 epinephrine was utilized. Tonsillectomy was carried out using dissection and air technique. The right tonsillectomy electrocoagulation Bovie suction was utilized for hemostasis. Examination of the nasopharynx was normal.

The patient tolerated the procedure well and went to the recovery room in good condition.


PATRICK RODDEN, M.D.

JR:as
D: 6/3/20xx
T: 6/4/20xx

OPERATIVE REPORT

PT. NAME: PERRON, CARLEEN
ID NO: 672894017
ROOM NO: 312
ATT. PHYS: PATRICK RODDEN, M.D.

Figure 4.11 Operative report. Surgeon's account of a surgical procedure.

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PATHOLOGY REPORTPATIENT: PERRON, CARLEEN
28 Y (FEMALE)

DATE RECEIVED: June 3, 20xx.

DATE REPORTED: June 4, 20xx

GROSS:

Received are two tonsils each 2.5 cm in greatest diameter.

MICROSCOPIC:

The sections show deep tonsillar crypts associated with follicular lymphoid hyperplasia. No bacterial granules are seen.

DIAGNOSIS:

CHRONIC LYMPHOID HYPERPLASIA OF RIGHT AND LEFT TONSILS.


MARY NEEDHAM, M.D.

MN:gds

D: 6/4/20xx

T: 6/5/20xx

Figure 4.12 Pathology report.

THAT CONDITION WHICH AFTER STUDY IS DETERMINED TO BE THE REASON FOR ADMISSION TO THE HOSPITAL		MEDICAL RECORDS USE
PRINCIPAL DIAGNOSIS - <i>Chronic Tonsillitis</i>		474.00
FINAL DIAGNOSIS - NO ABBREVIATIONS		474.00
<i>Same</i>		
SECONDARY DIAGNOSIS:		
—		
COMPLICATIONS AND/OR COMORBIDITY:		
—		
PRINCIPAL OPERATION/PROCEDURES(S)/TREATMENT RENDERED:		
<i>Tonsillectomy</i>		
SECONDARY OPERATIONS/PROCEDURES:		
—		
CONDITION ON DISCHARGE <i>Stable</i>		
<input type="checkbox"/> DISCHARGE INSTRUCTIONS		<input type="checkbox"/> PRE-PRINTED INSTRUCTIONS GIVEN
MEDICATIONS <i>Tylenol</i>		
PHYSICAL ACTIVITY <i>Bed rest</i>		
DIET <i>full liquid</i>		
FOLLOW-UP <i>office in 48 h</i>		
DATE OF SUMMARY IF DICTATED:		
DATE ADMITTED: <i>6/3/XX</i>		DATE DISCHARGED: <i>6/4/XX</i>
		ATTENDING PHYSICIAN <i>J. Rodden</i> M.D.
FOR MED. RECORDS USE ONLY	ASSEMBLY	ANALYSIS
<i>gl</i>	<i>ML37</i>	<i>W</i>
CODED	KEYED	FINAL CHECK
<i>W</i>	<i>Ly</i>	<i>S</i>
CONSULTANTS:		<i>06/03/20XX</i>
	AA	<i>1</i>
	DP	<i>R48</i>
	SC	<i>1212</i>
<p>CENTRAL MEDICAL CENTER</p> <p>DIAGNOSIS RECORD/ DISCHARGE SUMMARY</p>		

Figure 4.13 Discharge summary (abstract). Final report documented at the time of discharge that includes the diagnostic record and diagnosis-related group (DRG)—the number assigned to the individual hospitalization based on the patient’s diagnoses, complications, age, etc.—and that translates to a fixed dollar amount payable from a third-party payer, e.g., Medicare.

Medical Record Abbreviations

Following are common medical record abbreviations used in patient care documentations. They represent the “acceptable” terms used extensively throughout this text. It is important to note that individual medical facilities provide their own list of acceptable terms and abbreviations that may differ from site to site. Memorize the terms and abbreviations from this list, and plan on adapting them to the variations you encounter in the workplace.

ERROR-PRONE ABBREVIATIONS AND SYMBOLS

Medical errors caused by illegible entries and misinterpretations of medical abbreviations and symbols have led health care agencies, such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), to require that medical facilities publish lists of authorized abbreviations for use by all personnel, including a list of those that are unacceptable.

In this text, the abbreviations and symbols that have been identified as error prone are **bolded red**. Depending on the medical facility, their use may or may not be deemed acceptable; therefore, it is very important to study them, too, so that you can properly interpret their meaning if they have been used in a medical record.

Abbreviation	Meaning
MEDICAL CARE FACILITIES	
CCU	coronary (cardiac) care unit
ECU	emergency care unit
ER	emergency room
ICU	intensive care unit
IP	inpatient (a registered bed patient)
OP	outpatient
OR	operating room
PACU	postanesthetic care unit
PAR	postanesthetic recovery
post-op/postop	postoperative (after surgery)
pre-op/preop	preoperative (before surgery)
RTC	return to clinic
RTO	return to office
PATIENT CARE	
BRP	bathroom privileges
CP	chest pain
DC, D/C	discharge, discontinue
ETOH	ethyl alcohol

Abbreviation	Meaning
Ⓕ	left
Ⓖ	right
pt	patient
RRR	regular rate and rhythm
SOB	shortness of breath
Tr	treatment
Tx	treatment or traction
VS	vital signs
T	temperature
P	pulse
R	respiration
BP	blood pressure
Ht	height
Wt	weight
WDWN	well-developed and well-nourished
y.o.	year old
#	number or pound: if before the numeral, it means number (e.g., #2 = number two); if after the numeral, it means pound (e.g., 150# = 150 pounds)
♀	female
♂	male
°	degree or hour
↑	increased
↓	decreased
⊖	none or negative
♀	standing
♂	sitting
○	lying

Common Diagnostic Tests and Procedures

Diagnostic tests and procedures are an integral part of patient care. Analyses of urine, stool, and blood specimens are recorded among the earliest efforts to understand conditions of disease. The advance of technology has led to the development of a myriad of highly sophisticated laboratory testing, examples of which will be featured in this text as they pertain to a specific body system. The two most common laboratory tests performed as part of a general health inquiry or to rule out a particular condition are the complete blood count, or CBC (see Fig. 4.8, Hematology, and Fig. 8.6 in Chapter 8) and urinalysis, or UA (see Fig. 4.8 Continued and Fig. 15.9 in Chapter 15).

It is valuable for health care professionals to recognize common diagnostic tests and procedures and the types of technology used to produce them.

Diagnostic Imaging Modalities

Methods of diagnostic imaging have rapidly expanded in the years since the discovery of x-rays by Wilhelm Roentgen in 1895. Radiation from x-rays, which pass through the body to produce images of the skeleton and other body structures, was found to be ionizing, a process that changes the electrical charge of atoms with a possible effect on body cells. Overexposure to ionizing radiation can have harmful side effects, e.g., cancer; however, technological advances have produced images requiring significantly lower doses of radiation to minimize risk.

Further advancement has led to the discovery and use of other imaging modalities (techniques) under the umbrella of the medical specialty known as radiology. Common ionizing modalities include radiography (x-ray), computed tomography, and nuclear medicine. Common nonionizing modalities that present no apparent risk include magnetic resonance imaging and sonography.

IONIZING IMAGING

Radiography (X-ray)

Radiography is a modality using x-rays (ionizing radiation) to provide images of the body's anatomy to diagnose a condition or impairment. An image is produced when a small amount of radiation is passed through the body to expose a sensitive film. The image is called a radiograph. (Note: -graph is the preferred suffix used in radiology to refer to an x-ray record. It is taken by a radiologic technologist [also known as a radiographer] and interpreted or read by a radiologist, a physician specializing in the study of radiology.) (See Figure 4.14.)

Computed Tomography or Computed Axial Tomography

Computed tomography (CT), also known as computed axial tomography (CAT), is a radiologic procedure that uses a machine (called a scanner) to examine a body site by taking a series of cross-sectional (tomographic) x-ray films in a full circle rotation. A computer then calculates and converts the rates of absorption and density of the x-rays into a three-dimensional picture on a screen (Fig. 4.15).

Nuclear Medicine Imaging or Radionuclide Organ Imaging

This diagnostic imaging technique uses an injected or ingested radioactive isotope, also called a radionuclide (a chemical that has been tagged with radioactive compounds that emit gamma rays). A gamma camera detects and produces an image of the



Figure 4.14 The first published x-ray image of the hand and signet ring of Professor Roentgen's wife. It was produced December 22, 1895.

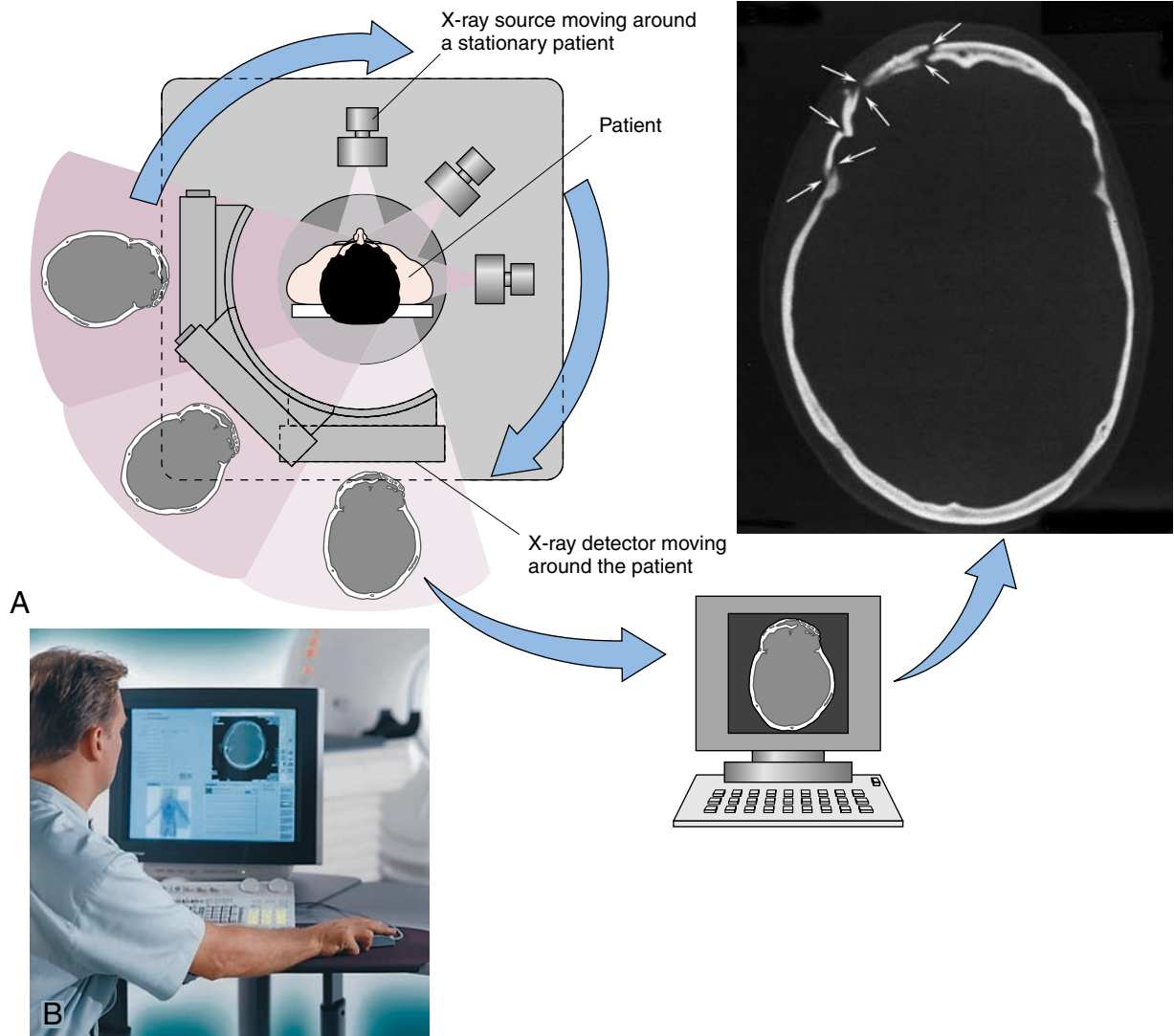


Figure 4.15 **A.** Principles of computed tomography (CT). *Inset*, CT showing multiple open fractures (arrows) of skull. **B.** CT imaging process.

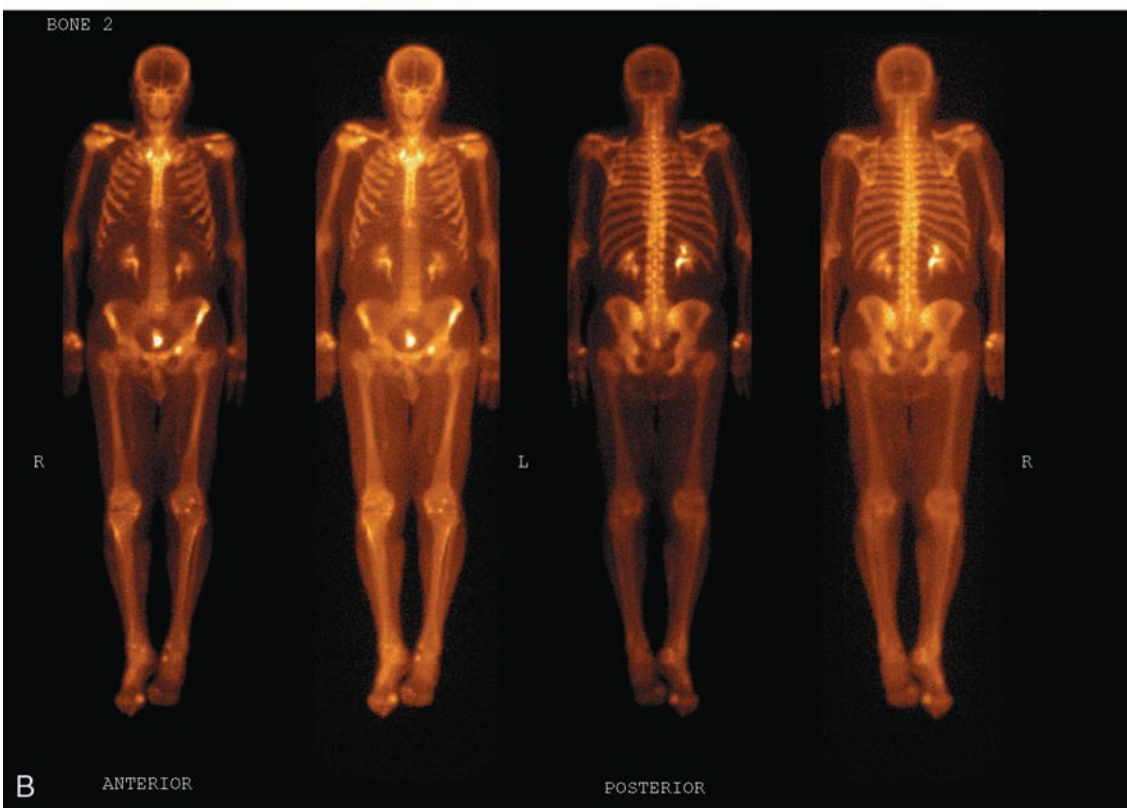


Figure 4.16 Nuclear medicine image. **A.** Gamma camera used to produce image. **B.** Radionuclide whole-body bone scan.

distribution of the gamma rays in the body. This is useful in determining the size, shape, location, and function of body organs such as the brain, lungs, bones, and heart (Fig. 4.16).

NONIONIZING IMAGING

Magnetic Resonance Imaging

Magnetic resonance imaging (MRI) is a nonionizing imaging technique using magnetic fields and radiofrequency waves to visualize anatomical structures within the body. A large magnet surrounds the patient as a scanner subjects the body to a radio signal that temporarily alters the alignment of the hydrogen atoms in the patient's tissue. As the radiowave signal is turned off, the atoms realign and the energy produced is absorbed by detectors and interpreted using computers to provide detailed anatomical images of the body part. MRI is particularly useful in examining soft tissues, joints, and the brain and spinal cord (Fig. 4.17).

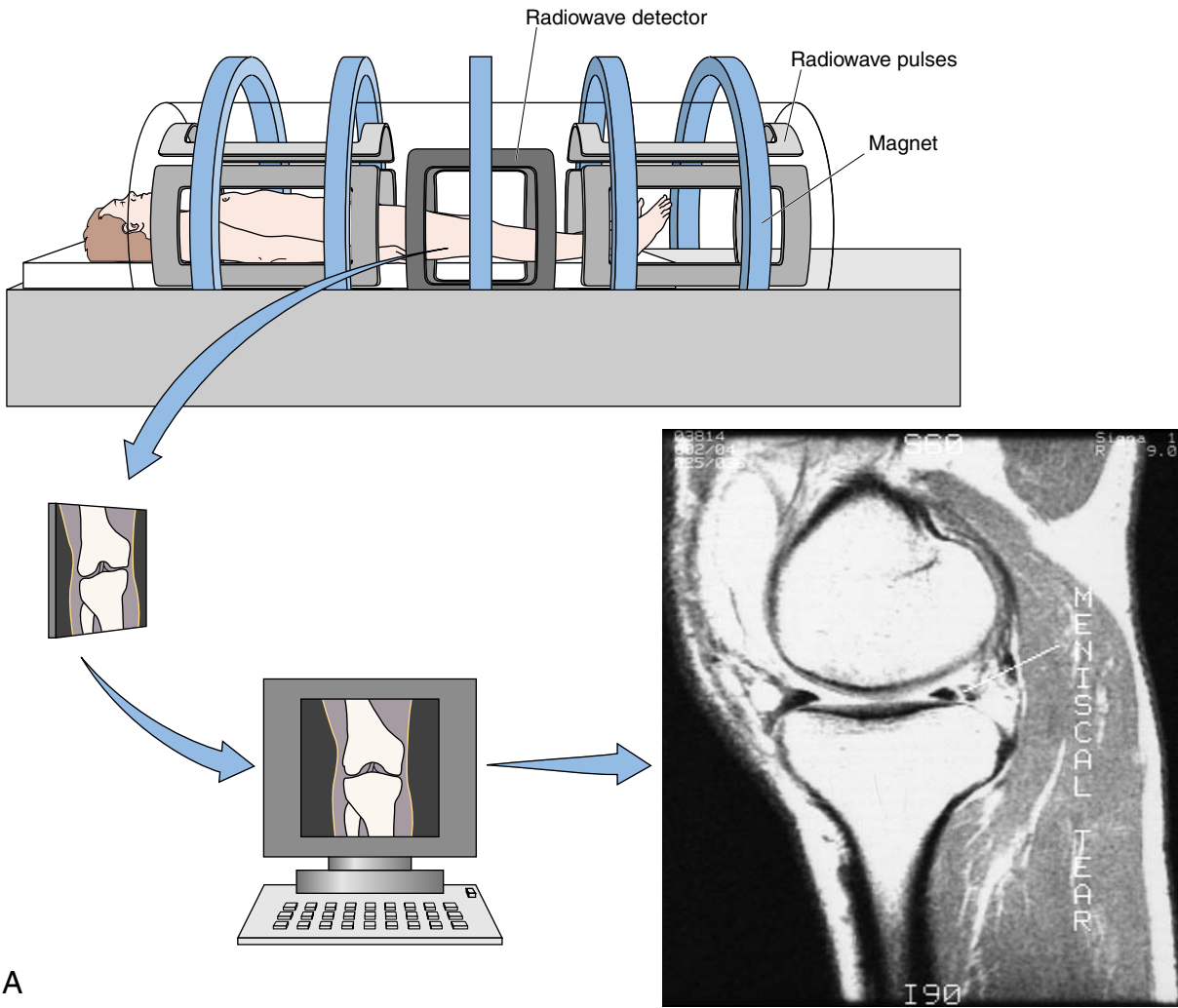
Magnetic resonance angiography (MRA) applies MR technology in the study of blood flow (see Diagnostic Tests and Procedures in Chapters 7 and 10).

Sonography

Sonography (diagnostic ultrasound)[U/S or US] is the use of high-frequency sound waves (ultrasound) to visualize body tissues. Ultrasound waves sent through a scanning device, called a transducer, are reflected off structures within the body and analyzed by a computer to produce moving images on a monitor. Sonography is used to examine many parts of the body, including the abdomen, male and female reproductive organs, thyroid and parathyroid glands, and the cardiovascular system (Fig. 4.18).

USE OF CONTRAST

Some imaging procedures require the internal administration of a contrast medium to enhance the visualization of anatomical structures. There are many different kinds of contrast media, including barium, iodinated compounds, gasses (air, carbon dioxide), and other chemicals known to increase visual clarity. Depending on the medium, it may be injected, swallowed, or introduced through an enema or catheter. Compare Figures 15.5 and 15.8 (x-rays of the urinary tract) in Chapter 15, which show images taken with and without contrast.

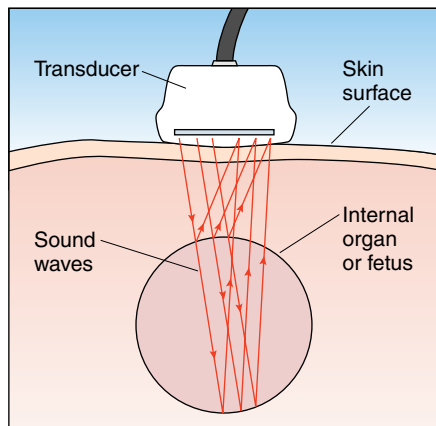


A



B

Figure 4.17 **A.** Principles of magnetic resonance imaging (MRI). Patient is positioned within a magnetic field as radiowave signals are conducted through the selected body part. Energy is absorbed by tissues and then released. A computer processes the released energy and formulates the image. *Inset*, MRI of the knee (lateral view) identifying a torn meniscus. **B.** MRI unit.



A Energy in the form of sound waves is reflected off internal organs or, during pregnancy, the fetus and transformed into an image on a TV-type monitor.



Figure 4.18 **A.** Principles of sonography. **B.** Obstetric sonography.

Common Medical Record Terms Related to Disease

NORMAL. The word stems from the Latin word *normalis*, referring to that which is made according to a carpenter's square, from *norma*, a carpenter's square; thus, normal refers to a rule or pattern. Abnormal is out of line, not conforming to the rule of pattern.

BENIGN VERSUS MALIGNANT. These antonyms, stemming from the Latin words *benignus*, meaning kind origin, and *malignus*, meaning bad origin, were first used to refer to conditions that were kind or mild as opposed to those that were bad or severe. Galen is credited for using the terms in reference to tumors. A tumor is considered malignant if cancerous and benign if not.

The following terms related to disease are common in medical records. Learn them as a foundation on which you will build as your vocabulary expands.

Term	Meaning
acute ă-kyūt'	sharp; having intense, often severe symptoms and a short course
chronic kronī'k	a condition developing slowly and persisting over time
benign bi-nīn'	mild or noncancerous
malignant mă-lig'nănt	harmful or cancerous
degeneration dē-jen-er-ă'shŭn	gradual deterioration of normal cells and body functions
degenerative disease	any disease in which there is deterioration of structure or function of tissue
diagnosis dī-ag-nō'sis	determination of the presence of a disease based on an evaluation of symptoms, signs, and test findings (results) (dia = through; gnosis = knowing)
etiology ē-tē-ol'ō-jē	cause of a disease (etio = cause)
exacerbation eg-zas-er-bă'shŭn	increase in severity of a disease with aggravation of symptoms (ex = out; acerbo = harsh)
remission rē-mish'ŭn	a period in which symptoms and signs stop or abate

Term	Meaning
febrile fe'brīl	relating to a fever (elevated temperature)
gross	large; visible to the naked eye
idiopathic id'ē-ō-path'ik	a condition occurring without a clearly identified cause (idio = one's own)
localized lō'kāl-īzd	limited to a definite area or part
systemic sis-tem'ik	relating to the whole body rather than only a part
malaise mă-lāz'	a feeling of unwellness, often the first indication of illness
marked	significant
equivocal ē-kwīv'ō-kl	vague, questionable
morbidity mor-bid'i-tē	sick; a state of disease
morbidity rate	the number of cases of a disease in a given year; the ratio of sick to well individuals in a given population
mortality mor-tal'i-tē	the state of being subject to death
mortality rate	death rate; ratio of total number of deaths to total number in a given population
prognosis prog-nō'sis	foreknowledge; prediction of the likely outcome of a disease based on the general health status of the patient along with knowledge of the usual course of the disease
progressive prō-gres'iv	the advance of a condition as signs and symptoms increase in severity
prophylaxis prō-fi-lak'sis	a process or measure that prevents disease (pro = before; phylassein = to guard)
recurrent rē-kūr'ent	to occur again; describes a return of symptoms and signs after a period of quiescence (rest or inactivity)
sequela sē-kwel'ă	a disorder or condition after, and usually resulting from, a previous disease or injury
sign	a mark; objective evidence of disease that can be seen or verified by an examiner
symptom simp'tōm	occurrence; subjective evidence of disease that is perceived by the patient and often noted in his or her own words
syndrome sin'drōm	a running together; combination of symptoms and signs that give a distinct clinical picture indicating a particular condition or disease, e.g., menopausal syndrome



FEBRILE. Febrile is derived from the Latin febris, meaning "I am warm." In the ancient world, fever was considered a favorable symptom, and the origin of the word is associated with February (the month for cleansing or purifying). Before the clinical thermometer was developed, the method of estimating fever was to lay the hand on the skin.

Term	Meaning
noncontributory	not involved in bringing on the condition or result
unremarkable	not significant or worthy of noting

Pharmaceutical Abbreviations and Symbols

Pharmaceutical abbreviations and symbols are frequently used in documenting patient care. They are found throughout the medical record. Efficient medical record keeping and effective communication among health care workers depend on knowledge of commonly used pharmaceutical abbreviations and symbols.

UNITS OF MEASURE

The following are common metric and apothecary units of measurement. Consult your medical dictionary for a complete listing of units of measurement and conversion formulas.

Metric System

Metric is the most commonly used system of measurement in health care. It is a decimal system based on the following units.

meter (m)	length	39.37 inches
liter (L)	volume	1.0567 U.S. quarts
gram (g or gm)	weight	15.432 grains

Apothecary System

The apothecary system is an outdated method of liquid and weight measure used by the earliest chemists and pharmacists. The liquid measure was based on one drop. The weight measure was based on one grain of wheat. Although the small apothecary measures are rarely used, the larger ones, e.g., fluid ounces, are still common.



DRUG. The Middle English *drogge* or *drugge* is derived from the Old French *drogue*, all meaning drug. Earlier origin is uncertain, possibly either a Teutonic root meaning dry or the Persian *droa* meaning odor because many drugs had a strong odor. Although the ancients listed the use of various medicines, the term drug did not appear until the end of the medieval period. The word *druggist* did not appear until the 16th century.

Common Abbreviations and Symbols

Abbreviation	Meaning
METRIC	
cc	cubic centimeter (1 cc = 1 mL)
cm	centimeter (2.5 cm = 1 inch)
g or gm	gram
kg	kilogram [1,000 grams (2.2 pounds)]
L	liter
mg	milligram [one-thousandth (0.001) of a gram]
ml, mL	milliliter [one-thousandth (0.001) of a liter]
mm	millimeter [one-thousandth (0.001) of a meter]
cu mm	cubic millimeter

Abbreviation	Meaning
APOTHECARY	
fl oz	fluid ounce
gr	grain
gt	drop (L. gutta = drop)
gtt	drops
dr	dram (1/8 ounce)
oz	ounce
lb or #	pound (16 ounces)
qt	quart (32 ounces)

MEDICATION ADMINISTRATION

Prescribed medications can be administered to patients in various ways, depending on the indication for the drug and the status of the patient. The following is an overview of forms of drugs and routes of administration, including abbreviations and symbols.

Drug Form	Route of Administration	
SOLID AND SEMISOLID FORMS		
tablet (tab)	oral [per os (p.o.)]	by mouth
capsule (cap)	sublingual (SL) buccal	under the tongue in the cheek
suppository (suppos)	vaginal [per vagina (PV)] rectal [per rectum (PR)]	inserted in vagina inserted in rectum
LIQUID FORMS		
fluid	inhalation	inhaled through nose or mouth [e.g., aerosol (spray) or neblizer (device used to produce a fine spray or mist, often in a metered dose)]
parenteral	by injection (Fig. 4.19) <i>intra</i> dermal (ID) <i>intra</i> muscular (IM) <i>intra</i> venous (IV) <i>subcutaneous</i> (Sub-Q, SC , SQ)	within the skin within the muscle within the vein under the skin
cream, lotion, ointment	topical	applied to the surface of the skin
other delivery systems	transdermal implant	absorption of a drug through unbroken skin a drug reservoir imbedded in the body to provide continual infusion of a medication (see Chapter 11, Fig. 11.9)

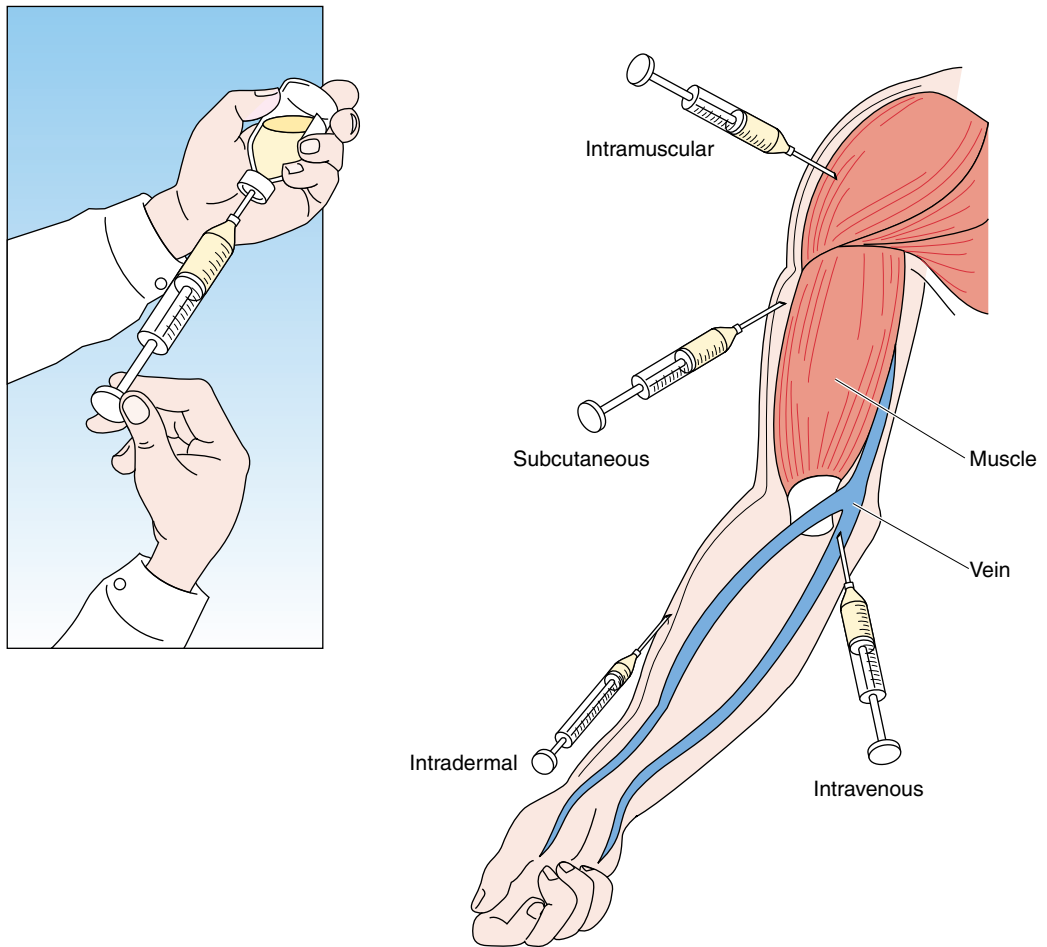


Figure 4.19 Parenteral drug administration.



Rx. The symbol found at the beginning of a prescription stands for recipe. The cross on the tail of the Rx incorporates the astrological sign of Jupiter, which has no connection with the word recipe. The sign of Jupiter was placed at the top of a formula to appease the chief Roman god so that the compound might act favorably. The period during the ascendancy of the planet Jupiter was considered a favorable time for the collection of herbs and the preparation of medicines.

The Prescription

A prescription is a written direction by a physician for dispensing or administering a medication to a patient. It is an order to supply a named patient with a particular drug of a specific strength and quantity along with specific instructions for administration. The prescription is a legal document that must be written in a specific format (Fig. 4.20).

DRUG NAMES

The *chemical name* is assigned to a drug in the laboratory at the time it is invented. It is the formula for the drug, which is written exactly according to its chemical structure. The *generic name* is the official, nonproprietary name given a drug. The *trade* or *brand* is the manufacturer's name for a drug. For example:

chemical name

1-[[3-(6,7-dihydro-1-methyl-7-oxo-3-propyl-1H-pyrazolo[4,3-d]pyrimidin-5-yl)-4-ethoxyphenyl]sulfonyl]-4-methylpiperazine citrate

generic name

sildenafil

trade or brand

Viagra (Pfizer Pharmaceutical Company)

CENTRAL MEDICAL GROUP, INC.
Patrick Rodden, M.D.
DEA #: AR 0000000
201 Medical Center Drive
Central City, US 90000-1234

Name of Patient Carleen Perron Date 6/4/xx
Address _____

Rx Tylenol w/ codeine No. 3 #24
Sig: tab + q 4h prn pain

SUBSTITUTION PERMITTED M.D. Patrick Rodden M.D.
DISPENSE AS WRITTEN

May refill 3 times

Figure 4.20 Sample prescription.

PRESCRIPTION ABBREVIATIONS

Many Latin abbreviations and symbols are commonly used in prescription writing as well as in physicians' orders. Being familiar with these symbols makes it possible to read a prescription or physician's order.

Historically, prescriptions were written in Latin. The words were abbreviated for convenience. For example, quater in die, Latin for four times a day, is abbreviated q.i.d. The periods were included to indicate the abbreviation of three words; if not carefully documented, however, they can be interpreted with drastic implications. For example, the period in q.d (meaning once a day) can be misinterpreted as q.i.d (four times a day) when handwritten. For the purpose of proper recognition, the periods were included in the abbreviations in this text, but the trend is to discourage their use, especially in writing, because they can be misinterpreted. In practice, you will find variations including or excluding the periods and the use of uppercase instead of lowercase letters, e.g., QID versus qid.

Roman numerals were used exclusively in the early days and are still used today; however, most pharmacy organizations now promote the use of Arabic numerals only.

Error-Prone Abbreviations and Symbols



Listed is a sampling of abbreviations and symbols deemed most error prone, including the risk for misinterpretation and preferred use.

Error-Prone Abbreviation	Meaning	Risk	Preferred Use
q.d	every day	mistaken for q.i.d. when the period after the “q” is sloppily written to look like an “i”	spell out “daily”
q.o.d.	every other day	mistaken for q.d when the “o” is mistaken for a period	spell out “every other day”
DC, D/C	discharge, discontinue	when used to mean “discharge,” mistaken for “discontinue” when followed by medications prescribed at the time of discharge	spell out “discontinue” or “discharge”
AS, AD, AU	left ear, right ear, both ears	mistaken for each other	spell out
OS, OD, OU	left eye, right eye, both eyes	mistaken for each other	spell out
SC or SQ	subcutaneous	mistaken for SL (sublingual) or “5 every”	spell out “subcutaneously” or use Sub-Q
>, <	greater than, less than	mistaken for each other	spell out

Common Abbreviations and Symbols

Abbreviation	Meaning	Latin ^a
TIME AND FREQUENCY		
ā	before	ante
a.c.	before meals	ante cibum
a.m.	before noon	ante meridiem
b.i.d.	twice a day	bis in die
d	day	
h	hour	hora
h.s.	at hour of sleep (bedtime)	hora somni
noc.	night	noctis
p̄	after	post
p.c.	after meals	post cibum
p.m.	after noon	post meridiem
p.r.n.	as needed	pro re nata
q	every	quaque
q d	every day	quaque die
q h	every hour	quaque hora
q 2 h	every 2 hours	
q.i.d.	four times a day	quater in die
q.o.d.	every other day	quaque altera die
STAT	immediately	statim
t.i.d.	three times a day	ter in die
wk	week	
yr	year	
MISCELLANEOUS		
AD	right ear	auris dextra
AS	left ear	auris sinistra
AU	both ears	ures unitas
ad lib.	as desired	ad libitum
amt	amount	
aq	water	aqua
Ⓟ	bilateral	
C	Celsius, centigrade	
ċ	with	cum



DEXTER AND SINISTER.

Dexter is Latin for right, and sinister is Latin for left. The origin of these terms, however, is earlier than ancient Rome. Sun worshippers facing the morning sun had the south on their right hand. The Sanskrit word for south is dekkan, allied to dhu, shining; thus, the right hand was the south or warm shining hand. The left hand was the north or cold hand. Therefore, dexterity or right-handedness was skill, whereas sinister was ill-omened. Among the Romans, sinisteritas (left-handedness) meant awkwardness.

Abbreviation	Meaning	Latin ^a
F	Fahrenheit	
(m)	murmur	
NPO	nothing by mouth	non per os
OD	right eye	oculus dexter
OS	left eye	oculus sinister
OU	both eyes	oculi unitas
per	by or through	
p.o.	by mouth	per os
PR	through rectum	per rectum
PV	through vagina	per vagina
q.n.s.	quantity not sufficient	
q.s.	quantity sufficient	
Rx	recipe; prescription	
Sig:	label; instruction to the patient	signa
s	without	sine
ss	one-half	semis
w.a.	while awake	
×	times or for [e.g., × 6 (six times), × 2 d (for 2 days)]	
>	greater than	
<	less than	
†	one (modified lowercase Roman numeral i)	
††	two (modified lowercase Roman numeral ii)	
†††	three (modified lowercase Roman numeral iii)	
†∇	four (modified lowercase Roman numeral iv)	
I, II, III, IV, V, VI, VII, VIII, IX, X	uppercase Roman numerals 1–10 (Note: Arabic numerals are preferred)	

^aOriginal Latin given when it is deemed helpful.

Recording Date and Time

The date and time are usually required in entries in a medical record. Always include the month, day of the month, and the year (e.g., 12/25/xx); sometimes eight digits are required (e.g., 01/08/20xx). Often military time is used (Fig. 4.21).

Standard	Military	Standard	Military
1:00 a.m.	0100 zero one hundred	1:00 p.m.	1300 thirteen hundred
2:00 a.m.	0200 zero two hundred	2:00 p.m.	1400 fourteen hundred
2:15 a.m.	0215 zero two fifteen	3:00 p.m.	1500 fifteen hundred
3:00 a.m.	0300 zero three hundred	4:00 p.m.	1600 sixteen hundred
4:00 a.m.	0400 zero four hundred	5:00 p.m.	1700 seventeen hundred
4:30 a.m.	0430 zero four thirty	6:00 p.m.	1800 eighteen hundred
5:00 a.m.	0500 zero five hundred	7:00 p.m.	1900 nineteen hundred
6:00 a.m.	0600 zero six hundred	8:00 p.m.	2000 twenty hundred
7:00 a.m.	0700 zero seven hundred	9:00 p.m.	2100 twenty-one hundred
8:00 a.m.	0800 zero eight hundred	10:00 p.m.	2200 twenty-two hundred
9:00 a.m.	0900 zero nine hundred	11:00 p.m.	2300 twenty-three hundred
10:00 a.m.	1000 ten hundred		hundred
11:00 a.m.	1100 eleven hundred	12:00 a.m.	2400 twenty-four hundred hours
12:00 p.m.	1200 twelve hundred hours (noon)	(midnight)	hundred hours

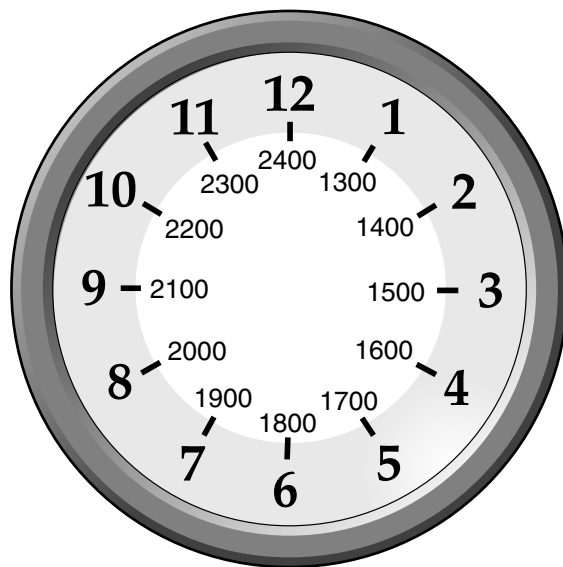


Figure 4.21 Military and standard time.

Regulations and Legal Considerations

Medical record documentations are made by physicians caring for the patient as well as other authorized health care professionals involved with care.

State, federal, and private accrediting agencies, e.g., the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), provide specific guidelines that regulate how medical records are kept, including proper format for all forms, use of appropriate terminology and accepted abbreviations, protocol for personnel having access to records, and responsibilities for documentation.

Corrections

Sometimes mistakes are made when making an entry in a medical record. Careful clarification of the error is essential. If a mistake is made in a handwritten entry, it should be identified by drawing a single line through it, and the correction written in the margin above or immediately after. Include the date, the abbreviation “corr.,” and the initials of the person making the correction. The use of correction fluid, e.g., Wite-Out, is forbidden!

The medical record often becomes evidence in medical malpractice cases. Obliterations and signs of possible tampering can be construed as trying to withhold information or covering up negligent wrongdoing. Complete and accurate record keeping is your best defense against any possible legal action (Fig. 4.22).

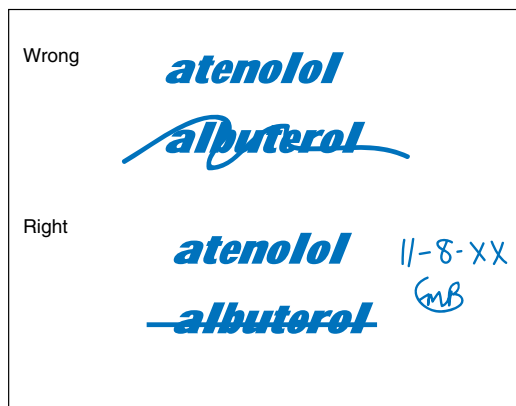


Figure 4.22 Proper correction of a medical record.



PRACTICE EXERCISES

Write the full medical term for the following abbreviations and symbols, and put an asterisk (*) next to those that are error prone:

1. CC _____
2. OH _____
3. PR _____
4. BRP _____
5. PACU _____
6. PH _____
7. D/C _____
8. Sig: _____
9. ER _____
10. ICU _____
11. R/O _____
12. NPO _____
13. L&W _____
14. BP _____
15. AU _____
16. Sx _____
17. VS _____
18. ROS _____
19. pt _____
20. OD _____
21. Sub-Q _____
22. H&P _____
23. Tx _____
24. Dx _____
25. HPI _____

26. ♀ _____
27. ↓ _____

Match the following terms with their meanings:

- | | |
|------------------------|--|
| 28. _____ febrile | a. period in which symptoms stop |
| 29. _____ syndrome | b. probable outcome of a disease |
| 30. _____ chronic | c. name of a disease based on history, exam, and testing |
| 31. _____ remission | d. elevated temperature |
| 32. _____ etiology | e. set of symptoms characteristic of a particular disease or condition |
| 33. _____ malignant | f. increase in severity with aggravation of symptoms |
| 34. _____ prognosis | g. developing slowly over time |
| 35. _____ diagnosis | h. limited to a definite area or part |
| 36. _____ exacerbation | i. cancerous |
| 37. _____ localized | j. the study of the cause of a disease |

Match the following definitions with their abbreviation or symbol:

- | | |
|-------------------------------------|---------------|
| 38. _____ route of oral medications | a. pre-op |
| 39. _____ place for surgery | b. prn |
| 40. _____ as desired | c. parenteral |
| 41. _____ progress note | d. po |
| 42. _____ after surgery | e. STAT |
| 43. _____ pound | f. ad lib |
| 44. _____ as needed | g. post op |
| 45. _____ by injection | h. OR |
| 46. _____ before surgery | i. SOAP |
| 47. _____ immediately | j. # |

Write the meaning for the following pharmaceutical phrases:

48. VS q h × 4 h, then q 2 h _____
49. † po qid pc hs _____
50. aspirin (ASA) gr $\ddot{\text{T}}\bar{\text{T}}\bar{\text{S}}\bar{\text{S}}$ _____

51. 650 mg po q 4 h prn temp $>101^{\circ}$ _____
52. † suppos PR q noc prn _____
53. gt † OU tid \times 7 d _____
54. cap †† STAT, then † q 6 h _____

Write the standard pharmaceutical abbreviations for the following:

55. one tablet by mouth three times a day for 7 days

56. one suppository in the vagina at bedtime

57. five milliliters by mouth four times a day

58. one or two by mouth every 3 to 4 hours as needed

59. two drops in left ear every 3 hours

60. one capsule by mouth two times a day, morning and evening

61. two by mouth immediately, then one by mouth every 6 hours

62. thirty milligrams by mouth at bedtime as needed

Give the military time for the following:

63. 1:00 a.m.
64. 2:30 p.m.
65. midnight
66. 1:00 p.m.
67. 7:00 p.m.
68. 4:50 a.m.

Match the following chart entries with the corresponding health record abbreviations:

- | | |
|---|---------|
| 69. _____ works as a security officer | a. UCHD |
| 70. _____ advised to lower salt intake | b. HPI |
| 71. _____ father, age 88, L&W; mother, age 78, died, stroke | c. PE |
| 72. _____ quit smoking 2 years ago, drinks alcohol socially | d. CC |
| 73. _____ diagnosis: tonsillitis | e. OH |
| 74. _____ c/o lower back pain | f. SH |
| 75. _____ pain in lower back for 2 weeks, worse at night | g. FH |
| 76. _____ no reaction to any previously administered drug | h. P |
| 77. _____ had all commonly contracted childhood diseases | i. A |
| 78. _____ lungs: clear; heart: regular rate and rhythm | j. NKA |

Give the meaning for the following abbreviations deemed error prone, and list the preferred term for each:

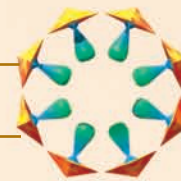
Abbreviation	Meaning	Preferred Term
79. q.d	_____	_____
80. q.o.d.	_____	_____
81. OS	_____	_____
82. AD	_____	_____
83. AU	_____	_____
84. >	_____	_____
85. D/C	_____	_____

From the following list of diagnostic imaging modalities, circle those that use ionizing radiation:

- 86. computed tomography
- 87. magnetic resonance imaging
- 88. radiology
- 89. radionuclide organ imaging
- 90. sonography

Match the following imaging modalities with the type of radiation used:

- | | |
|--------------------------------------|---------------------|
| 91. _____ computed tomography | a. standard x-rays |
| 92. _____ magnetic resonance imaging | b. gamma rays |
| 93. _____ radiology | c. ultrasound waves |
| 94. _____ radionuclide organ imaging | d. radio waves |
| 95. _____ sonography | e. 3-D x-rays |



MEDICAL RECORD ANALYSES

MEDICAL RECORD 4.1

Progress Note

CC: 37 y.o. ♂ c̄ diabetes c / o swelling of the (R) foot and calf × 3d
 S: There is no Hx of trauma, pain, SOB, or cardiac Sx, smoker × 12 yr, s̄s pkg q d, denies ETOH consumption
 Meds: parenteral insulin qd, NKDA
 O: Pt is afebrile, BP 140/84, P 72, R 16, lungs are clear; abdomen is benign s̄ organomegaly; muscle tone and strength are WNL; there is swelling of the (R) calf but s̄ erythema or tenderness
 A: Edema of (R) calf of unknown etiology
 P: Schedule STAT vascular sonogram of lower extremities; pt is to keep the leg elevated × †† d, then RTC for follow-up and test results on Thursday (or sooner if ↑ edema, SOB, or CP)

- What is the sex of the patient?
 - male
 - female
- Where was the patient seen?
 - emergency room
 - outpatient office of clinic
 - inpatient hospital
 - not stated
- What was the condition of the patient's abdomen?
 - shows signs of cancer
 - internal organs are enlarged
 - internal organs are not enlarged
 - muscle tone and strength are weak
- How much does the patient smoke per day?
 - one package
 - two packages
 - half a package
 - none; patient quit smoking 12 years ago
- How is the patient's insulin administered?
 - orally
 - transdermally
 - infusion through implant
 - by injection
- What is the cause of the patient's complaint?
 - unknown
 - fever
 - shortness of breath
 - trauma
- When should the sonogram be performed?
 - immediately
 - within two days
 - at the time of follow-up
 - only if symptoms persist
- How long should the patient's leg be kept elevated?
 - one week
 - two weeks
 - one day
 - two days

MEDICAL RECORD 4.2

Postop Meds for Laparotomy

1. Vicodin, † tab p.o. q 3 h prn mild pain, or †† tab p.o. q 3 h prn moderate pain
2. Demerol, 100 mg IM q 3 h prn severe pain
3. Tylenol (acetaminophen) 650 mg p.o. q 4 h prn oral temp \uparrow 100.4°F
4. Dalmane (flurazepam) 30 mg p.o. h.s. prn sleep
5. Mylicon (simethicone) 80 mg, † tab chewed and swallowed q.i.d.
6. Ducolax (bisacodyl) suppos, † PR in a.m.

1. How is the Demerol to be administered?
 - a. by mouth
 - b. within the vein
 - c. under the skin
 - d. within the muscle
2. What is the Sig: on the Mylicon?
 - a. one every other day
 - b. one twice a day
 - c. one three times a day
 - d. one four times a day
3. What is the Sig: on the Ducolax?
 - a. one suppository in the rectum in the morning
 - b. one suppository taken orally before noon
 - c. two suppositories before breakfast
 - d. one suppository as needed in the morning
4. When should the Dalmane be administered?
 - a. each night
 - b. at bedtime
 - c. as needed
 - d. every hour
5. What are the instructions for administering the Vicodin in the case of moderate pain?
 - a. one tablet every three hours
 - b. three tablets every hour
 - c. two tablets every three hours
 - d. three tablets every three hours
6. How should the Tylenol be administered?
 - a. one dose every four hours as needed
 - b. one dose every four hours only if patient has a temperature of 100.4°F or higher
 - c. one dose every four hours as long as the patient's temperature does not go over 100.4°
 - d. one dose every hour up to four per day
7. Laparotomy refers to
 - a. a puncture of the abdomen
 - b. excision of the stomach
 - c. a puncture of the stomach
 - d. an incision in the abdomen

MEDICAL RECORD 4.3

Michael Marsi has had chronic health problems in the past 2 years and has been seeing Dr. Spaulding, his personal physician, regularly in recent months. Dr. Spaulding uses problem-oriented medical records and writes a new SOAP progress note at each patient visit. Mr. Marsi has come to see Dr. Spaulding today because he feels worse than usual.

DIRECTIONS

Read Medical Record 4.3 (page 105) for Michael Marsi, and answer the following questions. This record is the progress note for today's visit, part of Dr. Spaulding's POMR for Mr. Marsi. Dr. Spaulding handwrote it herself during the patient's visit.

QUESTIONS ABOUT MEDICAL RECORD 4.3

Write your answers in the spaces provided.

1. How old is Mr. Marsi? _____
2. Where was the treatment rendered? _____
3. List the three elements of the patient's complaint
 - a. _____
 - b. _____
 - c. _____
4. In your own words, not using medical terminology, briefly summarize Mr. Marsi's history:

5. Which of the following is *not* mentioned at all in this history?
 - a. The prescription medication Mr. Marsi takes
 - b. Mr. Marsi's smoking habit
 - c. Mr. Marsi's activity level at work
 - d. Mr. Marsi's consumption of alcohol
6. Dr. Spaulding and Mr. Marsi talked at length about Mr. Marsi's symptoms and how they've changed recently, and then Dr. Spaulding examined him. List three objective findings she noted in this examination.
 - a. _____
 - b. _____
 - c. _____

PROGRESS NOTES

Patient Name: MARSI, Michael

DATE	FINDINGS
2-3-xx	CC: 51 y.o. ♂ C/O dizziness x 3 wk and headaches 5-6 x/wk. Today he woke r numbness in (R) leg and hand.
S	Hx of ↑ BP x 4 yrs Smoker x 20 yrs - 1 pkg/d MEDS: Dyazide i q d. + CP + SOB occipital headaches in am mod fat diet 3 beers q noc. NKDA
O	BP 150/100 (R) arm R, Ht 68" WT 198# T 98.7° P 76 R 15 Heart - RRR S (m) Lungs clear HEENT - WNL
A	Hypertension (HTN) R/O Congestive heart failure (CHF)
P	Chest X-ray and electrocardiogram today ↓ ETO" to i beer q noc. D.C. Smoking Rx: Procardia XL 30mg i p.o. daily ↑ exercise to 3x/wk for 20-30 min stop if CP, SOB or dizzy ↓ fat and cholesterol in diet re v BP i wk RTO sooner if CP, SOB or dizzy
	JR Spaulding MD

7. Dr. Spaulding's assessment is that Mr. Marsi has _____.

But she also wants to make sure he does *not* have _____

_____.

8. Dr. Spaulding's treatment plan involves four areas. List the specific plan(s) for each of these.

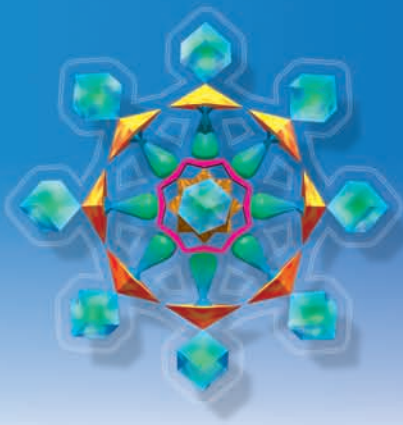
Diagnostic tests ordered: _____

Instruct patient to change (and how) these personal habits: _____

Drug prescribed (and how much and when): _____

Future diagnostic check and/or action to take: _____

9. When is Dr. Spaulding expecting to see Mr. Marsi again? _____



Integumentary System

OBJECTIVES

After completion of this chapter you will be able to

- Define common combining forms used in relation to the integumentary system
- Describe the basic functions of the integumentary system
- Define basic anatomical terms related to the integumentary system
- Identify common symptomatic terms related to the integumentary system
- Identify common diagnostic terms related to the integumentary system
- List common diagnostic tests and procedures related to the integumentary system
- Identify common operative terms referring to the integumentary system
- Identify common therapeutic terms including drug classifications related to the integumentary system
- Explain common terms and abbreviations used in documenting medical records involving the integumentary system

Combining Forms

Combining Form	Meaning	Example
adip/o	fat	adiposis ad-i-pō'sis
lip/o		lipoma li-pō'ma
steat/o		steatoma stē-ā-tō'mă
derm/o	skin	hypodermic hī'pō-der'mik
dermat/o		dermatology der-mă-tol'ō-jē
cutane/o		subcutaneous süb-kyū-tă'nē-ŭs
erythr/o	red	erythrodermatitis ě-rith-rō-der'mă-tī'tis
hidr/o	sweat	anhidrosis an-hī-drō'sis

Combining Form	Meaning	Example
hist/o	tissue	histology his-tol'ō-jē
histi/o		histiogenic his'tē-ō-jen'ik
ichthy/o	fish	ichthyoid ik'thē-oyd
kerat/o	hard	keratosis ker-ă-tō'sis
scler/o		scleroderma sklēr-ō-der'mă
leuk/o	white	leukonychia lū-kō-nik'ē-ă
melan/o	black	melanocyte mel'ă-nō-sīt
myc/o	fungus	mycosis mī-kō'sis
onych/o	nail	onychodystrophy on'i-kō-dis'trō-fē
plas/o	formation	dysplastic dis-plas'tik
purpur/o	purple	purpuric pūr'pū'rik
seb/o	sebum (oil)	seborrhea seb-ō-rē'ă
squam/o	scale	squamous skwā'mūs
trich/o	hair	trichorrhexis trik-ō-rek'sis
xanth/o	yellow	xanthoma zan-thō'mă
xer/o	dry	xerosis zē-rō'sis

Integumentary System Overview

The integumentary system is composed of the skin (also called the *integument*) and its appendages, including hair, nails, sweat glands, and sebaceous glands. It protects the body from injury or intrusion of microorganisms, helps regulate body temperature, and houses the receptors for the sense of touch, including pain and sensation (Fig. 5.1).

The skin is the largest organ in the body. Skin layers are divided into an outer layer called the epidermis, an inner layer called the dermis, and a subcutaneous tissue layer beneath the dermis.

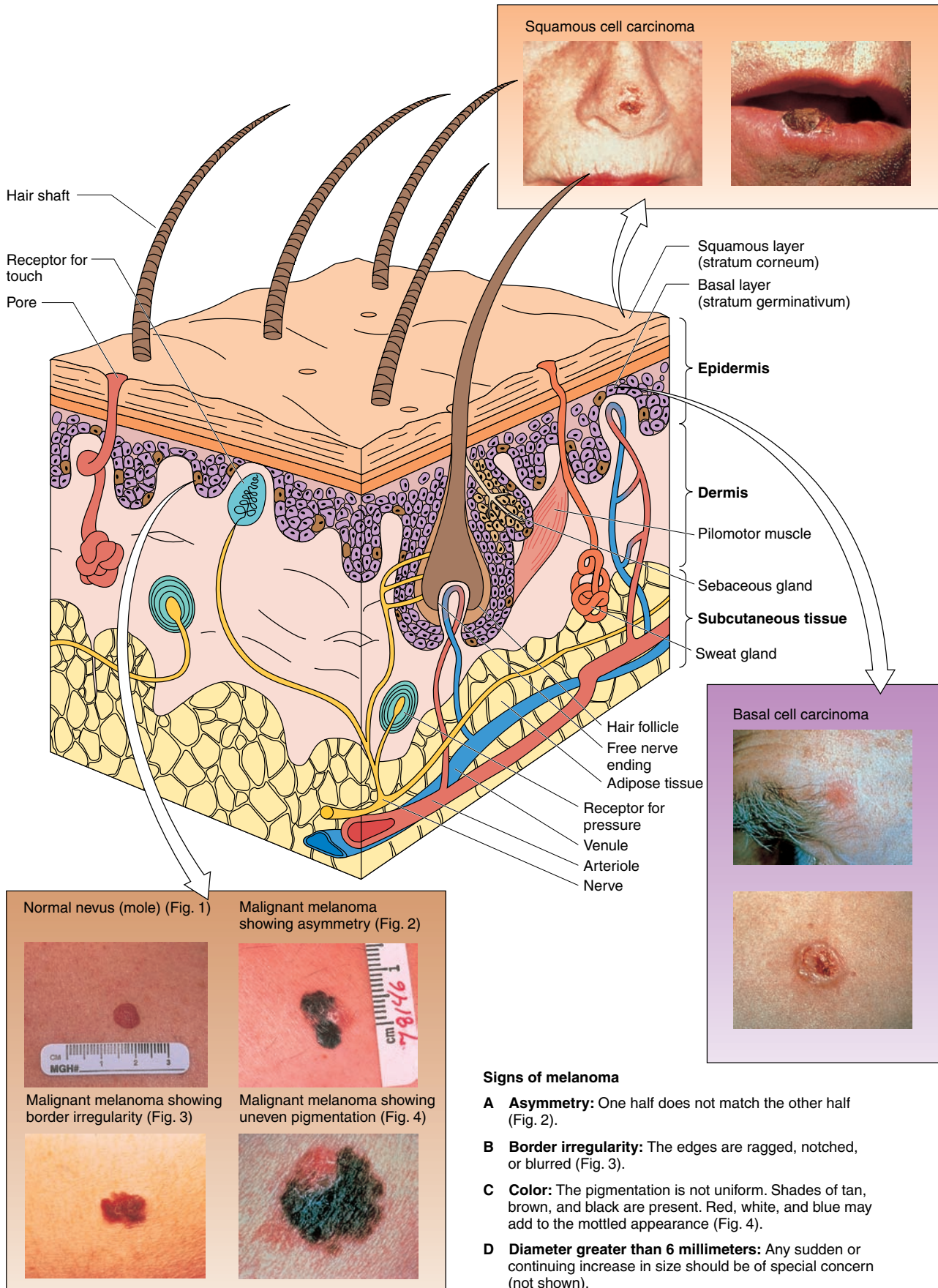


Figure 5.1 The skin.

Epidermis

The epidermis consists of several layers of stratified squamous (scale-like) epithelium. The two significant layers are the innermost layer, known as the *basal layer* (stratum germinativum), and the outermost layer, called the *squamous layer* (stratum corneum). The cells of the basal layer are constantly being produced, moving the older cells up toward the surface. As these cells are being pushed up, they flatten, become filled with a hard protein substance called *keratin*, and soon die. As a result, many layers of tightly packed dead cells accumulate in the outermost squamous layer, where they are sloughed off from the surface of the skin.

Melanocytes, which produce the pigment called *melanin* that gives color to the skin, are found in the basal layer.

Dermis

The dermis, also called the *corium*, is the connective tissue layer; it contains blood and lymphatic vessels, nerves and nerve endings, glands, and hair follicles within a network of elastic and collagen fibers. Collagen is a fibrous protein material that is tough and resistant. These fibers give the skin its qualities of toughness and elasticity.

Subcutaneous Tissue

The subcutaneous layer is below the dermis and is composed of loose connective tissue and adipose (fatty) tissue.

Anatomical Terms

Term	Meaning
epithelium ep-i-thē'lē-ŭm	cells covering external and internal surfaces of the body
epidermis ep-i-derm'is	thin, cellular outer layer of the skin
squamous cell layer skwā'mŭs	flat, scale-like epithelial cells comprising the outermost layers of the epidermis
basal layer bā'sāl	deepest region of the epidermis
melanocyte mel'ă-nō-sīt	a cell found in the basal layer that gives color to the skin
melanin mel'ă-nin	dark brown to black pigment contained in melanocytes
dermis	dense, fibrous connective tissue layer of the skin (also known as the corium)
sebaceous glands sē-bā'shŭs	oil glands in the skin
sebum sē'bŭm	oily substance secreted by the sebaceous glands
sudoriferous glands sū-dō-rif'er-ŭs	sweat glands (sudor = sweat; ferre = to bear)

Term	Meaning
subcutaneous tissue süb-kyū-tā'nē-ūs	connective and adipose tissue layer just under the dermis
collagen kol'lā-jen	protein substance found in skin and connective tissue (koila = glue; gen = producing)
hair	outgrowth of the skin composed of keratin
nail	outgrowth of the skin attached to the distal end of each finger and toe, composed of keratin
keratin ker'ă-tin	hard protein material found in the epidermis, hair, and nails

Symptomatic Terms

Term	Meaning
lesion lē'zhŭn	an area of pathologically altered tissue (two types: primary and secondary) (Fig. 5.2)
primary lesions	lesions arising from previously normal skin
<i>flat, nonpalpable changes in skin color</i>	
macule (macula) mak'yŭl	a flat, discolored spot on the skin up to 1 cm across (e.g., a freckle) (Fig. 5.3A)
patch	a flat, discolored area on the skin larger than 1 cm (e.g., vitiligo) (Fig. 5.3B)
<i>elevated, palpable, solid masses</i>	
papule pap'yŭl	a solid mass on the skin up to 0.5 cm in diameter [e.g., a nevus (mole)] (Fig. 5.3C)
plaque plāk	a solid mass greater than 1 cm in diameter, limited to the surface of the skin (Fig. 5.3D)
nodule nod'yŭl	a solid mass greater than 1 cm, which extends deeper into the epidermis (Fig. 5.3E)
tumor tu'mŏr	a solid mass larger than 1–2 cm (Fig. 5.3F)
wheal hwēl	an area of localized skin edema (swelling) (e.g., a hive) (Fig. 5.3G)
<i>elevation formed by fluid within a cavity</i>	
vesicle ves'ī-kl	little bladder; an elevated, fluid-filled sac (blister) within or under the epidermis up to 0.5 cm in diameter (e.g., a fever blister) (Fig. 5.3H)
bulla bul'ă	a blister larger than 0.5 cm (e.g., a second-degree burn) (bulla = bubble) (Fig. 5.3I)
pustule pŭs'chŭl	a pus-filled sac (e.g., a pimple) (Fig. 5.3J)

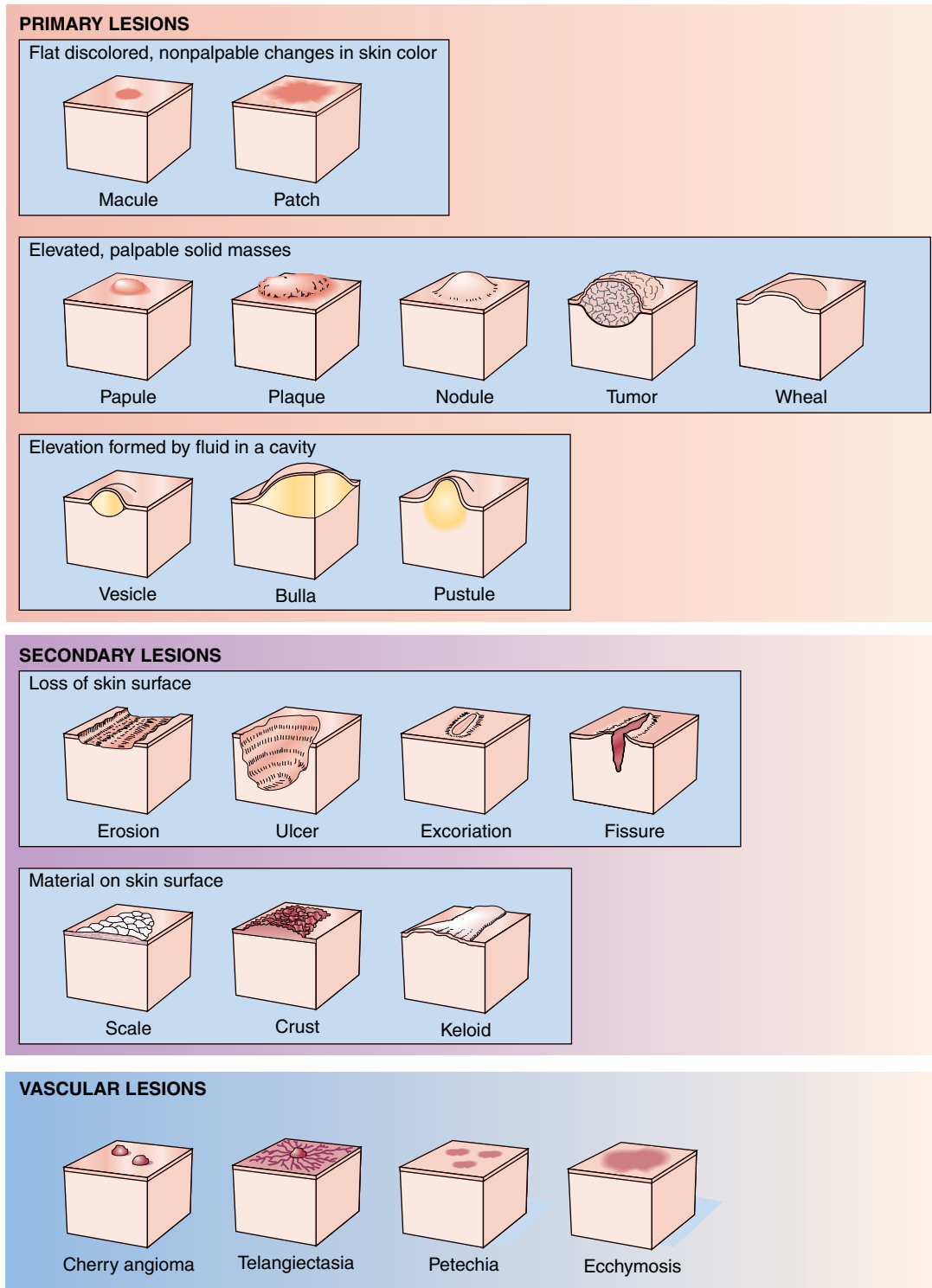


Figure 5.2 Types of primary, secondary, and vascular lesions.

Term	Meaning
secondary lesions	lesions that result in changes in primary lesions
<i>loss of skin surface</i>	
erosion ēr-ō'zhŭn	to gnaw away; loss of superficial epidermis leaving an area of moisture but no bleeding (e.g., area of moisture after rupture of a vesicle) (Fig. 5.3K)



Figure 5.3 Skin lesions.

Term	Meaning
ulcer	an open sore on the skin or mucous membrane that can bleed and scar and is sometimes accompanied by infection (e.g., decubitus ulcer) (Fig. 5.3L)
excoriation eks-kō'rē-ā'shūn	a scratch mark (e.g., from a cat scratch) (Fig. 5.3M)
fissure fish'ūr	a linear crack in the skin (Fig. 5.3N)

Term	Meaning
<i>material on skin surface</i>	
scale	a thin flake of exfoliated epidermis (e.g., dandruff) (Fig. 5.3O)
crust	dried residue of serum (body liquid), pus, or blood on the skin (e.g., in impetigo) (Fig. 5.3P)
<i>other secondary lesions</i>	
cicatrix of the skin sik'ă-triks	a mark left by the healing of a sore or wound showing the replacement of destroyed tissue by fibrous tissue (cicatrix = scar)
keloid kē'loyd	an abnormal overgrowth of scar tissue that is thick and irregular (kele = tumor) (Fig. 5.3Q)
vascular lesions	
cherry angioma chār'ē an-jē-ō'mă	a small, round, bright-red blood vessel tumor on the skin, often on the trunk of the elderly ((Fig. 5.3R)
telangiectasia tel-an'jē-ek-tā'zē-ă	a tiny, red blood vessel lesion formed by the dilation of a group of blood vessels radiating from a central arteriole, most commonly seen on the face, neck, or chest
spider angioma spī'der an-jē-ō'mă	(telos = end) (Fig. 5.3S)
purpuric lesions pŭr'pŭ-rik	
petechia pe-tē'kē-ă	spot; a reddish-brown, minute hemorrhagic spot on the skin that indicates a bleeding tendency—small purpura (Fig. 5.3T)
ecchymosis ek-i-mō'sis	bruise; a black and blue mark—large purpura (chymo = juice)
epidermal tumors	
nevus nē'vŭs	a congenital malformation on the skin that can be epidermal or vascular—also called a mole (see Fig. 5.1)
dysplastic nevus dis-plas'tik nē'vŭs	a mole with precancerous changes
verruca vě-rŭ'kă	an epidermal tumor caused by a papilloma virus—also called a wart (Fig. 5.4)

GENERAL SYMPTOMATIC TERMS

alopecia al-ō-pē'shē-ă	baldness; natural or unnatural deficiency of hair
comedo (pl. comedos, comedones) kom'ē-dō	a plug of sebum (oil) within the opening of a hair follicle (Fig. 5.5)
closed comedo (whitehead)	below the skin surface with a white center
open comedo (blackhead)	open to the skin surface with a black center caused by the presence of melanin exposed to air



COMEDO, a plug of sebum within the

opening of a hair follicle, also known as whitehead or blackhead, is derived from the Latin word meaning to eat up or consume. The material when expressed has a worm-like appearance, and ancient writers thought there was an actual worm eating into the flesh.



Figure 5.4 Verrucae on a knee. (From Dr. Barankin Dermatology Collection.)



Figure 5.5 Open and closed comedones.

Term	Meaning
eruption ē-rŭp'shŭn	appearance of a skin lesion
erythema er-i-thē'mă	redness of skin
pruritus prŭ-rĭ'tŭs	severe itching
rash	a general term for skin eruption, most often associated with communicable disease
skin pigmentation	skin color due to the presence of melanin
depigmentation	loss of melanin pigment in the skin
hypopigmentation	areas of skin lacking color due to deficient amounts of melanin
hyperpigmentation	darkened areas of skin caused by excessive amounts of melanin
suppuration sŭp'yŭ-ră'shŭn	production of purulent matter (pus)
urticaria er'ti-kar'i-a	hives; an eruption of wheals on the skin accompanied by itch (urtica = stinging nettle) (see Fig. 5.3G)
xeroderma zēr'ō-der'mă	dry skin

Diagnostic Terms

Term	Meaning
acne ak'nē	an inflammation of the sebaceous glands and hair follicles of the skin evidenced by comedones, pustules, or nodules on the skin (acne = point) (Fig. 5.6)
albinism al'bi-nizm	a hereditary condition characterized by a partial or total lack of melanin pigment (particularly in the eyes, skin, and hair)

Term	Meaning
burn	any injury to body tissue caused by heat, chemicals, electricity, radiation, or gases
first-degree burn	a burn involving only the epidermis, characterized by erythema (redness) and hyperesthesia (excessive sensation)
second-degree burn	a burn involving the epidermis and the dermis, characterized by erythema, hyperesthesia, and vesications (blisters)
third-degree burn	a burn involving all layers of the skin, characterized by the destruction of the epidermis and dermis with damage or destruction of the subcutaneous tissue
cellulitis	an acute inflammation of subcutaneous tissue resulting from a bacterial invasion through a break in the skin (cellula = small storeroom)
dermatitis (eczema) der-mă-tī'tis	an inflammation of the skin characterized by redness, pruritus (itching), and various lesions
common types:	
atopic dermatitis (atopic eczema)	a chronic skin inflammation characterized by the appearance of inflamed, swollen papules and vesicles that crust and scale, with severe itching and burning; most outbreaks begin in infancy and are marked by exacerbations and remissions that usually clear up before adulthood; occurs in persons with atopy (a genetic hypersensitivity to environmental irritants or allergens)
contact dermatitis	an inflammation of the skin resulting from contact with a substance to which one is allergic (e.g., chemicals in dyes, preservatives, fragrances, rubber; allergic dermatitis); or one that is a known skin irritant (e.g., acid, solvent; irritant dermatitis) (Fig. 5.7)
seborrheic dermatitis	redness of the skin covered by a yellow, oily, itchy scale most commonly at the hairline, forehead, and around the nose, ears, or eyelashes and developing at any age; referred to as “cradle cap” in infants



Figure 5.6 Acne lesions. Inflammatory papules, pustules, and closed comedones are present on the face of a patient diagnosed with acne vulgaris.



Figure 5.7 Contact dermatitis. This eczematous dermatitis on the dorsa of the hands was caused by exposure to lanolin.

Term	Meaning
dermatosis der-mă-tō'sis	any disorder of the skin
exanthematous viral disease eg-zan-them'ă-tŭs	eruption of the skin caused by a viral disease (exanthema = eruption)
rubella rŭ-bel'ă	reddish; German measles
rubeola rŭ-bē'ō-lă	reddish; 14-day measles
varicella var-ĭ-sel'ă	a tiny spot; chickenpox
eczema ek'zē-mă	to boil out; the term is often used interchangeably with dermatitis to denote a skin condition characterized by the appearance of inflamed, swollen papules and vesicles that crust and scale, often with sensations of itching and burning
furuncle fyŭ'rŭng-kl	a boil; a painful nodule formed in the skin by inflammation originating in a hair follicle—caused by staphylococcosis
carbuncle kar'bŭng-kl	a skin infection consisting of clusters of furuncles (carbo = small, glowing embers)
abscess ab'ses	a localized collection of pus in a cavity formed by the inflammation of surrounding tissues that heals when drained or excised (abscessus = a going away)
gangrene gang'grĕn	an eating sore; death of tissue associated with a loss of blood supply resulting from trauma or an inflammatory or infectious process such as seen in complications of frostbite, severe burns, and conditions that affect circulation (e.g., diabetes)
herpes simplex virus type 1 (HSV-1) her'pĕz	transient viral vesicles (e.g., cold sores, fever blisters) that infect the facial area, especially the mouth and nose (herpes = creeping skin disease)
herpes simplex virus type 2 (HSV-2)	sexually transmitted ulcer-like lesions of the genital and anorectal skin and mucosa; after initial infection, the virus lies dormant in the nerve cell root and may recur at times of stress (see Chapter 17, Fig. 17.9)
herpes zoster her'pĕz zos'ter	a viral disease affecting the peripheral nerves characterized by painful blisters that spread over the skin following the affected nerves; usually unilateral—also known as shingles (zoster = girdle) (see Chapter 10, Fig. 10.10)
ichthyosis ik-thĕ-ō'sis	a skin condition caused by a gene defect that results in dry, thick, scaly skin; ichthyosis vulgaris is the most common of the many types (vulgaris is a Greek word meaning common)
impetigo im-pe-tĭ'gō	highly contagious, bacterial skin inflammation marked by pustules that rupture and become crusted—most often occurs around the mouth and nostrils

Term	Meaning
keratoses ker-ă-tō'sez	thickened areas of epidermis
actinic keratoses ak-tin'ik	localized thickening of the skin caused by excessive exposure to sunlight; a known precursor to cancer (actinic = ray; solar = sun) (Fig. 5.8)
solar keratoses	
seborrheic keratoses seb-ō-rē'ik	benign wart-like lesions (seen especially on elderly skin) (Fig. 5.9)
lupus lū'pūs	a chronic autoimmune disease characterized by inflammation of various parts of the body (lupus = wolf)
cutaneous lupus kyū-tā'nē-ūs	limited to the skin; evidenced by a characteristic rash especially on the face, neck, and scalp
systemic lupus erythematosus (SLE) sis-tem'ik lū'pūs er-i-them'ă-tō-sis	a more severe form of lupus involving the skin, joints, and often the vital organs (e.g., lungs, kidneys)
malignant cutaneous neoplasm mä-lig'nănt kyū-tā'nē-ūs nē'ō-plazm	skin cancer
squamous cell carcinoma (SCC) skwā'mūs sel kar-si-nō'mă	a malignant tumor of squamous epithelium (see Fig. 5.1)
basal cell carcinoma (BCC) bā'săl sel kar-si-nō'mă	a malignant tumor of the basal layer of the epidermis [the most common type of skin cancer (see Fig. 5.1)]
malignant melanoma mä-lig'nănt mel'ă-nō'mă	a malignant tumor composed of melanocytes—most develop from a pigmented nevus over time (see Signs of Melanoma in Fig. 5.1)
Kaposi sarcoma kăp'ō-sē sar-kō'mă	a malignant tumor of the walls of blood vessels appearing as painless, dark bluish-purple plaques on the skin; often spreads to lymph nodes and internal organs (Fig. 5.10)
onychia ō-nik'ē-ă	inflammation of the fingernail or toenail



Figure 5.9 Seborrheic keratoses. **A.** Lesion with warty, stuck-on appearance. **B.** Multiple lesions showing various colors and sizes.

Figure 5.8 Actinic (solar) keratoses.



Figure 5.10 Skin lesions associated with Kaposi sarcoma.

Term	Meaning
paronychia par-ō-nik'ē-ă	inflammation of the nail fold (Fig. 5.11)
pediculosis pě-dik'yū-lō'sis	infestation with lice that causes itching and dermatitis (pediculo = louse) (Fig. 5.12)
pediculosis capitis pě-dik'yū-lō'sis kap'i-tis	head lice (capitis = head)
pediculosis pubis pě-dik'yū-lō'sis pyū'bis	lice that generally infect the pubic region, but hair of the axilla, eyebrows, lashes, beard, or other hairy body surfaces may also be involved—also called crabs (pubis = groin)
psoriasis sō-rī'ă-sis	an itching; a chronic, recurrent skin disease marked by silver-gray scales covering red patches on the skin that result from overproduction and thickening of skin cells—elbows, knees, genitals, arms, legs, scalp, and nails are common sites of involvement (Fig. 5.13)
scabies skā'bēz	a contagious disease caused by a parasite (mite) that invades the skin, causing an intense itch—most often found at articulations between the fingers or toes, elbow, etc. (scabo = to scratch)
seborrhea seb-ō-rē'ă	a skin condition marked by the hypersecretion of sebum from the sebaceous glands
tinea tin'ē-ă	a group of fungal skin diseases identified by the body part that is affected, including tinea corporis (body), commonly called ringworm, and tinea pedis (foot), also called athlete's foot
vitiligo vit-i-lī'gō	a condition caused by the destruction of melanin that results in the appearance of white patches on the skin, commonly the face, hands, legs, and genital areas (see Fig. 5.3B)



Figure 5.11 Chronic paronychia.

TINEA. Tinea is Latin for a grub, a gnawing worm; it is used to describe the gnawed or moth-eaten appearance of the skin in this condition.

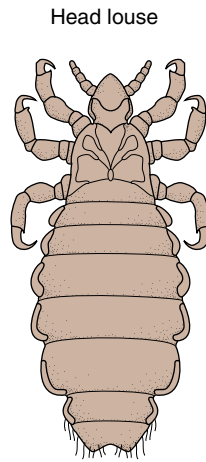
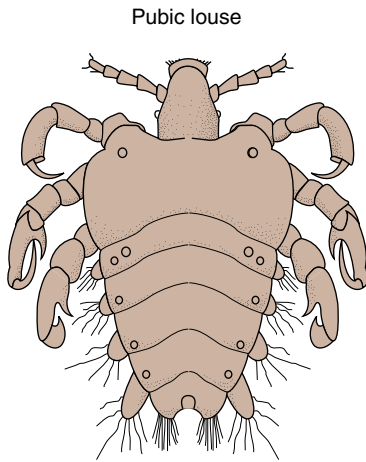


Figure 5.12 Pediculosis.



Figure 5.13 Psoriasis of the scalp.

Diagnostic Tests and Procedures

Term	Meaning
biopsy (Bx) bī'op-sē	removal of a small piece of tissue for microscopic pathological examination (Fig. 5.14)
excisional Bx	removal of an entire lesion
incisional Bx	removal of a selected portion of a lesion
shave Bx	a technique using a surgical blade to “shave” tissue from the epidermis and upper dermis
culture and sensitivity (C&S)	a technique of isolating and growing colonies of microorganisms to identify a pathogen and to determine which drugs might be effective in combating the infection it has caused
frozen section (FS)	a surgical method involving cutting a thin piece of tissue from a frozen specimen for immediate pathological examination



SUTURE. Suture is derived from the Latin *sutura*, meaning a seam, a sewing together. In surgery, a suture is a thread or other material used for sewing. Also, to suture is to sew up or stitch together. Numbers indicate thickness of the thread (i.e., lower numbers denote thicker thread; higher numbers denote thinner thread).



Figure 5.14 Collection of a biopsy specimen.

Term	Meaning
skin tests	methods for determining the reaction of the body to a given substance by applying it to, or injecting it into, the skin—commonly seen in treating allergy
scratch test	the substance is applied to the skin through a scratch
patch test	the substance is applied topically to the skin on a small piece of blotting paper or wet cloth

Operative Terms (Fig. 5.15)

Term	Meaning
chemosurgery kem'ō-ser-jer-ē	a technique for restoring wrinkled, scarred, or blemished skin by application of an acid solution to “peel” away the top layers of the skin
chemical peel	
cryosurgery krī-ō-ser'jer-ē	destruction of tissue by freezing—involves application of an extremely cold chemical (e.g., liquid nitrogen)
dermabrasion der-mă-bră'zhŭn	surgical removal of frozen epidermis using wire brushes and emery papers to remove scars, tattoos, and/or wrinkles; aerosol spray is used to freeze the skin
debridement dā-brēd-mon'	removal of dead tissue from a wound or burn site to promote healing and prevent infection
curettage kyū-rě-tahzh'	to clean; scraping of a wound using a spoon-like cutting instrument called a curette; this technique is used in debridement
electrosurgical procedures	use of electric currents to destroy tissue—the type and strength of the current and method of application varies
electrocautery ē-lek'trō-caw'ter-ē	use of an instrument heated by electric current (cautery) to coagulate bleeding areas by burning the tissue (e.g., to sear a blood vessel) (Fig. 5.16)
electrodesiccation ē-lek'trō-des-i-kā'shŭn	use of short, high-frequency, electric currents to destroy tissue by drying—the active electrode makes direct contact with the skin lesion (desicco = to dry up)
fulguration ful-gŭ-rā'shŭn	to lighten; use of long, high-frequency, electric sparks to destroy tissue; the active electrode does <i>not</i> touch the skin
incision and drainage (I&D)	incision and drainage of an infected skin lesion (e.g., an abscess)
laser surgery lā'zer	surgery using a laser in various dermatological procedures to remove lesions, scars, tattoos, etc.
laser	an acronym for light amplification by stimulated emission of radiation; an instrument that concentrates high frequencies of light into a small, extremely intense beam that is precise in depth and diameter; it is applied to body tissues to destroy lesions or for dissection (cutting of parts for study)



CAUTERY. A Greek word meaning

branding iron refers to the surgical use of flame or heat to destroy tissue, control bleeding of wound sites, etc. The ancients used actual cautery with a metallic instrument heated in a flame and potential cautery with a caustic chemical.

CENTRAL MEDICAL SURGICENTER
211 Medical Center Drive • Central City, US 90000-1234 • PHONE: (012) 125-6784 • FAX: (012) 125-9999

OPERATIVE REPORT

PREOPERATIVE DIAGNOSIS: Complex lacerations of the nose and upper lip due to a dog bite.

POSTOPERATIVE DIAGNOSIS: Complex lacerations of the nose and upper lip due to a dog bite.

OPERATION: Revision and closure of complex lacerations of the nose and upper lip.

ANESTHESIOLOGIST: H. Vaughn, M.D.

INDICATIONS:
 This 33-year-old female sustained a dog bite to her face while she was handling a dog at a veterinary clinic. Because of the complexity of her injuries, a plastic surgery consultation was requested.

PROCEDURE:
 The patient's face was prepped and draped in the usual sterile fashion. A copious amount of dilute Betadine and saline were used to irrigate out all the lacerations. Subcutaneous tissues in the vicinity of the lacerations were infiltrated with 0.5% Xylocaine with 1:200,000 concentration epinephrine. Attention was directed to the patient's upper lip. There was a laceration approximately 1.5 cm oriented parallel to the mucocutaneous junction. There was another diagonal laceration measuring approximately 1.0 cm. The devitalized tissues were debrided sharply. The laceration was closed in layers with 5-0 Vicryl sutures and then with 6-0 and 7-0 Prolene on the skin. Attention was directed to the patient's nose. There are two major lacerations. There is a 2 cm laceration to the left ala. This was a full thickness laceration through the entire alar cartilage into the nose as well as the entire alar rim. First, the devitalized cartilage was debrided sharply. The intranasal incision was closed with 4-0 chromic catgut suture. The alar rim was meticulously reapproximated with a few tacking sutures to produce perfect anatomic continuity. The remainder of the laceration was closed with 6-0 and 7-0 Prolene sutures in interrupted and running fashion. At this time, attention was directed to another laceration measuring approximately 2.5 cm located in the right nasal sill area extending to the columella and lip junction. The columella was detached. Again, all devitalized tissues were debrided sharply. Deep subcutaneous tissues were approximated with 5-0 chromic catgut sutures in such a fashion so as to meticulously reapproximate the columella into its normal anatomic position. The nasal sill was reapproximated with 6-0 Prolene sutures meticulously reapproximating the detailed anatomy of this area. The remainder of the wounds were closed with 6-0 and 7-0 Prolene sutures in a running and interrupted fashion. A few smaller lacerations were closed with Prolene sutures on the bridge of the nose. All the wounds were covered with Neosporin ointment, Adaptic, and appropriate bandages.

The patient was given intravenous antibiotics; and she will be started on Keflex 250 mg p.o. t.i.d. The patient will be seen in my office in 24 hours for follow-up.

T. Romero MD
T. Romero, M.D.

TR:kf
 D: 10/19/20xx
 T: 10/20/20xx

OPERATIVE REPORT	PT. NAME: SMITH, WILMA ID NO: OPS-167480621 SURGEON: T. ROMERO, M.D.
------------------	--

Jagged tears

Agents used to clean the wound

Anesthetic

A type of absorbable thread used to sew up deeper layers of tissue

Absorbable suture made of sheep or beef intestine coated with salt to prolong holding strength

Oral antibiotic

Dead tissue removed from the wound

A type of nonabsorbable thread used to sew up surface layers of tissue, removed after healing

Brought together again

Topical antibiotic

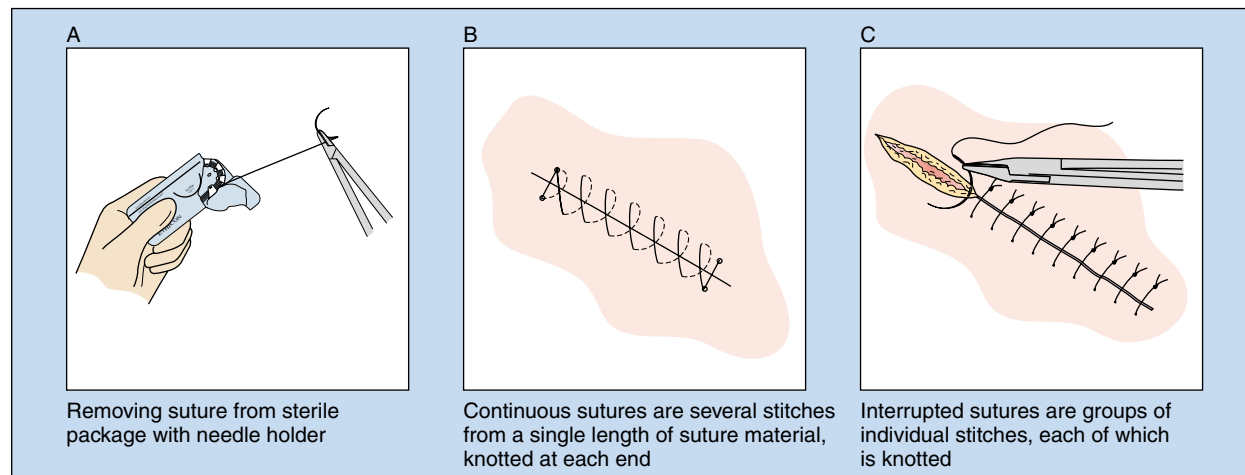


Figure 5.15 Typical documentation of a surgical procedure. Suturing is also depicted.



Figure 5.16 Electrocautery. A cautery device is used to perform hemostasis during a surgical procedure.

Term	Meaning
Mohs surgery mōz	a technique used to excise tumors of the skin by removing fresh tissue layer by layer until a tumor-free plane is reached
skin grafting	transfer of skin from one body site to another to replace skin lost through burns or injury
autograft aw'to-graft	transfer to a new position in the body of the same person (auto = self)
homograft hō'mō-graft	donor transfer between individuals of the same species such as human to human (homo = same; allo=other)
allograft al'ō-graft	
xenograft zen'ō-graft	a graft transfer from one animal species to one of another species (xeno = strange; hetero = different)
heterograft het'er-ō-graft	

Therapeutic Terms

Term	Meaning
chemotherapy kēm'ō-ther-ă-pē	treatment of malignancies, infections, and other diseases with chemical agents that destroy selected cells or impair their ability to reproduce
radiation therapy rā'dē-ă'shŭn	treatment of neoplastic disease by using ionizing radiation to deter proliferation of malignant cells
sclerotherapy sklēr-ō-ther'ă-pē	use of sclerosing agents in treating diseases (e.g., injection of a saline solution into a dilated blood vessel tumor in the skin, resulting in hardening of the tissue within and eventual sloughing away of the lesion)
ultraviolet therapy ŭl-tră-vī'ō-let	use of ultraviolet light to promote healing of a skin lesion (e.g., an ulcer)

COMMON THERAPEUTIC DRUG CLASSIFICATIONS

anesthetic an-es-thet'ik	a drug that temporarily blocks transmission of nerve conduction to produce a loss of sensations (e.g., pain)
antibiotic an'tē-bī-ot'ik	a drug that kills or inhibits the growth of microorganisms

Term	Meaning
antifungal an-tē-fūng'ăl	a drug that kills or prevents the growth of fungi
antihistamine an-tē-his'tă-mēn	a drug that blocks the effects of histamine in the body
histamine his'tă-mēn	a regulating body substance released in excess during allergic reactions causing swelling and inflammation of tissues [e.g., in urticaria (hives), hay fever]
anti-inflammatory an'tē-in-flam'ă-tor-ē	a drug that reduces inflammation
antipruritic an'tē-prū-rit'ik	a drug that relieves itching
antiseptic isms an-tă-sep'tik	an agent that inhibits the growth of infectious microorganisms

Summary of Chapter 5 Acronyms/Abbreviations

BCC.....basal cell carcinoma	HSV-2.....herpes simplex virus type 2
Bx.....biopsy	I&D.....incision and drainage
C&S.....culture and sensitivity	SCC.....squamous cell carcinoma
FS.....frozen section	SLE.....systemic lupus erythematosus
HSV-1.....herpes simplex virus type 1	

7. leukotrichia

_____ / _____ / _____
CF R S

DEFINITION: _____

8. mycology

_____ / _____
CF S

DEFINITION: _____

9. epidermal

_____ / _____ / _____
P R S

DEFINITION: _____

10. lipoma

_____ / _____
R S

DEFINITION: _____

11. subcutaneous

_____ / _____ / _____
P R S

DEFINITION: _____

12. anhidrosis

_____ / _____ / _____
P R S

DEFINITION: _____

13. histopathology

_____ / _____ / _____
CF CF S

DEFINITION: _____

14. paronychia

_____ / _____ / _____
P R S

DEFINITION: _____

15. adiposis

_____ / _____
R S

DEFINITION: _____

16. squamous

_____ / _____
R S

DEFINITION: _____

17. erythrodermatitis

_____ / _____ / _____
 CF R S

DEFINITION: _____

18. desquamation

_____ / _____ / _____
 P R S

DEFINITION: _____

19. histotoxic

_____ / _____ / _____
 CF R S

DEFINITION: _____

20. melanocyte

_____ / _____ / _____
 CF R S

DEFINITION: _____

21. xerosis

_____ / _____
 R S

DEFINITION: _____

22. purpuric

_____ / _____
 R S

DEFINITION: _____

23. seborrhea

_____ / _____
 CF S

DEFINITION: _____

24. xanthoma

_____ / _____
 R S

DEFINITION: _____

25. asteatosis

_____ / _____ / _____
 P R S

DEFINITION: _____

Complete the medical term by writing the missing part:

26. _____ oma = black tumor

27. _____ dermic = pertaining to below the skin

28. _____ angioma = bright-red, round blood vessel tumor
29. _____ coriation = scratch mark on the skin
30. _____ section = type of microscopic study of fresh tissue
31. _____ comedo = whitehead
32. anti_____ = a drug that relieves itching
33. _____ mycosis = condition of fungus of the fingernail or toenail
34. _____ biopsy = removal of an entire lesion for microscopic examination
35. _____ graft = transfer of skin to a new position in the body of the same person
36. _____ therapy = method of eliminating a dilated blood vessel tumor of the skin by injection of a hardening solution
37. _____ pigmentation = darkened areas of skin caused by excessive amounts of melanin

For each of the following, circle the combining form that corresponds to the meaning given:

- | | | | |
|-------------------|----------|----------|----------|
| 38. fat | leuk/o | steat/o | seb/o |
| 39. black | necr/o | trich/o | melan/o |
| 40. fungus | seb/o | myc/o | onych/o |
| 41. nail | onych/o | trich/o | squam/o |
| 42. red | xanth/o | purpur/o | erythr/o |
| 43. hair | trich/o | histi/o | fibr/o |
| 44. dry | ichthy/o | xer/o | xanth/o |
| 45. oil | py/o | hidr/o | seb/o |

Write the correct medical term for each of the following definitions:

46. death of tissue associated with a loss of blood supply as a result of trauma or inflammatory or infectious process _____
47. severe itching _____
48. skin infection consisting of a cluster of furuncles _____
49. baldness _____
50. use of a spoon-like instrument to scrape tissue, such as that used in debridement of a wound _____

51. inflammation of the sebaceous glands and hair follicles of the skin evidenced by comedones, pustules, or nodules on the skin _____
52. chronic, recurrent skin disease marked by silver-gray scales covering red patches on the skin _____
53. acute inflammation of subcutaneous tissue as the result of bacterial invasion through a break in the skin (derived using the Latin word meaning *small storeroom*) _____

Match the lay terms with the appropriate medical terms:

- | | |
|-------------------------------|--------------------------|
| 54. _____ mole | a. pediculosis capitis |
| 55. _____ black and blue mark | b. cicatrix |
| 56. _____ blackhead | c. seborrheic dermatitis |
| 57. _____ boil | d. urticaria |
| 58. _____ crabs | e. verruca |
| 59. _____ cradle cap | f. nevus |
| 60. _____ head lice | g. furuncle |
| 61. _____ hives | h. comedo |
| 62. _____ scar | i. ecchymosis |
| 63. _____ wart | j. pediculosis pubis |

Using the suffix -derma, name the following conditions of the skin:

64. _____ white skin
65. _____ yellow skin
66. _____ dry skin
67. _____ red skin
68. _____ hard skin

Give the medical terms for the following exanthematous viral diseases:

69. German measles _____
70. chickenpox _____
71. 14-day measles _____

Match the following primary lesions with their descriptions:

- | | |
|-------------------|---|
| 72. _____ vesicle | a. tiny, flat discolored spot on the skin, up to 1 cm diameter |
| 73. _____ pustule | b. large, flat discolored area on the skin, larger than 1 cm diameter |
| 74. _____ papule | c. solid mass on skin less than 0.5 cm diameter |
| 75. _____ bulla | d. solid mass greater than 1 cm that extends into the epidermis |
| 76. _____ nodule | e. solid mass greater than 1 cm limited to the skin's surface |
| 77. _____ wheal | f. small blister |
| 78. _____ macule | g. area of localized skin edema, such as a hive |
| 79. _____ tumor | h. large blister |
| 80. _____ patch | i. pus-filled sac |
| 81. _____ plaque | j. solid mass larger than 1–2 cm diameter |

Write the abbreviation used to identify the following terms:

82. biopsy _____
83. incision and drainage _____
84. basal cell carcinoma _____
85. herpes virus that causes cold sores _____
86. culture and sensitivity _____
87. systemic lupus erythematosus _____

Match the following terms:

- | | |
|-----------------------------|--------------------|
| 88. _____ scabies | a. chemical peel |
| 89. _____ cryosurgery | b. purpuric lesion |
| 90. _____ telangiectasia | c. eczema |
| 91. _____ tinea | d. xenograft |
| 92. _____ heterograft | e. intense light |
| 93. _____ actinic keratoses | f. desiccation |
| 94. _____ radiation therapy | g. spider angioma |
| 95. _____ petechia | h. solar keratoses |
| 96. _____ homograft | i. allograft |

97. _____ laser j. cancer treatment
98. _____ chemosurgery k. freezing treatment
99. _____ electro-surgery l. mycosis
100. _____ dermatitis m. mites

Write the plural forms of the following terms:

101. keratosis _____
102. bulla _____
103. nevus _____
104. macula _____
105. ecchymosis _____

Briefly describe the difference between the following terms:

106. electrodesiccation/fulguration _____

107. actinic keratoses/seborrheic keratoses _____

108. vitiligo/albinism _____

109. cicatrix/keloid _____

110. dermatosis/dermatitis _____

111. incisional biopsy/excisional biopsy _____

112. heterograft/allograft _____

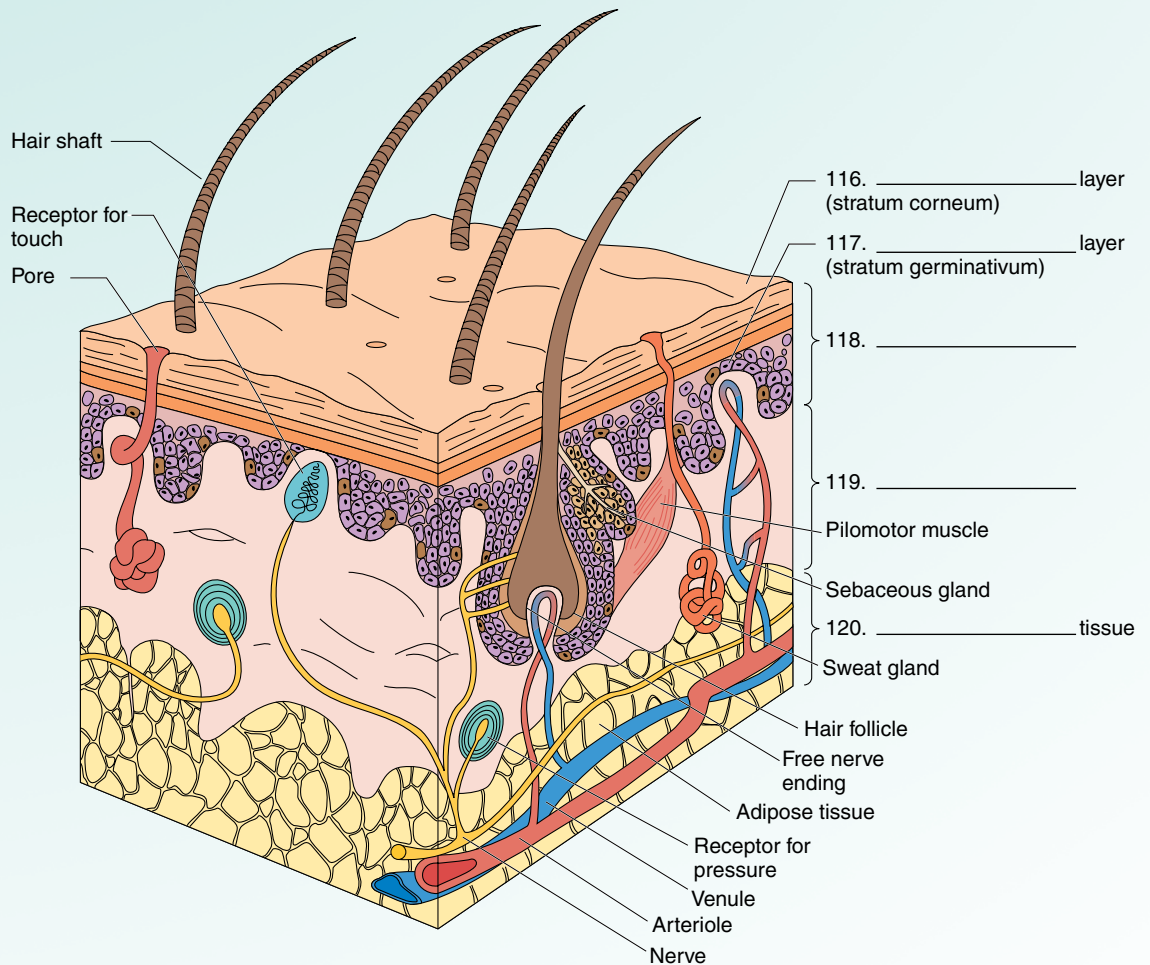
113. closed comedo/open comedo _____

114. cutaneous lupus/systemic lupus erythematosus _____

115. dysplastic nevus/malignant melanoma _____

Write in the missing words on the blank lines in the following illustration of the skin.

116–120.

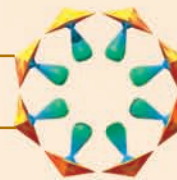


For each of the following, circle the correct spelling of the term:

- | | | |
|------------------|-------------|------------|
| 121. cicatrix | scicatrix | cicatrex |
| 122. pruritis | purritis | pruritus |
| 123. petechia | patechia | petecchia |
| 124. veruca | verucca | verruca |
| 125. eckamosis | ecchymosis | eckemyosis |
| 126. excission | excisison | excision |
| 127. soriasis | psoreyeasis | psoriasis |
| 128. impetigo | infantiego | impatiego |
| 129. eggszema | eczema | ecczema |
| 130. debridemant | debridement | debredment |

Give the noun that was used to form the following adjectives:

131. _____ keratotic
132. _____ bullous
133. _____ nodular
134. _____ seborrheic
135. _____ petechial
136. _____ ecchymotic
137. _____ urticarial
138. _____ eczematous
139. _____ macular
140. _____ suppurative



MEDICAL RECORD ANALYSES

MEDICAL RECORD 5.1

Progress Note

S: This is a 30 y.o. ♀ presenting with an erythematous and scaly eruption on the face and ears × 6 mo. Stress and emotional tensions aggravate the rash. Over-the-counter remedies provide no relief.

O: Patchy erythema with greasy, yellowish scaling appears over the nose and along the eyebrows. The external ears are similarly affected. Erythematous papules are scattered across the face, and there is ↑oiliness around the nose.

A: Seborrheic dermatitis

P: Rx: hydrocortisone cream, \overline{ss} oz tube

Sig: apply to affected areas t.i.d.

1. What is the sex of the patient?
 - a. male
 - b. female
 - c. not stated
2. What is the patient's CC?
 - a. stress and emotional tension
 - b. appearance of raised, yellow, pus-filled lesions on the skin
 - c. appearance of red areas on the skin with flaking of the outer layers of the skin
 - d. appearance of red areas on the skin with open sores
 - e. appearance of a communicable rash on the face and ear
3. What is the diagnosis?
 - a. inflammation of the sebaceous glands and hair follicles of the skin evidenced by comedones
 - b. fungus of the skin
 - c. inflammation of the skin with excessive secretion of sebum from the sebaceous glands
 - d. highly contagious bacterial skin inflammation marked by pustules that rupture and become crusted
 - e. transient, viral cold sores that infect the facial area
4. How much hydrocortisone cream was prescribed?
 - a. one ounce
 - b. two ounces
 - c. one-half dram
 - d. one dram
 - e. one-half ounce
5. What is the Sig: on the prescription?
 - a. apply to affected areas twice a day
 - b. apply to affected areas three times a day
 - c. apply to affected areas four times a day
 - d. apply to affected areas every 2 hours
 - e. apply to affected areas every 3 hours

MEDICAL RECORD 5.2

After ignoring various skin problems for months, Robert Fuller consulted his doctor in October when he became alarmed by what he saw happening on his right hand. His doctor referred him to Dr. Luong, a dermatologist, who then diagnosed and treated Mr. Fuller.

Directions

Read Medical Record 5.2 for Robert Fuller (page 136) and answer the following questions. This record is a SOAP progress note dictated by Dr. Luong immediately after the treatment of Mr. Fuller and transcribed the next day by his assistant.

QUESTIONS ABOUT MEDICAL RECORD 5.2

Write your answers in the spaces provided.

1. Below are medical terms used in this record that you have not yet encountered in this text. Underline each where it appears in the record and define below:

vulgaris _____

verruciform _____

2. In your own words, not using medical terminology, briefly describe Mr. Fuller's complaint.

3. In your own words, not using medical terminology, briefly describe Dr. Luong's three objective findings.

a. _____

b. _____

c. _____

4. Define the three diagnoses for those three objective findings.

a. _____

b. _____

c. _____

5. Briefly describe the treatments for those three diagnoses:

a. _____

b. _____

c. _____

6. What did Dr. Luong tell Mr. Fuller might occur in the future? Check *all* that apply:

- _____ scarring where the lesions were
- _____ nausea and possible vomiting from the nitrogen
- _____ red, freckle-like spots appearing on the right hand
- _____ possible regrowth of lesions
- _____ self-desiccating tissue destruction

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Department of Dermatology

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CHART NOTE

PATIENT: FULLER, ROBERT K.

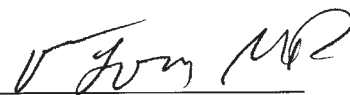
DATE: October 19, 20xx

SUBJECTIVE: The patient presents with a growth on the right hand, multiple lesions, and other growths.

OBJECTIVE: Ulcerated growth on the right hand, marked A; one verruciform tumor on the left hand; erythematous keratotic patches on the arms.

ASSESSMENT: Basal cell carcinoma, verruca vulgaris, and actinic keratoses.

PLAN: Following full counseling on healing with scarring, keloids, and possible recurrence, the growth from the right hand was excised. The site was anesthetized with Xylocaine 2% without epinephrine, 2 cc. Following excision, the bases of the growths were treated with fulguration and electrodesiccation. Desiccation was also performed on 0.3 cm of normal surrounding skin. The wart was treated with liquid nitrogen, two cycles. Freezing time: 8-10 seconds. Ten erythematous keratotic patches were also treated with liquid nitrogen, two cycles. Freezing time: 10-14 seconds.



D. Luong, M.D.

DL:ti

D: 10/19/20xx

T: 10/20/20xx

MEDICAL RECORD 5.3

About 5 months ago, Patricia Brown saw Dr. Luong, the dermatologist, and was treated for a skin problem. Since she was told then that there was a chance of recurrence, she has watched that area of her skin carefully. When what looked to her like a small dot appeared in the same area, she called Dr. Luong for another appointment.

Directions

Read Medical Record 5.3 for Patricia Brown (page 138) and answer the following questions. This record is the progress note dictated by Dr. Luong after treating her and transcribed the next day by his assistant.

QUESTIONS ABOUT MEDICAL RECORD 5.3

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

pigmented _____

margin _____

defect _____

- In your own words, not using medical terminology, briefly describe what Dr. Luong found in the first visit 5 months ago and the treatment he then gave:

- Dr. Malloy analyzed a tissue sample for Dr. Luong 5 months ago and diagnosed the lesion marked C. Translate her diagnosis into lay language:

- Before initiating treatment of the recurrent lesion in this visit, Dr. Luong fully explained to Ms. Brown the likely and possible results. What three specific things (in nonmedical language) did she agree to accept as possible risks?

a. _____

b. _____

c. _____

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CHART NOTE

PATIENT: BROWN, PATRICIA D.

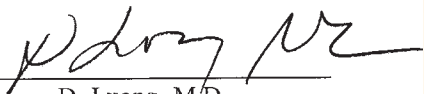
DATE: May 11, 20xx

SUBJECTIVE: Recurrence of growth on the patient's left leg. The patient was in my office on December 12, 20xx. At that time, three changing moles were excised: one on the left leg, marked C; one on the back; and one on the right of the chest. The one marked C was read by Dr. Malloy, the pathologist, as a pigmented compound nevus with mild atypical melanocytic hyperplasia, margins free and adequate.

OBJECTIVE: Very small pigmented lesion, approximately 2-3 mm in diameter, in the same area.

ASSESSMENT: Atypical and dysplastic nevus, possible recurrence.

PLAN: Fully counseled patient regarding healing with scarring and keloid; however, due to the nature of the nevus and the recurrence, we will need to remove a minimum of 4-5 mm of normal surrounding skin. With the patient's full acceptance of scarring, a keloid, and the possibility of recurrence, the tumor was re-excised with a large area surrounding the brown pigment, approximately 3-4 mm. The defect was then closed using 4-0 Vicryl x 3 and 4-0 Prolene x 4 interrupted. The specimen was marked C-1 and was sent to DermLab again to Dr. Malloy who read the patient's slide on December 12, 20xx. The patient is to return in two weeks for suture removal. An aftercare handout was given and discussed.


D. Luong, M.D.

DL:ti

D: 5/11/20xx

T: 5/12/20xx

5. Treatment of the recurrent lesion involved several steps. Put the following actions in correct order by numbering them 1 to 5:

_____ sample sent to lab

_____ suture removal

_____ excision of tumor and surrounding area

_____ patient's permission given

_____ suturing the wound

6. What, briefly, is Dr. Malloy's role *this* time? Is this the same as or different from her role in Ms. Brown's first treatment?

MEDICAL RECORD 5.4

Mary Chen’s physician, Dr. Ogawa, treated her for a skin lesion more than 2 months ago and more recently did a biopsy after that carcinoma apparently recurred. Dr. Ogawa then referred Mary to Dr. Volkman, a dermatologic surgeon.

Directions

Read Medical Record 5.4 (pages 141–142) for Mary Chen and answer the following questions. This record is the operative report dictated by Dr. Volkman after performing the surgery.

QUESTIONS ABOUT MEDICAL RECORD 5.4

Write your answers in the spaces provided.

1. Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

supine _____

gentian (crystal) violet _____

hemostasis _____

flap (full thickness) _____

2. In your own words, not using medical terminology, briefly describe Ms. Chen’s preoperative diagnosis.

Now describe the meaning of the addition to that diagnosis in the postoperative diagnosis.

3. In your own words, describe Dr. Ogawa’s earlier treatment of Ms. Chen’s lesion.

4. The surgery was performed with Ms. Chen in what position?

- a. lying flat, face down
- b. lying flat, face up
- c. lying on her side
- d. sitting

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OPERATIVE REPORT

DATE OF OPERATION: May 6, 20xx

LOCATION: Mohs' surgery suite.

PREOPERATIVE DIAGNOSIS: Recurrent basal cell carcinoma, left nasal tip.

POSTOPERATIVE DIAGNOSIS: Recurrent basal cell carcinoma, left nasal tip, with extension and full-thickness loss.

OPERATION PERFORMED: Mohs' histographic surgery, fresh tissue technique.

SURGEON: E. Volkman, M.D.

ASSISTANT: K. Ball, M.D.

ANESTHESIA: Local.

INDICATIONS:

The patient is a 64-year-old white female with a history of a lesion over the left nasal tip, which was biopsied on March 27, 20xx, slide number K-476-xx. Findings revealed recurrent basal cell carcinoma. Examination revealed a 12 x 10 mm ill-defined area of the left tip with waxiness and indistinct margins. The patient was referred by Dr. Ogawa who performed the above biopsy and additionally had treated the patient in February 20xx for a basal cell carcinoma with a shave curettage and desiccation, slide number K-159-xx. In light of this, it was thought that Mohs' surgery would be appropriate. I discussed it with the patient. The patient fully understands the aims, risks, alternatives, and possible complications and elects to proceed. There are no medical or surgical contraindications to the procedure.

PROCEDURE:

The patient was placed in the supine position on the operating table in the Mohs' surgery suite. The area was prepared and draped in a standard manner. Gentian violet was used to outline the clinical margins of the tumor, and thereafter, local anesthesia with 1% Lidocaine with 1:100,000 epinephrine mixed with 0.5% Marcaine was administered; a total amount of 7.2 cc was used throughout the entire procedure. All of the grossly visible tumor was removed, and an underlying

(continued)

OPERATIVE REPORT
Page 1

PT. NAME: CHEN, MARY S.
ID NO: OP-078919
SURGEON: EARL VOLKMAN, M.D.

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OPERATIVE REPORT

layer was taken and was processed by the Mohs' technique. Hemostasis was obtained with electrocautery. The tumor was found to be present on the gross vertical and extended deep between cartilages and throughout the left alar tip. The first Mohs' layer consisted of seven sections with seven slides being evaluated. The second Mohs' layer consisted of seven sections with seven slides being evaluated. The third Mohs' layer consisted of three sections with three slides being evaluated. A total of the vertical and 17 slides were examined under the microscope via the Mohs' technique. A cancer-free plane was reached after the third layer. The final size of the defect was 25 x 23 mm. The wound was covered with an antibiotic ointment and a nonadherent dressing between stages.

Estimated blood loss for the total procedure was 4 cc.

Total operative time, including tissue processing in the Mohs' laboratory and microscopic Mohs' frozen section slide review per Dr. O'Connor, was four hours. The patient tolerated the procedure well and left the operating room in good condition. There was full-thickness loss of the left ala (wing-like flap of the nostril composed of cartilage). The patient was placed on Keflex 250 mg 1 p.o. q.i.d. and was referred to Dr. Jensen in plastic surgery who will see the patient later today for consideration of reconstructive repair which may indeed require a forehead flap. She is to take Tylenol with Codeine 1 q 4 h p.r.n. pain and will also be followed by Dr. Ogawa.



Earl Volkman, M.D.

EV:ti

D: 5/6/20xx

T: 5/7/20xx

OPERATIVE REPORT
Page 2

PT. NAME: CHEN, MARY S.
ID NO: OP-078919
SURGEON: EARL VOLKMAN, M.D.

5. Put the following surgical actions in correct order to describe the surgery by numbering them 1 to 8:

_____ removing the gross tumor
 _____ stopping the bleeding
 _____ applying antibiotics
 _____ outlining clinical margins of the tumor
 _____ removing first underlying layer
 _____ evaluating tissues microscopically
 _____ administering local anesthetic
 _____ removing second and third layers

6. Translate the surgeon's phrase "Hemostasis was obtained with electrocautery":

7. Describe a "frozen section": _____

How many frozen sections were analyzed in this surgery? _____

8. For the other two physicians mentioned, give their specializations and their roles in treating Ms. Chen now and in the future:

Dr. O'Connor's specialization _____

role in treatment _____

Dr. Jensen's specialization _____

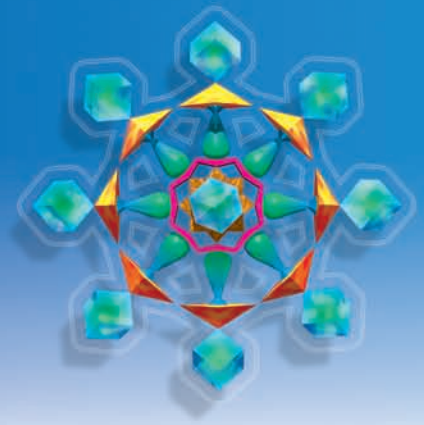
role in treatment _____

9. Translate the instructions for the two medications Ms. Chen will be taking postoperatively:

Drug Name	Route of Administration	Dose	Frequency of Dose
_____	_____	_____	_____
_____	_____	_____	_____

10. In your own words, not using medical terminology, briefly describe the additional treatment to be considered for Ms. Chen.

Musculoskeletal System



OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define common combining forms used in relation to the musculoskeletal system
- ◆ Describe the basic functions of the musculoskeletal system
- ◆ Define the basic anatomical terms referring to the musculoskeletal system
- ◆ Describe the anatomical position
- ◆ List the planes of the body
- ◆ Define positional and directional terms
- ◆ Define the terms related to body movements
- ◆ Define common symptomatic and diagnostic terms related to the musculoskeletal system
- ◆ List common diagnostic tests and procedures related to the musculoskeletal system
- ◆ Identify common operative terms referring to the musculoskeletal system
- ◆ Identify common therapeutic terms including drug classifications related to the musculoskeletal system
- ◆ Explain the terms and abbreviations used in documenting medical records involving the musculoskeletal system

Combining Forms

Combining Form	Meaning	Example
ankyl/o	crooked or stiff	ankylosis ang-ki-lot'ik
arthr/o	joint (articulation)	arthritis ar-thrī'tis
articul/o		articular ar-tik'yū-lār
brachi/o	arm	brachium brā'kē-ūm
cervic/o	neck	cervical ser'vī-kal
chondr/o	cartilage (gristle)	chondral kon'drāl

Combining Form	Meaning	Example
cost/o	rib	intercostal in-ter-kos'täl
crani/o	skull	cranial krä'nē-äl
dactyl/o	digit (finger or toe)	dactylomegaly dak'til-ō-meg'ä-lē
fasci/o	fascia (a band)	fasciodesis fas-ē-od'ě-sis
femor/o	femur	femoral fem'ō-räl
fibr/o	fiber	fibrous fi'brūs
kyph/o	humpback	kyphosis kī-fō'sis
lei/o	smooth	leiomyoma lī'o-mī-ō'mă
lord/o	bent	lordosis lör-dō'sis
lumb/o	loin (lower back)	lumbar lüm'bar
myel/o	bone marrow or spinal cord	myelitis mī-ě-lī'tis
my/o	muscle	myalgia mī-al'jē-ä
myos/o		myositis mī-ō-sī'tis
muscul/o		muscular müs'kyū-lär
oste/o	bone	osteomyelitis os'tē-o-mī-ě-lī'tis
patell/o	knee cap	patellar pa-tel'är
pelv/i	hip bone or pelvic cavity	pelvimeter pel-vim'ě-ter
pelv/o		pelvic pel'vik
radi/o	radius	radial rā'dē-äl
rhabd/o	rod shaped or striated (skeletal)	rhabdomyoma rab'dō-mī-ō'mă
sarc/o	flesh	sarcoma sar-kō'mă
scoli/o	twisted	scoliosis skō-lē-ō'sis



DIGIT. The Latin term for finger or toe. Digit in the sense of a number was derived from the habit of counting on the fingers, which probably accounts for the decimal system. Digitalis, the heart drug, is an extract of the purple foxglove plant, also known as ladies fingers.

Combining Form	Meaning	Example
spondyl/o	vertebra	spondylitis spon-di-lī'tis
vertebr/o		vertebral ver'tě-brāl
stern/o	sternum (breastbone)	sternocostal ster'nō-kos'tāl
ten/o	tendon (to stretch)	tenodesis tě-nod'ē-sis
tend/o		tendolysis ten-dol'i-sis
tendin/o		tendinitis ten-di-nī'tis
thorac/o	chest	thoracic thō-ras'ik
ton/o	tone or tension	myotonia mī-ō-tō'nē-ă
uln/o	ulna	ulnar ŭl'nār

Musculoskeletal System Overview

The musculoskeletal system provides support and gives shape to the body. The skeleton gives structure to the body by providing a framework of bones and cartilage. Also, the bones store calcium and other minerals and produce certain blood cells within the bone marrow (Figs. 6.1 to 6.4).

The muscles cover the bones where they hinge (articulate) and supply the forces that make movement possible. They also provide a protective covering for internal organs and produce body heat (Figs. 6.5 and 6.6).



SKELETON.

Skeleton is derived from a Greek word meaning "dried up." The Greeks used the term in reference to a mummy or dried-up body. They never used the word in the modern meaning of the bony framework of the body. The first recorded use of the modern term in English occurred in 1578.



ELBOW.

Many terms referring to the elbow are based on the L-shape formed at the joint. This is the basis of the "el" of elbow. It is also the root of the Latin term ulna. An "ell" was an old measure of length, particularly of cloth, being the amount from the elbow (or shoulder) to the fingers, which was a convenient way of rapidly measuring lengths. Boga was a bending or a bow.

Anatomical Terms Related to Bones (Figs. 6.1 to 6.4)

Term	Meaning
appendicular skeleton ap'en-dik'yū-lār	bones of shoulder, pelvis, and upper and lower extremities
axial skeleton ak'sē-ăl	bones of skull, vertebral column, chest, and hyoid bone (U-shaped bone lying at the base of the tongue); refer to Figure 6.4 for abbreviated identification and numbering of cervical, thoracic, and lumbar vertebrae
bone	specialized connective tissue composed of osteocytes (bone cells) forming the skeleton

TYPES OF BONE TISSUE

compact bone	tightly solid, strong bone tissue resistant to bending
spongy (cancellous) bone spŭn'jē kan'sē-lŭs	mesh-like bone tissue containing marrow and fine branching canals through which blood vessels run

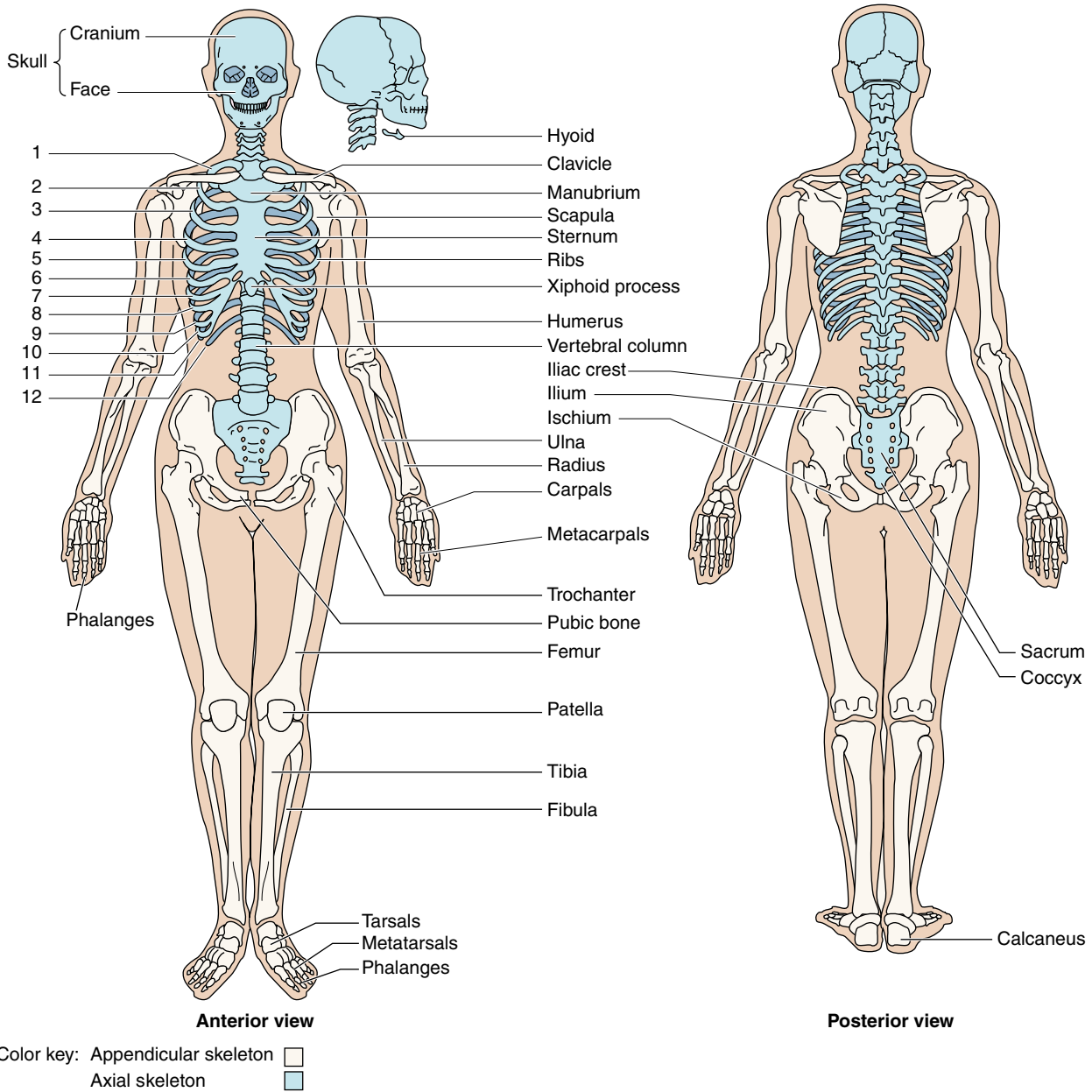
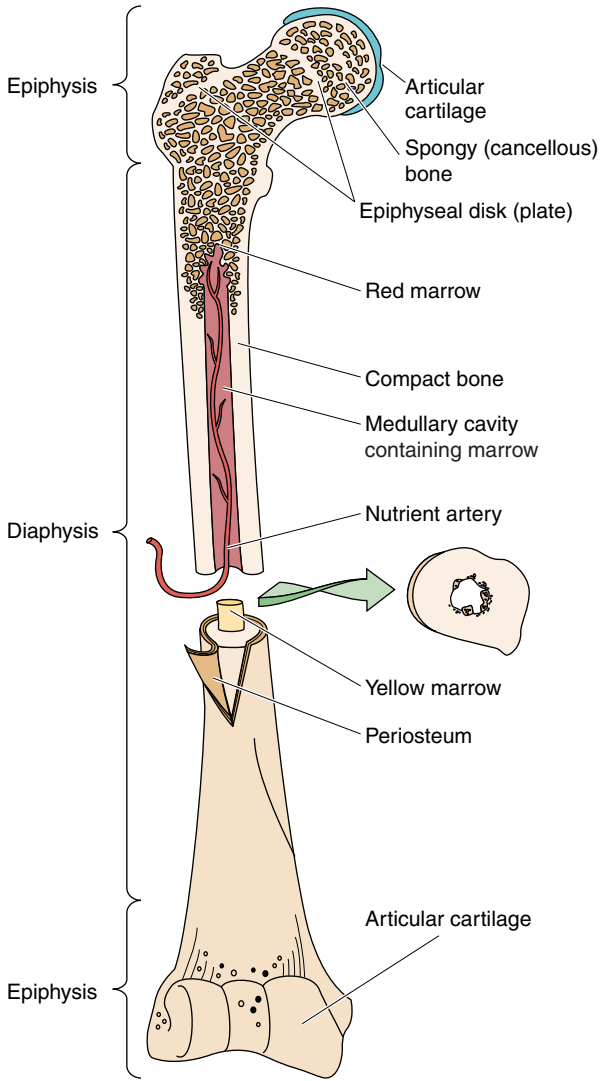


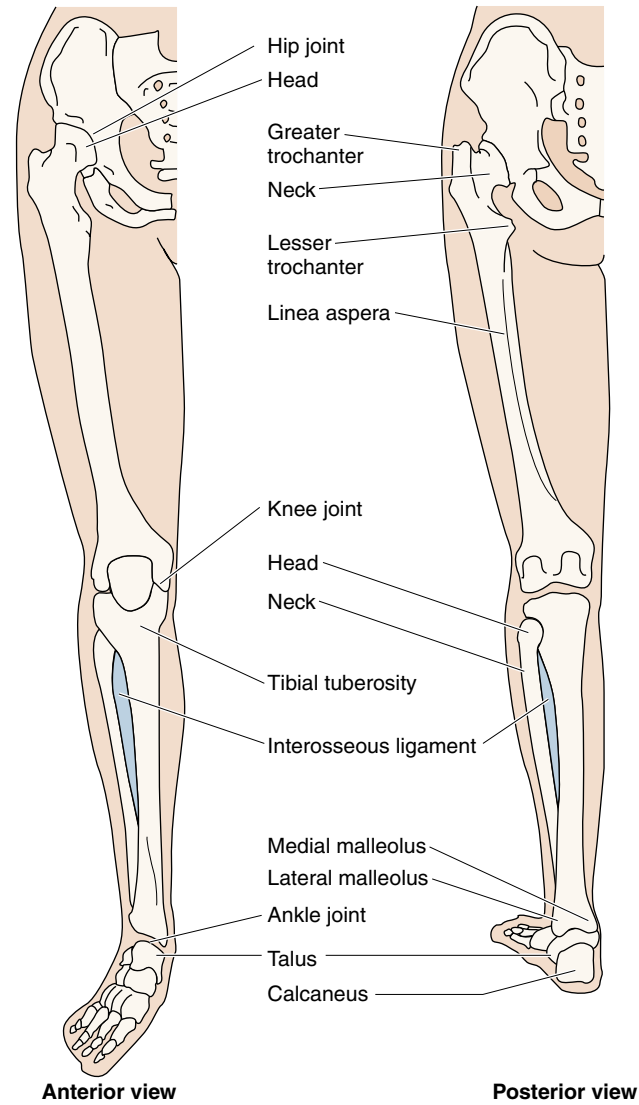
Figure 6.1 The skeleton.

Term	Meaning
CLASSIFICATION OF BONES	
long bones	bones of arms and legs
short bones	bones of wrists and ankles
flat bones	bones of ribs, shoulder blades, pelvis, and skull
irregular bones	bones of vertebrae and face
sesamoid bones ses'ă-moyd	round bones found near joints (e.g., patella)

Anatomy of a long bone



Joints of lower limb



Anatomy of joints

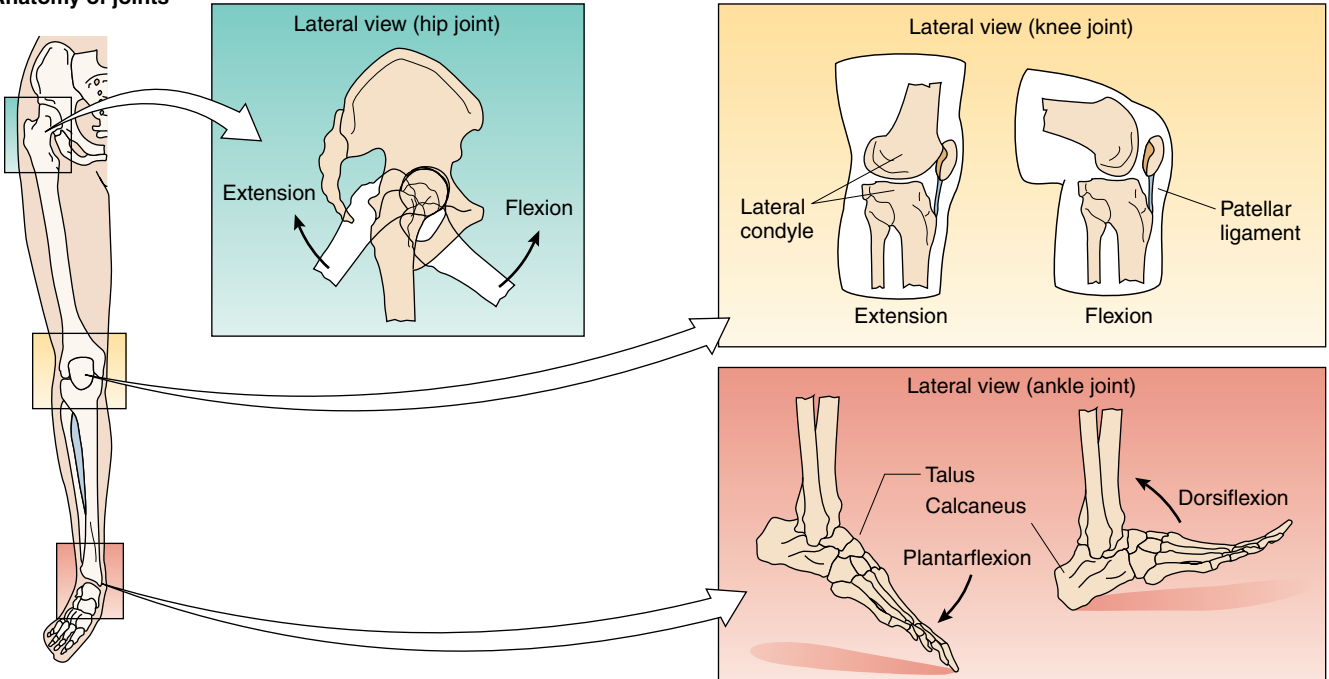


Figure 6.2 Anatomy of bone and joints.

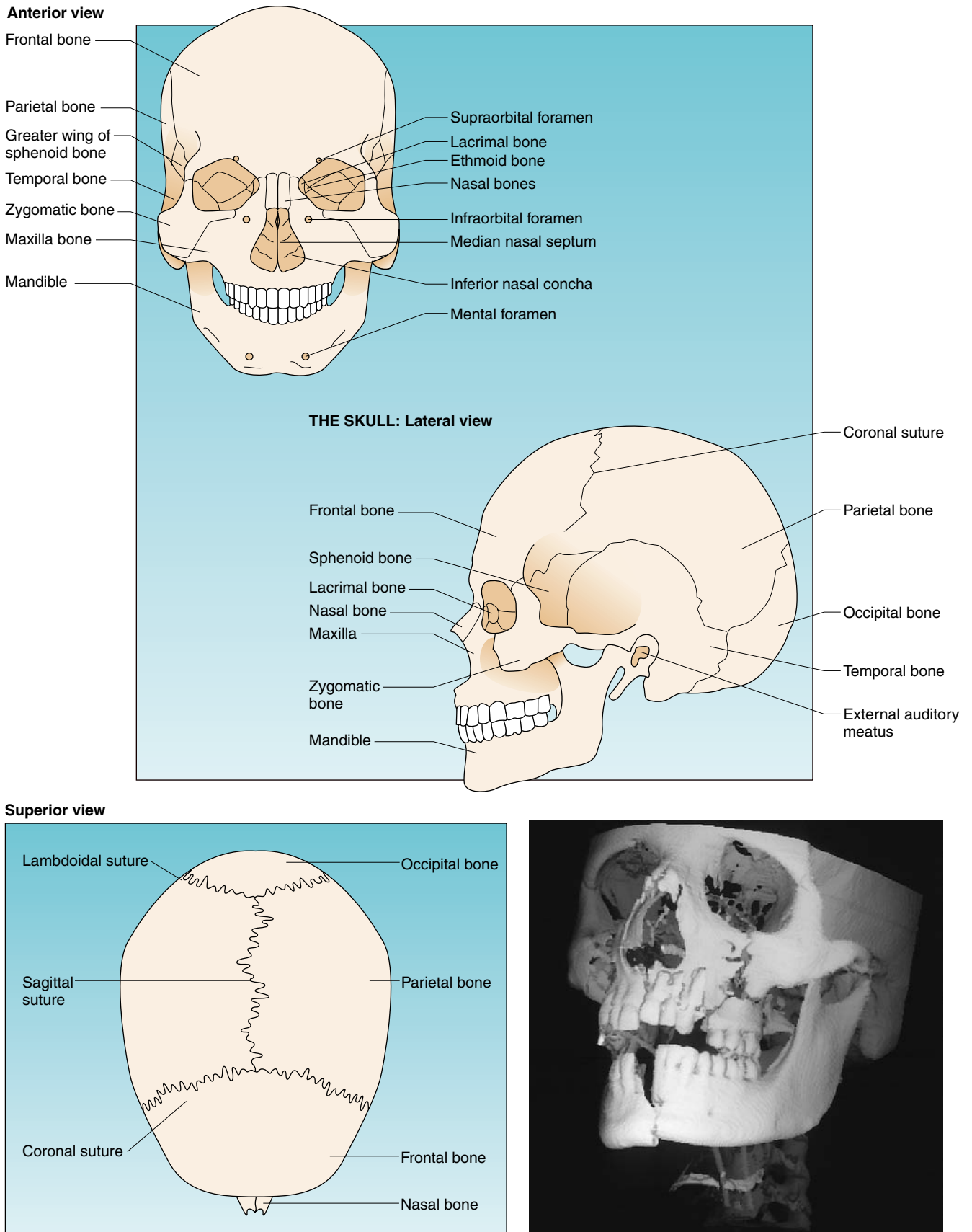
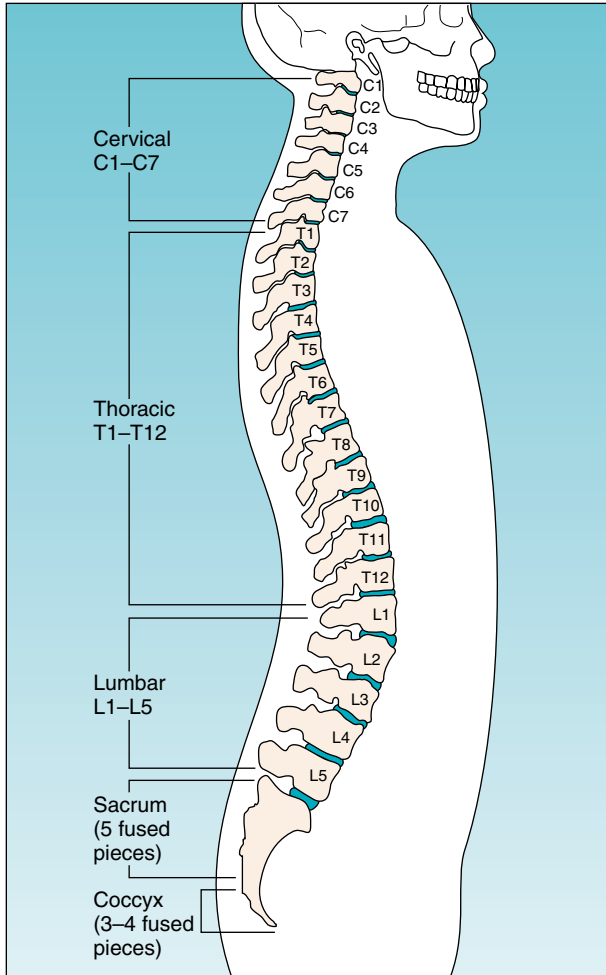


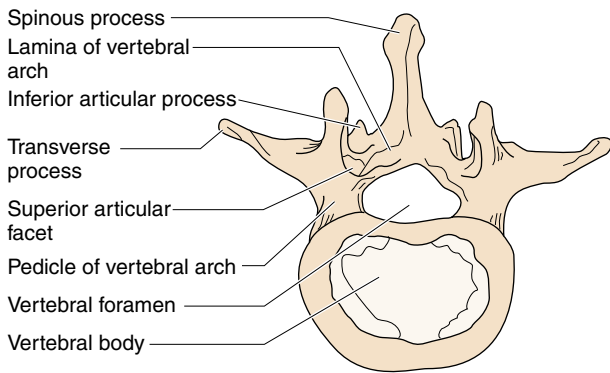
Figure 6.3 The skull.

Three-dimensional CT reconstruction of a skull showing traumatic injury to facial bones suffered as the result of a motor vehicle accident.

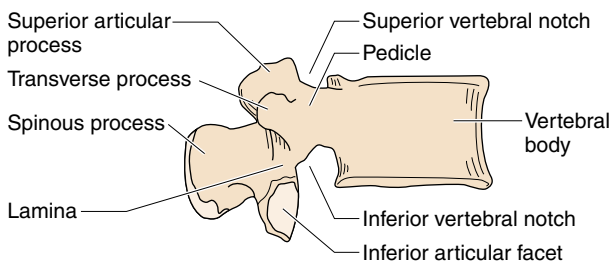
THE VERTEBRAE: Lateral view



Superior view (L2)



Lateral view (L2)



Magnetic resonance image of portions of the lower vertebrae (lower thoracic, lumbar, sacrum, and coccyx) demonstrating normal anatomy.

Lateral view

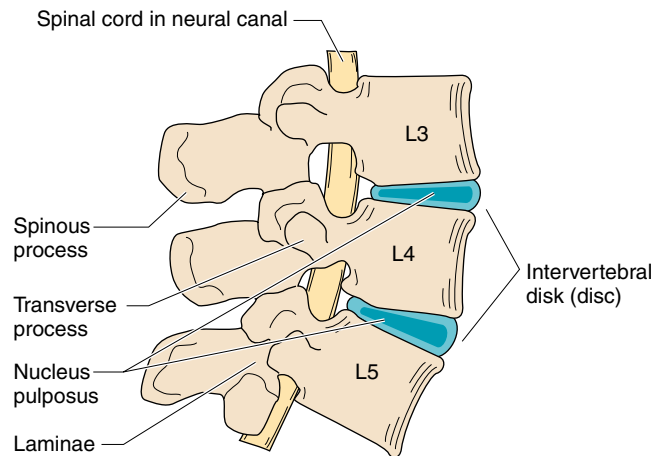


Figure 6.4 The vertebrae.

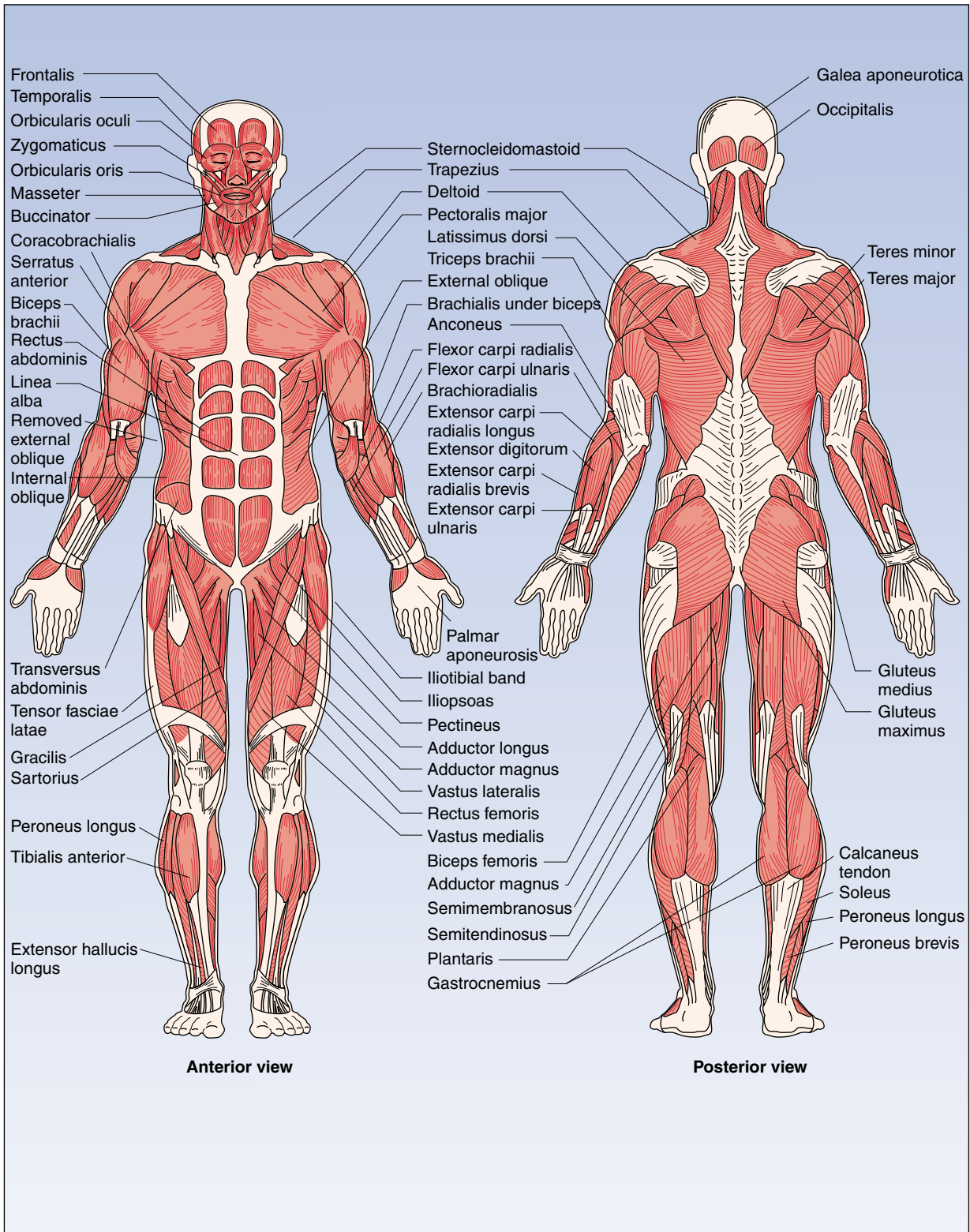


Figure 6.5 Muscles of the body.

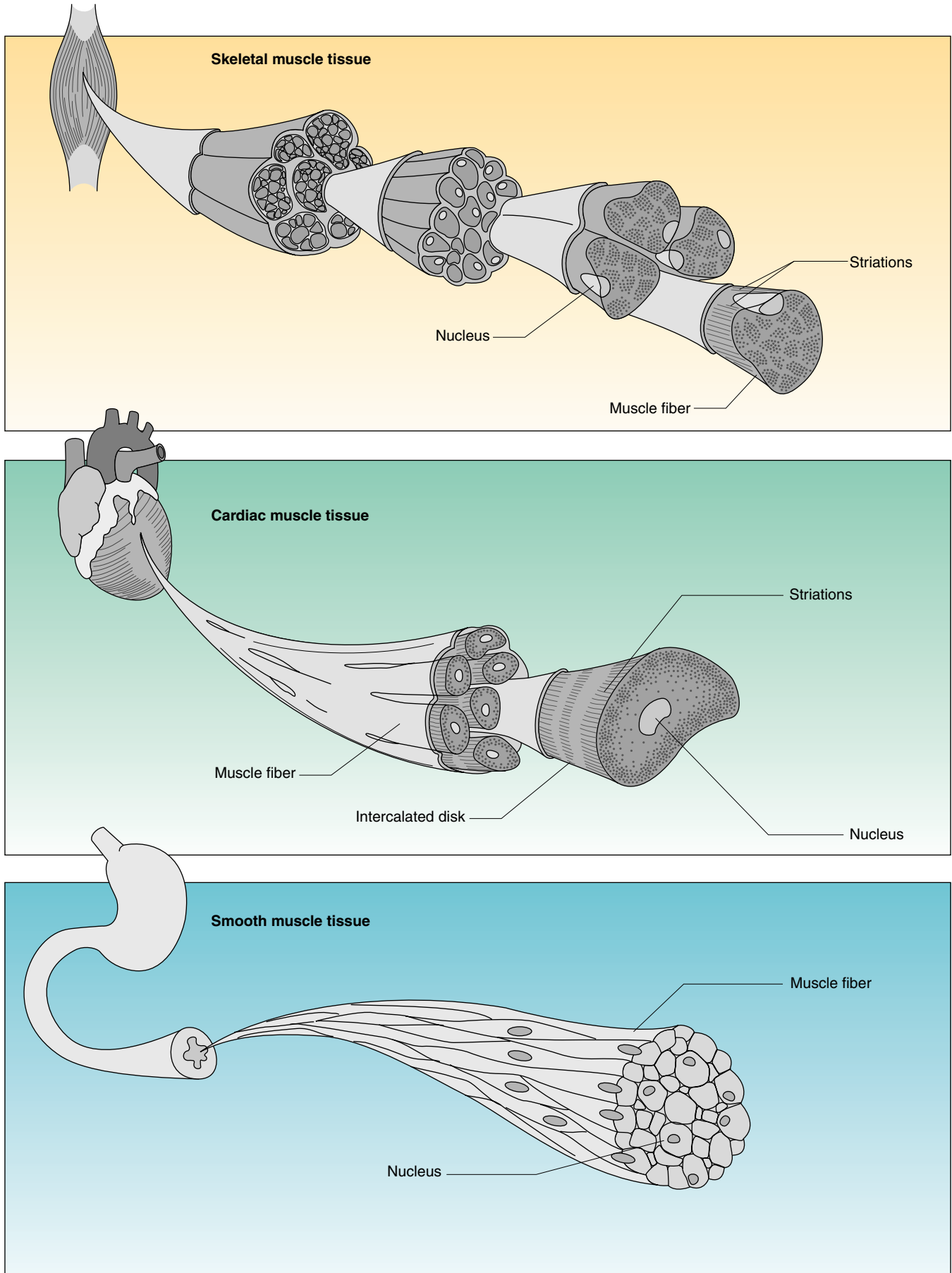


Figure 6.6 Architecture of the three types of muscle.

Term	Meaning
PARTS OF A LONG BONE (SEE FIG. 6.2)	
epiphysis e-pif'i-sis	wide ends of a long bone (physis = growth)
diaphysis dī-af'i-sis	shaft of a long bone
metaphysis mě-taf'i-sis	growth zone between epiphysis and diaphysis during development of a long bone
endosteum en-dos'tē-ŭm	membrane lining the medullary cavity of a bone
medullary cavity med'ŭ-lār-ē	cavity within the shaft of the long bones filled with bone marrow
bone marrow mar'ō	soft connective tissue within the medullary cavities of bones
red bone marrow	found in cavities of most bones in infants; functions in formation of red blood cells, some white blood cells, and platelets; in adults, red bone marrow is found most often in the flat bones
yellow bone marrow	gradually replaces red bone marrow in adult bones, functions as storage for fat tissue, and is inactive in formation of blood cells
periosteum per-ē-os'tē-ŭm	a fibrous, vascular membrane that covers the bone
articular cartilage ar-tik'yū-lār kar'ti-lij	a gristle-like substance found on bones where they articulate

Anatomical Terms Related to Joints and Muscles (Figs. 6.2 to 6.7)

Term	Meaning
articulation ar'tik-yū-lā'shŭn	a joint; the point where two bones come together (Fig. 6.7)
bursa ber'să	a fibrous sac between certain tendons and bones that is lined with a synovial membrane that secretes synovial fluid
disk (disc)	a flat, plate-like structure composed of fibrocartilaginous tissue found between the vertebrae to reduce friction (see Fig. 6.4)
nucleus pulposus nu'klē-ŭs pŭl-pō'sŭs	the soft, fibrocartilaginous, central portion of intervertebral disk
ligament lig'ă-ment	a flexible band of fibrous tissue that connects bone to bone (Fig. 6.8)
synovial membrane si-nō'vē-ăl mem'brān	membrane lining the capsule of a joint
synovial fluid si-nō'vē-ăl flū'id	lubricating fluid secreted by the synovial membrane



ANKLE. Ank, a very old Greek root meaning

bend or angle, is the origin of the term for the ankle joint. It is also associated with ankylo, a combining form meaning crooked or bent.



BURSA. A Latin word for a purse was given to the

small synovial pouch associated with a joint. The meaning stems from the use of a purse by the bursar, the man who holds the purse in order to pay out of it. Most anatomical terms come from the names of familiar objects [e.g., patella (dish), acetabulum (bowl)].

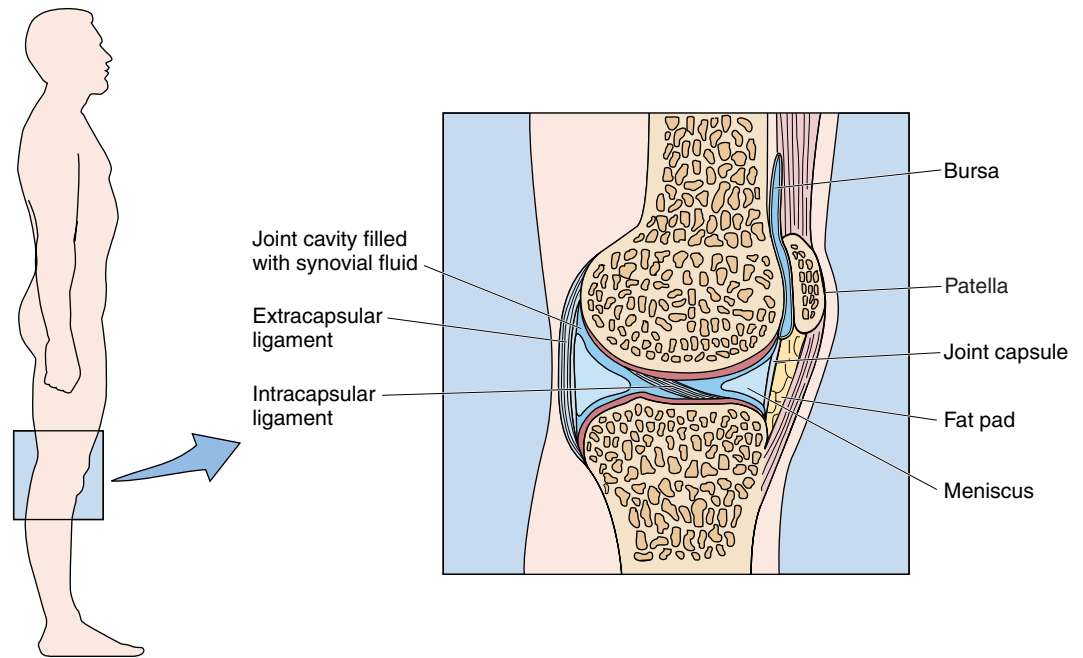


Figure 6.7 Lateral view of the knee joint.

Term	Meaning
muscle mūs'ĕl	tissue composed of fibers that can contract, causing movement of an organ or part of the body (see Figs. 6.5 and 6.6)
striated (skeletal) muscle stri'ā-ted (skel'e-tāl)	voluntary striated muscle attached to the skeleton
smooth muscle	involuntary muscle found in internal organs
cardiac muscle	muscle of the heart
origin of a muscle	muscle end attached to the bone that does not move when the muscle contracts

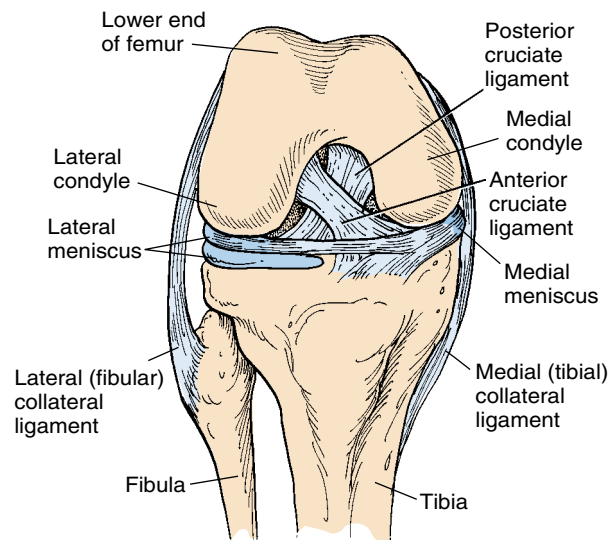


Figure 6.8 Posterior view of the knee and ligaments.

Term	Meaning
insertion of a muscle	muscle end attached to the bone that moves when the muscle contracts
tendon ten'dŏn	a band of fibrous tissue that connects muscle to bone
fascia fash'ē-ă	a band or sheet of fibrous connective tissue that covers, supports, and separates muscle



FASCIA. Fascia is derived from a Latin word for a band or bandage derived from *fascis*, a bundle (the bandage that ties up a bundle, especially a band around a bundle of sticks). *Fasces* were bundles of sticks from which an ax projected; they were carried by Roman officials. In the 20th century, fasces were adopted in Italy as a political party badge, hence the term “fascist.” In anatomy, the sheets of connective tissue that wrap the muscles or other parts are called fascia. Many are named for those who first described them, such as Camper, Scarpa, Colles.

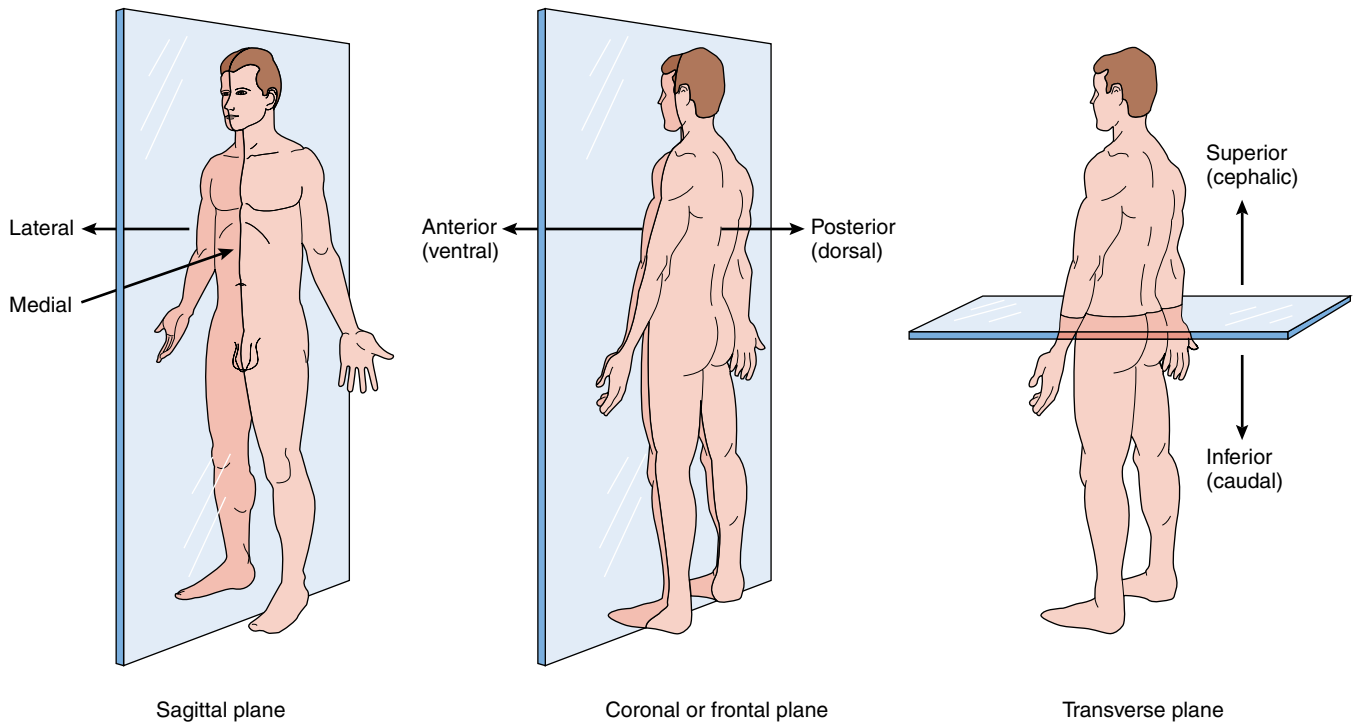
Anatomical Position and Terms of Reference

To communicate effectively about the body, health professionals use terms with specific meanings to refer to body positions, directions, and planes. These terms of reference are based on the body being in anatomical position, in which the person is assumed to be standing upright (erect), facing forward, feet pointed forward and slightly apart, arms at the sides with palms facing forward. The patient is visualized in this pose before applying any other term of reference.

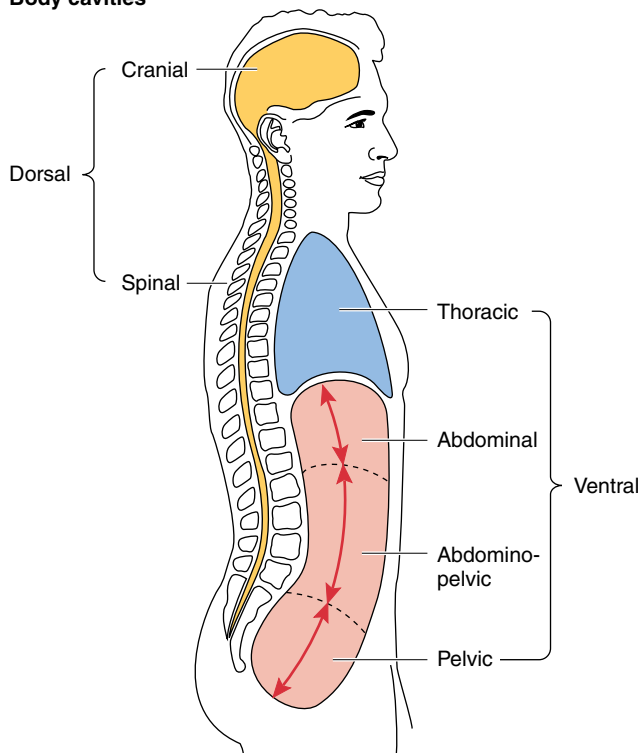
With the body in an anatomical position, three different imaginary lines divide the body in half, forming body *planes*. In addition to the three body planes, *positional and directional terms* are used to indicate the location or direction of body parts in respect to each other (Fig. 6.9).

Term	Meaning
BODY PLANES	
coronal (frontal) plane kŏr'ŏ-năl (frŭn'tăl)	vertical division of the body into front (anterior) and back (posterior) portions
sagittal plane saj'i-tăl	vertical division of the body into right and left portions
transverse plane trans-vers'	horizontal division of the body into upper and lower portions
TERMS OF POSITION AND DIRECTION	
anterior (A) (ventral) an-tēr'ē-ŏr (ven'trăl)	front of the body
posterior (P) (dorsal) pos-tēr'ē-ŏr (dor'săl)	back of the body
anterior-posterior (AP)	from front to back; commonly associated with the direction of an x-ray beam
posterior-anterior (PA)	from back to front; commonly associated with the direction of an x-ray beam
superior (cephalic) su-pēr'ē-ŏr (se-fal'ik)	situated above another structure, toward the head
inferior (caudal) in-fē'rē-ŏr (kaw'dăl)	situated below another structure, away from the head

Body planes



Body cavities



Thoracic cavity

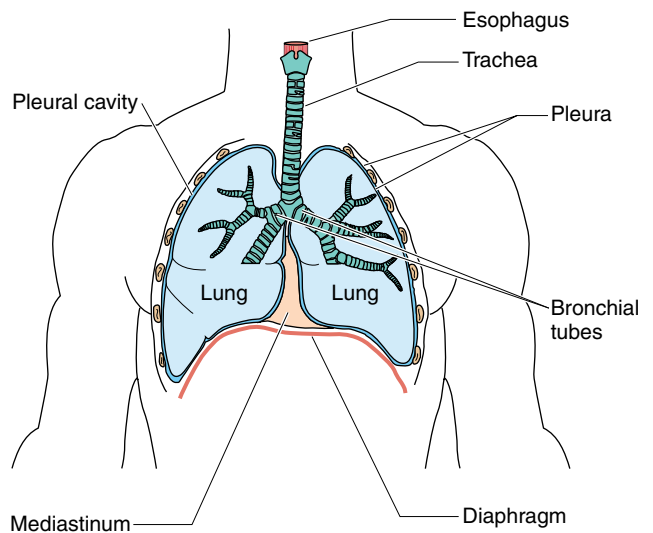


Figure 6.9 Body planes and cavities.

Term	Meaning
proximal prok'si-măĭ	toward the beginning or origin of a structure [e.g., the proximal aspect of the femur (thigh bone) is the area closest to where it attaches to the hip]
distal dis'tăĭ	away from the beginning or origin of a structure [e.g., the distal aspect of the femur (thigh bone) is the area at the end of the bone near the knee]
medial mē'dē-ăĭ	toward the middle (midline)
lateral lat'er-ăĭ	toward the side
axis ak'sis	line that runs through the center of the body or a body part
BODY POSITIONS	
erect ĕ-rĕkt'	normal standing position
decubitus dē-kyū'bi-tūs	lying down, especially in bed; i.e., lateral decubitus is lying on the side (decumbo = to lie down)
prone prōn	lying face down and flat
recumbent rē-kūm'bent	lying down
supine sū-pīn'	horizontal recumbent; lying flat on the back— “on the spine” (Fig. 6.10)
BODY MOVEMENTS (FIG. 6.11)	
flexion flek'shŭn	bending at the joint so that the angle between the bones is decreased
extension eks-ten'shŭn	straightening at the joint so that the angle between the bones is increased
abduction ab-dŭk'shŭn	movement away from the body
adduction ă-duk'shŭn	movement toward the body
rotation rō-tă'shŭn	circular movement around an axis
eversion ĕ-ver'zhŭn	turning outward, i.e., of a foot
inversion in-ver'zhŭn	turning inward, i.e., of a foot

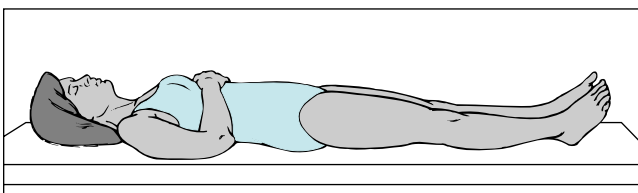


Figure 6.10 Supine (horizontal recumbent position). Patient lies on back with the legs extended.

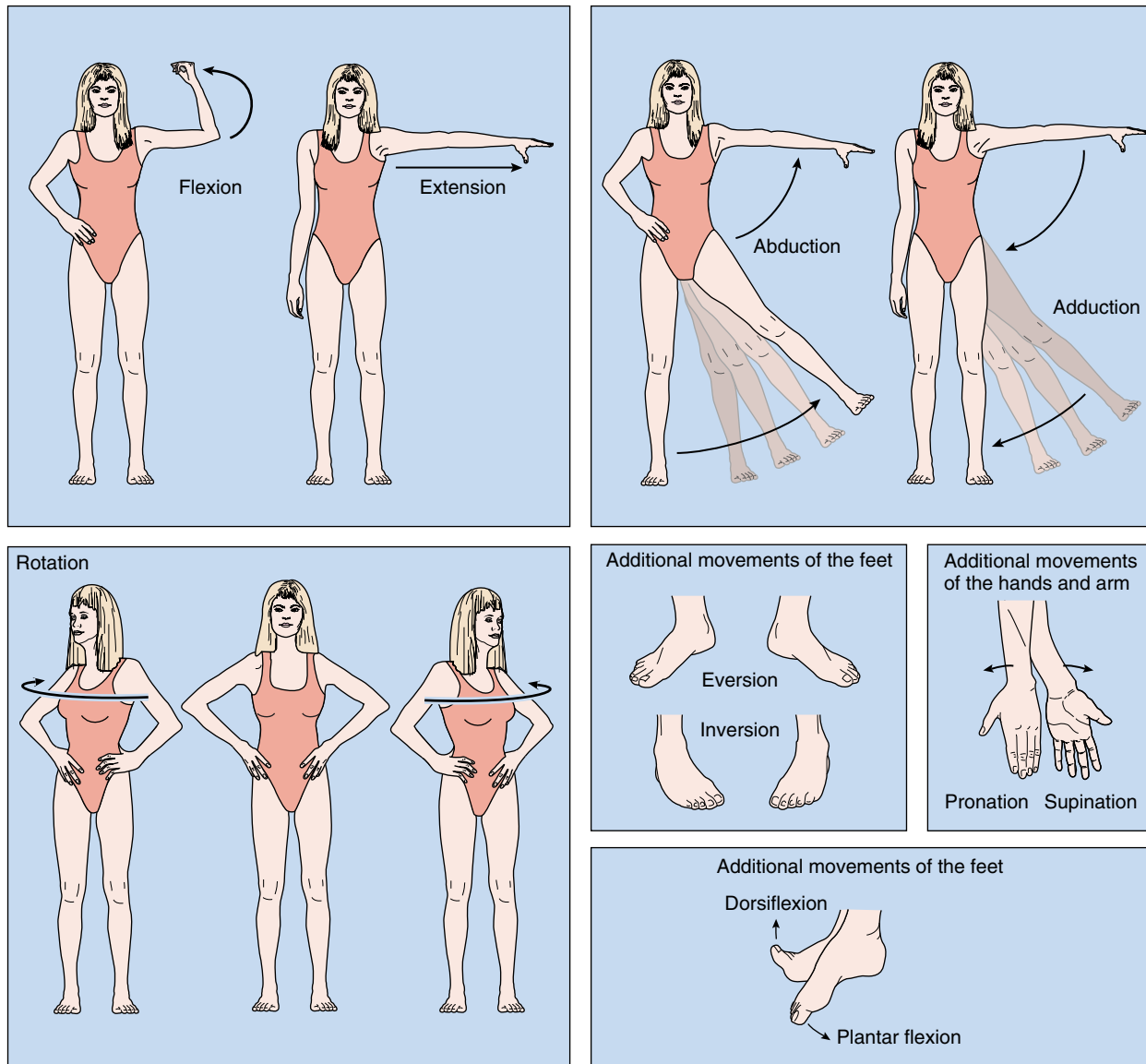


Figure 6.11 Body movements.

Term	Meaning
supination sū'pi-nā'shŭn	turning upward or forward of the palmar surface (palm of the hand) or plantar surface (sole of the foot)
pronation prō-nā'shŭn	turning downward or backward of the palmar surface (palm of the hand) or plantar surface (sole of the foot)
dorsiflexion dōr-si-flek'shŭn	bending of the foot or the toes upward
plantar flexion plan'tār	bending of the sole of the foot by curling the toes toward the ground
range of motion (ROM)	total motion possible in a joint, described by the terms related to body movements, i.e., ability to flex, extend, abduct, or adduct; measured in degrees
goniometer gō-nē-om'ě-ter	instrument used to measure joint angles (gonio = angle) (Fig. 6.12)

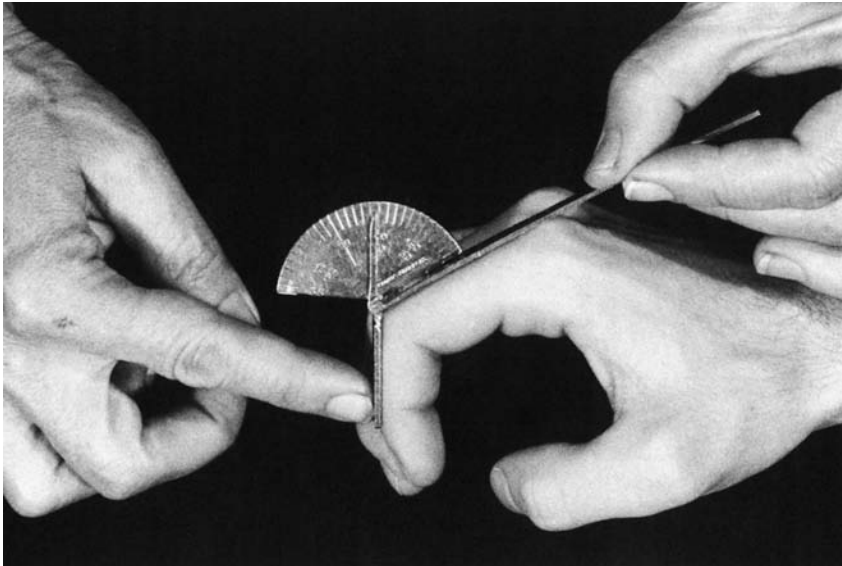


Figure 6.12 Dorsal placement of goniometer used when measuring digital motion.

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC	
arthralgia ar-thral'jē-ă	joint pain
atrophy at'rō-fē	shrinking of tissue such as muscle
crepitation krep-i-tā'shŭn	grating sound made by movement of some joints or broken bones
crepitus krep-i-tŭs	
exostosis eks-os-tō'sis	a projection arising from a bone that develops from cartilage
flaccid flas'id	flabby, relaxed, or having defective or absent muscle tone
hypertrophy hī-per'trō-fē	increase in the size of tissue such as muscle
hypotonia hī'pō-tō'ne-ă	reduced muscle tone or tension
myalgia mī-al'jē-ă	muscle pain
myodynia mī'ō-din'ē-ă	
ostealgia os-tē-al'jē-ă	bone pain
osteodynia os-tē-o-din'ē-ă	
rigor or rigidity rig'er or ri-jid'i-tē	stiffness; stiff muscle

Term	Meaning
spasm spazm	drawing in; involuntary contraction of muscle
spastic spas'tik	uncontrolled contractions of skeletal muscles causing stiff and awkward movements (resembles spasm)
tetany tet'ă-nē	tension; prolonged, continuous muscle contraction
tremor trem'er	shaking; rhythmic muscular movement

DIAGNOSTIC

ankylosis ang'ki-lō'sis	stiff joint condition
arthritis ar-thrī'tis	inflammation of the joints characterized by pain, swelling, redness, warmth, and limitation of motion—there are more than 100 different types of arthritis
osteoarthritis (OA) os'tē-ō-ar-thrī'tis	most common form of arthritis that especially affects weight-bearing joints (e.g., knee, hip); characterized by the erosion of articular cartilage (Fig. 6.13)
degenerative arthritis dē-jen'er-ă-tiv ar-thrī'tis	
degenerative joint disease (DJD) dē-jen'er-ă-tiv joynt di-zēz'	

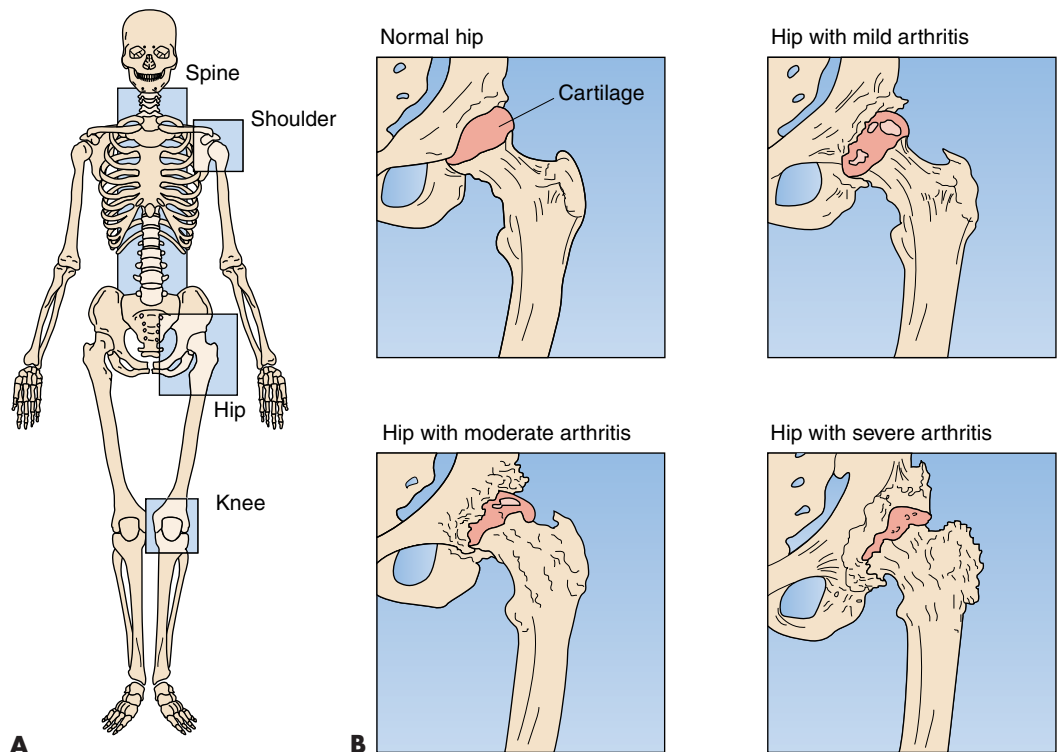


Figure 6.13 Osteoarthritis. **A.** Common sites of osteoarthritis. **B.** How osteoarthritis affects the hip.

Term	Meaning
rheumatoid arthritis (RA) rū'mă-toyd ar-thrī'tis	most crippling form of arthritis characterized by a chronic, systemic inflammation most often affecting joints and synovial membranes (especially in the hands and feet) causing ankylosis (stiff joints) and deformity (Fig. 6.14)
gouty arthritis gow'tē ar-thrī'tis	acute attacks of arthritis usually in a single joint (especially the great toe) caused by hyperuricemia (an excessive level of uric acid in the blood)



GOUT. The term for gout stems from the Latin

word meaning a drop. Known to the ancients, the condition was thought to be caused by a liquid secretion that was distilled drop by drop on the diseased part.

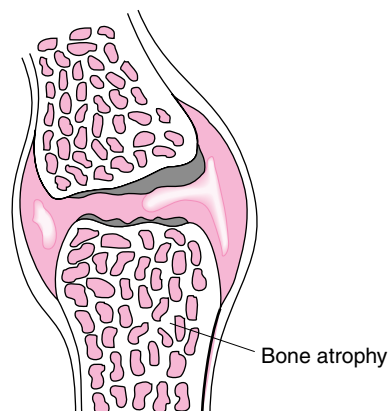
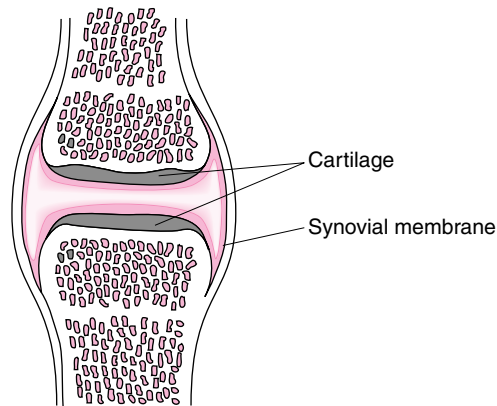


Figure 6.14 Joints of the hand affected by rheumatoid arthritis. **A.** X-ray of normal hand. **B.** X-ray of hand with rheumatoid arthritis.

Term	Meaning
bony necrosis ně-krō'sis sequestrum sē-kwes'trūm	dead bone tissue from loss of blood supply such as can occur after a fracture (sequestrum = something laid aside)
bunion būn'yŭn	swelling of the joint at the base of the great toe caused by inflammation of the bursa
bursitis ber-sī'tis	inflammation of a bursa
carpal tunnel syndrome kar'pāl	condition that results from compression of the median nerve within the carpal tunnel at the wrist, characterized by pain, numbness, and tingling in the wrist and fingers and weak grip; commonly seen as a result of cumulative trauma of surrounding tendons (Fig. 6.15)
chondromalacia kon'drō-mă-lā'shē-ă	softening of cartilage
epiphysitis e-pif-i-sī'tis	inflammation of epiphyseal regions of the long bone

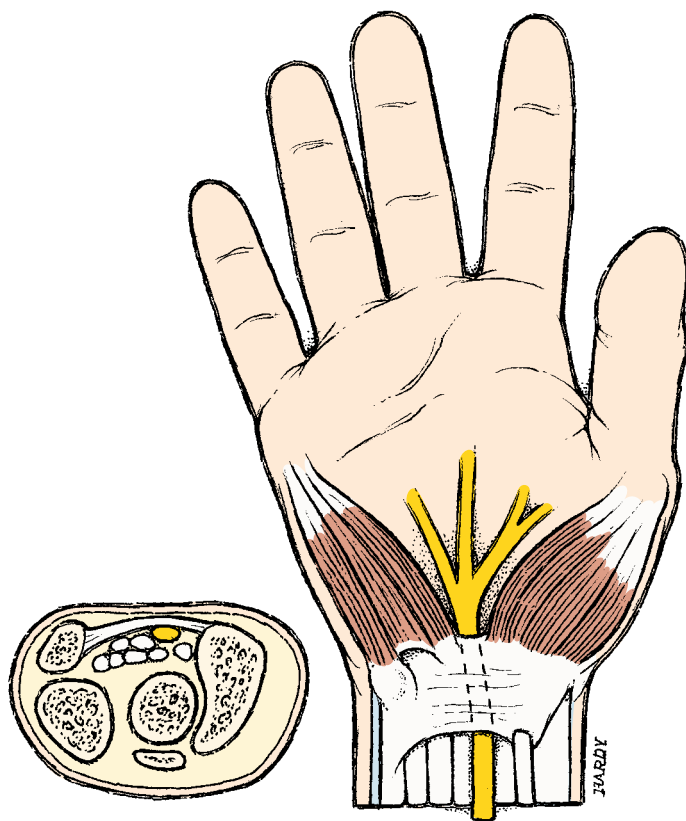


Figure 6.15 Carpal tunnel containing the median nerve and the flexor tendons of the fingers and thumb.

Term	Meaning
fracture (Fx) frak'chūr	a broken or cracked bone (Fig. 6.16)
closed fracture	a broken bone with no open wound
open fracture	compound fracture; a broken bone with an open wound
simple fracture	a nondisplaced fracture involving one fracture line that does not require extensive treatment to repair (e.g., hairline Fx, stress Fx, or crack)
complex fracture	a displaced fracture that requires manipulation or surgery to repair
fracture line	line made by broken bone (e.g., oblique, spiral, or transverse)
comminuted fracture kom'i-nū-ted	broken in many little pieces
greenstick fracture	bending and incomplete break of a bone—most often seen in children
herniated disk or disc her'nē-ā-ted	protrusion of a degenerated or fragmented intervertebral disk so that the nucleus pulposus protrudes, causing compression on the nerve root (see Chapter 10, Fig. 10.9)
myeloma mī-ě-lō'mă	bone marrow tumor
myositis mī-ō-sī'tis	inflammation of muscle
myoma mī-ō'mă	muscle tumor
leiomyoma lī'ō-mī-ō'mă	smooth muscle tumor
leiomyosarcoma lī'ō-mī'ō-sar-kō'mă	malignant smooth muscle tumor
rhabdomyoma rab'dō-mī-o'mă	skeletal muscle tumor
rhabdomyosarcoma rab'dō-mī-ō-sar-kō'mă	malignant skeletal muscle tumor
muscular dystrophy mūs'kyū-lăr dis'trō-fē	a category of genetically transmitted diseases characterized by progressive atrophy of skeletal muscles (Duchenne's type is most common)
osteoma os-tē-ō'mă	bone tumor
osteosarcoma os'tē-ō-sar-kō'mă	type of malignant bone tumor
osteomalacia os'tē-ō-mă-lă'shē-ă	disease marked by softening of the bone caused by calcium and vitamin D deficiency
rickets rik'ets	osteomalacia in children (causes bone deformity)

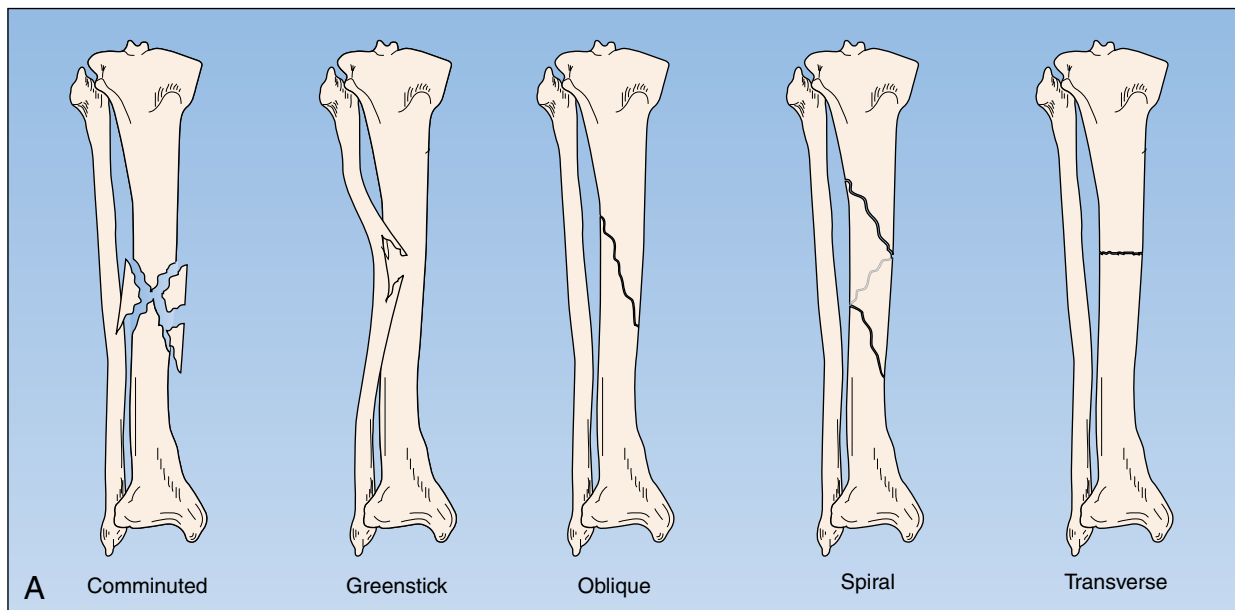
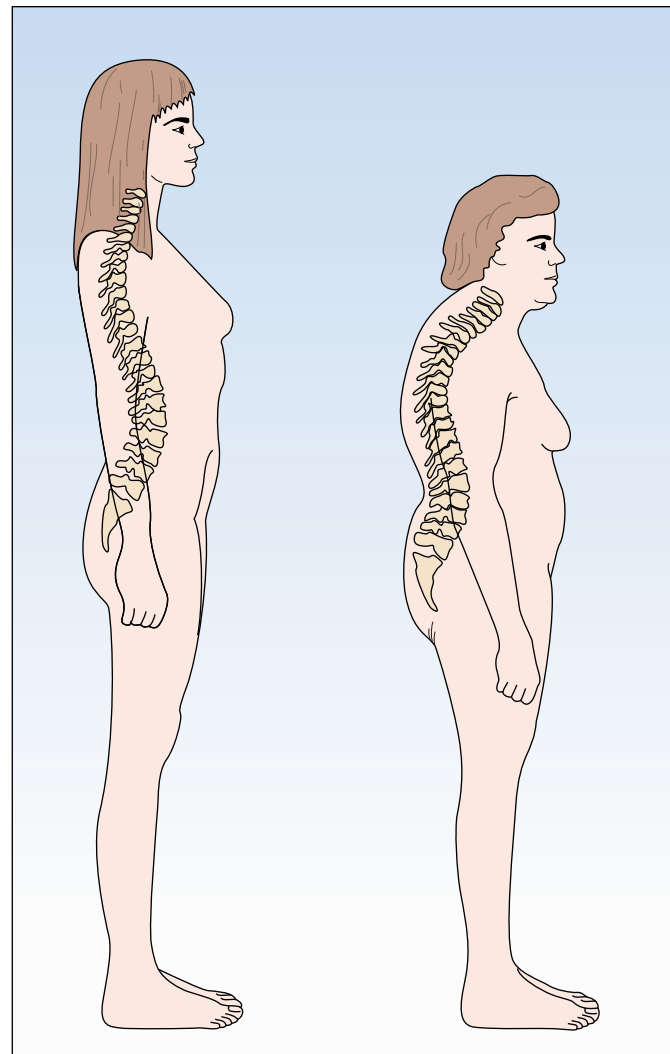
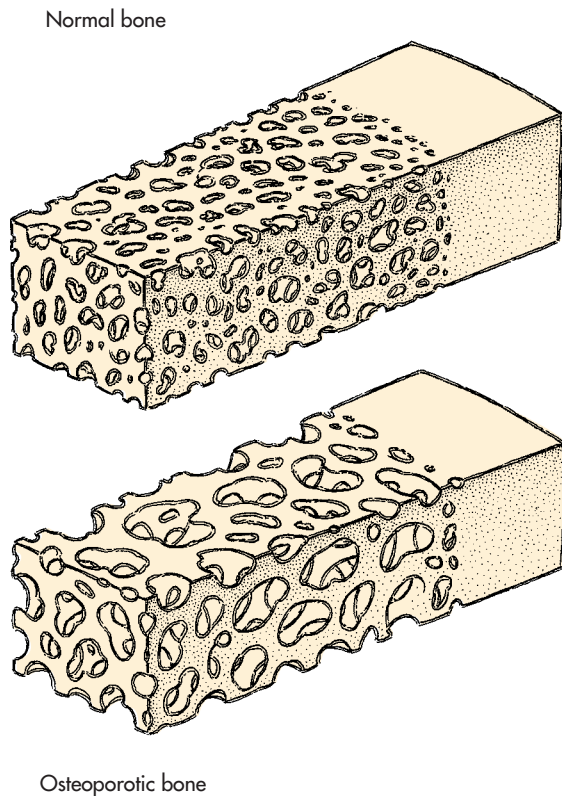


Figure 6.16 A. Types of common fracture. B. AP radiograph of lower leg demonstrating open fractures of the tibia and fibula (arrows). C. Lateral view radiograph demonstrating a closed spiral fracture of the tibia (arrows). (Note: -graph is the preferred suffix used in radiology to refer to an x-ray record.)

Term	Meaning
osteomyelitis os'tē-ō-mī-ĕ-lī'tis	infection of bone and bone marrow causing inflammation
osteoporosis os'tē-ō-pō-rō'sis	condition of decreased bone density and increased porosity, causing bones to become brittle and liable to fracture (porosis = passage) (Fig. 6.17)
spinal curvatures (Fig. 6.18) spī'nāl	
kyphosis kī-fō'sis	abnormal posterior curvature of the thoracic spine (humpback condition)
lordosis lōr-dō'sis	abnormal anterior curvature of the lumbar spine (sway-back condition)
scoliosis skō-lē-ō'sis	abnormal lateral curvature of the spine (S-shaped curve) (Fig. 6.19)



Normal spine in premenopausal woman

Spine compression and loss of height due to osteoporosis in postmenopausal woman

Figure 6.17 Osteoporosis.

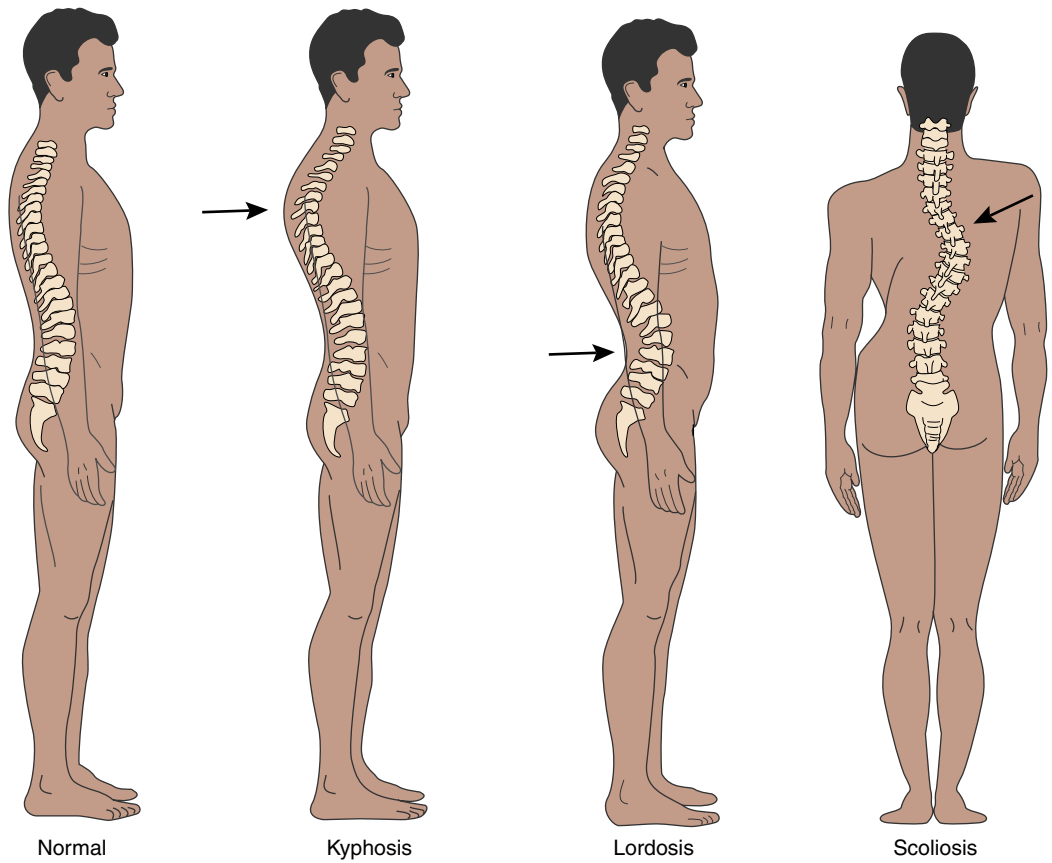


Figure 6.18 Spinal curvatures.



Figure 6.19 AP thoracic spine radiograph demonstrating scoliosis.

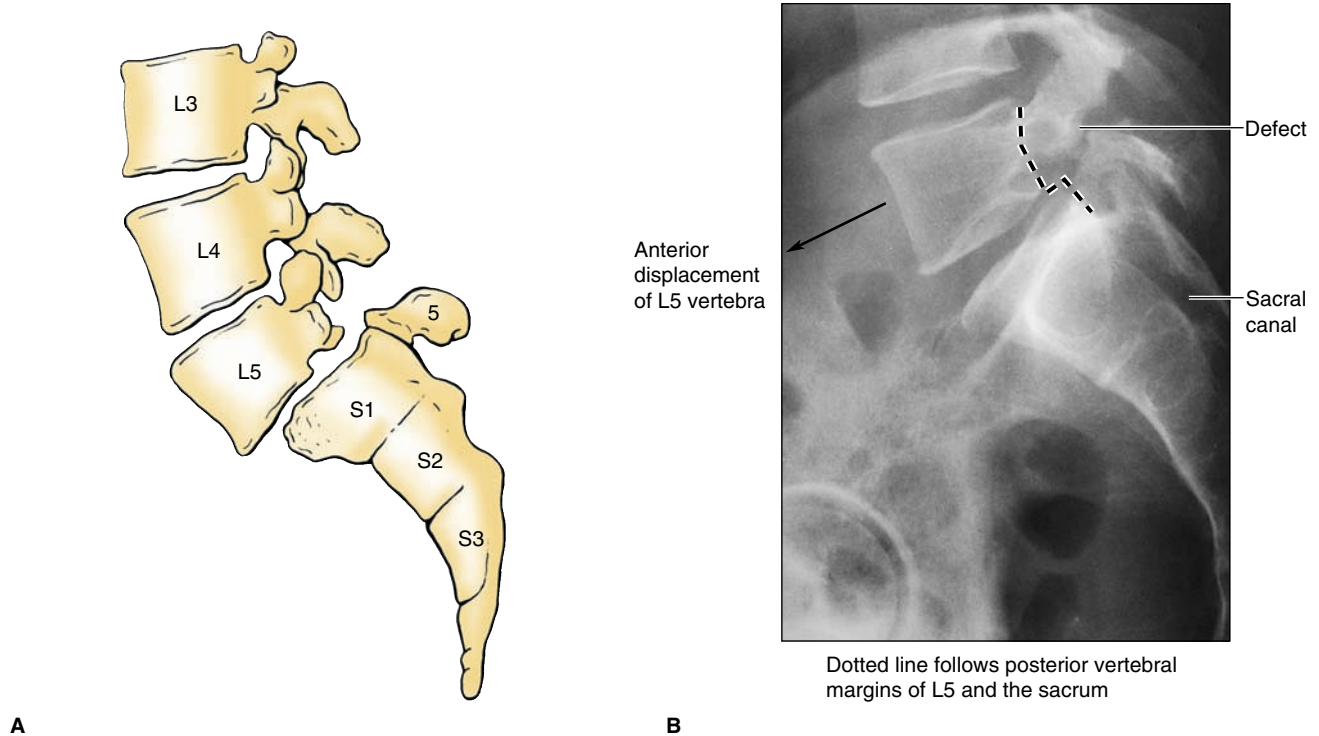


Figure 6.20 Spondylolisthesis. **A.** Drawing illustrates forward slipping of L5 vertebra. **B.** X-ray showing displacement.

Term	Meaning
spondylolisthesis spon/'di-lō-lis-thē'sis	forward slipping of a lumbar vertebra (listhesis = slipping) (Fig 6.20)
spondylosis spon-di-lō'sis	stiff, immobile condition of vertebrae due to joint degeneration
sprain sprān	injury to a ligament caused by joint trauma but without joint dislocation or fracture
subluxation sūb-lūk-sā'shūn	a partial dislocation (luxation = dislocation) (Fig. 6.21)
tendinitis ten-di-nī'tis	inflammation of a tendon
tendonitis ten-dō-nī'tis	

Diagnostic Tests and Procedures

Test or Procedure	Explanation
electromyogram (EMG) ē-lek-trō-mī'ō-gram	a neurodiagnostic graphic record of the electrical activity of muscle at rest and during contraction to diagnose neuromusculoskeletal disorders (e.g., muscular dystrophy); usually performed by a neurologist

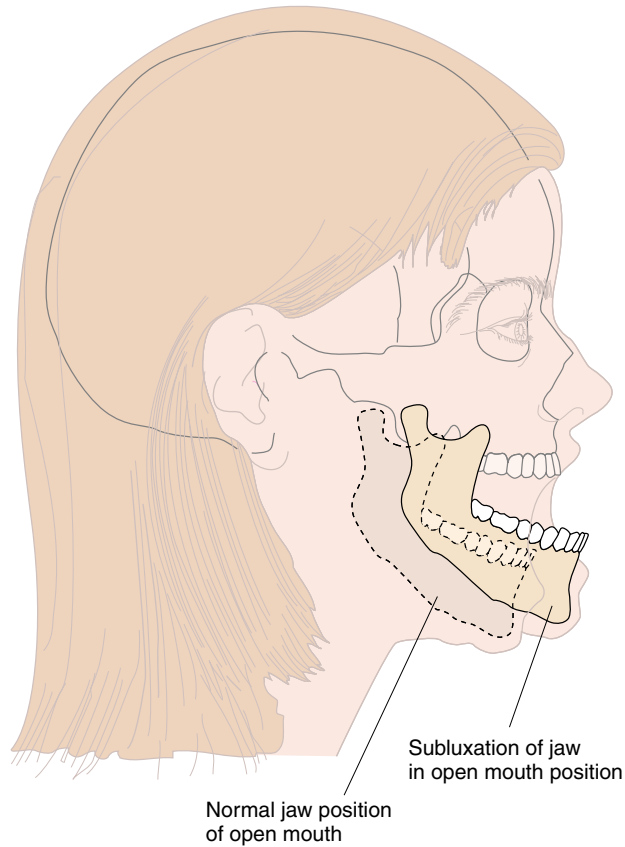


Figure 6.21 Subluxation.

Test or Procedure	Explanation
magnetic resonance imaging (MRI) măg-nět'ik rez'ō-nans im'ă-jing	a nonionizing imaging technique using magnetic fields and radiofrequency waves to visualize anatomical structures—useful in orthopedics to detect joint, tendon, and vertebral disk disorders (see MRI of spine in Fig. 6.4 and MRI of knee in Chapter 4, Fig. 4.17A)
nuclear medicine nū'klē-er	ionizing imaging technique using radioactive isotopes
radionuclide organ imaging rā'dē-ō-nū'klīd	
bone scan	radionuclide image of bone tissue to detect tumor, malignancy, etc. (see whole-body bone scan in Chapter 4, Fig. 4.16B)
radiography (x-ray) rā'dē-og'rā-fē	x-ray imaging; an ionizing technique commonly used in orthopedics to visualize the extremities, ribs, back, shoulders, joints, etc. (see Fig. 6.19 and first radiograph in Chapter 4, Fig. 4.14)
arthrogram ar'thrō-gram	an x-ray of a joint taken after injection of a contrast medium
diskogram dis'kō-gram	an x-ray of an intervertebral disk after injection of a contrast medium



X-RAYS.

Wilhelm
Roentgen

discovered x-rays in 1895. He used the expression rays for the sake of brevity and named them x-rays to distinguish them from others of the same name. The first x-ray image was made of Roentgen's wife's hand.

Test or Procedure	Explanation
dual-energy x-ray absorptiometry (DEXA) ab-sōrp'tom'ě-trē	an x-ray scan that measures bone mineral density of the spine and extremities to diagnose osteoporosis, determine fracture risk, and monitor treatment; classifications of bone mass include normal, osteopenic, or osteoporotic as indicated by a T score (amount of bone mass of the patient compared to that of a normal young adult)
computed tomography (CT) tō-mog'ră-fē computed axial tomography (CAT)	a specialized x-ray procedure producing a series of cross-sectional images that are processed by a computer into a 2-dimensional or 3-dimensional image (see Fig. 6.3)
sonography sō-nog'ră-fē	ultrasound imaging; a nonionizing technique useful in orthopedics to visualize muscles, ligaments, displacements, and dislocations or to guide a therapeutic intervention such as that performed during arthroscopy

Operative Terms

Term	Meaning
amputation am-pyū-tă'shŭn	partial or complete removal of a limb; AKA, above-knee amputation; BKA, below-knee amputation
arthrocentesis ar'thrō-sen-tē'sis	puncture for aspiration of a joint
arthrodesis ār-thrō-dē'sis	binding or fusing of joint surfaces
arthroplasty ar'thrō-plas-tē	repair or reconstruction of a joint
arthroscopy ar-thros'kā-pē	procedure using an arthroscope to examine, diagnose, and repair a joint from within (Fig. 6.22)
bone grafting	transplantation of a piece of bone from one site to another to repair a skeletal defect
bursectomy ber-sek'tō-mē	excision of a bursa
myoplasty mī'ō-plas-tē	repair of muscle
open reduction, internal fixation (ORIF) of a fracture	internal surgical repair of a fracture by bringing bones back into alignment and fixing them into place, often utilizing plates, screws, pins, etc. (Fig. 6.23)
osteoplasty os'tē-ō-plas-tē	repair of bone

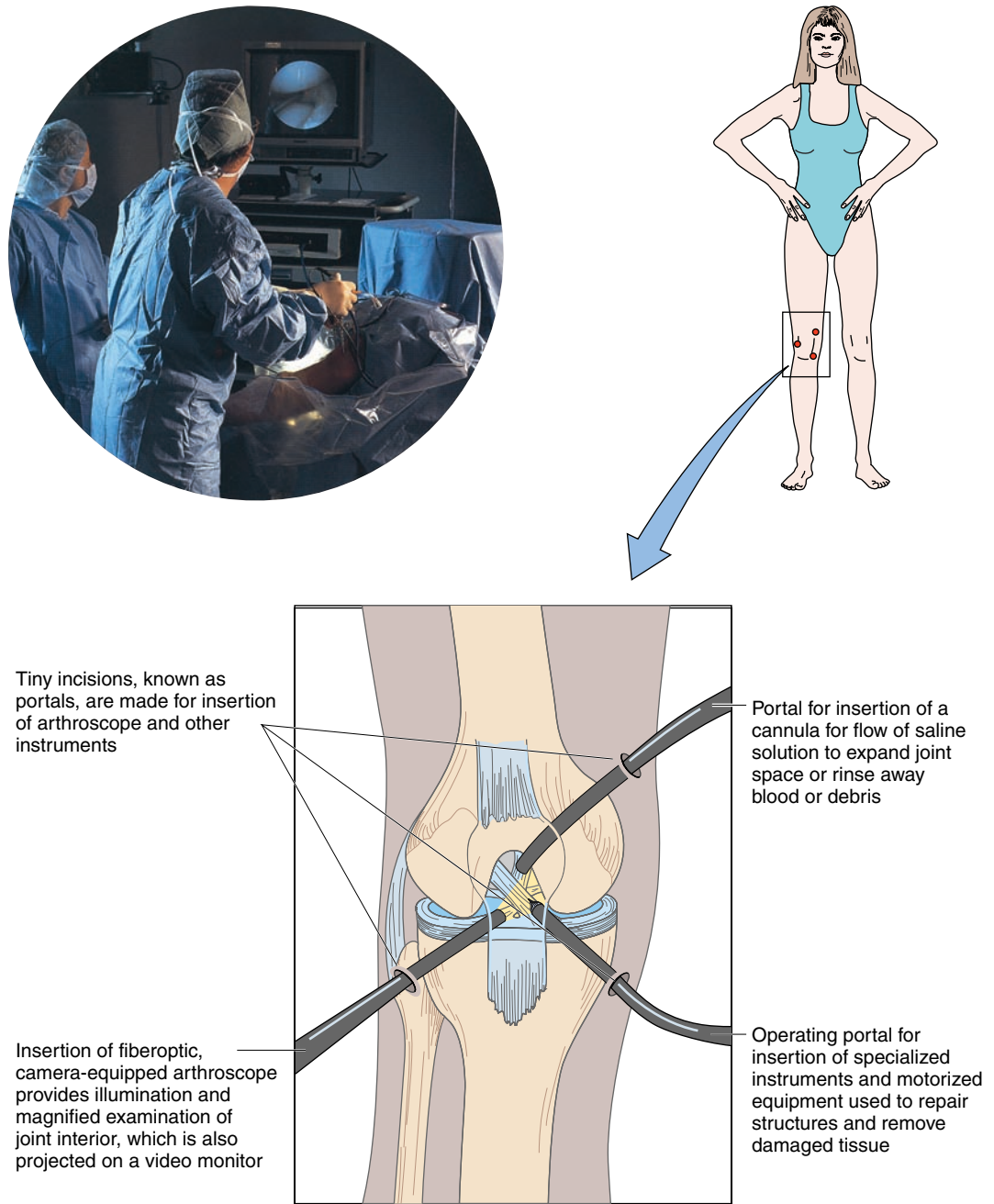


Figure 6.22 Scene of arthroscopic knee surgery with projection of surgeon’s view on a video monitor.

Term	Meaning
osteotomy os-tē-ot’ō-mē	an incision into bone
spondylosyndesis spon’di-lō-sin-dē’sis	spinal fusion (see Chapter 10, Fig. 10.24B)
tenotomy te-not’ō-mē	division by incision of a tendon to repair a deformity caused by shortening of a muscle



Figure 6.23 An x-ray image taken after open reduction, internal fixation (ORIF) of the right ankle (see Medical Record 6.2).

Therapeutic Terms

Term	Meaning
closed reduction, external fixation of a fracture	external manipulation of a fracture to regain alignment along with application of an external device to protect and hold the bone in place while healing
casting	use of a stiff, solid dressing around a limb or other body part to immobilize it during healing (Fig. 6.24)
splinting	use of a rigid device to immobilize or restrain a broken bone or injured body part; provides less support than a cast, but can be adjusted easier to accommodate for swelling from an injury (Fig. 6.25)
traction (Tx) trak'shŭn	application of a pulling force to a fractured bone or dislocated joint to maintain proper position during healing (Fig. 6.26)
closed reduction, percutaneous fixation of a fracture	external manipulation of a fracture to regain alignment, followed by insertion of one or more pins through the skin to maintain position—often includes use of an external device called a <i>fixator</i> to keep the fracture immobilized during healing (Fig. 6.27)



Figure 6.24 Applying a short arm cast.

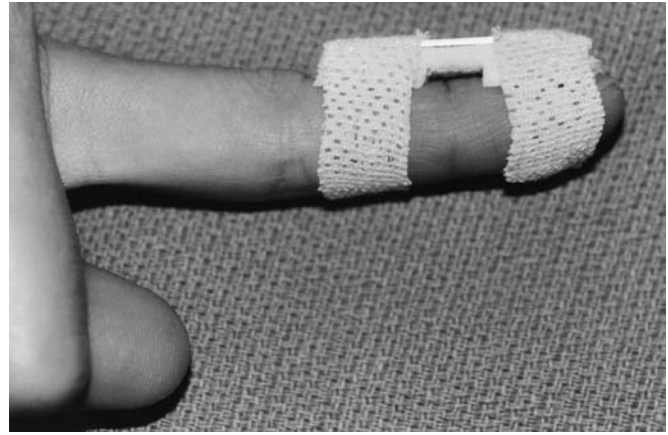


Figure 6.25 Finger splint.



BRACE. A Latin word from *brachia*, the arms, was originally used as a measure of length (the two extended arms), or a pair. The meaning was expanded to the idea of two arms that connect, support, or strengthen, i.e., to brace. Braces in the form of splints were used in ancient Egypt and by most surgeons throughout the centuries.

Term	Meaning
orthosis ōr-thō'sis	use of an orthopedic appliance to maintain a bone's position or provide limb support (e.g., back, knee, or wrist brace) (Fig. 6.28)
physical therapy (PT) fiz'i-kāl ther'ă-pē	treatment to rehabilitate patients disabled by illness or injury, involving many different modalities (methods), such as exercise, hydrotherapy, diathermy, and ultrasound
prosthesis pros'thē-sis	an artificial replacement for a diseased or missing body part such as a hip, joint, or limb (Fig. 6.29)



Figure 6.26 Cervical traction.



Figure 6.27 This radiograph, taken after closed reduction, percutaneous fixation of an open comminuted distal tibia/fibula fracture, shows placement of an external fixator to maintain pin placement during the healing process. The injury was the result of a gunshot to the right lower extremity.



Figure 6.28 Examples of orthoses: back, knee, and wrist.



Figure 6.29 **A.** Prosthetist holding an above-the-knee prosthesis with an array of prostheses on the table in the foreground. **B.** A prosthetic leg makes it possible for an above-the-knee amputee to lead an active life.

COMMON THERAPEUTIC DRUG CLASSIFICATIONS

analgesic an-ăl-jē'zik	a drug that relieves pain
narcotic nar-kot'ik	a potent analgesic that has addictive properties
anti-inflammatory an'tē-in-flam'ă-tō-rē	a drug that reduces inflammation
antipyretic an'tē-pī-ret'ik	a drug that relieves fever
nonsteroidal anti-inflammatory drug (NSAID) non-stēr'oy-dăl	a group of drugs with analgesic, anti-inflammatory, and antipyretic properties (e.g., ibuprofen, aspirin) commonly used to treat arthritis

Summary of Chapter 6 Acronyms/Abbreviations

A anterior	MRI magnetic resonance imaging
AKA above-knee amputation	NSAID nonsteroidal anti-inflammatory drug
AP anterior-posterior	OA osteoarthritis
BKA below-knee amputation	ORIF open reduction, internal fixation
CAT computed axial tomography	P posterior
CT computed tomography	PT physical therapy
DEXA dual-energy x-ray absorptiometry	RA rheumatoid arthritis
DJD degenerative joint disease	ROM range of motion
EMG electromyogram	Tx traction
Fx fracture	x-ray radiography



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

EXAMPLE

hypertrophy

____ / ____ / ____
P R S

hyper/troph/y

P R S

DEFINITION: above or excessive/nourishment or development/condition or process of

1. thoracic

____ / ____
R S

DEFINITION: _____

2. myofascial

____ / ____ / ____
CF R S

DEFINITION: _____

3. arthropathy

____ / ____ / ____
CF R S

DEFINITION: _____

4. spondylolysis

____ / ____
CF S

DEFINITION: _____

5. osteopenia

____ / ____
CF S

DEFINITION: _____

6. achondroplasia

____ / ____ / ____ / ____
P CF R S

DEFINITION: _____

7. ostealgia

____ / ____
R S

DEFINITION: _____

8. polymyositis

_____ / _____ / _____
P R S

DEFINITION: _____

9. leiomyosarcoma

_____ / _____ / _____ / _____
CF CF R S

DEFINITION: _____

10. myelocyte

_____ / _____ / _____
CF R S

DEFINITION: _____

11. costovertebral

_____ / _____ / _____
CF R S

DEFINITION: _____

12. musculotendinous

_____ / _____ / _____
CF R S

DEFINITION: _____

13. orthosis

_____ / _____
R S

DEFINITION: _____

14. kyphoplasty

_____ / _____
CF S

DEFINITION: _____

15. craniectomy

_____ / _____
R S

DEFINITION: _____

16. arthrodesis

_____ / _____
CF S

DEFINITION: _____

17. fibromyalgia

_____ / _____ / _____
CF R S

DEFINITION: _____

18. rhabdomyoma

_____ / _____ / _____
CF R S

DEFINITION: _____

19. sternocostal

_____ / _____ / _____
CF R S

DEFINITION: _____

20. intra-articular

_____ / _____ / _____
P R S

DEFINITION: _____

21. syndactylism

_____ / _____ / _____
P R S

DEFINITION: _____

22. lumbodynia

_____ / _____
CF S

DEFINITION: _____

23. cervicobrachial

_____ / _____ / _____
CF R S

DEFINITION: _____

24. arthroscopy

_____ / _____
CF S

DEFINITION: _____

25. lordosis

_____ / _____
R S

DEFINITION: _____

Complete the medical term by writing the missing part:

26. inter _____ al = pertaining to between the *ribs*

27. _____ algia = *joint* pain

28. myo _____ = *incision* in a muscle

29. spondylosyn _____ = *binding* together of vertebrae

30. _____ myoma = *smooth* muscle tumor
31. osteo _____ = *softening* of bone
32. _____ listhesis = slipping of a *vertebra*
33. arthro _____ = *x-ray* of a joint
34. _____ tomy = incision into *bone*
35. epiphys _____ = *inflammation* of the ends of the long bones
36. _____ al = pertaining to the *neck*
37. bony _____ osis = *dead* bone tissue
38. _____ oma = tumor of *cartilage*
39. arthro _____ = *puncture for aspiration* of a joint
40. osteo _____ = *repair or reconstruction* of bone

For each of the following, circle the combining form that corresponds to the meaning given:

- | | | | |
|------------------------|----------|-----------|-----------|
| 41. cartilage | crani/o | cost/o | chondr/o |
| 42. vertebra | myel/o | spondyl/o | lumb/o |
| 43. bone marrow | my/o | myel/o | muscul/o |
| 44. neck | thorac/o | crani/o | cervic/o |
| 45. joint | oste/o | arthr/o | ankyl/o |
| 46. chest | thorac/o | cervic/o | spondyl/o |
| 47. muscle | my/o | myel/o | lei/o |
| 48. rib | stern/o | chondr/o | cost/o |

Write the correct medical term for each of the following:

49. lateral curvature of the spine _____
50. bone tumor _____
51. grating sound made by movement of broken bones _____
52. synonym for bony necrosis _____
53. plane that divides the body into right and left portions _____
54. application of a pulling force to a fractured or dislocated joint to maintain proper position during healing _____

55. arthritis caused by hyperuricemia _____
56. a partial dislocation _____
57. toward the beginning of a structure _____
58. osteomalacia in children _____
59. physician specializing in x-ray technology _____

Match the following terms related to muscles with their meaning:

- | | |
|-----------------------|---|
| 60. _____ atrophy | a. uncontrolled, stiff, and awkward muscle contractions |
| 61. _____ tremor | b. flabby muscle |
| 62. _____ spasm | c. involuntary muscle contraction |
| 63. _____ rigidity | d. prolonged, continuous muscle contraction |
| 64. _____ spastic | e. stiff muscle |
| 65. _____ hypertrophy | f. rhythmic muscle movement |
| 66. _____ flaccid | g. increase in the size of a muscle |
| 67. _____ tetany | h. shrinking of muscle size |

Briefly describe the difference between the following terms:

68. arthrogram/arthroscopy _____

69. rhabdomyoma/rhabdomyosarcoma _____

70. osteoarthritis/rheumatoid arthritis _____

71. osteomalacia/osteoporosis _____

72. orthosis/prosthesis _____

73. closed reduction, external fixation of a Fx/open reduction, internal fixation of a Fx

74. ankylosis/spondylosis _____

75. leiomyoma/leiomyosarcoma _____

76. lordosis/kyphosis _____

77. spondylolisthesis/spondylosyndesis _____

Match the following positions:

- | | |
|---------------------|--|
| 78. _____ erect | a. lying down, especially in bed |
| 79. _____ supine | b. normal standing |
| 80. _____ decubitus | c. face down and flat |
| 81. _____ prone | d. horizontal recumbent (“on the spine”) |

Define the following abbreviations:

82. CT _____

83. PT _____

84. Tx _____

85. ROM _____

86. Fx _____

87. EMG _____

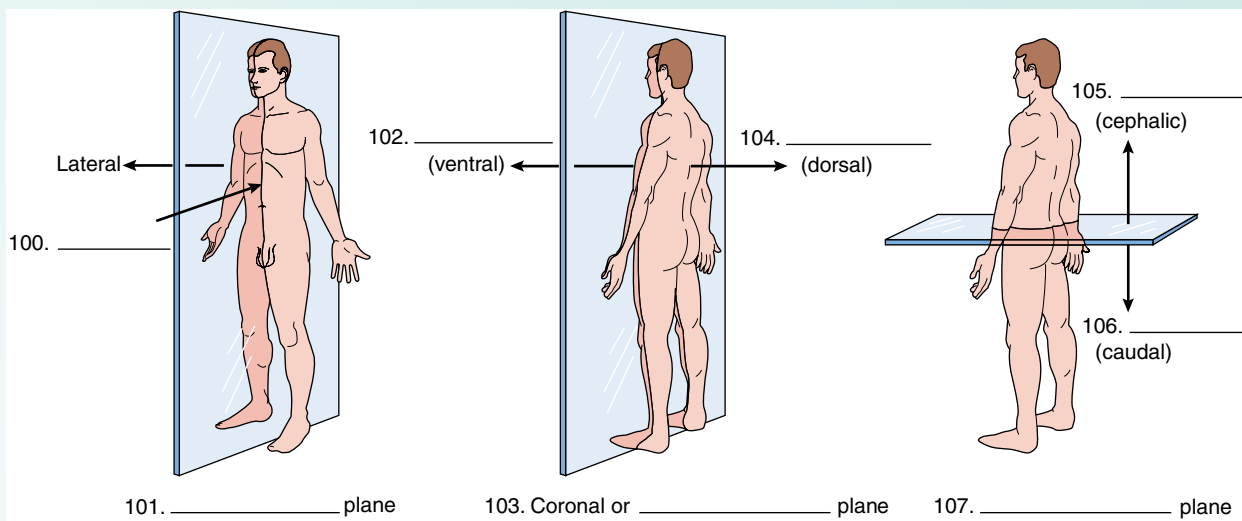
For each of the following, circle the correct spelling of the term:

- | | | |
|-----------------|-------------|-------------|
| 88. spondelosis | spandalosis | spondylosis |
| 89. scholiosis | scoliosis | scoleosis |
| 90. arthrodynia | arthradynia | arthrodenia |
| 91. osteoalgia | ostealgia | osstealgia |
| 92. sagital | saggittal | sagittal |

93. flaccid	flacid	flascid
94. sekquestrum	sequestrom	sequestrum
95. anklylosis	ankylosis	anklosis
96. chondral	chrondral	chondrel
97. dorsaflexion	dorsiflexion	dorsflexion
98. osteoparosis	osteoporosis	osteophorosis
99. rabdomyoma	rrhabdomyoma	rhabdomyoma

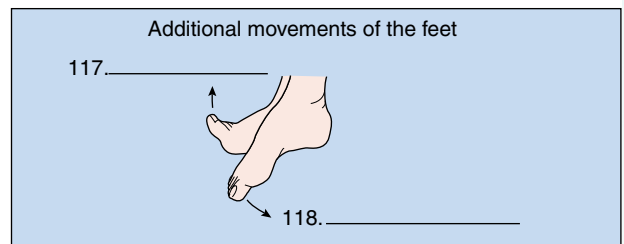
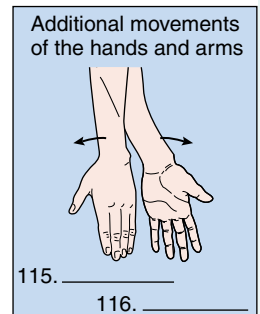
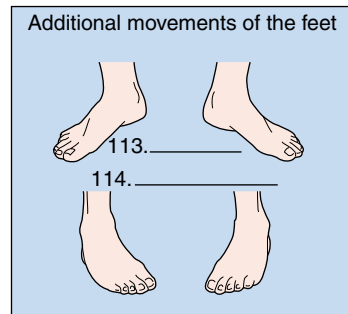
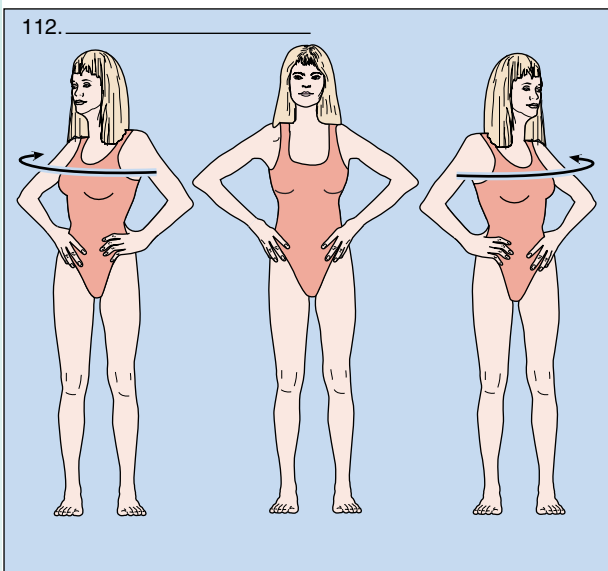
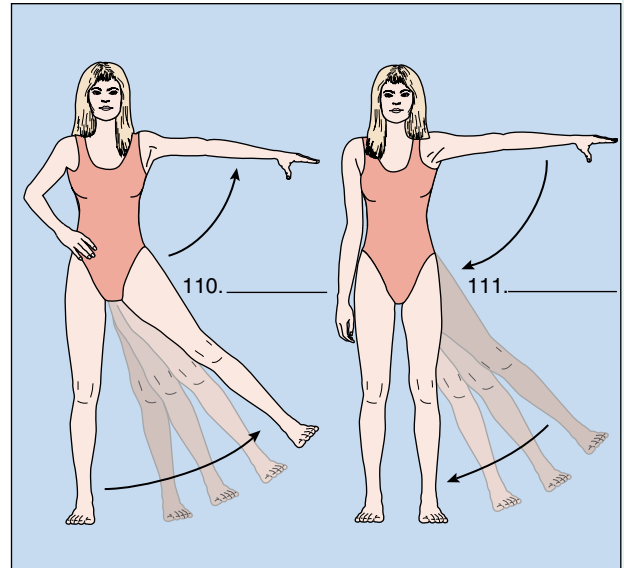
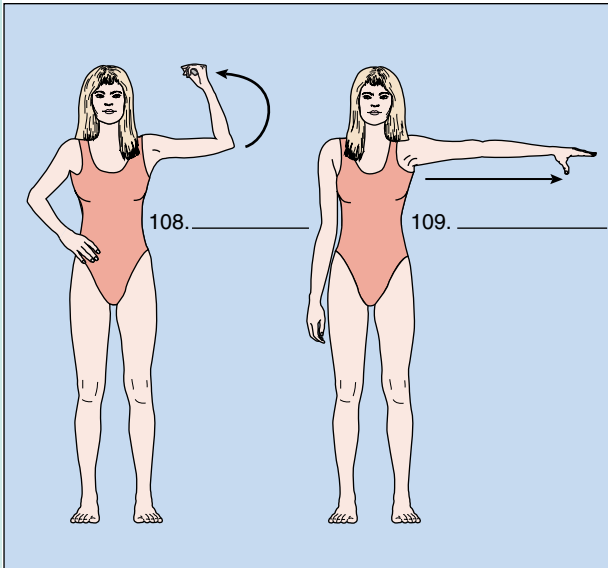
Write in the missing words on the blank lines in the following illustrations of body planes.

100–107.



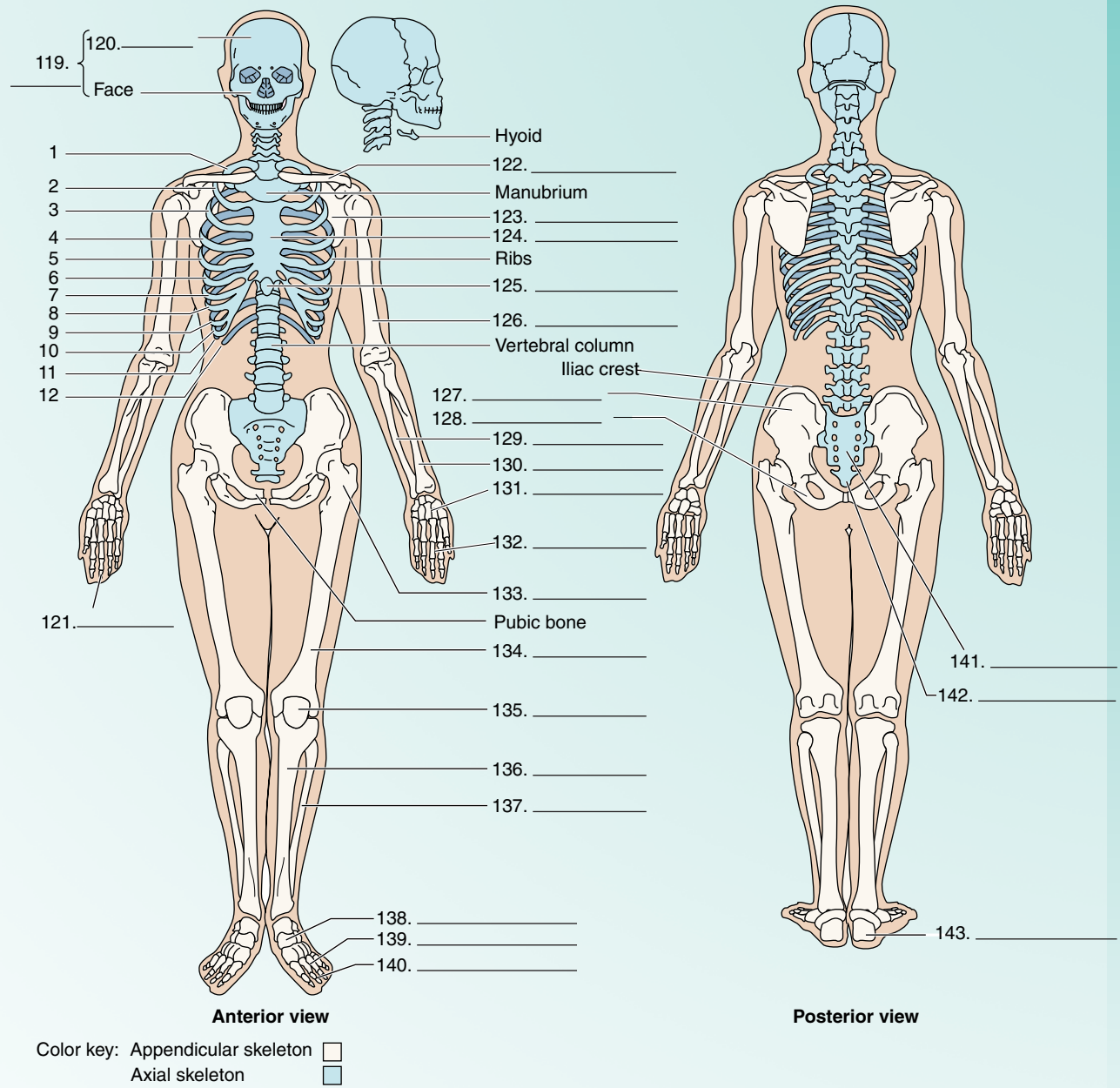
Write in the missing words on the blank lines in the following illustrations of body movements.

108–118.



Write in the missing anatomical terms on the blank lines in the following illustrations.

119–143.



Give the noun that was used to form the following adjectives:

144. orthotic _____

145. hypertrophic _____

146. radial _____

147. kyphotic _____

148. bursal _____

149. dystrophic _____

150. necrotic _____

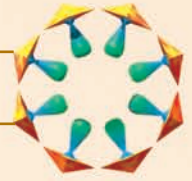
151. osteoporotic _____

152. lordotic _____

153. ulnar _____

154. scoliotic _____

155. prosthetic _____



MEDICAL RECORD ANALYSES

MEDICAL RECORD 6.1

History and Physical Examination

CC: “attacks” of right knee discomfort and instability

HPI: This 19 y/o ♂ presents with “attacks” of right knee pain and instability. Three years ago, while playing basketball, he turned sharply and felt his kneecap pop in and out. It was acutely swollen and painful and required manipulation to reduce it. He had a course of PT and did reasonably well for a few months until resuming athletic activities. Since then, he has had recurrent episodes of the knee slipping in and out, all related to twisting and turning while surfing or playing basketball. His primary complaint is the episodic discomfort and the inability to trust the knee. He is asymptomatic at this time.

PMH: NKDA. Hx of right ankle Fx in 20xx. Meds: none. Operations none.

SH: alcohol rarely used. FH: Father, age 49, Mother, age 43, both L&W.

ROS: noncontributory

PE: The patient is a cooperative male in NAD.

VS: T 97.2° F., P 64, R 14, BP 118/66

HEENT: WNL. Neck: supple, no tenderness, full ROM, no adenopathy.

Lungs, heart, abdomen: WNL. Back: no tenderness or deformity.

Extremities: unremarkable except for involved knee. Knee ROM is 0–45° equally.

There is no parapatellar tenderness.

Neurologic: Negative.

Radiographs show subluxation of the right knee.

IMP: RECURRENT RIGHT KNEE PATELLAR INSTABILITY

RECOMMENDATION: Patelloplasty is being discussed, and the risks and benefits of the procedure have been explained. The patient will return with his parents for further consultation before deciding whether to proceed with treatment.

1. Which describes the patient’s symptoms at the time of the initial injury?
 - a. severe pain over a short course
 - b. pain that comes and goes
 - c. pain that progressively gets worse
 - d. pain that develops slowly over time
 - e. no pain

2. What treatment was provided 3 years ago?
 - a. puncture for aspiration of a joint
 - b. transplantation of a piece of bone from one site to another
 - c. examination of a joint from within
 - d. physical rehabilitation including exercise
 - e. binding or fusing joint surfaces

3. Which best describes the patient's symptoms at the time of this visit?
 - a. severe pain
 - b. moderate pain
 - c. progressive pain
 - d. mild pain
 - e. no pain

4. Describe the orthopedic condition noted in the past history:
 - a. forward slipping of a vertebra
 - b. broken bone
 - c. arthritis
 - d. bone pain
 - e. dislocation

5. What does full ROM indicate?
 - a. swelling
 - b. spasm
 - c. inflammation
 - d. bruising
 - e. mobility

6. What did the radiographs indicate?
 - a. no radiographs were mentioned
 - b. patellar instability
 - c. partial dislocation
 - d. inflammation
 - e. joint stiffness

7. What treatment did the physician recommend?
 - a. surgical reconstruction of the knee cap
 - b. physical therapy
 - c. surgical repair of bone
 - d. excision of the patella
 - e. examination and repair of a joint from within using an endoscope

MEDICAL RECORD 6.2

As Alice Toohey was playing with her young granddaughter, she stepped on a toy dump truck and fell down her porch steps, wrenching her ankle violently. Because of the sharp pain and immediate swelling, Ms. Toohey was taken immediately to the hospital. After being seen by the emergency room physician, she was admitted and scheduled for surgery.

Directions

Read Medical Record 6.2 for Alice Toohey (page 189) and answer the following questions. This record is the operative report dictated by the surgeon, Dr. Ricardo Rodriguez, immediately after the operation and processed by a medical transcriptionist.

QUESTIONS ABOUT MEDICAL RECORD 6.2

Write your answers in the spaces provided.

1. Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

malleolus _____

oblique _____

sterile _____

2. In your own words, not using medical terminology, briefly describe the preoperative diagnosis for Ms. Toohey.

3. Put the following operative steps in correct order by numbering them 1 to 10:

- ___ x-ray of the screws that were too long
- ___ incision on the outer side of the ankle
- ___ plate placed onto the fibula
- ___ sewing the incisions
- ___ x-ray of satisfactory screw position
- ___ towel clip positioned
- ___ removal of medial hematoma
- ___ removal of lateral hematoma
- ___ placement of a screw into the lower tibia
- ___ incision on the inner side of the right ankle

4. In this operation, the surgeon redid one step after using a diagnostic procedure to check whether that step was as effective as possible. In your own words, explain what Dr. Rodriguez changed and why.

5. Describe the fracture line.

6. When Dr. Rodriguez examined the ankle after making the first incision, he found a problem he could not and did not repair. In your own words, what had been destroyed in Ms. Toohey's injury?

7. Which of the following actions did *not* occur in this operation?

- a. washing the wound with antibiotic
- b. taping the fracture line
- c. drilling holes in the bone
- d. stapling the skin closed

8. Describe Ms. Toohey's condition when transferred to PAR after the operation.

CENTRAL MEDICAL CENTER

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OPERATIVE REPORT

PREOPERATIVE DIAGNOSIS: Trimalleolar fracture, right ankle/fracture dislocation.

POSTOPERATIVE DIAGNOSIS: Trimalleolar fracture, right ankle/fracture dislocation.

OPERATION PERFORMED: Open reduction and internal fixation of medial malleolus and lateral malleolus, right ankle.

ANESTHESIOLOGIST: K. Teglam, M.D.

ANESTHESIA: General.

DESCRIPTION OF OPERATION: After successful general anesthesia, the right lower extremity was prepped and draped in a sterile fashion. A pneumatic tourniquet was used in the case at 300 mm Hg (mercury) for 51 minutes. The medial side was opened first; the skin was incised, and this was carried down through the subcutaneous tissue down to the periosteum which was incised enough at the fracture site for visualization of a large transverse medial malleolar fracture. A hematoma was evacuated by curettage and irrigation. Unfortunately, there was some debris within the joint which was articular cartilage destruction and damage on the talus.

Attention was then directed laterally where an incision was made and carried through the skin and subcutaneous tissue. The fracture was brought into full view very easily. The fracture was long and oblique. This was curetted of hematoma and irrigated, and using a bone clamp, it was clamped in a reduced position. A 6-hole semitubular fibular-type plate was then bent to position and placed onto the fibula; and after predrilling, premeasuring, and pretapping, six cortical 3.5 mm diameter screws were used to hold the plate to the fractured fibula.

Attention was then directed medially. The fracture was reduced and held in place with a towel clip, and a 60 mm long malleolar screw was then inserted into the fragment into the distal tibia. X-rays revealed that three of the screws laterally were too long, and these were changed. The medial malleolus screw was also tightened down further. Repeat film revealed very satisfactory position of all the screws. The posterior malleolar fragment was felt to be adequately positioned. All the wounds were then irrigated with goodly amounts of antibiotic solution. Vicryl sutures, 0 and 2-0, were used to close the subcutaneous tissue on both sides; and staples were used for the skin. A bulky Jones dressing was applied with splints anteriorly and posteriorly.

The patient tolerated the procedure well and was transferred to the recovery room with stable vital signs.



R. Rodriguez, M.D.

RR:mb

D: 10/19/20xx

T: 10/20/20xx

OPERATIVE REPORT

PT. NAME: TOOHEY, ALICE M.
 ID NO: IP-236701
 ROOM NO: 729
 ATT. PHYS: R. RODRIGUEZ, M.D.

MEDICAL RECORD 6.3

Jay Dorn, a retired construction worker, has had intermittent back pain for the last 2 months. When he began also having shooting pains in his legs, he went to his doctor at Central Medical Center. After a physical examination, Mr. Dorn underwent a series of back x-rays.

Directions

Read Medical Record 6.3 for Jay Dorn (page 191) and answer the following questions. This record is the radiographic report dictated by Dr. Mary Volz, the radiographer, after studying Mr. Dorn's x-rays and later transcribed for the record.

QUESTIONS ABOUT MEDICAL RECORD 6.3

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

eburnation _____

lipping _____

discogenic _____

- What phrase in the report indicates that more than one x-ray was taken?

Does the report state how many x-rays were taken?

_____ no _____ yes If yes, how many?

- In your own words, not using medical terminology, describe the three diagnoses Dr. Volz makes.

a. _____

b. _____

c. _____

- Not using any abbreviations, explain what test Dr. Volz says may be useful for Mr. Dorn to have next.

- Which of the following is *not* mentioned in the report as a finding?

a. lateral curvature of the spine

b. forward slipping of a vertebra

c. immobile condition of the spine

d. inflammation of the bone marrow

e. inflammation of both hips

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X-RAY REPORT**LUMBOSACRAL SPINE:**

Multiple views reveal no evidence of fracture. There is slight lumbar spondylosis with slight lipping and minimal bridging. The disc spaces appear maintained except for slight narrowing at L4-L5 and L5-S1. There is also a Grade I spondylolisthesis of L5 on S1 and evidence of spondylolysis at L5 on the left. There is also slight dextroscoliosis in the lumbar region and slight increased lordosis in the lumbosacral region. The bony architecture is unremarkable except for eburnation between the articulating facets at L5-S1. The SI joints appear unremarkable. Incidentally noted are slight osteoarthritic changes involving both hips.

CONCLUSION:

1. Slight lumbar spondylosis with hypertrophic lipping and slight narrowing of the L4-L5 and L5-S1 disc spaces, rule out discogenic disease. If clinically indicated, CT of the lumbosacral spine may prove helpful in further evaluation.
2. Grade I spondylolisthesis of L5 on S1 with evidence of spondylolysis at L5 on the left.
3. Slight dextroscoliosis in the lumbar region and slight increased lordosis in the lumbosacral region.


M. Volz, M.D.

MV:ti

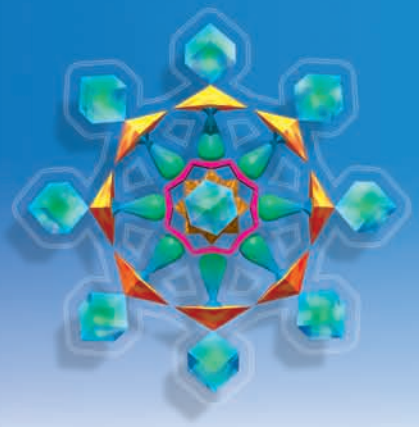
D: 10/19/20xx

T: 10/20/20xx

X-RAY REPORT

PT. NAME: DORN, JAY F.
ID NO: RL-483091
ATT. PHYS: T. LIGHT, M.D.

Cardiovascular System



OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define common combining forms used in relation to the cardiovascular system
- ◆ Identify basic anatomical terms referring to the heart and blood vessels
- ◆ Trace the flow of blood through the heart
- ◆ Define blood pressure and related terms
- ◆ Describe the pathway of electrical conduction in the heart and define related terms
- ◆ Define common symptomatic terms referring to the cardiovascular system
- ◆ Identify common diagnostic terms related to the cardiovascular system
- ◆ List the common diagnostic tests and procedures related to the cardiovascular system
- ◆ Identify common operative terms referring to the cardiovascular system
- ◆ Identify common therapeutic terms including drug classifications related to the cardiovascular system
- ◆ Explain terms and abbreviations used in documenting medical records involving the cardiovascular system

Combining Forms

Combining Form	Meaning	Example
angi/o	vessel	angiogram an'jē-ō-gram
vas/o		vasospasm vā'sō-spazm
vascul/o		vascular vas'ku-lar
aort/o	aorta	aortic ā-ōr'tik
arteri/o	artery	arteriosclerosis ar-tēr'ē'ō'skler-ō'sis
ather/o	fatty (lipid) paste	atheroma ath-er-ō'mā

Combining Form	Meaning	Example
atri/o	atrium	atrioventricular a'trē-ō-ven-trik'yū-lăr
cardi/o	heart	cardiology kar-dē-ol'ō-jē
coron/o	circle or crown	coronary kōr'o-nār-ē
my/o	muscle	myocardial mī-ō-kar'dē-ăl
pector/o	chest	pectoral pek'tō-ral
steth/o		stethoscope steth'ō-skōp
sphygm/o	pulse	sphygmomanometer sfig-mō-mă-nom'ě-ter
thrombo	clot	thrombocyte throm'bō-sīt
ven/o	vein	venous vē'nūs
phleb/o		phlebitis flē-bī'tis
varic/o	swollen, twisted vein	varicosis vār-i-kō'sis
ventricul/o	ventricle (belly or pouch)	ventricular ven-trik'yū-lăr

Cardiovascular System Overview

The cardiovascular system consists of the heart and blood vessels that transport blood throughout the body.

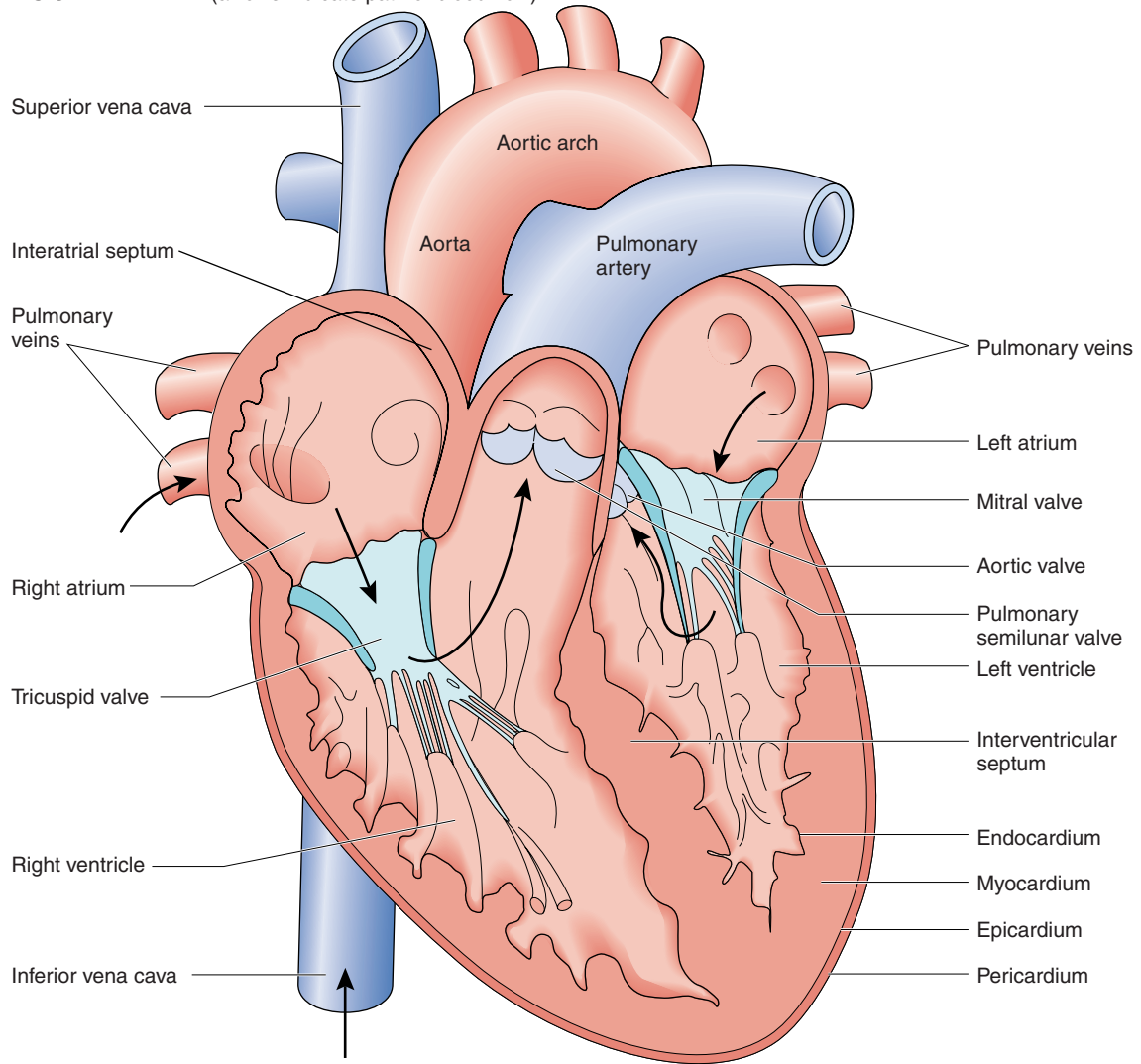
The heart is the muscular organ that pumps blood throughout the body (Fig. 7.1). Its hollow interior has four chambers: the *right atrium* and *left atrium* (upper chambers) and the *right ventricle* and *left ventricle* (lower chambers). A partition, called the *septum*, divides the heart into right and left portions. The atria are separated by the *interatrial septum*, and the ventricles are separated by the *interventricular septum*. The valves of the heart open and close with the heartbeat to maintain the one-way flow of blood through the heart. They include the *tricuspid valve*, the *mitral (bicuspid) valve*, the *pulmonary semilunar valve*, and the *aortic valve*.

There are three layers of the heart: endocardium, myocardium, and epicardium. The *endocardium* is the membrane that lines the interior cavities of the heart; the *myocardium* is the thick, muscular layer; and the *epicardium* is the outer membrane. Surrounding and enclosing the heart is a loose, protective sac called the *pericardium*.

Blood transports essential elements within the body. It is circulated throughout the body via *arteries*, *arterioles*, *capillaries*, *venules*, and *veins*. (Blood is discussed separately in Chapter 8.) Blood flow through the heart is as follows.

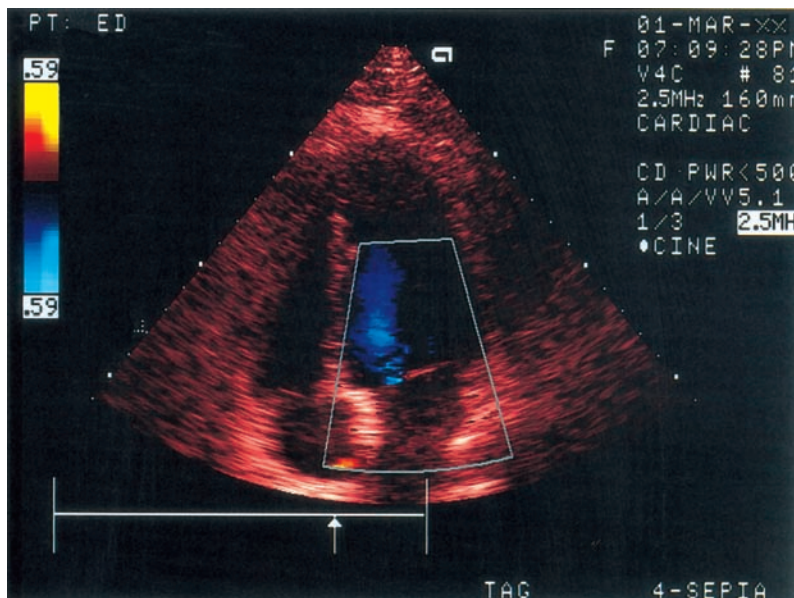
Deoxygenated (depleted of oxygen) blood returning from circulation in the body enters the heart through the *superior vena cava* and *inferior vena cava* into the right atrium. During atrial contraction, the tricuspid valve opens to allow blood to flow into the right ventricle. Contraction of the ventricle pushes blood through the pulmonary

STRUCTURES OF THE HEART (arrows indicate path of blood flow)



ECHOCARDIOGRAM

Normal, two-dimensional, apical four-chamber view



BLOOD CIRCULATION

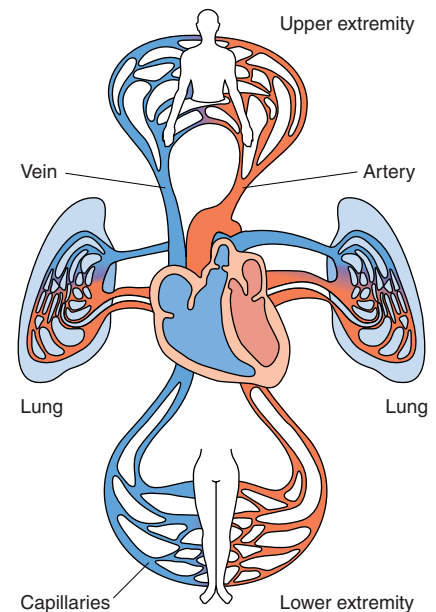


Figure 7.1 The heart and blood circulation.

semilunar valve into the pulmonary artery. The *pulmonary artery* carries the blood through two branches going to the lungs and on through the *pulmonary circulation* (a network of arteries, capillaries, air sacs, and veins in the lung), where it is oxygenated (supplied with oxygen) and gives off carbon dioxide waste. The oxygenated blood returns to the heart via the *pulmonary veins* into the left atrium. With atrial contraction, the mitral valve (also called bicuspid valve) opens to allow blood flow into the left ventricle. Contraction of the left ventricle pushes blood through the aortic valve into the aorta. Blood is then carried to all parts of the body through the *systemic circulation* (arteries, arterioles, capillaries, and veins) to provide transport for oxygen and nutrients. Note that the right side of the heart (right heart) handles deoxygenated blood and the left side of the heart (left heart) handles oxygenated blood.

The heart is the first organ to receive oxygenated blood via the coronary circulation. Branching from the aorta, the right and left coronary arteries divide to distribute blood throughout the entire heart (Fig. 7.2).

Anatomical Terms

Term	Meaning
SEPTA AND LAYERS OF THE HEART	
atrium ā'trē-ŭm	upper right and left chambers of the heart
endocardium en-dō-kar'dē-ŭm	membrane lining the cavities of the heart
epicardium ep-i-kar'dē-ŭm	membrane forming the outer layer of the heart
interatrial septum in-ter-ā'-trē-ăl sep'tŭm	partition between right and left atrium
interventricular septum in-ter-ven-trik'yŭ-lăr sep'tŭm	partition between right and left ventricle
myocardium mī-ō-kar'dē-ŭm	heart muscle
pericardium per-i-kar'dē-ŭm	protective sac enclosing the heart composed of two layers with fluid between
parietal pericardium pā-rī'ē-tāl	outer layer (parietal = pertaining to wall)
pericardial cavity pēr-ī-kar'dē-ăl	fluid-filled cavity between the pericardial layers
visceral pericardium vis'er-ăl	layer closest to the heart (visceral = pertaining to organ)
ventricle ven'tri-kāl	lower right and left chambers of the heart
VALVES OF THE HEART AND VEINS	
heart valves	structures within the heart that open and close with the heartbeat to regulate the one-way flow of blood
aortic valve ā-ōr'tik	heart valve between the left ventricle and the aorta
mitral or bicuspid valve mī'trăl or bī-kŭs'pid	heart valve between the left atrium and left ventricle (cuspis = point)

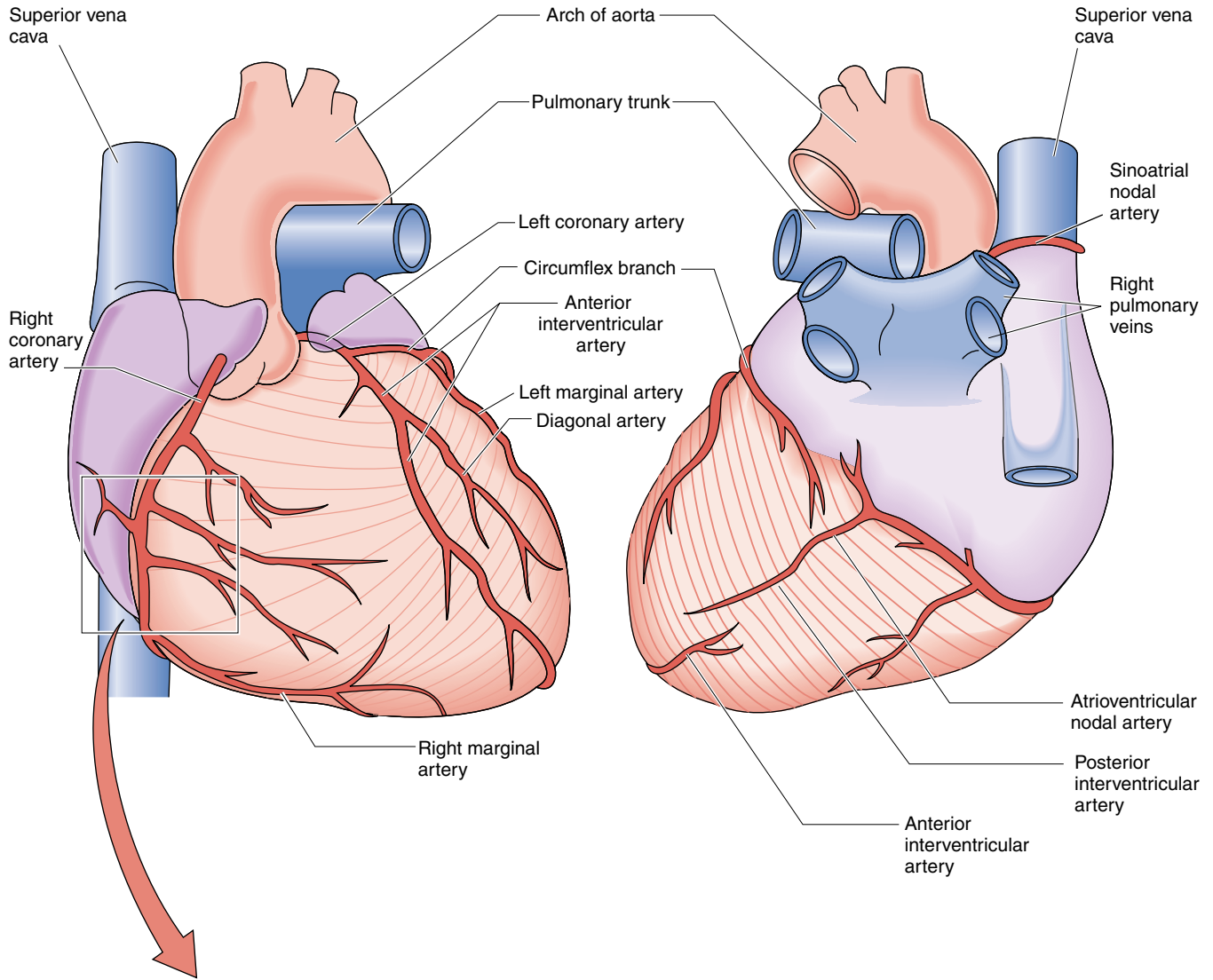


MITRAL. Stems from mitre, the Latin word

referring to a kind of cap or headband worn on the head and tied under the chin, and used to name the headdress of Christian bishops. In medicine, the term mitral is applied to the bicuspid valve of the heart because its two parallel cusps have a shape similar to a bishop's mitre.

ANTERIOR VIEW OF CORONARY ARTERIES

POSTERIOR VIEW OF CORONARY ARTERIES

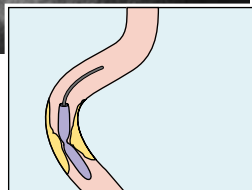
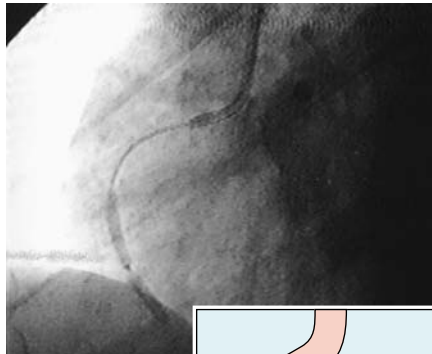
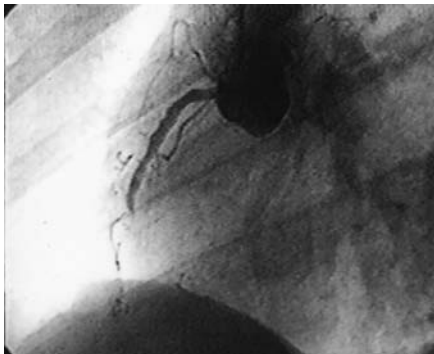


PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY (PTCA)

Predilation angiogram revealing 99% stenosis of the right coronary artery (RCA).

PTCA procedure showing catheter placement and straddling of the balloon at the occluded site.

Post-PTCA angiogram showing successful dilation.



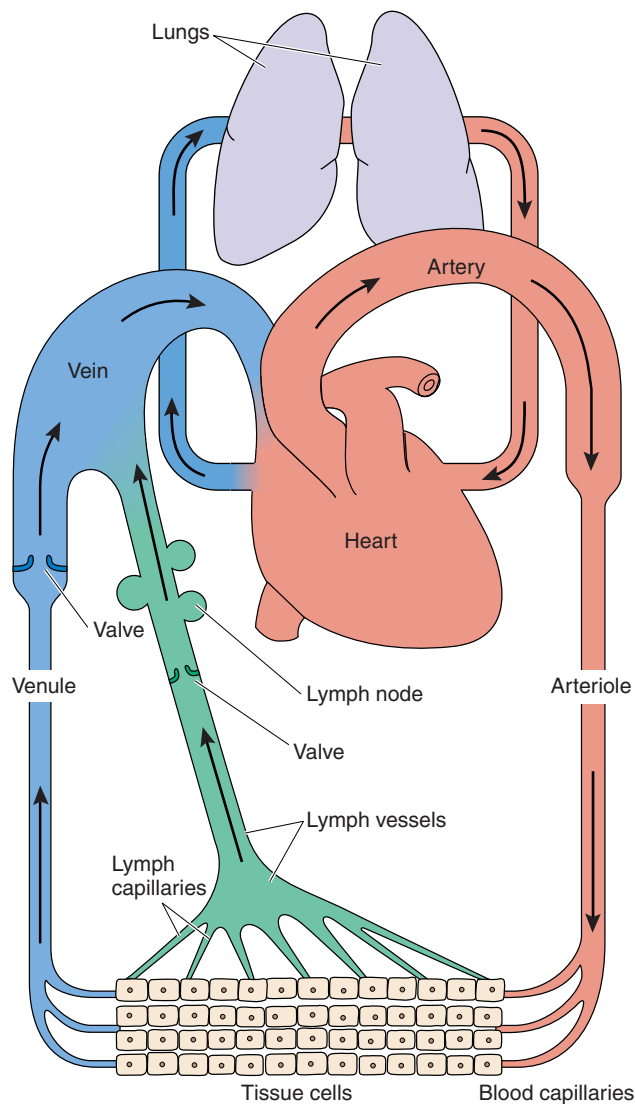
Catheter and wire placement with balloon inflation.

Figure 7.2. Coronary arteries and angiograms illustrating angioplasty.

Term	Meaning
pulmonary semilunar valve pŭl'mō-nār-ē sem-ē-lū'nār	heart valve opening from the right ventricle to the pulmonary artery (luna = moon)
tricuspid valve trī-kŭs'pid	valve between the right atrium and the right ventricle
valves of the veins	valves located at intervals within the lining of veins, especially in the legs, which constrict with muscle action to move the blood returning to the heart

BLOOD VESSELS (FIG. 7.3)

arteries ār'tēr-ēz	vessels that carry blood <i>from</i> the heart to the arterioles (Fig. 7.4)
aorta ā-ōr'tā	large artery that is the main trunk of the arterial system branching from the left ventricle



Deoxygenated blood ■
 Oxygenated blood ■

Figure 7.3 Blood and lymph circulation.

ARTERIAL BLOOD CIRCULATION

Arteries (carry blood from the heart)

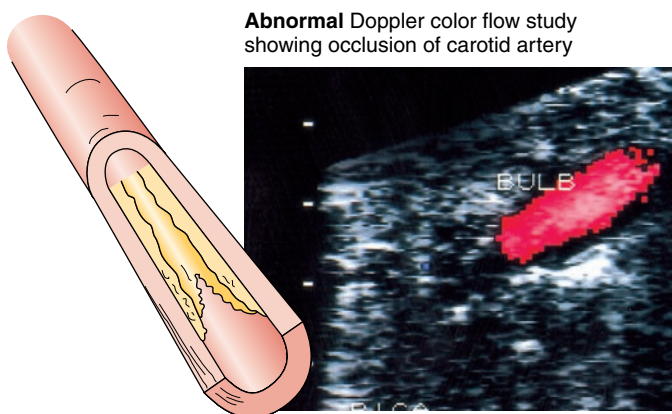
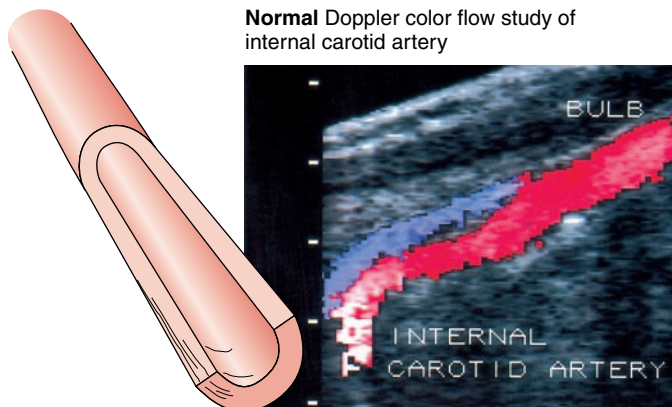
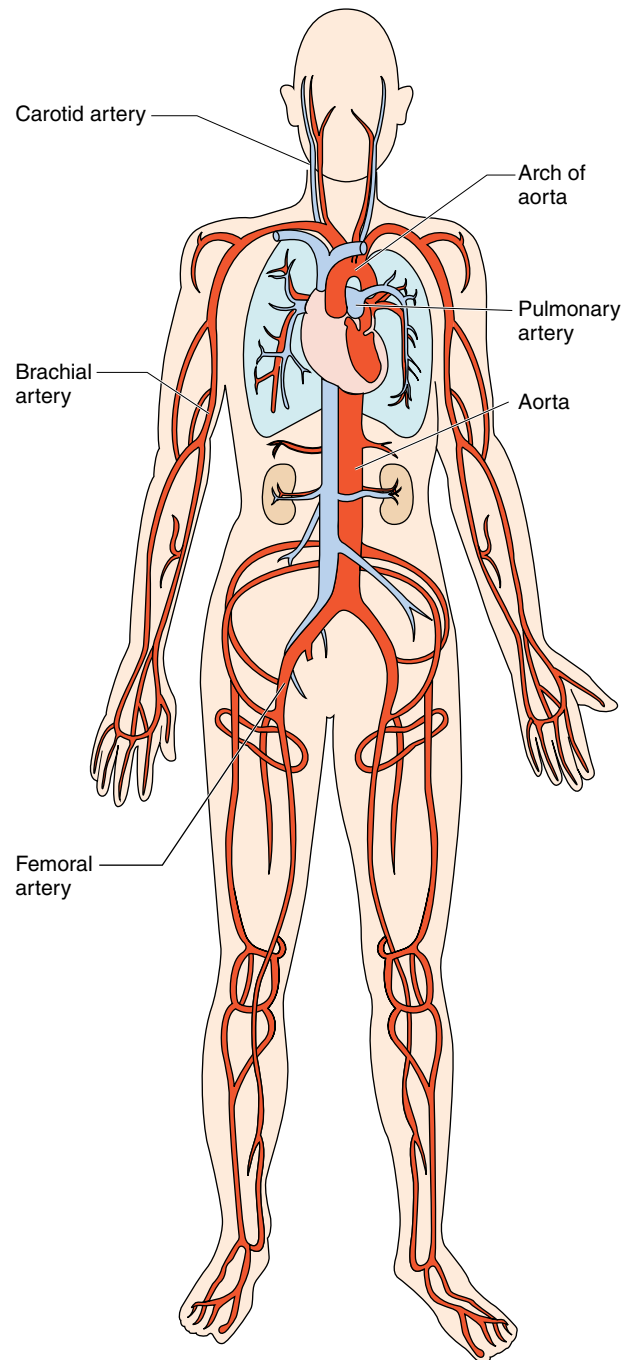
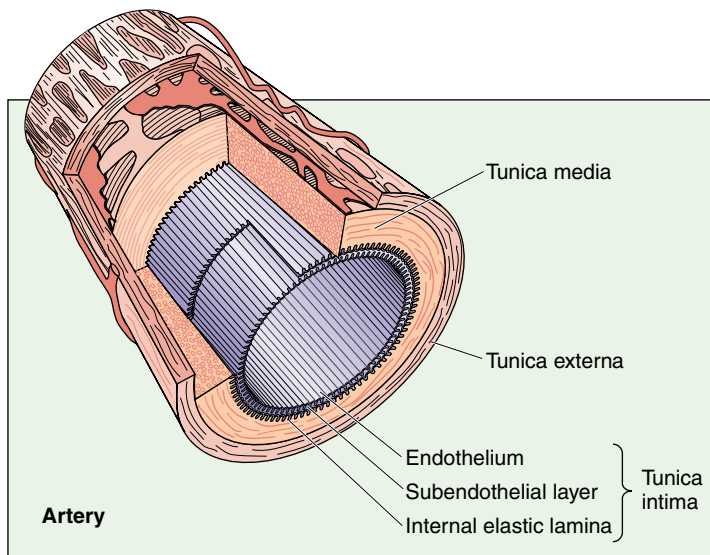


Figure 7.4 Arteries.

Term	Meaning
arterioles ār-tēr'ē-ōlz	small vessels that receive blood from the arteries
capillaries kap'i-lār-ēz	tiny vessels that join arterioles and venules
venules ven'yūlz	small vessels that gather blood from the capillaries into the veins
veins vānz	vessels that carry blood to the heart from the venules (Fig. 7.5)
CIRCULATION	
systemic circulation sis-tēm'ik	circulation of blood throughout the body through arteries, arterioles, capillaries, and veins to deliver oxygen and nutrients to body tissues
coronary circulation kōr'o-nār-ē	circulation of blood through the coronary blood vessels to deliver oxygen and nutrients to the heart muscle tissue
pulmonary circulation pūl'mō-nār-ē	circulation of blood from the pulmonary artery through the vessels in the lungs and back to the heart via the pulmonary vein, providing for the exchange of gases

**CAPILLARY.**

A term formed from the Latin word *capillus*, a hair of the head (from *caput*, meaning head, and *pilus*, a hair), hence a very fine tube. Leonardo da Vinci was the first to make observations on capillary phenomena and spoke of capillary veins.

Blood Pressure

Blood pressure is the force exerted by circulating blood on the walls of the arteries, veins, and heart chambers. This pressure is determined by the volume of blood, the space within the arteries and arterioles, and the force of heart contractions (Fig. 7.6).

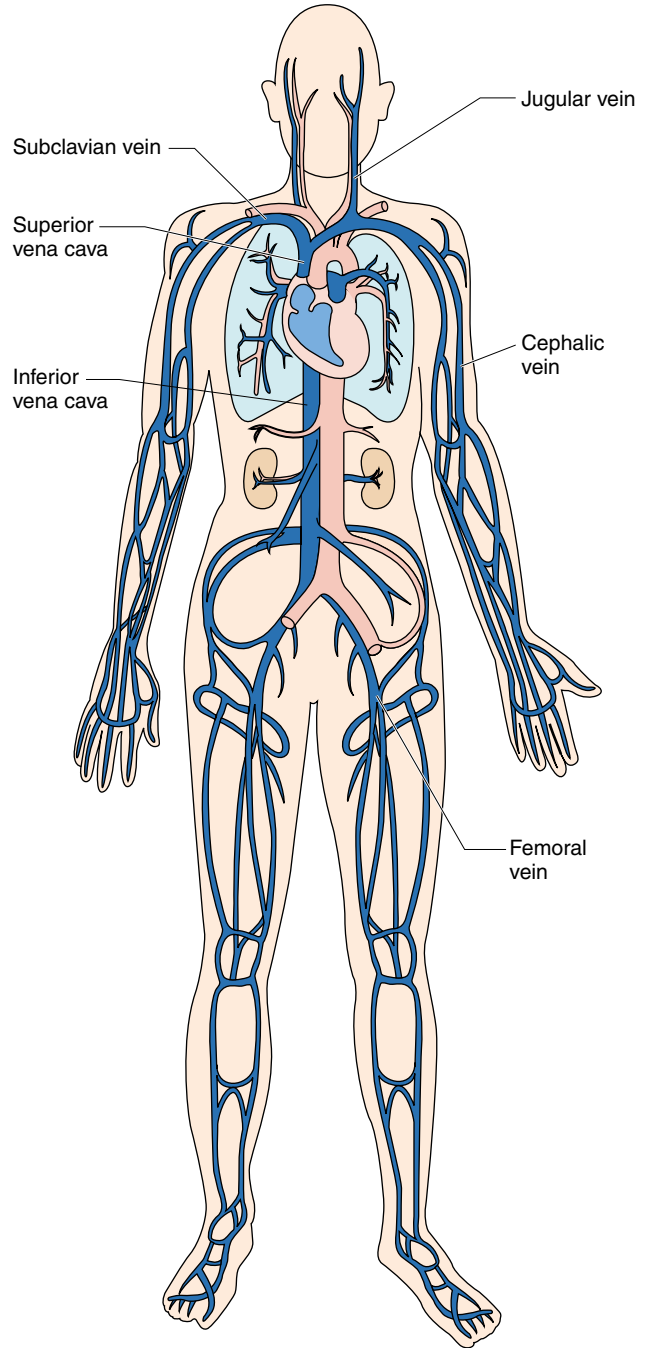
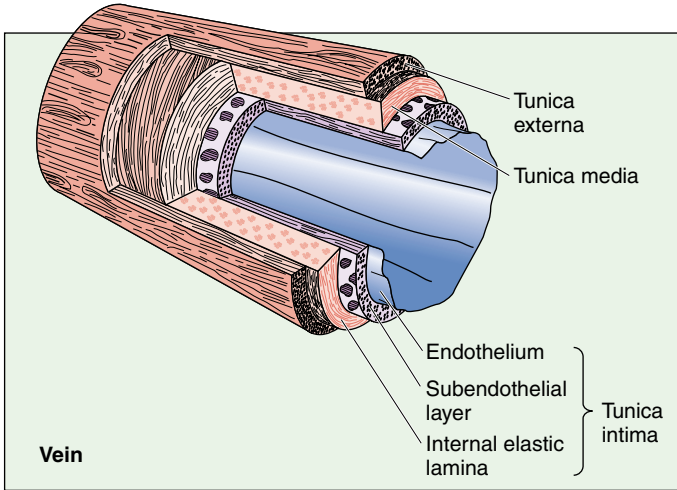
Blood pressure (BP) technique involves measuring pressure within the walls of an artery during the period of contraction of the heart, or *systole*, and during the period of relaxation of the heart, or *diastole*. When blood pressure is written, the systolic measurement is recorded first, followed by a slash, then the diastolic measurement (e.g., BP 120/80 means that the systolic reading is 120 and the diastolic reading is 80).

Blood Pressure Terms

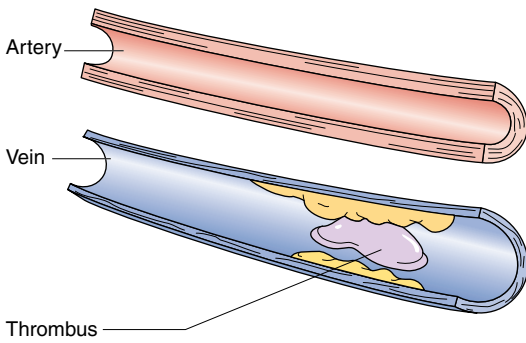
Term	Meaning
diastole dī-as'tō-lē	to expand; period in the cardiac cycle when blood enters the relaxed ventricles from the atria
systole sis'tō-lē	to contract; period in the cardiac cycle when the heart is in contraction and blood is ejected through the aorta and pulmonary artery
normotension nōr-mō-ten'shŭn	normal blood pressure
hypotension hī'pō-ten'shŭn	low blood pressure
hypertension hī'per-ten'shŭn	high blood pressure

VENOUS CIRCULATION

Veins (carry blood to the heart)



FEMORAL THROMBUS



Color flow Doppler showing femoral vein thrombus

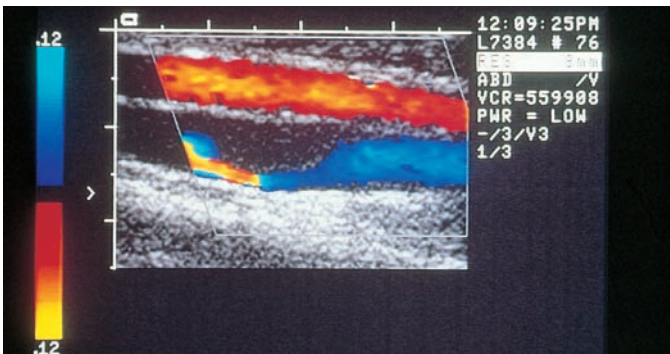


Figure 7.5 Veins.



Figure 7.6 Blood pressure determination.

Cardiac Conduction

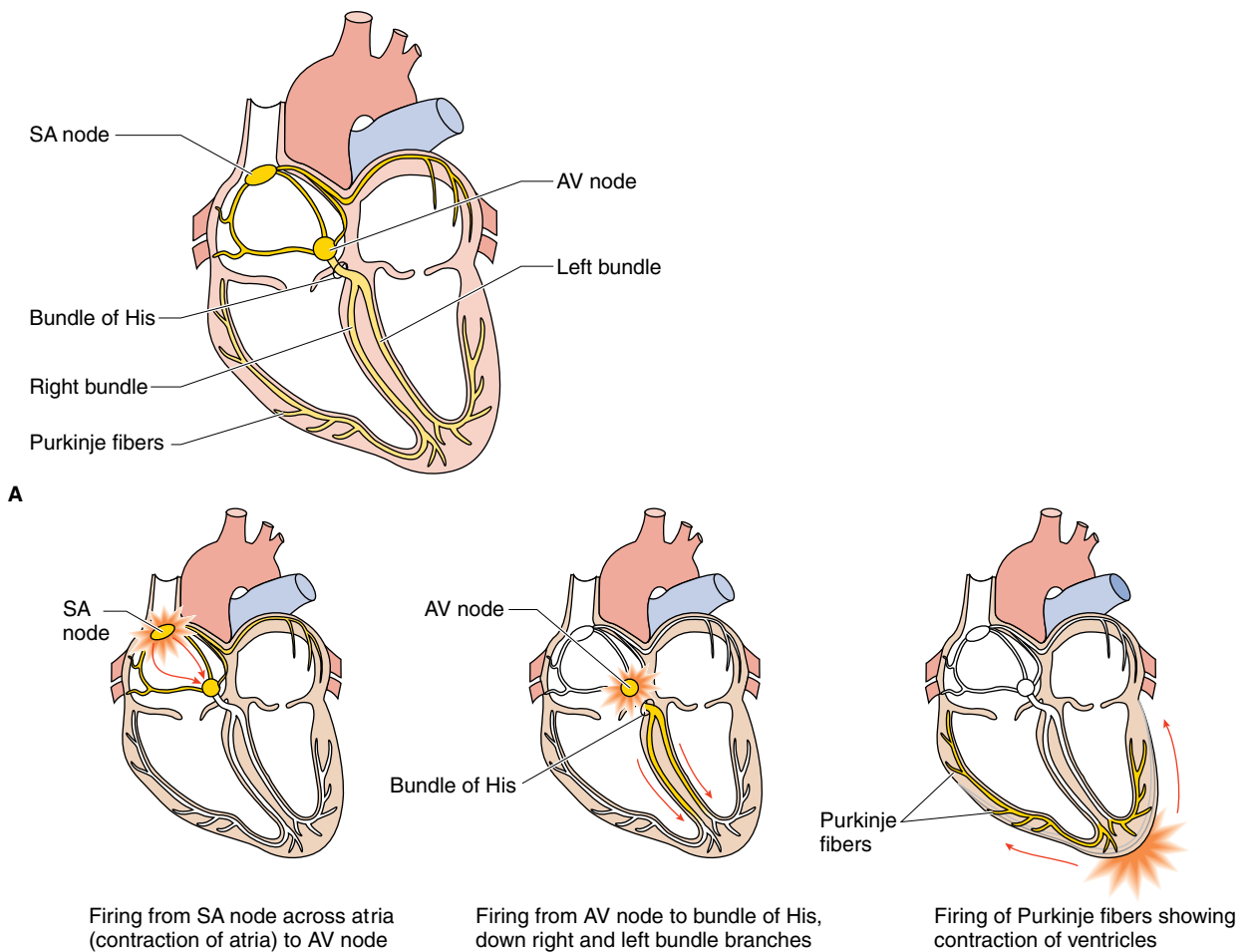
Movement of blood through the heart is made possible by cardiac conduction. The *cardiac cycle* is the repeated action of the heart during which an electrical impulse is conducted from the sinoatrial (SA) node (the pacemaker of the heart) to the atrioventricular (AV) node, to the bundle of His, to the left and right bundle branches, and to the Purkinje fibers, causing contraction of the heart and circulation of the blood (Fig. 7.7).

Initiated by the SA node, each myocardial cell responds to stimulation conducted by electrical impulses, changing from a resting state (polarized) to a state of contraction (depolarized) and then returning to a resting state by recharging (repolarizing); it is then ready again to begin the continuous cycle of contraction and relaxation of the myocardium that pumps blood through the heart.

Cardiac Conduction Terms

Term	Meaning
sinoatrial node (SA node) sī'nō-ā'trē-āl nōd	the pacemaker; highly specialized neurological tissue, embedded in the wall of the right atrium, responsible for initiating electrical conduction of the heartbeat, causing the atria to contract and firing conduction of impulses to the AV node
atrioventricular node (AV node) ā'trē-ō-ven-trik'yū-lār	neurological tissue in the center of the heart that receives and amplifies the conduction of impulses from the SA node to the bundle of His
bundle of His bŭn'dl	neurological fibers, extending from the AV node to the right and left bundle branches, that fire the impulse from the AV node to the Purkinje fibers

Term	Meaning
Purkinje fibers (network) pŭr-kin'jē fī'berz	fibers in the ventricles that transmit impulses to the right and left ventricles, causing them to contract
polarization pō'lār-i-zā'shŭn	resting; resting state of a myocardial cell
depolarization dē-pō-lār-i-zā'shŭn	change of a myocardial cell from a polarized (resting) state to a state of contraction (de = not; polarization = resting)
repolarization rē-pō-lār-i-zā'shŭn	recharging of the myocardial cell from a contracted state back to a resting state (re = again; polarization = resting)
normal sinus rhythm (NSR)	regular rhythm of the heart cycle stimulated by the SA node (average rate of 60 to 100 beats/minute) (see Figs. 7.7 and 7.11)



B
Figure 7.7 Cardiac conduction. **A.** Anatomy. **B.** Path of conduction.

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC TERMS (FIG. 7.8)	
arteriosclerosis ar-tēr'ē'ō'skler-ō'sis	thickening, loss of elasticity, and calcification (hardening) of the arterial walls
atherosclerosis ath'er-ō-skler-ō'sis	buildup of fatty substances within the walls of arteries
atheromatous plaque ath-er-ō'mā-tūs plak	a swollen area within the lining of an artery caused by the buildup of fat (lipids)
thrombus throm'būs	a stationary blood clot
embolus em'bō-lūs	a clot (e.g., air, fat, foreign object) carried in the bloodstream that obstructs when it lodges (embolus = a stopper)
stenosis ste-nō-sis	condition of narrowing of a part
constriction kon-strik'shūn	compression of a part
occlusion ō-klū'zhūn	plugging; obstruction or a closing off
ischemia is-kē'mē-ă	to hold back blood; decreased blood flow to tissue caused by constriction or occlusion of a blood vessel

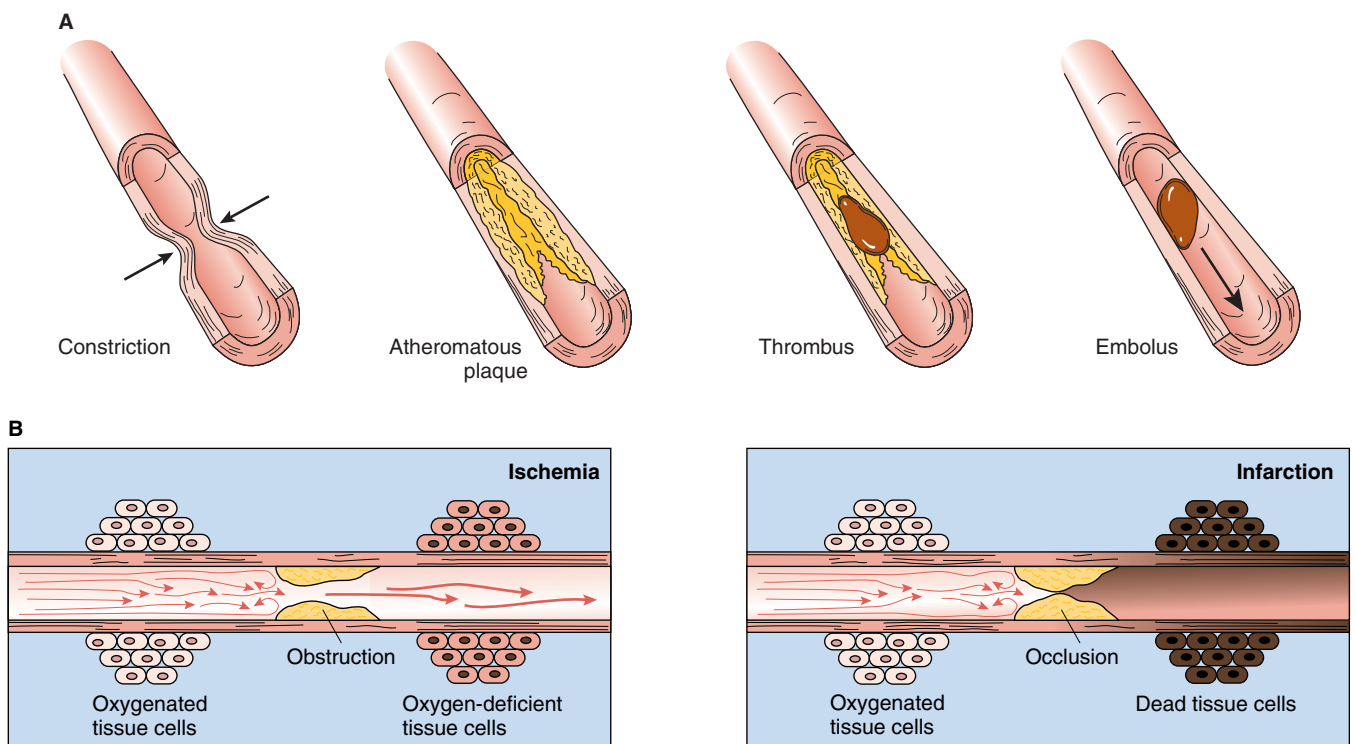


Figure 7.8 **A.** Examples of conditions causing reduction of blood flow. **B.** Effects of reduction of blood flow.

Term	Meaning
perfusion deficit per-fyū'zhŭn def'i-sit	a lack of flow through a blood vessel caused by narrowing, occlusion, etc.
infarct in'farkt	to stuff; a localized area of necrosis (condition of tissue death) caused by ischemia as a result of occlusion of a blood vessel
angina pectoris an'ji-nā pek'tō-ris	chest pain caused by a temporary loss of oxygenated blood to heart muscle often caused by narrowing of the coronary arteries (angina = to choke)
aneurysm an'yū-rizm	a widening; bulging of the wall of the heart, the aorta, or an artery caused by congenital defect or acquired weakness (Fig. 7.9)
saccular sāk-ū-lār	a sac-like bulge on one side
fusiform fū'zī-form	a spindle-shaped bulge
dissecting dī-sēkt'ing	a split or tear of the vessel wall
claudication klaw-dī-kā'shŭn	to limp; pain in a limb (especially the calf) while walking that subsides after rest; it is caused by inadequate blood supply
diaphoresis dī-ā-fō-rē'sis	profuse sweating
heart murmur hart mer'mer	an abnormal sound from the heart produced by defects in the chambers or valves
palpitation pal-pi-tā'shŭn	subjective experience of pounding, skipping, or racing heartbeats
vegetation vej-ē-tā'shŭn	to grow; an abnormal growth of tissue around a valve, generally a result of an infection such as bacterial endocarditis (Fig. 7.10)

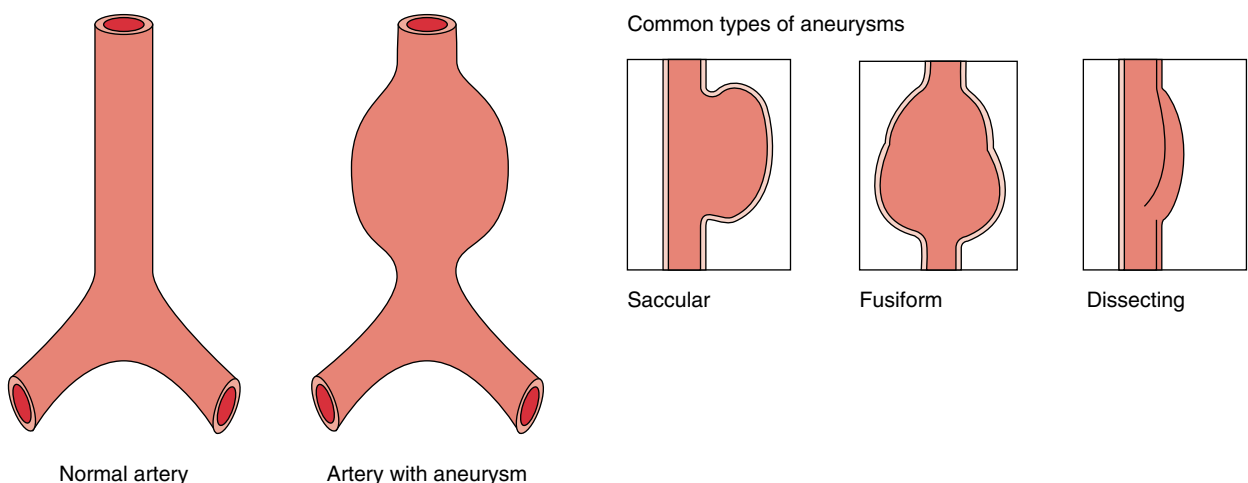


Figure 7.9 Types of aneurysms.

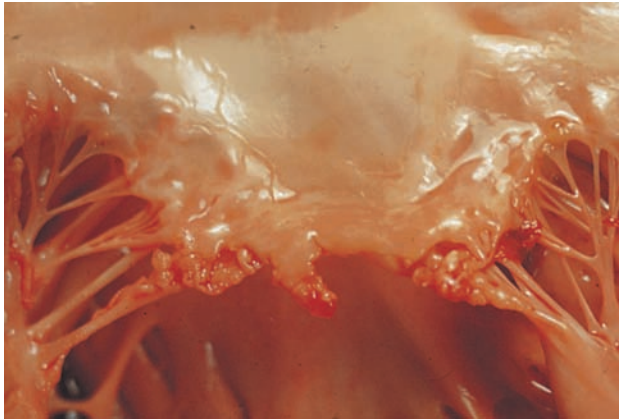
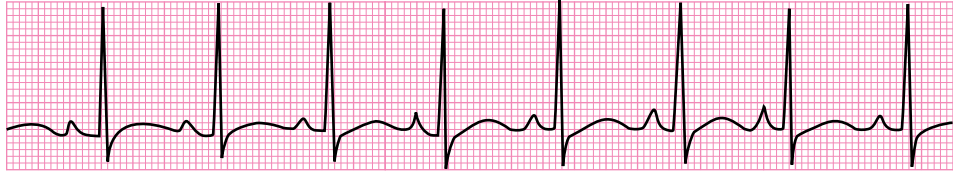


Figure 7.10 The mitral valve shows destructive vegetations, which have eroded through the free margins of the valve leaflets in a patient with bacterial endocarditis.

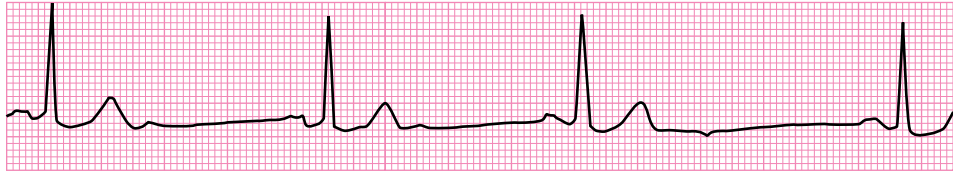
DIAGNOSTIC TERMS

arrhythmia ă-rith'mē-ă	any of several kinds of irregularity or loss of rhythm of the heartbeat (Fig. 7.11)
dysrhythmia dis-rith'mē-ă	
bradycardia brad-ē-kar'dē-ă	slow heart rate (<60 beats/minute)
fibrillation fib-ri-lā'shūn	chaotic, irregular contractions of the heart, as in atrial or ventricular fibrillation
flutter flūt'er	extremely rapid but regular contractions of the heart, as in atrial or ventricular flutter (typically from 250 to 350 beats/minute)
heart block hart blok	an interference with the normal electrical conduction of the heart defined by the location of the block (e.g., AV block)
premature ventricular contraction (PVC) prē-mă-tūr' ven-trik'yū-lăr kon-trak'shūn	a ventricular contraction preceding the normal impulse initiated by the SA node (pacemaker)
tachycardia tak'i'kar'dē-ă	fast heart rate (>100 beats/minute)
arteriosclerotic heart disease (ASHD) ar-tēr'ē-ō-skler-ot'ik	a degenerative condition of the arteries characterized by thickening of the inner lining, loss of elasticity, and susceptibility to rupture—seen most often in the aged or smokers
bacterial endocarditis bak-tēr'ē-ăl en'dō-kar-dī'tis	a bacterial inflammation that affects the endocardium or the heart valves (see Fig. 7.10)
cardiac tamponade kar'dē-ak tam-pō-nād'	compression of the heart produced by the accumulation of fluid in the pericardial sac as results from pericarditis or trauma, causing rupture of a blood vessel within the heart (tampon = a plug)

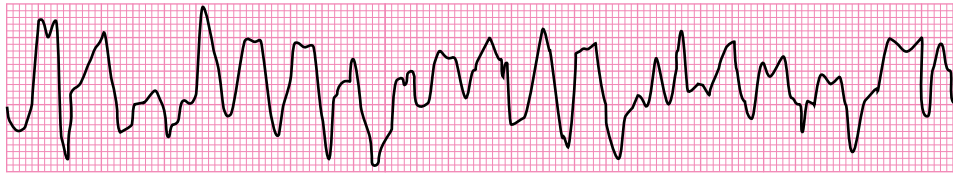
Normal sinus rhythm (NSR)



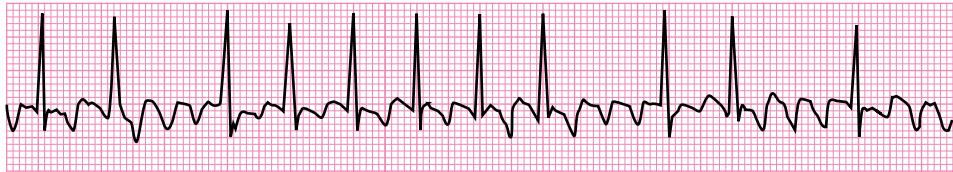
Bradycardia



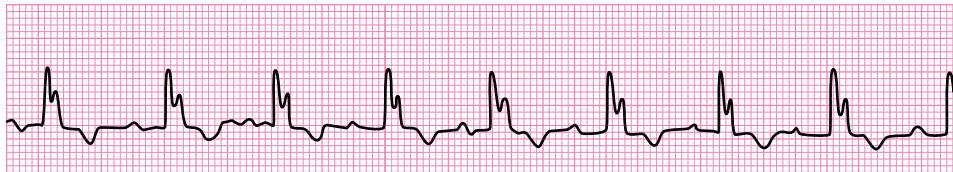
Fibrillation (ventricular)



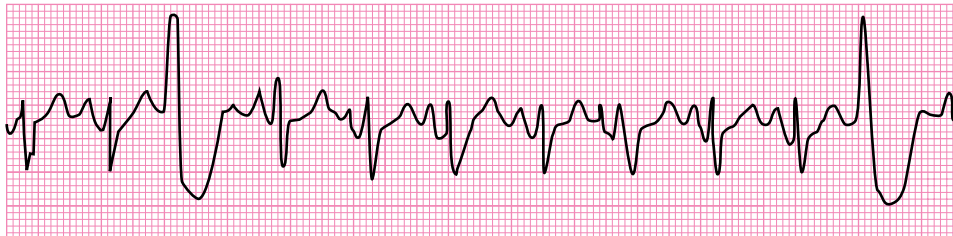
Flutter (atrial)



Heart block



Premature ventricular contraction (PVC)



Tachycardia (sinus)



Figure 7.11 Electrocardiogram tracings showing common types of arrhythmia.

Term	Meaning
cardiomyopathy kar'dē-ō-mī-op'ă-thē	a general term for disease of the heart muscle [e.g., alcoholic cardiomyopathy (damage to the heart muscle caused by excessive consumption of alcohol)]
congenital anomaly of the heart kon-jen'i-tăl ă-nom'ă-lē	malformations of the heart present at birth (anomaly = irregularity)
atrial septal defect (ASD) ā'trē-ăl sep'tăl dē'fekt	an opening in the septum separating the atria
coarctation of the aorta kō-ark-tă'shŭn	narrowing of the descending portion of the aorta resulting in a limited flow of blood to the lower part of the body (Fig. 7.12)
patent ductus arteriosus (PDA) pā'těnt dŭk'tŭs ăr-těr-ē-ō'sŭs	an abnormal opening between the pulmonary artery and the aorta caused by the failure of the fetal ductus arteriosus to close after birth (patent = open) (Fig. 7.13)
tetralogy of Fallot tet-ral-ō-jē făl-ō	an anomaly that consists of four defects: pulmonary stenosis, ventricular septal defect, malposition of the aorta, and right ventricular hypertrophy—causes blood to bypass the pulmonary circulation so that deoxygenated blood goes into the systemic circulation, resulting in cyanosis (tetra = four)
ventricular septal defect (VSD) ven-trik'yŭ-lăr sep'tăl dē'fekt	an opening in the septum separating the ventricles
congestive heart failure (CHF) kon-jes'tiv	failure of the left ventricle to pump an adequate amount of blood to meet the demands of the body, resulting in a “bottleneck” of congestion in the lungs that may extend to the veins, causing edema in lower portions of the body
left ventricular failure	
cor pulmonale kōr pul-mō-nă'lē	a condition of enlargement of the right ventricle as a result of chronic disease within the lungs that causes congestion within the pulmonary circulation and resistance of blood flow to the lungs (cor = heart)
right ventricular failure	

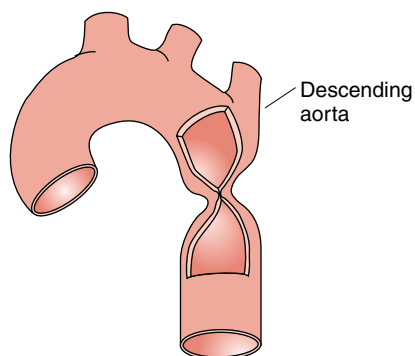


Figure 7.12. Coarctation of the aorta.

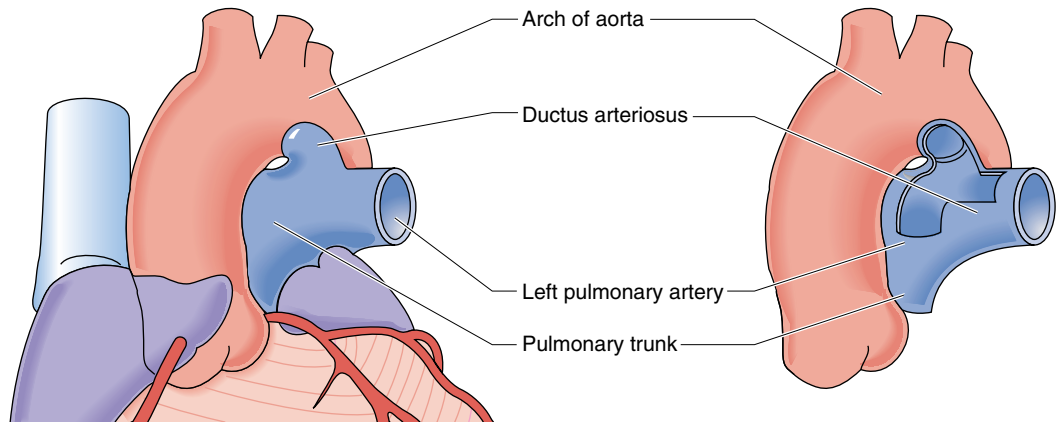


Figure 7.13. Patent ductus arteriosus.

Term	Meaning
coronary artery disease (CAD)	a condition affecting arteries of the heart that reduces the flow of blood and delivery of oxygen and nutrients to the myocardium—most often caused by atherosclerosis (Fig. 7.14)
hypertension (HTN) hī'per-ten'shŭn	persistently high blood pressure
essential (primary) hypertension ĕ-sen'shăl hī'per-ten'shŭn	high blood pressure attributed to no single cause, but risks include smoking, obesity, increased salt intake, hypercholesterolemia, and hereditary factors
secondary hypertension	high blood pressure caused by the effects of another disease (e.g., kidney disease)
mitral valve prolapse (MVP) mī'trăl	protrusion of one or both cusps of the mitral valve back into the left atrium during ventricular contraction, resulting in incomplete closure and backflow of blood

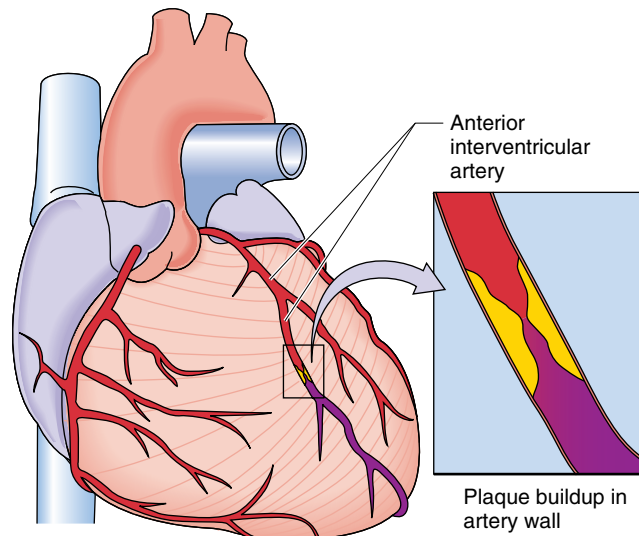


Figure 7.14 Coronary artery disease.

Term	Meaning
myocardial infarction (MI) mī-ō-kar'dē-ăl in-fark'shŭn	heart attack; death of myocardial tissue (infarction) owing to loss of blood flow (ischemia) as a result of an occlusion (plugging) of a coronary artery—usually caused by atherosclerosis; symptoms include pain in the chest or upper body (shoulders, neck, and jaw), shortness of breath, diaphoresis, and nausea (Fig. 7.15)
myocarditis mī'o-kar-dī'tis	inflammation of the myocardium most often caused by viral or bacterial infection
pericarditis per'i-kar-dī'tis	inflammation of the pericardium
phlebitis flĕ-bī'tis	inflammation of a vein
rheumatic heart disease rū-mat'ik	damage to heart muscle and heart valves by rheumatic fever (a streptococcal infection)
thrombophlebitis throm'bō-flĕ-bī'tis	inflammation of a vein associated with a clot formation
varicose veins vār'ī-kōs	abnormally swollen, twisted veins with defective valves, most often seen in the legs (Fig. 7.16)
deep vein thrombosis (DVT) throm-bō'sis	formation of a clot in a deep vein of the body, occurring most often in the femoral and iliac veins (see Fig 7.5)

Diagnostic Tests and Procedures

Test or Procedure	Explanation
auscultation aws-kŭl-tā'shŭn	a physical examination method of listening to sounds within the body with the aid of a stethoscope (e.g., auscultation of the chest for heart and lung sounds) (Fig. 7.17)



AUSCULTATION.

The Latin root means to listen or hear with attention. Listening to the sound of the breathing and of the beating of the heart is an ancient art that was current in Hippocrates' time. It was accomplished by placing the ear directly on the chest wall—direct or immediate auscultation. Indirect or mediate auscultation has been used in modern times since the invention of the stethoscope.

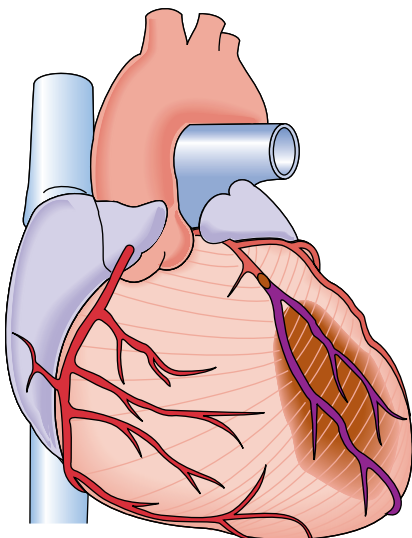


Figure 7.15 Anterolateral myocardial infarction (darkened area), caused by occlusion of the anterior descending branch of the left coronary artery.

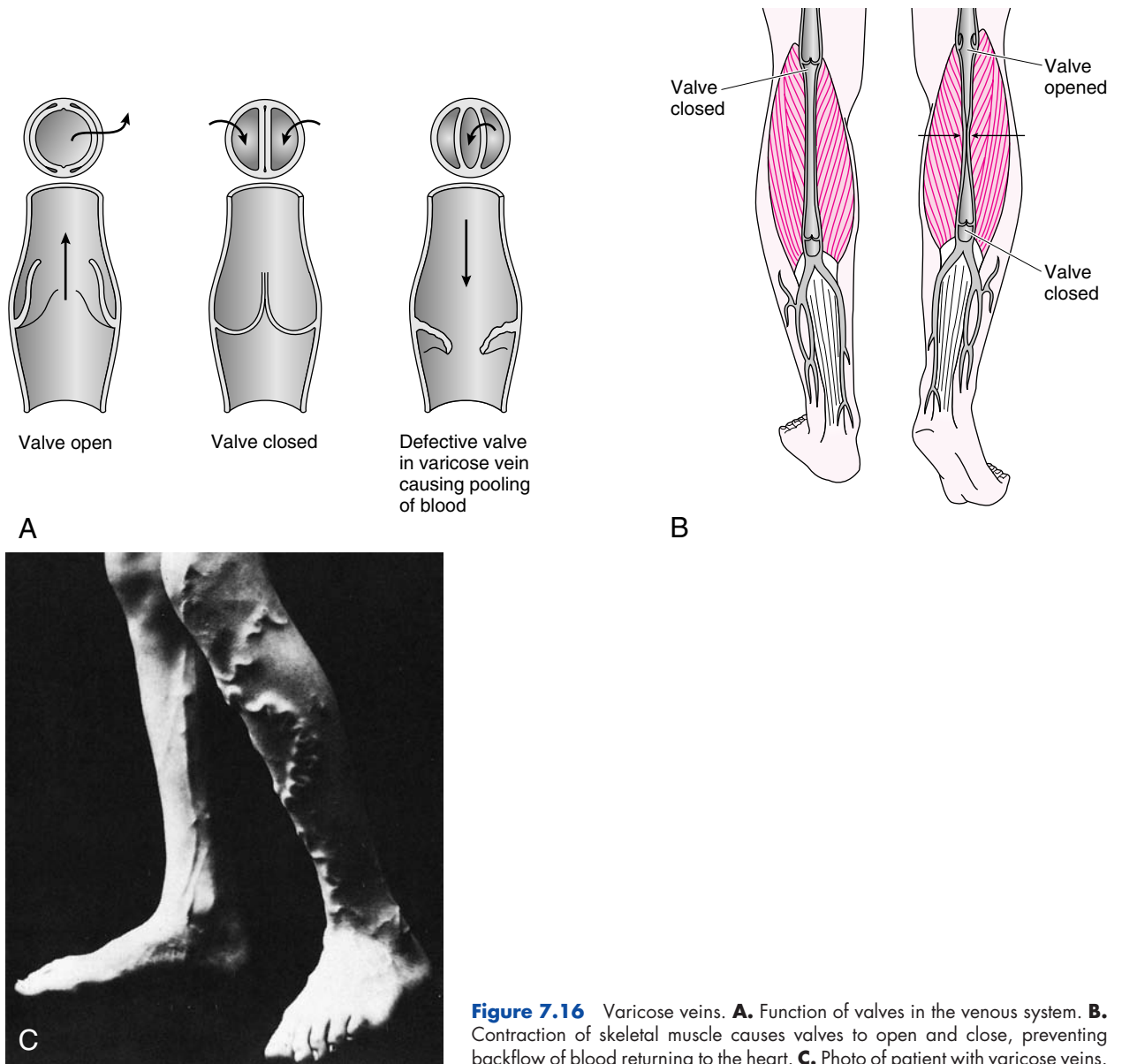


Figure 7.16 Varicose veins. **A.** Function of valves in the venous system. **B.** Contraction of skeletal muscle causes valves to open and close, preventing backflow of blood returning to the heart. **C.** Photo of patient with varicose veins.



Figure 7.17. Auscultating heart sounds.

Test or Procedure	Explanation
bruit brū-ē'	noise; an abnormal heart sound caused by turbulence within
gallop	an abnormal heart sound that mimics the gait of a horse; related to abnormal ventricular contraction
electrocardiogram (ECG or EKG) ē-lek-trō-kar'dē-ō-gram	an electrical picture of the heart represented by positive and negative deflections on a graph labeled with the letters P, Q, R, S, and T, corresponding to events of the cardiac cycle (Fig. 7.18)
stress electrocardiogram	an ECG of the heart recorded during the induction of controlled physical exercise using a treadmill or ergometer (bicycle); useful in detecting conditions such as ischemia and infarction (Fig. 7.19)
Holter ambulatory monitor hōlt'er am'byū-lā-tōr-ē mon'i-ter	a portable electrocardiograph worn by the patient that monitors electrical activity of the heart over 24 hours—useful in detecting periodic abnormalities
intracardiac electrophysiological study (EPS) in'tr ā-kar'dē-ak ē-lek'trō-fiz-ē-ō-loj'i-kāl stūd'ē	invasive procedure involving placement of catheter-guided electrodes within the heart to evaluate and map the electrical conduction of cardiac arrhythmias; intracardiac catheter ablation may be performed at the same time to treat the arrhythmia

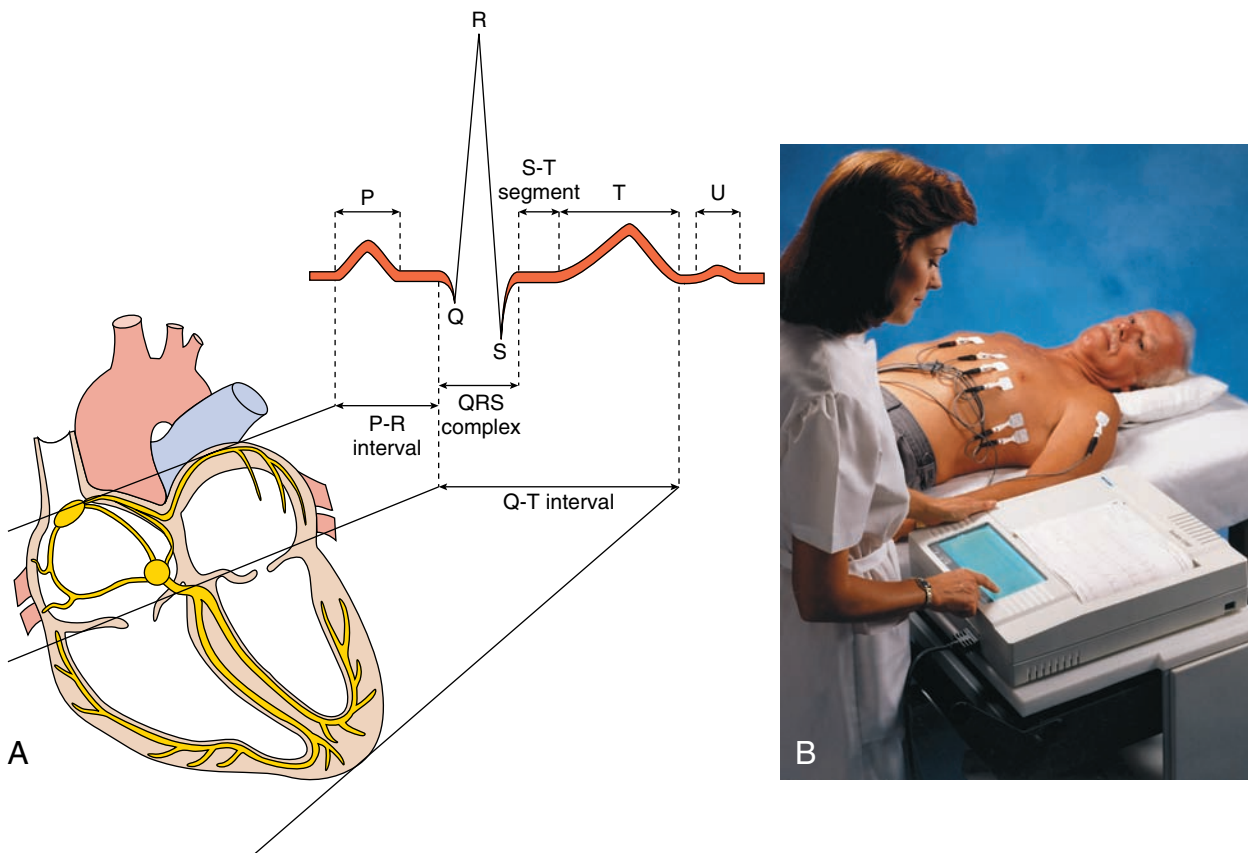


Figure 7.18 **A.** Electrocardiographic pattern associated with electrical conduction of the heart. **B.** Resting electrocardiography.



Figure 7.19 Stress electrocardiography.

Test or Procedure	Explanation
<p>intracardiac catheter ablation in'tră-kar'dē-ak kath'ēter ab-lā'shŭn</p>	<p>use of radiofrequency waves sent through a catheter within the heart to treat arrhythmias by selectively destroying myocardial tissue at sites generating abnormal electrical pathways</p>
<p>magnetic resonance angiography (MRA) rez'ō-nans an-jē-og'ră-fē</p>	<p>magnetic resonance imaging of the heart and blood vessels for evaluation of pathology (see Chapter 10, Fig. 10.18)</p>
<p>nuclear medicine imaging of the heart nū'klē-ar med'i-sin im'ă-jing</p>	<p>radionuclide organ imaging of the heart after administration of radioactive isotopes to visualize structures and analyze functions</p>
<p>myocardial radionuclide perfusion scan mī-ō-kar'dē-ăl ră'dē-ō-nū'klīd per-fyū'zhŭn</p>	<p>a scan of the heart made after an intravenous injection of an isotope (e.g., thallium) that is absorbed by myocardial cells in proportion to blood flow throughout the heart</p>
<p>myocardial radionuclide perfusion stress scan</p>	<p>a nuclear scan of the heart taken after the induction of controlled physical exercise via treadmill or bicycle or administration of a pharmaceutical agent that produces the effect of exercise stress in patients unable to ambulate</p>
<p>positron emission tomography (PET) scan of the heart poz'i-tron ē-mish'shŭn tō-mog'ră-fē</p>	<p>use of nuclear isotopes and computed tomography techniques to produce perfusion (blood flow) images and study the cellular metabolism of the heart; can be taken at rest or with stress</p>

Test or Procedure	Explanation
radiology	x-ray imaging
angiography an-jē-og' rǎ-fē	an x-ray of a blood vessel after injection of contrast medium
angiogram an'jē-ō-gram	a record obtained by angiography
coronary angiogram kōr'o-nār-ē an'jē-ō-gram	an x-ray of the blood vessels of the heart (see Fig. 7.2)
arteriogram ar-tēr'e-ō-gram	an x-ray of a particular artery (e.g., coronary arteriogram, renal arteriogram)
aortogram ā-ōr'tō-gram	an x-ray of the aorta
venogram vē'nō-gram	an x-ray of a vein
cardiac catheterization kar'dē-ak kath'ē-ter-ī-zā'shŭn	introduction of a flexible, narrow tube or <i>catheter</i> through a vein or artery into the heart to withdraw samples of blood, measure pressures within the heart chambers or vessels, and inject contrast media for fluoroscopic radiography and cine film (motion picture) imaging of the chambers of the heart and coronary arteries—very often includes interventional procedures such as angioplasty and atherectomy (see endovascular procedures listed under “Operative Terms”) (Fig. 7.20)
left heart catheterization	an x-ray of the left ventricular cavity and coronary arteries
right heart catheterization	measurement of oxygen saturation and pressure readings of the right side of the heart
ventriculogram ven-trik'ū-lō-gram	an x-ray visualizing the ventricles
stroke volume (SV)	measurement of the amount of blood ejected from a ventricle in one contraction
cardiac output (CO)	measurement of the amount of blood ejected from either ventricle of the heart per minute
ejection fraction ē-jek'shŭn frak'shŭn	measurement of the volume percentage of left ventricular contents ejected with each contraction
sonography	sonographic imaging
echocardiography (ECHO) ek'ō-kar-dē-og'r ă-f ē	recording of sound waves through the heart to evaluate structure and motion (see Figs. 7.1 and 7.21)
stress echocardiogram (stress ECHO)	an echocardiogram of the heart recorded during the induction of controlled physical exercise via treadmill or bicycle or administration of a pharmaceutical agent that produces the effect of exercise stress in patients unable to ambulate—useful in detecting conditions such as ischemia and infarction

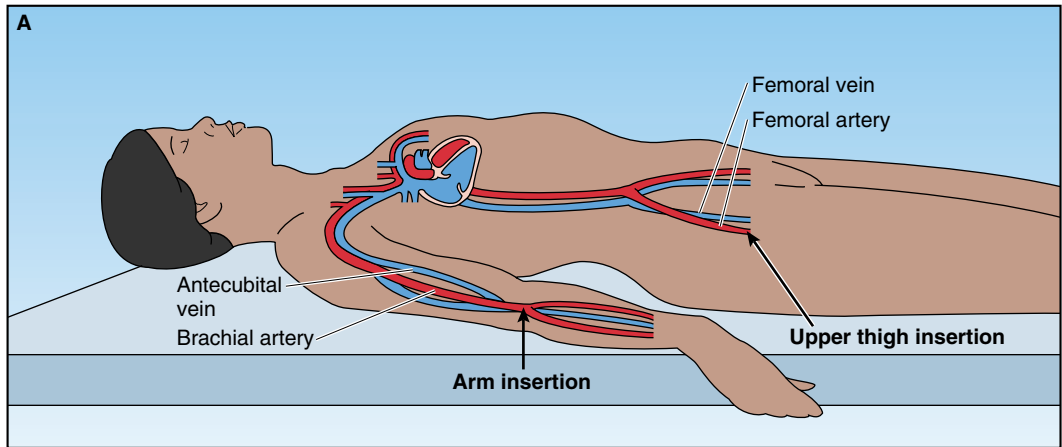


Figure 7.20 Cardiac catheterization. **A.** Possible insertion sites for cardiac catheterization. **B.** Cardiac catheterization catheters: *left*, 6 French JL4; *middle*, 6 French pigtail; *right*, 6 French JR4. **C.** Cardiac catheterization laboratory.



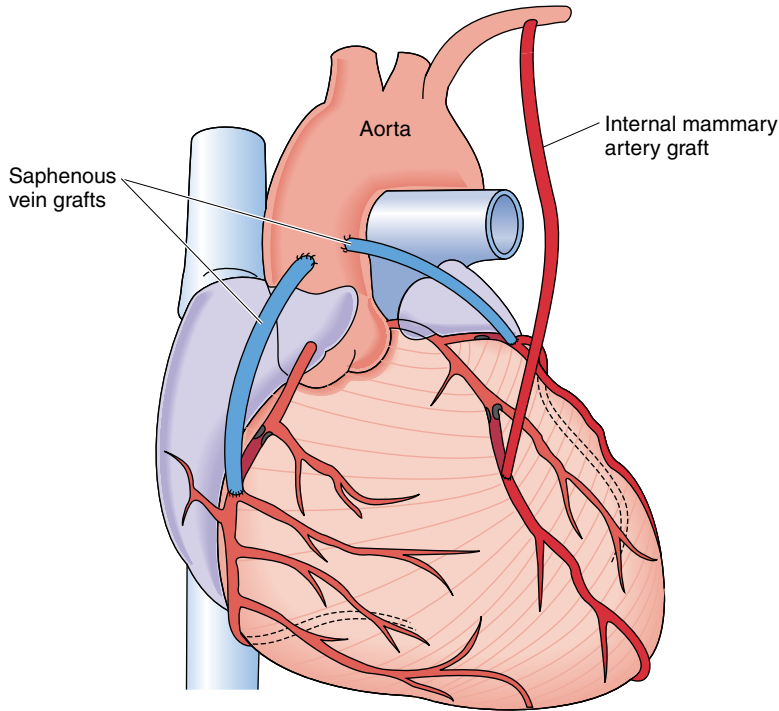
Figure 7.21 Echocardiography.

Test or Procedure	Explanation
transesophageal echocardiogram (TEE) trans-ē-sof'ă-jē'ăl	an echocardiographic image of the heart after placement of an ultrasonic transducer at the end of an endoscope inside the esophagus
Doppler sonography dōp'lēr sō-nog'ră-fē	an ultrasound technique used to evaluate blood flow to determine the presence of a deep vein thrombosis (DVT) or carotid insufficiency, or flow through the heart, chambers, valves, etc. (see Figs. 7.4 and 7.5)
intravascular sonography in'tra-vas'kyū-lăr sō-nog'ră-fē	ultrasound images made after a sonographic transducer is placed at the tip of a catheter within a blood vessel—done to evaluate pathological conditions such as buildup of plaque

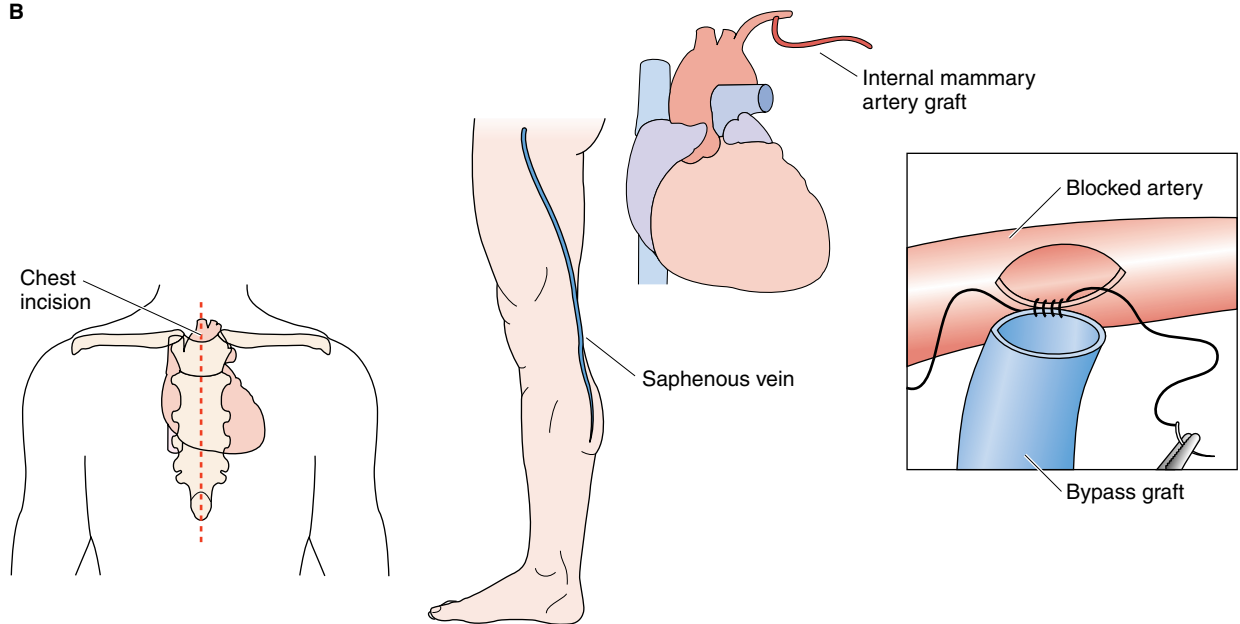
Operative Terms

Term	Meaning
coronary artery bypass graft (CABG)	grafting of a portion of a blood vessel retrieved from another part of the body (such as a length of saphenous vein from the leg or mammary artery from the chest wall) to bypass an occluded coronary artery, restoring circulation to myocardial tissue (Fig. 7.22); the traditional method includes temporary arrest of the heart with circulation (bypass) of the patient's blood through a heart-lung machine during the procedure—an alternative off-pump approach uses a stabilizer to perform the procedure on the beating heart
anastomosis ă-nas'tō-mō'sis	opening; joining of two blood vessels to allow flow from one to the other
endarterectomy end-ar-ter-ek'tō-mē	incision and coring of the lining of an artery to clear a blockage caused by a clot or atherosclerotic plaque buildup (e.g., carotid endarterectomy)

A



B



1. Bypass incisions

An incision is made in the chest dividing the sternum to allow access to the heart.

2. Bypass vessels

The long saphenous vein in the leg can be used to make several bypasses, if needed. The internal mammary artery may also be used as a graft. Both are "excess" blood vessels the body does not need.

3. Bypass grafting

Grafting is performed under magnification using extremely fine sutures. Each graft is sewn to the aorta, except for the internal mammary artery, which already originates from a branch of the aorta. The other end is sewn to the artery below the blockage.

Figure 7.22 Coronary artery bypass graft. **A.** Common sites for bypass grafts. **B.** Bypass process.

Term	Meaning
transmyocardial revascularization (TMR)	a laser technique used to open tiny channels in the heart muscle to restore blood flow, thereby relieving angina in patients with advanced coronary artery disease; an option for patients not treatable with angioplasty or coronary artery bypass
valve replacement	surgery to replace a diseased heart valve with an artificial one types of artificial valves: <i>tissue</i> —most commonly made from animal tissue such as porcine (pig) or bovine (cow) <i>mechanical</i> —made from synthetic material (Fig. 7.23)
valvuloplasty val'vyū-lō-plas-tē	repair of a heart valve
endovascular surgery	interventional procedures performed endoscopically at the time of cardiac catheterization (Fig. 7.24)
angioscopy (vascular endoscopy) an-jē-os'kō-pē	use of a flexible fiberoptic angioscope accompanied by an irrigation system, a camera, a video recorder, and a monitor that is guided through a specific blood vessel to visually assess a lesion and select the mode of therapy
atherectomy āth-er-ek'tō-mē	excision of atheromatous plaque from within an artery utilizing a device housed in a flexible catheter that selectively cuts away or pulverizes tissue buildup (Fig. 7.24A)

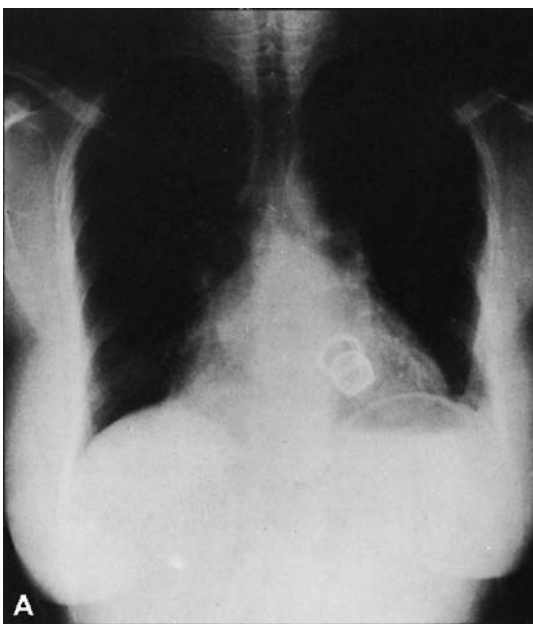


Figure 7.23 **A.** X-ray showing artificial replacement of mitral valve (Starr-Edwards). **B.** Starr-Edwards Silastic ball mechanical valve.

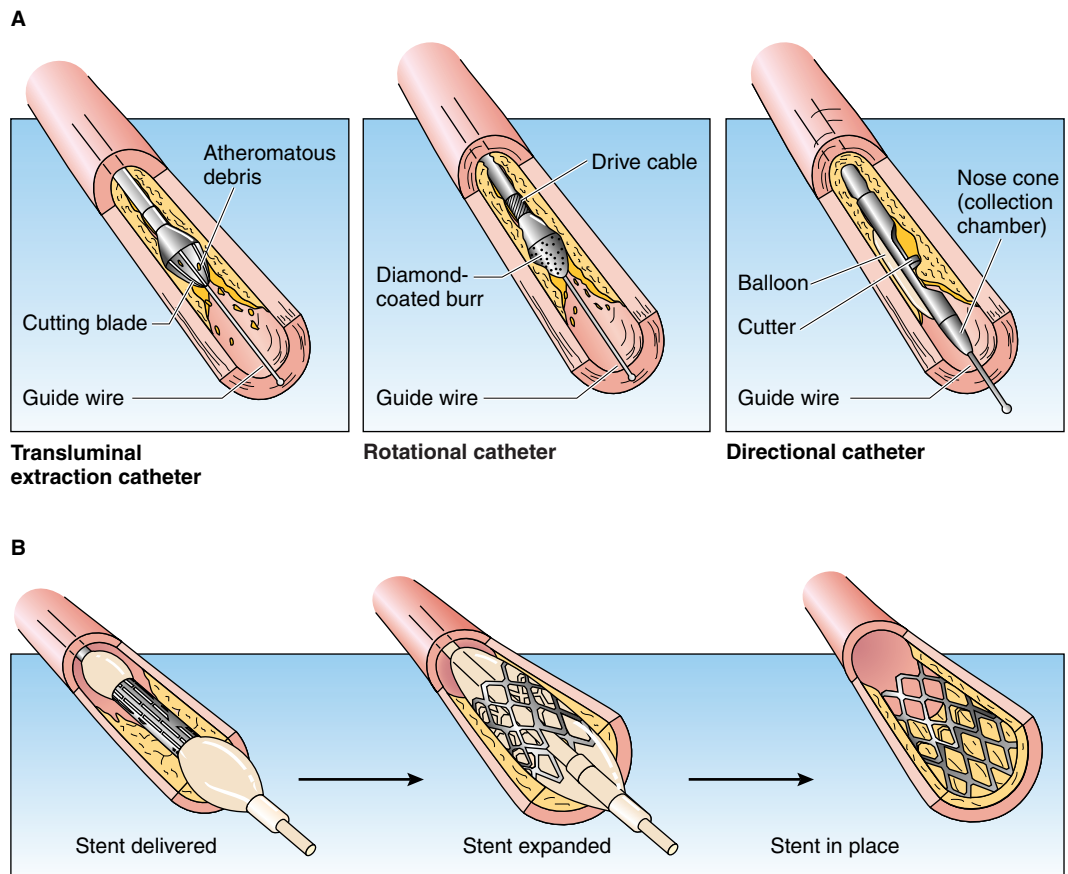


Figure 7.24 Examples of devices used in endovascular interventional procedures. **A.** Atherectomy devices. **B.** Intravascular stent.

Term	Meaning
<p>percutaneous transluminal coronary angioplasty (PTCA) per-kyū-tā' nē-ūs trāns-lū'mī-nāl kōr'o-nār-ē an'jē-ō-plas-tē</p>	<p>a method of treating the narrowing of a coronary artery by inserting a specialized catheter with a balloon attachment, then inflating it to dilate and open the narrowed portion of the vessel and restore blood flow to the myocardium (see Fig. 7.2); most often includes placement of a stent</p>
<p>intravascular stent in'tra-vas'kyū-lār</p>	<p>implantation of a device used to reinforce the wall of a vessel and ensure its patency (openness)—most often used to treat a stenosis or a dissection (a split or tear in the wall of a vessel) or to reinforce patency of a vessel after angioplasty (see Fig. 7.24B)</p>

Therapeutic Terms

Term	Meaning
<p>defibrillation dē-fib'ri-lā'shūn</p>	<p>termination of ventricular fibrillation by delivery of an electrical stimulus to the heart, most commonly by applying electrodes of the defibrillator externally to the chest wall but can be performed internally at the time of open heart surgery or via an implanted device (Fig. 7.25)</p>
<p>defibrillator dē-fib'ri-lā'ter</p>	<p>a device that delivers the electrical stimulus in defibrillation</p>

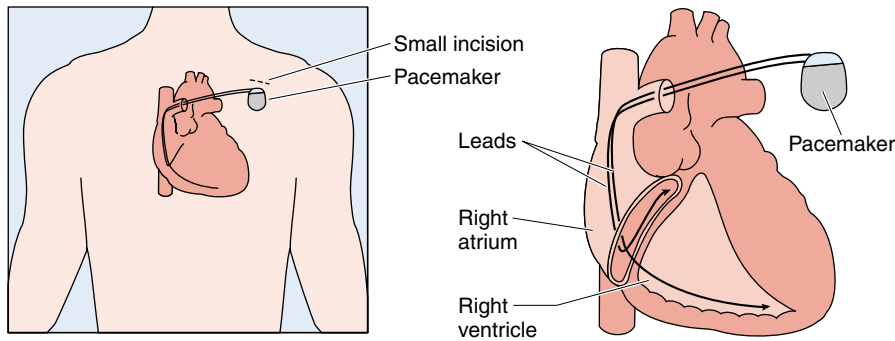


Figure 7.25 **A.** External defibrillation. **B.** Internal defibrillation performed in the operating room.

Term	Meaning
cardioversion kar'dē-ō-ver'zhŭn	termination of tachycardia either by pharmaceutical means or by delivery of electrical energy
implantable cardioverter defibrillator (ICD) kar'dē-ō-ver'ter dē-fib'ri-lā'ter	an implanted, battery-operated device with rate-sensing leads that monitors cardiac impulses and initiates an electrical stimulus as needed to stop ventricular fibrillation or tachycardia
pacemaker	a device used to treat slow heart rates (bradycardia) by electrically stimulating the heart to contract, most often implanted with lead wires and battery circuitry under the skin but can be temporarily placed externally with lead wires inserted into the heart via a vein (Fig. 7.26)
thrombolytic therapy throm-bō-lit'ik	dissolution of thrombi using drugs [e.g., streptokinase, tissue plasminogen activator (TPA)]

COMMON THERAPEUTIC DRUG CLASSIFICATIONS

angiotensin-converting enzyme (ACE) inhibitor ān'jē-ō-tēn'sin-kōn-vēr'ting ěn'zīm	a drug that suppresses the conversion of angiotensin in the blood by the angiotensin-converting enzyme; used in the treatment of hypertension
antianginal an'tē-an'ji-nāl	a drug that dilates coronary arteries, restoring oxygen to the tissues to relieve the pain of angina pectoris



A small incision is made in the upper chest, below the clavicle, to access a large vein nearby.

A

The pacemaker leads are then guided through the vein and into the heart. After proper placement is determined, the leads are secured in position.

A small “pocket” to house the pacemaker is created just under the skin at the incision site. The leads are connected to the pacemaker that is secured in the “pocket.” Finally, the incision is closed with a few sutures.



B

Figure 7.26 Pacemaker. **A.** Endocardial pacemaker. **B.** Teleradiology/critical care workstation. Chest x-rays on screen show pacemaker placement.

Term	Meaning
antiarrhythmic an'tē-ă-rith'mik	a drug that counteracts cardiac arrhythmia
anticoagulant an'tē-kō-ag'yū-lant	a drug that prevents clotting of the blood commonly used in treating thrombophlebitis and myocardial infarction
antihypertensive an'tē-hī-per-ten'siv	a drug that lowers blood pressure
beta-adrenergic blocking agents bā'tā ad-rē-ner'jik blok'ing beta blockers bā'tā blok'ers	agents that inhibit responses to sympathetic adrenergic nerve activity causing a slowing of electrical conduction and heart rate and a lowering of the pressure within the walls of the vessels; used to treat angina pectoris and hypertension

Term	Meaning
calcium channel blockers kal'sē-ŭm chan'ĕl blok'ers	agents that inhibit the entry of calcium ions in heart muscle cells causing a slowing of the heart rate, lessening the demand for oxygen and nutrients, and relaxing of the smooth muscle cells of the blood vessels to cause dilation; used to prevent or treat angina pectoris, some arrhythmias, and hypertension
cardiotonic kar'dē-ō-ton'ik	a drug that increases the force of myocardial contractions in the heart commonly used to treat congestive heart failure
diuretic dī-yū-ret'ik	a drug that increases the secretion of urine commonly prescribed in treating hypertension
hypolipidemic hī-pō-lip'i-dē'mik	a drug that reduces serum fat and cholesterol
statins	agents that lower cholesterol in the blood by inhibiting the effect of HMG-CoA reductase, a liver enzyme responsible for producing cholesterol
thrombolytic agents throm'bō-lit'ik	drugs used to dissolve thrombi (blood clots) (e.g., streptokinase, tissue plasminogen activator [TPA or tPA])
vasoconstrictor vā'sō-kon-strik'ter	a drug that causes narrowing of the blood vessels, decreasing blood flow
vasodilator vā'sō-dī-lā'ter	a drug that causes dilation of the blood vessels, increasing blood flow

Summary of Chapter 7 Acronyms/Abbreviations

ACE.....angiotensin-converting enzyme	MI.....myocardial infarction
ASD.....atrial septal defect	MRA.....magnetic resonance angiography
ASHD.....arteriosclerotic heart disease	MVP.....mitral valve prolapse
AV.....atrioventricular	NSR.....normal sinus rhythm
BP.....blood pressure	PDA.....patent ductus arteriosus
CABG.....coronary artery bypass graft	PET.....positron emission tomography
CAD.....coronary artery disease	PTCA.....percutaneous transluminal coronary angioplasty
CHF.....congestive heart failure	PVC.....premature ventricular contraction
CO.....cardiac output	SA.....sinoatrial
DVT.....deep vein thrombosis	SV.....stroke volume
ECG, EKG.....electrocardiogram	TEE.....transesophageal echocardiogram
ECHO.....echocardiography	TMR.....transmyocardial revascularization
EPS.....electrophysiological study	tPA, TPA.....tissue plasminogen activator
HTN.....hypertension	VSD.....ventricular septal defect
ICD.....implantable cardioverter-defibrillator	



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the term.

EXAMPLE

endocardial

_____ / _____ / _____
 P R S

endo/cardi/al
 P R S

DEFINITION: within/heart/pertaining to

1. angiography

_____ / _____
 CF S

DEFINITION: _____

2. varicosis

_____ / _____
 R S

DEFINITION: _____

3. pectoral

_____ / _____
 R S

DEFINITION: _____

4. vasospasm

_____ / _____
 CF S

DEFINITION: _____

5. venous

_____ / _____
 R S

DEFINITION: _____

6. aortocoronary

_____ / _____ / _____
 CF R S

DEFINITION: _____

7. thrombophlebitis

_____ / _____ / _____
 CF R S

DEFINITION: _____

8. pericardiocentesis

_____ / _____ / _____
 P R S

DEFINITION: _____

9. vasculopathy

_____ / _____ / _____
 CF R S

DEFINITION: _____

10. atherogenesis

_____ / _____
 CF S

DEFINITION: _____

11. stethoscope

_____ / _____
 CF S

DEFINITION: _____

12. myocardium

_____ / _____ / _____
 CF R S

DEFINITION: _____

13. aortoplasty

_____ / _____
 CF S

DEFINITION: _____

14. venostomy

_____ / _____
 CF S

DEFINITION: _____

15. arteriostenosis

_____ / _____ / _____
 CF R S

DEFINITION: _____

16. phlebotomy

_____ / _____
 CF S

DEFINITION: _____

17. cardioaortic

_____ / _____ / _____
 CF R S

DEFINITION: _____

18. ventriculogram

_____ / _____
 CF S

DEFINITION: _____

19. phlebitis

_____ / _____
 R S

DEFINITION: _____

20. angioplasty

_____ / _____
 CF S

DEFINITION: _____

21. endovascular

_____ / _____ / _____
 P R S

DEFINITION: _____

22. cardiotoxic

_____ / _____ / _____
 CF R S

DEFINITION: _____

23. arteriogram

_____ / _____
 CF S

DEFINITION: _____

24. atherectomy

_____ / _____
 R S

DEFINITION: _____

25. atherothrombosis

_____ / _____ / _____
 CF R S

DEFINITION: _____

Fill in the blanks with the appropriate medical terms.

26. _____ anomalies = malformations of the heart present at birth

27. arterio _____ osis = thickening, loss of elasticity, and calcification (hardening) of arterial walls

28. _____ = irregularity or loss of rhythm of the heartbeat

29. cardiomyo _____ = general term for disease of the heart muscle

30. _____ = joining of two blood vessels to allow flow from one to the other
31. _____ = abnormal heart sound that mimics the gait of a horse
32. _____ cardiogram = a recording of sound waves directed through the heart to evaluate structure and motion
33. cor _____ = a condition of enlargement of the right ventricle as a result of chronic disease within the lungs
34. coronary _____ = an x-ray of the blood vessels of the heart made with the introduction of a catheter and release of a contrast medium
35. _____ ECG = electrocardiogram of the heart recorded during controlled physical exercise
36. intracardiac catheter _____ = treatment of arrhythmia by destroying myocardial tissue at sites generating abnormal electrical pathways

For each of the following, circle the combining form that corresponds to the meaning given:

- | | | | |
|---------------------------|----------|-------------|----------|
| 37. chest | phleb/o | sphygm/o | pector/o |
| 38. vein | aort/o | phleb/o | varic/o |
| 39. vessel | angi/o | arteri/o | coron/o |
| 40. heart | ven/o | coron/o | cardi/o |
| 41. fatty paste | aor/o | ather/o | atri/o |
| 42. circle | cardi/o | coron/o | sphygm/o |
| 43. pulse | sphygm/o | steth/o | thromb/o |
| 44. clot | atri/o | angi/o | thromb/o |
| 45. artery | arteri/o | angi/o | aort/o |
| 46. belly or pouch | varic/o | ventricul/o | ven/o |

Match the following terms with their meanings:

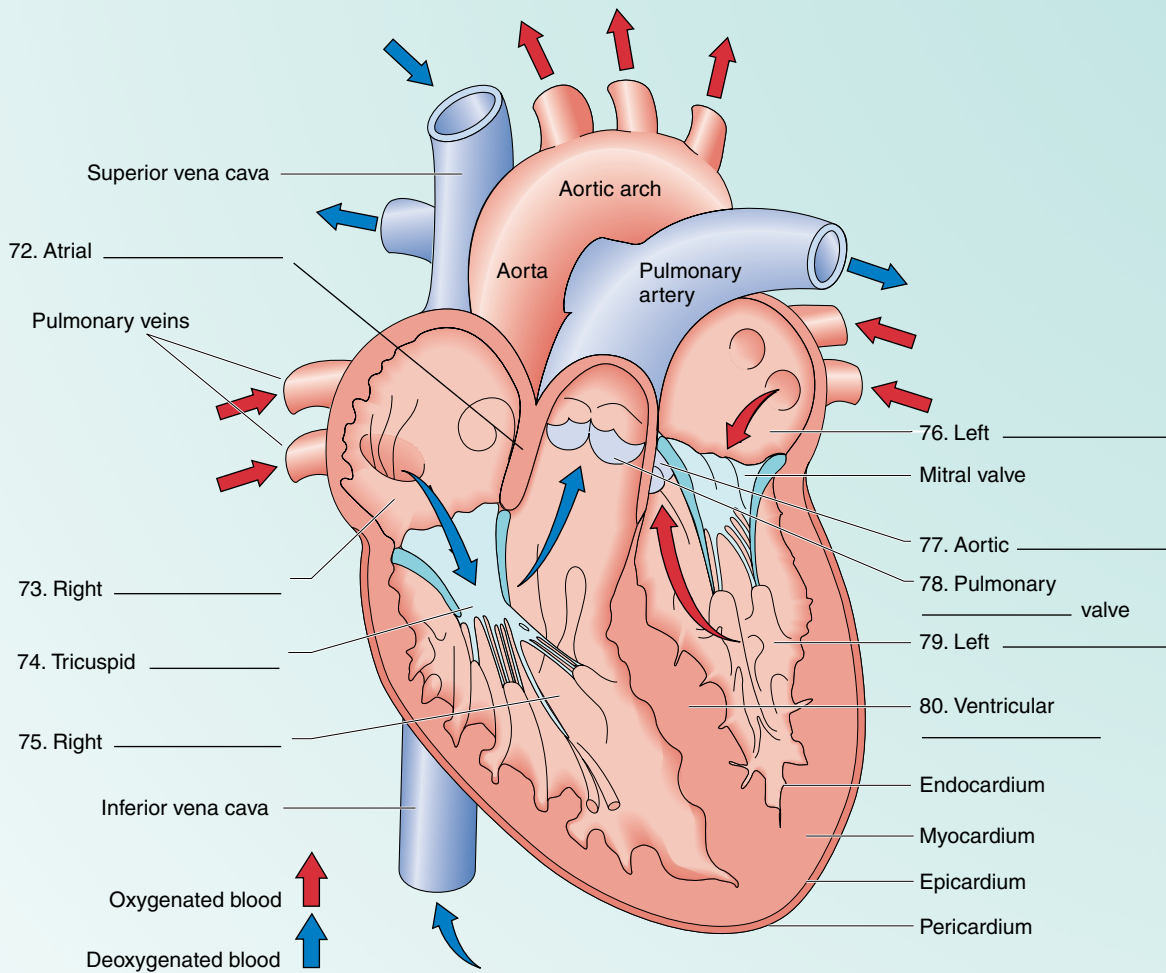
- | | |
|----------------------------|---|
| 47. _____ atherosclerosis | a. high blood pressure |
| 48. _____ infarct | b. bulging of a vessel |
| 49. _____ hypotension | c. stationary clot |
| 50. _____ vegetation | d. cramp in leg muscle |
| 51. _____ embolus | e. normal blood pressure |
| 52. _____ occlusion | f. hard, nonelastic condition |
| 53. _____ hypertension | g. traveling clot that obstructs when it lodges |
| 54. _____ thrombus | h. buildup of fat |
| 55. _____ constriction | i. growth of tissue |
| 56. _____ normotension | j. a plugging |
| 57. _____ angina | k. loss of blood flow |
| 58. _____ claudication | l. compression |
| 59. _____ ischemia | m. cramp in heart muscle |
| 60. _____ arteriosclerosis | n. low blood pressure |
| 61. _____ aneurysm | o. scar left by necrosis |

Write the full medical term for the following abbreviations:

- 62. PVC _____
- 63. PDA _____
- 64. ASHD _____
- 65. ICD _____
- 66. CHF _____
- 67. CAD _____
- 68. HTN _____
- 69. MVP _____
- 70. MRA _____
- 71. VSD _____

Write in the missing words on the blank lines in the following illustration of the heart.

72–80.



Match the following abbreviations with their meanings:

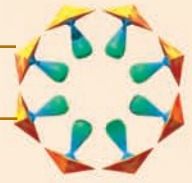
- | | |
|----------------|--|
| 81. _____ ECG | a. balloon angioplasty |
| 82. _____ tPA | b. magnetic resonance of blood vessels |
| 83. _____ MRA | c. a clot in a vein |
| 84. _____ PTCA | d. heart bypass surgery |
| 85. _____ MI | e. electrical picture of heart |
| 86. _____ DVT | f. echocardiogram directed through the esophagus |
| 87. _____ ASD | g. left ventricular failure |
| 88. _____ CABG | h. thrombolytic drug |
| 89. _____ TEE | i. an abnormal opening in the atrial septum |
| 90. _____ CHF | j. heart attack |

For each of the following, circle the correct spelling of the term:

- | | | |
|----------------------|------------------|------------------|
| 91. ventricel | ventrical | ventricle |
| 92. aorta | aorto | aorrta |
| 93. thrombos | thrombus | thrommbus |
| 94. myocardial | mycardial | myocardiol |
| 95. hypatension | hyptension | hypotension |
| 96. diastolie | diastoly | diastole |
| 97. ischemia | ishchemia | ishemia |
| 98. oclusion | occlusion | ocllusion |
| 99. infart | enfarct | infarct |
| 100. anuerysm | aneurysm | annurysm |
| 101. atherosclerotic | atherosclerrotic | atherasclerotic |
| 102. thromboflebitus | thromboflebitis | thrombophlebitis |
| 103. anngiogram | angiogram | angeogram |
| 104. defibrillation | defibillation | defibrilation |
| 105. antarhythmic | antiarrhythmic | antiarhythmic |

Write the term that means the opposite of each given term:

106. vasoconstriction _____
107. coagulant _____
108. hypotension _____
109. bradycardia _____
110. diastole _____



MEDICAL RECORD ANALYSES

MEDICAL RECORD 7.1

Progress Note

- S: This 54 y.o. ♂ was admitted to CCU with onset of acute anterior chest pain radiating to the left shoulder and SOB; pt underwent a CABG × 4 six months ago.
- O: BP 190/110, P 100, R 72, T 38°C
On PE, pt was in moderate to severe distress. An ECG showed sinus tachycardia, and a CXR revealed left ventricular hypertrophy.
- A: R/O MI
- P: Order blood enzyme measurement STAT
echocardiogram
CT scan of chest

- What is the patient's CC?
 - severe angina
 - angina developing slowly over time
 - enlargement of the heart
 - fast heart rate
 - slow heart rate
- Describe the procedure that the patient underwent 6 months ago:
 - surgery to dilate and open narrowed portions of coronary arteries
 - replacement of occluded arteries with transplanted portions of vein
 - replacement of a diseased heart valve
 - coring of the lining of an artery to remove a clot
 - heart transplant
- Where was the patient treated?
 - outpatient medical office
 - outpatient emergency room
 - inpatient intensive care
 - inpatient coronary care
 - outpatient cardiology department
- What type of physician is most appropriate to provide initial care and assessment of this patient?
 - emergency room physician
 - internist
 - gerontologist
 - cardiovascular surgeon
 - cardiologist
- What did the electrical picture of the heart reveal?
 - extremely rapid but regular contractions of the heart
 - slow heart rate
 - chaotic, irregular contractions of the heart
 - fast heart rate
 - interference with normal electrical conduction of the heart known as a block
- What was the assessment?
 - patient may have had a heart attack
 - patient may be suffering from right heart failure
 - patient has congestive heart failure
 - patient may have high blood pressure
 - patient may have an enlarged heart
- What were the objective findings of the chest radiograph?
 - unknown
 - increase in size of left ventricle
 - vessel disease
 - dead heart muscle
 - fast heart rate
- Identify the x-ray imaging procedure ordered in the plan:
 - sonogram of heart
 - chest radiography
 - blood pressure
 - computed tomography
 - biochemistry panel

MEDICAL RECORD 7.2

Richard Stratten has had serious heart problems for more than 10 years. He has had two operations. During the past 6 months, he has developed increasing pain in the chest and is having more trouble breathing. His cardiologist, Dr. Charles Feingold, has now admitted him to Central Medical Center for further tests.

Directions

Read Medical Record 7.2 for Richard Stratten (pages 233–236) and answer the following questions. This record is the history and physical examination dictated by Dr. Feingold after his examination of Mr. Stratten.

QUESTIONS ABOUT MEDICAL RECORD 7.2

Write your answers in the spaces provided.

1. Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

obtuse _____

dyspnea (dyspneic) _____

hiatal hernia _____

basilar rales _____

visceromegaly _____

clubbing _____

2. In your own words, not using medical terminology, briefly describe why Mr. Stratten has been admitted to the hospital and what test he will be undergoing.

3. Name the diagnosis that underlies the nature of Mr. Stratten's heart conditions.

Briefly describe this diagnosis using nonmedical language.

4. Identify the surgical procedure noted in the history that was *initially* performed to treat Mr. Stratten's heart disease.
- dilation of narrow occluded coronary arteries
 - replacement of occluded arteries with transplanted portion of vein
 - replacement of a diseased heart valve
 - coring of the lining of an artery to remove a thrombus
 - heart transplant

5. What were the patient's symptoms 8 years later on May 15, 20xx?

Using nonmedical language, briefly describe the diagnosis made at that time.

6. Describe the test that showed changes consistent with the diagnosis.

7. Spell out TPA, and identify the reason why the drug was given to Mr. Stratten.

8. Which of the following were findings of the radiographic tests performed after the May 15 hospitalization? (Mark all that are appropriate.)

- hemorrhage of insertion site of obtuse marginal artery graft
- thromboembolism in the left anterior descending artery
- occluded circumflex artery
- torn sutures of the circumflex artery graft
- stenosis of the left anterior descending artery graft
- total occlusion of the left internal mammary vein graft
- dilated right coronary artery graft

9. List the arteries that were grafted in *both* bypass operations.

10. Using nonmedical language, list the three symptoms Mr. Stratten is now experiencing.

a. _____

b. _____

c. _____

11. Mr. Stratten is taking eight different medications. Translate the medication instruction for these:

Drug Name	Dosage	Frequency of Dose
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

12. What family members have had a medical history of problems in the same body system?

13. In addition to Mr. Stratten’s heart problems, Dr. Feingold’s physical examination revealed abnormal findings in what other areas?

- a. head
- b. abdomen
- c. extremities
- d. all of the above
- e. none of the above

14. What does “probable end-stage cardiomyopathy” mean? What treatment seems possible to Dr. Feingold, even though he had not yet performed the diagnostic tests for which he hospitalized Mr. Stratten?

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HISTORY

CHIEF COMPLAINT:

The patient is admitted for heart catheterization and coronary arteriography with a view of possible cardiac transplantation.

HISTORY OF PRESENT ILLNESS:

The patient is a 53-year-old Caucasian male who has had a known history of coronary artery disease. The patient had initial 4-vessel bypass surgery 10 years ago on July 18, 20xx, at which time the patient had a saphenous vein bypass graft to the left anterior descending, diagonal, obtuse marginal, and right coronary artery.

Eight years later, on May 15, 20xx, the patient was rehospitalized at Central Medical Center because of acute chest pain with electrocardiogram changes consistent with acute inferior wall infarction for which the patient was given TPA. Following that, the patient had dramatic improvement in terms of electrocardiogram changes and symptoms and subsequently underwent reevaluation, including heart catheterization and coronary arteriography. This revealed the following findings:

Native right coronary artery, left anterior descending, and circumflex were all totally occluded. The bypass graft to the left anterior descending had an 80% stenosis proximally and was totally occluded distally. Circumflex was previously totally occluded. Bypass graft to the obtuse marginal had a 70% occlusion followed by 90% occlusion at the insertion site of the graft. The right coronary artery graft had 95-98% stenosis. This diagonal graft was previously demonstrated to be totally occluded.

Because of this, the patient underwent a second bypass surgery on May 25, 20xx, at which time the patient had a left internal mammary graft to the left anterior descending and right internal mammary graft to the diagonal. The patient also had a saphenous vein bypass graft to the obtuse marginal and right coronary artery.

Since that time, the patient has continued to have intermittent angina, particularly within the last six months or so. In addition, the patient has gotten progressively weaker and dyspneic.

(continued)

HISTORY AND PHYSICAL
PAGE 1

PT. NAME: STRATTEN, R.
ID NO:
ROOM NO:
ADM. DATE: October 15, 20xx
ATT. PHYS: C. FEINGOLD, M.D.

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HISTORY

At the present time, the patient is taking Prinivil 5 mg daily in a.m., Procainamide 500 mg q 6 h, Lasix 80 mg b.i.d., Lipitor 10 mg daily, Lanoxin 0.25 mg daily, Aspirin 81 mg daily, Atenolol 10 mg daily, and Nitro-Dur 0.4 mg/hr patch, apply daily q a.m. and remove h.s.

Because of increasing symptoms, the patient is being evaluated for cardiac transplant. The patient is undergoing heart catheterization for evaluation.

PAST MEDICAL HISTORY:

PAST ILLNESSES: There is no prior history of hypertension or diabetes. See above regarding previous coronary bypass surgery and myocardial infarctions.

The patient has a known hiatal hernia, but it is asymptomatic at this time.

ALLERGIES: None known.

MEDICATIONS: See above.

PREVIOUS OPERATIONS: See above.

FAMILY HISTORY:

Father died of coronary artery disease at age 50. Paternal uncle also died of coronary artery disease. Maternal uncle and grandfather are both diabetic. The patient has no siblings. The remainder of family history is noncontributory.

SOCIAL HISTORY:

MARITAL HISTORY: Single.

HABITS: The patient is a nonsmoker and denies drinking ethanolic beverages.

INVENTORY BY SYSTEMS:

Noncontributory. There is no prior history of transient ischemic attack or claudication.

(continued)

HISTORY AND PHYSICAL
PAGE 2

PT. NAME: STRATTEN, R.
ID NO:
ROOM NO:
ADM. DATE: October 15, 20xx
ATT. PHYS: C. FEINGOLD, M.D.

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PHYSICAL EXAMINATION**GENERAL:**

The patient is a well-developed, well-nourished Caucasian male who is not in acute distress.

VITAL SIGNS:

Blood Pressure: 120/80. Pulse: 70 and regular.

HEENT:

HEAD: Normocephalic, atraumatic.

NECK: Neck veins are essentially normal. There are no carotid bruits.

CHEST:

HEART: Revealed cardiomegaly. There is no murmur. There is an equivocal third heart sound.

LUNGS: There are a few basilar rales.

ABDOMEN:

No visceromegaly. The bowel sounds are normal. No masses or tenderness.

RECTAL:

Deferred.

EXTREMITIES:

No clubbing, cyanosis, or peripheral edema. The peripheral pulses are intact.

NEUROLOGIC:

Physiologic.

IMPRESSION:

CORONARY ARTERY DISEASE WITH PREVIOUS ANTERIOR AND INFERIOR WALL INFARCTION STATUS POST PREVIOUS CORONARY BYPASS SURGERY x 2 WITH PROGRESSIVE INCREASE IN SYMPTOMATOLOGY IN TERMS OF ANGINA AND DYSPNEA WITH PROBABLE END-STAGE CARDIOMYOPATHY.

(continued)

HISTORY AND PHYSICAL
PAGE 3

PT. NAME: STRATTEN, R.
ID NO:
ROOM NO:
ADM. DATE: October 15, 20xx
ATT. PHYS: C. FEINGOLD, M.D.

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HISTORY AND PHYSICAL

The details of heart catheterization and coronary angiography have been discussed with the patient, including the risks and potential complications. The patient understands and wishes to proceed. This will be performed on October 16, 20xx.


C. Feingold, M.D.

CF:ti

D: 10/19/20xx

T: 10/20/20xx

HISTORY AND PHYSICAL
Page 4

PT. NAME: STRATTEN, R.
ID NO:
ROOM NO:
ADM. DATE: October 15, 20xx
ATT. PHYS: C. FEINGOLD, M.D.

MEDICAL RECORD 7.3

William Smith woke in the middle of the night with substernal chest heaviness that radiated to both arms. After getting no relief from taking aspirin and antacids, he went to the emergency room and was seen by Dr. Roland Galasso. The chest pain subsided only after administration of intravenous nitroglycerin. Dr. Galasso decided to admit Mr. Smith for further cardiac evaluation and treatment. A cardiac catheterization was performed the next day.

Directions

Read Medical Record 7.3 for William Smith (pages 239–240) and answer the following questions. This record is a report of the cardiac catheterization performed by Dr. Galasso and transcribed by a cardiology department transcriptionist.

QUESTIONS ABOUT MEDICAL RECORD 7.3

Write your answers in the spaces provided.

1. Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record:

ostium _____

hemodynamic _____

mitral regurgitation _____

focal _____

2. In your own words, not using medical terminology, briefly describe the *indications* for performing the cardiac catheterization.

3. Put the following actions in correct order by numbering them 1 to 14:

_____ pigtail catheter advanced to the left ventricle

_____ hemostasis obtained by C-clamp pressure

_____ right coronary arteriography performed

_____ pigtail catheter exchanged for left coronary artery catheter

_____ informed consent signed

_____ arterial pressures recorded

_____ right groin prepped and draped

_____ left coronary arteriography performed

_____ right femoral artery entered and Cordis sheath inserted

_____ right coronary catheter and femoral artery sheath removed

_____ pigtail catheter inserted through sheath and guided to descending thoracic aorta

_____ left coronary catheter exchanged for right coronary catheter

_____ left ventriculography performed

_____ heparin administered

4. Briefly describe the conclusions of the procedure in nonmedical language:

a. _____

b. _____

5. From the recommendations, describe the test that will be performed right away.

6. Identify the possible complications likely to occur in the future.

Describe the procedure that is recommended should these complications occur.

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CARDIAC CATHETERIZATION**DATE OF PROCEDURE:** November 3, 20xx**PROCEDURE PERFORMED:** Left heart catheterization with left ventriculography, left and right coronary arteriography.**INDICATIONS:** Recent onset of angina pectoris.**CATHETERS USED:** 6 French pigtail Cordis, 6 French JLA, 6 French JR4.**CONTRAST:** Optiray-320.**MEDICATIONS GIVEN:** None.**PROCEDURE IN DETAIL:**

Informed consent was obtained. The patient was brought to the Cardiac Catheterization Laboratory where the right groin was prepped and draped in the usual sterile fashion. The skin was anesthetized with 1% Xylocaine. The right femoral artery was entered by Seldinger technique and a 7 French Cordis sheath was inserted through which a 7 French angled pigtail catheter was inserted and advanced under fluoroscopic guidance to the descending thoracic aorta. Heparin was administered. Arterial pressures were recorded. The pigtail catheter was then advanced across the aortic valve to the left ventricle. Pressures were recorded, and left ventriculography was performed by power injection of 40 cc of contrast at 12 cc per second with cine in the RAO projection. Post ventriculography pressures were recorded, and pullback across the aortic valve was performed. The pigtail catheter was exchanged for a left coronary catheter as listed above which was advanced to the ostium of the left coronary artery. Left coronary arteriography was performed by hand injections of 8-10 cc of contrast with cine in multiple views. The left coronary catheter was exchanged for the right coronary catheter, as listed above, and it was then advanced to the ostium of the right coronary artery. Right coronary arteriography was performed by hand injections of 8-10 cc of contrast with cine in multiple views. The right coronary catheter and femoral artery sheath were removed, and hemostasis was obtained by C-clamp pressure for 30-45 minutes. Complications: None. Fluoro time: 2.2 minutes. Contrast dose: 76 cc.

(continued)

CARDIAC CATHETERIZATION Page 1	PT. NAME: SMITH, W. ID NO: ROOM NO: ATT. PHYS: R. GALASSO, M.D.
-----------------------------------	--

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CARDIAC CATHETERIZATION

FINDINGS:

1. HEMODYNAMICS:

Left ventricle: 182/0; end-diastolic: 16 mm Hg. Aorta: 190/70; mean: 110 mm Hg.

2. LEFT VENTRICULOGRAPHY:

The left ventricle is normal in configuration, dimensions, and segmental wall motion with ejection fraction computed at 58% by area-length method. There is no evidence of mitral regurgitation.

3. CORONARY ARTERIOGRAPHY:

Left Main: Normal.

Left Anterior Descending: Seventy percent focal stenosis immediately after the first septal perforator branch. The remainder of the left anterior descending is within normal limits.

Ramus Intermedius: Normal.

Left Circumflex: Nondominant vessel with one marginal branch, all free of disease.

Right Coronary Artery: Large dominant vessel free of disease.

CONCLUSIONS:

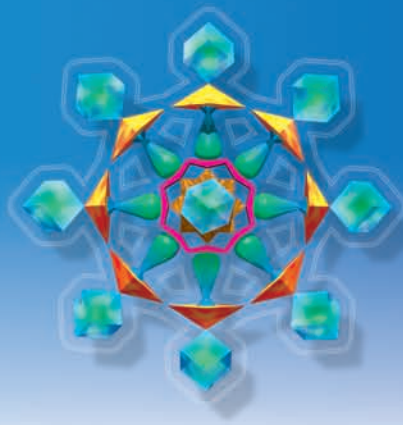
1. MODERATE STENOSIS OF THE LEFT ANTERIOR DESCENDING CORONARY ARTERY.
2. NORMAL LEFT VENTRICULAR FUNCTION WITH EJECTION FRACTION 56%.

RECOMMENDATIONS:

The patient will be managed medically at this time. Radionuclide perfusion stress testing will be performed. If the patient has progressive anginal symptoms or has marked reversible ischemia in the distribution of the left anterior descending coronary artery, angioplasty of this vessel would be considered.

CARDIAC CATHETERIZATION
Page 2

PT. NAME: SMITH, W.
ID NO:
ROOM NO:
ATT. PHYS: R. GALASSO, M.D.



Blood and Lymph Systems

OBJECTIVES

After completion of this chapter, you will be able to

- ◆ Define common term components used in relation to the blood and lymph systems
- ◆ Describe the basic functions of the blood and lymph systems
- ◆ Define the basic anatomical terms referring to blood and lymph
- ◆ Define common symptomatic and diagnostic terms referring to the blood and lymph systems
- ◆ List common diagnostic tests and procedures related to the blood and lymph systems
- ◆ Identify common operative terms referring to the blood and lymph systems
- ◆ Identify common therapeutic terms including drug classifications related to the blood and lymph systems
- ◆ Explain terms and abbreviations used in documenting medical records involving the blood or lymph systems

Combining Forms

Combining Form	Meaning	Example
blast/o	germ or bud	erythroblastemia ě-rith'ró-blas-tē'mē-ă
-blast (also a suffix)		megaloblast meg'ă-lō-blast
chrom/o	color	chromic krō'mik
chromat/o		hemochromatosis hē'mō-krō-mă-tō'sis
chyl/o	juice	chylemia kī-lē'mē-ă
hem/o	blood	hemostat hē'mō-stat
hemat/o		hematopoiesis hē'mă-tō-poy-ē'sis

Combining Form	Meaning	Example
immun/o	safe	immunology im'yū-nol'ō-jē
lymph/o	clear fluid	lymphogenous lim-foj'ē-nūs
morph/o	form	morphologic mōr-fō-loj'ik
myel/o	bone marrow (also spinal cord)	myelogenous mī-ē-loj'ē-nūs
phag/o	eat or swallow	phagocytosis fag'ō-sī-tō'sis
plas/o	formation	aplastic ā-plas'tik
reticul/o	a net	reticulocyte re-tik'yū-lō-sīt
splen/o	spleen	splenomegaly splē-nō-meg'ă-lē
thromb/o	clot	thrombocyte throm'bō-sīt
thym/o	thymus gland	thymic thī'mik

Blood System Overview

The blood circulates through the blood vessels to transport oxygen, nutrients, and hormones to body cells and to carry away wastes. The liquid portion of the blood is called *plasma*. The cellular components suspended in the plasma are the *erythrocytes*, *leukocytes*, and *platelets*. The portion of the plasma that remains after the clotting process is called *serum* (Fig. 8.1).

Anatomical Terms

Term	Meaning
TERMS RELATED TO BLOOD FLUID	
plasma plaz'mah	liquid portion of the blood and lymph containing water, proteins, salts, nutrients, hormones, vitamins, and cellular components (leukocytes, erythrocytes, and platelets)
serum sēr'ŭm	liquid portion of the blood left after the clotting process
CELLULAR COMPONENTS OF THE BLOOD	
erythrocyte ē-rith'rō-sīt	red blood cell that transports oxygen and carbon dioxide within the bloodstream
hemoglobin hē'mō-glō'bin	protein-iron compound contained in the erythrocyte that has bonding capabilities for the transport of oxygen and carbon dioxide



SERUM. Serum is Latin for whey, the

watery part of curdled milk, which looks similar to the watery part of clotted blood. The term was first recorded in English in 1672.

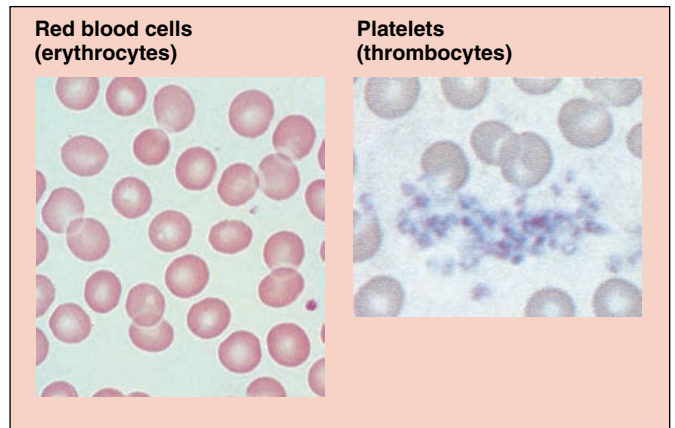
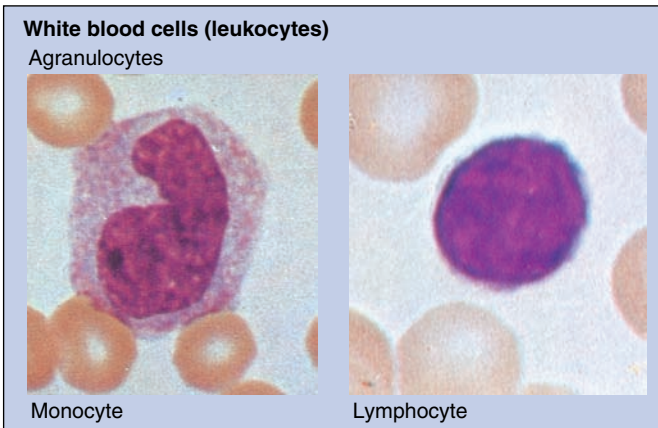
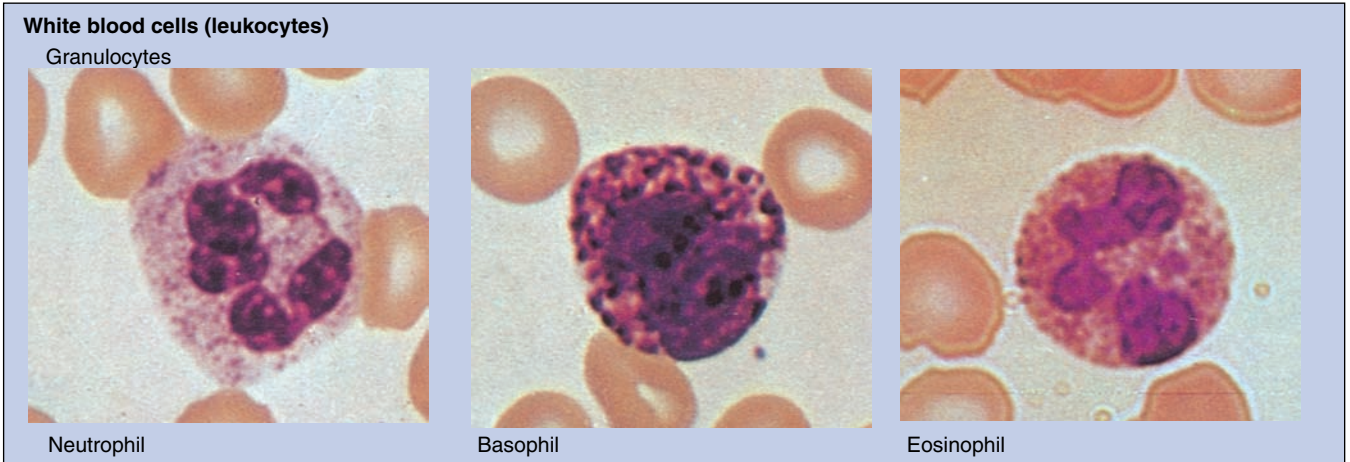
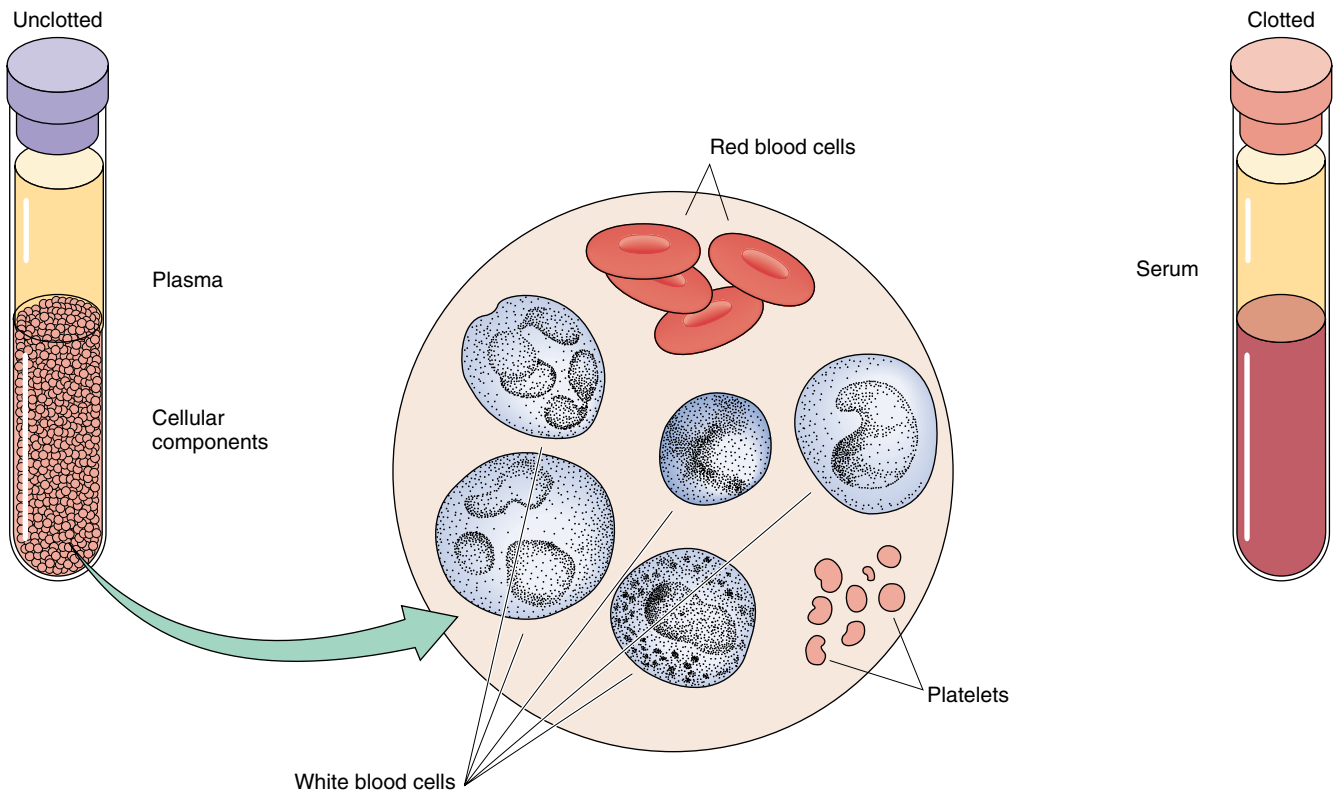


Figure 8.1 Components of the blood.

Term	Meaning
leukocyte lu'kō-sīt	white blood cell that protects the body from invasion of harmful substances
granulocytes gran'yū-lō-sīts	a group of leukocytes containing granules in their cytoplasm
neutrophil nū' trō-fil	a granular leukocyte, named for the neutral stain of its granules, that fights infection by swallowing bacteria (phagocytosis) (neutro = neither; phil = attraction for)
polymorphonuclear leukocyte (PMN) pol-ē-mōr'fō-nū' klē-ār	another term for neutrophil, named for the many segments present in its nucleus (poly = many; morpho = form; nucleus = kernel)
band	an immature neutrophil
eosinophil ē-ō-sin'ō-fil	a granular leukocyte, named for the rose-color stain of its granules, that increases with allergy and some infections [eos = dawn-colored (rosy); phil = attraction for]
basophil bā'sō-fil	a granular leukocyte, named for the dark stain of its granules, that brings anticoagulant substances to inflamed tissues (baso = base; phil = attraction for)
agranulocytes ă-gran'yū-lō-sīts	a group of leukocytes without granules in their nuclei
lymphocyte lim'fō-sīt	an agranulocytic leukocyte that is active in the process of immunity—there are four categories of lymphocytes: T cells (thymus dependent) B cells (bone marrow derived) NK cells (natural killer) K-type cells
monocyte mon'ō-sīt	an agranulocytic leukocyte that performs phagocytosis to fight infection (mono = one)
platelets plāt'lets	thrombocytes; cell fragments in the blood essential for blood clotting (coagulation)

Lymphatic System Overview

The lymphatic system is made up of an intricate network of capillaries, vessels, valves, ducts, nodes, and organs. It protects the body by filtering microorganisms and foreign particles from the lymph and supporting the activities of the lymphocytes in the immune response. It also serves to maintain the body's internal fluid environment by acting as an intermediary between the blood in the capillaries and tissue cells. In addition, it is responsible for carrying fats away from the digestive organs (Fig. 8.2).

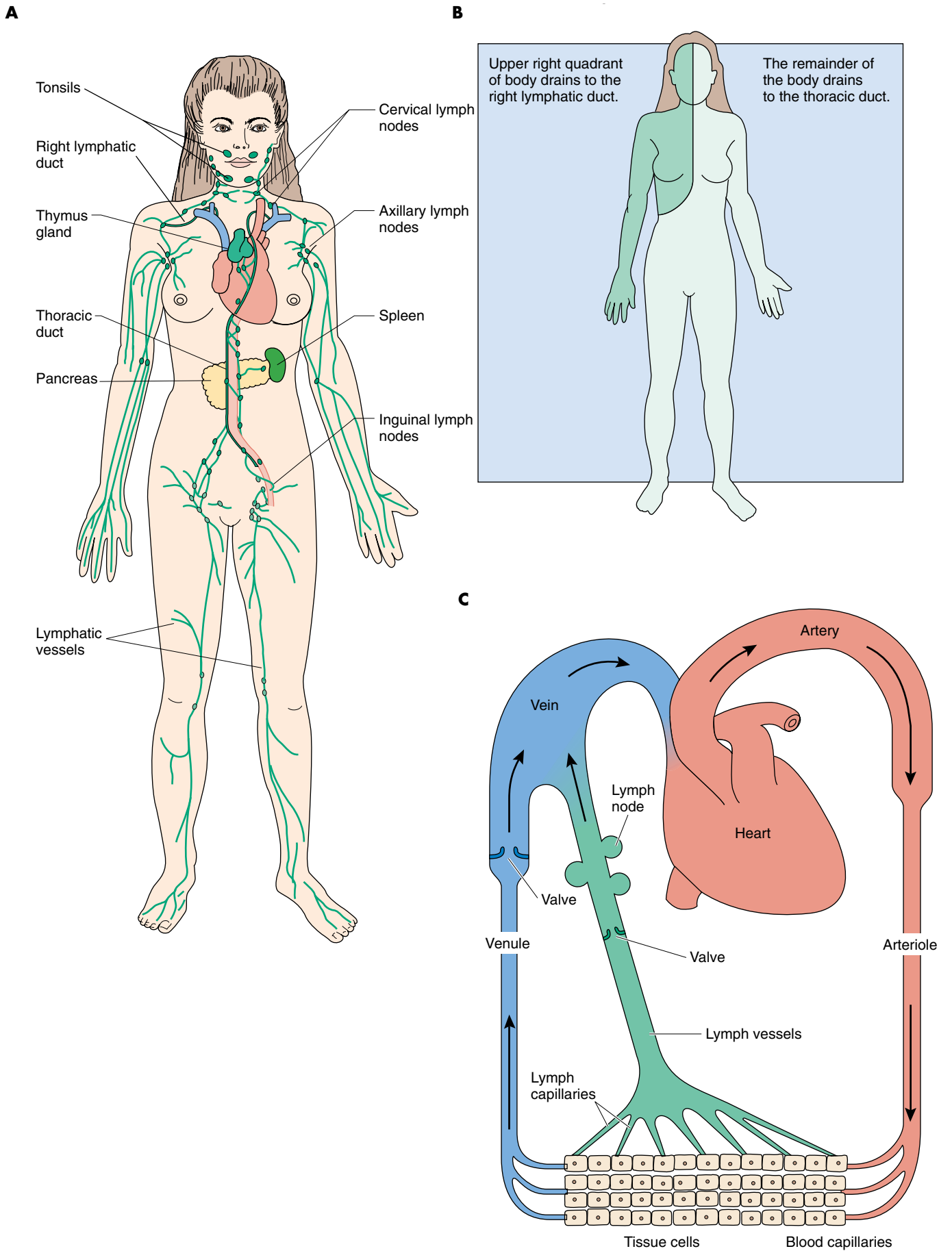


Figure 8.2 Lymphatic system. **A.** Lymph structures. **B.** Lymph drainage. **C.** Blood and lymph circulation.

Anatomical Terms

Term	Meaning
LYMPH ORGANS	
thymus thī´mūs	the primary gland of the lymphatic system, located within the mediastinum; helps maintain the body's immune response by producing T lymphocytes
spleen splēn	the organ between the stomach and diaphragm that filters out aging blood cells, removes cellular debris by performing phagocytosis, and provides the environment for the initiation of immune responses by lymphocytes
LYMPH STRUCTURES	
lymph body limf	fluid originating in the organs and tissues of the body that is circulated through the lymph vessels
lymph capillaries limf kap´i-lār-ēz	microscopic vessels that draw lymph from the tissues to the lymph vessels
lymph vessels limf ves´ēlz	vessels that receive lymph from the lymph capillaries and circulate it to the lymph nodes
lacteals lak´tē-ālz	specialized lymph vessels in the small intestine that absorb fat into the bloodstream (lacteus = milky)
chyle kīl	a white or pale yellow substance of the lymph that contains fatty substances absorbed by the lacteals
lymph nodes limf nōdz	many small oval structures that filter the lymph received from the lymph vessels—major locations include the cervical region, axillary region, and inguinal region
lymph ducts limf düktz	collecting channels that carry lymph from the lymph nodes to the veins
right lymphatic duct lim-fat´ik dükt	receives lymph from the upper-right part of the body
thoracic duct thō-ras´ik dükt	receives lymph from the left side of the head, neck, chest, abdomen, left arm, and lower extremities
IMMUNITY	
antigen an´ti-jen	a substance that, when introduced into the body, causes the formation of antibodies against it
antibody an´tē-bod-ē	a substance produced by the body that destroys or inactivates an antigen that has entered the body
immunoglobulins (Ig) im´yu-nō-glob´yu-lins	protein antibodies secreted by B lymphocytes that protect the body from invasion of foreign pathogens; the five major classes include IgA, IgD, IgE, IgG, and IgM

Term	Meaning
immunity i-myū'ni-tē	process of disease protection induced by exposure to an antigen
active immunity ak'tiv i-myū'ni-tē	an immunity that protects the body against a future infection, as the result of antibodies that develop <i>naturally</i> after contracting an infection or <i>artificially</i> after administration of a vaccine
passive immunity pas'iv i-myū'ni-tē	an immunity resulting from antibodies that are conveyed <i>naturally</i> through the placenta to a fetus or <i>artificially</i> by injection of a serum containing antibodies

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC	
<i>Related to Blood</i>	
microcytosis mī'krō-sī-tō'sis	the presence of small red blood cells (Fig. 8.3)
macrocytosis mak'rō-sī-tō'sis	the presence of large red blood cells (see Fig. 8.4)
anisocytosis an-ī'sō-sī-tō'sis	the presence of red blood cells of unequal size (an = without; iso = equal) (see Fig. 8.4)
poikilocytosis poy'ki-lō-sī-tō'sis	the presence of large, irregularly shaped red blood cells (poikil/o = irregular) (Fig. 8.4)
reticulocytosis re-tik'yū-lō-sī-tō'sis	an increase of immature erythrocytes in the blood
erythropenia ě-rith-rō-pē'nē-ă	an abnormally reduced number of red blood cells
lymphocytopenia lim'fō-sī-tō-pē'nē-ă	an abnormally reduced number of lymphocytes
neutropenia nū'trō-pē'nē-ă	a decrease in the number of neutrophils
pancytopenia pan'sī-tō-pē'nē-ă	an abnormally reduced number of all cellular components in the blood
hemolysis hē-mol'i-sis	breakdown of the red blood cell membrane
<i>Related to Lymph</i>	
immunocompromised im'yū-nō-kom'pro-m īzd	impaired immunological defenses caused by an immunodeficiency disorder or therapy with immunosuppressive agents
immunosuppression im'yū-nō-sū-presh'ŭn	impaired ability to provide an immune response
lymphadenopathy lim-fad-ě-nop'ă-thē	the presence of enlarged (diseased) lymph nodes

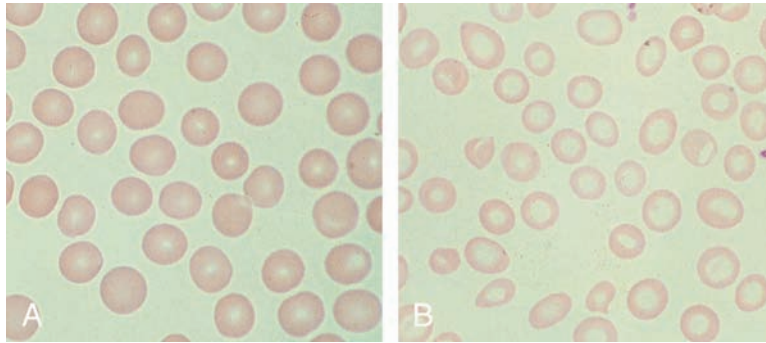


Figure 8.3 A blood smear showing normal erythrocytes (A) compared with a blood smear revealing microcytic-hypochromic erythrocytes in a patient with iron deficiency anemia (B).

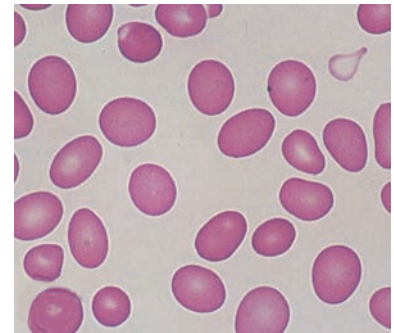


Figure 8.4 Photomicrograph of a blood smear from a patient with pernicious anemia reveals macrocytosis, anisocytosis, and poikilocytosis.

Term	Meaning
splenomegaly splē-nō-meg´ā-lē	enlargement of the spleen
DIAGNOSTIC	
acquired immunodeficiency syndrome (AIDS) ă-kwīrd´ i-myūn´o-dē-fish´en-sē sin´drōm	a syndrome caused by the human immunodeficiency virus (HIV) that renders immune cells ineffective, permitting opportunistic infections, malignancies, and neurological diseases to develop; it is transmitted sexually or through exposure to contaminated blood
anemia ă-nē´mē-ă	a condition in which there is a reduction in the number of red blood cells, the amount of hemoglobin, or the volume of packed red cells in the blood, resulting in a diminished ability of the red blood cells to transport oxygen to the tissues; common types follow:
aplastic anemia ā-plas´tik	a normocytic-normochromic type of anemia characterized by the failure of bone marrow to produce red blood cells
iron deficiency anemia i´ern dē-fish´en-sē	a microcytic-hypochromic type of anemia characterized by a lack of iron, affecting production of hemoglobin and characterized by small red blood cells containing low amounts of hemoglobin (see Fig. 8.3)
pernicious anemia per-nish´ūs	a macrocytic-normochromic type of anemia characterized by an inadequate supply of vitamin B ₁₂ , causing red blood cells to become large, varied in shape, and reduced in number (see Fig. 8.4)
autoimmune disease aw-tō-i-myun´ di-zēz´	any disorder characterized by abnormal function of the immune system that causes the body to produce antibodies against itself, resulting in tissue destruction or loss of function; rheumatoid arthritis and lupus are examples of autoimmune diseases

Term	Meaning
erythroblastosis fetalis ě-rith'ró-blas-tó'sis fē'tă'lis	a disorder that results from the incompatibility of a fetus with an Rh-positive blood factor and a mother who is Rh negative, causing red blood cell destruction in the fetus; necessitates a blood transfusion to save the fetus
Rh factor	the presence, or lack, of antigens on the surface of red blood cells that may cause a reaction between the blood of the mother and fetus, resulting in fetal anemia
Rh positive	the presence of antigens
Rh negative	the absence of antigens
hemochromatosis hē'mō-krō-mă-tó'sis	a hereditary disorder that results in an excessive buildup of iron deposits in the body
hemophilia hē-mō-fil'ē-ă	a group of hereditary bleeding disorders in which there is a defect in clotting factors necessary for the coagulation of blood
leukemia lū-kē'mē-ă	a chronic or acute malignant (cancerous) disease of the blood-forming organs, marked by abnormal leukocytes in the blood and bone marrow; classified according to the types of white cells affected (e.g., myelocytic, lymphocytic)
myelodysplasia mī'ě-lō-dis-plă'zē-ă	a disorder within the bone marrow characterized by the proliferation of abnormal stem cells (cells that give rise to the different types of blood cells); usually develops into a specific type of leukemia
lymphoma lim-fō'mă	any neoplastic disorder of lymph tissue, usually malignant, as in Hodgkin disease
metastasis mě-tas'tă-sis	the process by which cancer cells are spread by blood or lymph circulation to distant organs
mononucleosis mon'ō-nū-klē-ō'sis	a condition caused by the Epstein-Barr virus characterized by an increase in mononuclear cells (monocytes and lymphocytes) in the blood, along with enlarged lymph nodes (lymphadenopathy), fatigue, and sore throat (pharyngitis)
polycythemia pol'ē-sī-thē'mē-ă	an increase in the number of erythrocytes and hemoglobin in the blood
septicemia sep-ti-sē'mē-ă	a systemic disease caused by the infection of microorganisms and their toxins in the circulating blood
thrombocytopenia throm'bō-sī-tō-pē'nē-ă	a bleeding disorder characterized by an abnormal decrease in the number of platelets in the blood, which impairs the clotting process

Diagnostic Tests and Procedures

Test or Procedure

Explanation

BLOOD STUDIES

blood chemistry blūd kem'is-trē	a test of the fluid portion of blood to measure the presence of a chemical constituent (e.g., glucose, cholesterol)
blood chemistry panels	specialized batteries of automated blood chemistry tests performed on a single sample of blood; used as a general screen for disease or to target specific organs or conditions (e.g., metabolic panel, lipid panel, arthritis panel)
basic metabolic panel met-ă-bol'ik	battery of tests used as a general screen for disease: calcium, carbon dioxide (CO ₂), chloride, creatinine, glucose, potassium, sodium and blood urea nitrogen (BUN)
comprehensive metabolic panel	tests in addition to basic metabolic panel for expanded screening purposes: albumin, bilirubin, alkaline phosphatase, protein, ALT, and AST (Fig. 8.5)
blood culture blūd kŭl'chŭr	a test to determine if infection is present in the bloodstream by isolating a specimen of blood in an environment that encourages the growth of microorganisms; the specimen is observed and the organisms that grow in the culture are identified
CD4 cell count	a measure of the number of CD4 cells (a subset of T lymphocytes) in the blood; used in monitoring the course of HIV and timing the treatment of AIDS; the normal adult range is 600–1,500 cells
complete blood count (CBC)	the most common laboratory blood test performed as a screen of general health or for diagnostic purposes; the following is a listing of the component tests included in a CBC (Fig. 8.6) (note: CBC results are usually reported with normal values so that the clinician can interpret the results based on the instrumentation used by the laboratory; normal ranges also may vary depending on factors such as the region and climate)
white blood count (WBC)	a count of the number of white blood cells per cubic millimeter obtained by manual or automated laboratory methods
red blood count (RBC)	a count of the number of red blood cells per cubic millimeter obtained by manual or automated laboratory methods
hemoglobin (HGB or Hgb) hē'mō-glō'bin	a test to determine the blood level of hemoglobin (expressed in grams)
hematocrit (HCT or Hct) hē'mă-tō-krit	a measurement of the percentage of packed red blood cells in a given volume of blood

CENTRAL MEDICAL CENTER

211 Medical Center Drive • Central City, US 90000-1234 • PHONE: (012) 125-6784 • FAX: (012) 125-9999

11/02/20xx
14:27

NAME : TEST, PATIENT LOC: TEST DOB: 2/2/xx AGE: 27Y
MR# : TEST-221 SEX: M
ACCT# : H111111111

M63558 COLL: 11/2/20xx 13:23 REC: 11/2/20xx 13:24

HEMOGRAM

CBC			
WBC	*11.5	[4.5–10.5]	K/UL
RBC	5.84	[4.6–6.2]	M/UL
HGB	17.2	[14.0–18.0]	G/DL
HCT	50.8	[42.0–52.0]	%
MCV	87	[82–92]	FL
MCH	29.5	[27–31]	PG
MCHC	33.9	[32–36]	G/DL
PLT	202	[150–450]	K/UL

Auto Lymph %	15	[20–40]	%
Auto Mono %	2	[1–11]	%
Auto Neutro %	82	[50–75]	%
Auto Eos %	1	[0–6]	%
Auto Baso %	0	[0–2]	%
Auto Lymph #	1.7	[1.5–4.0]	K/UL
Auto Mono #	0.2	[0.2–0.9]	K/UL
Auto Neutro #	9.4	[1.0–7.0]	K/UL
Auto Eos #	0.1	[0–0.7]	K/UL
Auto Baso #	0.0	[0–0.2]	K/UL

TEST, PATIENT TEST-221
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END OF REPORT

PAGE 1
INTERIM REPORT

INTERIM REPORT COMPLETE

Figure 8.6 Complete blood count (CBC) report.

Test or Procedure	Explanation												
differential count	a determination of the number of each type of white blood cell (leukocyte) seen on a stained blood smear; each type is counted and reported as a percentage of the total examined <table border="0"> <tr> <td><i>Type of Leukocyte</i></td> <td><i>Normal Range</i></td> </tr> <tr> <td>lymphocytes</td> <td>25–33%</td> </tr> <tr> <td>monocytes</td> <td>3–7%</td> </tr> <tr> <td>neutrophils</td> <td>54–75%</td> </tr> <tr> <td>eosinophils</td> <td>1–3%</td> </tr> <tr> <td>basophils</td> <td>0–1%</td> </tr> </table>	<i>Type of Leukocyte</i>	<i>Normal Range</i>	lymphocytes	25–33%	monocytes	3–7%	neutrophils	54–75%	eosinophils	1–3%	basophils	0–1%
<i>Type of Leukocyte</i>	<i>Normal Range</i>												
lymphocytes	25–33%												
monocytes	3–7%												
neutrophils	54–75%												
eosinophils	1–3%												
basophils	0–1%												
red cell morphology mōr-fol'ō-jē	as part of identifying and counting the WBCs, the condition of the size and shape of the red blood cells in the background of the smeared slide is noted (e.g., anisocytosis, poikilocytosis)												
platelet count (PLT) plāt'let	a calculation of the number of thrombocytes in the blood: normal range 150,000–450,000/cubic millimeters												

Test or Procedure	Explanation
erythrocyte sedimentation rate (ESR) ě-rith'ró-sīt sed'i-men-tā'shūn rāt	a timed test to measure the rate at which red blood cells settle or fall through a given volume of plasma
partial thromboplastin time (PTT)	a test to determine coagulation defects such as platelet disorders
thromboplastin throm-bō-plas'tin	a substance present in tissues, platelets, and leukocytes that is necessary for coagulation
prothrombin time (PT)	a test to measure the activity of prothrombin in the blood
prothrombin prō-throm'bin	a protein substance in the blood that is essential to the clotting process
venipuncture ven-i-pūnk'chūr	an incision into or puncture of a vein to withdraw blood for testing
phlebotomy flě-bot'ō-mē	

BONE AND LYMPH STUDIES

bone marrow aspiration bōn mar'ō as-pi-rā'shūn	a needle aspiration of bone marrow tissue for pathological examination (Fig. 8.7)
bone marrow biopsy bōn mar'ō bī'op-sē	a pathological examination of bone marrow tissue
lymphangiogram lim-fan'jē-ō-gram	an x-ray image of a lymph node or vessel taken after injection of a contrast medium

DIAGNOSTIC IMAGING

computed tomography (CT)	full-body x-ray CT images are used to detect tumors and cancers such as lymphoma
positron emission tomography (PET)	radionuclide scans, especially of the whole body, are useful in determining the recurrence of cancers or to measure response to therapy; commonly used in evaluating lymphoma

Operative Terms

Term	Meaning
bone marrow transplant bōn mar'ō tranz'plant	the transplantation of healthy bone marrow from a compatible donor to a diseased recipient to stimulate blood cell production
lymphadenectomy lim-fad-ě-nek'tō-mē	the removal of a lymph node
lymphadenotomy lim-fad-ě-not'ă-mē	an incision into a lymph node
lymph node dissection limf nōd di-sek'shūn	the removal of possible cancer-carrying lymph nodes for pathological examination

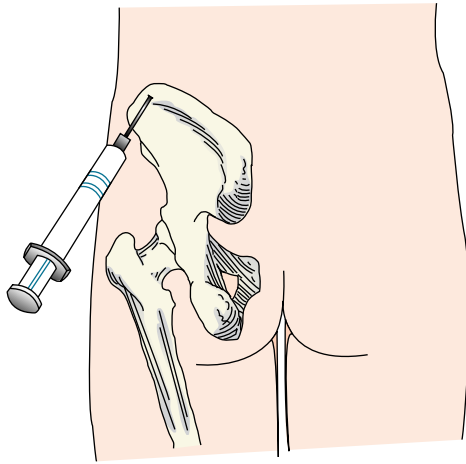


Figure 8.7 Bone marrow aspiration. Posterior view of the pelvic region showing common site.

Term	Meaning
splenectomy splē-nek'tō-mē	the removal of the spleen
thymectomy thī-mek'tō-mē	the removal of the thymus gland

Therapeutic Terms

Term	Meaning
blood transfusion	the introduction of blood products into the circulation of a recipient whose blood volume is reduced or deficient in some manner
autologous blood aw-tol'ō-gūs blud	blood donated by, and stored for, a patient for future personal use (e.g., upcoming surgery)
homologous blood hō-mol'ō-gūs blud	blood voluntarily donated by any person for transfusion to a compatible recipient
blood component therapy	the transfusion of specific blood components such as packed red blood cells, platelets, and plasma
crossmatching	a method of matching a donor's blood to the recipient by mixing a sample in a test tube to determine compatibility
chemotherapy kem'ō-thēr'ă-pē	the treatment of malignancies, infections, and other diseases with chemical agents that destroy selected cells or impair their ability to reproduce
immunotherapy im'ū-nō-thār'ă-pē	the use of biological agents to prevent or treat disease by stimulating the body's own defense mechanisms; as seen in the treatment of AIDS, cancer, and allergy
plasmapheresis plaz'mă-fě-rē'sis	the removal of plasma from the body with separation and extraction of specific elements (such as platelets) followed by reinfusion (apheresis = a withdrawal)

Term	Meaning
<i>Common Therapeutic Drug Classifications</i>	
anticoagulant an'tē-kō-ag'yū-lant	a drug that prevents clotting of the blood
hemostatic hē-mō-stat'ik	a drug that stops the flow of blood within the vessels
vasoconstrictor vā'sō-kon-strik'ter	a drug that causes a narrowing of blood vessels, decreasing blood flow
vasodilator vā'sō-dī'lā-ter	a drug that causes dilation of blood vessels, increasing blood flow

Summary of Chapter 8 Acronyms/Abbreviations

AIDS.....acquired immunodeficiency syndrome	Ig.....immunoglobulin
ALT.....alanine aminotransferase (enzyme)	MCH.....mean corpuscular (cell) hemoglobin
AST.....aspartate aminotransferase (enzyme)	MCHC.....mean corpuscular (cell) hemoglobin concentration
BUN.....blood urea nitrogen	MCV.....mean corpuscular (cell) volume
CBC.....complete blood count	PET.....positron emission tomography
CO₂.....carbon dioxide	PLT.....platelet count
CT.....computed tomography	PMN.....polymorphonuclear leukocyte
ESR.....erythrocyte sedimentation rate	PT.....prothrombin time
Fe.....iron (ferrous)	PTT.....partial thromboplastin time
HCT or Hct.....hematocrit	RBC.....red blood cell or count
HGB or Hgb.....hemoglobin	WBC.....white blood cell or count



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

EXAMPLE

dys-hematopoi-esis

_____ / _____ / _____
 P CF S

dys/hemato/poiesis

P CF S

DEFINITION: painful, difficult, or faulty/blood/formation

1. erythroblastosis

_____ / _____ / _____
 CF R S

DEFINITION: _____

2. myelodysplasia

_____ / _____ / _____ / _____
 CF P R S

DEFINITION: _____

3. hemocytometer

_____ / _____ / _____
 CF CF S

DEFINITION: _____

4. splenorrhagia

_____ / _____
 CF S

DEFINITION: _____

5. lymphadenitis

_____ / _____ / _____
 R R S

DEFINITION: _____

6. immunotoxic

_____ / _____ / _____
 CF R S

DEFINITION: _____

7. reticulocytosis

_____ / _____ / _____
 CF R S

DEFINITION: _____

8. thymopathy

_____ / _____ / _____
 CF R S

DEFINITION: _____

9. leukocytic

_____ / _____ / _____
 CF R S

DEFINITION: _____

10. lymphangiogram

_____ / _____ / _____
 R CF S

DEFINITION: _____

11. splenomegaly

_____ / _____
 CF S

DEFINITION: _____

12. promyelocyte

_____ / _____ / _____ / _____
 P CF R S

DEFINITION: _____

13. leukocytopenia

_____ / _____ / _____
 CF CF S

DEFINITION: _____

14. splenectomy

_____ / _____
 R S

DEFINITION: _____

15. chylopoiesis

_____ / _____
 CF S

DEFINITION: _____

16. lymphoma

_____ / _____
 R S

DEFINITION: _____

17. cytomorphology

_____ / _____ / _____
 CF CF S

DEFINITION: _____

18. hemolysis

_____ / _____
 CF S

DEFINITION: _____

19. anemia

_____ / _____
 P S

DEFINITION: _____

20. metastasis

_____ / _____
 P S

DEFINITION: _____

Complete the medical term by writing the missing part:

- 21. neutro_____ = abnormal reduction of neutrophils
- 22. _____ cyte = white blood cell
- 23. hemato_____ = formation of blood
- 24. spleno_____ = enlargement of the spleen
- 25. _____ penia = an abnormally reduced number of red blood cells
- 26. _____ ic = pertaining to the thymus gland
- 27. ____ granulocytes = white cells without granules in their nuclei
- 28. eosino_____ = a granular leukocyte named for its attraction to the rose-color stain of its granules
- 29. _____ cyte = red blood cell
- 30. _____ cytopenia = reduced number of all cellular components in the blood

For each of the following, circle the combining form that corresponds to the meaning given:

- 31. **eat or swallow** phas/o phag/o plas/o
- 32. **clot** thromb/o thym/o lymph/o
- 33. **juice** lymph/o hemat/o chyl/o
- 34. **formation** plas/o troph/o thromb/o
- 35. **color** hem/o chrom/o cyan/o
- 36. **blood** erythr/o hem/o lymph/o

37. **safe** toxic/o reticul/o immun/o
38. **germ or bud** blast/o gen/o crin/o

Fill in the blanks with the appropriate medical terms and abbreviations:

39. The procedure of counting the number of leukocytes in the blood is called a _____ and is abbreviated _____.
40. The blood study that determines the amount of pigment present in RBCs is called a _____ and is abbreviated _____.
41. The blood study that determines packed red blood cell volume is called a _____ and is abbreviated _____.
42. The classification of WBCs is performed in a _____.
43. The calculations provided in blood indices, MCV _____, MCH _____, and MCHC _____, are used to classify types of _____.
44. Venipuncture is also termed _____.
45. Hodgkin disease is a malignant type of _____.

Write the full medical term for the following abbreviations:

46. PT _____
47. ESR _____
48. PTT _____
49. CBC _____

Match the following terms with their meanings:

- | | |
|--------------------------|------------------------------------|
| 50. _____ microcytosis | a. large red blood cells |
| 51. _____ poikilocytosis | b. thrombocyte |
| 52. _____ neutrophil | c. WBC with rose-stained granules |
| 53. _____ monocyte | d. RBC |
| 54. _____ eosinophil | e. agranulocyte active in immunity |
| 55. _____ lymphocyte | f. WBC with dark-stained granules |
| 56. _____ basophil | g. WBC termed “one cell” |
| 57. _____ platelet | h. RBCs of unequal size |
| 58. _____ erythrocyte | i. WBC with granules |
| 59. _____ granulocyte | j. large, irregular RBCs |
| 60. _____ anisocytosis | k. polymorphonuclear WBC |
| 61. _____ macrocytosis | l. small red blood cells |

Write the correct medical term for each of the following:

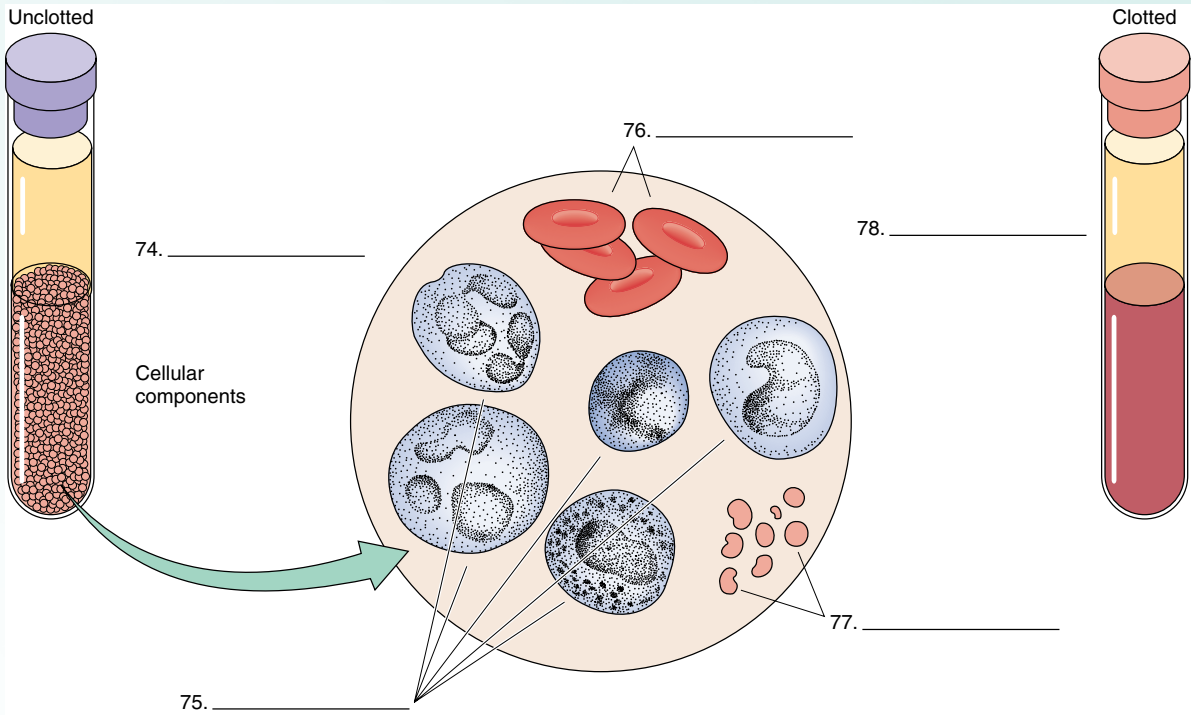
62. impaired ability to provide an immune response _____
63. test tube method of matching a donor’s blood to the recipient _____
64. syndrome caused by HIV _____
65. condition characterized by an increase in mononuclear cells caused by the Epstein-Barr virus _____
66. removal of plasma from the body, extraction of specific elements, then reinfusion _____

Briefly describe the difference between the following terms:

- 67. plasma/serum _____
- _____
- 68. anemia/leukemia _____
- _____
- 69. autologous blood/homologous blood _____
- _____
- 70. antibody/antigen _____
- _____
- 71. vasoconstrictor/vasodilator _____
- _____
- 72. anticoagulant/hemostatic _____
- _____
- 73. polycythemia/hemochromatosis _____
- _____

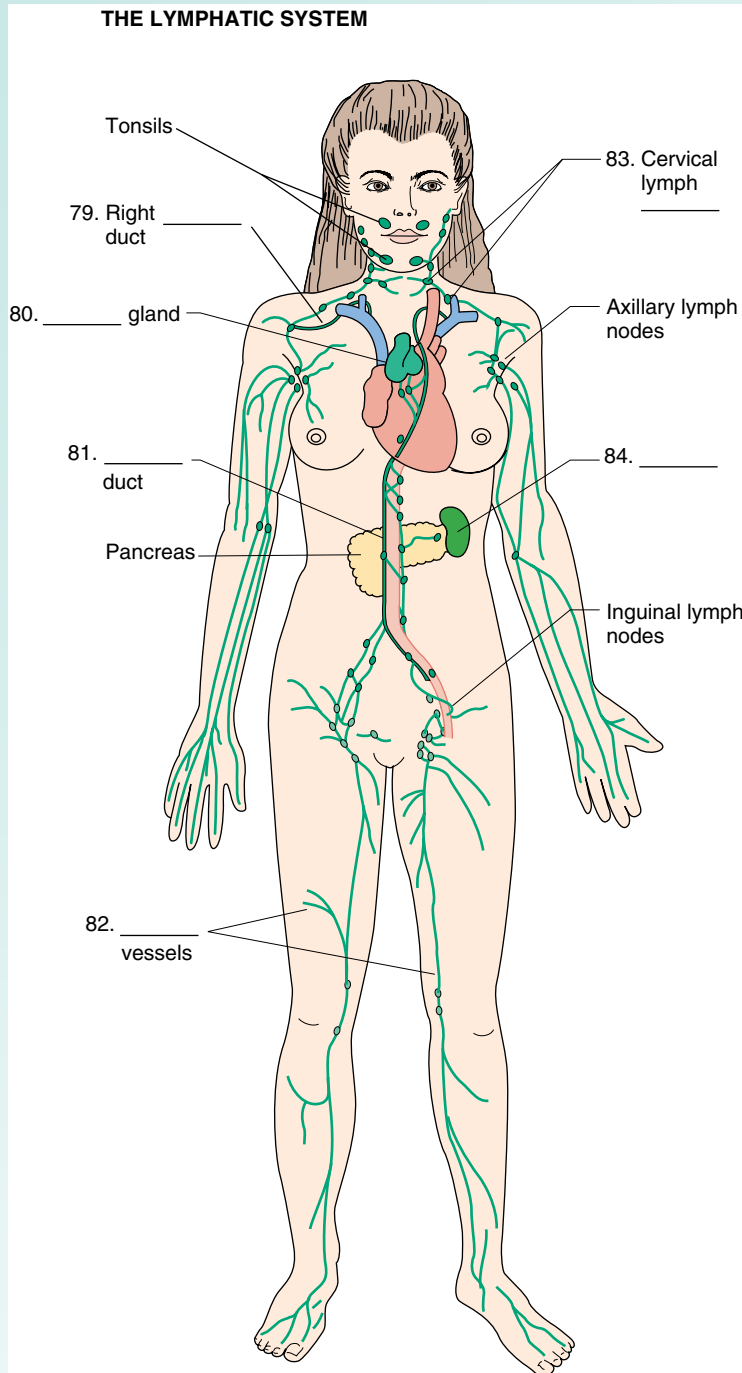
Write in the missing words on the lines in the following illustrations of the components of blood.

74–78.



Write in the missing words on the lines in the following illustrations of the lymphatic system.

79–84.

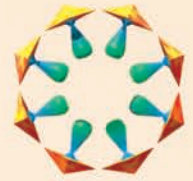


For each of the following, circle the correct spelling of the term:

- | | | |
|---------------------|------------------|------------------|
| 85. hematopoesis | hematopoiesis | hematoepoisis |
| 86. platelets | plattelets | plateletts |
| 87. anissocytosis | aniscocytosis | anisocytosis |
| 88. polkulocytosis | poikilocytosis | poiekilocytosis |
| 89. hemalysis | hemoliesis | hemolysis |
| 90. lymphadenpathy | lymphadenopathy | lymphoadenopathy |
| 91. myelodysplasia | mylodysplasia | myelodysphazia |
| 92. thrombocytopena | thrombocytopenia | throboctytenia |
| 93. hematocrit | hemacrit | hematocrete |
| 94. spleneckotomy | splenectomy | spleenectomy |
| 95. plasmapheresis | plazmaphoresis | plasmophoresis |
| 96. vasodialator | vasodilater | vasodilator |
| 97. venipuncture | venapuncture | venepuncture |

Give the noun that was used to form the following adjectives:

98. leukemic _____
99. immunosuppressive _____
100. thymic _____
101. hematopoietic _____
102. splenic _____
103. septicemic _____
104. hemophilic _____
105. myelodysplastic _____



MEDICAL RECORD ANALYSES

MEDICAL RECORD 8.1

Progress Note

CC: fatigue

S: This 43 y/o female c/o feeling rundown with lack of energy \times 1 mo. Pt denies fever, chills, nausea, vomiting, diarrhea, constipation and reports no weight loss. She has had very heavy menstrual periods lasting 5 days since DC of birth control pills 1 year ago.

PMH: mononucleosis at age 14, NKDA. FH: father, age 68, died of MI
Mother, age 74, has myelodysplasia; sister, age 45, L&W

SH: married \times 8 yr, no children; ETOH—wine with dinner, denies smoking.

O: VS: T 98.8°F, P 81, R 15, BP 136/62. WDWN female in NAD. HEENT-WNL

Neck: supple \bar{s} lymphadenopathy. Lungs: clear. Heart RRR \bar{s} murmur

Abdomen: soft and tender \bar{s} organomegaly. Extremities: no edema.

A: Etiology of fatigue and decreased energy unclear. Possible iron deficiency anemia in light of heavy menstrual periods.

P: Blood studies to include comprehensive metabolic panel, CBC \bar{c} differential.
RTO in 1 wk for lab results.

- Which of the following is not mentioned in the history?
 - type of treatment the patient received for mononucleosis
 - patient's consumption of alcohol
 - how long the patient has been married
 - health status of the patient's sister
- Describe the condition of the patient's mother:
 - she has leukemia
 - she has a bleeding disorder characterized by an abnormally decreased number of platelets in the blood
 - she has a hereditary disorder characterized by an excessive buildup of iron deposits in the body
 - she has a disorder within the bone marrow characterized by a proliferation of abnormal stem cells, which usually develops into leukemia
- Which of the following describes the findings of the physical examination?
 - swollen lymph glands
 - normal examination
 - fast heart rate
 - heart murmur
- What is the possible cause of the patient's fatigue?
 - viral condition characterized by an increase in mononuclear cells (monocytes and lymphocytes) in the blood
 - macrocytic-normochromic type of anemia characterized by an inadequate supply of vitamin B₁₂, causing red blood cells to become large, varied in shape, and reduced in number
 - microcytic-hypochromic type of anemia characterized by small red blood cells containing low amounts of hemoglobin because of lack of iron in the body
 - normocytic-normochromic type of anemia characterized by the failure of bone marrow to produce red blood cells
- Identify the subjective information most significantly linked to the assessment:
 - enlarged lymph glands
 - heavy menstrual periods
 - fatigue
 - the patient quit taking birth control pills
- Of the following tests, which test is part of the plan?
 - test to determine coagulation defects such as platelet disorders
 - test to diagnose an infection in the bloodstream, by culturing a specimen of blood
 - needle aspiration of bone marrow tissue for pathological examination
 - expanded battery of automated blood chemistry tests used as a general screen for disease

MEDICAL RECORD 8.2

Henry Lin went to his personal physician after an extended period of feeling weak and tired, and starting to lose weight. His doctor admitted him to Central Medical Center hospital for additional tests after conducting a physical examination and blood tests. He is now being treated as an outpatient by his internist, Dr. Bradley, and an oncologist, Dr. Ellison, to whom he was referred for consultation and concurrent care.

Directions

Read Medical Record 8.2 for Mr. Lin (pages 267–268) and answer the following questions.

The progress note is the oncology/hematology progress note dictated by Dr. Ellison, the oncologist treating Mr. Lin, at the time of a follow-up visit 2 weeks after Mr. Lin's hospitalization. The second document is a hematology lab report, submitted before a second follow-up with Dr. Ellison 2 weeks later.

QUESTIONS ABOUT MEDICAL RECORD 8.2

Write your answers in the spaces provided.

- Below are medical terms used in the progress note you have not yet encountered in this text. Underline each where it appears in the record and define below:

edema _____

scaphoid _____

anorexia _____

- In your own words, not using medical terminology, translate Mr. Lin's diagnosis:

- Name the diagnostic test that confirmed this diagnosis:

- Write the medical term for Mr. Lin's enlarged spleen:

- Dr. Ellison's March 31 record includes the results of two CBC component tests from the earlier March 23 lab report, as well as results from the same tests for March 31. The April 15 lab report also contains the CBC component tests. In the spaces below, write the name of the tests and their results at these three times. Do not use abbreviations. Be sure to include units of measure.

Test	Result		
	March 23	March 31	April 15
_____	_____	_____	_____
_____	_____	_____	_____

6. What are the three elements Dr. Ellison includes in Mr. Lin's treatment plan?
- a. _____
 - b. _____
 - c. _____

7. Study the April 15 laboratory report carefully and complete the following table of selected test results. Write the name of the component that is abbreviated and an N if the result for Mr. Lin is within the normal range or an A (abnormal) if the result is outside the normal range.

- a. WBC _____
- b. RBC _____
- c. HGB _____
- d. HCT _____
- e. MCV _____
- f. MCH _____
- g. MCHC _____
- h. PLT _____
- i. lymph _____
- j. mono _____
- k. neutro _____
- l. eos _____
- m. baso _____

CENTRAL MEDICAL GROUP, INC.*Department of Oncology/Hematology*

201 Medical Center Drive • Central City, US 90000-1234 • PHONE: (012) 125-8888 • FAX: (012) 125-3434

PROGRESS NOTE

PATIENT: LIN, HENRY N.

DATE: March 31, 20xx

Mr. Lin is a 69-year-old man seen for myelodysplasia while hospitalized on March 17, 20xx. He was transfused with 4.0 U of packed cells during that hospitalization. A bone marrow biopsy revealed histology consistent with chronic myelomonocytic leukemia (myelodysplasia).

A follow-up blood count was obtained through Dr. Bradley's office on March 23, 20xx, and revealed a hemoglobin of 11.0 G/DL and a hematocrit of 31.0%.

There have been no fevers, sweats, or anorexia; but he has noted some weight loss. There has been no bleeding. There has been no nausea, vomiting, or dark and bloody stools.

Exam: Weight: 172 lb. Blood Pressure: 120/50. Temperature: 98.6°F. Pulse: 88.
Respirations: 18.

HEENT: Mild gum atrophy and inflammation. NECK: Supple. LYMPH NODES: There is no cervical or supraclavicular adenopathy. LUNGS: Clear. CARDIOVASCULAR: Normal. ABDOMEN: Scaphoid, soft, and nontender. The spleen is enlarged. EXTREMITIES: Without edema or petechiae.

TODAY'S LAB: Complete blood count reveals a total leukocyte count of 6600/cu mm, a hemoglobin of 8.0 G/DL, a hematocrit of 23.0%, and a platelet count of 149,000/cu mm.

CLINICAL DIAGNOSIS:

Chronic myelomonocytic leukemia (myelodysplastic syndrome). The patient is transfusion dependent.

The patient will be typed and crossmatched today and will be transfused with 2.0 U of packed red blood cells through the Oncology Day Facility tomorrow on April 1, 20xx.

I have asked the patient to follow up with Dr. Bradley next week and with me in two weeks.


A. Ellison, M.D.

AE:gds

cc: Blair Bradley, M.D.

D: 3/31/20xx

T: 4/3/20xx

CENTRAL MEDICAL CENTER

211 Medical Center Drive • Central City, US 90000-1234 • PHONE: (012) 125-6784 • FAX: (012) 125-9999

04/15/20xx
14:27

NAME : Lin, Henry LOC: TEST DOB: 2/2/xx AGE: 69Y
MR# : TEST-226 SEX: M
ACCT# : 168946701

M63558 COLL: 04/15/20xx 13:23 REC: 04/15/20xx 13:25

HEMOGRAM

CBC

WBC	4.1	[4.5–10.5]	K/UL
RBC	2.93	[4.6–6.2]	M/UL
HGB	9.1	[14.0–18.0]	G/DL
HCT	25.3	[42.0–52.0]	%
MCV	86.2	[82–92]	FL
MCH	31.1	[27–31]	PG
MCHC	36.0	[32–36]	G/DL
PLT	90	[150–450]	K/UL

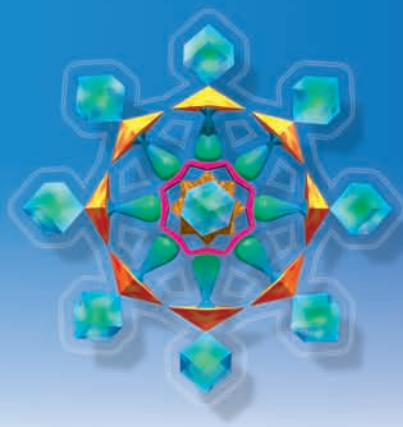
Auto Lymph %	8.3	[20–40]	%
Auto Mono %	32.6	[1–11]	%
Auto Neutro %	57.8	[50–75]	%
Auto Eos %	1.0	[0–6]	%
Auto Baso %	0.3	[0–2]	%
Auto Lymph #	0.3	[1.5–4.0]	K/UL
Auto Mono #	1.3	[0.2–0.9]	K/UL
Auto Neutro #	2.4	[1.0–7.0]	K/UL
Auto Eos #	0.0	[0–0.7]	K/UL
Auto Baso #	0.0	[0–0.2]	K/UL

TEST, PATIENT TEST-221
04/15/20xx 14:27

END OF REPORT

PAGE 1
INTERIM REPORT

INTERIM REPORT COMPLETE



Respiratory System

OBJECTIVES

After completion of this chapter, you will be able to

- ◆ Define common term components used in relation to the respiratory system
- ◆ Describe the basic functions of the respiratory system
- ◆ Define the basic anatomical terms referring to the respiratory system
- ◆ Define common symptomatic and diagnostic terms referring to the respiratory system
- ◆ List the common diagnostic tests and procedures related to the respiratory system
- ◆ Identify common operative terms referring to the respiratory system
- ◆ Identify common therapeutic terms including drug classifications related to the respiratory system
- ◆ Explain the terms and abbreviations used in documenting medical records involving the respiratory system

Combining Forms

Combining Form	Meaning	Example
alveol/o	alveolus (air sac)	alveolar al-vē'ō-lăr
bronch/o	bronchus (airway)	bronchoscope brong'kō-skōp
bronchi/o		bronchiocele brong'kē-ō-sēl
bronchiol/o	bronchiole (little airway)	bronchiolitis brong-kē-ō-lī'tis
capn/o	carbon dioxide	hypercapnia hī-per-kap'nē-ă
carb/o		hypocarbica hī-pō-kar'bē-ă
laryng/o	larynx (voice box)	laryngospasm lă-ring'gō-spazm
lob/o	lobe (a portion)	lobectomy lō-bek'tō-mē
nas/o	nose	nasal nā'zăl
rhin/o		rhinorrhea rī-nō-rē'ă

Combining Form	Meaning	Example
or/o	mouth	oropharyngeal ōr-ō-fă-rin´jē-ăl
ox/o	oxygen	hypoxemia hī-pok-sē´mē-ă
palat/o	palate	palatoplasty pal´ă-tō-plas-tē
pharyng/o	pharynx (throat)	pharyngitis far-in-jī´tis
phren/o	diaphragm (also mind)	phrenospasm fren´ō-spazm
pleur/o	pleura	pleurisy plūr´i-sē
pneum/o	air or lung	pneumonia nū-mō´nē-ă
pneumon/o		pneumonectomy nū´mō-nek´tō-mē
pulmon/o	lung	pulmonologist pŭl´mō-nol´ō-jist
sinus/o	sinus (cavity)	sinusitis sī-nŭ-sī´tis
spir/o	breathing	spirometry spī-rom´ě-trē
thorac/o	chest	thoracotomy thōr-ă-kot´ō-mē
pector/o		pectoralgia pek-tō-ral´jē-ă
steth/o		stethoscope steth´ō-skōp
tonsill/o	tonsil (almond)	tonsillitis ton´si-lī´tis
trache/o	trachea (windpipe)	trachea trā´kē-ă
uvul/o	uvula	uvulitis yu-vyu-lī´tis
ADDITIONAL SUFFIX		
-pnea	breathing	dyspnea disp-nē´ă

Respiratory System Overview

The respiratory system is composed of the organs and structures that function to exchange gases within the body. The exchange of gases, called respiration, occurs when oxygen from the air is inhaled into the lungs and passes into the blood and carbon dioxide diffuses from the blood into the lungs and is exhaled into the air. Respiration is also known as *breathing* or *ventilation*. Intake of air is called *inspiration* or *inhalation*, and outflow of air is called *expiration* or *exhalation* (Fig. 9.1).

RESPIRATORY SYSTEM

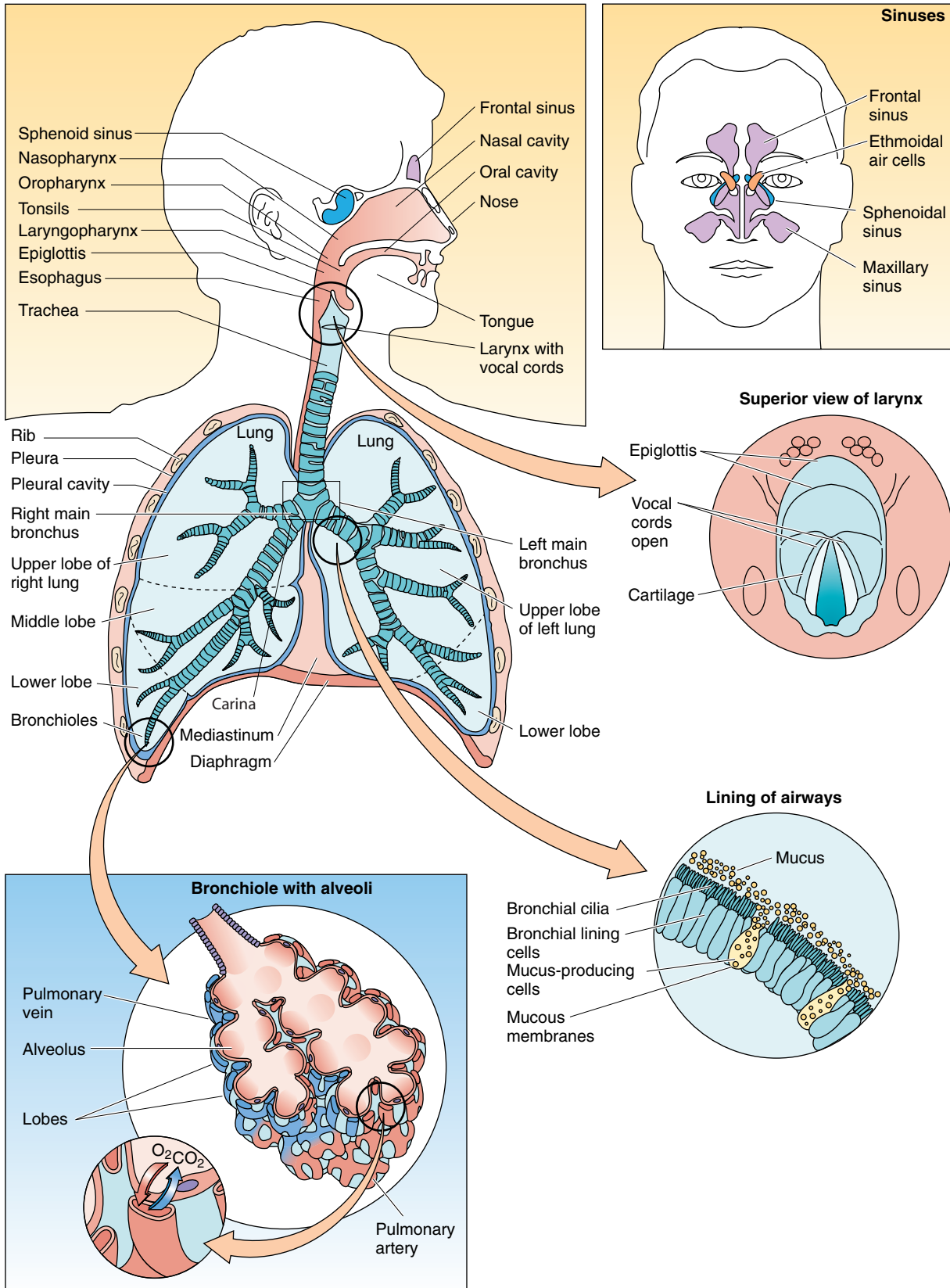


Figure 9.1. Respiratory tract.

Anatomical Terms

Term	Meaning
nose nōz	structure that warms, moistens, and filters air as it enters the respiratory tract and that houses the olfactory receptors for the sense of smell
sinuses sī'nūs-ĕz	air-filled spaces in the skull that open into the nasal cavity
palate pal'ăt	partition between the oral and nasal cavities; divided into the hard and soft palate
pharynx far'ingks	throat; passageway for food to the esophagus and air to the larynx
nasopharynx nā'zō-far-ingks	part of the pharynx directly behind the nasal passages
oropharynx ōr'ō-far-ingks	central portion of the pharynx between the roof of the mouth and the upper edge of the epiglottis
laryngopharynx lā-ring'gō-far-ingks	lower part of the pharynx just below the oropharynx opening into the larynx and the esophagus
tonsils ton'silz	oval lymphatic tissues on each side of the pharynx that filter air to protect the body from bacterial invasion—also called palatine tonsils
adenoid ad'ĕ-noyd	lymphatic tissue on the back of the pharynx behind the nose—also called pharyngeal tonsil
uvula yu'vyu-lă	small projection hanging from the back middle edge of the soft palate, named for its grape-like shape (see Chapter 14, Fig. 14.2)
larynx lar'ingks	voice box; passageway for air moving from pharynx to trachea; contains vocal cords
glottis glot'is	opening between the vocal cords in the larynx
epiglottis ep-i-glot'is	lid-like structure that covers the larynx during swallowing to prevent food from entering the airway
trachea tră'kĕ-ă	windpipe; passageway for air from the larynx to the area of the carina where it splits into the right and left bronchus
bronchial tree brong'kĕ-ăl	branched airways that lead from the trachea to the alveoli
right and left bronchus brong'kŭs	two primary airways branching from the area of the carina into the lungs
bronchioles brong'kĕ-ōlz	progressively smaller tubular branches of the airways
alveoli al-vĕ'ō-lī	thin-walled microscopic air sacs that exchange gases

Term	Meaning
lungs lūngz	two spongy organs, located in the thoracic cavity enclosed by the diaphragm and rib cage, responsible for respiration
lobes lōbz	subdivisions of the lung, two on the left and three on the right
pleura plūr'ă	membranes enclosing the lung (visceral pleura) and lining the thoracic cavity (parietal pleura)
pleural cavity plūr'ăl kav'î-tē	potential space between the visceral and parietal layers of the pleura
diaphragm dī'ă-fram	muscular partition that separates the thoracic cavity from the abdominal cavity and aids in respiration by moving up and down
mediastinum me'dē-as-tī'nūm	partition that separates the thorax into two compartments (that contain the right and left lungs) and encloses the heart, esophagus, trachea, and thymus gland
mucous membranes myū'kūs mem'brānz	thin sheets of tissue that line the respiratory passages and secrete mucus, a viscid (sticky) fluid
cilia sil'ē-ă	hair-like processes from the surface of epithelial cells, such as those of the bronchi, that provide upward movement of mucus cell secretions
parenchyma pă-reng'ki-mă	functional tissues of any organ such as the tissues of the bronchioles, alveoli, ducts, and sacs that perform respiration



LUNG. Lung is an Anglo-Saxon term derived

from *lungre*, meaning *quickly* or *lightly*. The connection suggests that the lungs were named for their lightness and ability to float in water. The lungs were also called "lights."

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC	
<i>Breathing (Fig. 9.2)</i>	
eupnea yūp-nē'ă	normal breathing
bradypnea brad-ip-nē'ă	slow breathing
tachypnea tak-ip-nē'ă	fast breathing
hypopnea hī-pop'nē-ă	shallow breathing
hyperpnea hi-perp-nē'ă	deep breathing
dyspnea disp-nē'ă	difficulty breathing
apnea ap'nē-ă	inability to breathe

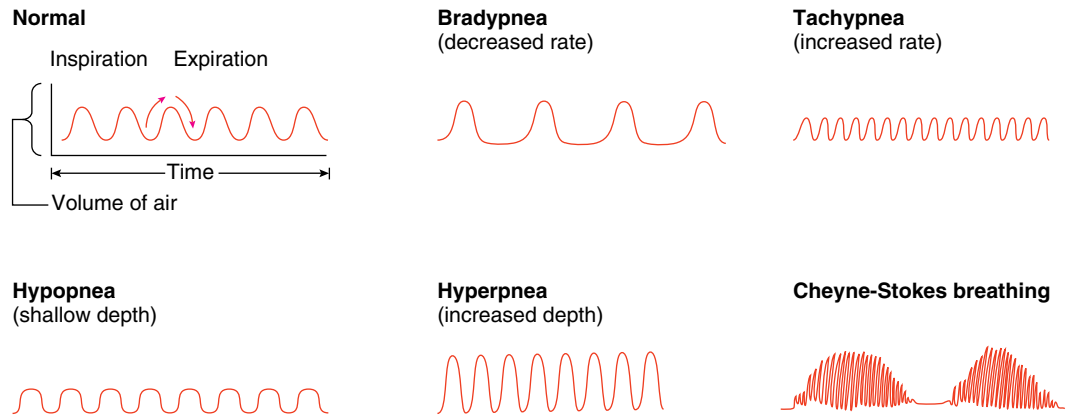


Figure 9.2 Examples of breathing patterns.

Term	Meaning
orthopnea ōr-thop-nē´ă	ability to breathe only in an upright position
Cheyne-Stokes respiration res-pi-rā´shŭn	pattern of breathing characterized by a gradual increase of depth and sometimes rate to a maximum level, followed by a decrease, resulting in apnea
<i>Lung Sounds</i>	
crackles krak´ĕlz rales rahlz	popping sounds heard on auscultation of the lung when air enters diseased airways and alveoli—occurs in disorders such as bronchiectasis or atelectasis
wheezes hwēz´ez rhonchi rong´kī	high-pitched, musical sounds heard on auscultation of the lung as air flows through a narrowed airway—occurs in disorders such as asthma or emphysema
stridor strī´dōr	a high-pitched crowing sound that is a sign of obstruction in the upper airway (trachea or larynx)
<i>General Symptomatic Terms</i>	
caseous necrosis kā´sē-ŭs nĕ-kro´sis	degeneration and death of tissue with a cheese-like appearance (characteristic of tuberculosis)
dysphonia dis-fō´nē-ă	hoarseness (phon/o = voice or sound)
epistaxis ep´i-stak´sis	nosebleed (epi = upon; stazo = to drip)
expectoration ek-spek-tō-rā´shŭn	coughing up and spitting out of material from the lungs
sputum spŭ´tŭm	material expelled from the lungs by coughing
hemoptysis hĕ-mop´ti-sis	coughing up and spitting out blood originating in the lungs (ptysis = to spit)

Term	Meaning
hypercapnia hī-per-kap'nē-ă	excessive level of carbon dioxide in the blood (capno = smoke; carbo = coal)
hypercarbia hī-per-kar'bē-ă	
hyperventilation hī'per-ven-ti-lā'shŭn	excessive movement of air in and out of the lungs causing hypocapnia
hypoventilation hī'pō-ven-ti-lā'shŭn	deficient movement of air in and out of the lungs causing hypercapnia
hypoxemia hī-pok-sē'mē-ă	deficient amount of oxygen in the blood
hypoxia hī-pok'sē-ă	deficient amount of oxygen in tissue cells
obstructive lung disorder lŭng dis-ōr'der	condition blocking the flow of air moving out of the lungs (Fig. 9.3C)
restrictive lung disorder	condition limiting the intake of air into the lungs (see Fig. 9.3B)
pulmonary edema pŭl'mō-nār-ē e-dē'mă	fluid filling of the spaces around the alveoli, eventually flooding into the alveoli
pulmonary infiltrate pŭl'mō-nār-ē in-fil'trăt	density on an x-ray representing solid material within the air spaces of the lungs, usually indicating inflammatory changes (see Fig. 9.7)
rhinorrhea rī-nō-rē'ă	thin, watery discharge from the nose

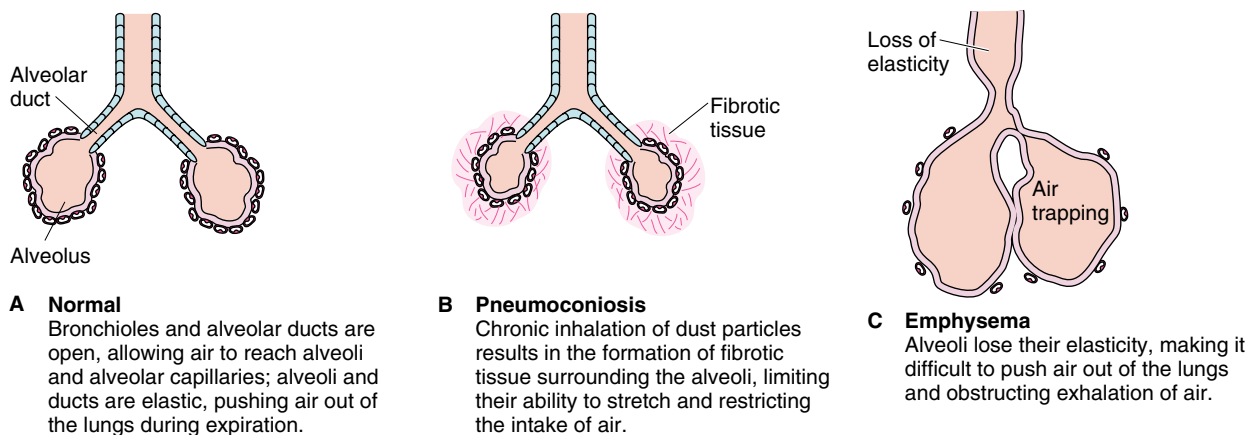


Figure 9.3 Comparison of normal alveoli (A) with alveoli in restrictive (B) and obstructive (C) lung disorders.

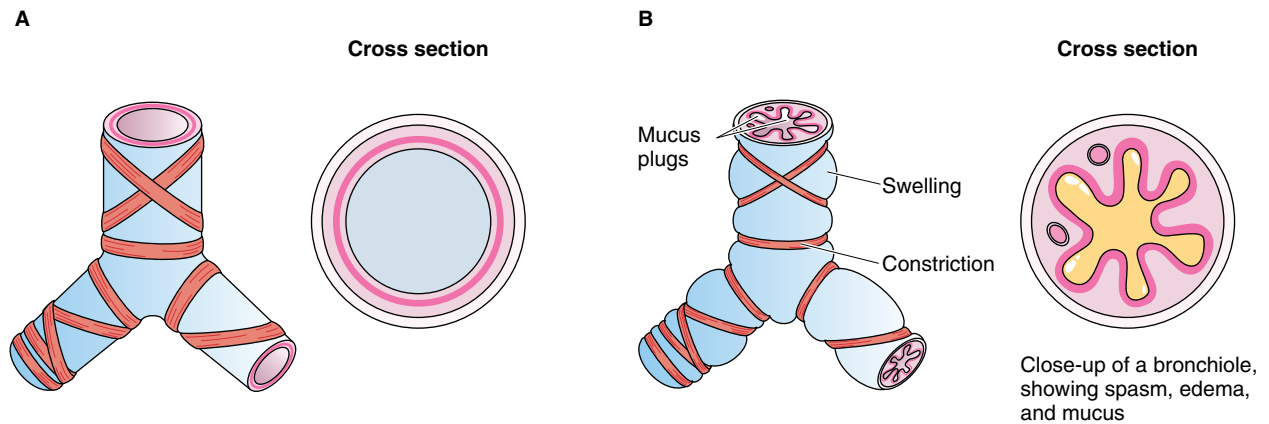


Figure 9.4 Constricted bronchial tubes in asthma. **A.** Normal. **B.** Asthma.

Term	Meaning
DIAGNOSTIC	
asthma az´mä	panting; obstructive pulmonary disease caused by a spasm of the bronchial tubes or by swelling of their mucous membrane, characterized by paroxysmal (sudden, periodic) attacks of wheezing, dyspnea, and cough (Fig. 9.4)
atelectasis at-ě-lek´tä-sis	collapse of lung tissue (alveoli) (atele = imperfect)
bronchiectasis brong-kě-ek´tä-sis	abnormal dilation of the bronchi with accumulation of mucus (Fig. 9.5)
bronchitis brong-kī´tis	inflammation of the bronchi
bronchogenic carcinoma brong-kō-jen´ik kar-si-nō´mä	lung cancer
bronchospasm brong´kō-spazm	constriction of bronchi caused by spasm of the peribronchial smooth muscle
emphysema em-fi-sě´mä	obstructive pulmonary disease characterized by overexpansion of the alveoli with air, with destructive changes in their walls resulting in loss of lung elasticity and gas exchange (emphysan = to inflate) (see Fig. 9.3C)
chronic obstructive pulmonary disease (COPD) kron´ik pŭl´mō-nār-ē di-zěz´	permanent, destructive pulmonary disorder that is a combination of chronic bronchitis and emphysema
cystic fibrosis sis´tik fī-brō´sis	inherited condition of exocrine gland malfunction causing secretion of abnormally thick, viscous (sticky) mucus that obstructs passageways within the body, commonly affecting the lungs and digestive tract; mucus that obstructs the airways leads to infection, inflammation, and lung tissue damage
laryngitis lar-in-jī´tis	inflammation of the larynx

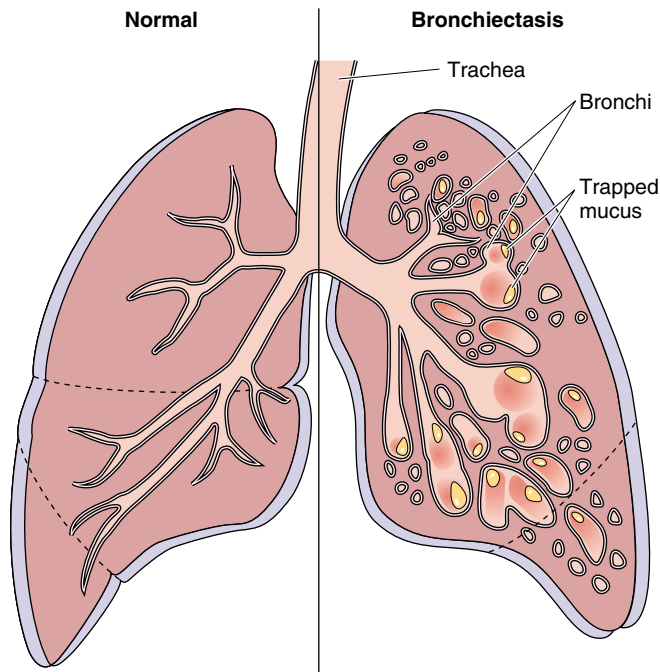


Figure 9.5. Bronchiectasis.

Term	Meaning
laryngotracheobronchitis (LTB) lār-ing'gō-trā'kē-o-brong-kī'tis croup krūp	inflammation of the upper airways with swelling that creates a funnel-shaped elongation of tissue causing a distinct “seal bark” cough
laryngospasm lā-ring'gō-spazm	spasm of laryngeal muscles causing constriction
nasal polyposis nā'zāl pol'i-pō'sis	presence of numerous polyps in the nose (a polyp is a tumor on a stalk)
pharyngitis far-in-jī'tis	inflammation of the pharynx
pleural effusion plūr'āl e-fū'zhŭn	accumulation of fluid within the pleural cavity (Fig. 9.6)
empyema em-pī-ē'mă pyothorax pī-ō-thōr'aks	accumulation of pus in the pleural cavity
hemothorax hē-mō-thōr'aks	accumulation of blood in the pleural cavity
pleuritis plūr-ī'tis pleurisy plūr'i-sē	inflammation of the pleura

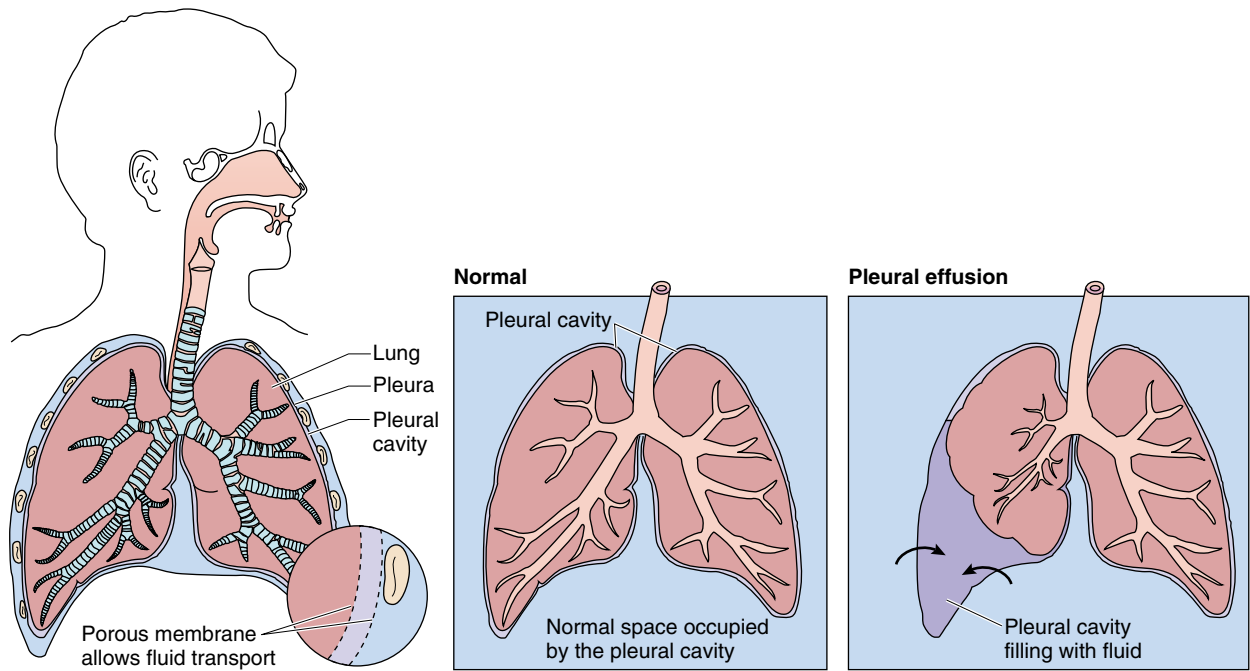


Figure 9.6 Pleural effusion.

Term	Meaning
pneumoconiosis nū'mō-kō-nē-ō'sis	chronic restrictive pulmonary disease resulting from prolonged inhalation of fine dusts such as coal, asbestos (asbestosis), or silicone (silicosis) (conio = dust) (see Fig. 9.3B)
pneumonia nū-mō'nē-ă	inflammation in the lung caused by infection from bacteria, viruses, fungi, or parasites, or resulting from aspiration of chemicals (Fig. 9.7)
pneumocystis pneumonia nū-mō-sis'tis nū-mō'nē-ă	pneumonia caused by the <i>Pneumocystis carinii</i> organism—a common opportunistic infection seen in those with positive human immunodeficiency virus
pneumothorax nū-mō-thōr'aks	air in the pleural cavity caused by a puncture of the lung or chest wall (Fig. 9.8)
pneumohemothorax nū'mō-hē-mō-thōr'aks	air and blood in the pleural cavity
pneumonitis nū-mō-nī'tis	inflammation of the lung often caused by hypersensitivity to chemicals or dusts
pulmonary embolism (PE) pŭl'mō-nār-ē em'bō-lizm	occlusion in the pulmonary circulation, most often caused by a blood clot (see Figs. 9.11 and 9.15)
pulmonary tuberculosis (TB) pŭl'mō-nār-ē tū-ber-kyū-lō'sis	disease caused by the presence of <i>Mycobacterium tuberculosis</i> in the lungs characterized by the formation of tubercles, inflammation, and necrotizing caseous lesions (caseous necrosis) (Fig. 9.9)
sinusitis sī-nŭ-sī'tis	inflammation of the sinuses

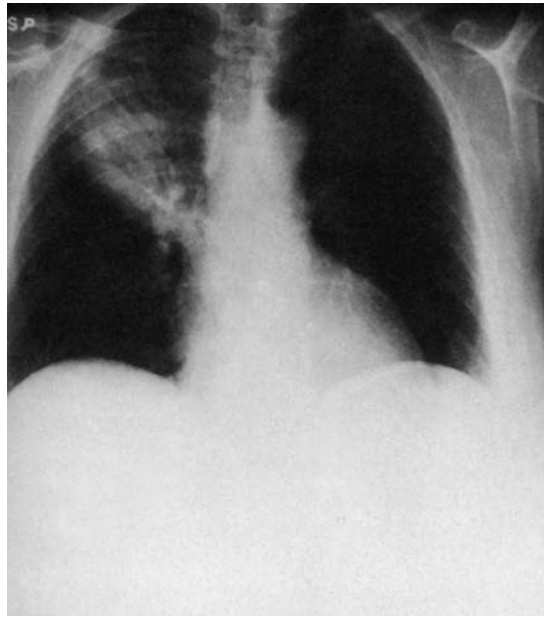
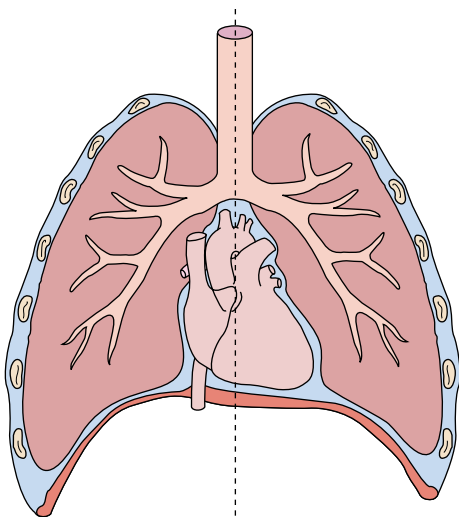


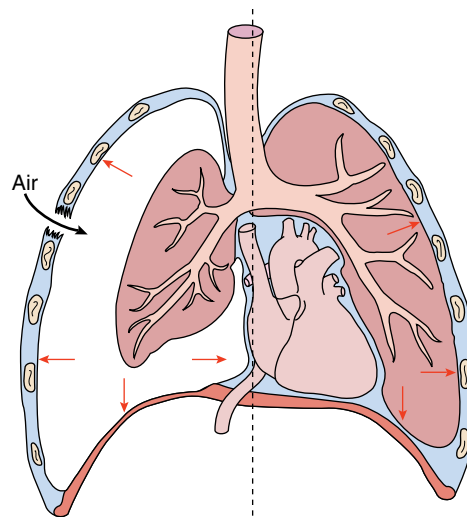
Figure 9.7 Chest x-ray showing pulmonary infiltrates in right upper lobe consistent with lobar pneumonia. Dense material (inflammatory exudate) absorbs radiation, whereas normal alveoli do not.

Term	Meaning
sleep apnea slēp ap'nē-ă	periods of breathing cessation (10 seconds or more) that occur during sleep, often causing snoring
tonsillitis ton'si-lī'tis	acute or chronic inflammation of the tonsils

Normal



Pneumothorax



Inspiration

Air entering through a wound in the chest causes a collapse of the lung; contents of the thoracic cavity shift to the opposite side, compressing the other lung.

Figure 9.8 Simple pneumothorax.

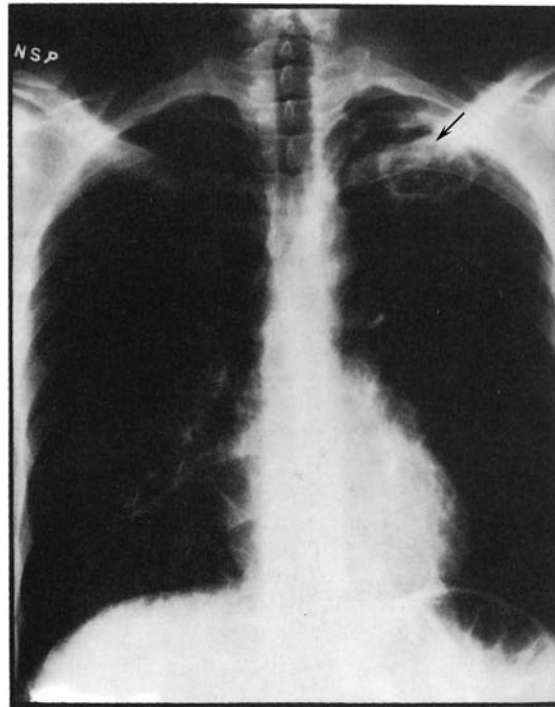


Figure 9.9 Chest x-ray showing presence of tuberculosis in the left upper lobe (arrow).

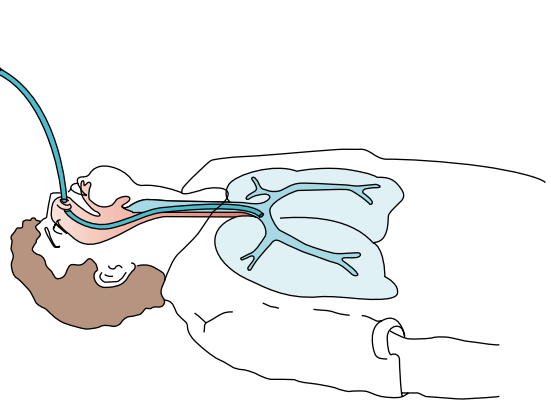
Term	Meaning
<p>upper respiratory infection (URI) res'pi-ră-tōr-ē in-fek'shŭn</p>	<p>infectious disease of the upper respiratory tract involving the nasal passages, pharynx, and bronchi</p>

Diagnostic Tests and Procedures

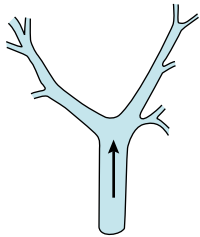
Test or Procedure	Explanation
<p>arterial blood gases (ABGs) ar-tē'rē-ăl</p>	<p>analysis of arterial blood to determine the adequacy of lung function in the exchange of gases</p>
<p>pH</p>	<p>a measure of blood acidity or alkalinity</p>
<p>PaO₂</p>	<p>partial pressure of oxygen measuring the amount of oxygen in the blood</p>
<p>PaCO₂</p>	<p>partial pressure of carbon dioxide measuring the amount of carbon dioxide in the blood</p>
<p>endoscopy en-dos'kō-pē</p>	<p>examination of a body cavity with a flexible endoscope to examine within for diagnostic or treatment purposes</p>
<p>bronchoscopy brong-kos'kō-pē</p>	<p>use of a flexible endoscope, called a bronchoscope, to examine the airways (Fig. 9.10)</p>
<p>nasopharyngoscopy nă'zō-fa-ring-gos'kō-pē</p>	<p>use of a flexible endoscope to examine the nasal passages and the pharynx (throat) to diagnose structural abnormalities such as obstructions, growths, and cancers</p>



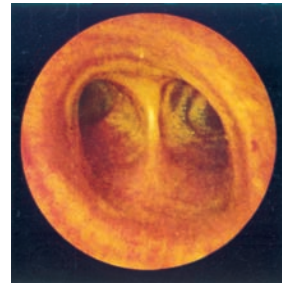
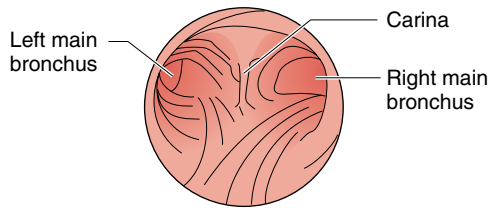
Bronchoscopy team performing procedure



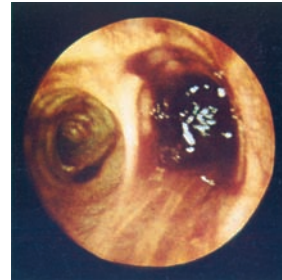
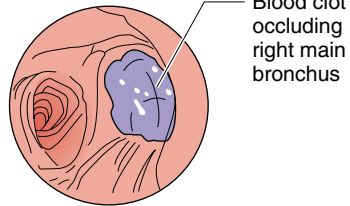
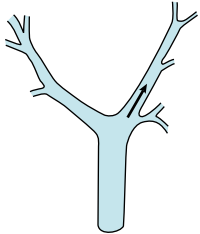
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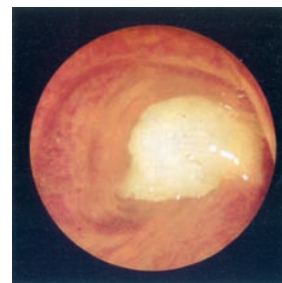
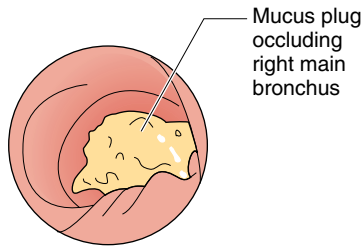
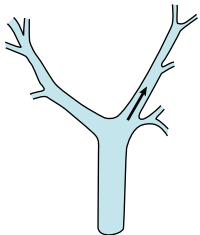
Bronchoscopic views



Blood clot



Mucus plug



Foreign body

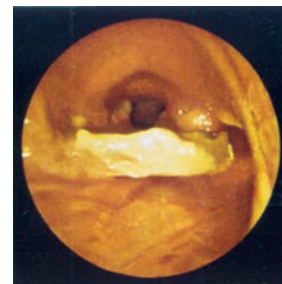
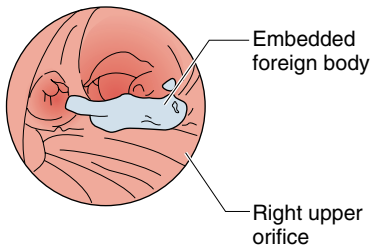
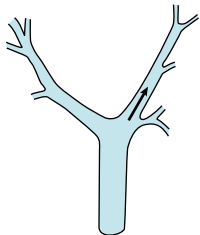


Figure 9.10 Bronchoscopy procedure.

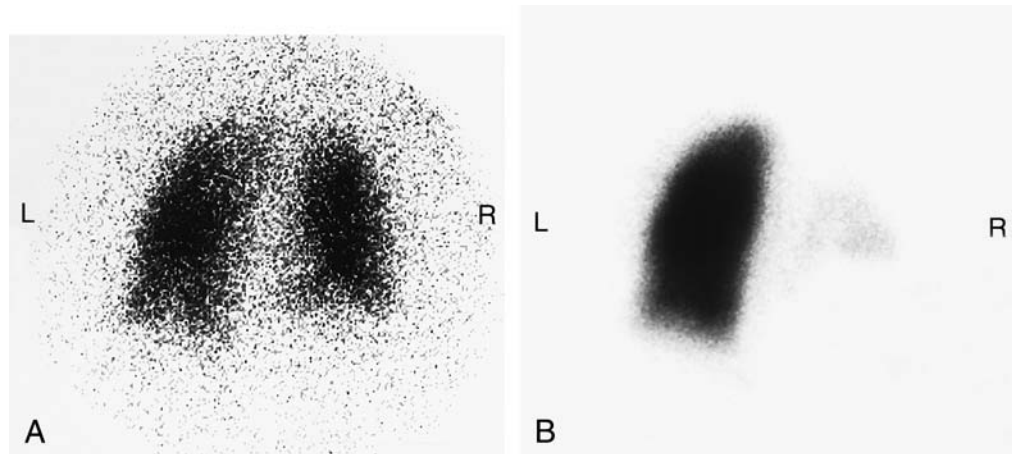


Figure 9.11 Posterior lung scan in a patient with an embolus in the right lung. Ventilation image (A) shows a normal pattern. Absence of blood flow to the right lung is apparent on perfusion scan (B). L, left; R, right.



STETHOSCOPE.

The Greek word *stethos* means chest and *skopeo* means to view. The stethoscope was invented by René Laënnec in 1816. He is said to have first thought of it when watching children playing; some of them listening at one end of a beam of wood could hear a pin scratching at the other end. He applied this principle to auscultation of the chest, which was then performed by placing the ear directly on the patient's chest. The first stethoscope was made of wood.

Test or Procedure	Explanation
lung biopsy (Bx) lŭng bī'op-sē	removal of a small piece of lung tissue for pathological examination
lung scan lŭng skan	two-part nuclear scan of the lungs to detect abnormalities of perfusion (blood flow) or ventilation (respiration), commonly called a V/Q (ventilation/perfusion) scan (Fig. 9.11) ventilation scan—made as the patient breathes radioactive material into the airways perfusion scan—made after radioactive material is injected into the blood and circulates to the lungs
magnetic resonance image (MRI) mag-net'ic rez'ō-nans im'ij	nonionizing image of the lung to visualize lung lesions
polysomnography (PSG) pol'ē-som-nog'ră-fē	recording of various aspects of sleep (eye and muscle movements, respiration, brain wave patterns) for diagnosis of sleep disorders (somn/o = sleep) (see Chapter 10, Fig. 10.16)
physical examination methods	
auscultation aws-kŭl-tă'shŭn	to listen; physical examination method of listening to the sounds within the body with the aid of a stethoscope, such as auscultation of the chest for heart and lung sounds
percussion per-kŭsh'ŭn	physical examination method of tapping over the body to elicit vibrations and sounds to estimate the size, border, or fluid content of a cavity such as the chest
pulmonary function testing (PFT) pŭl'mō-nār-ē fŭngk'shŭn	direct and indirect measurements of lung volumes and capacities
spirometry spī-rom'ē-trē	portion of pulmonary function testing that is a direct measurement of lung volume and capacity (Fig. 9.12)

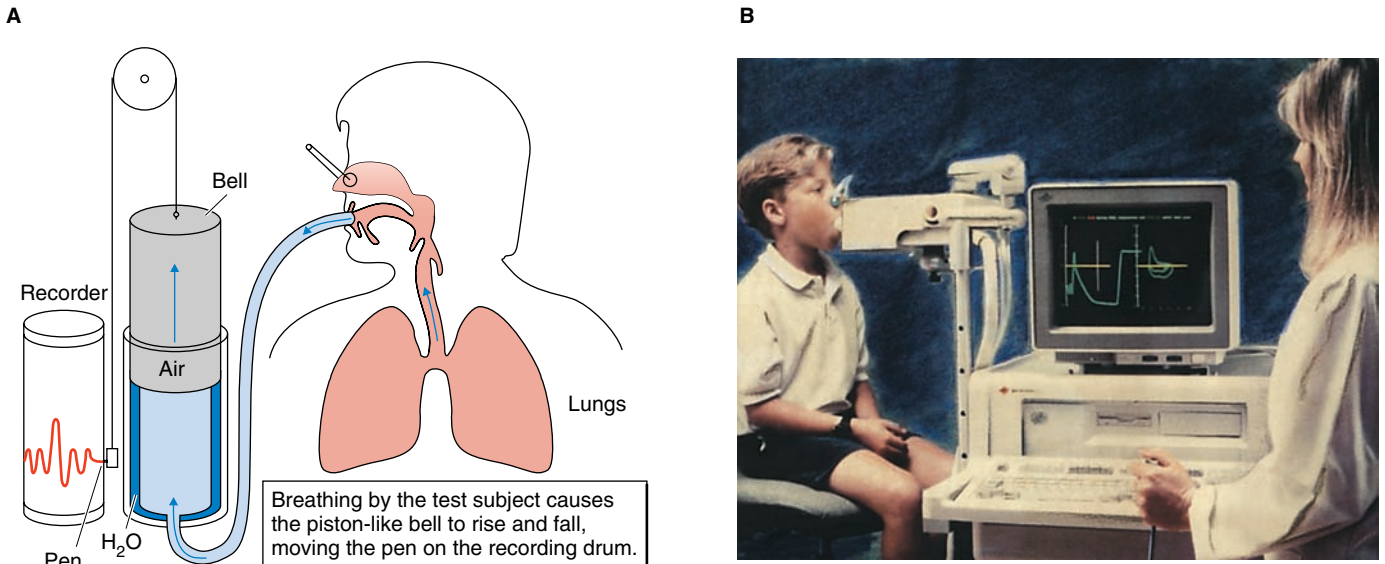


Figure 9.12 A. Principle of spirometry. B. Modern spirometry.

Test or Procedure	Explanation
tidal volume (TV or V_T) tī'dāl vol'yŭm	amount of air exhaled after a normal inspiration
vital capacity (VC) vīt'āl kā-pas'i-tē	amount of air exhaled after a maximal inspiration
peak flow (PF) peak expiratory flow rate (PEFR) ek-spī'rā-tō-rē flō rāt	measure of the fastest flow of exhaled air after a maximal inspiration (Fig. 9.13)



Figure 9.13. Routine peak flow monitoring by asthmatic adolescent female is performed to predict signs of an oncoming attack.

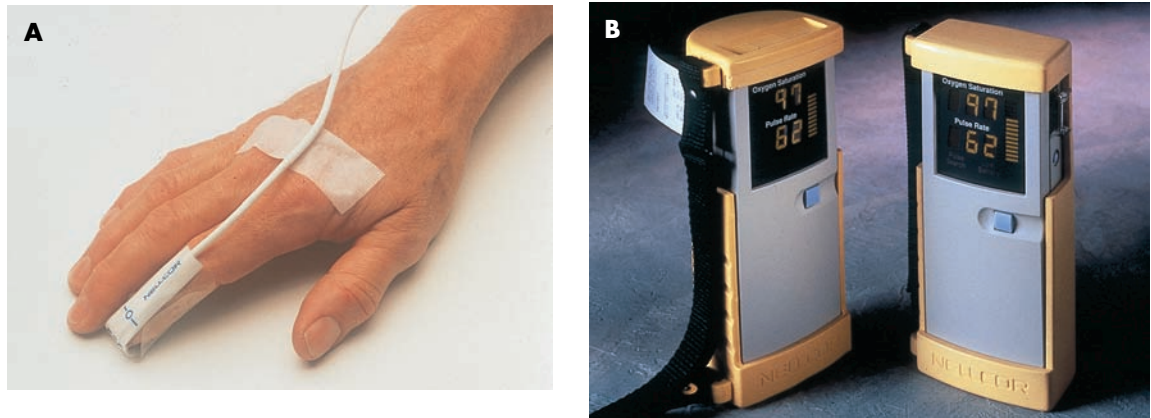


Figure 9.14 Pulse oximetry. **A.** Placement of a sensor on the patient’s finger. **B.** Oxygen saturation reading on a portable monitor.

Test or Procedure	Explanation
<p>pulse oximetry pŭls ok-sim'ē-trē</p>	<p>noninvasive method of estimating the percentage of oxygen saturation in the blood using an oximeter with a specialized probe attached to the skin at a site of arterial pulsation, commonly the finger; used to monitor hypoxemia (Fig. 9.14)</p>
<p>radiology rā-dē-ol'ō-jē</p>	<p>x-ray imaging</p>
<p>chest x-ray (CXR)</p>	<p>x-ray image of the chest to visualize the lungs</p>
<p>computed tomography (CT) tō-mog'ră-fē</p>	<p>computed x-ray imaging of the head is used to visualize the structures of the nose and sinuses; CT of the thorax is used to detect lesions in the lung</p>
<p>pulmonary angiography pŭl'mō-nār-ē an-jē-og'ră-fē</p>	<p>x-ray of the blood vessels of the lungs after injection of contrast material (Fig. 9.15)</p>

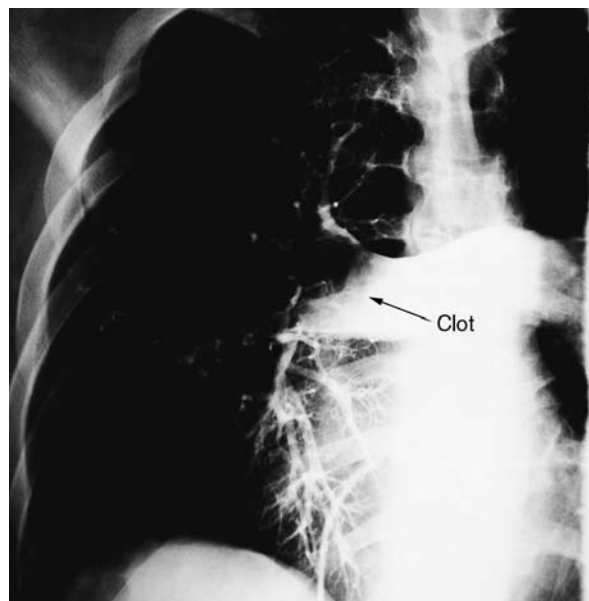


Figure 9.15 Pulmonary angiogram: embolus obstructing pulmonary circulation (arrow).

Operative Terms

Term	Meaning
adenoidectomy ad'ě-noy-dek'tō-mē	excision of the adenoids
lobectomy lō-bek'tō-mē	removal of a lobe of a lung
nasal polypectomy nā'zāl pol-i-pek'tō-mē	removal of a nasal polyp
pneumonectomy nū'mō-nek'tō-mē	removal of an entire lung
thoracentesis thōr'ă-sen-tē'sis	puncture for aspiration of the chest (Fig. 9.16)
thoracoplasty thōr'ă-kō-plas-tē	repair of the chest involving fixation of the ribs
thoracoscopy thōr'ă-kos'kō-pē	endoscopic examination of the pleural cavity using a thoracoscope
thoracostomy thōr'ă-kos'tō-mē	creation of an opening in the chest usually for insertion of a tube (see Fig. 9.16)
thoracotomy thōr'ă-kot'ō-mē	incision into the chest
tonsillectomy ton'si-lek'tō-mē	excision of the palatine tonsils
tonsillectomy and adenoidectomy (T & A) ad'ě-noy-dek'tō-mē	excision of the tonsils and adenoids
tracheostomy trā'kē-os'tō-mē	creation of an opening in the trachea, most often to insert a tube (Fig. 9.17)
tracheotomy trā'kē-ot'ō-mē	incision into the trachea (see Fig. 9.17)

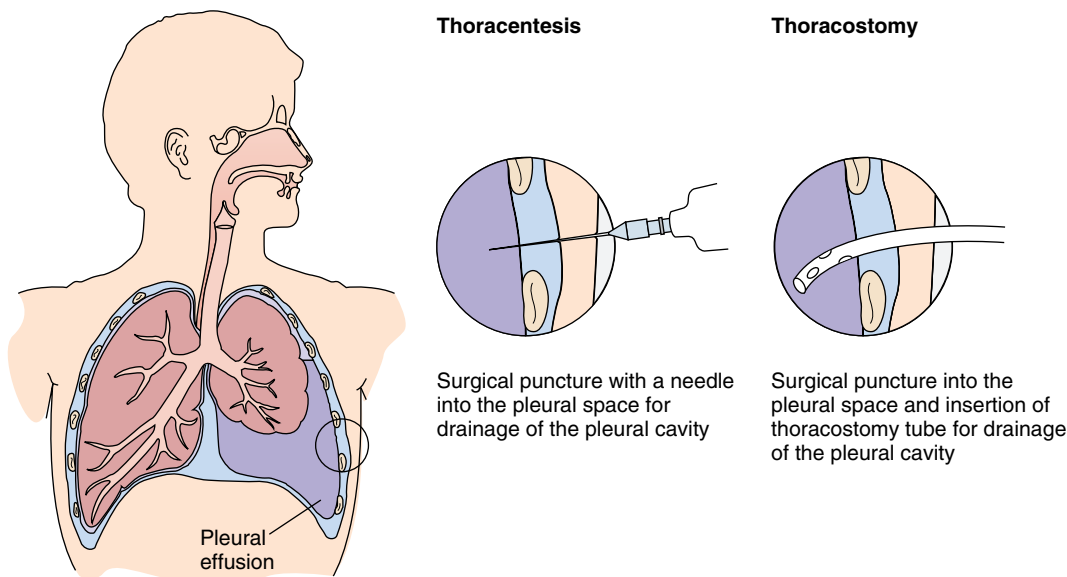


Figure 9.16 Common treatments of pleural effusion.

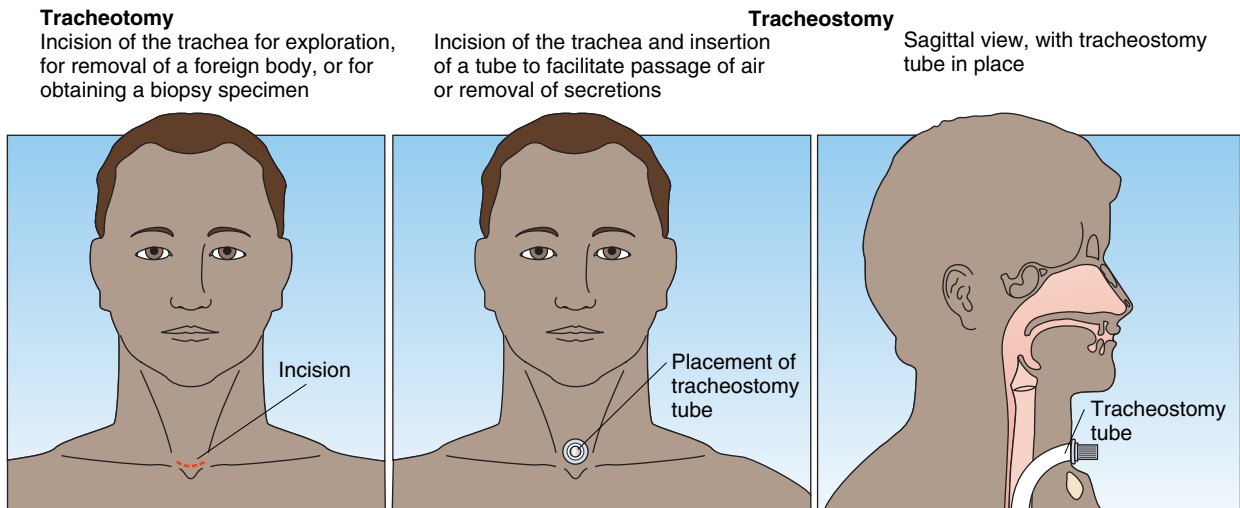


Figure 9.17 Operative procedures related to the trachea.

Therapeutic Terms

Term	Meaning
<p>cardiopulmonary resuscitation (CPR) kar'dē-ō-pŭl'mo-nār-ē rē-sŭs'ī-tā'shŭn</p>	<p>method of artificial respiration and closed-chest massage used to restore breathing and cardiac output after cardiac arrest</p>
<p>continuous positive airway pressure (CPAP)</p>	<p>device that pumps a constant pressurized flow of air through the nasal passages, commonly used during sleep to prevent airway closure in sleep apnea (Fig. 9.18)</p>
<p>endotracheal intubation en'dō-trā'kē-āl in-tū-bā'shŭn</p>	<p>passage of a tube into the trachea via the nose or mouth to open the airway for delivering gas mixtures to the lungs (e.g., oxygen, anesthetics, or air)</p>
<p>incentive spirometry in-sen'tiv spī-rom'ē-trē</p>	<p>common postoperative breathing therapy using a specially designed spirometer to encourage the patient to inhale and repeatedly sustain an inspiratory volume to exercise the lungs and prevent pulmonary complications (Fig. 9.19)</p>
<p>mechanical ventilation mě-kan'ī-kāl ven-ti-lā'shŭn</p>	<p>mechanical method performed by a respiratory therapist to provide assisted breathing using a ventilator (Fig. 9.20)</p>



Figure 9.18 Patient wearing a CPAP mask.



Figure 9.19 Incentive spirometer.



Neonate



Pediatric



Adult

Figure 9.20 Mechanical ventilation.

Term	Meaning
COMMON THERAPEUTIC DRUG CLASSIFICATIONS	
antibiotic an'tē-bī-ot'ik	drug that kills or inhibits the growth of microorganisms
anticoagulant an'tē-kō-ag'yū-lant	drug that dissolves, or prevents the formation of, thrombi or emboli in the blood vessels (e.g., heparin)
antihistamine an-tē-his'tā-mēn	drug that neutralizes or inhibits the effects of histamine
histamine his'tā-mēn	compound in the body that is released by injured cells in allergic reactions, inflammation, etc., causing constriction of bronchial smooth muscle, dilation of blood vessels, etc.
bronchodilator brong-kō-dī-lā'ter	drug that dilates the muscular walls of the bronchi
expectorant ek-spek'tō-rănt	drug that breaks up mucus and promotes coughing

Summary of Chapter 9 Acronyms/Abbreviations

ABGs arterial blood gases	PaO₂ partial pressure of oxygen
Bx biopsy	PE pulmonary embolism
COPD chronic obstructive pulmonary disease	PEFR peak expiratory flow rate
CPAP continuous positive airway pressure	PF peak flow
CPR cardiopulmonary resuscitation	PFT pulmonary function testing
CT computed tomography	pH potential of hydrogen
CXR chest x-ray	PSG polysomnography
HIV human immunodeficiency virus	T & A tonsillectomy and adenoidectomy
LTB laryngotracheobronchitis	TB tuberculosis
MRI magnetic resonance image	TV or V_T tidal volume
O₂ oxygen	URI upper respiratory infection
PaCO₂ partial pressure of carbon dioxide	VC vital capacity



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

EXAMPLE

intranasal

_____/_____/_____
P R S

intra/nas/al

P R S

DEFINITION: within/nose/pertaining to

1. pulmonology

_____/_____
CF S

DEFINITION: _____

2. thoracocentesis

_____/_____
CF S

DEFINITION: _____

3. nasosinusitis

_____/_____/_____
CF R S

DEFINITION: _____

4. hypoxemia

_____/_____/_____
P R S

DEFINITION: _____

5. pleuritis

_____/_____
R S

DEFINITION: _____

6. hypercarbia

_____/_____/_____
P R S

DEFINITION: _____

7. alveolar

_____ / _____
R S

DEFINITION: _____

8. tracheotomy

_____ / _____
CF S

DEFINITION: _____

9. oronasal

_____ / _____ / _____
CF R S

DEFINITION: _____

10. rhinorrhea

_____ / _____
CF S

DEFINITION: _____

11. thoracostomy

_____ / _____
CF S

DEFINITION: _____

12. tonsillectomy

_____ / _____
R S

DEFINITION: _____

13. tracheobronchitis

_____ / _____ / _____
CF R S

DEFINITION: _____

14. bronchospasm

_____ / _____
CF S

DEFINITION: _____

15. laryngostenosis

_____ / _____ / _____
CF R S

DEFINITION: _____

16. spirogram

_____ / _____
CF S

DEFINITION: _____

17. lobectomy

_____ / _____
 R S

DEFINITION: _____

18. peripleural

_____ / _____ / _____
 P R S

DEFINITION: _____

19. stethoscope

_____ / _____
 CF S

DEFINITION: _____

20. pneumonic

_____ / _____
 R S

DEFINITION: _____

21. nasopharyngoscopy

_____ / _____ / _____
 CF CF S

DEFINITION: _____

22. bronchiolectasis

_____ / _____
 R S

DEFINITION: _____

23. phrenoptosis

_____ / _____
 CF S

DEFINITION: _____

24. pectoral

_____ / _____
 R S

DEFINITION: _____

25. uvulopalatopharyngoplasty

_____ / _____ / _____ / _____
 CF CF CF S

DEFINITION: _____

Complete the medical term by writing the missing part:

26. _____coni_____ = lung condition caused by prolonged dust inhalation

27. bronchi_____ = dilation of bronchus
28. _____plasty = surgical repair of the chest
29. _____itis = inflammation of the lung
30. _____metry = process of measuring breathing
31. _____ventilation = deficient movement of air in and out of the lungs
32. _____pnea = normal breathing
33. _____pnea = slow breathing
34. _____pnea = difficulty breathing
35. _____pnea = inability to breathe except in an upright position
36. _____pnea = inability to breathe
37. _____pnea = fast breathing

For each of the following, circle the meaning that corresponds to the combining form given:

- | | | | |
|------------------------|----------|----------|-----------|
| 38. nose | ren/o | rhin/o | nos/o |
| 39. air or lung | aden/o | pneum/o | thorac/o |
| 40. throat | thorac/o | laryng/o | pharyng/o |
| 41. chest | thorac/o | pneum/o | lapar/o |
| 42. voice box | laryng/o | trache/o | pharyng/o |
| 43. breathing | aer/o | spir/o | crin/o |
| 44. diaphragm | phren/o | pleur/o | pneumon/o |
| 45. mouth | ox/o | or/o | spir/o |

Write the correct medical term for each of the following:

46. air in the pleural space

47. pus in the pleural space

48. blood in the pleural space

49. listening to sounds within the body

50. endoscope used to examine the airways

51. coughing up and spitting out material from the lungs

52. inflammation of the pleura

53. to elicit sounds or vibrations by tapping

54. puncture for aspiration of the chest

55. hoarseness

56. inflammation of the voice box

57. deficient amount of oxygen in tissue cells

58. disease characterized by overexpansion of the alveoli with air

59. nosebleed _____
60. cancer originating in the bronchus

61. inherited condition of exocrine gland malfunction that causes mucus to obstruct the airways _____
62. collapse of lung tissue

63. material expelled from the lungs by coughing

64. high-pitched crowing sound that is a sign of obstruction in the upper airway

65. blood clot in the lungs

66. surgical creation of an opening in the trachea

67. disease characterized by paroxysmal wheezing, dyspnea, and cough

68. excessive movement of air in and out of the lungs

- 69. common lung infection seen in those with positive HIV

- 70. disorder that is a combination of emphysema and chronic bronchitis

Write the full medical term for the following abbreviations:

- 71. PEFR _____
- 72. VC _____
- 73. TB _____
- 74. CPR _____
- 75. COPD _____
- 76. PaCO₂ _____
- 77. URI _____
- 78. V_T _____
- 79. PFT _____
- 80. PSG _____
- 81. CPAP _____

Match the following:

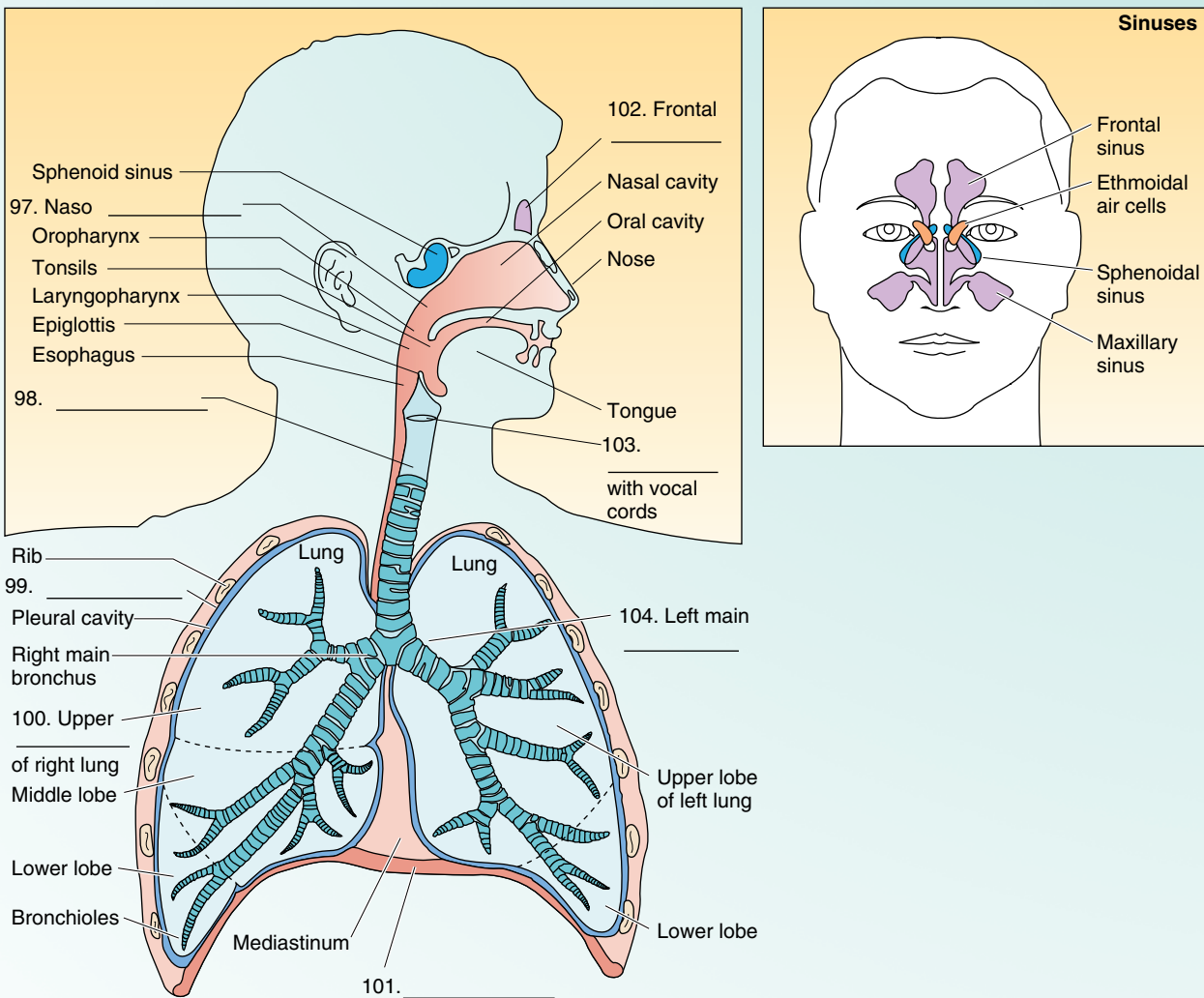
- | | |
|--------------------------|---------------------|
| 82. _____ crackles | a. naso |
| 83. _____ wheezes | b. hyperventilation |
| 84. _____ pleurisy | c. LTB |
| 85. _____ pneumoconiosis | d. thoraco |
| 86. _____ empyema | e. CPAP |
| 87. _____ hemothorax | f. asbestosis |
| 88. _____ stetho | g. pleuritis |
| 89. _____ sleep apnea | h. rhonchi |
| 90. _____ hypocapnia | i. pyothorax |
| 91. _____ rhino | j. hypoventilation |
| 92. _____ hypercapnia | k. rales |
| 93. _____ croup | l. thoracentesis |

Write the standard abbreviations for the following:

- 94. chest x-ray _____
- 95. analysis of blood to determine the adequacy of lung function in exchange of gases _____
- 96. surgical removal of the tonsils and adenoids _____

Write in the missing words on the blank lines in the following illustration of the respiratory tract.

97–104.

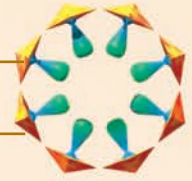


For each of the following, circle the correct spelling of the term:

- | | | |
|-------------------|-----------------|----------------|
| 105. auskucation | auscultation | ascultation |
| 106. tackypnea | tachypenia | tachypnea |
| 107. eupnea | eupenia | eupneia |
| 108. plurisy | plurisey | pleurisy |
| 109. hemathorax | hemothorax | hematothorex |
| 110. stethoscope | stethescope | stethascope |
| 111. epitaxes | epistaxes | epistaxis |
| 112. ronchi | rhonchi | rhonkhi |
| 113. hemoptysis | hemaptysis | hemoptsis |
| 114. rhinorhea | rhinorrhea | rinorhea |
| 115. imphasema | emphysema | emphasema |
| 116. atelectasis | atalexisis | attelexis |
| 117. bronkodieler | bronchodialator | bronchodilator |

Give the noun that was used to form the following adjectives:

118. orthopneic _____
119. pleural _____
120. hypoxic _____
121. dyspneic _____
122. pharyngeal _____
123. apneic _____
124. tracheal _____
125. asthmatic _____



MEDICAL RECORD ANALYSES

MEDICAL RECORD 9.1

S: This is a 26 y.o. ♀ c/o a nonproductive cough, dyspnea, and fever × 2 d; pt does not smoke and has otherwise been in good health.

O: T 101°F, BP 100/64, R 25, 104

Tachypnea is accompanied by mild cyanosis, and inspiratory crackles are noted upon auscultation. WBC 31,000, Hct 37%, platelet count 109,000. CXR shows diffuse infiltrates at the bases of both lungs. An ABG taken while the patient was breathing room air showed a pH of 7.54, PaCO₂ of 20, PaO₂ of 74, sputum specimen contains 3+ WBC but no bacteria.

A: Pneumonia of unknown etiology

P: IV erythromycin STAT
admit to ICU
deliver O₂ by face mask and monitor for hypoxemia

- What is the patient's chief complaint?
 - afebrile with a dry cough and difficulty breathing
 - febrile with a dry cough and difficulty breathing
 - cannot breathe, fever, and coughing up material from the lungs
 - hoarse throat, dry cough, and fever
 - febrile, coughing up sputum, and breathing fast
- What are the findings upon PE?
 - slow breathing, blue skin, and rhonchi heard in the lungs as the patient exhales
 - fast breathing, blue skin, and musical sounds heard in the lungs as the patient inhales
 - slow breathing, blue skin, and rales heard in the lungs as the patient holds her breath
 - fast heart, blue skin, and rales heard in the lungs as the patient inhales
 - fast breathing, blue skin, and popping sounds heard in the lungs as the patient inhales
- What did the chest x-ray show?
 - tuberculosis
 - asthma
 - density representing solid material usually indicating inflammation
 - fluid filling of spaces around the lungs
 - lung cancer
- What is the impression?
 - dilation of the bronchi with an accumulation of mucus
 - inflammation of the bronchi
 - inflammation of the pleura
 - inflammation of the lungs due to sensitivity to dust or chemicals
 - inflammation of the lungs of unknown cause
- What is an ABG?
 - analysis of blood to determine the adequacy of lung function in the exchange of gases
 - measurement of lung volume and capacity
 - measure of the flow of air during inspiration
 - scan to detect breathing abnormalities
 - image of the lungs used to visualize lung lesions
- Describe the condition for which the patient was monitored while undergoing oxygen therapy:
 - blockage of airflow out of the lungs
 - excessive movement of air in and out of the lungs
 - deficient amount of oxygen in the blood
 - deficient amount of oxygen in the tissue cells
 - excessive level of carbon dioxide in the blood
- What is the Sig: on the erythromycin?
 - not mentioned
 - inject into a vein immediately
 - take four immediately
 - insert into the vagina immediately
 - inject into a muscle immediately

MEDICAL RECORD 9.2

Angelica Torrance, a retired painter who for years has boasted to friends that she has the good health of a 30-year-old, suffered a broken ankle when she slipped off a footstool in her basement. The surgical repair of her fracture at Central Medical Center was routine, but soon after surgery Ms. Torrance developed other problems, and a pulmonologist was eventually called in for a consultation.

Directions

Read Medical Record 9.2 for Ms. Torrance (pages 300–302) and answer the following questions. This record is the history and physical examination report from Dr. Carl Brownley, the pulmonologist who consulted with Ms. Torrance’s doctors after she developed breathing problems.

QUESTIONS ABOUT MEDICAL RECORD 9.2

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

morphine _____

heparin _____

obese _____

- In your own words, not using medical terminology, describe what surgery Ms. Torrance had for her broken ankle:

- Describe in your own words the four symptoms that Ms. Torrance developed postsurgically:

a. _____

b. _____

c. _____

d. _____

- Before Ms. Torrance’s acute “sense of suffocating,” she was being treated with what three pharmacological treatments?

a. _____

b. _____

c. _____

- Immediately after her reported “sense of suffocating,” she was given what two treatments?

a. _____

b. _____

6. Put the following events that occurred in the hospital in correct order by numbering them 1 to 8:

_____ postoperative pulmonary symptoms
 _____ transport to intensive care
 _____ sense of suffocation
 _____ episode of tachycardia
 _____ nuclear lung scan showing high probability of embolus
 _____ evaluation for complications in the lungs
 _____ open reduction, internal fixation
 _____ intravenous drugs first administered

7. In your own words, not using medical terminology, describe the two diagnostic imaging studies performed the morning of 10/24:

a. _____
 b. _____

8. Name and describe the test that was performed to monitor Ms. Torrance's heparin therapy:

9. Translate into lay language Dr. Brownley's first four assessments from the examination:

a. _____
 b. _____
 c. _____
 d. _____

10. Dr. Brownley's recommendations include requests for certain tests to be run (or run again) and certain other actions to be taken while Ms. Torrance stays in the hospital. Without using abbreviations, list the tests to be performed and the actions to be taken:

Tests:

a. _____
 b. _____
 c. _____
 d. _____
 e. _____
 f. _____

Actions:

g. _____
 h. _____

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HISTORY

DATE OF CONSULTATION:

October 24, 20xx

HISTORY:

The patient is a 75-year-old woman who is admitted to this hospital on October 18, 20xx, after having fractured her right ankle. She underwent an ORIF of this lesion. Upon emerging from surgery, it was noted that she was quite wheezy and was having copious, purulent secretions. She was started on antibiotics; however, fever, cough, and breathlessness persisted. Finally, she was evaluated on October 20, 20xx, for possible pulmonary complications. A V/Q scan at that time showed a high probability for pulmonary emboli, and she was started on IV Heparin along with her antibiotics and bronchodilators. The patient did well with resolution of symptoms and fever and was progressing to the point of discharge.

Late yesterday evening, however, the patient developed the acute onset of "a sense of suffocating." This lasted for about 20-30 minutes and did resolve somewhat with the application of nasal oxygen and morphine sulfate 2 mg. The patient denies any cough, mucus, or actual chest pressure or pain. She denies any wheezing during this episode. Her heart rate went as high as 115-120; however, she was normotensive.

She was transported to ICU for further evaluation and management. An ECG obtained at that time revealed slight ST segment depression and T wave flattening at V4-6 with sinus tachycardia. Arterial blood gases done during the episode on 7 L O₂ showed a PaO₂ of 78, a pH of 7.44, and a PaCO₂ of 35. This morning, a chest x-ray revealed continuing resolution of the right upper and right lower lobe infiltrates. A V/Q scan showed evidence of resolving multiple perfusion defects on the right that appeared to actually match the defects noted on the chest x-ray. PTT, which had been continually in control during her Heparin therapy, was as high as 150 on 7 units of Heparin per hour.

PAST MEDICAL HISTORY:

The patient denies a past history of chronic respiratory disease but did have severe pneumonia about 30 years ago. The patient is a nonsmoker who has never smoked, and she has an essentially negative past medical history.

ALLERGIES:

The patient denies any personal allergies, but her family all suffer from chronic post nasal drip.

(continued)

PULMONARY CONSULTATION
Page 1

PT. NAME:	TORRANCE, ANGELICA W.
ID NO:	IP-228904
ROOM NO:	663
ATT. PHYS.	C. BROWNLEY, M.D.

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PHYSICAL EXAMINATION**GENERAL:**

Well-nourished, somewhat overweight woman in no acute distress, having recently come back from x-ray with no undue dyspnea.

VITAL SIGNS:

BP: 110/70. Respirations: 16. Heart Rate: 80 and regular. Temperature: 99°.

CHEST:

LUNGS: Fair expansion bilaterally. Percussion note is normal. There are rare, distant end inspiratory rales at both bases.

HEART: No clinical cardiomegaly. There are no murmurs or gallops.

ABDOMEN:

Obese, soft, nontender.

EXTREMITIES:

1+ pretibial edema on the left with a cast on the right.

ASSESSMENT:

1. ACUTE ONSET OF SHORTNESS OF BREATH OF UNCLEAR ETIOLOGY.
2. HYPOXIA.
3. HYPOTHROMBINEMIA (PATIENT ON HEPARIN).
4. STATUS POST PULMONARY EMBOLISM WITH RESOLUTION AND NO EVIDENCE OF RECURRENCE.
5. STATUS POST OPEN REDUCTION INTERNAL FIXATION OF TRIMALLEOLAR FRACTURE ON THE RIGHT.
6. RULE OUT ACUTE MYOCARDIAL INFARCTION VERSUS ISCHEMIA.
7. POSSIBLE MUCUS PLUG.

(continued)

PULMONARY CONSULTATION
Page 2

PT. NAME: TORRANCE, ANGELICA W.
ID NO: IP-228904
ROOM NO: 663
ATT. PHYS. C. BROWNLEY, M.D.

CENTRAL MEDICAL CENTER

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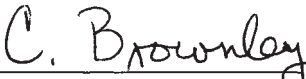
PHYSICAL EXAMINATION

RECOMMENDATIONS:

Cardiac enzymes should be obtained, and the ECG should be repeated as well. Recheck ABGs. Recheck PTT and discontinue Heparin until PTT diminishes to the 60s. Check CBC and comprehensive metabolic panel. Continue to observe in the ICU.

It is somewhat unclear as to what is the etiology of the episode of dyspnea. A possibility might be a mucous plug which has mobilized into the central airway and momentarily caused increased respiratory distress.

Thank you for the opportunity to assist in the management of this patient.


C. Brownley, M.D.
Pulmonologist

CB:im

D: 10/24/20xx

T: 10/25/20xx

PULMONARY CONSULTATION
Page 3

PT. NAME: TORRANCE, ANGELICA W.
ID NO: IP-228904
ROOM NO: 663
ATT. PHYS. C. BROWNLEY, M.D.

MEDICAL RECORD 9.3

Richard Puma, a heavy smoker until recently, had been treated for pneumonia in the last month. Even though his condition had deteriorated in the last few days, he refused to be hospitalized. Today, May 18, having much trouble breathing, he came to Central Medical Center and was seen by Dr. Theresa Cunningham.

Directions

Read Medical Record 9.3 for Richard Puma (pages 306–309) and answer the following questions. This record includes the history, physical examination, and discharge summary dictated by Dr. Cunningham and transcribed the next day.

QUESTIONS ABOUT MEDICAL RECORD 9.3

Write your answers in the spaces provided.

- Below are medical terms used in these records you have not yet encountered in this text. Underline each where it appears in the record and define below:

hepatosplenomegaly _____

precordial _____

fulminant _____

respiratory acidosis _____

cardiac arrest _____

- In your own words, not using medical terminology, describe Mr. Puma's chief complaint to Dr. Cunningham:

- Following are various elements from the history of Mr. Puma's present illness. Put them in correct chronological order by numbering them 1 to 7, starting with the event that occurred first:

___ productive cough with some show of blood

___ seen at the Bradford Emergiclinic

___ progressively worsening with marked SOB

___ diagnosis of pneumonia

___ refusal to be hospitalized

___ administration of Cipro began

___ administration of Cipro started a second time

4. In your own words, not using medical terminology, describe how Mr. Puma looked in general at the time of examination:

5. Although examination of the abdomen produced no negative findings, Dr. Cunningham's auscultation of the lungs and heart was more significant. In your own words, what were her findings?

6. Dr. Cunningham concluded her examination with a diagnosis and treatment plan. Although the cause of Mr. Puma's condition is unclear, the diagnosis statement itself is definite. Describe it in your own words:

7. In the history and physical examination, Dr. Cunningham's treatment plan called for what immediate action?

8. As noted in the discharge summary, Dr. Anderson was next to see Mr. Puma. In your own words, describe Dr. Anderson's specialty:

9. What diagnostic test was first to be performed on admission to the CCU?

10. During the CCU examination, what happened to Mr. Puma?

How did Dr. Anderson respond?

11. Put Dr. Cunningham's final three diagnoses in your own words (do not include history or treatment information):

a. _____

b. _____

c. _____

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HISTORY

CHIEF COMPLAINT:

Marked respiratory distress.

HISTORY OF PRESENT ILLNESS:

The patient is a 62-year-old white male with a history of pneumonia diagnosed four weeks ago. He appeared to have a favorable response to a two-week course of Cipro; however, after being off the medication for two days, symptoms including hemoptysis and yellow sputum returned. He was restarted on half a dose of the antibiotic for five more days with some improvement. This was finished 1 1/2 weeks ago. Over the past 10 days, he has become progressively worse with a marked increase in shortness of breath and orthopnea. Two days ago, he was seen at the Bradford Emergiclinic because of the progressive nature of his shortness of breath. At that time, hospitalization was recommended, but the patient refused.

PAST MEDICAL HISTORY:

The patient states there is no prior history of heart disease, although he says an electrocardiogram showed a possible old heart attack in the past; this was noted approximately 14 years ago. He has a history of possible hypertension in the past.

ALLERGIES: He has no known allergies.

HABITS: He smoked two packs of cigarettes per day for 35 years; he stopped one month ago. He drinks approximately one beer a month.

SURGERIES: He had several hernia surgeries in the past.

FAMILY HISTORY: The patient's father died at age 42 of heart problems.

REVIEW OF SYSTEMS:

Noncontributory to the present illness.

(continued)

HISTORY AND PHYSICAL
Page 1

PT. NAME: PUMA, RICHARD G.
ID NO: 077321
ADM. DATE: May 18, 20xx
ATT. PHYS. T. CUNNINGHAM, M.D.

CENTRAL MEDICAL CENTER

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PHYSICAL EXAMINATION**GENERAL APPEARANCE:**

Markedly tachypneic, thin, cyanotic white male in marked respiratory distress. VITAL SIGNS:
Blood pressure: 90/50.

HEENT:

Eyes: Pupils are equal and reactive to light and accommodation. Extraocular movements are normal. Ears, nose, and throat are negative.

NECK: Supple. Jugular venous pulsations are normal. Carotids are 2+ and equal bilaterally without bruit.

CHEST:

LUNGS: There is a very rapid rate with a few basilar rales and decreased breath sounds in the bases.

HEART: It was difficult to auscultate because of the marked tachypnea and respiratory noises. There were no obvious murmurs heard.

ABDOMEN: Soft and nontender. No hepatosplenomegaly or masses were noted.

GENITALIA/RECTAL:

Normal male. The rectal examination was not performed due to the acute nature of the patient's illness.

EXTREMITIES:

There was no edema. Peripheral pulses are barely palpable. There was no marked cyanosis.

LABORATORY AND X-RAY DATA:

An electrocardiogram shows regular sinus rhythm with PVCs and fusion beats, nonspecific inferior ventricular conduction delay, right axis deviation, poor precordial R-wave progression, and nonspecific ST-T wave changes.

(continued)

HISTORY AND PHYSICAL
Page 2

PT. NAME: PUMA, RICHARD G.
ID NO: 077321
ADM. DATE: May 18, 20xx
ATT. PHYS. T. CUNNINGHAM, M.D.

CENTRAL MEDICAL CENTER

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PHYSICAL EXAMINATION

IMPRESSION:

1. MARKED, SEVERE RESPIRATORY DISTRESS WITH CYANOSIS DUE TO UNKNOWN ETIOLOGY. RULE OUT FULMINANT PNEUMONIA, RULE OUT CONGESTIVE HEART FAILURE, RULE OUT OTHER CAUSES.
2. CHRONIC OBSTRUCTIVE PULMONARY DISEASE.
3. POSSIBLE HISTORY OF HYPERTENSION, PRESENTLY HYPOTENSIVE.

PLAN:

The patient is admitted to the CCU immediately after being seen in the office. Upon admission, he will be seen by Dr. Anderson in pulmonary consult. Further evaluation and treatment will depend upon the results of the studies.



T. Cunningham, M.D.

TC:ti

D: 5/18/xx

T: 5/19/xx

HISTORY AND PHYSICAL
PAGE 3

PT. NAME: PUMA, RICHARD G.
ID NO: 077321
ADM. DATE: May 18, 20xx
ATT. PHYS. T. CUNNINGHAM, M.D.

CENTRAL MEDICAL CENTER

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DISCHARGE SUMMARY**DATE OF ADMISSION:** May 18, 20xx**DATE OF DISCHARGE:** May 18, 20xx**DIAGNOSES:**

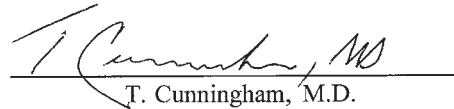
1. ACUTE SEVERE RESPIRATORY DISTRESS, WITH RESPIRATORY FAILURE, TREATED, DIED.
2. CARDIAC ARREST, DUE TO UNKNOWN ETIOLOGY, PROBABLY SECONDARY TO MARKED PULMONARY DISEASE, TREATED WITH CARDIOPULMONARY RESUSCITATION, UNSUCCESSFUL.
3. CHRONIC OBSTRUCTIVE PULMONARY DISEASE WITH A LONG HISTORY OF TOBACCO ABUSE.

SUMMARY:

This patient was seen in the office on the morning of admission in marked respiratory distress. He was markedly tachypneic and cyanotic, and he had a history of pneumonia which was treated one month ago with progressive symptoms over the past week.

The patient was admitted immediately to the CCU where he was met by M. Anderson, M.D., a pulmonologist, who saw him in consultation. During the initial evaluation, while the patient was getting ready for a CXR in the CCU, he suddenly had a cardiac arrest.

Resuscitation was begun immediately. The patient was seen by me at that time; however, he did not respond to any measures. An arterial line was placed. He had marked respiratory acidosis, and after no response to resuscitation, he was pronounced dead.



T. Cunningham, M.D.

TC:ti

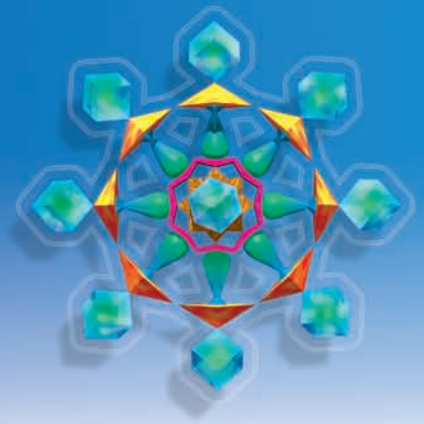
D: 5/18/xx

T: 5/19/xx

DISCHARGE SUMMARY

PT. NAME: PUMA, RICHARD G.
 ID NO: 077321
 ROOM: CCU
 ATT. PHYS. T. CUNNINGHAM, M.D.

Nervous System



OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define common term components used in relation to the nervous system and psychiatry
- ◆ Describe the basic functions of the nervous system
- ◆ Define the basic anatomical terms referring to the nervous system
- ◆ Define common symptomatic and diagnostic terms related to the nervous system
- ◆ Define common diagnostic terms related to the nervous system
- ◆ List common diagnostic tests and procedures related to the nervous system
- ◆ Define common operative terms related to the nervous system
- ◆ Define common therapeutic terms including drug classifications related to the nervous system
- ◆ Define common symptomatic terms related to psychiatry
- ◆ Define common diagnostic terms related to psychiatry
- ◆ Define common therapeutic terms related to psychiatry
- ◆ Explain common terms and abbreviations used in documenting medical records involving the nervous system or field of psychiatry

Combining Forms

Combining Form	Meaning	Example
arthr/o	articulation	dysarthria
cerebell/o	cerebellum (little brain)	cerebellar ser-e-bel'ar
cerebr/o	cerebrum (largest part of brain)	cerebrospinal ser'ě-brō-spī-nāl
crani/o	skull	cranium krā'nē-ŭm
encephal/o	entire brain	encephalography en-sef-ă-log'ră-fě
esthesi/o	sensation	hyperesthesia hī'per-es-thē'zē-ă
gangli/o	ganglion (knot)	ganglioneuroma gang'glē-ō-nū-rō'mă

Combining Form	Meaning	Example
gli/o	glue	glial glī'ál
gnos/o	knowing	gnosia nō'sēă
hypn/o	sleep	hypnosis hip-nō'sis
somn/i		somnipathy som-nip'ă-thē
somn/o		polysomnography pol'ē-som-nog'ră-fē
kinesi/o	movement	kinesiology ki-nē-sē-ol'ō-jē
lex/o	word or phrase	dyslexia dis-lek'sē-ă
mening/o	meninges (membrane)	meningocele mē-ning'gō-sēl
meningi/o		meningitis men-in-jī'tis
myel/o	spinal cord or bone marrow	myeloma mī-ē-lō'mă
narc/o	stupor, sleep	narcotic nar-kot'ik
neur/o	nerve	neuralgia nū-ral'jē-ă
phas/o	speech	dysphasia dis-fă'zē-ă
phob/o	exaggerated fear or sensitivity	phobia fō'bē-ă
phor/o	carry or bear	euphoria yu-fōr'ē-ă
phren/o	mind	schizophrenia skiz'-ō-frē'nē-ă
psych/o		psychotic sī-kot'ik
thym/o		dysthymia dis-thī'mē-ă
schiz/o	split	schizoid skiz'oyd
somat/o	body	psychosomatic sī'kō-sō-mat'ik
spin/o	spine (thorn)	spinal spī'năl
spondyl/o	vertebra	spondylosynthesis spon'di-lō-sin-dē'sis
vertebr/o		vertebral ver'te-brăl

Combining Form	Meaning	Example
stere/o	three dimensional or solid	stereotaxic ster'ē-ō-tak'sik
tax/o	order or coordination	ataxic ă-tak'sik
thalam/o	thalamus (a room)	thalamotomy thal-ă-mot'ō-mē
ton/o	tone or tension	tonic ton'ik
top/o	place	topesthesia top'es-thē'-zē-ă
ventricul/o	ventricle (belly or pouch)	ventriculostomy ven-trik-yū-los'tō-mē
ADDITIONAL PREFIX		
cata-	down	catatonic kat-ă-ton'ik
ADDITIONAL SUFFIXES		
-asthenia	weakness	neurasthenia nūr-as-thē'nē-ă
-lepsy	seizure	narcolepsy nar'kō-lep-sē
-mania	condition of abnormal impulse toward	necromania nek-rō-mā'nē-ă
-paresis	slight paralysis	hemiparesis hem'ē-pa-rē'sis
-plegia	paralysis	paraplegia par-ă-plē'jē-ă

Nervous System Overview

The nervous system is an intricate communication network of structures that activates and controls all functions of the body and receives all input from the environment.

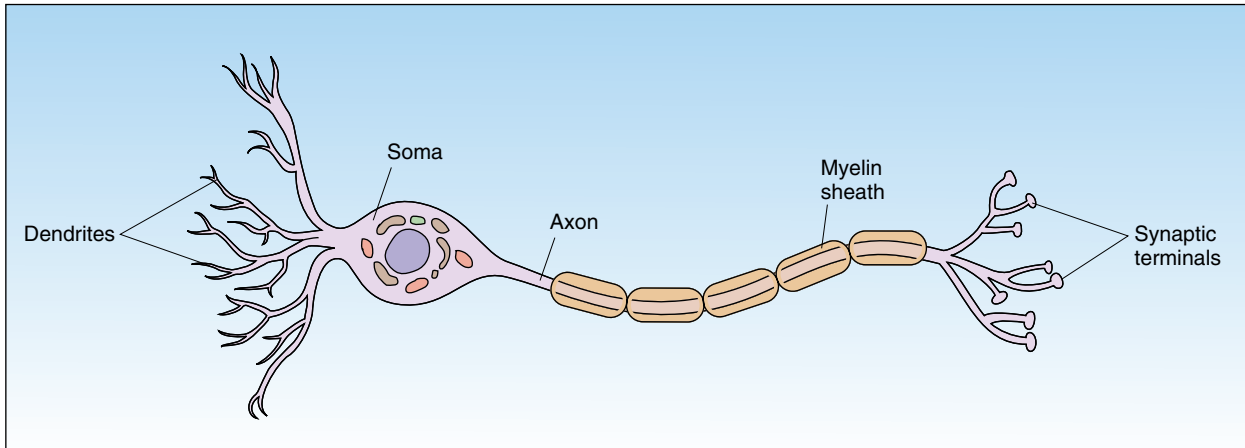
There are two major classes of cells that make up the nervous system: the *neuron*, the basic structure, and the *neuroglia*, the supporting cells (Fig. 10.1).

Each neuron is made up of a *soma* (the body of the neuron), *dendrites* (the afferent branches of the soma), and an *axon* (the efferent branch of the soma), which are linked via terminals called *synapses*. At the synapse, chemicals known as *neurotransmitters* are released to effect changes that inhibit or excite cells. They function within the vast complex of impulse-carrying fibers called *nerves*. A ganglion is a collection of somas in the peripheral nervous system, and a nucleus is a collection of somas in the central nervous system.

Four types of neuroglia perform essential functions in the nervous system: *ependymal cells* make the cerebrospinal fluid that circulates in and around the brain and spinal cord. The star-shaped *astrocytes* have the responsibility of passing nutrients from blood to neurons. *Myelin*, the lipid that surrounds nerve fibers and helps to conduct neuronal impulses, is produced by the *oligodendroglia*. The small, branching *microglia* perform phagocytosis.

The nervous system has three divisions: (a) central nervous system, (b) peripheral nervous system, and (c) autonomic nervous system.

NEURON



GLIAL CELLS

Ependymal cells
(line brain ventricles)

Oligodendrocytes
(wrap axons: myelination)

Astrocytes
(support capillaries)

Microglial cells
(engulf invading microorganisms and dead tissues)

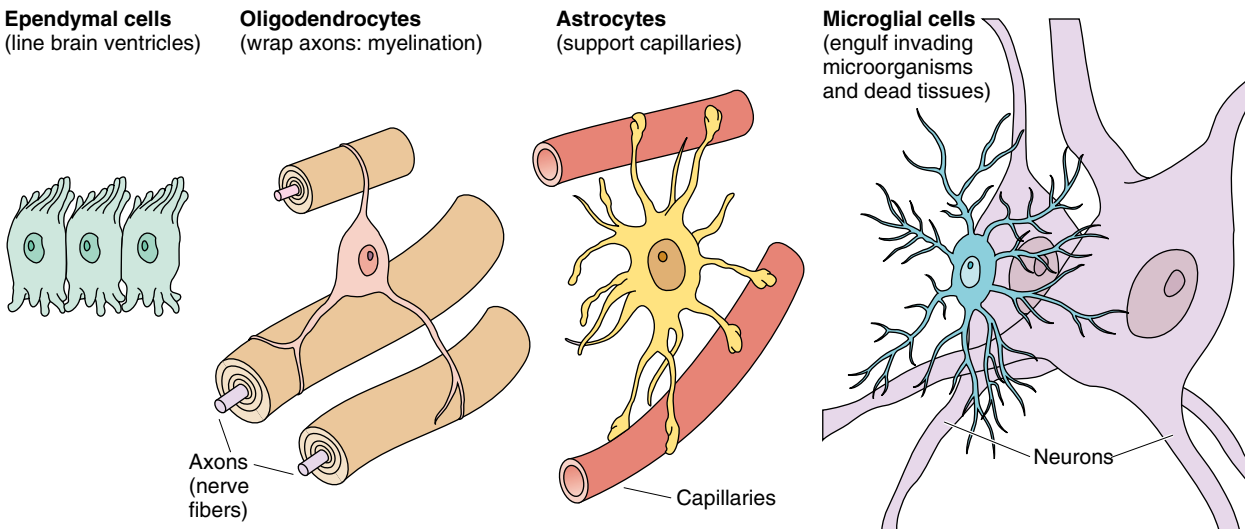


Figure 10.1 Basic components of the nervous system.

Anatomical Terms

Term	Meaning
central nervous system (CNS)	brain and spinal cord
brain	portion of the central nervous system contained within the cranium
cerebrum sēr-ē'brum	largest portion of the brain; it is divided into right and left halves known as <i>cerebral hemispheres</i> that are connected by a bridge of nerve fibers called the <i>corpus callosum</i> ; lobes of the cerebrum are named after the skull bones they underlie (Fig. 10.2)
frontal lobe frūn'tāl lōb	anterior section of each cerebral hemisphere responsible for voluntary muscle movement and personality
parietal lobe pā-rī'ē-tāl lōb	portion posterior to the frontal lobe, responsible for sensations such as pain, temperature, and touch

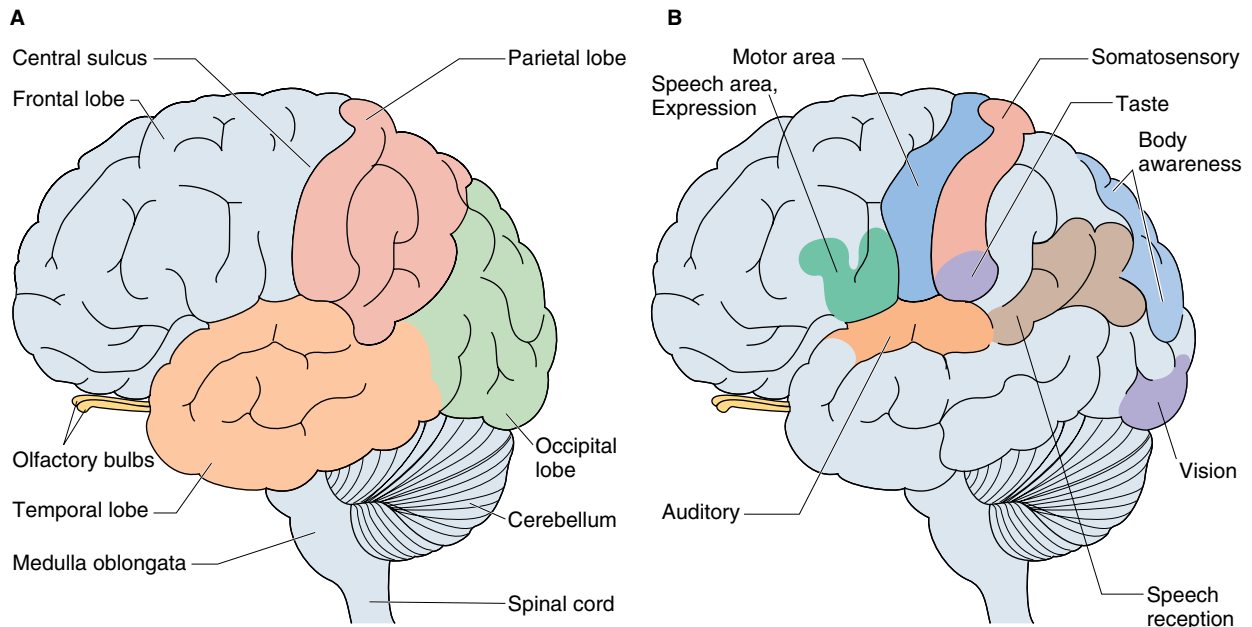
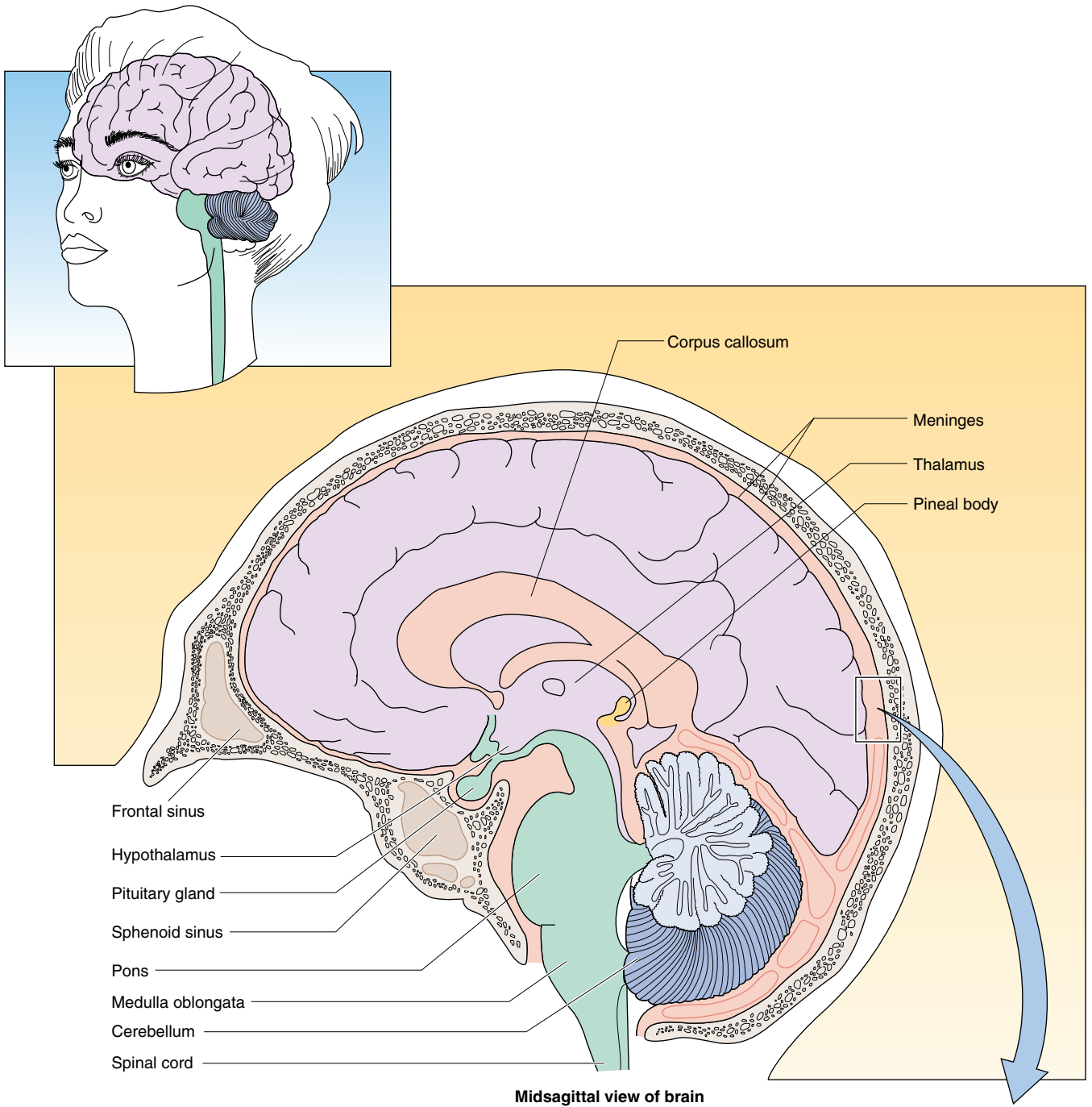


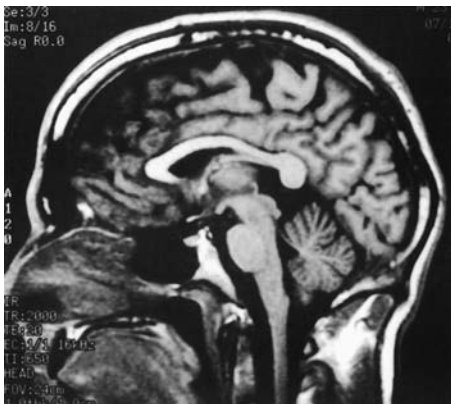
Figure 10.2 A. Lobes of the brain. B. Localized functions of the cerebrum.

Term	Meaning
temporal lobe tem'pö-räl lōb	portion that lies below the frontal lobe, responsible for hearing, taste, and smell
occipital lobe ok-sip'i-täl lōb	portion posterior to the parietal and temporal lobes, responsible for vision
cerebral cortex ser'ě-bräl kōr'teks	outer layer of the cerebrum consisting of gray matter, responsible for higher mental functions (cortex = bark)
thalamus (diencephalon) thal'ă-mūs dī-en-sef'ă-lon	two gray matter nuclei deep within the brain, responsible for relaying sensory information to the cortex
gyri jī'rī	ring or circle; convolutions (mounds) of the cerebral hemispheres
sulci sül'sī	ditch; shallow grooves that separate gyri
fissures fish'ürz	splitting crack; deep grooves in the brain
cerebellum ser'ě-bel'üm	portion of the brain located below the occipital lobes of the cerebrum, responsible for control and coordination of skeletal muscles (Fig. 10.3)
brainstem brän'stem	region of the brain that serves as a relay between the cerebrum, cerebellum, and spinal cord, responsible for breathing, heart rate, and body temperature; there are three levels: mesencephalon (midbrain), pons, and medulla oblongata
ventricles ven'tri-klz	series of interconnected cavities within the cerebral hemispheres and brainstem filled with cerebrospinal fluid (Fig. 10.4)

THE BRAIN



Midsagittal view of brain



Magnetic resonance imaging (MRI) of normal brain, midsagittal view

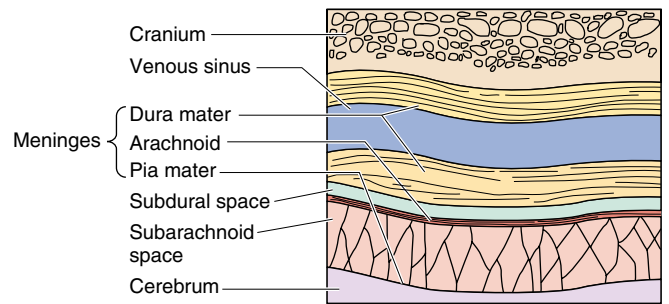
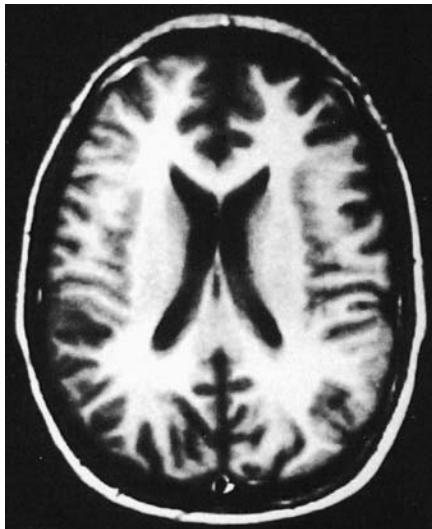
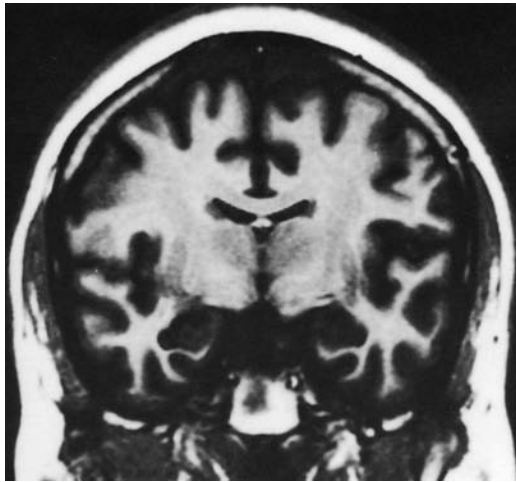


Figure 10.3 Midsagittal view of the brain.



Magnetic resonance image, horizontal view A



Magnetic resonance image, coronal view B

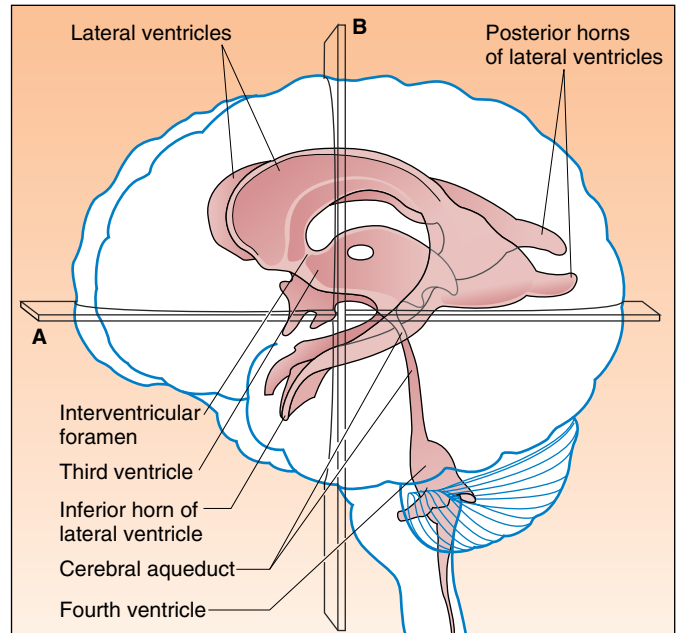


Figure 10.4 Ventricles of the brain.

Term	Meaning
cerebrospinal fluid (CSF) ser'ě-brō-spī-nāl flū'id	plasma-like clear fluid circulating in and around the brain and spinal cord
spinal cord spī'nāl kōrd	column of nervous tissue from the brainstem through the vertebrae, responsible for nerve conduction to and from the brain and the body
meninges mě-nin'jēz	three membranes that cover the brain and spinal cord, consisting of the dura mater, pia mater, and arachnoid
peripheral nervous system (PNS)	nerves that branch from the central nervous system, including nerves of the brain (cranial nerves) and spinal cord (spinal nerves) (Fig. 10.5)
cranial nerves krā'nē-āl nervz	12 pairs of nerves arising from the brain

THE PERIPHERAL NERVOUS SYSTEM

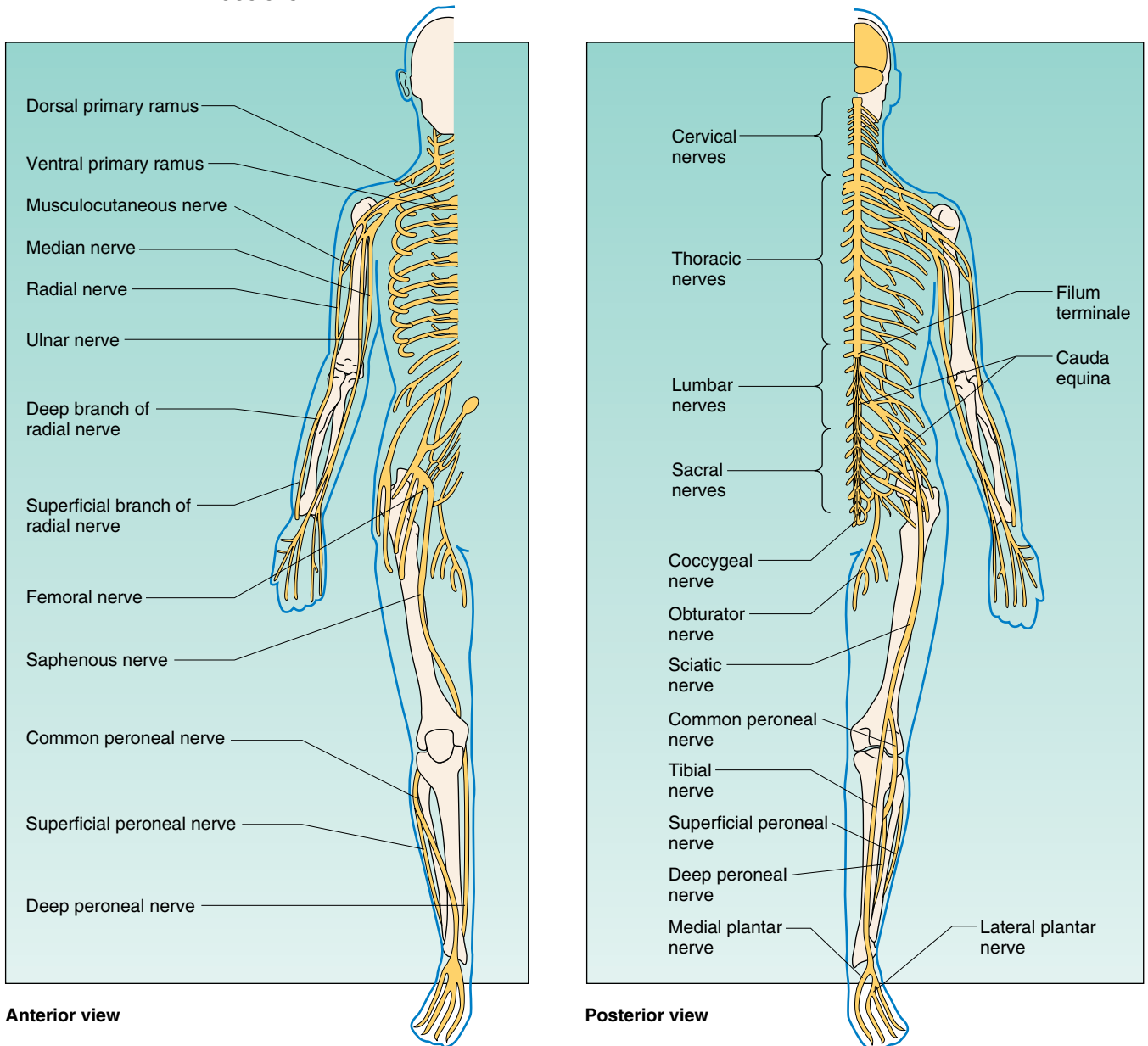


Figure 10.5 Peripheral nervous system.

Term	Meaning
spinal nerves	31 pairs of nerves arising from the spinal cord
sensory nerves sen'sō-rē nervz	nerves that conduct impulses from body parts and carry sensory information to the brain—also called afferent nerves (ad = toward; ferre = carry)
motor nerves	nerves that conduct motor impulses from the brain to muscles and glands; also called efferent nerves (e = out; ferre = carry)

Term	Meaning
autonomic nervous system (ANS)	nerves that carry involuntary impulses to smooth muscle, cardiac muscle, and various glands
hypothalamus hī'pō-thal'ă-mŭs	control center for the autonomic nervous system located below the thalamus (diencephalon)
sympathetic nervous system sim-pă-thet'ik	division of the ANS concerned primarily with preparing the body in stressful or emergency situations
parasympathetic nervous system par-ă-sim-pă-thet'ik	division of the ANS that is most active in ordinary conditions; it counterbalances the effects of the sympathetic system by restoring the body to a restful state after a stressful experience

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC	
aphasia ă-fă'zē-ă	condition without speech; impairment due to localized brain injury that affects understanding, retrieving, and formulating meaningful and sequential elements of language
dysarthria dis-ar'thrē-ă	condition of difficult articulation; group of related speech impairments that may affect the speed, range, direction, strength, and timing of motor movement as a result of paralysis, weakness, or incoordination of speech muscles (arthr/o = articulation)
dysphasia dis-fă'zē-ă	difficulty speaking
coma kō'mă	general term referring to levels of decreased consciousness with varying responsiveness; a common method of assessment is the Glasgow coma scale (Fig. 10.6)
delirium dē-lir'ē-ŭm	state of mental confusion due to disturbances in cerebral function—there are many causes, including fever, shock, or drug overdose (deliro = to draw the furrow awry in plowing, i.e., to go off the rails)
dementia dē-men'shē-ă	impairment of intellectual function characterized by memory loss, disorientation, and confusion (dementio = to be mad)
motor deficit mō'ter def'i-sit	loss or impairment of muscle function
sensory deficit sen'sō-rē def'i-sit	loss or impairment of sensation



COMA. Coma is derived from a Greek word meaning a deep sleep, a state of unconsciousness from which one cannot be roused. In Greek mythology, Comos was the guardian of banquets who indulged in nightly orgies that resulted in a state of profound insensibility caused by a drunken stupor. The ingestion of a toxin such as alcohol is only one of many causes of coma. The words comic and comical share the same origin with coma.

Glasgow Coma Scale			A.M.			P.M.			A.M.						
Assessment	Reaction	Score	8	10	12	2	4	6	8	10	12	2	4	6	8
Eye Opening	Spontaneously	4	X						X	X	X	X	X		
Response	To speech	3		X				X							
	To pain	2			X	X	X								
	No response	1													
Motor Response	Obeys verbal command	6	X						X	X	X	X	X		
	Localizes pain	5		X	X										
	Flexion withdrawal	4				X		X							
	Flexion	3					X								
	Extension	2													
	No response	1													
Verbal Response	Oriented x3	5	X						X	X	X	X	X		
	Conversation confused	4		X				X							
	Inappropriate speech	3			X										
	Incomprehensible sounds	2				X	X								
	No response	1													

Figure 10.6 Glasgow Coma Scale scoring for a child. A score of 3 to 8 denotes severe trauma; a score of 9 to 12 denotes moderate trauma; and a score of 13 to 15 denotes slight trauma. Notice the gradual improvement from coma in this example.

Term	Meaning
neuralgia nū-ral'jē-ă	pain along the course of a nerve
paralysis	temporary or permanent loss of motor control
flaccid paralysis flas'sid pã-ral'i-sis	defective (flabby) or absent muscle control caused by a nerve lesion
spastic paralysis spas'tik pã-ral'i-sis	stiff and awkward muscle control caused by a central nervous system disorder
hemiparesis hem-ē-pa-rē'sis	partial paralysis of the right or left half of the body
sciatica sī-at'i-kă	pain that follows the pathway of the sciatic nerve caused by compression or trauma of the nerve or its roots
seizure sē'zher	sudden, transient disturbances in brain function resulting from abnormal firing of nerve impulses (may or may not be associated with convulsion)
convulsion kon-vül'shŭn	to pull together; type of seizure that causes a series of sudden, involuntary contractions of muscles
syncope sin'kō-pē	fainting
tactile stimulation tak'til	evoking a response by touching

Term	Meaning
hyperesthesia hī'per-es-thē'zē-ă	increased sensitivity to stimulation such as touch or pain
paresthesia par-es-thē'zē-ă	abnormal sensation of numbness and tingling without objective cause
DIAGNOSTIC	
agnosia ag-nō'sē-ă	any of many types of loss of neurological function associated with interpretation of sensory information
astereognosis ă-stēr'ē-og-nō'sis	inability to judge the form of an object by touch (e.g., a coin from a key)
atopognosis ă-top-og-nō'sis	inability to locate a sensation properly, such as to locate a point touched on the body
Alzheimer disease	disease of structural changes in the brain resulting in an irreversible deterioration that progresses from forgetfulness and disorientation to loss of all intellectual functions, total disability, and death (see Fig. 10.19)
amyotrophic lateral sclerosis (ALS) ā-mī-ō-trō'fik	a condition of progressive deterioration of motor nerve cells resulting in total loss of voluntary muscle control; symptoms advance from muscle weakness in the arms, legs, muscles of speech, swallowing, and breathing to total paralysis and death—also known as Lou Gehrig disease
cerebral palsy (CP) ser'ē-brāl pawl'zē	condition of motor dysfunction caused by damage to the cerebrum during development or injury at birth, characterized by partial paralysis and lack of muscle coordination (palsy = paralysis)
cerebrovascular disease	disorder resulting from a change within one or more blood vessels of the brain
cerebral arteriosclerosis ar-tēr'ē-ō-skler-ō'sis	hardening of the arteries of the brain
cerebral atherosclerosis ath'er-ō-skler-ō'sis	condition of lipid (fat) buildup within the blood vessels of the brain (ather/o = fatty [lipid] paste)
cerebral aneurysm an'yū-rizm	dilation of a blood vessel in the brain (aneurysm = dilation or widening)
cerebral thrombosis throm-bō'sis	presence of a stationary clot in a blood vessel of the brain
cerebral embolism em'bō-lizm	obstruction of a blood vessel in the brain by an embolus transported through the circulation
cerebrovascular accident (CVA) stroke	damage to the brain caused by cerebrovascular disease (e.g., occlusion of a blood vessel by an embolus or thrombus or intracranial hemorrhage after rupture of an aneurysm) (Fig. 10.7)
transient ischemic attack (TIA) tran'zē-ěnt is-kē'mik	brief episode of loss of blood flow to the brain usually caused by a partial occlusion that results in temporary neurological deficit (impairment)—often precedes a CVA (Fig. 10.8)

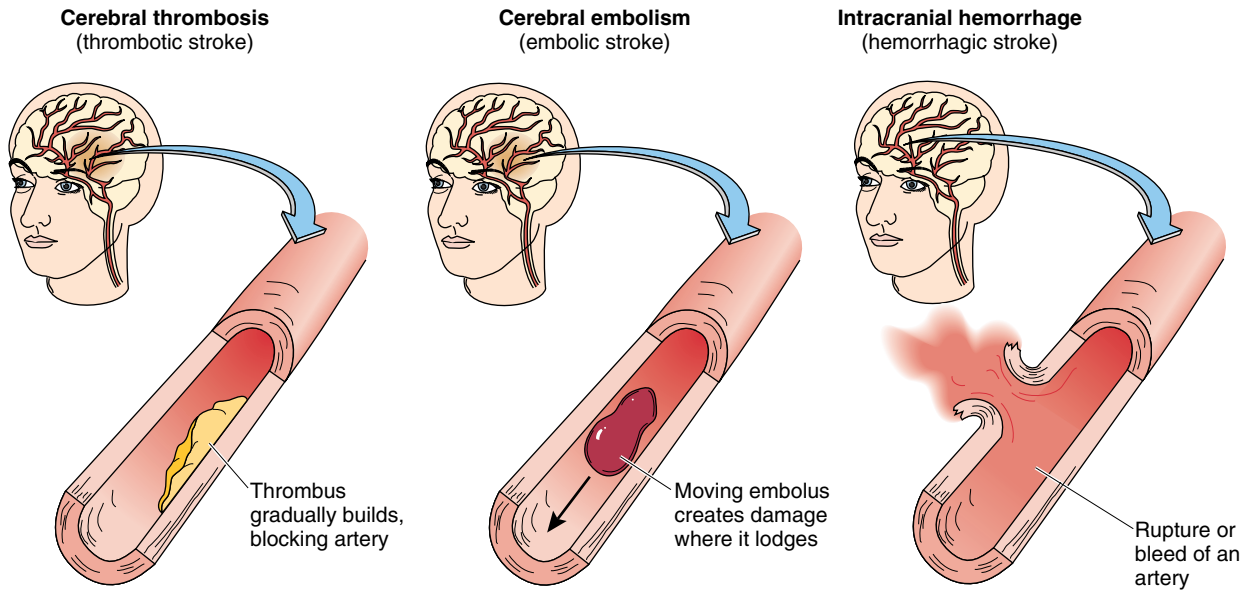


Figure 10.7 Cerebrovascular accident.

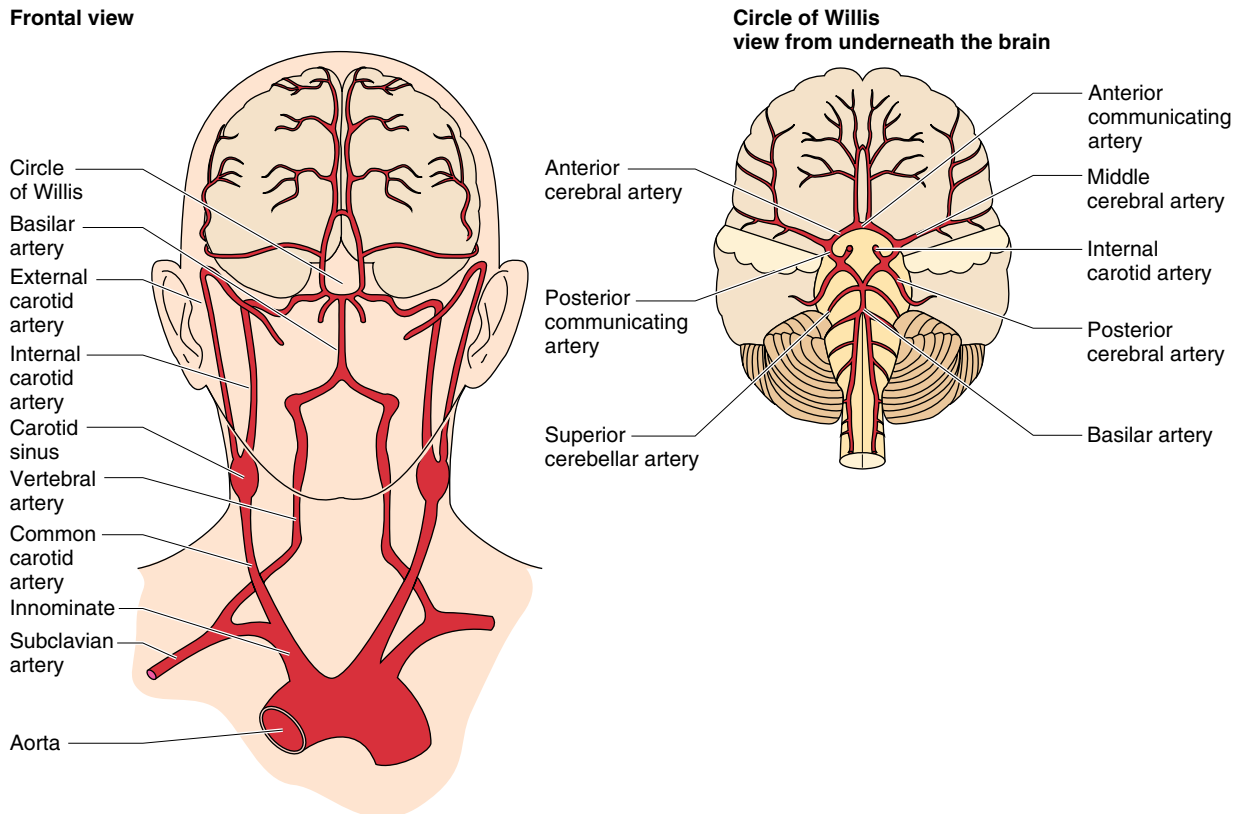


Figure 10.8 Sites of transient ischemic attack: carotid and vertebrobasilar circulation.



CAROTID. Carotid stems from the Greek word meaning to stupefy or throttle. The ancients used the term to describe the arteries in the neck because they believed that when they were pressed hard, one became sleepy.



EPILEPSY. Epilepsy comes from a Greek word for seizure. Aristotle used the word to mean a convulsive seizure, a condition that came to be called epilepsy. It was regarded in ancient times as an infliction from the gods, hence the Roman term, *morbus sacer* (sacred disease). Many other terms were applied to epilepsy, such as “disease of Hercules” because sufferers seemed to have superhuman strength.

Term	Meaning
carotid TIA ka-rot'id	ischemia of the anterior circulation of the brain
vertebrobasilar TIA ver'tě-brō-bas'i-lār	ischemia of the posterior circulation of the brain
encephalitis en-sef-ă-lī'tis	inflammation of the brain
epilepsy ep'i-lep'sē	disorder affecting the central nervous system characterized by recurrent seizures
tonic-clonic ton'ik-klon'ik	stiffening-jerking; a major motor seizure involving all muscle groups—previously termed grand mal (big bad) seizure
absence ab'sens	seizure involving a brief loss of consciousness without motor involvement—previously termed petit mal (little bad) seizure
partial	seizure involving only limited areas of the brain with localized symptoms
glioma glī-ō'mă	tumor of glial cells graded by degree of malignancy
herniated disk her'nē-ā-ted	protrusion of a degenerated or fragmented intervertebral disk so that the nucleus pulposus protrudes, causing compression on the nerve root (Fig. 10.9)
herpes zoster her'pēz zos'ter	viral disease affecting the peripheral nerves, characterized by painful blisters that spread over the skin following the affected nerves, usually unilaterally—also known as shingles (Fig. 10.10)
Huntington disease (HD)	hereditary disease of the central nervous system
Huntington chorea kōr-ē'ă	characterized by bizarre involuntary body movements and progressive dementia (choros = dance)

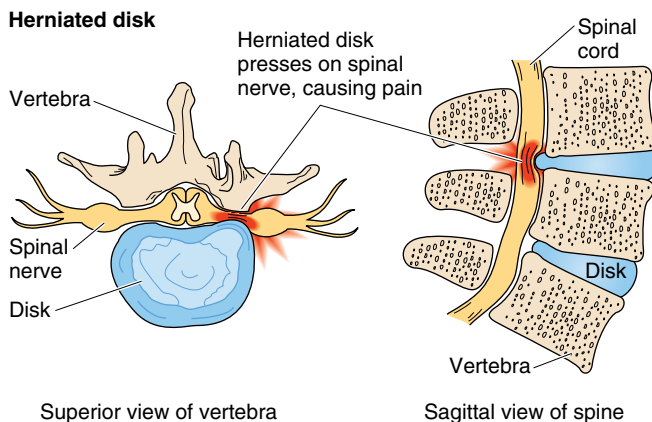


Figure 10.9 Herniated disk.

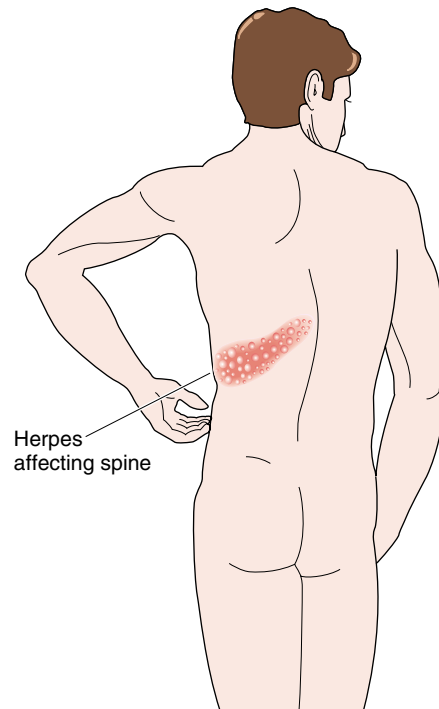


Figure 10.10 Herpes zoster: typical eruption site.

Term	Meaning
hydrocephalus hī-drō-sef'ă-lŭs hydrocephaly	abnormal accumulation of cerebrospinal fluid in the ventricles of the brain as a result of developmental anomalies, infection, injury, or tumor (Fig. 10.11; also see Fig. 10.13)
meningioma mĕ-nin'jĕ-ō'mă	benign tumor of the coverings of the brain (meninges)
meningitis men-in-jī'tis	inflammation of the meninges
migraine headache mī'grān	paroxysmal attacks of mostly unilateral headache often accompanied by disordered vision, nausea, and/or vomiting, lasting hours or days and caused by dilation of arteries
multiple sclerosis (MS) sklĕ-rō'sis	disease of the central nervous system characterized by the demyelination (deterioration of the myelin sheath) of nerve fibers, with episodes of neurological dysfunction (exacerbation) followed by recovery (remission) (Fig. 10.12)
myasthenia gravis mī-as-thĕ'nĕ-ă gra'vās	autoimmune disorder that affects the neuromuscular junction, causing a progressive decrease in muscle strength with activity and a return of strength after a period of rest
myelitis mī-ĕ-lī'tis	inflammation of the spinal cord

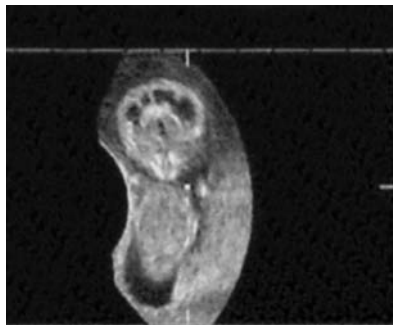


Figure 10.11 Sonogram of fetus with hydrocephalus.

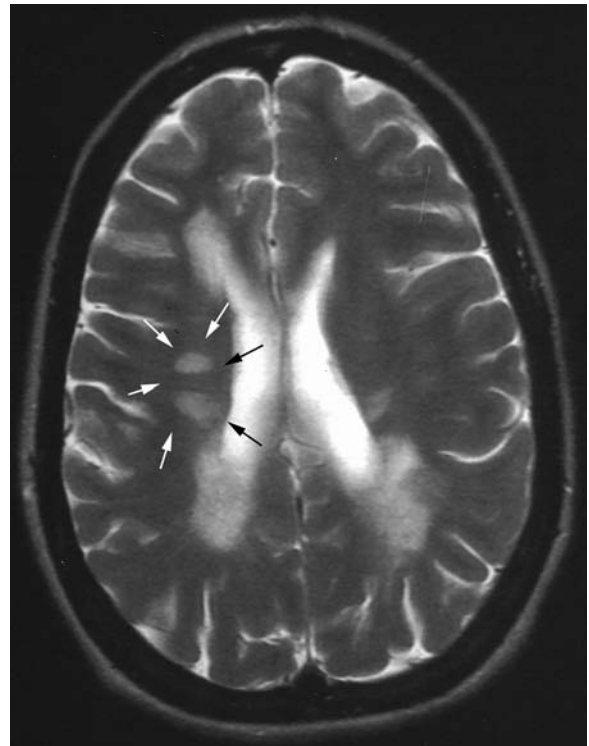


Figure 10.12 Magnetic resonance image of the brain. Arrows, plaque formation in a patient with multiple sclerosis.

Term	Meaning
narcolepsy nar'kō-lep-sē	sleep disorder characterized by a sudden, uncontrollable need to sleep, attacks of paralysis (cataplexy), and dreams intruding while awake (hypnagogic hallucinations)
Parkinson disease	condition of slowly progressive degeneration of an area of the brainstem (substantia nigra) resulting in a decrease of dopamine (a chemical neurotransmitter that is necessary for proper movement); characterized by tremor, rigidity of muscles, and slow movements (bradykinesia), usually occurring later in life
plegia plē'jē-ă	paralysis
hemiplegia hem-ē-plē'jē-ă	paralysis on one side of the body
paraplegia par-ă-plē'jē-ă	paralysis from the waist down
quadriplegia kwah'dri-plē'jē-ă	paralysis of all four limbs
poliomyelitis po'lē-ō-mi'ē-lī'tis	inflammation of the gray matter of the spinal cord caused by a virus, often resulting in spinal and muscle deformity and paralysis (polio = gray)

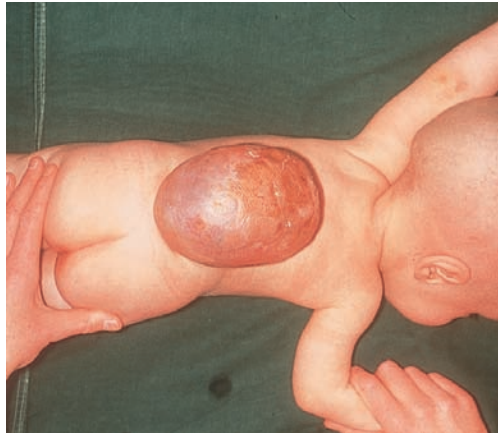


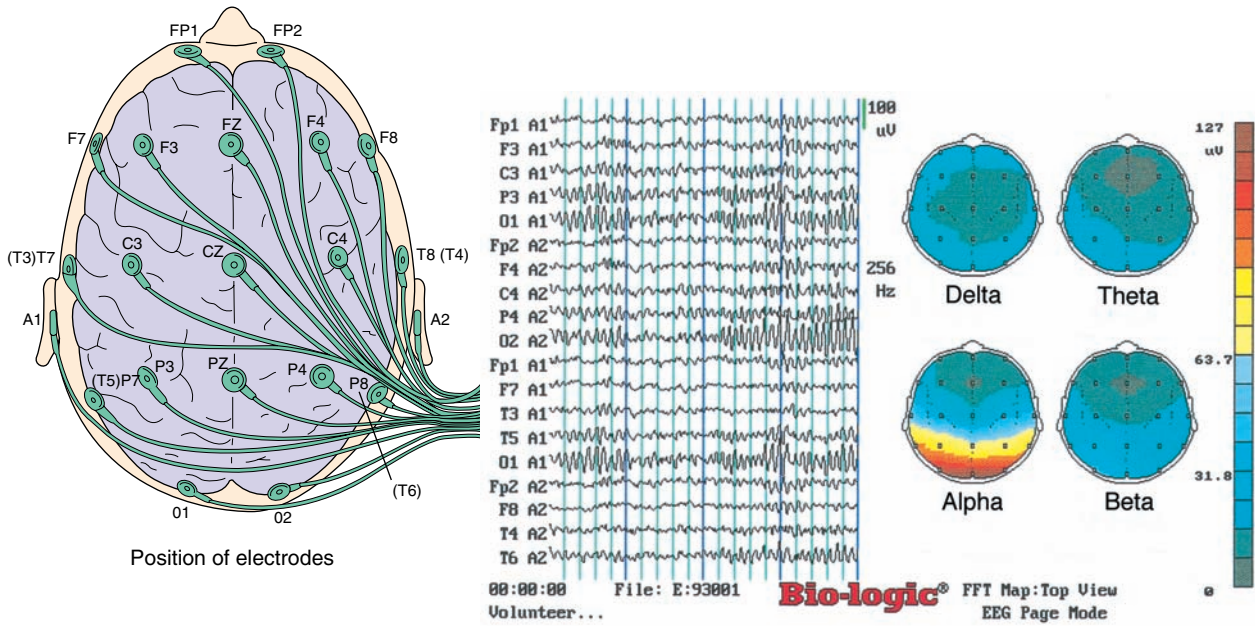
Figure 10.13 Spina bifida with myelomeningocele. The infant also has hydrocephaly.

Term	Meaning
polyneuritis pol'ē-nū-rī'tis	inflammation involving two or more nerves, often owing to a nutritional deficiency such as lack of thiamine
reflex sympathetic dystrophy (RSD) rē'fleks sim-pă-thet'ik dis'trō-fē	condition of abnormal function of the sympathetic nervous system in response to pain perception, usually as the result of an injury to an extremity; symptoms include persistent burning pain, tissue edema, joint tenderness, changes in skin color and temperature, and abnormal sweating at the pain site—decreased mobility caused by pain can lead to muscle atrophy and loss of motor function
sleep apnea ap'nē-ă	periods of breathing cessation that occur during sleep, often causing snoring
spina bifida spī'nă bi'fă-dă	congenital defect in the spinal column characterized by the absence of vertebral arches, often resulting in pouching of spinal membranes or tissue (Fig. 10.13)

Diagnostic Tests and Procedures

Test or Procedure	Explanation
electrodiagnostic procedures ē-lek'trō-dī-ag-nōs'tik	
electroencephalogram (EEG) ē-lek'trō-en-sef'ă-lō-gram	record of the minute electrical impulses of the brain used to identify neurological conditions that affect brain function and level of consciousness (Fig. 10.14)
evoked potentials ē-vokt' pō-ten'shāls	record of minute electrical potentials (waves) that are extracted from ongoing EEG activity to diagnose auditory, visual, and sensory pathway disorders—also used to monitor the neurological function of patients during surgery (Fig. 10.15)

Electroencephalography (EEG)



Normal EEG wave forms shown on left and computer compilation of frequency bands (delta, theta, alpha, and beta) mapped on right

Figure 10.14 Electroencephalography.



SOMNUS.

Somnus is a Latin word for sleep that was derived from ancient mythology. Somnus was the poetical god of sleep, the son of Nox (night), who lived with his brother Thanatos (death) in a palace at the western end of the world.

Test or Procedure

nerve conduction velocity (NCV)
nerv kon-dük'shŭn

polysomnography (PSG)
pol'ē-som-nog'ră-fē

Explanation

electrical shock of peripheral nerves to record time of conduction; used to diagnose various peripheral nervous system diseases

recording of various aspects of sleep (e.g., eye and muscle movements, respiration, EEG patterns) to diagnose sleep disorders (Fig. 10.16)



Figure 10.15 Use of evoked potentials to monitor neurological function during surgery.



Figure 10.16 Polysomnography.



Figure 10.17 Magnetic resonance imaging unit.

Test or Procedure	Explanation
lumbar puncture (LP) lūm'bar pūnk'chūr	introduction of a specialized needle into the spine in the lumbar region for diagnostic or therapeutic purpose, such as to obtain cerebrospinal fluid for testing; also called spinal tap
magnetic resonance imaging (MRI) mag-net'ic rez'ō-nans im'ā-jing	nonionizing imaging technique using magnetic fields and radiofrequency waves to visualize anatomical structures (especially soft tissue), such as the tissues of the brain and spinal cord (Fig. 10.17; also see Figs. 10.3, 10.4, and 10.12)
magnetic resonance angiography (MRA) mag-net'ic rez'ō-nans an-jē-og'rā-fē	use of magnetic resonance in imaging of the blood vessels—useful in detecting pathological conditions such as atherosclerosis and thrombosis
intracranial MRA in'trā-krā'nē-āl	magnetic resonance image of the head to visualize the vessels of the circle of Willis (common site of cerebral aneurysm, stenosis, or occlusion) (Fig. 10.18A)
extracranial MRA eks'trā-krā'nē-āl	magnetic resonance image of the neck to visualize the carotid artery (Fig. 10.18B)
nuclear medicine imaging	radionuclide organ imaging
SPECT brain scan (single photon emission computed tomography)	scan combining nuclear medicine and computed tomography technology to produce images of the brain after administration of radioactive isotopes

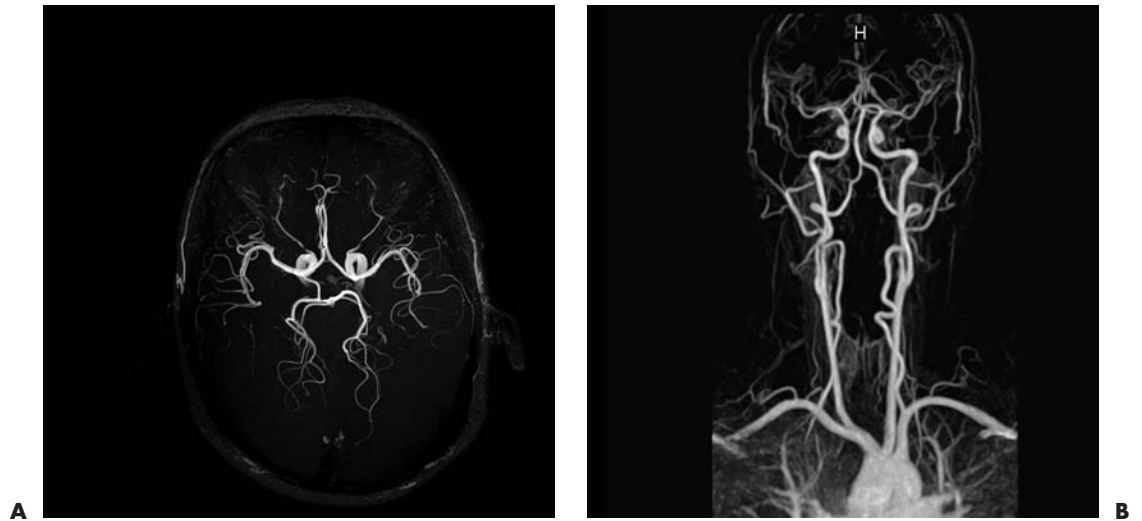


Figure 10.18 **A.** Contrast-enhanced intracranial magnetic resonance angiography showing circulation of the circle of Willis. **B.** Contrast-enhanced extracranial magnetic resonance angiography showing carotid circulation.

Test or Procedure	Explanation
<p>positron emission tomography (PET) poz'i-tron ē-mish'ŭn tō-mog'ră-fē</p>	<p>technique combining nuclear medicine and computed tomography technology to produce images of brain anatomy and corresponding physiology—used to study stroke, Alzheimer disease, epilepsy, metabolic brain disorders, chemistry of nerve transmissions in the brain, etc.; it provides greater accuracy than SPECT but is used less often because of cost and limited availability of the radioisotopes (Fig. 10.19)</p>

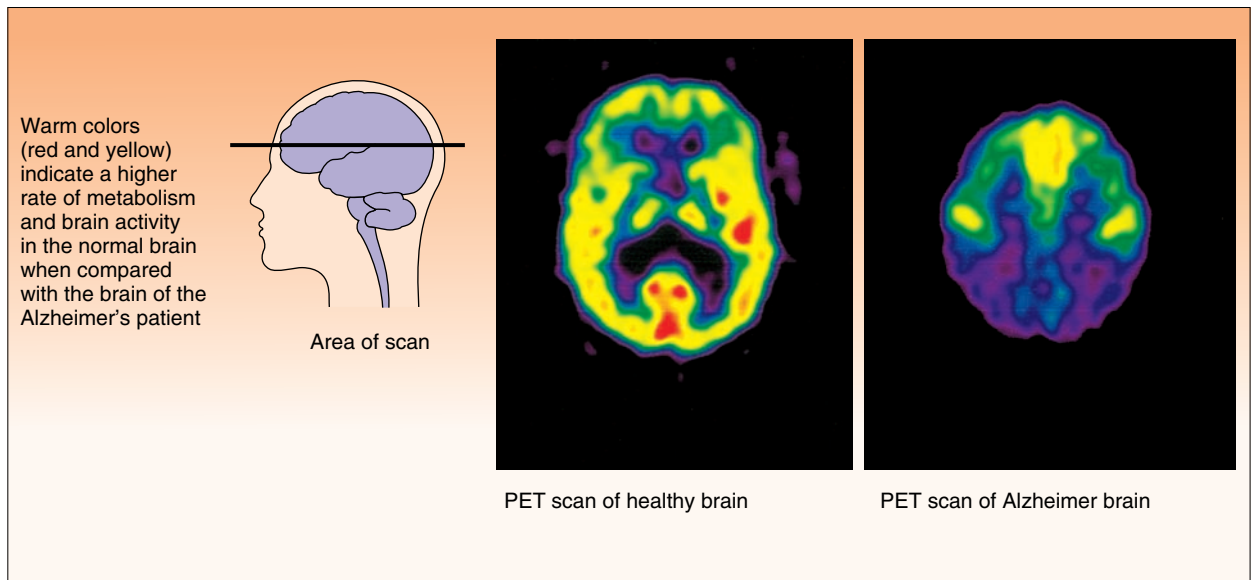


Figure 10.19 Positron emission tomography (PET) scans.

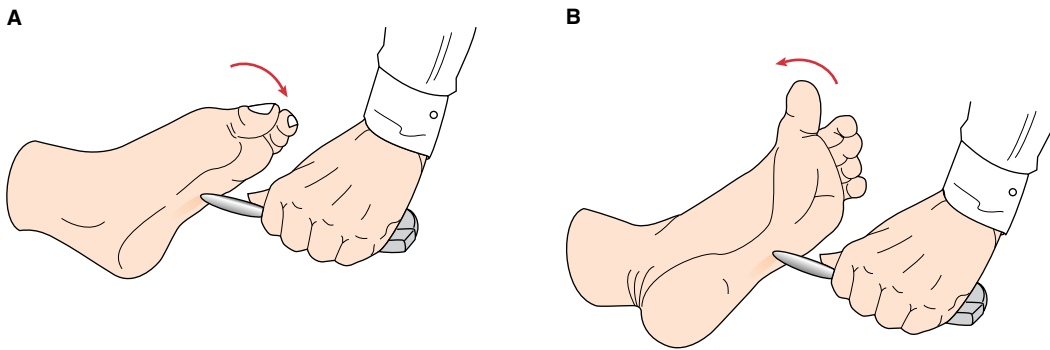


Figure 10.20 Reflex testing. **A.** Normal plantar reflex. **B.** Babinski sign.

Test or Procedure	Explanation
radiography rā'dē-og'rā-fē	x-ray imaging
cerebral angiogram ser'ě-brāl an'jē-ō-gram	x-ray of blood vessels in the brain after intracarotid injection of contrast medium
computed tomography (of the head)	computed tomographic x-ray images of the head used to visualize abnormalities within (e.g., brain tumors, malformations)
myelogram	x-ray of the spinal cord made after intraspinal injection of contrast medium
reflex testing	test performed to observe the body's response to a stimulus (Fig. 10.20A)
deep tendon reflexes (DTR)	involuntary muscle contraction after percussion at a tendon (e.g., patella, Achilles) indicating function; positive findings are noted when there is either no reflex response or an exaggerated response to stimulus; numbers are often used to record responses: no response 1+ diminished response 2+ normal response 3+ more brisk than average response 4+ hyperactive response
Babinski sign or reflex	pathological response to stimulation of the plantar surface of the foot; a positive sign is indicated when the toes dorsiflex (curl upward) (Fig. 10.20B)
transcranial sonogram trans-krā'nē-āl	image made by sending ultrasound beams through the skull to assess blood flow in intracranial vessels—used in diagnosis and management of stroke and head trauma (Fig. 10.21)



Figure 10.21 Transcranial sonography procedure.

Operative Terms

Term	Meaning
craniectomy krā'nē-ek'tō-mē	excision of part of the skull to approach the brain
craniotomy krā-nē-ot'ō-mē	incision into the skull to approach the brain
diskectomy (discectomy) dis-ek'tō-mē	removal of a herniated disk often done percutaneously (Fig. 10.22)
laminectomy lam'i-nek'tō-mē	excision of one or more laminae of the vertebrae to approach the spinal cord
vertebral lamina	flattened posterior portion of the vertebral arch (see Chapter 6, Figure 6.4)

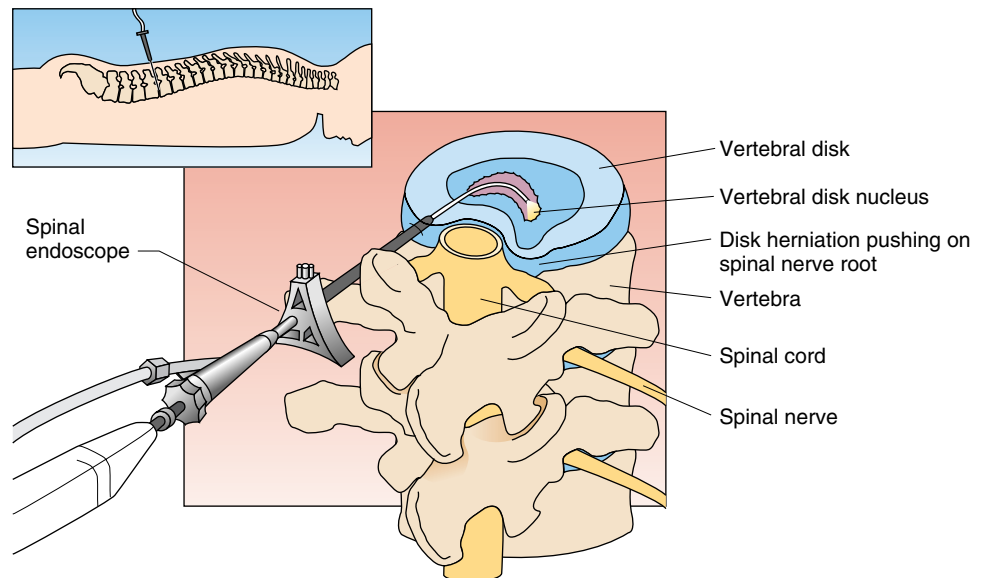


Figure 10.22 Diskectomy (discectomy).



Figure 10.23 Microscope designed for neurological surgery.

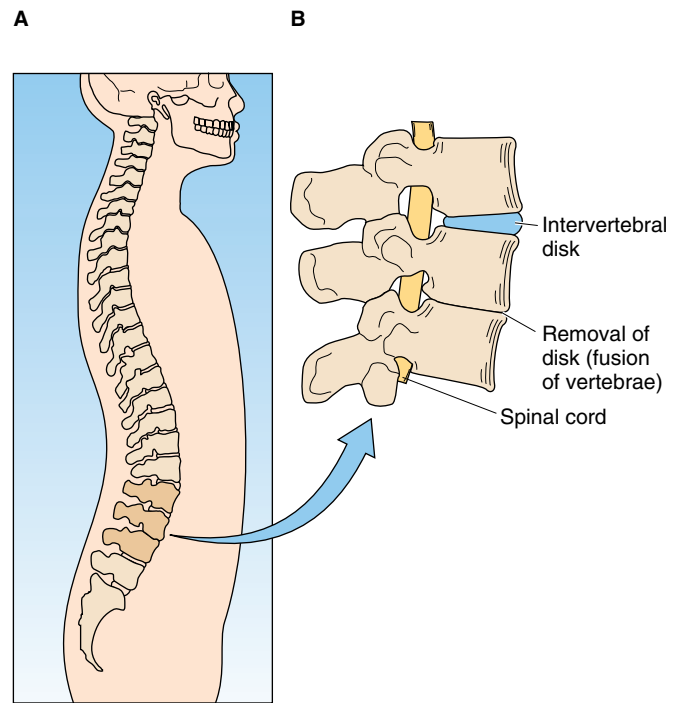


Figure 10.24 Spondylosyndesis. **A.** Spinal column. **B.** Spinal fusion.

Term	Meaning
microsurgery mī-krō-ser'jer-ē	utilization of a microscope to dissect minute structures during surgery (Fig. 10.23)
neuroendovascular surgery nūr'ō-en-do-vas'kyu-lār ser'jer-ē	diagnosis and treatment of disorders within cerebral blood vessels performed in a specialized angiographic laboratory by interventional neuroradiologists; common procedures include: <ul style="list-style-type: none"> • cerebral angioplasty and stent to restore blood flow through narrowed vessels such as the carotid artery, middle cerebral, and vertebrobasilar arteries • embolization (plugging) of intracranial aneurysms and other malformations
neuroplasty nūr'ō-plas-tē	surgical repair of a nerve
spondylosyndesis spon'di-lō-sin-dē'sis	spinal fusion (Fig. 10.24)

Therapeutic Terms

Term	Meaning
chemotherapy kem'ō-thār'ă-pē	treatment of malignancies, infections, and other diseases with chemical agents that destroy selected cells or impair their ability to reproduce
radiation therapy rā'dē-ā'shūn thār'ă-pē	treatment of neoplastic disease using ionizing radiation to impede proliferation of malignant cells (Fig. 10.25)
stereotactic (stereotaxic) radiosurgery ster'ē-ō-tak'tik (ster'ē-ō-tak'sik) rā'dē-ō-ser'jer-ē	radiation treatment to inactivate malignant lesions involving the focus of multiple, precise external radiation beams on a target with the aid of a stereotactic frame and imaging such as CT, MRI, or angiography; used to treat inoperable brain tumors and other lesions
stereotactic (stereotaxic) frame	mechanical device used to localize a point in space targeting a precise site (Fig. 10.26)
thrombolytic therapy throm-bō-lit'ik	dissolution of thrombi using drugs [e.g., tissue plasminogen activator (tPA)] used to treat acute ischemic stroke

COMMON THERAPEUTIC DRUG CLASSIFICATIONS

analgesic an-ăl-jē'zik	agent that relieves pain
anticoagulant an'tē-kō-ag'yū-lant	drug that prevents clotting of the blood; commonly used to prevent heart attack and ischemic stroke



Figure 10.25 Radiation therapy: linear accelerator.

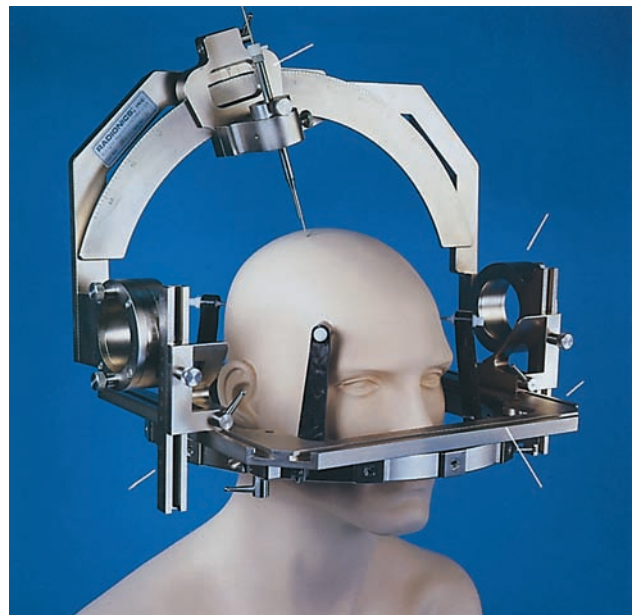


Figure 10.26 Stereotactic frame.

Term	Meaning
anticonvulsant an'tē-kon-vŭl'sant	agent that prevents or lessens convulsion
hypnotic hip-not'ik	agent that induces sleep
sedative sed'ă-tiv	agent that has a calming effect

Psychiatric Terms

Term	Meaning
SYMPTOMATIC TERMS	
affect af'fekt	emotional feeling or mood
flat affect	significantly dulled emotional tone or outward reaction
apathy ap'ă-thē	lack of interest or display of emotion
catatonia kat-ă-tō'nē-ă	state of unresponsiveness to one's outside environment, usually including muscle rigidity, staring, and inability to communicate
delusion dē-loo'zhŭn	persistent belief that has no basis in reality
grandiose delusion	person's false belief that he or she possesses great wealth, intelligence, or power
persecutory delusion	person's false belief that someone is plotting against him or her with intent to harm
dysphoria dis-fōr'ē-ă	restless, dissatisfied mood
euphoria yu-fōr'ē-ă	exaggerated, unfounded feeling of well-being
hallucination ha-loo'si-nā'shŭn	false perception of the senses for which there is no reality, most commonly hearing or seeing things (alucino = to wander in mind)
ideation ī-dē-ā'shŭn	formation of thoughts or ideas [e.g., suicidal ideation (thoughts of suicide)]
mania mā'nē-ă	state of abnormal elation and increased activity
neurosis noo-rō'sis	psychological condition in which anxiety is prominent
psychosis sī-kō'sis	mental condition characterized by distortion of reality, resulting in the inability to communicate or function within one's environment
thought disorder	thought that lacks clear processing or logical direction



Psychiatric Diagnostic Terms

Term	Meaning
MOOD DISORDERS	
major depression major depressive illness clinical depression major affective disorder unipolar disorder	disorder causing periodic disturbances in mood that affect concentration, sleep, activity, appetite, and social behavior; characterized by feelings of worthlessness, fatigue, and loss of interest
dysthymia dis-thī' mē-ă	milder affective disorder characterized by a chronic depression persisting for at least 2 years
manic depression bipolar disorder (BD)	affective disorder characterized by mood swings of mania and depression (extreme up and down states)
seasonal affective disorder (SAD)	affective disorder marked by episodes of depression that most often occur during the fall and winter and remit in the spring
ANXIETY DISORDERS	
generalized anxiety disorder (GAD)	most common anxiety disorder, characterized by chronic, excessive, and uncontrollable worry about everyday problems that affects the ability to relax or concentrate but does not usually interfere with social interactions or employment; physical symptoms include muscle tension, trembling, twitching, fatigue, headaches, nausea, and insomnia—symptoms must exist for at least 6 months before a diagnosis can be made
panic disorder (PD)	disorder of sudden, recurrent attacks of intense feelings including physical symptoms that mimic a heart attack such as rapid heart rate, chest pain, shortness of breath, chills, sweating, and dizziness, with a general sense of loss of control or feeling that death is imminent; often progresses to agoraphobia

Term	Meaning
phobia fō'bē-ă	exaggerated fear of a specific object or circumstance that causes anxiety and panic; named for the object or circumstance, such as agoraphobia (marketplace), claustrophobia (confinement), or acrophobia (high places)
posttraumatic stress disorder (PTSD)	condition resulting from an extremely traumatic experience, injury, or illness that leaves the sufferer with persistent thoughts and memories of the ordeal; may occur after a war, violent personal assault, physical or sexual abuse, serious accident, natural disaster, etc.; symptoms include feelings of fear, detachment, exaggerated startle response, restlessness, nightmares, and avoidance of anything or anyone who triggers the painful recollections
obsessive-compulsive disorder (OCD)	anxiety disorder featuring unwanted, senseless obsessions accompanied by repeated compulsions, which can interfere with all aspects of a person's daily life (e.g., the thought that a door is not locked, with repetitive checking to make sure that it is locked; thoughts that one's body has been contaminated, with repetitive washing)
hypochondriasis hī'pō-kon-drī'ă-sis	preoccupation with thoughts of disease and concern that one is suffering from a serious condition that persists despite medical reassurance to the contrary
DISORDERS USUALLY DIAGNOSED IN CHILDHOOD	
autism aw'tizm	developmental disability commonly appearing during the first 3 years of life, resulting from a neurological disorder affecting brain function, evidenced by difficulties with verbal and nonverbal communication, and an inability to relate to anything beyond oneself (auto = self) in social interactions; individuals with autism often exhibit body movements such as rocking, repetitive hand movements, and commonly become preoccupied with observing parts of small objects or moving parts or performing meaningless rituals
dyslexia dis-lek'sē-ă	developmental disability characterized by a difficulty understanding written or spoken words, sentences, or paragraphs, affecting reading, spelling, and self-expression
attention-deficit/hyperactivity disorder (ADHD)	dysfunction characterized by consistent hyperactivity, distractibility, and lack of control over impulses, which interferes with the ability to function normally at school, home, or work; specific criteria must be met before a diagnosis is made
mental retardation	condition of subaverage intelligence characterized by an IQ of 70 or below, resulting in the inability to adapt to normal social activities

Term	Meaning
EATING DISORDERS	
anorexia nervosa an-ō-rek'sē-ă ner'vōs-ă	severe disturbance in eating behavior caused by abnormal perceptions about one's body weight, evidenced by an overwhelming fear of becoming fat that results in a refusal to eat and body weight well below normal
bulimia nervosa boo-lim'ē-ă	eating disorder characterized by binge eating followed by efforts to limit digestion through induced vomiting, use of laxatives, or excessive exercise
SUBSTANCE ABUSE DISORDERS	
substance abuse disorders	mental disorders resulting from abuse of substances such as drugs, alcohol, or other toxins causing personal and social dysfunction; identified by the abused substance, such as alcohol abuse, amphetamine abuse, opioid (narcotic) abuse, or polysubstance abuse
PSYCHOTIC DISORDERS	
schizophrenia skiz'ō-frē'nē-ă	disease of brain chemistry causing a distorted cognitive and emotional perception of one's environment characterized by a broad range of "positive" and "negative" symptoms positive symptoms include distortions of normal function (behaviors that are absent in normal people, e.g., disorganized thought, delusions, hallucinations, catatonic behavior) negative symptoms (normal reactions missing in persons with schizophrenia) including flat affect, apathy, and withdrawal from reality
types:	
disorganized	featuring disorganized speech, behavior, and flat or inappropriate affect
catatonic	featuring catatonia
paranoid par'ă-noyd	featuring delusions, most often persecutory or grandiose types
schizoaffective disorder skiz'ō-ă-fek'tiv	concurrent with major depression or manic depression

Psychiatric Therapeutic Terms

Term	Meaning
electroconvulsive therapy (ECT) ē-lek'trō-kon-vūl'siv	electrical shock applied to the brain to induce convulsions; used to treat severely depressed patients
light therapy	use of specialized illuminating light boxes and visors to treat seasonal affective disorder

Term	Meaning
psychotherapy sī'kō-thār'ă-pē	treatment of psychiatric disorders using verbal and nonverbal interaction with patients, individually or in a group, employing specific actions and techniques
behavioral therapy bē-hāv'ver-ăl thār'ă-pē	treatment to decrease or stop unwanted behavior
cognitive therapy kog'ni-tiv	treatment to change unwanted patterns of thinking
COMMON THERAPEUTIC DRUG CLASSIFICATIONS	
psychotropic drugs sī'kō-trōp'ik	medications used to treat mental illnesses (trop/o = a turning)
antianxiety agents an'tē-ang-zī'ě-tē	drugs used to reduce anxiety
anxiolytic agents ang'zē-ō-lit'ik	
antidepressant an'tē-dē-pres'ănt	agent that counteracts depression
neuroleptic agents noor-ō-lep'tik	drugs used to treat psychosis, especially schizophrenia

Summary of Chapter 10 Acronyms/Abbreviations

ADHD attention-deficit/hyperactivity disorder	MRI magnetic resonance imaging
ALS amyotrophic lateral sclerosis	MS multiple sclerosis
ANS autonomic nervous system	NCV nerve conduction velocity
BD bipolar disorder	OCD obsessive-compulsive disorder
CNS central nervous system	PD panic disorder
CP cerebral palsy	PET positron emission tomography
CSF cerebrospinal fluid	PNS peripheral nervous system
CVA cerebrovascular accident	PSG polysomnography
DTR deep tendon reflexes	PTSD posttraumatic stress disorder
ECT electroconvulsive therapy	RSD reflex sympathetic dystrophy
EEG electroencephalogram	SAD seasonal affective disorder
GAD generalized anxiety disorder	SPECT single photon emission computed tomography
HD Huntington disease	TIA transient ischemic attack
LP lumbar puncture	
MRA magnetic resonance angiography	

7. dysthymia

_____ / _____ / _____
 P R S

DEFINITION: _____

8. polysomnogram

_____ / _____ / _____
 P CF S

DEFINITION: _____

9. spondylosyndesis

_____ / _____ / _____
 CF P S

DEFINITION: _____

10. hemiplegia

_____ / _____
 P S

DEFINITION: _____

11. craniotomy

_____ / _____
 CF S

DEFINITION: _____

12. thalamic

_____ / _____
 R S

DEFINITION: _____

13. neuroglial

_____ / _____ / _____
 CF R S

DEFINITION: _____

14. dyslexia

_____ / _____ / _____
 P R S

DEFINITION: _____

15. somniphathy

_____ / _____ / _____
 CF R S

DEFINITION: _____

16. hydrocephalic

_____ / _____ / _____
 CF R S

DEFINITION: _____

17. dysarthria

_____ / _____ / _____
P R S

DEFINITION: _____

18. acrophobia

_____ / _____ / _____
CF R S

DEFINITION: _____

19. hypnotic

_____ / _____
CF S

DEFINITION: _____

20. euphoria

_____ / _____ / _____
P R S

DEFINITION: _____

21. parasomnia

_____ / _____ / _____
P R S

DEFINITION: _____

22. narcolepsy

_____ / _____
CF S

DEFINITION: _____

23. stereotaxy

_____ / _____ / _____
CF R S

DEFINITION: _____

24. hemiparesis

_____ / _____
P S

DEFINITION: _____

25. neurasthenia

_____ / _____
R S

DEFINITION: _____

26. myelopathy

_____ / _____ / _____
CF R S

DEFINITION: _____

27. intracranial

_____ / _____ / _____
 P R S

DEFINITION: _____

28. aphasia

_____ / _____ / _____
 P R S

DEFINITION: _____

29. schizophrenia

_____ / _____ / _____
 CF R S

DEFINITION: _____

30. cerebrospinal

_____ / _____ / _____
 CF R S

DEFINITION: _____

Complete the medical term by writing the missing part:

31. electro_____gram = record of electrical brain impulses

32. _____syndesis = spinal fusion

33. crani_____ = excision of part of the skull

34. cerebral _____sclerosis = fat buildup in blood vessels of the brain

35. hyper_____ = increased sensations

36. dys_____ = condition of difficulty speaking

37. _____algesia = loss of sense of pain

38. a_____gnosis = inability to judge the form of an object by touch
 (e.g., to tell a coin from a key)

For each of the following, circle the combining form that corresponds to the meaning given:

39. **brain** encephal/o crani/o neur/o

40. **movement** esthesi/o kinesi/o somat/o

41. **speech** lex/o gnos/o phor/o

42. **body** somn/o somat/o phren/o

43. **spinal cord** vertebr/o spondyl/o myel/o

44. mind	cerebr/o	thym/o	thalm/o
45. sensation	esthesi/o	neur/o	kinesi/o
46. place	top/o	tax/o	phor/o
47. sleep	somat/o	hypn/o	esthesi/o
48. knowing	phren/o	phas/o	gnos/o

Write the correct medical term for each of the following:

49. inflammation of the meninges _____
50. excision of a herniated disk _____
51. slowly progressive degeneration of nerves in the brain characterized by tremor, rigidity of muscles, and slow movements _____
52. pathological response to stimulation of the plantar surface of the foot indicated by dorsiflexion of the toes _____
53. numbness and tingling _____
54. state of unconsciousness _____
55. congenital defect of the spinal column resulting in pouching of spinal membranes _____

Match the following neurological terms with their abbreviations:

- | | |
|---|-----------------------|
| 56. _____ amyotrophic lateral sclerosis | a. PSG |
| 57. _____ herpes zoster | b. tonic-clonic |
| 58. _____ spinal tap | c. CVA |
| 59. _____ faint | d. Alzheimer disease |
| 60. _____ grand mal | e. Lou Gehrig disease |
| 61. _____ petit mal | f. flaccid |
| 62. _____ cerebral thrombus | g. absence |
| 63. _____ flabby | h. clot |
| 64. _____ stroke | i. LP |
| 65. _____ dementia | j. shingles |
| 66. _____ sleep study | k. syncope |

Write the full medical term for the following abbreviations:

67. CT _____

68. MRI _____

69. PET _____

70. MS _____

71. CNS _____

72. CP _____

73. TIA _____

74. EEG _____

75. DTR _____

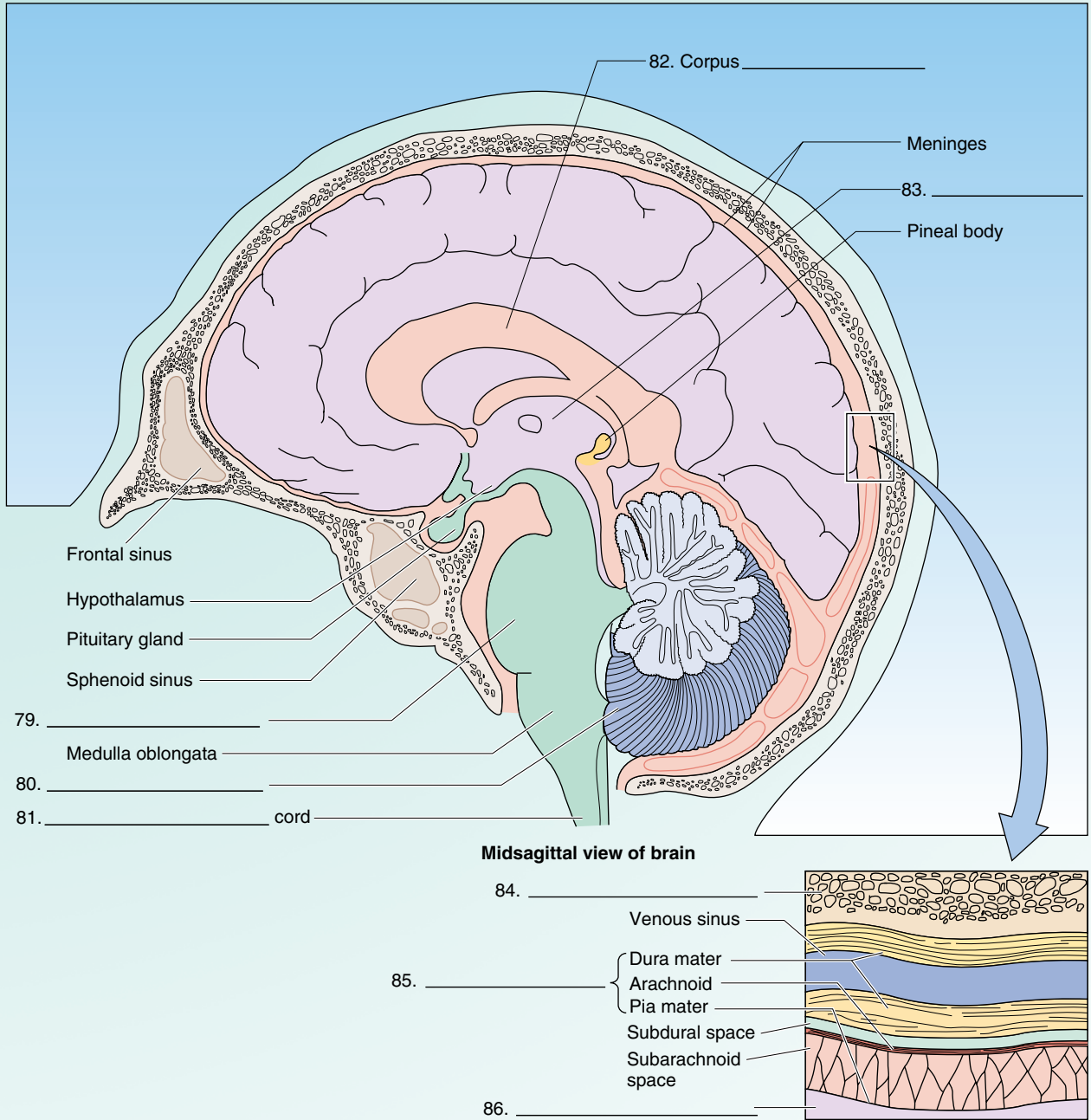
76. CSF _____

77. MRA _____

78. CVA _____

Write in the missing words on the blank lines in the following illustration of brain anatomy.

79–86.



Match the following psychiatric terms with their meanings:

- | | |
|--------------------------------|---|
| 87. _____ hallucination | a. exaggerated, unfounded feeling of well-being |
| 88. _____ persecutory delusion | b. dull emotional tone or outward reaction |
| 89. _____ catatonia | c. false belief that one is very wealthy, intelligent, or powerful |
| 90. _____ apathy | d. false belief that one is being plotted against |
| 91. _____ euphoria | e. state of abnormal elation and increased activity |
| 92. _____ mania | f. lack of interest or display of emotion |
| 93. _____ flat affect | g. thoughts that lack clear process or logical direction |
| 94. _____ dysphoria | h. state of unresponsiveness including muscle rigidity, staring, and inability to communicate |
| 95. _____ thought disorder | i. restless, dissatisfied mood |
| 96. _____ grandiose delusion | j. hearing or seeing things |

Write the full medical term for the following abbreviations:

97. GAD _____
98. ADHD _____
99. OCD _____
100. ECT _____
101. PD _____
102. BD _____
103. PTSD _____

Match the following psychiatric diagnoses:

- | | |
|---|------------------------|
| 104. _____ unipolar disorder | a. hypochondriasis |
| 105. _____ anxiety disorder | b. anorexia nervosa |
| 106. _____ bipolar disorder | c. clinical depression |
| 107. _____ psychosis | d. dysthymia |
| 108. _____ disorder identified in childhood | e. schizophrenia |
| 109. _____ eating disorder | f. manic depression |
| 110. _____ mild depression | g. autism |

Match the following psychiatric conditions with therapeutic terms:

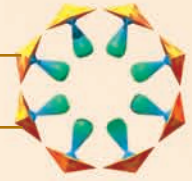
- | | |
|--|------------------------------|
| 111. _____ anxiety | a. behavioral therapy |
| 112. _____ schizophrenia | b. light therapy |
| 113. _____ seasonal affective disorder | c. anxiolytic agent |
| 114. _____ major affective disorder | d. electroconvulsive therapy |
| 115. _____ bulimia | e. neuroleptic agent |

For each of the following, circle the correct spelling of the term:

- | | | |
|----------------------|----------------|------------------|
| 116. Alsheimer | Alzheimer | Alshiemer |
| 117. skitzoprenia | skizophrenia | schizophrenia |
| 118. polysomnography | polysonography | polysolemography |
| 119. parenoia | paranoia | paranoyea |
| 120. atopagnosis | atopegnosis | atopognosis |
| 121. demensha | dementia | dimentia |
| 122. epilapsey | epilepsey | epilepsy |
| 123. catonia | catatonia | catetonia |
| 124. delushion | dilusion | delusion |
| 125. hellucination | hallucination | hallucinashun |
| 126. poliomyalitis | poliomyelitis | poleiomyalitis |

Give the noun that was used to form the following adjectives:

127. epileptic _____
128. euphoric _____
129. delusional _____
130. syncopal _____
131. autistic _____
132. psychotic _____
133. cerebral _____
134. dysphasic _____
135. paranoid _____



MEDICAL RECORD ANALYSES

MEDICAL RECORD 10.1

Progress Note

OP H&P

Neurological Services

CC: numbness and tingling in feet and hands

HPI: This 44 y.o. right-handed female c/o numbness in her feet for the past two weeks with “pockets” of numbness in the abdomen. Her legs feel heavy and numb. Her hands started tingling a week ago and she is feeling very nervous. She has had similar episodes over the past 3 years, lasting about a week at a time, often after stressful events, or during hot weather.

PMH: Operations: none. No serious illnesses/accidents

FH: Father, age 71, L&W; Mother, age 66, is bipolar;

Her only sibling, a sister, age 28, has cerebral palsy.

SH: Denies smoking or use of street drugs, but drinks socially

OH: certified public accountant. Marital Status: single

ROS: noncontributory.

VS: T 98.2° F., P 82, R 16, BP 110/68, Ht 5'2", Wt 138#

PE: HEENT: WNL. Neck: negative. Heart/Lungs: normal.

Cranial nerves intact. Reflexes: DTR's are increased, greater on the left than the right without spasticity.

Toes upgoing bilaterally.

There is numbness to tactile pin stimulation over both extremities. She has no finger-to-nose ataxia. Her gait is steady.

A: R/O MS

P: Schedule MRI of the brain with and without gadolinium (contrast) RTO for report and further evaluation × 1 wk

- Which medical term best describes the patient's symptoms:
 - hyperesthesia
 - paresthesia
 - ataxia
 - hemiparesis
 - neuralgia
- What is noted in the history about the patient's mother?
 - she is alive and well
 - she suffers from depression
 - she has mood swings of mania and depression
 - she suffers from generalized anxiety
 - she is a hypochondriac
- Describe the sister's condition:
 - disorder affecting the central nervous system characterized by seizures
 - hereditary disease of the central nervous system characterized by bizarre involuntary body movements and progressive dementia
 - abnormal accumulation of cerebrospinal fluid in the ventricles of the brain as a result of developmental abnormality
 - condition of motor dysfunction caused by damage to the cerebrum during development or injury at birth
 - slowly progressive degeneration of nerves in the brain characterized by tremor, rigidity, and slow movements

4. Which medical term describes the positive finding of the “toes upgoing” bilaterally?
 - a. Babinski sign
 - b. neuralgia
 - c. hemiparesis
 - d. spastic paralysis
 - e. flaccid paralysis

5. What is the doctor’s impression?
 - a. the patient has multiple sclerosis
 - b. the patient does not have multiple sclerosis
 - c. the patient may have multiple sclerosis
 - d. the patient may have hardening of the arteries in the brain
 - e. the patient does not have hardening of the arteries in the brain

6. Describe the test noted in the plan:
 - a. x-ray
 - b. nuclear image
 - c. ultrasound scan
 - d. tomographic radiograph
 - e. scan produced by magnetic fields and radiofrequency waves

MEDICAL RECORD 10.2

Mary Clarke came into the living room where her father, Bob Clarke, had been watching television and found him slumped back in his chair, apparently asleep. When she could not wake him, she realized he was unconscious and called 911. The ambulance rushed him to the Central Medical Center emergency room, where he was seen by Dr. Gregory Kincaid.

Directions

Read Medical Record 10.2 for Mr. Clarke (pages 351–353) and answer the following questions. This record is the history and physical examination report dictated by Dr. Kincaid after his examination and initial treatment of Mr. Clarke.

QUESTIONS ABOUT MEDICAL RECORD 10.2

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not encountered in this text so far. Underline each where it appears in the record and define below:

abrasion _____

foci of atrophy _____

ambulate _____

cataract _____

- In your own words, not using medical terminology, briefly describe Mr. Clarke's condition from the time he was found at home:

Describe his condition after he arrived at the ER:

- Which of the following was *not* an emergency treatment provided for Mr. Clarke?
 - administration of Valium
 - assessment of respiratory rate
 - CPR
 - assistance with breathing

- Define "postictal": _____

- Mr. Clarke has a past medical history of several different illnesses. On the following list, check all health problems Mr. Clarke has experienced:

_____ skin bruising

_____ heart attacks

_____ excessive thyroid secretion

- _____ COPD
- _____ skin scrapes
- _____ headaches
- _____ nausea and vomiting
- _____ atrial fibrillation
- _____ pulmonary embolus

6. From the list of medications Mr. Clarke is taking, one includes an abbreviation that has been deemed error prone. Identify the abbreviation, potential problem, and preferred wording.

<i>Abbreviation</i>	<i>Potential Problem</i>	<i>Preferred Wording</i>
_____	_____	_____

7. In your own words, describe the surgery Mr. Clarke had in the past:

8. In lay language, what nervous system disorder did a family member experience?

9. Dr. Kincaid’s diagnosis identifies three possible conditions that may have led to Mr. Clarke’s seizure. Put each in your own words:

- a. _____
- b. _____
- c. _____

10. What three actions will now occur in the ICU?

- a. _____
- b. _____
- c. _____

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HISTORY**DATE OF ADMISSION:** August 1, 20xx**REASON FOR ADMISSION:** Seizure episode.**HISTORY OF PRESENT ILLNESS:** The patient is a 76-year-old male brought to the emergency room following a seizure episode at home where he was found to be in mild tonic condition and was given intravenous Valium at which time his respiratory rate dropped, and he required some ventilatory assistance. He remained unresponsive postictal until an hour after emergency room arrival. He has a past history of a similar seizure in 20xx which was treated with Dilantin for a year and was then discontinued. No focal abnormality was noted at that time with the exception of an abnormality on CT showing small foci of atrophy possibly secondary to vascular disease. He has been evaluated by Dr. Levy, a neurologist. Please refer to Dr. Levy's consultation report.**PAST MEDICAL HISTORY:** The patient has a past medical history of severe chronic obstructive airways disease; he is on multiple medications. He takes Slo-Bid 300 mg b.i.d., Medrol 5 mg q.o.d., and p.r.n. inhalation of albuterol up to q.i.d. He has a long history of being steroid dependent and is daily symptomatic. He has a history of coronary artery disease with myocardial infarctions, questionable congestive heart failure, and chronic atrial fibrillation. He is being seen by Dr. Foley, a cardiologist. He is on Lanoxin 0.25 mg, Verelan 120 mg, Lasix 40 mg, and Micro-K 750 mg on a daily basis. He also has a history of hypothyroidism and takes Synthroid 0.1 mg. He has a history of steroid-dependent skin fragility with multiple ecchymoses; a recent fall resulted in a number of abrasions which were under treatment by Dr. Depmore, a family practitioner, with good healing.**PAST SURGICAL HISTORY:** Septoplasty.**MEDICATIONS:** As mentioned above.**ALLERGIES:** The patient does not report any allergies to medications.**REVIEW OF SYSTEMS:** The patient is not reported to have problems with headaches or dizzy spells. He does have exertional shortness of breath that he maintains control of with medications, and he is able to ambulate at least a mile a day. No abdominal or gastrointestinal symptoms are noted. There is no arthralgia.

(continued)

HISTORY AND PHYSICAL
Page 1PT. NAME: CLARKE, ROBERT B.
ID NO: 088676
ROOM NO: ICU
ATT. PHYS. G. KINCAID, M.D.

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HISTORY

FAMILY HISTORY: The patient's parents lived into their late 80s and died of old age. His brother died at age 70 of a cerebral vascular accident (CVA). There is no family history of diabetes, cardiac, pulmonary, renal, hepatic, or hematologic disorder; but his father did have cancer of the prostate.

PHYSICAL EXAMINATION

VITAL SIGNS: Blood Pressure: 173/78. Pulse: 90-100. Respirations: 12.

GENERAL APPEARANCE: The patient is able to respond to some degree to voice but poorly follows directions, this being due to the fact that he is still somewhat under the influence of Valium.

SKIN: Multiple ecchymoses of extremities. Only his back, abdomen, and head are free of signs of injury. The skin is dry. There are active abrasions from his seizure episode on the right ankle and both forearms.

HEENT: Tympanic membranes, nose, and throat appear to be normal. His teeth are in good condition. Both eyes are reactive to light. The right fundus is normal; however, the left fundus is not visualized secondary to cataract.

NECK: There is no cervical adenopathy or thyroid enlargement.

CHEST:

LUNGS: The patient's lungs are clear to percussion and auscultation. There are no rales, rhonchi, or wheezes.

HEART: Tones are regular without murmur.

ABDOMEN: The abdomen is flat, soft, and nontender without organ enlargement or masses. The bowel sounds are active.

RECTAL/GENITALIA: The rectal examination is normal. The patient has normal circumcised external genitalia.

(continued)

HISTORY AND PHYSICAL
Page 2

PT. NAME: CLARKE, ROBERT B.
ID NO: 088676
ROOM NO: ICU
ATT. PHYS. G. KINCAID, M.D.

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PHYSICAL EXAMINATION

EXTREMITIES: There are multiple ecchymoses. Deep tendon reflexes are absent. The patient is able to move all four extremities without any evidence of motor deficit. He is unable to report sensory activity. There was no Babinski sign.

IMPRESSION:
SEIZURE DISORDER, POSSIBLY SECONDARY TO CEREBRAL EMBOLI, HYPOXIA, OR UNKNOWN CAUSES, POSSIBLY DUE TO INTRACEREBRAL DISEASE.

PLAN: Recommend observation in Intensive Care Unit as workup proceeds and will ask for neurologic and pulmonary support from specialists R. Wilson, M.D., and E. Wong, M.D.


G. Kincaid, M.D.

GK:wq

D: 8/2/20xx

T: 8/5/20xx

MEDICAL RECORD 10.3

Anne Cross had been fairly healthy until she had a stroke about 2 months ago. She was treated by Dr. Paul Jiang, her personal physician, at that time and was discharged from the hospital on medication. At the request of Ms. Cross, Dr. Jiang called for a consultation from a neurologist, Dr. Melvin Classen.

Directions

Read Medical Record 10.3 for Ms. Cross (pages 356–357) and answer the following questions. This record is a consultation report written by Dr. Classen as a letter back to Ms. Cross’s physician, Dr. Jiang, after his consultation.

QUESTIONS ABOUT MEDICAL RECORD 10.3

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered. Underline each where it appears in the record and define below:

homonymous hemianopsia _____

finger-nose test _____

apraxia _____

clonus _____

- In your own words, not using medical terminology, briefly describe Ms. Cross’s symptoms in April before she was admitted to the hospital:

- Write the missing parts in this table summarizing the diagnostic tests performed in April:

<i>Test</i>	<i>Definition of Test</i>	<i>Findings</i>
CT	_____	_____
_____	sound waves through heart	_____
carotid ultrasound	_____	_____
_____	_____	slowed electrical pulses on right side

- What family member had a problem perhaps similar to Ms. Cross’s?

5. For each of the following medications given to Ms. Cross, translate the dosage instructions:

Persantine _____

aspirin _____

Proventil _____

Procardia _____

6. Dr. Classen recommends two diagnostic studies. Describe both in your own words:

a. _____

b. _____

In one sentence, describe Dr. Classen's rationale for recommending the combination of these two tests:

7. Name the preventive surgical procedure Dr. Classen suggests that may be appropriate if changes are found in the carotid blood vessels:

Describe that procedure in your own words:

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Department of Neurology

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June 9, 20xx

Paul Jiang, M.D.
1409 West Ninth Street
Central City, US 90000-1233

Dear Dr. Jiang:

RE: Anne Cross

I had the pleasure of meeting Mrs. Cross today. As you know, she is a 65-year-old right-handed female who began to have difficulties on or about April 17, 20xx. She experienced dizziness that she described as occurring in the midday; there was also some associated slurring of speech. By the next morning, she seemed to have some disorientation with putting on her clothes, and she had some difficulties using the left side of her body. She had no headache or other problems. Prior to that time, she denied having any symptomatology. She was admitted to the hospital, as you are aware, and underwent a series of studies. A CT scan was reviewed and showed evidence of a right ischemic occipital infarct. In addition, she underwent an echocardiogram that was normal and an electroencephalogram that showed some right-sided slowing. A carotid ultrasound study suggested 60-70% stenosis of the bifurcation and/or internal carotids.

The patient was discharged on a combination of Persantine 50 mg t.i.d, enteric-coated aspirin 81 mg daily, Proventil 1 q 12 h p.r.n. for chronic obstructive pulmonary disease, and Procardia XL 1 daily for hypertension. The patient also has stopped smoking.

The patient reports that in the past, she has been essentially well except for some eye surgery. Additionally, after her discharge, she underwent visual field studies which confirmed the presence of an incomplete left-sided homonymous hemianopsia.

By way of family background, her brother died from complications of a stroke at age 78. Her mother died from liver cancer, and her father died from a myocardial infarction.

The patient has no specific allergy to drugs.

The patient's risk factors have been otherwise unremarkable.

On examination today, the patient is a slender female in no acute distress.

Blood pressure from the left arm in a sitting position is 130/95 and from the right arm in the sitting position is 145/95. Her pulse rate is 76 and regular.

No bruits are present over the carotid distributions. The temporal arteries are not enlarged or tender.

On examination of the eyes, the patient showed some mild arteriolar narrowing without hemorrhage or exudate. Gross visual confrontation suggests a neglect of left hemianopsia. The extraocular movements are full. The pupils are symmetrical. There is no ptosis. Facial movements are normal, and speech is normal.

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There is no drift to the outstretched hands. Finger-to-nose test is performed symmetrically.

The patient does not have any asymmetrical topagnosia. She has no evidence of apraxia.

The patient's reflexes are physiologic: they are 2+ at the biceps, triceps, and brachioradialis. The knee and ankle jerks are 2+. No clonus is elicited.

Gait and stance are normal.

OVERALL ASSESSMENT:

Without prior warning, this woman had a new onset of a cerebral infarct. By her description, it is likely that she had a posterior circulatory infarct in the area of the occipital lobe. There may have been an association zone in the parietal area as well. Since that time, she has had some residual hemianopsia as described.

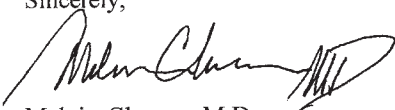
PLAN:

At this time, it is suggested that the most prudent approach would be to do an MRA and an MRI. This should include the great vessels of the neck and the vertebrobasilar system. The MRI would allow us to see the nature of residuals of the stroke, the distribution of the stroke, and would allow us to determine if there are any asymptomatic lesions, including microvascular infarcts which would not be seen on the CAT scan. The MRA would allow us to determine the overall anatomy of the vasculature—including the neck, the bifurcations, and the posterior circulation—in a noninvasive way. Depending on the results of both of these studies, we would have to consider if she needs a full angiogram done with selective views. If, in fact, she has had an infarct of the posterior occipital lobe, then the current treatment with aspirin and Persantine would be adequate. If, by the nature of the MRA, it is determined that there are significant changes or irregularity of the contour of the intima of the vessels at the bifurcations, then there may be an indication for prophylaxis for an endarterectomy despite not having a stroke in that distribution of the vessels. This, of course, would all be determined by the results of this study. The advantage of the MRA-MRI combined would allow us to visualize adequately the vessels combined with the detailed evaluation of her brain.

I think this would be the patient's best and most prudent approach to the patient's health and would help to prevent recurrence of this problem.

Please do not hesitate to call me if there are any questions regarding this patient's evaluation.

Sincerely,

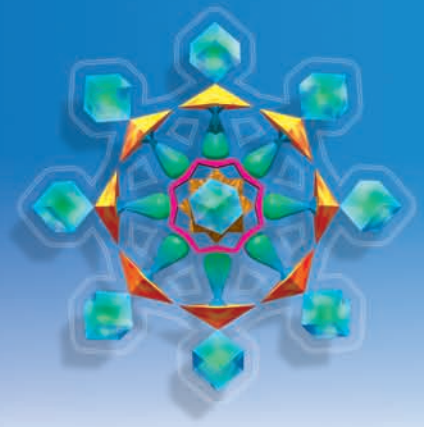


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MC:mar
DOT:6/10/20xx

cc: Mrs. Anne Cross

Endocrine System



OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define common term components used in relation to the endocrine system
- ◆ Describe the basic functions of the endocrine system
- ◆ Define the basic anatomical terms referring to the endocrine system
- ◆ Define common symptomatic and diagnostic terms referring to the endocrine system
- ◆ List the common diagnostic tests and procedures related to the endocrine system
- ◆ Identify common operative terms referring to the endocrine system
- ◆ Identify common therapeutic terms including drug classifications related to the endocrine system
- ◆ Explain the terms and abbreviations used in documenting medical records involving the endocrine system

Combining Forms

Combining Form	Meaning	Example
aden/o	gland	adenoma ad-ĕ-nō'mă
adren/o	adrenal gland	adrenotrophic ă-drĕ-nō-trō'fik
adrenal/o		adrenalopathy ă-drĕ-nă-lop'ă-thĕ
andr/o	male	androgenous an-droj'ĕ-nŭs
crin/o	to secrete	endocrine en'dō-krin
dips/o	thirst	polydipsia pol-ĕ-dip'sĕ-ă
gluc/o	sugar	glucogenic glŭ-kō-jen'ik
glucos/o		glucose gloo'kōs
glyc/o		hyperglycemia hi'per-glī-sĕ'mĕ-ă
glycos/o		glycosuria glī-kō-sŭ'rĕ-ă

Combining Form	Meaning	Example
hormon/o	hormone (an urging on)	hormonal hōr-mōn'ăl
ket/o	ketone bodies	ketogenic kē-tō-jen'ik
keton/o		ketonuria kē-tō-nū'rē-ă
pancreat/o	pancreas	pancreatitis pan'krē-ă-tī'tis
thym/o	thymus gland	thymoma thī-mō'mă
thyr/o	thyroid gland (shield)	thyrotoxic thī-rō-tok'sik
thyroid/o		thyroiditis thī-roy-dī'tis

**THYMUS.**

Derived from the Greek word for an offer or sacrifice, the thyme plant was burnt on altars because of its sweet smell. The term was applied to the thymus gland because of its likeness to a bunch of thyme.

**THYROID.**

Thyroid is from a Greek word referring to a large oblong shield carried by soldiers. It had a deep notch at the top for the chin. The thyroid gland and the thyroid cartilage in the neck were named for this shield because of their similar appearance.

Endocrine System Overview

The endocrine system is a network of ductless glands and other structures that affect the function of targeted organs by the secreting *hormones*. Figure 11.1 shows the locations of the endocrine glands. The hormones secreted by these glands and their functions are described under “Anatomical Terms” and in Figure 11.2.

Anatomical Terms

Gland or Hormone	Location or Function
adrenal glands ă-drē'năl	located next to each kidney, the adrenal cortex secretes steroid hormones and the adrenal medulla secretes epinephrine and norepinephrine
suprarenal glands sū'pră-rē'năl	
steroid hormones stēr'oyd	regulate carbohydrate metabolism and salt and water balance; some effect on sexual characteristics
glucocorticoids glū-kō-kōr'ti-koydz	
mineral corticosteroids min'er-ăl	
kōr'ti-kō-stēr'oydz	
androgens an'drō-jenz	
epinephrine ep'i-nef'rin	affect sympathetic nervous system in stress response
norepinephrine nōr'ep-i-nef'rin	
ovaries ō'vă-rēz	located one on each side of the uterus in the female pelvis, functioning to secrete estrogen and progesterone

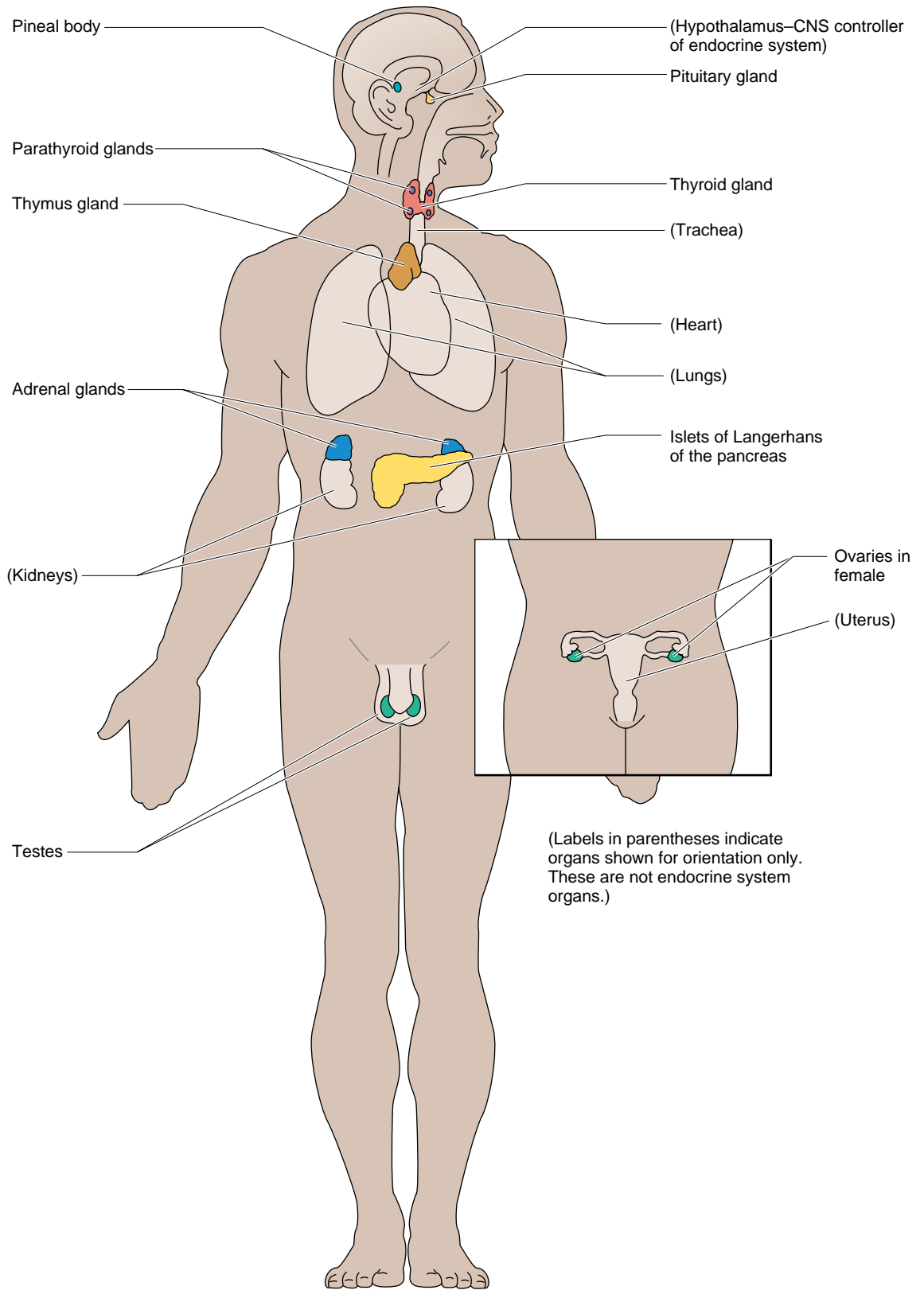





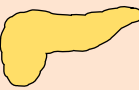


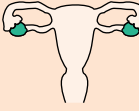



Figure 11.1 Endocrine system.

Endocrine gland	Secretions	Function
* Anterior pituitary (adenohypophysis) 	Thyroid-stimulating hormone (TSH) Adrenocorticotropic hormone (ACTH) Follicle-stimulating hormone (FSH) Luteinizing hormone (LH) Melanocyte-stimulating hormone (MSH) Growth hormone (GH) Prolactin (lactogenic hormone)	Stimulates secretion from thyroid gland Stimulates secretion from adrenal cortex Initiates growth of ovarian follicle; stimulates secretion of estrogen in females and sperm production in males Causes ovulation; stimulates secretion of progesterone by corpus luteum; causes secretion of testosterone in testes Affects skin pigmentation Influences growth Stimulates breast development and milk production during pregnancy
* Posterior pituitary (neurohypophysis) 	Antidiuretic hormone (ADH) Oxytocin	Influences the absorption of water by kidney tubules Influences uterine contraction
Pineal body 	Melatonin Serotonin	Exact function unknown, affects onset of puberty Serves as a precursor to melatonin
Thyroid gland 	Triiodothyronine (T ₃), thyroxine (T ₄) Calcitonin	Regulate metabolism Regulates calcium and phosphorus metabolism
Parathyroid glands 	Parathyroid hormone (PTH)	Regulates calcium and phosphorus metabolism
Pancreas (islets of Langerhans) 	Insulin, glucagon	Regulates carbohydrate/sugar metabolism
Thymus gland 	Thymosin	Regulates immune response
Adrenal glands (suprarenal glands) 	Steroid hormones: glucocorticoids, mineral corticosteroids, androgens Epinephrine, norepinephrine	Regulate carbohydrate metabolism and salt and water balance; some effect on sexual characteristics Affect sympathetic nervous system in stress response
Ovaries 	Estrogen, progesterone	Responsible for the development of female secondary sex characteristics and for the regulation of reproduction
Testes 	Testosterone	Affects masculinization and reproduction

* Release of hormones in pituitary is controlled by hypothalamus

Figure 11.2 Functions of the endocrine glands.

Gland or Hormone	Location or Function
estrogen es'trō-jen progesterone prō-jes'ter-ōn	responsible for the development of female secondary sex characteristics and the regulation of reproduction
pancreas (islets of Langerhans) pan'krē-as insulin in'sū-lin glucagon glū'kă-gon	located behind the stomach in front of the first and second lumbar vertebrae, functioning to secrete insulin and glucagon regulate carbohydrate/sugar metabolism
parathyroid glands par-ă-thī'royd parathyroid hormone (PTH)	located on the posterior aspect of the thyroid gland in the neck, functioning to secrete parathyroid hormone (PTH) regulates calcium and phosphorus metabolism
pineal gland pin'ē-ăl melatonin mel-ă-tōn'in serotonin	located in the center of the brain, functioning to secrete melatonin and serotonin exact function unknown; affects onset of puberty a neurotransmitter that serves as the precursor to melatonin
pituitary gland pi-tū'i-tār-ē hypophysis hī-pof'i-sis anterior pituitary (adenohypophysis) ad'ĕ-nō-hī-pof'i-sis thyroid-stimulating hormone (TSH) adrenocorticotrophic hormone (ACTH) ă-drē'nō-kōr'ti-kō-trō'fik follicle-stimulating hormone (FSH) fol'i-kl luteinizing hormone (LH) lū'tē-ī-nī-z-ing	located at the base of the brain, the anterior pituitary secretes thyroid-stimulating hormone, adrenocorticotrophic hormone, follicle-stimulating hormone, luteinizing hormone, melanocyte-stimulating hormone, growth hormone, and prolactin; the posterior pituitary releases antidiuretic hormone and oxytocin stimulates secretion from thyroid gland stimulates secretion from adrenal cortex initiates growth of ovarian follicle; stimulates secretion of estrogen in females and sperm production in males causes ovulation; stimulates secretion of progesterone by corpus luteum; causes secretion of testosterone in testes

Gland or Hormone	Location or Function
<p>melanocyte-stimulating hormone (MSH) mel'ă-nō-sīt</p> <p>growth hormone (GH)</p> <p>prolactin (lactogenic hormone) prō-lak'tin</p> <p>posterior pituitary (neurohypophysis) nūr'ō-hī-pof'i-sis</p> <p>antidiuretic hormone (ADH) an'tē-dī-yū-ret'ik</p> <p>oxytocin ok-sē-tō'sin</p>	<p>affects skin pigmentation</p> <p>influences growth</p> <p>stimulates breast development and milk production during pregnancy</p> <p>influences the absorption of water by kidney tubules</p> <p>influences uterine contraction</p>
<p>testes tes'tēz</p> <p>testosterone tes-tos'tē-rōn</p>	<p>located one on each side within the scrotum in the male, functioning to secrete testosterone</p> <p>affects masculinization and reproduction</p>
<p>thymus gland thī'mūs</p> <p>thymosin thī'mō-sin</p>	<p>located in the mediastinal cavity anterior to and above the heart, functioning to secrete thymosin</p> <p>regulates immune response</p>
<p>thyroid gland</p> <p>triiodothyronine (T₃) trī-ī'ō-dō-thī'rō-nēn</p> <p>thyroxine (T₄) thī-rok'sēn</p> <p>calcitonin kal-si-tō'nin</p>	<p>located in front of the neck, functioning to secrete triiodothyronine (T₃), thyroxine (T₄), and calcitonin</p> <p>known as the thyroid hormones; regulate metabolism</p> <p>regulates calcium and phosphorus metabolism</p>

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC	
<p>exophthalmos ek-sof-thal'mos</p> <p>exophthalmus</p>	<p>protrusion of one or both eyeballs, often because of thyroid dysfunction or a tumor behind the eyeball (see Fig. 11.6B)</p>

Term	Meaning
glucosuria glū-kō-sū'rē-ă glycosuria glī-kō-sū'rē-ă	glucose (sugar) in the urine
hirsutism her'sū-tizm	shaggy; an excessive growth of hair especially in unusual places (e.g., a woman with a beard)
hypercalcemia hī'per-kal-sē'mē-ă	an abnormally high level of calcium in the blood
hypocalcemia hī'pō-kal-sē'mē-ă	an abnormally low level of calcium in the blood
hyperglycemia hī'per-glī-sē'mē-ă	high blood sugar
hypoglycemia hī'pō-glī-sē'mē-ă	low blood sugar
hyperkalemia hī'per-kā-lē'mē-ă	an abnormally high level of potassium in the blood (kalium = potassium)
hypokalemia hī'pō-ka-lē'mē-ă	deficient level of potassium in the blood
hypernatremia hī'per-nā-trē'mē-ă	excessive level of sodium ions in the blood (natro = sodium)
hyponatremia hī'pō-nā-trē'mē-ă	low level of sodium ions in the blood
hypersecretion hī'per-se-krē'shŭn	abnormally increased secretion
hyposecretion hī'pō-se-krē'shŭn	decreased secretion
ketosis kē-tō'sis ketoacidosis kē-tō-as-i-dō'sis diabetic ketoacidosis (DKA)	presence of an abnormal amount of ketone bodies (acetone, beta-hydroxybutyric acid, and acetoacetic acid) in the blood and urine indicating an abnormal utilization of carbohydrates as seen in uncontrolled diabetes and starvation (keto = alter)
metabolism mē-tab'ō-lizm	all chemical processes in the body that result in growth, generation of energy, elimination of waste, and other body functions
polydipsia pol-ē-dip'sē-ă	excessive thirst
polyuria pol-ē-yū'rē-ă	excessive urination

Term	Meaning
DIAGNOSTIC	
<i>Adrenal Glands</i>	
Cushing syndrome	collection of signs and symptoms caused by an excessive level of cortisol hormone from any cause, such as a result of excessive production by the adrenal gland (often caused by a tumor), or more commonly as a side effect of treatment with glucocorticoid (steroid) hormones such as prednisone for asthma, rheumatoid arthritis, lupus or other inflammatory diseases; symptoms include upper body obesity, facial puffiness (moon-shaped appearance), hyperglycemia, weakness, thin and easily bruised skin with stria (stretch marks), hypertension, and osteoporosis (Fig. 11.3)
adrenal virilism ă-drē'nāl vir'i-lizm	excessive output of the adrenal secretion of androgen (male sex hormone) in adult women owing to tumor or hyperplasia; evidenced by amenorrhea (absence of menstruation), acne, hirsutism, and deepening of the voice (virilis = masculine)
<i>Pancreas (pan'krē-as)</i>	
diabetes mellitus (DM) di-ă-bē'tēz mel'i-tūs	metabolic disorder caused by an abnormal utilization of insulin secreted by the pancreas; evidenced by hyperglycemia and glucosuria (diabetes = passing through; mellitus = sugar)
insulin in'sū-lin	hormone secreted by the beta cells of the islets of Langerhans of the pancreas responsible for regulating the metabolism of glucose (insulin = island)
type 1 diabetes mellitus	diabetes in which there is no beta cell production of insulin—the patient is dependent on insulin for survival



Figure 11.3 Cushing syndrome.

Term	Meaning
type 2 diabetes mellitus	diabetes in which the body produces insulin, but not enough, or there is insulin resistance (a defective use of the insulin that is produced)—the patient usually is not dependent on insulin for survival
hyperinsulinism hī'per-in'sū-lin-izm	condition resulting from an excessive amount of insulin in the blood that draws sugar out of the bloodstream, resulting in hypoglycemia, fainting, and convulsions; often caused by an overdose of insulin or by a tumor of the pancreas
pancreatitis pan'krē-ă-tī'tis	inflammation of the pancreas
<i>Parathyroid Glands</i> (par-ă-thī'royd)	
hyperparathyroidism hī'per-par-ă-thī'royd-izm	hypersecretion of the parathyroid glands, usually caused by a tumor
hypoparathyroidism hī'pō-par-ă-thī'royd-izm	hyposcretion of the parathyroid glands
<i>Pituitary Gland</i> (<i>Hypophysis</i>)	considered the master gland because it secretes hormones that regulate the function of other glands, such as the thyroid gland, adrenal glands, ovaries, and testicles
acromegaly ak-rō-meg'ă-lē	disease characterized by enlarged features, especially the face and hands, caused by hypersecretion of the pituitary hormone after puberty, when normal bone growth has stopped; most often caused by a pituitary tumor (Fig. 11.4)



Figure 11.4 Enlarged hands and facial features in a patient with acromegaly.



Figure 11.5 Normal male (extreme right) and three types of dwarfism. (1) On the extreme left is a child who has failed to grow because of the congenital absence of the thyroid gland (cretinism). (2) The next two dwarfs have normal proportions but are half normal size (pituitary dwarfism). The next two dwarfs on the right show disproportionately short extremities but normal-size trunk and head (disproportionate dwarfism).

Term	Meaning
diabetes insipidus di-ă-bē'tēz in-sip'id-ŭs	condition of abnormal increase in urine output most commonly caused by inadequate secretion of pituitary antidiuretic hormone (vasopressin); symptoms include polyuria and polydipsia; urine appears colorless due to the inability of the kidneys to concentrate urine (insipid = without taste)
pituitary dwarfism dwōrf'izm	condition of congenital hyposecretion of growth hormone slowing growth and causing a short yet proportionate stature (not affecting intelligence)—often treated during childhood with growth hormone (Fig. 11.5) [note: there are many other forms of dwarfism, a condition of being markedly undersized; disproportionate types (short limb or short trunk) are most often caused by gene defects (see Fig. 11.5)]
pituitary gigantism jī'gan-tizm	condition of hypersecretion of growth hormone during childhood bone development that leads to an abnormal overgrowth of bone, especially of the long bones; most often caused by a pituitary tumor
<i>Thyroid Gland</i>	
goiter goy'ter	enlargement of the thyroid gland caused by thyroid dysfunction, tumor, lack of iodine in the diet, or inflammation (goiter = throat) (Fig. 11.6A)
hyperthyroidism hī-per-thī'royd-izm	condition of hypersecretion of the thyroid gland characterized by exophthalmia, tachycardia, goiter, and tumor (see Fig. 11.6 and Fig. 11.7A)
Graves disease grāvz di-zēz'	
thyrotoxicosis thī'rō-tok-si-kō'sis	

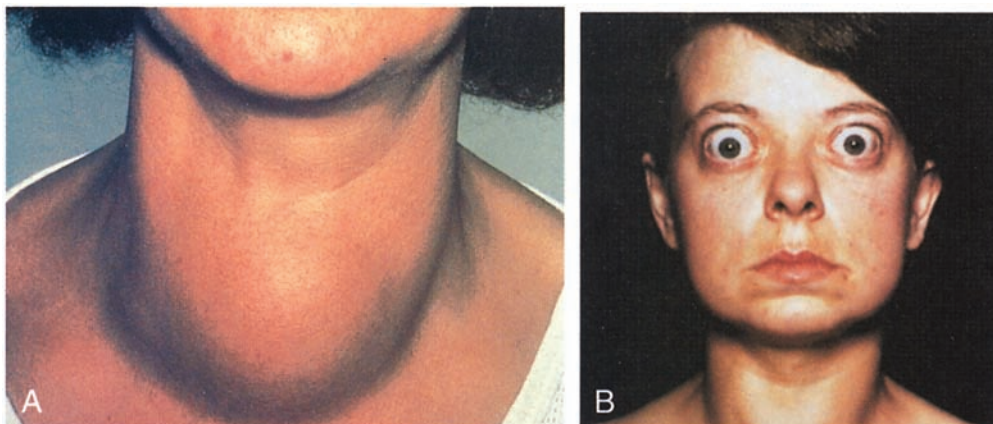


Figure 11.6 Hyperthyroidism. **A.** Patient with goiter. **B.** Patient with exophthalmos.

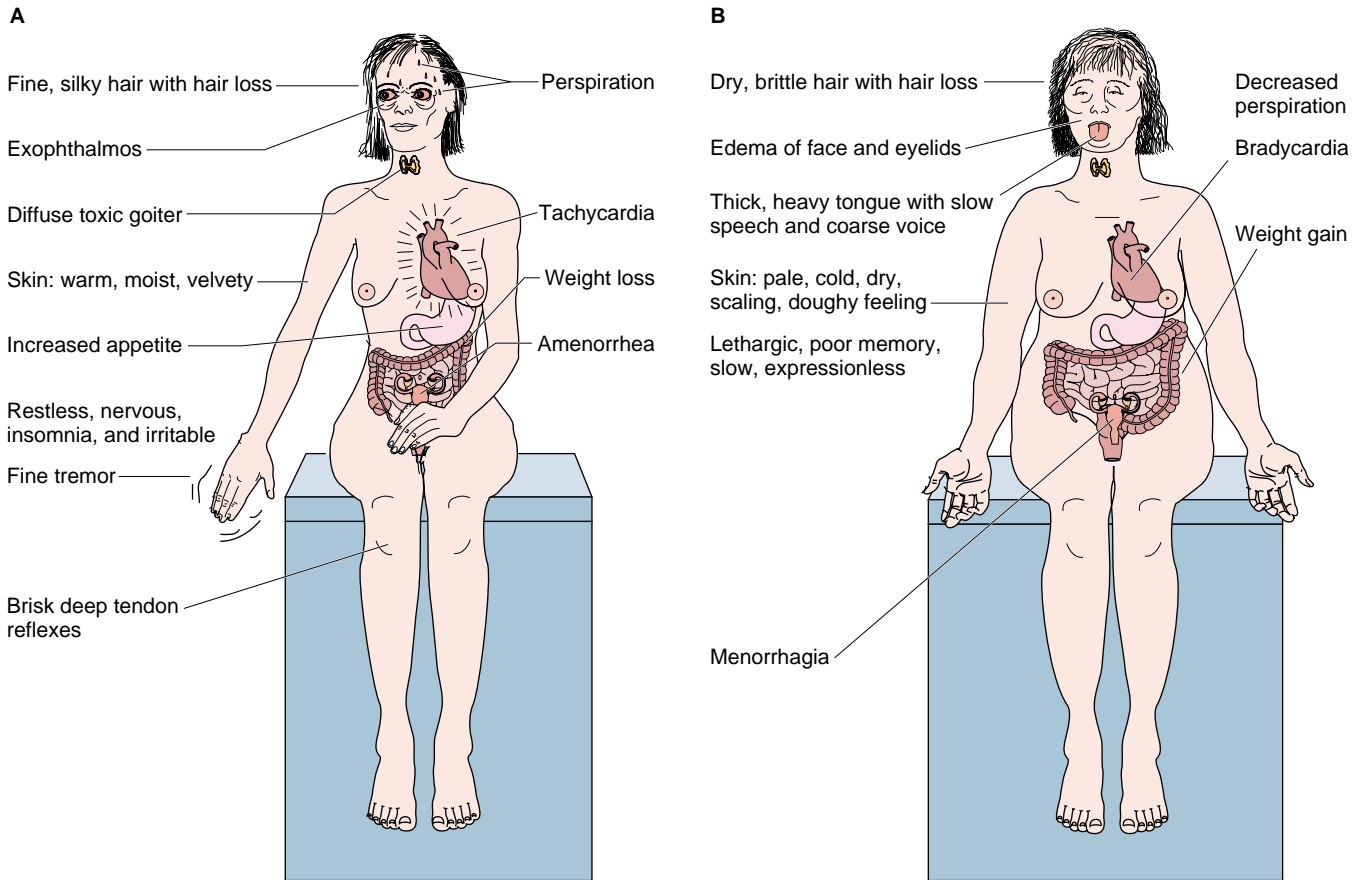


Figure 11.7 A. Hyperthyroidism. B. Hypothyroidism.

Term	Meaning
hypothyroidism hī'pō-thī'royd-izm	condition of hyposecretion of the thyroid gland causing low thyroid levels in the blood that result in sluggishness, slow pulse, and often obesity (Fig. 11.7B)
myxedema mik-se-dē'mă	advanced hypothyroidism in adults characterized by sluggishness, slow pulse, puffiness in the hands and face, and dry skin (myx = mucous)
cretinism krē'tin-izm	condition of congenital hypothyroidism in children that results in a lack of mental development and dwarfed physical stature; the thyroid gland is either congenitally absent or imperfectly developed (see Fig. 11.5)

Diagnostic Tests and Procedures

Test or Procedure	Explanation
LABORATORY TESTING	
blood sugar (BS) blood glucose	measurement of the level of sugar (glucose) in the blood
fasting blood sugar (FBS)	measurement of blood sugar level after a fast of 12 hours
postprandial blood sugar (PPBS)	measurement of blood sugar level after a meal, commonly after 2 hours
glucose tolerance test (GTT)	measurement of the body's ability to metabolize carbohydrates by administering a prescribed amount of glucose after a fasting period, then measuring blood and urine for glucose levels every hour thereafter—usually for 4 to 6 hours
glycohemoglobin glī-kō-hē-mō-glō'bin	molecule (fraction) in hemoglobin that rises in the blood as a result of an increased level of blood sugar; it is a common blood test used in diagnosing and treating diabetes, also known as glycosylated hemoglobin (HbA _{1c})
electrolytes ē-lek'tro-lītz	measurement of the level of specific ions (sodium, potassium, CO ₂ , and chloride) in the blood; electrolyte balance is essential for normal metabolism
thyroid function study	measurement of thyroid hormone levels in blood plasma to determine efficiency of glandular secretions, including T ₃ , T ₄ , and TSH
urine sugar and ketone studies kē'tōn	chemical tests to determine the presence of sugar or ketone bodies in the urine; used as a screen for diabetes (note: to void means to urinate)
IMAGING PROCEDURES	
computed tomography (CT)	CT of the head is used to obtain a transverse view of the pituitary gland
magnetic resonance imaging (MRI)	nonionizing images of magnetic resonance are useful in identifying abnormalities of pituitary, pancreas, adrenal, and thyroid glands
sonography	sonographic images are used to identify endocrine pathology, such as with thyroid ultrasound
thyroid uptake and image	nuclear image involving scan of the thyroid to visualize the radioactive accumulation of previously ingested isotopes to detect thyroid nodules or tumors (Fig. 11.8)

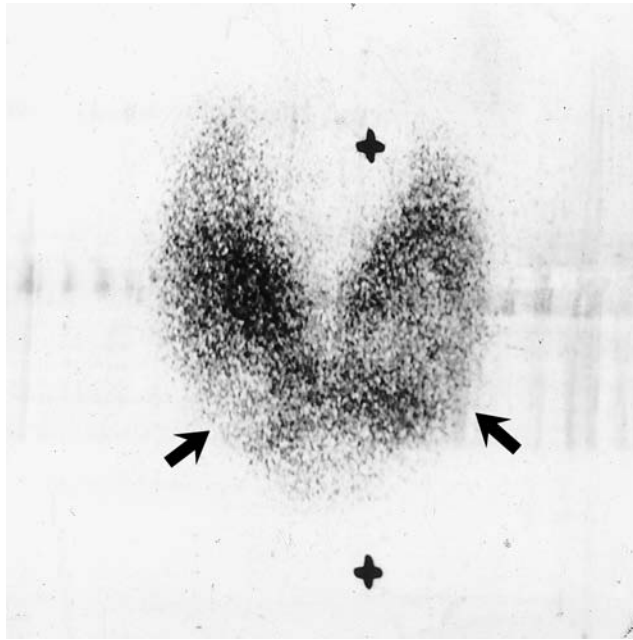


Figure 11.8 Thyroid uptake and image detecting presence of multiple nodules (arrows).

Operative Terms

Term	Meaning
adrenalectomy ă-drē-nāl-ek'tō-mē	excision of adrenal gland
hypophysectomy hī'pof-i-sek'tō-mē	excision of pituitary gland
pancreatectomy pan'krē-ă-tek'tō-mē	excision of pancreas
parathyroidectomy pa'ră-thī-roy-dek'tō-mē	excision of parathyroid gland
thymectomy thī-mek'tō-mē	excision of thymus gland
thyroidectomy thī-roy-dek'tō-mē	excision of thyroid gland

Therapeutic Terms

Term	Meaning
continuous subcutaneous insulin infusion (CSII) insulin pump therapy	use of an insulin-delivery device worn on the body (usually the abdomen) that subcutaneously infuses doses of insulin programmed according to the individual needs of the diabetic patient (Fig. 11.9)
radioiodine therapy ră'dē-ō-ī'ō-din	use of radioactive iodine to treat disease, such as to eradicate thyroid tumor cells



Figure 11.9 Abdominal placement of insulin pump (continuous subcutaneous insulin infusion).

Term	Meaning
COMMON THERAPEUTIC DRUG CLASSIFICATIONS	
antihypoglycemic an'tē-hī'pō-glī-sē'mik	drug that raises blood glucose
antithyroid drug	agent that blocks the production of thyroid hormones; used to treat hyperthyroidism
hormone replacement hōr'mōn	drug that replaces a hormone deficiency (e.g., estrogen, testosterone, thyroid)
hypoglycemic antihyperglycemic hī'pō-glī-sē'mik an'tē-hī'per-glī-sē'mik	drug that lowers blood glucose (e.g., insulin)

Summary of Chapter 11 Acronyms/Abbreviations

ACTH adrenocorticotrophic hormone	GH growth hormone
ADH antidiuretic hormone	GTT glucose tolerance test
BS blood sugar	LH luteinizing hormone
CO ₂ carbon dioxide	MRI magnetic resonance imaging
CSII continuous subcutaneous insulin infusion	MSH melanocyte-stimulating hormone
CT computed tomography	PPBS postprandial blood sugar
DKA diabetic ketoacidosis	PTH parathyroid hormone
DM diabetes mellitus	T ₃ triiodothyronine
FBS fasting blood sugar	T ₄ thyroxine
FSH follicle-stimulating hormone	TSH thyroid-stimulating hormone



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

EXAMPLE

parathyroid

_____ / _____ / _____
 P R S

para/thyr/oid
 P R S

DEFINITION: alongside of/thyroid gland/resembling

1. adenitis

_____ / _____
 R S

DEFINITION: _____

2. euglycemia

_____ / _____ / _____
 P R S

DEFINITION: _____

3. thyrotoxicosis

_____ / _____ / _____
 CF R S

DEFINITION: _____

4. polydipsia

_____ / _____ / _____
 P R S

DEFINITION: _____

5. hormonal

_____ / _____
 R S

DEFINITION: _____

6. ketosis

_____ / _____
 R S

DEFINITION: _____

7. polyuria

_____ / _____ / _____
 P R S

DEFINITION: _____

8. endocrine

_____ / _____ / _____
 P R S

DEFINITION: _____

9. thyroptosis

_____ / _____
 CF S

DEFINITION: _____

10. thymoma

_____ / _____
 R S

DEFINITION: _____

11. acromegaly

_____ / _____
 CF S

DEFINITION: _____

12. android

_____ / _____
 R S

DEFINITION: _____

13. adrenotropic

_____ / _____ / _____
 CF R S

DEFINITION: _____

14. pancreatogenic

_____ / _____ / _____
 CF R S

DEFINITION: _____

15. glycosuria

_____ / _____ / _____
 R R S

DEFINITION: _____

16. dipsogenic

_____ / _____ / _____
 CF R S

DEFINITION: _____

Complete the medical term by writing the missing part:

17. _____ secretion = abnormally increased secretion
18. _____ glycemia = low blood sugar
19. _____ syndrome = condition resulting from hypersecretion of the adrenal cortex causing obesity, hyperglycemia, and weakness
20. _____ secretion = decreased secretion
21. _____ glycemia = high blood sugar
22. _____ graphy = ultrasound imaging

For each of the following, circle the meaning that corresponds to the combining form given:

- | | | | |
|---------------------|-------------|-----------|---------------|
| 23. adren/o | male | extremity | adrenal gland |
| 24. thyr/o | nourishment | shield | chest |
| 25. crin/o | blue | cell | secrete |
| 26. gluc/o | stomach | sugar | pancreas |
| 27. dips/o | thirst | ketones | secrete |
| 28. thym/o | shield | hormone | thymus gland |
| 29. hormon/o | development | urging on | ketones |
| 30. aden/o | male | extremity | gland |

Write the correct medical term for each of the following:

31. another name for Graves disease _____
32. protrusion of one or both eyeballs _____
33. disease characterized by enlarged features caused by hypersecretion of the pituitary hormone after puberty _____
34. enlargement of the thyroid gland _____
35. condition of congenital hyposecretion of growth hormone _____
36. nuclear image of the thyroid _____

Match the following:

- | | |
|------------------------------------|------------------------------------|
| 37. _____ cretinism | a. gigantism |
| 38. _____ polydipsia | b. inadequate antidiuretic hormone |
| 39. _____ hyperthyroidism | c. excessive sodium |
| 40. _____ pituitary gland | d. depends on insulin |
| 41. _____ thyromegaly | e. congenital hypothyroidism |
| 42. _____ myxedema | f. hypophysis |
| 43. _____ hypokalemia | g. not usually insulin dependent |
| 44. _____ type 2 diabetes | h. excessive thirst |
| 45. _____ pituitary hypersecretion | i. goiter |
| 46. _____ adrenal virilism | j. low potassium |
| 47. _____ hypernatremia | k. advanced adult hypothyroidism |
| 48. _____ type 1 diabetes | l. thyrotoxicosis |
| 49. _____ diabetes insipidus | m. hirsutism |

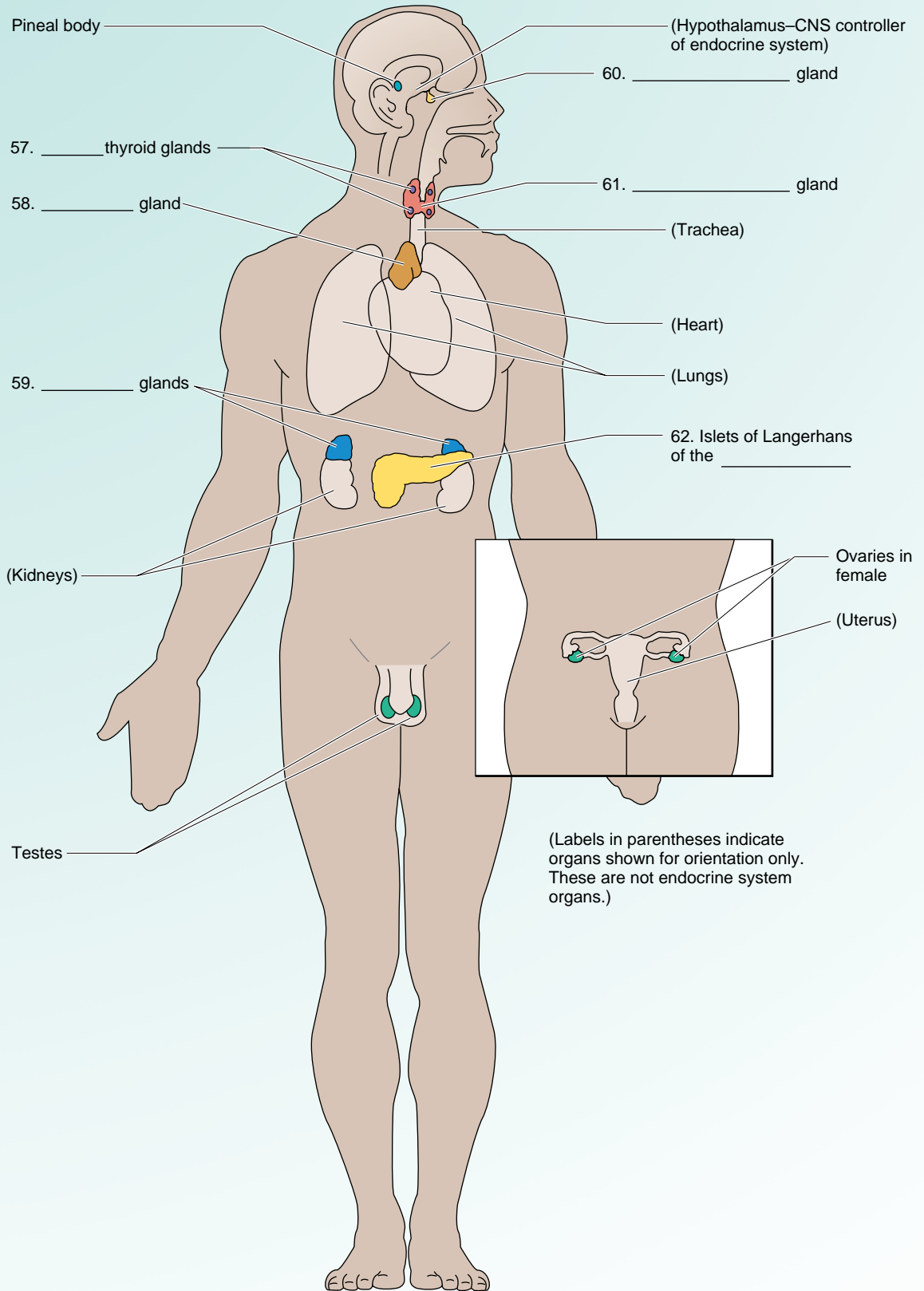
Write the full medical term for the following abbreviations:

50. BS _____
51. HRT _____
52. FBS _____
53. DM _____
54. PPBS _____
55. GTT _____
56. DKA _____

Write in the missing words on the blank lines in the following illustration of the endocrine glands.

57–62.

THE ENDOCRINE SYSTEM

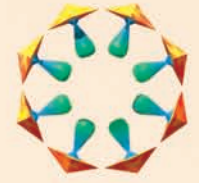


For each of the following, circle the correct spelling of the term:

- | | | |
|------------------|--------------|--------------|
| 63. hirsutism | hirsuitism | hirsitism |
| 64. exophthalmos | exopthamamos | exophthalmos |
| 65. myxedema | myxedema | myxadema |
| 66. goiter | goyter | goitir |
| 67. androgenius | androgenous | andreogenous |
| 68. virillism | virilism | viralism |
| 69. epinephrine | epinefrine | epineprine |
| 70. hypoglicemic | hypoglicemic | hypoglycemic |

Give the noun that was used to form the following adjectives:

71. _____ acromegalic
72. _____ exophthalmic
73. _____ metabolic
74. _____ diabetic
75. _____ hypoglycemic



MEDICAL RECORD ANALYSES

MEDICAL RECORD 11.1

- S: This is a 27 y.o. ♀ c a known Hx of diabetes seen in the ER with nausea and vomiting for the past three hours. She has skipped two doses of her insulin because BS levels monitored at home have been low. She is now experiencing a cephalalgia similar to what she has had in the past before coma.
- O: T 35.5° C, P 90, R 20, BP 126/68
Lab blood studies: sodium 130, potassium 4.1, CO₂ 9, chloride 102, glucose 296
- A: Diabetic ketoacidosis
- P: Admit to ICU: give 10 units insulin IV; measure BS 1° p̄ insulin given, then q 4 h; check urine for sugar and ketosis q void; repeat electrolytes in a.m.

- What is the CC?
 - nausea, vomiting, and headache
 - nausea, vomiting, and dizziness
 - nausea, vomiting, and high blood pressure
 - nausea, vomiting, and ringing in the ears
 - nausea, vomiting, and unconsciousness
- What is the diagnosis?
 - hyperglycemia
 - hypoglycemia
 - type 1 DM with presence of ketone bodies in the blood
 - type 2 DM without the presence of ketone bodies in the blood
 - combination of hyperglycemia and glucosuria
- As an inpatient, where was treatment provided?
 - neuropsychiatric facility
 - coronary care facility
 - emergency room
 - recovery room
 - critical care facility
- Which of the following are electrolytes? 1. sodium 2. potassium 3. chloride 4. glucose
 - only 1, 2, and 3 are correct
 - only 1 and 3 are correct
 - only 2 and 4 are correct
 - only 4 is correct
 - all are correct
- Why were the blood electrolyte studies performed?
 - to examine the electrical impulses of the brain
 - to measure the level of ions in the blood in evaluation of metabolism
 - to measure hormone levels and determine glandular efficiency
 - to visualize the accumulation of radioactive isotopes to eliminate the presence of tumor
 - to measure the level of glucose in the blood
- How should the insulin be administered?
 - within the skin
 - absorption through unbroken skin
 - within the muscle
 - within the vein
 - under the skin
- How often should the blood glucose be measured?
 - one hour after insulin administration, then every four hours
 - once each morning
 - each time the patient urinates
 - one hour before insulin administration, then four times a day
 - one hour before insulin administration, then every four hours thereafter

MEDICAL RECORD 11.2

Tara Nguyen had a long history of hyperthyroidism that was managed by pharmacological treatment for more than 5 years. She was often unhappy with how she felt, however, and decided on her own to stop taking the drug. Two months ago, the symptoms of hyperthyroidism recurred, and she sought medical attention.

Directions

Read Medical Record 11.2 for Ms. Nguyen (page 380) and answer the following questions. This record is the report by Dr. Rincon, who analyzed Ms. Nguyen's thyroid uptake and imaging study.

QUESTIONS ABOUT MEDICAL RECORD 11.2

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

propylthiouracil (PTU) _____

uptake _____

baseline (nonmedical term) _____

- In your own words, not using medical terminology, briefly describe what seems to have been missing in Ms. Nguyen's past medical management:

- In nonmedical terms, explain how the sodium iodide was administered:

- In your own words, not using medical terminology, briefly describe Dr. Rincon's diagnosis:

- What additional test did Dr. Rincon order on his own authority?
 - thyroid function study
 - fasting blood sugar
 - thyroid MRI
 - thyroid ultrasound
- Which of the following tests is recommended to be performed in 6 months?
 - thyroid function study
 - fasting blood sugar
 - thyroid MRI
 - thyroid ultrasound

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THYROID UPTAKE AND IMAGING STUDY

Date of Exam: 5/29/20xx

CLINICAL HISTORY: The patient has more than a six year history of hyperthyroidism which was treated until approximately one year ago with propylthiouracil (PTU). The patient relates some instability in symptomatology during the treatment. She had no previous uptake and imaging study, and radioiodine therapy was never discussed with the patient. She spontaneously discontinued taking the PTU approximately one year ago and has had recurrent symptoms of hyperthyroidism in the last two months.

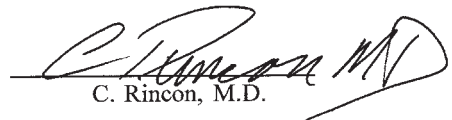
TECHNIQUE: The patient ingested a capsule containing 200 $\mu\text{Ci}^{123}\text{I}$ sodium iodide. Uptakes in the neck were measured at 6 and 24 hours. Images of the thyroid were obtained in multiple projections at 6 hours.

FINDINGS: Radioiodine uptake at 6 hours was 37% (normal: 0-15%), and at 24 hours, uptake was 57% (normal: 5-35%). Thyroid images reveal the gland to be diffusely modestly enlarged. Multiple areas of reduced function correlating with palpable nodules are present in both thyroid lobes with the largest nodule being present in the lower poles of both lobes but with the right lobe being somewhat more severely overall affected than the left lobe. No dominant functioning thyroid nodule is evident.

CONCLUSION:

TOXIC MULTINODULAR GOITER

NOTE: Because of the presence of the multiple nodules which are likely on a benign basis, I took the liberty of ordering a thyroid ultrasound as a baseline. This will be separately reported, and it is suggested that the thyroid ultrasound be repeated in six months to one year.


C. Rincon, M.D.

CR:se

D: 5/29/20xx T: 5/31/20xx

THYROID UPTAKE
AND IMAGING STUDY

PT. NAME: NGUYEN, TARA T.
ID NO: NM-384023
Sex: F Age: 58 Y DOB: 02/18/xx
ATT. PHYS. T. Hutton

MEDICAL RECORD 11.3

Jane Dano, an 11-year-old girl, started experiencing a constant thirst accompanied by frequent urination. Gradually, she lost weight. At the suggestion of Dr. Freeman, her family doctor, she was admitted to Central Medical Center for tests. Shortly after admission, her care was referred to Dr. Gallegos.

Directions

Read Medical Record 11.3 regarding Jane Dano (pages 383–385) and answer the following questions. These records represent the physician’s orders from Dr. Gallegos, who assumed the care of Jane at the time of her admission, and his clinical summary dictated at the time of her discharge.

QUESTIONS ABOUT MEDICAL RECORD 11.3

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the records and define below:

void _____

urinalysis _____

nocturia _____

dietitian _____

Kussmaul respiration _____

- In your own words, not using medical terminology, briefly describe Jane’s condition as identified by the admitting and final diagnosis:

- Dr. Gallegos requested that the unit nurses take Jane’s blood pressure every ____ hours.

- Explain in lay language Dr. Gallegos’ instructions to the nurses for Jane’s fluid intake:

- Every nurse helping care for Jane needs to know to check her urine for acetone and sugar at what times?

6. Part of Jane’s care involves teaching her and others how to manage her diabetes when she returns home after discharge. The nurses and dietician provided this education to which of the following people (check all that apply):

_____ Jane’s stepmother

_____ Jane’s father

_____ Jane’s teachers

_____ Jane’s older brother

_____ a neighbor

_____ Dr. Gallegos

_____ the twins

7. Explain in lay language the two symptoms Jane had for 2 months before being admitted:

What two additional symptoms occurred in the last 3 weeks?

8. At the time of discharge, Jane weighed:
- a. 40 lb
 - b. 148 lb
 - c. 89 lb
 - d. 148 kg
9. Which of the following diagnostic tests will Jane and her family be performing at home?
- a. blood glucose monitoring
 - b. vital signs
 - c. body weight
 - d. insulin injections
10. If you were Jane’s parent, what guidance would you give about how active she can be at school? (Put in terms an 11-year-old can understand.)

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DOCTOR: PLEASE STATE PERTINENT CLINICAL INFORMATION WHEN ORDERING RADIOLOGY PROCEDURES

WRITE WITH BALLPOINT INK PEN; PRESS HARD

DATE	TIME	AUTHORIZATION IS GIVEN TO DISPENSE ANOTHER BRAND OF DRUG IDENTICAL IN FORM AND CONTENT UNLESS CHECKED
11-11-XX	1400	1. STAT Comprehensive metabolic panel 2. glycohemoglobin (HbA1c) 3. anti-islet cell antibodies R Gallegos MD Noted 11/11/xx B. Hill, RN 1425
11-11-XX	1430	1. admit to 6 North 2. Dx: Type 1 DM new onset 3. VS per routine BP q 4 ^h during day 4. daily wt 5. encourage p.o. fluids 1200 cc q 8 ^h 6. a.m. insulin to be Novolin Regular and NPH Please have available on floor 7. U.A 8. Accucheck (blood sugar test) at 07-11-17-22-02 9. Give 7 units of Regular insulin now 10. Check urine for sugar, acetone and volume & void 11. accucheck 1 ^h p above insulin given R Gallegos MD C. Wells 11-11-XX 1500 Noted 11/11/xx B. Hill, RN 1600
11-11-XX	1530	1800-CALORIE diet based on USDA Dietary Guidelines = 3 meals and 2 SNACKS - NO A.M. SNACK R Gallegos MD C. Wells 11-11-XX 1830

PHYSICIAN'S ORDERS

PT. NAME: DANO, J.
 ID NO: 4038315
 SEX: F AGE: 11 DOB: 02/13/20xx
 ATT. PHYS: R. GALLEGOS, M.D.

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DISCHARGE SUMMARY**ADMITTING DIAGNOSIS:** New onset Type 1 diabetes mellitus.**FINAL DIAGNOSIS:** New onset Type 1 diabetes mellitus.**HISTORY OF PRESENT ILLNESS:** The patient is an 11-year-old white female who presented with a 3-week history of polyuria and polydipsia. She has also had nocturia for the past two months and associated weight loss. She was seen by E. Freeman, M.D., her private physician, on the day of admission. A urinalysis was positive for glucose. The patient was then referred to this examiner for further evaluation and management of new onset diabetes mellitus.**HOSPITAL COURSE:** The patient was admitted to the third floor. She was initially treated with regular insulin and then progressed to a 2-shot regimen with regular insulin and NPH before breakfast and regular insulin and NPH before dinner. She also required some spot dosing at lunch time for hyperglycemia. Prior to discharge, her blood sugars had stabilized. She did not have any overnight hypoglycemia. She had spilled 10 gm of glucose in her urine but no ketones. Also, during the course of hospitalization, the parents, the patient, and a neighbor underwent extensive education with nursing and the dietitian. The patient lives with her father and stepmother. Her stepmother is due to deliver twins in January, and her father travels quite a bit in his work; therefore, a neighbor was also trained to help in taking care of her diabetes. Prior to discharge, the patient and her parents have been able to give insulin injections and also do home blood glucose monitoring.**LABORATORY DATA:** Initial laboratory studies showed the following: Sodium: 134. Potassium: 4.0. Chloride: 102. CO₂: 28. Blood urea nitrogen (BUN): 9. Creatinine: 0.7. Serum glucose: 517. Thyroid function was normal with: T₄: 6.5; free thyroxine index (FTI): 7.8; T₃: 1.02; TSH: 2.0. Total cholesterol was 146. Liver function tests were normal. Glycohemoglobin was 19.5. Anti-islet cell antibodies were sent out and are pending at the time of discharge. [islet cell antibodies commonly occur in newly diagnosed insulin dependent diabetics].

(continued)

DISCHARGE SUMMARY

Page 1

PT. NAME:	DANO, JANE V.
ID NO:	IP-403831
ROOM NO:	610
ADM. DATE:	November 11, 20xx
DIS. DATE:	November 18, 20xx
ATT. PHYS:	R. GALLEGOS, M.D.

CENTRAL MEDICAL CENTER

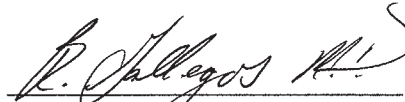
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DISCHARGE SUMMARY

PHYSICAL EXAMINATION: Temperature: 36.9°C. Heart rate: 68. Respirations: 18. Discharge weight: 40.4 kg. Height: 148 cm. **GENERAL:** The patient is awake and alert and in no acute distress. Eyes reveal normal fundoscopic examination. The neck is supple. The thyroid gland is nonpalpable. The chest is clear to percussion and auscultation. No Kussmaul's respirations were noted at discharge. **CARDIOVASCULAR:** Apical pulse is regular without murmur. **ABDOMEN:** The abdomen is soft and nontender. No enlargement or mass is noted. **GENITOURINARY:** Normal external female genitalia. **EXTREMITIES:** The patient did have significant improvement of the dryness on her hands and also around her mouth.

DISCHARGE PROGRAM: The patient is to be seen in the Diabetic Clinic in approximately two weeks. **DIET:** She is on a 2000-calorie diet based on USDA Dietary Guidelines with three meals and two snacks. Physical activity is ad lib. The patient may return to school at the end of the week. **SPECIAL INSTRUCTIONS:** The parents are to check blood sugar at 2 a.m. for the first two nights at home. They are also to call for insulin dose adjustments daily for the first week after discharge.

DISCHARGE MEDICATIONS: Novolin Human Insulin, 12 units of regular and 12 units of NPH, to be given 20 minutes before breakfast; 10 units of regular and 6 units of NPH to be given 20 minutes before dinner.



R. Gallegos, M.D.

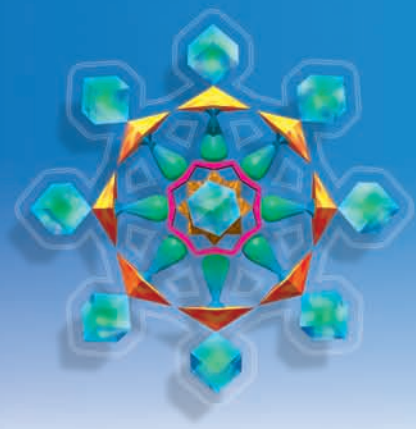
RG:ti

D: 11/18/xx

T: 11/19/xx

DISCHARGE SUMMARY
Page 2

PT. NAME:	DANO, JANE V.
ID NO:	IP-403831
ROOM NO:	610
ADM. DATE:	November 11, 20xx
DIS. DATE:	November 18, 20xx
ATT. PHYS:	R. GALLEGOS, M.D.



OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define the common term components used in relation to the eye
- ◆ Locate and name the major structures of the eye and list their functions
- ◆ Define common symptomatic and diagnostic terms referring to the eye
- ◆ List the common diagnostic tests and procedures related to the eye
- ◆ Identify common operative terms referring to the eye
- ◆ Identify common therapeutic terms including drug classifications related to the eye
- ◆ Explain the terms and abbreviations used in documenting medical records involving the eye

Combining Forms

Combining Form	Meaning	Example
aque/o	water	aqueous ak'wē-ŭs
blephar/o	eyelid	blepharospasm blef'ă-rō-spazm
conjunctiv/o	conjunctiva (to join together)	conjunctival kon-jŭnk-tī'vāl
corne/o	cornea	corneal kōr'nē-ăl
kerat/o		keratoplasty ker'ă-tō-plas-tē
cycl/o	ciliary body (circle)	cycloplegia sī-klō-plē'jē-ă
ir/o irid/o	iris (colored circle)	iritis ī-rī'tis iridectomy ir'i-dek'tō-mē
lacrim/o	tear	lacrimal lak'ri-māl
dacry/o		dacryocyst dak'rē-ō-sist

Combining Form	Meaning	Example
ocul/o	eye	ocular ok'yū-lăr
ophthalm/o		ophthalmology of-thal-mol'ō-jē
opt/o		optometry op-tom'ě-trē
phac/o	lens (lentil)	phacolysis fă-kol'i-sis
phak/o		phakoma fa-kō'mă
phot/o	light	photophobia fō-tō-fō'bē-ă
presby/o	old age	presbyopia prez-bē-ō'pē-ă
retin/o	retina	retinopathy ret-i-nop'ă-thē
scler/o	sclera (hard)	scleritis sklē-rī'tis
vitre/o	glassy	vitreous vit'rē-ŭs
ADDITIONAL SUFFIX		
-opia	condition of vision	hyperopia hī-per-ō'pē-ă

Eye Overview

The eye is the organ of sight that through pairing provides three-dimensional vision (Fig. 12.1). Each eye is located in a bony orbit (cavity) of the skull and is covered by the protective fold of the eyelid.

The *sclera*, the white of the eye, and the *cornea*, the transparent anterior coating, are part of the outer fibrous *tunic* (layer) that *refracts* (bends) light that enters the eye.

The *choroid*, a vascular layer located just beneath the sclera, contains blood vessels that nourish the outer portion of the retina. The *iris* contains blood vessels, pigment cells, and muscle fibers. Muscles of the iris regulate the amount of light that enters through the central opening known as the *pupil*. Melanin, the pigment present in the epithelial cells that cover the iris, gives color to the eyes. The *ciliary body* is a ring of muscle located behind the peripheral iris that controls the power of the lens. The elastic, transparent *lens*, located behind the pupil, focuses light rays on the *retina* in the inner, posterior part of the eye. *Aqueous humor*, produced by the surface epithelium of the ciliary body, provides nutrition to the avascular lens and cornea. *Vitreous* is the jelly-like material that occupies the space between the lens and retina.

The *retina* is the nerve tissue layer that contains cells for visual reception. The visual receptor neurons of the retina are the rods and cones. *Rods* are responsible for vision in dim light, and *cones* are responsible for vision in bright light. The *macula lutea* is the central region of the retina. It has a yellowish color caused by its pigment. At the center of the macula, a tiny, pinpoint depression known as the *fovea centralis* is the site of sharpest, central vision. The *optic disk* is the area in the retina where nerve fibers form the *optic nerve* for transmission to the optic tracts in the brain.

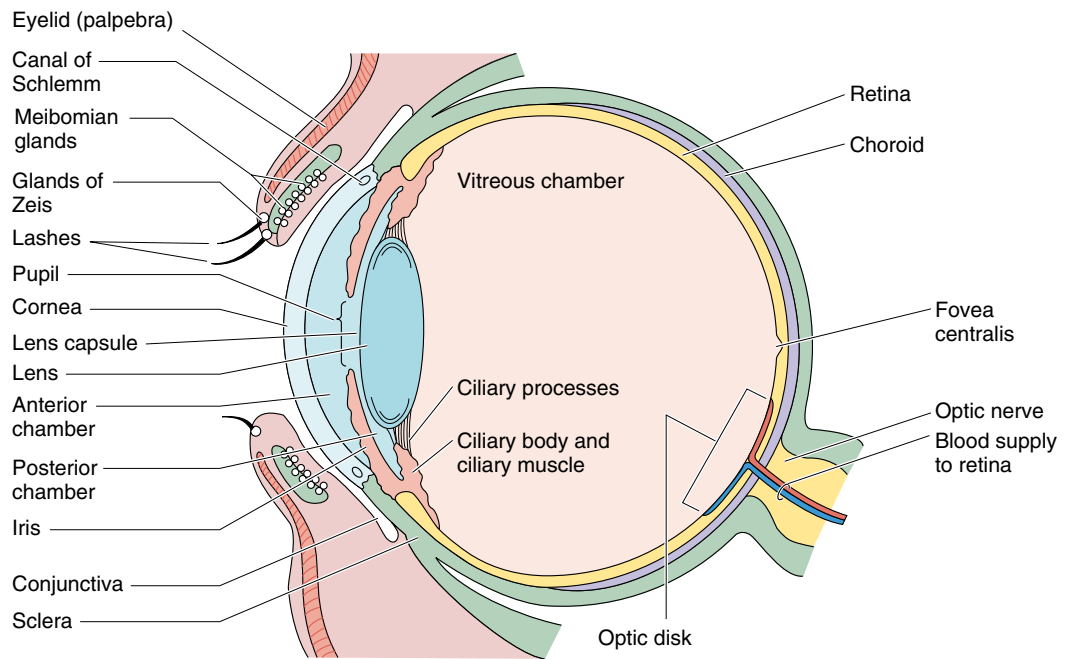


Figure 12.1 Anatomy of the eye (sagittal view).

The *conjunctiva* provides a lining for the eye and eyelid. The *lacrimal gland*, located in the orbit above each eye, secretes tears that lubricate and protect the eye. Tears constantly flow across the eye and downward to the *lacrimal ducts*, to the *lacrimal sac*, and then into the *nasolacrimal duct* that drains into the nose. The *meibomian glands* are sebaceous glands located within the rim of the eyelid that secrete sebum to keep the lids from sticking together, and the *glands of Zeis* are sebaceous glands surrounding the hair follicles of the eyelashes.

Anatomical Terms

Term	Meaning
anterior chamber	fluid-filled space between the cornea and iris
aqueous humor ak'wē-ūs hyū'mer	watery liquid secreted at the ciliary body that fills the anterior and posterior chambers of the eye and provides nourishment for the cornea, iris, and lens (humor = fluid)
canal of Schlemm	duct in the anterior chamber that carries filtered aqueous humor to the veins and bloodstream
choroid kō'royd	vascular layer beneath the sclera that provides nourishment to the outer portion of the retina
ciliary body sil'ē-ar-ē	ring of muscle behind the peripheral iris that controls the power of the lens
ciliary muscle	smooth muscle portion of the ciliary body, which contracts to assist in near-vision capability
ciliary processes	epithelial tissue folds on the inner surface of the ciliary body that secrete aqueous humor
conjunctiva kon-jŭnk-tī'vǎ	joining together; mucous membrane that lines the eyelids and outer surface of the eyeball

Term	Meaning
cornea kōr'nē-ă	transparent, anterior part of the eyeball covering the iris, pupil, and anterior chamber that functions to refract (bend) light to focus a visual image
eyelid (palpebra) pal-pē'bră	movable protective fold that opens and closes, covering the eye
fovea centralis fō'vē-ă sen-tră'lis	pinpoint depression in the center of the macula lutea that is the site of sharpest vision (fovea = pit)
fundus (base) fūn'dŭs	interior surface of the eyeball including the retina, optic disk, macula, and posterior pole (curvature at the back of the eye)
glands of Zeis	oil glands surrounding the eyelashes
meibomian glands mī-bō'mē-an	oil glands located along the rim of the eyelids
iris ī'ris	colored circle; colored part of the eye located behind the cornea that contracts and dilates to regulate light passing through the pupil
lacrimal gland lak'ri-măl	gland located in the upper outer region above the eyeball that secretes tears (Fig. 12.2)
lacrimal ducts	tubes that carry tears to the lacrimal sac
lacrimal sac	structure that collects tears before emptying into the nasolacrimal duct
lens	transparent structure behind the pupil that bends and focuses light rays on the retina
lens capsule	capsule that encloses the lens
macula lutea (macula) mak'yū-lă	central region of the retina responsible for central vision; yellow pigment provides its color (lutea = yellow) (see Fig. 12.13B)

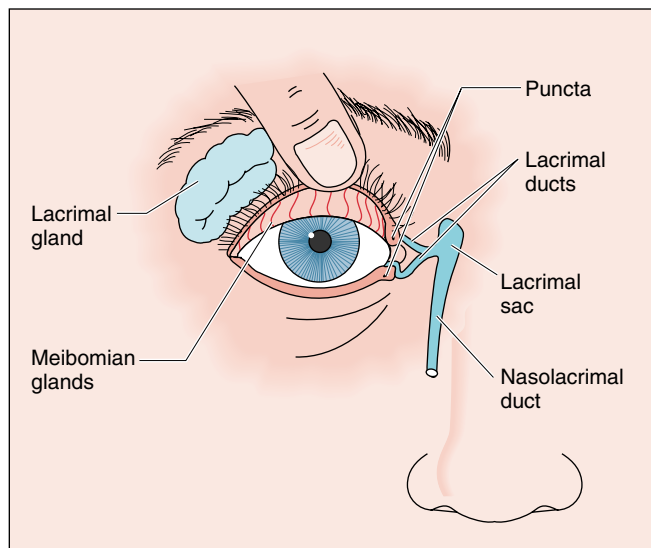


Figure 12.2 Lacrimal apparatus.



PUPIL. The Latin word, pupilla, the pupil of the eye, is derived from pupa, meaning a doll or little girl. The name is said to have been given to the pupil of the eye because a tiny image of the beholder may be seen reflected in it.

Term	Meaning
nasolacrimal duct nā-zō-lak'ri-māl	passageway for tears from the lacrimal sac into the nose
optic disk op'tik	exit site of retinal nerve fibers, as well as the entrance point for retinal arteries and the exit point for retinal veins (see Fig. 12.13B)
optic nerve	nerve responsible for carrying impulses for the sense of sight from the retina to the brain
posterior chamber	space between the back of the iris and the front of the vitreous filled with aqueous fluid
pupil pyū'pīl	black circular opening in the center of the iris through which light passes as it enters the eye
retina ret'i-nā	innermost layer that perceives and transmits light to the optic nerve (see Fig. 12.13B)
cones	cone-shaped cells within the retina that are color sensitive and respond to bright light
rods	rod-shaped cells within the retina that respond to dim light
sclera sklēr'ă	tough, fibrous, white outer coat extending from the cornea to the optic nerve
trabecular meshwork tră-bek'yū-lăr	mesh-like structure in the anterior chamber that filters the aqueous humor as it flows into the canal of Schlemm
vitreous vit'rē-ūs	jelly-like mass filling the inner chamber between the lens and retina that gives bulk to the eye

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC	
asthenopia as-thĕ-nō'pĕ-ă	eyestrain (asthenia = weak condition)
blepharospasm blef'ă-rō-spazm	involuntary contraction of the muscles surrounding the eye, causing uncontrolled blinking and lid squeezing
diplopia di-plō'pĕ-ă	double vision
exophthalmos ek-sof-thal'mos	abnormal protrusion of one or both eyeballs
exophthalmus	
lacrimation lak-ri-mă'shŭn	secretion of tears
nystagmus nis-tag'mŭs	involuntary, rapid oscillating movement of the eyeball (nystagmos = a nodding)
photophobia fō-tō-fō'bĕ-ă	extreme sensitivity to, and discomfort from, light

Term	Meaning
scotoma skō-tō'mă	blind spot in vision (skotos = darkness)
DIAGNOSTIC	
refractive errors rē-frac'tiv	defects in the bending of light as it enters the eye, causing an improper focus on the retina
astigmatism ă-stig'mă-tizm	distorted vision caused by an oblong or cylindrical curvature of the lens or cornea that prevents light rays from coming to a single focus on the retina (stigma = point)
hyperopia hī-per-ō'pē-ă	farsightedness; difficulty seeing close objects when light rays extend beyond the proper focus on the retina (Fig. 12.3A and B)
myopia mī-ō'pē-ă	nearsightedness; difficulty seeing distant objects when light rays fall short of the proper focus on the retina (Fig. 12.3A and C)
presbyopia prez-bē-ō'pē-ă	impaired vision owing to old-age loss of accommodation
accommodation ă-kom'ō-dă'shŭn	ability of the eye to adjust focus on near objects
amblyopia am-blē-ō'pē-ă	decreased vision in early life due to a functional defect that can occur as a result of strabismus, refractive errors (when one eye is more nearsighted, farsighted, or astigmatic than the other), or trauma; usually occurs in one eye, also known as lazy eye (ambly/o = dim)
aphakia ă-fă'kē-ă	absence of the lens, usually after cataract extraction
blepharitis blef'ă-rī'tis	inflammation of the eyelid
blepharochalasis blef'ă-rō-kal'ă-sis	baggy eyelid; overabundance and loss of elasticity of skin on the upper eyelid, causing a fold of skin to hang down over the edge of the eyelid when the eyes are open (chalasis = a slackening)
dermatochalasis der'mă-tō-kal'ă-sis	
blepharoptosis blef'ă-rop'tō-sis	drooping of the eyelid usually caused by paralysis
ptosis	

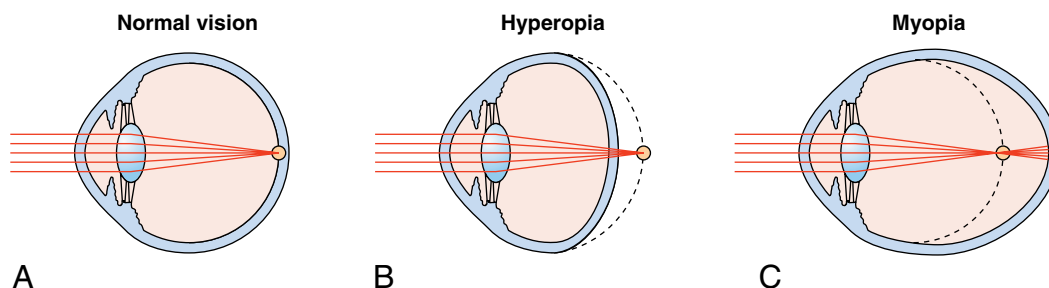


Figure 12.3 **A.** Proper focus of light rays on the retina. **B.** Light rays extend beyond proper focus in hyperopia. **C.** Light rays fall short of proper focus in myopia.



CATARACT. This Greek word meaning

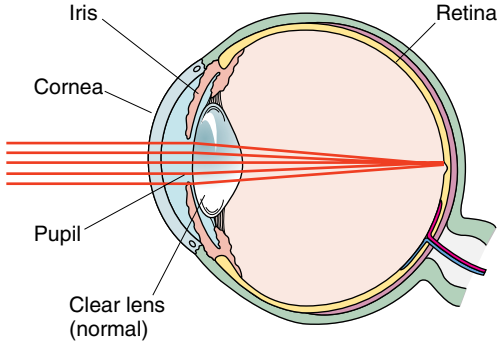
waterfall, or something that rushes down to form an obstruction, like a portcullis, was probably related to the obstruction of vision that is symptomatic of a cataract. It was an ancient belief that the interference with vision occurred between the lens and the iris (like a veil).

Term	Meaning
chalazion ka-lā'zē-on (shā-lā'zē-on)	chronic nodular inflammation of a meibomian gland, usually the result of a blocked duct; commonly presents as a swelling on the upper or lower eyelid (chalaza = hailstone) (Fig. 12.4)
cataract kat'ă-rakt	opaque clouding of the lens causing decreased vision (Figs. 12.5 and 12.6B)
conjunctivitis kon-jŭnk-ti-vī'tis	pinkeye; inflammation of the conjunctiva
dacryoadenitis dak'rē-ō-ad-ĕ-nī'tis	inflammation of the lacrimal gland
dacryocystitis dak'rē-ō'sis-tī'tis	inflammation of the tear sac (cyst/o = sac)
diabetic retinopathy dī-ă-bet'ik ret-i-nop'ă-thē	disease of the retina in diabetics characterized by capillary leakage, bleeding, and new vessel formation (neovascularization), leading to scarring and loss of vision (Figs. 12.6C and 12.13C)
ectropion ek-trō'pē-on	outward turning of the rim of the eyelid (trop/o = turning) (Fig. 12.7A)
entropion en-trō'pē-on	inward turning of the rim of the eyelid (Fig. 12.7B)
epiphora ē-pif'ō-ră	abnormal overflow of tears caused by blockage of the lacrimal duct (epi = upon; phor/o = to carry or bear)
glaucoma glaw-kō'mă	group of diseases of the eye characterized by increased intraocular pressure that results in damage to the optic nerve, producing defects in vision (Fig. 12.6D)
hordeolum hōr-dē'ō-lŭm	sty; an acute infection of a sebaceous gland of the eyelid (hordeum = barley) (Fig. 12.8)
iritis ī-rī'tis	inflammation of the iris
keratitis ker-ă-tī'tis	inflammation of the cornea

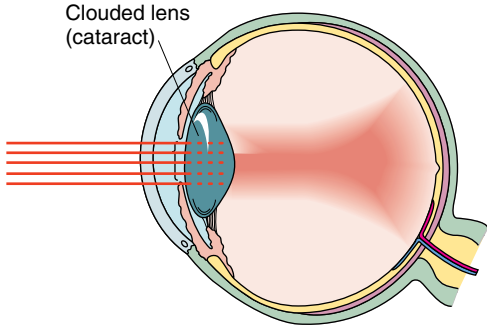


Figure 12.4 Chalazion.

Normal focus of light rays on the retina



Light rays diffused by a cataract



A

Normal daytime vision



B1

Simulation of daytime cataract vision



B2

Normal nighttime vision



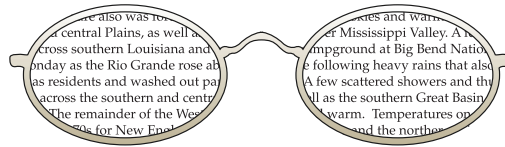
B3

Simulation of nighttime cataract vision



B4

Figure 12.5 Cataract. **A.** Normal light focus compared with light focus interference caused by a cataract. **B.** Simulation of cataract vision.



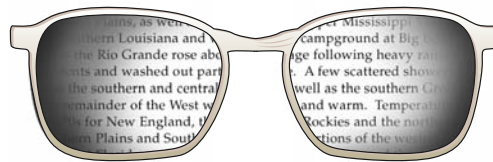
A Normal vision



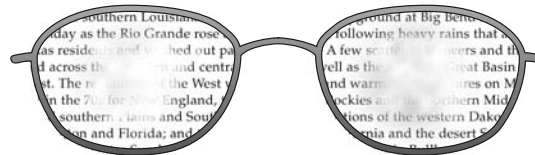
B Cataract (hazy vision)



C Diabetic retinopathy (retinal damage leads to blind spots)



D Glaucoma (loss of peripheral vision)



E Macular degeneration (loss of central vision)

Figure 12.6 Simulations of vision loss.

Term	Meaning
macular degeneration mak'yū-lăr dē-jen-er-ā'shŭn	breakdown or thinning of the tissues in the macula, resulting in partial or complete loss of central vision (see Fig. 12.6E)
pseudophakia sū-dō-fak'ē-ă	eye in which the natural lens is replaced with an artificial lens implant (pseudo = false)
pterygium tĕ-rij'ĕŭm	fibrous growth of conjunctival tissue that extends onto the cornea (Fig. 12.9)
retinal detachment ret-i-nal	separation of the retina from the underlying epithelium, disrupting vision and resulting in blindness if not repaired surgically (Fig. 12.13D)
retinitis ret-i-nī'tis	inflammation of the retina

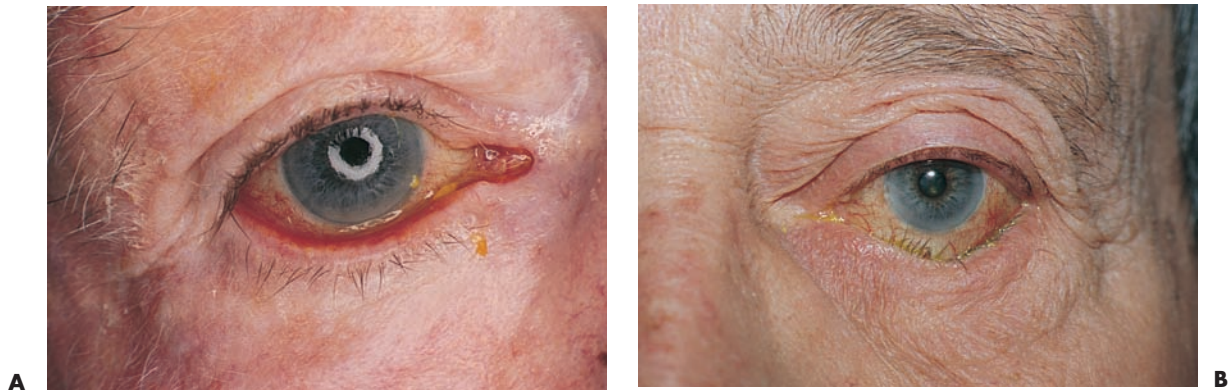


Figure 12.7 Eyelid abnormalities. **A.** Severe bilateral lower lid ectropion. **B.** Lower lid entropion causing the lashes to rub on the cornea.

Term	Meaning
strabismus stra-biz'mūs	crossed eyes; a condition of eye misalignment caused by intraocular muscle imbalance (strabismus = a squinting; hetero = other) (Fig. 12.10)
heterotropia het'er-ō-trō'pē-ă	
esotropia es-ō-trō'pē-ă	right or left eye deviates inward toward the nose (eso = inward; tropo = turning)
exotropia ek-sō-trō'pē-ă	right or left eye deviates outward away from the nose (exo = out; tropo = turning)
scleritis sklē-rī'tis	inflammation of the sclera
trichiasis trī-kī'ă-sis	misdirected eyelashes that rub on the conjunctiva or cornea



STRABISMUS. Strabo, a geographer and prominent figure in Alexandria during the Roman period, suffered from a peculiar and noticeable squint. Any man with the same type of squint was called Strabo, which led to the word strabismus.



Figure 12.8 Upper lid hordeolum.

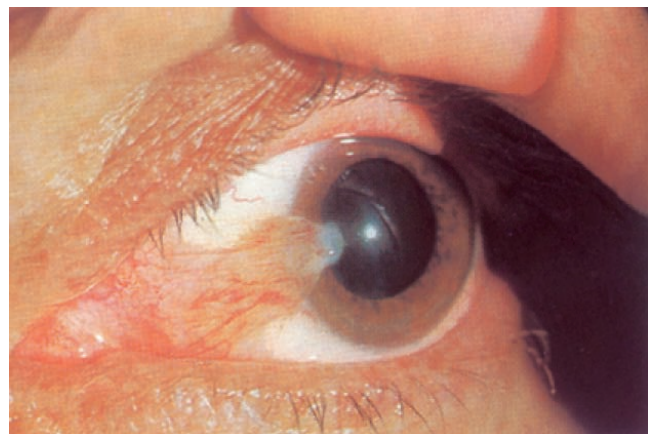


Figure 12.9 Pterygium caused by ultraviolet exposure and drying.

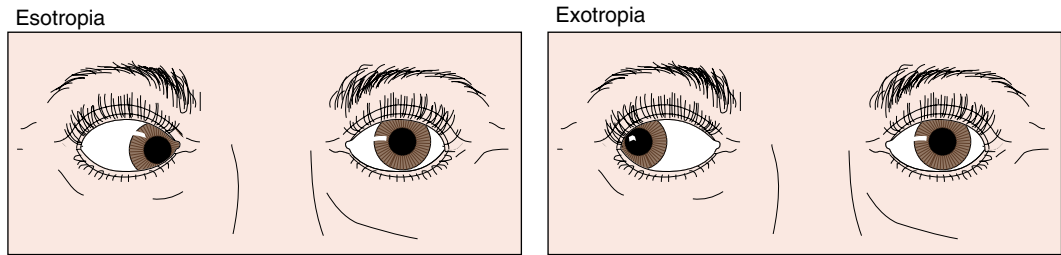


Figure 12.10 Strabismus.

Diagnostic Tests and Procedures

Test or Procedure	Explanation
distance visual acuity	measure of the ability to see the details and shape of identifiable objects from a specified distance (usually 20 feet), typically using a Snellen chart (Fig. 12.11)
fluorescein angiography flūr-es'ē-in an-jē-og'ră-fē	visualization and photography of retinal and choroidal vessels made as fluorescein dye, which is injected into a vein, circulates through the eye (Fig. 12.12)
ophthalmoscopy of-thal-mos'kō-pē	use of an ophthalmoscope to view the interior of the eye (Fig. 12.13)
refraction rē-frak'shŭn	measurement of refractive errors using a phoropter to determine best corrected vision and prescription for eye glasses or contact lenses
phoropter fō-rop'ter	instrument that holds corrective lenses in front of the eye to determine optical correction

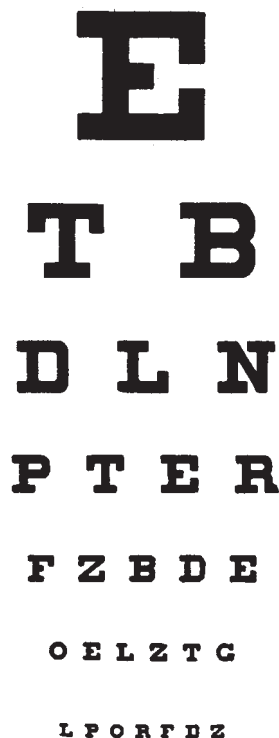


Figure 12.11 Snellen eye chart for testing distance visual acuity.

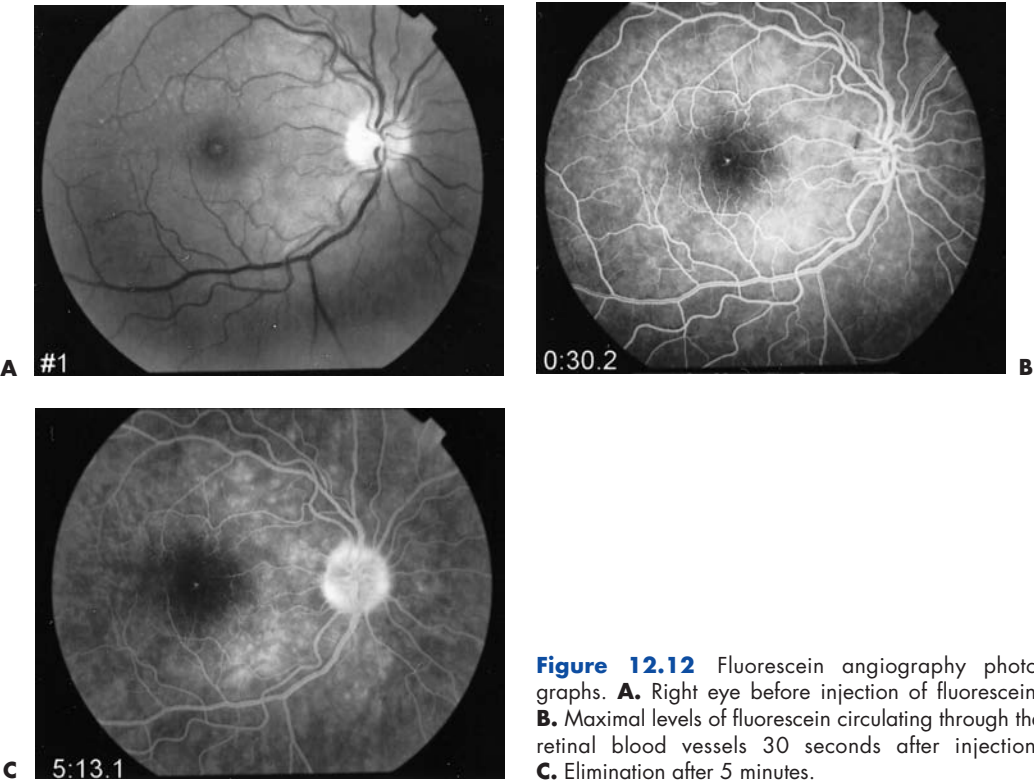


Figure 12.12 Fluorescein angiography photographs. **A.** Right eye before injection of fluorescein. **B.** Maximal levels of fluorescein circulating through the retinal blood vessels 30 seconds after injection. **C.** Elimination after 5 minutes.

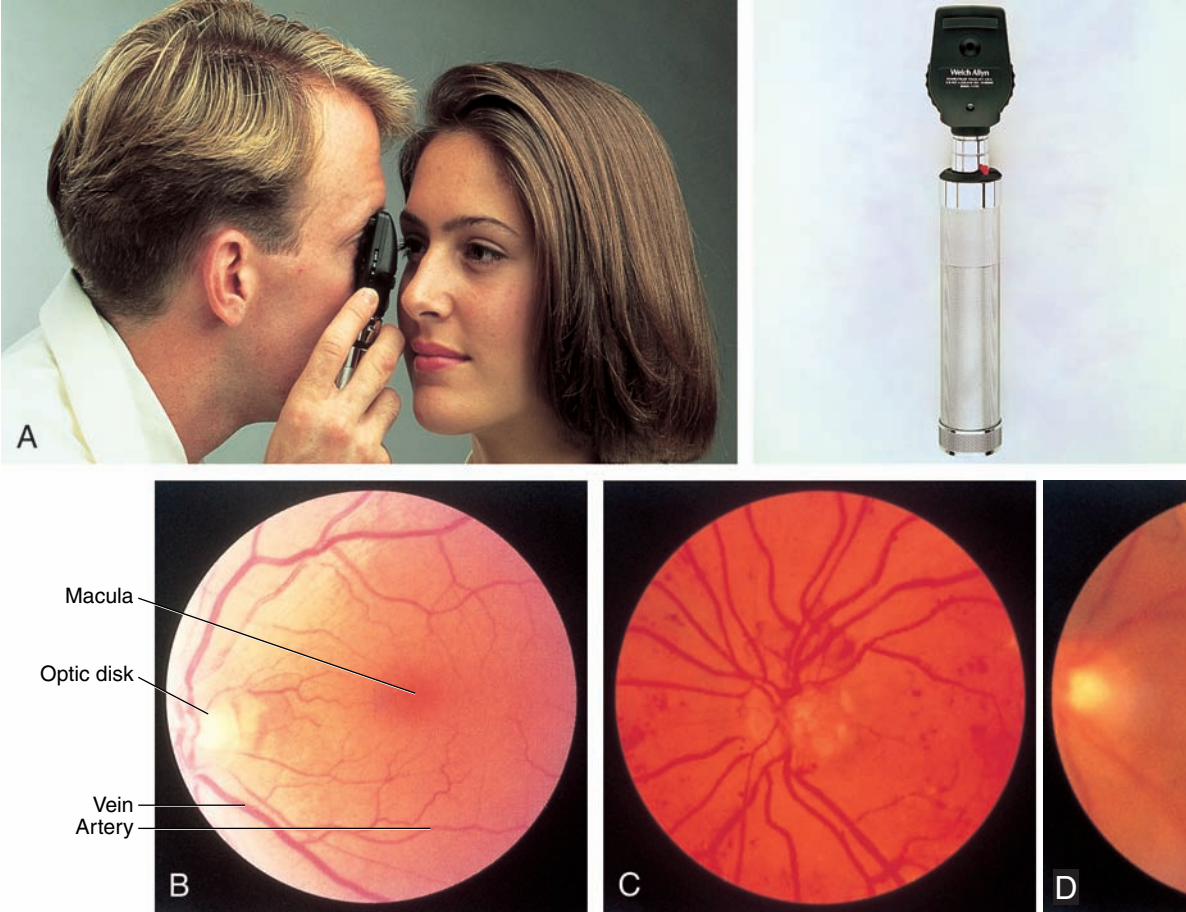


Figure 12.13 **A.** Doctor performing ophthalmoscopy using an ophthalmoscope. **B.** Normal retina. **C.** Aneurysms seen in diabetic retinopathy. **D.** Retinal detachment.



Figure 12.14 Slit-lamp biomicroscope.

Test or Procedure	Explanation
slit-lamp biomicroscopy bi'ō-mi-kros'kō-pē	use of a tabletop microscope to examine the eye, especially the cornea, lens, fluids, and membranes (Fig. 12.14)
sonography sō-nog'rā-fē	use of high-frequency sound waves to detect pathology within the eye such as foreign bodies or a detached retina
tonometry tō-nom'ē-trē	use of a tonometer to measure intraocular pressure, which is elevated in glaucoma (Fig. 12.15)

Operative Terms

Term	Meaning
blepharoplasty blef'ā-ro-plast-tē	surgical repair of an eyelid
cataract extraction kat'ā-rakt ek-strak'shūn	excision of a cloudy lens from the eye
cryoretinopexy krī-ō-ret'i-nō-pek-se	use of intense cold to seal a hole or tear in the retina; used to treat retinal detachment
cryopexy	
dacryocystectomy dak'rē-ō-sis-tek'tō-mē	excision of a lacrimal sac



Figure 12.15. Tonometer/tonometry.

Term	Meaning
enucleation ē-nū-klē-ā'shŭn	excision of an eyeball
iridectomy ir'i-dek'tō-mē	excision of a portion of iris tissue
iridotomy ir-i-dot'ō-mē	incision into the iris (usually with a laser) to allow for drainage of aqueous humor from the posterior to anterior chamber; used to treat a type of glaucoma
keratoplasty ker'ă-tō-plas-tē	corneal transplant; replacement of a diseased or scarred cornea with a healthy one from a matched donor
laser surgery	use of a laser to make incisions or destroy tissues (e.g., to create fluid passages, to obliterate tumors or aneurysms) (Fig. 12.16)
laser-assisted in situ keratomileusis (LASIK) in sī'tū ker'ă-tō-mil-oo'sis	technique using the excimer laser to reshape the surface of the cornea to correct refractive errors such as myopia, hyperopia, and astigmatism (smileusis = carving)



Figure 12.16. Simulation of laser application.

Term	Meaning
intraocular lens (IOL) implant in'tră-ok'yū-lăr	implantation of an artificial lens to replace a defective natural lens (e.g., after cataract extraction) (Fig. 12.17)
phacoemulsification fak'ō-ē-mūl-si-fi-kā'shūn	use of ultrasound to shatter and break up a cataract with aspiration and removal
scleral buckling sklēr'ăl būk'ling	surgery to treat retinal detachment by placing a band of silicone around the sclera to cinch it toward the middle of the eye and relieve pull on the retina—often combined with other techniques to seal retinal tears such as cryoretinopexy
trabeculectomy tră-bek'yū-lek'tō-mē	removal of a portion of the trabecular meshwork to increase the flow of aqueous humor from the eye; used in treatment of acute glaucoma or glaucoma not treatable with medication

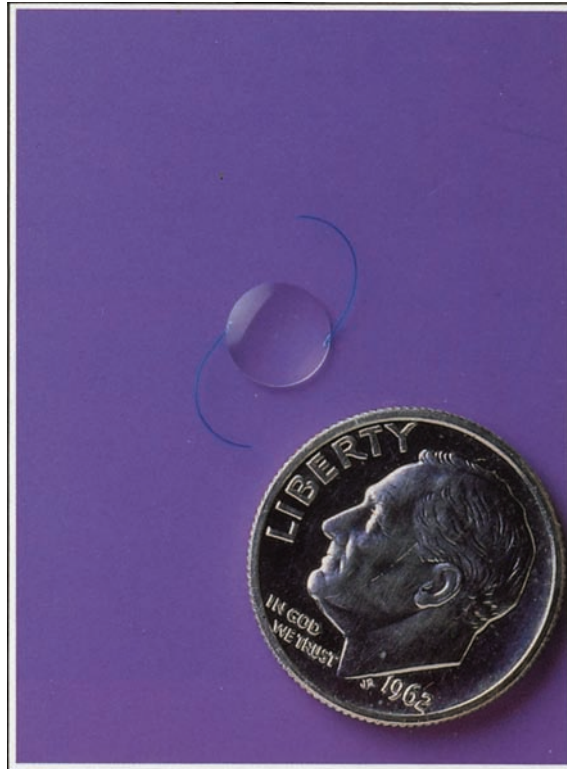


Figure 12.17. Size comparison of an intraocular lens to a dime.

Therapeutic Terms

Term	Meaning
contact lens	small plastic curved disk with optical correction that fits over the cornea; used to correct refractive errors
eye instillation	introduction of a medicated solution in the eye
eye irrigation	washing of the eye with water or other fluid (e.g., saline)

COMMON THERAPEUTIC DRUG CLASSIFICATIONS

antibiotic ophthalmic solution an'tē-bī-ot'ik of-thal'mik	antimicrobial agent in solution, used to treat bacterial infections (e.g., conjunctivitis, corneal ulcers)
cycloplegic sī-klō-plē'jik	agent that paralyzes the ciliary muscle and powers of accommodation; commonly used in pediatric eye examinations
mydriatic (dilation of pupil) mi-drē-at'ik	agent that causes dilation of the pupil (e.g., for certain eye examinations)
miotic mī-ot'ik	agent that causes the pupil to contract (mio = less)

Summary of Chapter 12 Acronyms/Abbreviations

IOL.....intraocular lens

LASIK.....laser-assisted in situ keratomileusis



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

EXAMPLE

epikeratophakia

____ / ____ / ____ / ____
P CF R S

epi/kerato/phak/ia

P CF R S

DEFINITION: upon/cornea/lens/condition of

1. blepharoptosis

____ / ____
CF S

DEFINITION: _____

2. iridotomy

____ / ____
CF S

DEFINITION: _____

3. ophthalmology

____ / ____
CF S

DEFINITION: _____

4. vitrectomy

____ / ____
R S

DEFINITION: _____

5. dacryolithiasis

____ / ____ / ____
CF R S

DEFINITION: _____

6. lacrimal

____ / ____
R S

DEFINITION: _____

7. photophobia

_____ / _____ / _____
CF R S

DEFINITION: _____

8. keratoplasty

_____ / _____
CF S

DEFINITION: _____

9. aqueous

_____ / _____
R S

DEFINITION: _____

10. iritis

_____ / _____
R S

DEFINITION: _____

11. corneal

_____ / _____
R S

DEFINITION: _____

12. phacolysis

_____ / _____
CF S

DEFINITION: _____

13. retinopathy

_____ / _____ / _____
CF R S

DEFINITION: _____

14. ocular

_____ / _____
R S

DEFINITION: _____

15. conjunctivitis

_____ / _____
R S

DEFINITION: _____

30. hard or sclera	corne/o	vitre/o	scler/o
31. lens (lentic)	phac/o	scler/o	conjunctiv/o
32. colored circle	chrom/o	irid/o	corne/o
33. tear	dacry/o	hydr/o	aque/o
34. eyelid	ocul/o	ophthalm/o	blephar/o
35. water	aque/o	hydr/o	vitre/o

Write the correct medical term for each of the following:

- 36. pinkeye _____
- 37. inflammation of the eyelid _____
- 38. eyestrain _____
- 39. an agent that causes dilation of the pupil _____
- 40. a sty; acute infection of a meibomian gland of the eyelid _____
- 41. clouding of the lens causing decreased vision _____
- 42. breakdown or thinning of the tissues in the macula, resulting in partial or complete loss of central vision _____

Match the surgical procedures with diagnoses:

- | | |
|-------------------------------|-----------------------|
| 43. _____ keratoplasty | a. myopia |
| 44. _____ phacoemulsification | b. retinal detachment |
| 45. _____ LASIK | c. cataract |
| 46. _____ trabeculectomy | d. dermatochalasis |
| 47. _____ blepharoplasty | e. scarred cornea |
| 48. _____ cryoretinopexy | f. acute glaucoma |

Briefly define the following medical terms:

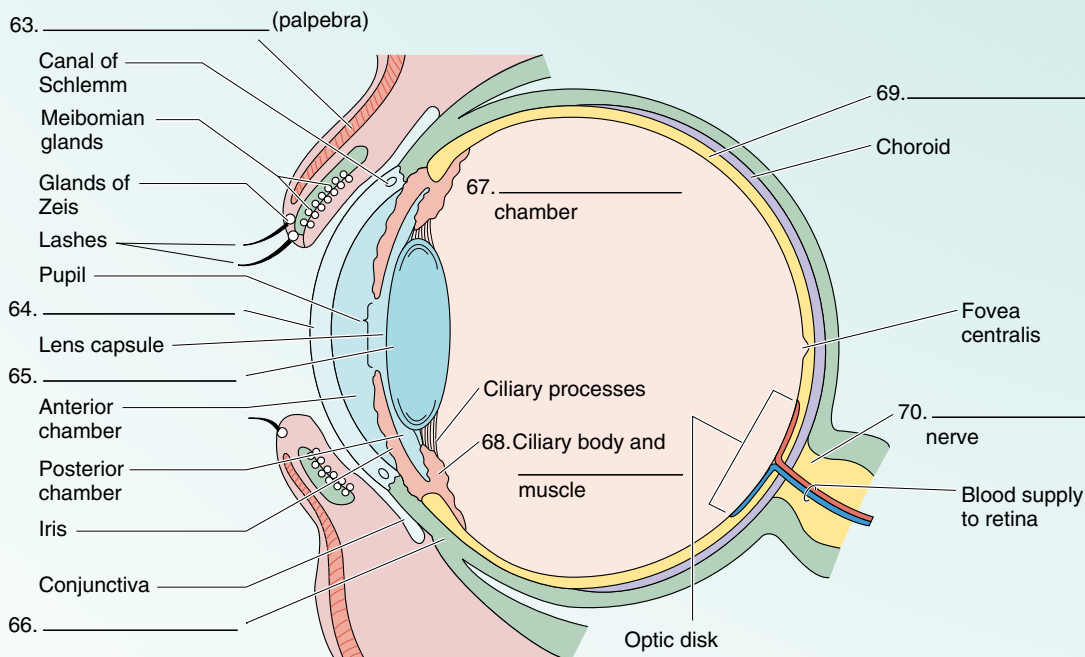
- 49. entropion _____
- 50. tonometer _____
- 51. ectropion _____
- 52. nystagmus _____

Match the following:

- | | |
|--------------------------|----------------------------------|
| 53. _____ myopia | a. old-age loss of accommodation |
| 54. _____ strabismus | b. lazy eye |
| 55. _____ presbyopia | c. pink eye |
| 56. _____ astigmatism | d. double vision |
| 57. _____ hyperopia | e. distorted vision |
| 58. _____ amblyopia | f. nearsightedness |
| 59. _____ scotoma | g. sty |
| 60. _____ diplopia | h. crossed eyes |
| 61. _____ conjunctivitis | i. farsightedness |
| 62. _____ hordeolum | j. blind spot in vision |

Write in the missing words on the blank lines in the following illustration of the eye's anatomy.

63–70.



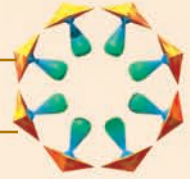
For each of the following, circle the correct spelling of the term:

71. asthenopia assthinopia asthinopia
72. terigium pterygium pteregium

73. horadeolum	hordeolum	hordeaolum
74. nistagmis	nystagmis	nystagmus
75. chalazion	shalazion	calazion
76. mydriatic	midriatic	myadriatic
77. skotoma	scotoma	schotoma
78. epiphora	epifora	epifhora
79. dakryeocyst	dacryocyst	dacreyocyst
80. ophthalmoscope	ofthalmoscope	ophthalmoscope

Give the noun that was used to form the following adjectives:

- 81. conjunctival _____
- 82. myopic _____
- 83. scleral _____
- 84. macular _____
- 85. exophthalmic _____



MEDICAL RECORD ANALYSES

MEDICAL RECORD 12.1

- S:** This 51 y/o ♀ c/o a growth in the corner of her right eye that is dry and irritated. She has had the feeling that there was “something in the eye” for about four months before actually noticing the growth three weeks ago. She wears contacts to correct farsightedness, but has recently switched to eyeglasses because of the discomfort. She is active physically and loves tennis and water sports, but does not frequently wear sunglasses.
- O:** Inspection of the right eye reveals an inflamed, raised, whitish, triangular wedge of fibrovascular tissue, whose base lies within the interpalpebral conjunctiva and whose apex encroaches the cornea. A photo documentation is made and included in the chart.
- A:** INFLAMED PTERYGIUM, RIGHT EYE
- P:** 1) The patient is advised that the pterygium is not dangerous, but further growth could interfere with vision and warrant surgical excision. She was counseled on the importance of wearing UV blocking sunglasses and advised to avoid smoky or dusty areas as much as possible.
 2) RX: fluorometholone, 0.1% suspension, 1 gt q 4h OD during the day for inflammation; OTC artificial tears solution, prn dryness/irritation
 3) RTO in 3 months for slit lamp evaluation, or sooner if symptoms persist.

- Describe the refractive error noted in the subjective information:
 - eyestrain
 - inflammation of the cornea
 - difficulty seeing distant objects
 - difficulty seeing close objects
 - blind spot in vision
 - use of a tabletop microscope to examine the eye, especially the cornea
 - implantation of an artificial lens
- Which action on the part of the patient likely contributed to the condition?
 - wearing contact lenses
 - removing contact lenses
 - playing tennis
 - not routinely wearing sunglasses
 - strenuous physical activity
 - use of a tonometer to measure intraocular pressure
- Which ophthalmological procedure is included in the plan?
 - use of a laser to reshape the surface of the cornea
 - use of an ophthalmoscope to view the interior of the eye
- How should the fluorometholone be administered?
 - one drop every 4 hours
 - four drops in the eye every morning
 - one drop every day for 4 days
 - as needed during the day
 - one drop every other day for 4 days
- When should the patient instill the artificial tears?
 - every day
 - every night
 - during the day
 - only as needed
 - when feeling the need to cry

6. What caused the pterygium?

- a. misdirected eyelashes that rub on the conjunctiva or cornea
- b. intraocular muscle imbalance
- c. separation of the retina from the underlying epithelium
- d. abnormal overflow of tears
- e. ultraviolet exposure and drying

7. What was the patient told about the pterygium?

- a. it is cancerous
- b. it is not cancerous
- c. it must be removed
- d. both a and c

MEDICAL RECORD 12.2

Not long ago, Cassandre Aquero had cataract surgery for her left eye, and she is now losing vision in her right eye because of another cataract. She is consulting an ophthalmologist, Dr. Oanh Tran, about surgery on the right eye.

Directions

Read Medical Record 12.2 for Ms. Aquero (pages 413–414) and answer the following questions. This record is the history and physical examination written by Dr. Tran in planning for Ms. Aquero’s surgery.

QUESTIONS ABOUT MEDICAL RECORD 12.2

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

appendectomy _____

irides _____

- In your own words, briefly describe Ms. Aquero’s current complaint and diagnosis noted under “History of Present Illness”:

- Describe in lay language the two medical conditions Ms. Aquero has in addition to her current problem and past surgeries:

- Which of the following findings on physical examination is related to her general medical condition in addition to her eye problems?

- rales on auscultation
- disoriented consciousness
- BP 180/100
- weight 135 lb

5. The planned operation involves several risks that the patient has accepted in the hopes of regaining good eyesight. Which of the following was *not* mentioned by Dr. Tran as a risk?
- a. hypertensive crisis
 - b. retinal detachment
 - c. edema of the macula
 - d. bleeding

6. The preoperative nursing staff will ensure that Ms. Aquero receives five medications before surgery. Translate the instructions for these:

a. _____

b. _____

c. _____

d. _____

e. _____

7. In your own words, not using medical terminology, briefly describe what will occur in the surgery:

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HISTORY**HISTORY OF PRESENT ILLNESS:**

This 57-year-old female complains of progressive loss of vision in the right eye over the last two years which has been diagnosed as a cataract. The patient recently underwent cataract surgery in the left eye and is currently scheduled for surgery in the right eye due to her decreased vision.

PAST MEDICAL HISTORY:

The patient has had the normal childhood diseases and has essential hypertension and hypothyroidism.

SURGERIES: Appendectomy 40 years ago. Tonsillectomy and adenoidectomy as a child. Cataract surgery in the left eye with a posterior chamber lens implant in 199x.

ALLERGIES: None.

MEDICATIONS: Propranolol 80 mg b.i.d. Hydrochlorothiazide 50 mg b.i.d. Clonidine, 0.1 mg, 2 tablets p.o. t.i.d. Synthroid 0.1 mg daily Slow-K 2 tablets p.o. daily

PHYSICAL EXAMINATION**VITAL SIGNS:**

WEIGHT: 135 lb. BLOOD PRESSURE: 180/100.

HEENT:

HEAD, EARS, EYES, NOSE, THROAT: Normal.

EYES: Best corrected visual acuity in the right eye is counting fingers at two feet and 20/50 in the left eye. Pinhole vision in the left eye is 20/30. Slit lamp examination reveals normal lids, conjunctivae, and sclerae. Corneas are clear. Anterior chambers are clear and deep. Irides are within normal limits in the right eye. Evaluation of the lens reveals a 4+ posterior subcapsular plaquing with 3-4+ nuclear sclerosis, and in the left eye, there is a posterior chamber lens that is in place with posterior lens capsular plaquing. Intraocular pressure: OD: 18. OS: 17. Fundus examination in the right eye was severely hindered due to the dense cataract. However, evaluation of the posterior pole in the right eye was within normal limits.

(continued)

HISTORY AND PHYSICAL
Page 1

PT. NAME: AQUERO, CASSANDRE D.
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ATT PHYS: O. TRAN, M.D.

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PHYSICAL EXAMINATION

CHEST:

Clear to percussion and auscultation. The breasts were normal, and the lungs were clear.

PELVIC/RECTAL:

Within normal limits.

EXTREMITIES:

Within normal limits.

NEUROLOGICAL:

Within normal limits.

IMPRESSION:

- 1) Cataract, right eye.
- 2) Pseudophakia, left eye.
- 3) Essential hypertension.
- 4) Hypothyroidism.

RISKS/BENEFITS:

The patient is aware of the alternatives, risks, benefits, and possible complications of the procedure that include hemorrhage, infection, loss of vision, reoperation, retinal detachment, macular edema; and the patient still desires to undergo the procedure.

PLAN:

Extracapsular cataract extraction with posterior chamber lens implant under local anesthesia using a +21 diopter posterior chamber lens with the ultraviolet filter. Preoperative medication will consist of the patient's morning dose of Propranolol, 80 mg; Hydrochlorothiazide, 50 mg; Clonidine, 0.2 mg; and Diamox, 250 mg with ¼ glass of water at approximately 10 a.m. on the day of surgery. The patient was also instructed to take Maxitrol, 1 gt OD, q 3 h starting 24 hours prior to the procedure, while awake.



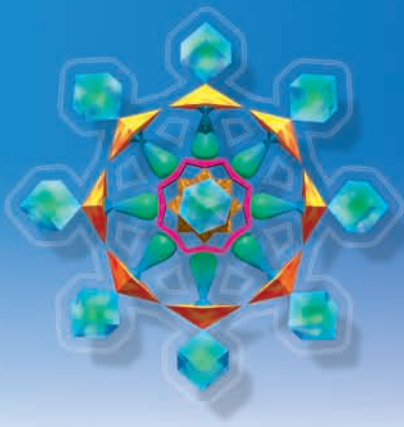
O. Tran, M.D.

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D: 10/19/20xx T: 10/20/20xx

HISTORY AND PHYSICAL
Page 2

PT. NAME: AQUERO, CASSANDRE D.
ID NO: 008654
ATT PHYS: O. TRAN, M.D.



OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define the common term components used in relation to the ear
- ◆ Locate and name the major structures of the ear and list their functions
- ◆ Define common symptomatic and diagnostic terms referring to the ear
- ◆ List the common diagnostic tests and procedures related to the ear
- ◆ Identify common operative terms referring to the ear
- ◆ Identify common therapeutic terms including drug classifications related to the ear
- ◆ Explain the terms and abbreviations used in documenting medical records involving the ear

Combining Forms

Combining Form	Meaning	Example
acus/o	hearing	acoustic ă-kūs'tik
audi/o		audiometry aw-dē-om'ě-trē
aer/o	air or gas	aerotitis ār-ō-tī'tis
aur/i	ear	auricle aw'ri-kl
ot/o		otology ō-tol'ō-jē
cerumin/o	wax	ceruminosis se-rū-mi-nō'sis
salping/o	eustachian tube or uterine tube	salpingoscope sal-ping'gō-skōp
tympan/o	eardrum	tympanic tim-pan'ik
myring/o		myringotomy mir-ing-got'ō-mē

ADDITIONAL SUFFIX

-acusis	hearing condition	presbycusis prez'bē-ă-kūs'is
---------	-------------------	---------------------------------



TYMPANUM.

Tympanum is the Latin word for tambourine or kettledrum, percussion instruments that are struck or beaten. Use of the term for eardrum was first introduced in 1255 and was adopted by the famous anatomist, Gabrielle Fallopius, because of the likeness of the eardrum to a tambourine.



OSSICLE.

Ossicle means a little bone; it is a diminutive of the Latin *ossiculum*, meaning bone. Specifically, ossicle means one of the small bones in the middle ear. The first authentic records indicate that the malleus and the incus were the first two to be discovered in 1514. The stapes was discovered around 1546.

Overview of the Ear

The sense of hearing occurs through the mechanical action of the ear and its three divisions: outer ear, middle ear, and inner ear (Fig. 13.1).

Sounds are gathered by the projections of the *external ear* called the *pinna*, or *auricle*, and then dispersed through the external auditory meatus (canal) to the *tympanum*, or eardrum, of the middle ear. Glands located throughout the external canal secrete a protective, waxy substance called *cerumen*.

The tympanum transmits sound vibrations through the auditory ossicles—*malleus*, *incus*, and *stapes*—to the oval window. Vibrations are increased as they are distributed from the tympanum to the malleus, incus, and stapes. When the stapes, held by a ligament called the *oval window*, vibrates, it stimulates the motion of the auditory fluids in the inner ear.

Within the *middle ear*, the *eustachian tube* or *auditory tube* provides a passageway to the throat, allowing air to pass to and from the outside of the body. This process is important for maintaining equal air pressure.

Located within the temporal bone of the skull, the *inner ear* receives sound vibrations passed from the oval window to the *cochlea*, the outer structure of the inner ear, which is part of the intricate intercommunicating tubes and chambers known as the *labyrinth*. Vibrations are passed through *perilymph*, a fluid within an area of the cochlea called the *scala vestibuli*, to the cochlear duct, which is filled with a fluid called *endolymph*. Finally, the vibrations are passed through the *organ of Corti*, where hairs along its lining stimulate surrounding nerve fibers, generating impulses that then travel to the brain for processing of hearing.

THE EAR

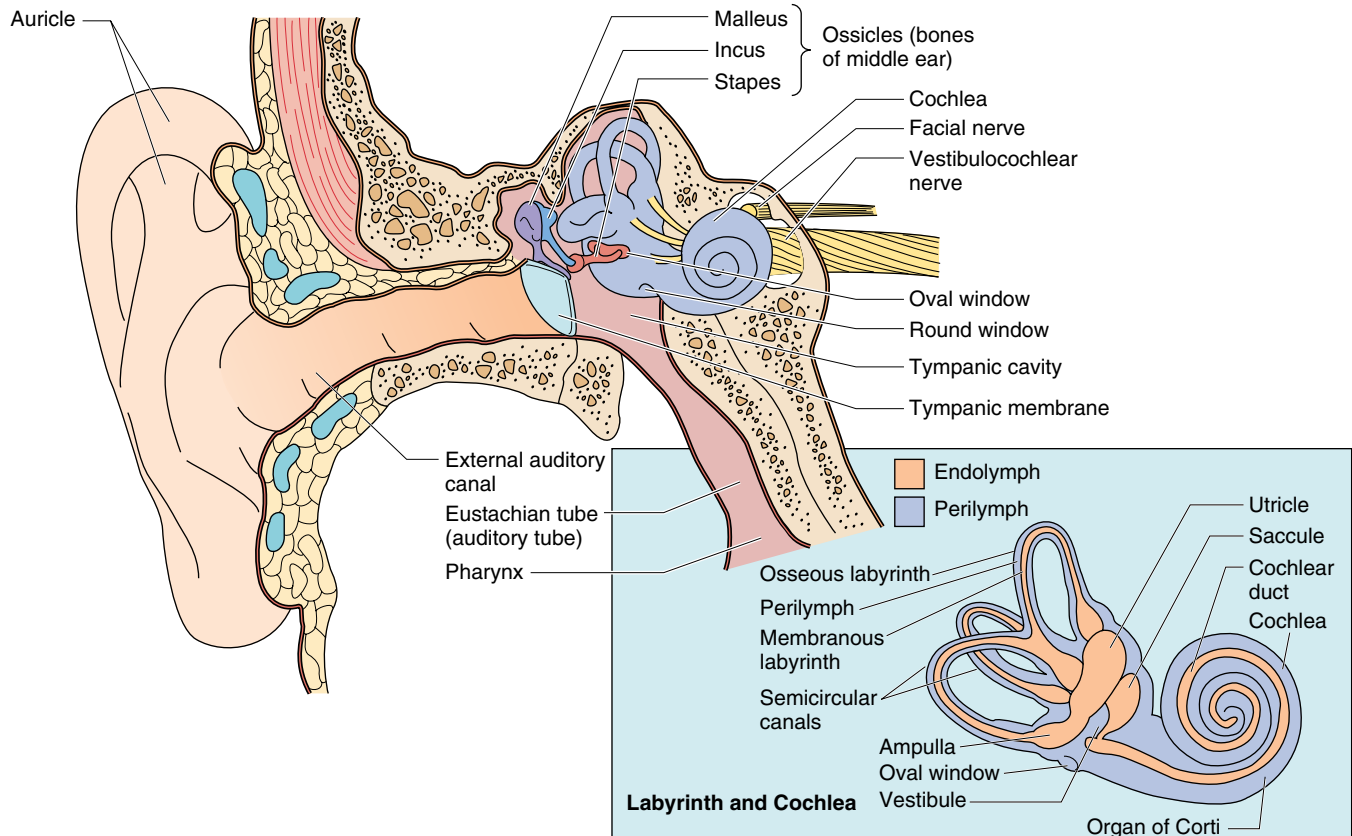


Figure 13.1. Anatomy of the ear.

In addition to hearing, the labyrinth is responsible for the equilibrium within the body. Within the labyrinth, the *semicircular canals* are connected to the cochlea by a cavity called the *vestibule*. Within the vestibule are structures known as the *utricle* and *sacculle*. Hair cells and surrounding nerve fibers within the canals that connect with the utricle respond to and are moved by endolymph to stimulate nerve conduction when changes in movement occur.

Anatomical Terms	
Term	Meaning
external ear	
pinna pin'ă	auricle (little ear); projected part of the external ear (pinna = feather)
external auditory meatus (canal)	external passage for sounds collected from the pinna to the tympanum (meat/o = opening)
cerumen sě-rū'men	waxy substance secreted by glands located throughout the external canal
middle ear	
tympanic membrane (TM) tim-pan'ik mem'brān	eardrum; drum-like structure that receives sound collected in the external auditory meatus (canal) and amplifies it through the middle ear (see Fig. 13.3B)
malleus mal'ē-ūs	hammer; first of the three auditory ossicles of the middle ear
incus ing'kūs	anvil; middle of the three auditory ossicles of the middle ear
stapes stā'pēz	stirrup; last of the three auditory ossicles of the middle ear
eustachian tube yū-stā'shūn	tube connecting the middle ear to the pharynx (throat)
auditory tube	
mastoid process mas'toyd	projection of the temporal bone located behind the ear containing air cells that connect to the middle ear (masto = breast)
oval window	membrane that covers the opening between the middle ear and inner ear
inner ear	
	structures and liquids that relay sound waves to the auditory nerve fibers on a path to the brain for interpretation of sound
labyrinth lab'i-rinth	maze; inner ear consisting of bony and membranous labyrinths
cochlea kok'lē-ă	coiled tubular structure of the inner ear that contains the organ of Corti (cochlea = snail)
perilymph per'i-limf	fluid that fills the bony labyrinth of the ear
endolymph en'dō-limf	fluid within the cochlear duct of the inner ear (labyrinth)

Term	Meaning
organ of Corti	organ located in the cochlea that contains receptors (hair cells) that receive vibrations and generate nerve impulses for hearing
vestibule ves'ti-būl	middle part of the inner ear in front of the semicircular canals and behind the cochlea that contains the utricle and saccule
utricle ū'tri-kl	larger of two sacs within the membranous labyrinth of the vestibule in the inner ear (uter = leather bag)
saccule sak'yūl	smaller of two sacs within the membranous labyrinth of the vestibule in the inner ear (sacculus = small bag)
semicircular canals sem'ē-sir'kyū-lār kă-nalz'	three canals within the inner ear that contain specialized receptor cells that generate nerve impulses with body movement

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC	
otalgia ō-tal'jē-ă	earache
otodynia ō-tō-din'ē-ă	
otorrhagia ō-tō-rā'jē-ă	bleeding from the ear
otorrhea ō-tō-rē'ă	purulent drainage from the ear
tinnitus ti-nī'tūs	a jingling; ringing or buzzing in the ear
vertigo ver'ti-gō	a turning round; dizziness
DIAGNOSTIC	
<i>External Ear</i>	
otitis externa ō-tī'tis eks-ter'nă	inflammation of the external auditory meatus (canal) (Fig. 13.2B)
cerumen impaction sĕ-rū'men im-pak'shŭn	excessive buildup of wax in the ear
<i>Middle Ear</i>	
myringitis mir-in-jī'tis	inflammation of the eardrum
tympanitis tim-pă-nī'tis	

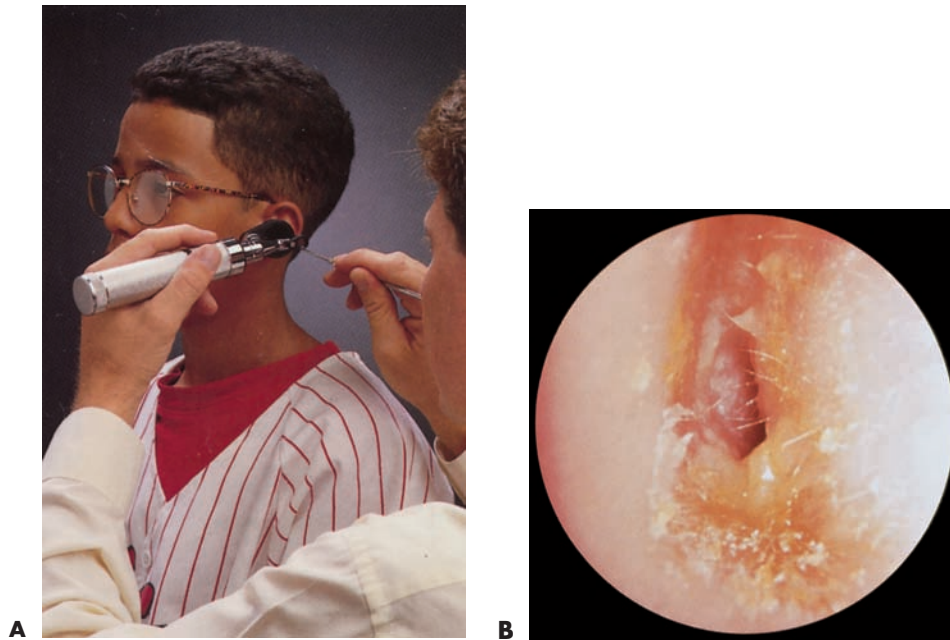


Figure 13.2. **A.** Otoscopic examination of the external auditory meatus (canal). **B.** Otitis externa.

Term	Meaning
otitis media ō-tī'tis mē'dē-ă	inflammation of the middle ear (Fig. 13.3C)
aerotitis media ār-ō-tī'tis mē'dē-ă	inflammation of the middle ear from changes in atmospheric pressure; often occurs in frequent air travel
otosclerosis ō'tō-sklē-rō'sis	hardening of the bony tissue in the ear
mastoiditis mas-toy-dī'tis	inflammation of the mastoid process; most commonly seen as a result of the spread of inflammation and infection in otitis media
eustachian obstruction yū-stā'shŭn ob-strŭk'shŭn	blockage of the eustachian tube usually as a result of infection, as in otitis media
<i>Inner Ear</i>	
acoustic neuroma ă-kŭs'tik noo-ro'mă	benign tumor on the auditory nerve (8th cranial nerve) that causes vertigo, tinnitus, and hearing loss
aplasia ă-plă-zē-ă	condition of absence or malformation of inner ear structures during embryonic development, resulting in hearing loss
labyrinthitis lab'ī-rin-thī'tis	inflammation of the labyrinth
Ménière disease mēn-yer'z	disorder of the inner ear due to an excessive buildup of endolymphatic fluid causing episodes of vertigo, tinnitus, nausea, vomiting, and hearing loss; one or both ears can be affected, and attacks vary in frequency and intensity

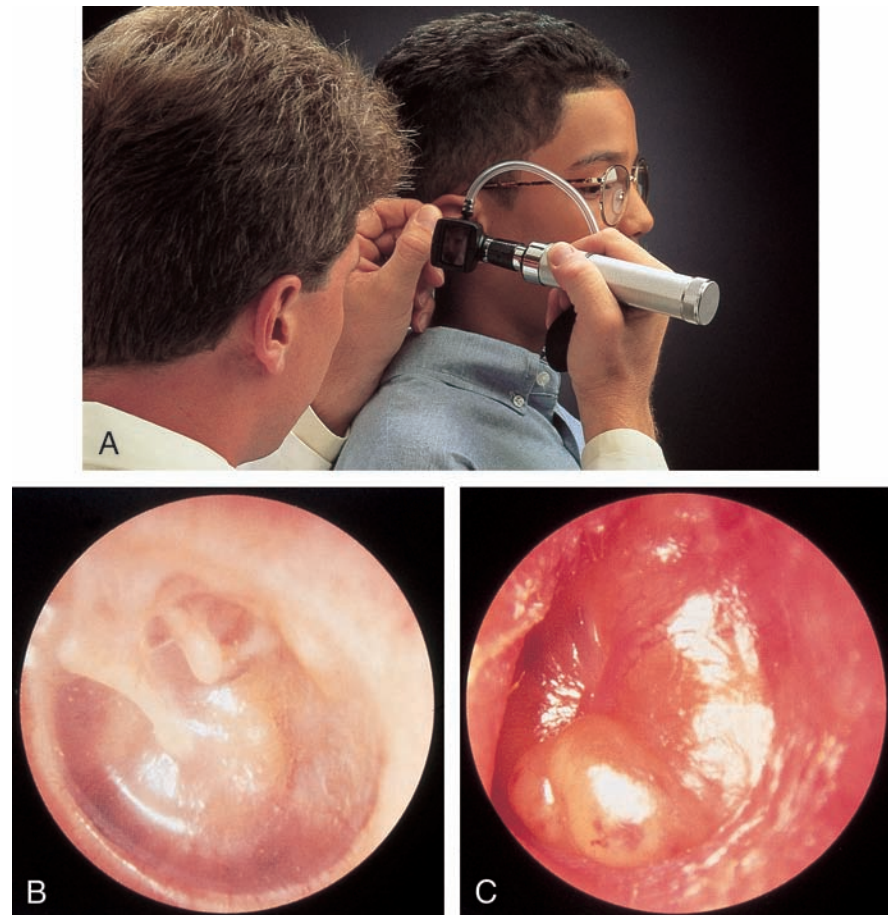


Figure 13.3. **A.** Doctor performing pneumatic otoscopy. **B.** Normal tympanic membrane. **C.** Otitis media.

Term	Meaning
<i>General</i>	
deafness def'nes	general term for partial or complete hearing loss
conductive hearing loss kon-dük'tiv	hearing impairment caused by interference with sound or vibratory energy in the external canal, middle ear, or ossicles
sensorineural hearing loss sen'sōr-i-nū'rāl	hearing impairment caused by lesions or dysfunction of the cochlea or auditory nerve
mixed hearing loss	combination of sensorineural and conductive hearing loss
presbycusis prez'bē-ă-kū'sis	hearing impairment in old age
presbycusis prez-bē-kū'sis	

Diagnostic Tests and Procedures

Test or Procedure	Explanation
audiometry aw-dē-om'ě-trē	process of measuring hearing (Fig. 13.4)
audiometer aw-dē-om'ě-ter	instrument to measure hearing
audiogram aw'dē-ō-gram	record of hearing measurement
audiologist aw-dē-ol'ō-jist	person who specializes in the study of hearing impairments
auditory acuity testing aw'di-tōr-ē ā-kyū'i-tē	physical assessment of hearing; useful in differentiating between conductive and sensorineural hearing loss (Fig. 13.5)
tuning fork	two-pronged, fork-like instrument that vibrates when struck: used to test for hearing, especially bone conduction



Figure 13.4. Audiometry: hearing screening.

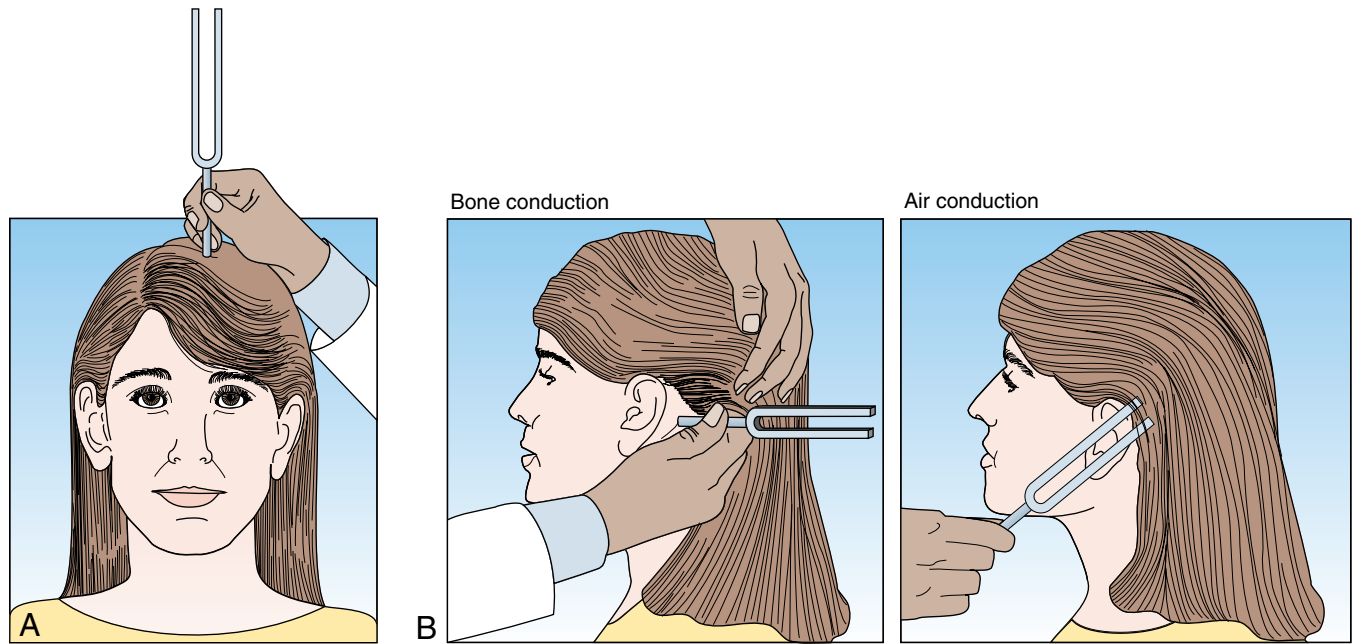


Figure 13.5. Tuning fork testing. **A.** Weber test. **B.** Rinne test.

Test or Procedure	Explanation
brainstem auditory evoked potentials (BAEP)	electrodiagnostic testing using computerized equipment to measure involuntary responses to sound within the auditory nervous system—commonly used to assess hearing in newborns (Fig. 13.6)
otoscopy ō-tos'kō-pē	use of an otoscope to examine the external auditory meatus (canal) and tympanic membrane (Figs. 13.2A and Fig. 13.7)



Figure 13.6. Brainstem auditory evoked potentials (BAEP) testing of a newborn.

Test or Procedure	Explanation
pneumatic otoscopy noo-mat'ik ō-tos'kō-pē	otoscopic observation of the tympanic membrane as air is released into the external auditory meatus (canal); immobility indicates the presence of middle ear effusion (fluid buildup) as occurs as a result of otitis media (see Fig. 13.3A)
tympanometry tim'pā-nom'ē-trē	measurement of the compliance and mobility (conductibility) of the tympanic membrane and ossicles of the middle ear by monitoring the response after exposure to external airflow pressures

Operative Terms

Term	Meaning
microsurgery mī-krō-ser'jer-ē	surgery with the use of a microscope; used in procedures involving delicate tissue such as the ear
myringotomy mir-ing-got'ō-mē tympanostomy tim'pān-os'tō-mē	incision into the eardrum, most often for insertion of a small metal or plastic tube [e.g., polyethylene (PE) tube], to keep the meatus (canal) open, avoiding fluid buildup (effusion) as that which occurs as a result of otitis media (Fig. 13.8)
otoplasty ō'tō-plas-tē	surgical repair of the external ear
stapedectomy stā-pě-dek'tō-mē	excision of the stapes to correct otosclerosis
tympanoplasty tim'pā-nō-plas-tē	vein graft of a scarred tympanic membrane to improve sound conduction



Figure 13.7. Otoscope.

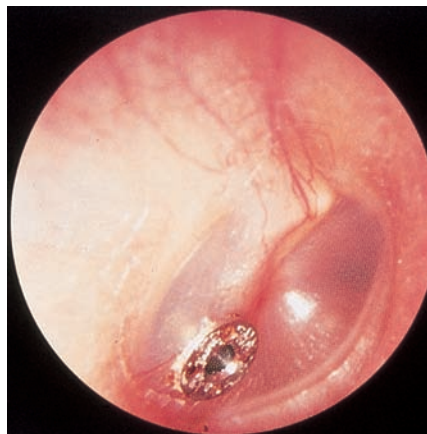


Figure 13.8. View through otoscope shows placement of tympanostomy tube.

Therapeutic Terms

Term	Meaning
auditory prosthesis pros'thē-sis	any internal or external device that improves or substitutes for natural hearing
hearing aid	external amplifying device designed to improve hearing by more effective collection of sound into the ear
cochlear implant kok'lē-ă r	electronic device implanted in the cochlea that provides sound perception to patients with severe or profound sensorineural (nerve) hearing loss in both ears (Fig. 13.9)
ear lavage lă-vahzh'	irrigation of the external ear canal, commonly done to remove excessive buildup of cerumen
ear instillation in-sti-lă'shŭn	introduction of a medicated solution into the external canal

COMMON THERAPEUTIC DRUG CLASSIFICATIONS

antibiotic an'tē-bī-ot'ik	drug that inhibits the growth of or destroys microorganisms; used to treat diseases caused by bacteria (e.g., otitis media)
antihistamine an-tē-his'tă-mēn	drug that blocks the effects of histamine
histamine his'tă-mēn	regulating body substance released in excess during allergic reactions that cause swelling and inflammation of tissues; seen in hay fever, urticaria (hives), etc.
anti-inflammatory an'tē-in-flam'ă-tō-rē	drug that reduces inflammation
decongestant dē-kon-jes'tant	drug that reduces congestion and swelling of membranes, such as those of the nose and eustachian tube after infection

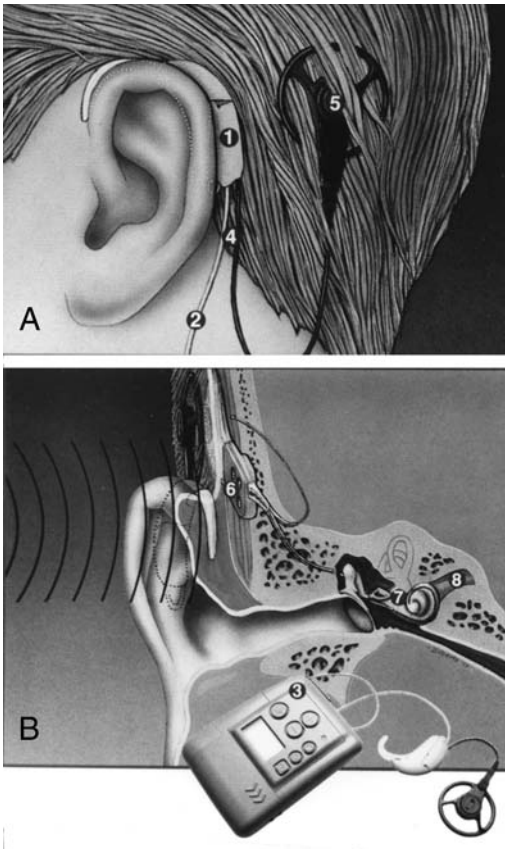


Figure 13.9. **A** and **B.** Operation of a cochlear implant. (1) Directional microphone. (2) Sound is carried from the microphone by a cord to the speech processor worn on the belt or pocket. (3) The speech processor filters, analyzes, and digitizes the sound into coded signals and sends it (4) to the transmitting coil (5). The coil sends the coded signals as FM radio signals to the cochlear implant inserted under the skin. The cochlear implant (6) delivers the electrical energy to the array of electrodes surgically inserted into the cochlea (7). The electrodes stimulate the remaining auditory nerve fibers (8), and sound information is sent to the brain for interpretation.

Summary of Chapter 13 Acronyms/Abbreviations

BAEPbrainstem auditory evoked potentials
PE.....polyethylene

TMtympanic membrane



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

EXAMPLE

macrotia

_____ / _____ / _____
 P R S

macr/ot/ia

P R S

DEFINITION: large or long/ear/condition of

1. acoustic

_____ / _____
 R S

DEFINITION: _____

2. otorrhea

_____ / _____
 CF S

DEFINITION: _____

3. myringoplasty

_____ / _____
 CF S

DEFINITION: _____

4. aerotitis

_____ / _____ / _____
 R R S

DEFINITION: _____

5. ototoxic

_____ / _____ / _____
 CF R S

DEFINITION: _____

6. ceruminolysis

_____ / _____
 CF S

DEFINITION: _____

7. salpingoscope

_____ / _____
 CF S

DEFINITION: _____

8. hyperacusis

_____ / _____
P S

DEFINITION: _____

9. audiometry

_____ / _____
CF S

DEFINITION: _____

10. tympanocentesis

_____ / _____
CF S

DEFINITION: _____

11. otodynia

_____ / _____
CF S

DEFINITION: _____

12. auricle

_____ / _____
R S

DEFINITION: _____

13. myringotomy

_____ / _____
CF S

DEFINITION: _____

14. ceruminosis

_____ / _____
R S

DEFINITION: _____

15. audiology

_____ / _____
CF S

DEFINITION: _____

Complete the medical term by writing the missing part:

16. oto_____osis = condition of hardening of the bony tissue of the ear

17. _____scope = instrument used to view the ear canal and tympanum

18. _____disease = disorder of the inner ear due to an excessive buildup of endolymphatic fluid

19. _____neuroma = tumor of the auditory nerve affecting hearing

For each of the following, circle the combining form that corresponds to the meaning given:

- | | | | |
|----------------------------|-----------|----------|-----------|
| 20. eardrum | salping/o | ot/o | myring/o |
| 21. hearing | ot/o | audi/o | angi/o |
| 22. wax | cerumin/o | crin/o | scler/o |
| 23. eustachian tube | tympan/o | myring/o | salping/o |
| 24. ear | rhin/o | ot/o | or/o |
| 25. air | acr/o | aur/i | aer/o |

Match the following:

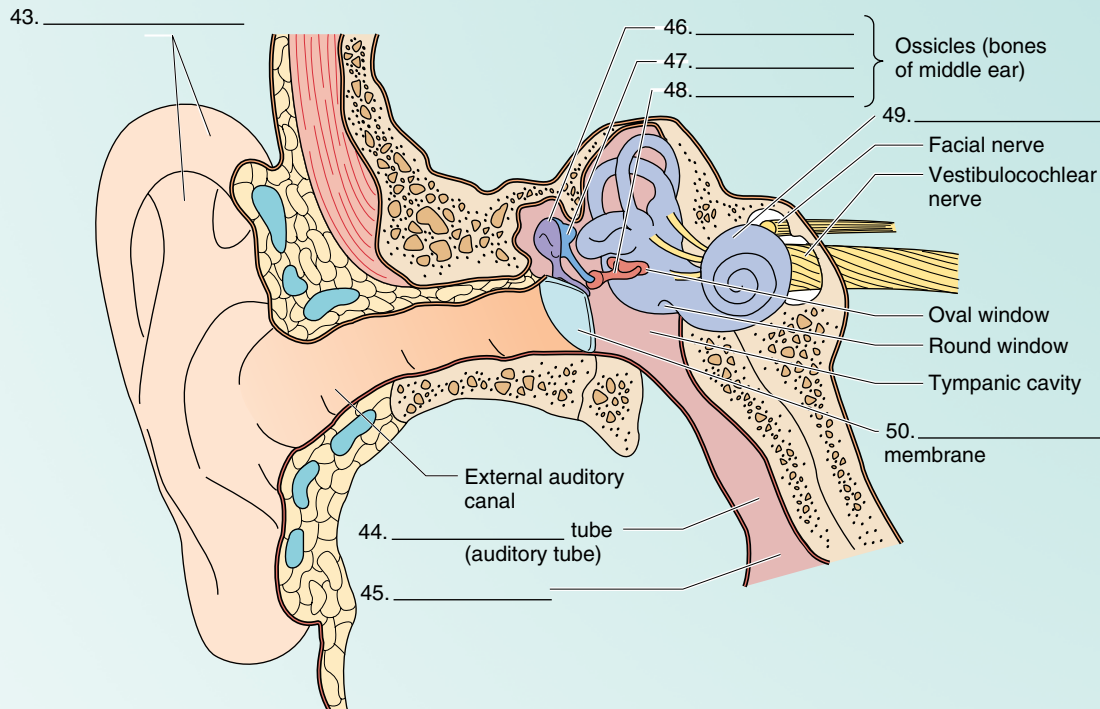
- | | |
|---|---------------------|
| 26. _____ conductive hearing loss | a. presbycusis |
| 27. _____ one who studies hearing impairments | b. aplasia |
| 28. _____ bleeding from the ear | c. otalgia |
| 29. _____ partial or complete hearing loss | d. cochlear implant |
| 30. _____ sensorineural hearing loss | e. otorrhea |
| 31. _____ hearing impairment of old age | f. nerve conduction |
| 32. _____ discharge from the ear | g. otorrhagia |
| 33. _____ auditory prosthetic | h. deafness |
| 34. _____ earache | i. audiologist |
| 35. _____ absence of inner ear structures | j. bone conduction |

Write the correct medical term for each of the following:

36. _____ = inflammation of labyrinth
37. _____ = dizziness
38. _____ = ringing in the ear
39. _____ = excision of stapes to correct otosclerosis
40. _____ = excessive buildup of earwax
41. _____ = the study of hearing
42. The introduction of a medicated solution into the external canal is called ear instillation. Irrigation of the external ear canal is called ear _____.

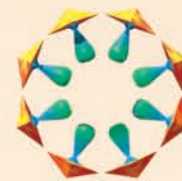
Write in the missing words on the blank lines in the following illustration of the ear.

43–50.



For each of the following, circle the correct spelling of the term:

- | | | |
|-------------------|---------------|----------------|
| 51. aerotitus | aerotitis | airotitis |
| 52. cerumen | ceramen | ceruman |
| 53. myrimogotomy | miringotomy | myringotomy |
| 54. presbyecusis | presbyacusis | presbeacusis |
| 55. vertigo | vertago | verttigo |
| 56. antihestamine | antihistamine | antehistamine |
| 57. tinnitis | tinitus | tinnitus |
| 58. stapedectomy | stapesectomy | stapedeckotomy |
| 59. defness | deafnass | deafness |
| 60. eustation | eustachian | euhestation |



MEDICAL RECORD ANALYSES

MEDICAL RECORD 13.1

Progress Note

S: This 21 y.o white male c/o a clogged (R) ear c̄ increasing tinnitus. He has had a slight pharyngitis and nasal congestion ×7 d.

O: On PE there was moist infectious debris in the (R) ear that was suctioned clear. The (R) tympanum was dull and thickened. The (L) external ear was clear and the tympanic membrane intact.

A: Otitis media (R) ear

P: (1) Keep ears dry; (2) Rx Pen VK 250 mg #24 † q.i.d. p.c. and h.s.; (3) RTO in 10 d for followup (f/u)

1. Summarize the subjective information:
 - a. patient complains of clogged, ringing ears; sore throat; and stuffy nose
 - b. patient has a clogged right ear, sore throat, stuffy nose, and dizziness
 - c. patient's right eardrum is thick and dull and clogged with infectious matter, causing dizziness
 - d. patient complains of a sore throat, stuffy nose, and a clogged right ear that is buzzing
 - e. patient has a sore throat, stuffy nose, and purulent drainage from the right ear
2. What was the assessment?
 - a. clogged right ear, sore throat, and stuffy nose
 - b. inflammation of the right middle ear
 - c. inflammation of the right external ear canal
 - d. blockage of the eustachian tube
 - e. inflammation of the right eardrum
3. When should the patient take the prescribed medication?
 - a. twice in 24 hours
 - b. before meals
 - c. at bedtime
 - d. four times a day
 - e. every 4 hours
4. Which is true of the plan?
 - a. patient should return to the office immediately if a fever develops
 - b. patient is given ear drops and advised not to get the ears wet for 10 days
 - c. doctor wants to examine the patient again in 10 days
 - d. patient is given an antibiotic and advised to increase fluid intake
 - e. if not better in 10 days, the patient will be referred to an otolaryngologist

MEDICAL RECORD 13.2

Hank Ball, a preschooler, has had recurrent ear infections for 1 year that his doctor has not been able to treat successfully with antibiotics and other drugs. His preschool teacher also identified nasal speech patterns that his doctor later confirmed were related to his medical problems. After Hank saw several doctors who recommended surgery, his parents have admitted him to Central Medical Center.

Directions

Read Medical Record 13.2 for Hank Ball (pages 434–436) and answer the following questions. These records are the history and physical examination before surgery and the subsequent operative report, both dictated by Dr. Baird, the surgeon.

QUESTIONS ABOUT MEDICAL RECORD 13.2

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

hepatosplenomegaly _____

turbinates _____

extubation _____

- In the left column, list the patient's medical problems noted in the HPI; in the right column, write the diagnosis that pertains to each.

<i>Medical Problem</i>	<i>Diagnosis</i>
a. _____	_____
_____	_____
b. _____	_____
_____	_____

- In your own words, explain how Hank's social history is related to his medical history:

- Under the "Review of Systems," were any additional medical symptoms or problems identified? If so, list below.

5. What does it mean that at the time of the examination Hank was afebrile?

6. Carefully read the physical examination. Mark the body areas/systems in which Dr. Baird found any abnormalities:

_____ general

_____ HEENT

_____ chest

_____ back

_____ rectal/genitalia

_____ extremities

7. List the surgical procedures identified under “Plan,” and briefly describe them in your own words, not using medical terminology:

a. _____

b. _____

c. _____

8. In your own words, not using medical terminology, briefly describe oral intubation.

9. Put the following operative actions in correct order by numbering them 1 to 11:

- _____ removal of adenoids
- _____ incision in right eardrum
- _____ PE tube placement in right tympanum
- _____ repositioning in Rose's position
- _____ incision in left eardrum
- _____ aspiration of right middle ear
- _____ extubation
- _____ removal of wax in right ear
- _____ nasopharynx examination
- _____ polyethylene tube placement in left tympanum
- _____ intubation

10. In your own words, not using medical terminology, briefly describe the condition of Hank's adenoids before adenoidectomy:

CENTRAL MEDICAL CENTER

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HISTORY

DATE OF ADMISSION: August 28, 20xx

HISTORY OF PRESENT ILLNESS: The patient is a 4-year-old white male with recurrent ear infections and ear congestion nonresponsive to antibiotic and decongestant therapy over the past 12 months. The patient also has a history of nasal obstruction and nasal speech. The patient is being admitted for myringotomy, polyethylene tubes, and examination of the nasopharynx and adenoidectomy. The patient has also seen other doctors who have recommended surgery, including Dr. Feldman and Dr. Saunders.


PAST MEDICAL HISTORY: Medications: None. Allergies: None. Hospitalizations: None. Surgeries: None. Childhood Diseases: Normal.

FAMILY HISTORY: No cancer or diabetes, although the patient's grandparents have a history of adult-onset diabetes.

SOCIAL HISTORY: Normal development except for speech.

REVIEW OF SYSTEMS: **CARDIOVASCULAR:** No hypertension and no heart murmurs. **PULMONARY:** No croup or asthma. **GASTROINTESTINAL:** No hepatitis. **RENAL:** Negative. **ENDOCRINE:** No diabetes. **MUSCULOSKELETAL:** No joint disease. **HEMATOLOGIC:** No anemia or bleeding tendencies.

(continued)



R. Baird, M.D.

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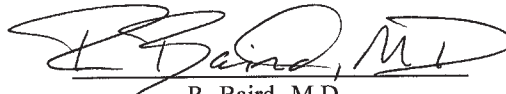
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HISTORY AND PHYSICAL
Page 1

PT. NAME: BALL, HANK F.
ID NO: OP-372201
ROOM: OPS
ADM. DATE: August 28, 20xx
ATT. PHYS: R. BAIRD, M.D.

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PHYSICAL EXAMINATION**GENERAL:** The patient is alert and afebrile.**HEENT:** TMs are dull and slightly retracted; there is decreased mobility. There is dull light reflex bilaterally. No sinus tenderness on percussion of the maxillary or frontal sinuses; there are swollen turbinates on nasal examination. The oropharynx shows hypertrophic tonsils, and there are hypertrophic adenoids on examination of the nasopharynx.**CHEST:** LUNGS: Clear to percussion and auscultation. **HEART:** Pulse: 88 and regular. There are no murmurs, gallops, or rubs. **ABDOMEN:** There are no masses or tenderness. No hepatosplenomegaly was noted. There was no costovertebral angle (CVA) tenderness.**BACK:** Supple. There are no masses or tenderness. There is mild anterior cervical adenopathy.**RECTAL/GENITALIA:** Deferred.**EXTREMITIES:** There was no peripheral edema, and there were no ecchymoses.**IMPRESSION:** CHRONIC OTITIS MEDIA WITH EFFUSION, NASAL SPEECH, AND NASAL OBSTRUCTION SECONDARY TO ADENOID HYPERTROPHY.**PLAN:** The patient is to be admitted as an outpatient for adenoidectomy, myringotomy, and polyethylene (PE) tubes as noted above. The surgery and potential risks and complications have been discussed with the grandfather and mother as well as the possible need for further repeat myringotomy and PE tubes.


R. Baird, M.D.

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 HISTORY AND PHYSICAL
Page 2

 PT. NAME: BALL, HANK F.
ID NO: OP-372201
ROOM NO: OPS
ADM. DATE: August 28, 20xx
ATT. PHYS: R. BAIRD, M.D.

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OPERATIVE REPORT

DATE OF OPERATION: August 28, 20xx

PREOPERATIVE DIAGNOSIS: Chronic otitis media with effusion bilaterally and nasal obstruction with chronic adenoiditis and adenoid hypertrophy.

POSTOPERATIVE DIAGNOSIS: Chronic otitis media with effusion bilaterally and adenoid hypertrophy and chronic adenoiditis.

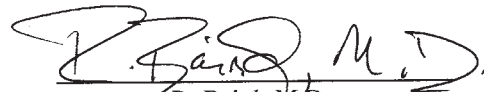
OPERATION PERFORMED: Bilateral myringotomy and tubes with adenoidectomy.

SURGEON: R. Baird, M.D.

ANESTHESIOLOGIST: F. Kodama, M.D.

PROCEDURE AND FINDINGS: After general anesthesia induction and oral intubation, the patient's ears were prepped and draped in the usual manner for microscopic myringotomy surgery. A myringotomy in the right ear was carried out following debridement of cerumen. Incision of the circumferential inferior anterior quadrant was carried out. Mucoïd material was aspirated from the middle ear. A Shepard polyethylene tube was placed in position without difficulty. Cotton dressing was applied to the ear. The left ear was examined. A similar dull, nonmobile TM was noted. An inferior anterior myringotomy was carried out again, and thick mucoïd material was aspirated. A Shepard polyethylene tube was inserted again in the left ear. Cotton dressing was applied to the ear canal. The patient was repositioned in the Rose's position for examination of the nasopharynx which was carried out with a palate retractor, McIvor mouth gag, tongue retractor, and was stabilized with the Mayo stand. The marked adenoid hypertrophy was noted, and the adenoïdectomy was carried out with curette technique. The patient tolerated the procedure well, and following extubation, he was sent back to the recovery room in satisfactory postoperative condition.

FINAL DIAGNOSIS: Chronic otitis media with effusion bilaterally, with chronic adenoiditis, adenoid hypertrophy, and nasal obstruction.

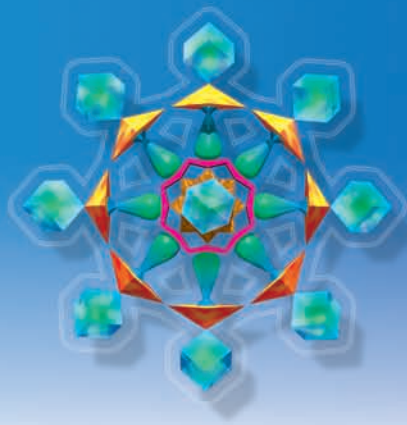

R. Baird, M.D.

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OPERATIVE REPORT
Page 1

PT. NAME: BALL, HANK F.
ID NO: OP-372201
ROOM NO: OPS
ATT. PHYS: R. BAIRD, M.D.



Gastrointestinal System

OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define common term components used in relation to the gastrointestinal system
- ◆ Describe the basic functions of the gastrointestinal system
- ◆ Define the basic anatomical terms referring to the gastrointestinal system and accessory organs
- ◆ Identify the anatomical and clinical divisions of the abdomen
- ◆ Define common symptomatic and diagnostic terms referring to the gastrointestinal system
- ◆ List the common diagnostic tests and procedures related to the gastrointestinal system
- ◆ Identify common operative terms referring to the gastrointestinal system
- ◆ Identify common therapeutic terms including drug classifications related to the gastrointestinal system
- ◆ Explain the terms and abbreviations used in documenting medical records involving the gastrointestinal system

Combining Forms

Combining Form	Meaning	Example
abdomin/o	abdomen	abdominocentesis ab-dom'i-nō-sen-tē'sis
celi/o		celiac sē'lē-ak
lapar/o		laparoscopy lap-ā-ros'kō-pē
an/o	anus	anal ā'nāl
appendic/o	appendix	appendical ā-pen'di-kāl
bil/i	bile	biligenic bil-i-jen'ik
chol/e		cholelithiasis kō'lē-li-thī'ā-sis

Combining Form	Meaning	Example
bucc/o	cheek	buccal bŭk'ăl
cheil/o	lip	cheiloplasty kī'lō-plas-tē
col/o	colon	colitis kō-lī'tis
colon/o		colonoscopy kō-lon-os'kō-pē
cyst/o	bladder or sac	cholecystectomy kō'lē-sis-tek'tō-mē
dent/i	teeth	dental den'tăl
doch/o	duct	choledochotomy kō-led-ō-kot'ō-mē
duoden/o	duodenum	duodenal dū'ō-dē'năl
enter/o	small intestine	enterocele en'ter-ō-sēl
esophag/o	esophagus	esophageal ē-sof'ă-jē'ăl
gastr/o	stomach	gastritis gas-trī'tis
gingiv/o	gum	gingivitis jin-ji-vī'tis
gloss/o	tongue	glossitis glo-sī'tis
lingu/o		lingual ling'gwăl
hepat/o	liver	hepatomegaly hep'ă-tō-meg'ă-lē
hepatic/o		hepaticotomy he-pat-i-kot'ō-mē
herni/o	hernia	herniorrhaphy her'nē-ōr'ă-fē
ile/o	ileum	ileostomy il'ē-os'tō-mē
inguin/o	groin	inguinal ing'gwi-năl
jejun/o	jejunum (empty)	jejunitis je-jū-nī'tis
lith/o	stone	lithiasis li-thī'ă-sis

Combining Form	Meaning	Example
or/o	mouth	oral or'ăl
stomat/o		stomatosis stō-mă-tō'sis
pancreat/o	pancreas	pancreatitis pan'krē-ă-tī'tis
peritone/o	peritoneum	peritoneoscopy per'i-tō-nē-os'kō-pē
phag/o	eat or swallow	aphagia ă-fă'jē-ă
proct/o	anus and rectum	proctologic prok-tō-loj'ik
pylor/o	pylorus (gatekeeper)	pyloric pī-lōr'ik
rect/o	rectum	rectal rek'tăl
sial/o	saliva	sialolithiasis sī'ă-lō-li-thī'ă-sis
sigmoid/o	sigmoid colon (resembles s)	sigmoidoscopy sig'moy-dos'kō-pē
steat/o	fat	steatolysis stē-ă-tol'i-sis
ADDITIONAL SUFFIX		
-emesis	vomiting	hematemesis hē-mă-tem'ē-sis

Gastrointestinal System Overview

The gastrointestinal (GI) system processes and transports nutrients and various wastes. The organs form a tube or tract, known as the *alimentary canal*, extending from the mouth to the anus. The alimentary canal is composed of the mouth, pharynx, esophagus, stomach, and intestines (Fig. 14.1).

The gastrointestinal system has three functions: digestion, absorption, and excretion. *Digestion* is the process by which food is broken down by chewing and swallowing and is then mixed with digestive juices in the stomach to convert some of the food into absorbable molecules. *Absorption* is the passage of digested food molecules through the walls of the intestines into the bloodstream to be carried to the body cells. *Excretion* is the elimination of materials that are not absorbed (waste products) by transporting them outside the body.

The accessory organs that aid in the digestion and absorption of food are the teeth, salivary glands, liver, gallbladder, and pancreas.

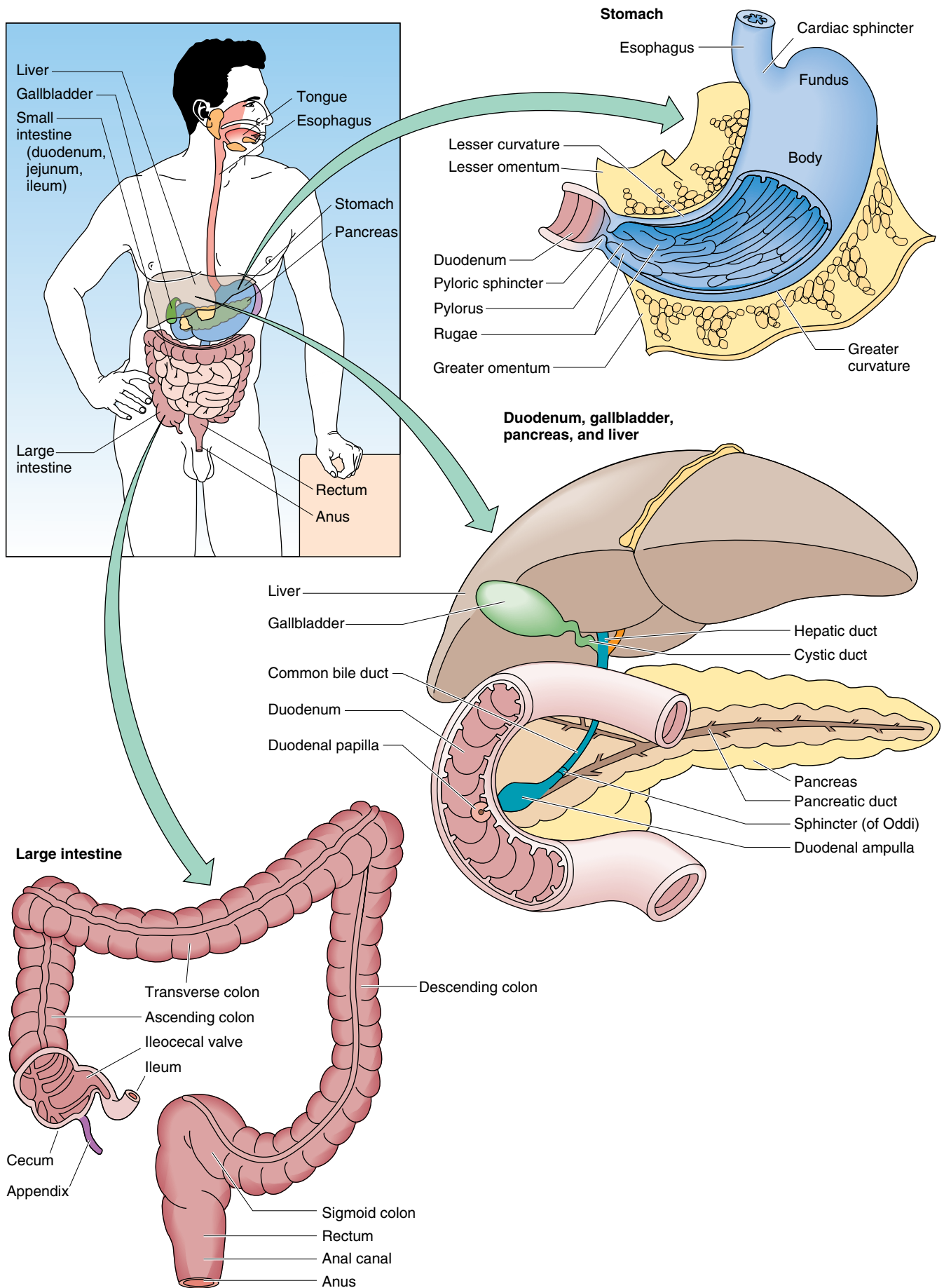


Figure 14.1 Gastrointestinal system.

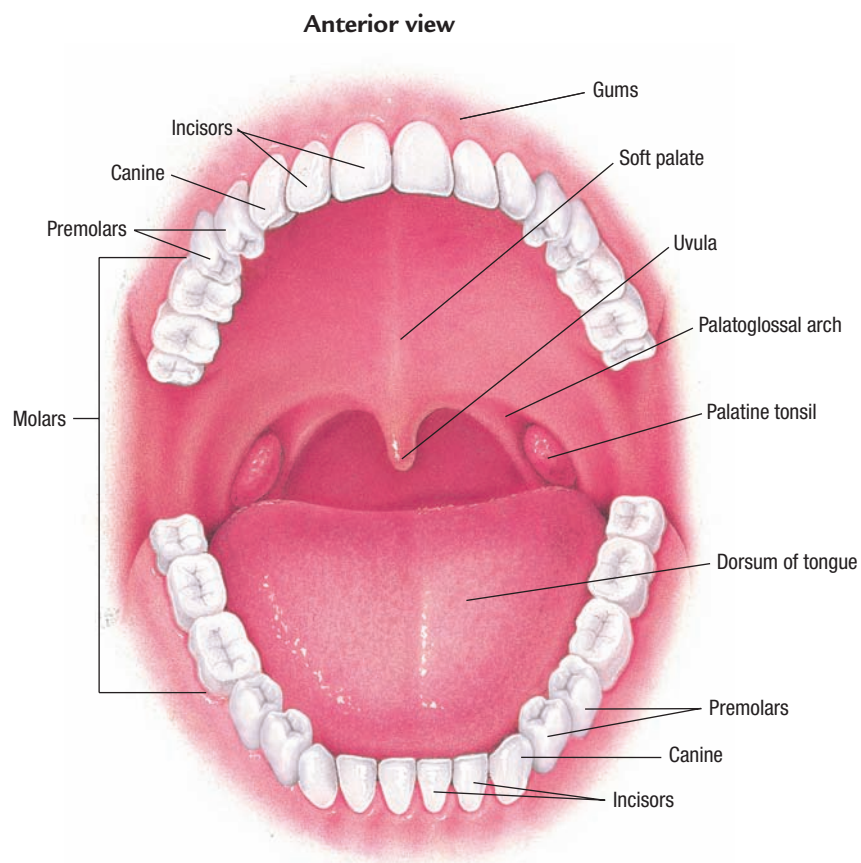


Figure 14.2 Oral cavity.

Anatomical Terms

Term	Meaning
oral cavity	cavity that receives food for digestion (Fig. 14.2)
mouth	
salivary glands sal'i-vār-ē	three pairs of exocrine glands in the mouth that secrete saliva: parotid, submandibular (submaxillary), and sublingual
cheeks	lateral walls of the mouth
lips	fleshy structures surrounding the mouth
palate pal'āt	structure that forms the roof of the mouth; it is divided into the hard and soft palate
uvula yū'vyū-lă	small projection hanging from the back middle edge of the soft palate
tongue	muscular structure of the floor of the mouth covered by mucous membrane and held down by a band-like membrane known as the <i>frenulum</i>
gums	tissue covering the processes of the jaws
teeth	hard bony projections in the jaws that serve to masticate (chew) food

**DUODENUM.**

The Latin word for 12 is the origin of the name for the first part of the small intestine because the length of the structure was estimated to be 12 fingerbreadths.

**JEJUNUM.**

The Latin word meaning empty or hungry was used for the portion of the small intestine that follows the duodenum because the ancients noted it was always empty after death.

Term	Meaning
pharynx far'ingks	throat; passageway for food traveling to the esophagus and air traveling to the larynx
esophagus ē-sof'ă-gŭs	muscular tube that moves food from the pharynx to the stomach
stomach stŭm'ŭk	sac-like organ that chemically mixes and prepares food received from the esophagus
cardiac sphincter kar'dē-ak sfingk'ter	opening from the esophagus to the stomach (sphincter = band)
pyloric sphincter pī-lŏr'ik sfingk'ter	opening of the stomach into the duodenum
small intestine in-tes'tin	tubular structure that digests food received from the stomach
duodenum dŭ-ŏ-dē'nŭm	first portion of the small intestine
jejunum jĕ-jŭ'nŭm	second portion of the small intestine
ileum il'ē-ŭm	third portion of the small intestine
large intestine	larger tubular structure that receives the liquid waste products of digestion, reabsorbs water and minerals, and forms and stores feces for defecation
cecum se'kŭm	first part of the large intestine
vermiform appendix ver'mi-fŏrm ă-pen'diks	worm-like projection of lymphatic tissue hanging off the cecum with no digestive function—may serve to resist infection (vermi = worm)
colon kŏ'lon	portions of the large intestine extending from the cecum to the rectum; identified by direction or shape
ascending colon as-send'ing	portion that extends upward from the cecum
transverse colon trans-vers'	portion that extends across from the ascending colon
descending colon dē-send'ing	portion that extends down from the transverse colon
sigmoid colon sig'moyd	portion (resembling an s) that terminates at the rectum
rectum rek'tŭm	distal (end) portion of the large intestine
rectal ampulla rek'tăl am-pŭl'lă	dilated portion of the rectum just above the anal canal
anus ă'nŭs	opening of the rectum to the outside of the body
feces fĕ'sēz	refuse; solid waste formed in the large intestine

Term	Meaning
defecation def-ĕ-kā'shŭn	evacuation of feces from the rectum
peritoneum per'i-tō-ne'ŭm	membrane surrounding the entire abdominal cavity consisting of the parietal layer (lining the abdominal wall) and visceral layer (covering each organ in the abdomen)
peritoneal cavity per-i-tō-nē'ăl	space between the parietal and visceral peritoneum
omentum ō-men'tŭm	a covering; an extension of the peritoneum attached to the stomach and connecting it with other abdominal organs
liver	organ in the upper right quadrant that produces bile, which is secreted into the duodenum during digestion
gallbladder gawl'blad-er	receptacle that stores and concentrates the bile produced in the liver
pancreas pan'krē-as	gland that secretes pancreatic juice into the duodenum, where it mixes with bile to digest food
biliary ducts bil'ē-ār-ē	ducts that convey bile, including hepatic, cystic, and common bile ducts

PANCREAS. The Greek word for sweetbread is formed by the combination of -creas, meaning flesh, and pan-, meaning all. The organ was so named because of its meaty or fleshy character. Aristotle used the term.

Anatomical and Clinical Divisions of the Abdomen

Anatomical and clinical divisions of the abdomen provide specific or general reference for descriptive purposes. There are nine specific anatomical divisions and four general clinical divisions (Figs. 14.3–14.5). All references are based on the *patient's* right or left.

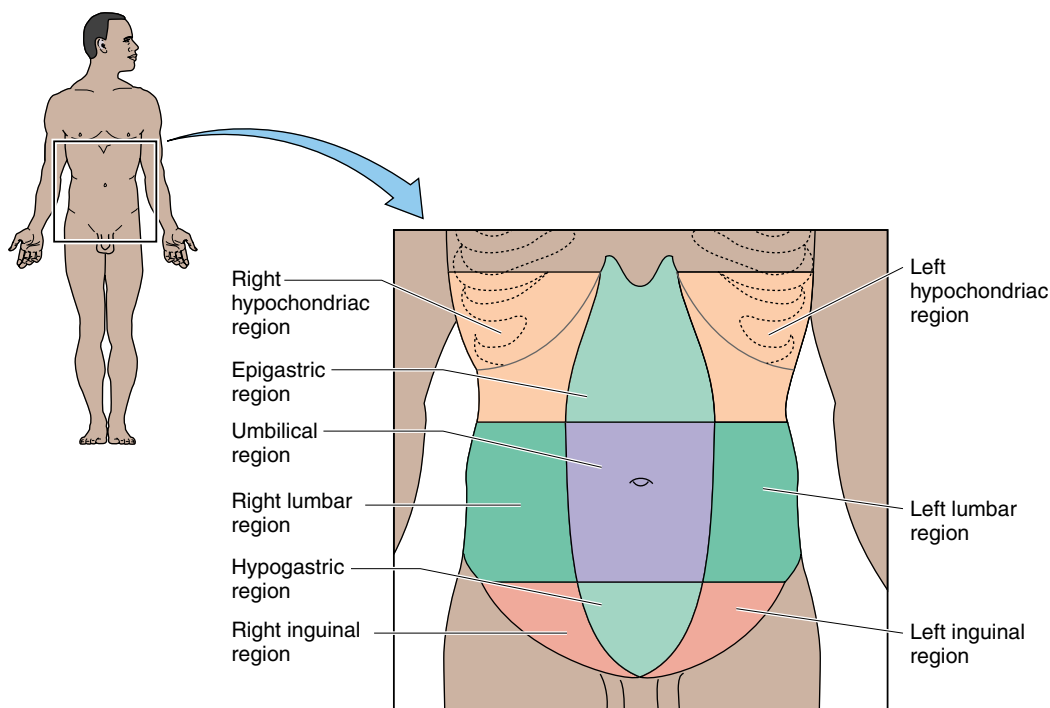


Figure 14.3 Anatomical divisions of the abdomen.

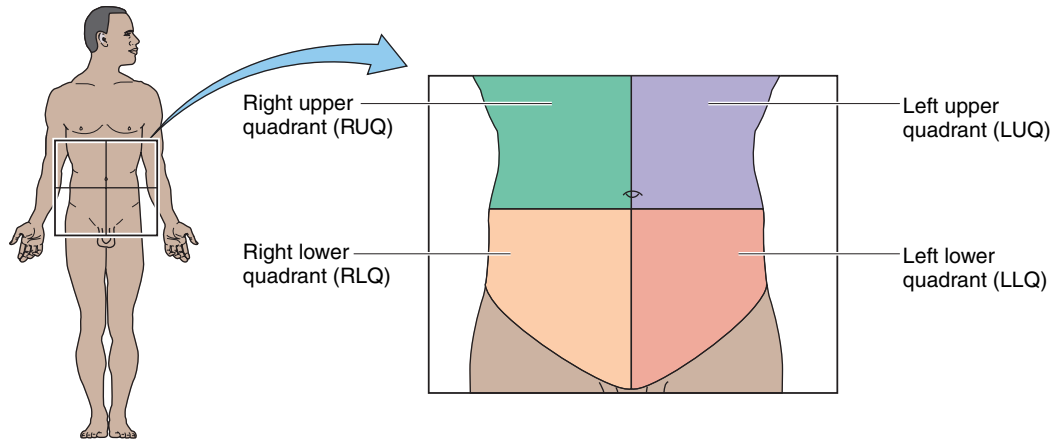


Figure 14.4 Clinical divisions of the abdomen.



HYPOCHONDIAC.

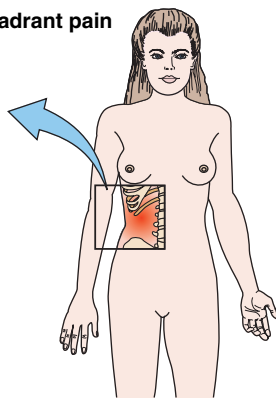
This Greek word meaning below the cartilage was used to refer to regions below the cartilages of the ribs. In these hypochondriac regions, various sensations of a distressing nature were sometimes experienced without apparent organic disease. People with such complaints were called hypochondriacs. Today, hypochondria refers to one who has an abnormal concern for one's health with the false belief that he or she is suffering from disease.

Anatomical Divisions

Region	Location
hypochondriac regions hī-pō-kon'drē-ak	upper lateral regions beneath the ribs
epigastric region ep-i-gas'trik	upper middle region below the sternum
lumbar regions lūm'bar	middle lateral regions

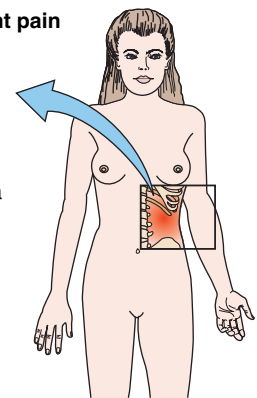
Right upper quadrant pain

- Gallbladder and biliary tract
- Cholecystitis
- Hepatitis
- Peptic ulcer
- Renal pain
- Pneumonia



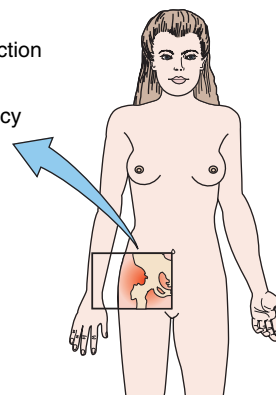
Left upper quadrant pain

- Gastritis
- Pancreatitis
- Splenomegaly
- Renal pain
- Myocardial ischemia
- Pneumonia



Right lower quadrant pain

- Appendicitis
- Intestinal obstruction
- Diverticulitis
- Ectopic pregnancy
- Ovarian cyst
- Salpingitis
- Endometriosis
- Ureteral calculi
- Renal pain



Left lower quadrant pain

- Diverticulitis
- Intestinal obstruction
- Ectopic pregnancy
- Ovarian cyst
- Salpingitis
- Endometriosis
- Ureteral calculi
- Renal pain

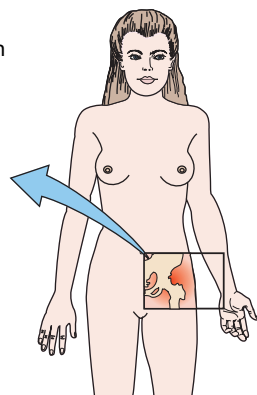


Figure 14.5 Common sites of abdominal pain characteristic of various conditions.

Region	Location
umbilical region ŭm-bil'i-kăl	region of the navel
inguinal regions ing'gwi-năl	lower lateral groin regions
hypogastric region hī-pō-gas'trik	region below the navel

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC	
anorexia an-ō-rek'sē-ă	loss of appetite (orexia = appetite)
aphagia ă-fă'jē-ă	inability to swallow
ascites ă-sī'tēz	accumulation of fluid in the peritoneal cavity (ascos = bag) (Fig. 14.6)
buccal bŭk'ăl	in the cheek



ASCITES. A Greek word for pouch or sac referring to the appearance of the abdomen with the collection of fluid in the peritoneal cavity.

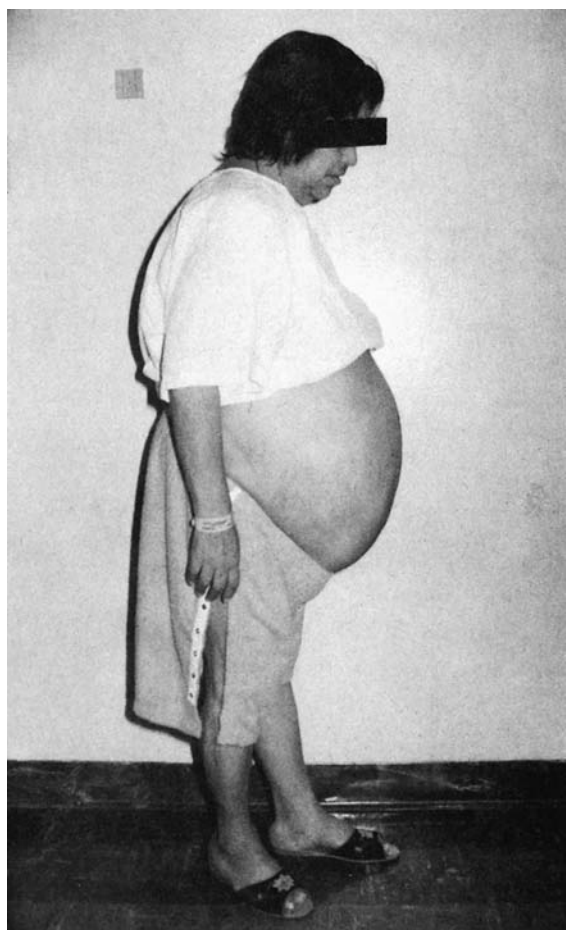


Figure 14.6 Side view of a patient showing massive ascites and distention of abdomen.

Term	Meaning
constipation kon-sti-pā'shŭn	infrequent or incomplete bowel movements characterized by hardened, dry stool that is difficult to pass (constipo = to press together)
diarrhea dī-ă-rē'ă	frequent loose or liquid stools
dyspepsia dis-pep'sē-ă	indigestion (peptin = to digest)
dysphagia dis-fă'jē-ă	difficulty in swallowing
eructation ē-rŭk-tă'shŭn	belch
flatulence flat'yŭ-lens	gas in the stomach or intestines (flatus = a blowing)
halitosis hal-i-tō'sis	bad breath (halitus = breath)
hematochezia hē'mă-tō-kē'zē-ă	red blood in the stool (chezo = defecate)
hematemesis hē-mă-tem'ě-sis	vomiting blood
hepatomegaly hep'ă-tō-meg'ă-lē	enlargement of the liver
hyperbilirubinemia hī'per-bil'i-rŭ-bi-nē'mē-ă	excessive level of bilirubin (bile pigment) in the blood
icterus ik'ter-ŭs jaundice jawn'dis	yellow discoloration of the skin, sclera (white of the eye), and other tissues caused by excessive bilirubin in the blood (jaundice = yellow) (Fig. 14.7)
melena me-lē'nă	dark-colored, tarry stool caused by old blood
nausea naw'zē-ă	sick in the stomach
steatorrhea ste'ă-tō-rē'ă	feces containing fat



ICTERUS. Icterus is a Greek word for jaundice meaning yellow bird. The yellow color associated with the condition was thought similar to the color of this bird. It was said that if a person suffering from jaundice looks at the bird, the bird dies and the patient recovers.



NAUSEA. Nausea is derived from a Greek word for ship referring to "ship sickness." Hippocrates used the term for seasickness; later, it became generally applied to the sick and uneasy feeling that precedes vomiting.



Figure 14.7 The yellow color of jaundice (icterus) is easily seen in the sclera of this patient and also in the skin as contrasted with the examiner's hand.

Term	Meaning
sublingual süb-ling'gwäl	under the tongue
hypoglossal hī-pō-glos'äl	
DIAGNOSTIC	
stomatitis stō-mă-tī'tis	inflammation of the mouth
sialoadenitis si'ă-lō-ad-ě-nī'tis	inflammation of a salivary gland
parotitis (parotiditis) par-ō-tī'tis	inflammation of the parotid gland; also called mumps
cheilitis kī-lī'tis	inflammation of the lip
glossitis glo-sī'tis	inflammation of the tongue
ankyloglossia ang'ki-lō-glos'ē-ă	tongue-tie; a defect of the tongue characterized by a short, thick frenulum (ankyl/o = crooked or stiff)
gingivitis jin-ji-vī'tis	inflammation of the gums
esophageal varices ē-sof'ă-jē'äl	swollen, twisted veins in the esophagus especially susceptible to ulceration and hemorrhage (see Fig. 14.15)
esophagitis ē-sof-ă-jī'tis	inflammation of the esophagus
gastritis gas-trī'tis	inflammation of the stomach (see Fig. 14.15)
gastroesophageal reflux disease (GERD) gas'trō-ē-sof'ă-jē'äl rē'flüks di-zēz'	backflow of stomach contents into the esophagus, often as a result of abnormal function of the lower esophageal sphincter; causes burning pain in the esophagus
pyloric stenosis pī-lōr'ik ste-nō'sis	narrowed condition of the pylorus
peptic ulcer disease (PUD) pep'tik ũl'ser di-zēz'	a sore on the mucous membrane of the stomach, duodenum, or any other part of the gastrointestinal system exposed to gastric juices; commonly caused by infection with <i>Helicobacter pylori</i> bacteria (pept/o = to digest) (Fig. 14.8)
gastric ulcer gas'trik	ulcer located in the stomach
duodenal ulcer dū'ō-dē'näl	ulcer located in the duodenum

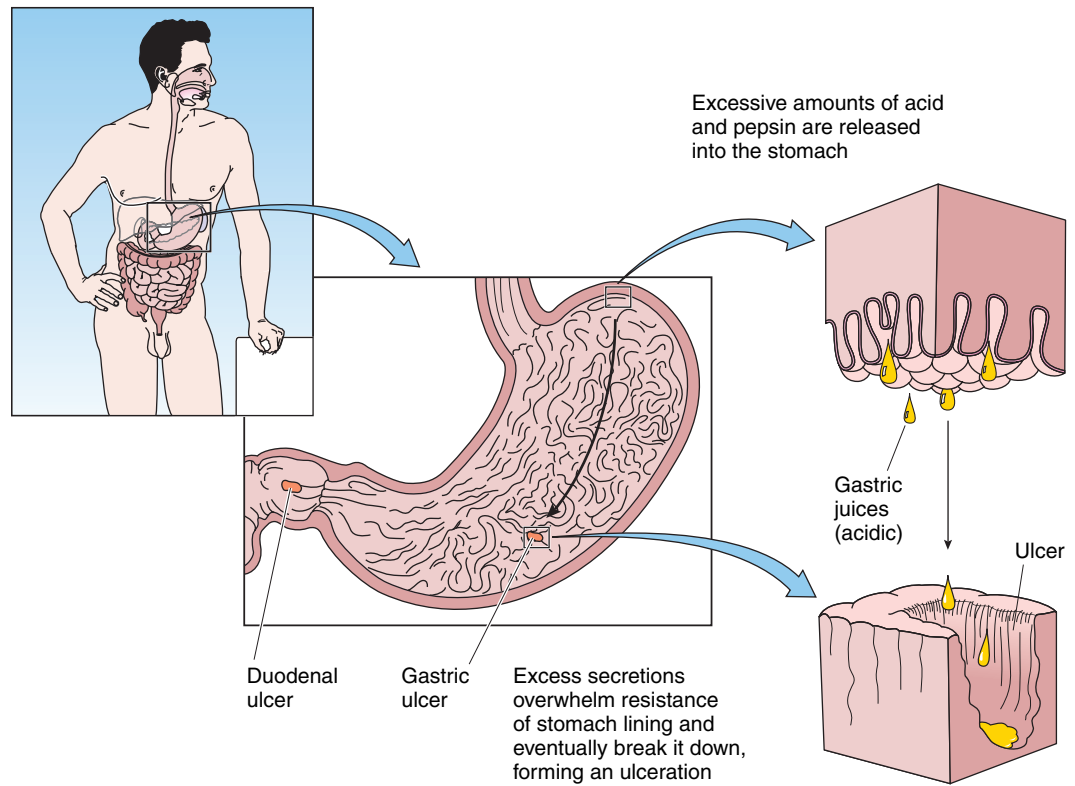


Figure 14.8 Peptic ulcer disease.

Term	Meaning
gastroenteritis gas'trō-en-ter-ī'tis	inflammation of the stomach and small intestine
enteritis en-ter-ī'tis	inflammation of the small intestine
ileitis il-ē-ī'tis	inflammation of the lower portion of the small intestine
colitis kō-lī'tis	inflammation of the colon (large intestine)
ulcerative colitis ūl'ser-ă-tiv	chronic inflammation of the colon along with ulcerations
diverticulum dī-ver-tik'yū-lūm	a by-way; an abnormal side pocket in the gastrointestinal tract usually related to a lack of dietary fiber
diverticulosis dī'ver-tik-yū-lō'sis	presence of diverticula in the gastrointestinal tract, especially in the bowel (Fig. 14.9; also see Fig. 14.15)
diverticulitis dī'ver-tik-yū-lī'tis	inflammation of diverticula
dysentery dis'en-tār-ē	inflammation of the intestine characterized by frequent, bloody stools, most often caused by bacteria or protozoa (e.g., amebic dysentery)

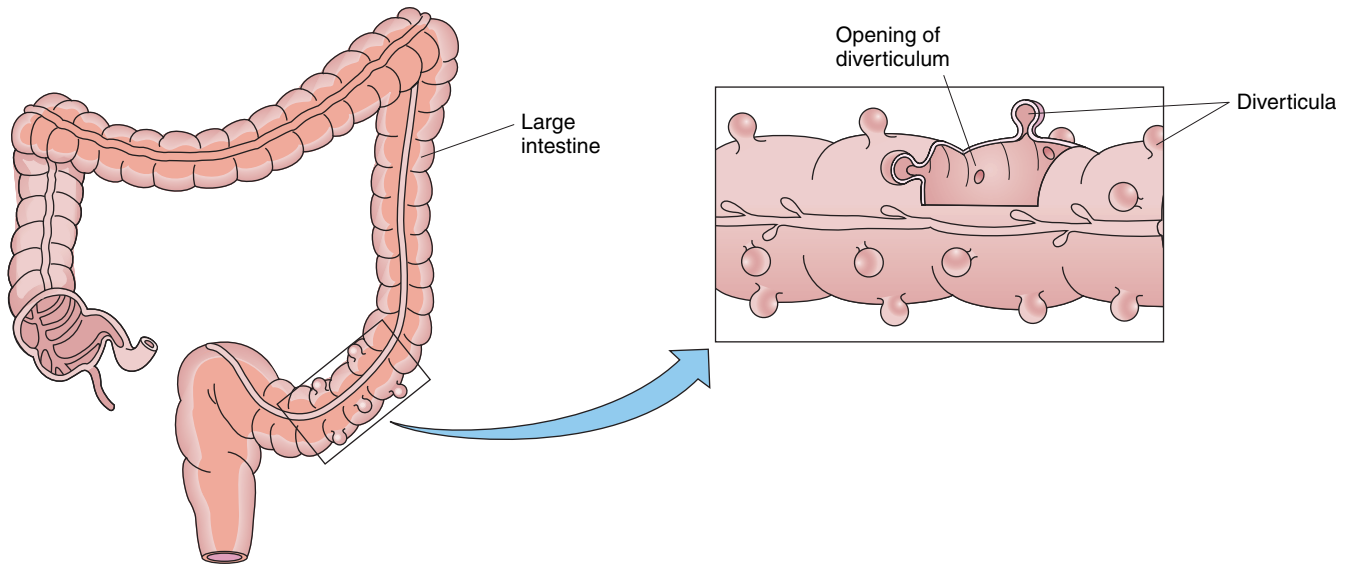
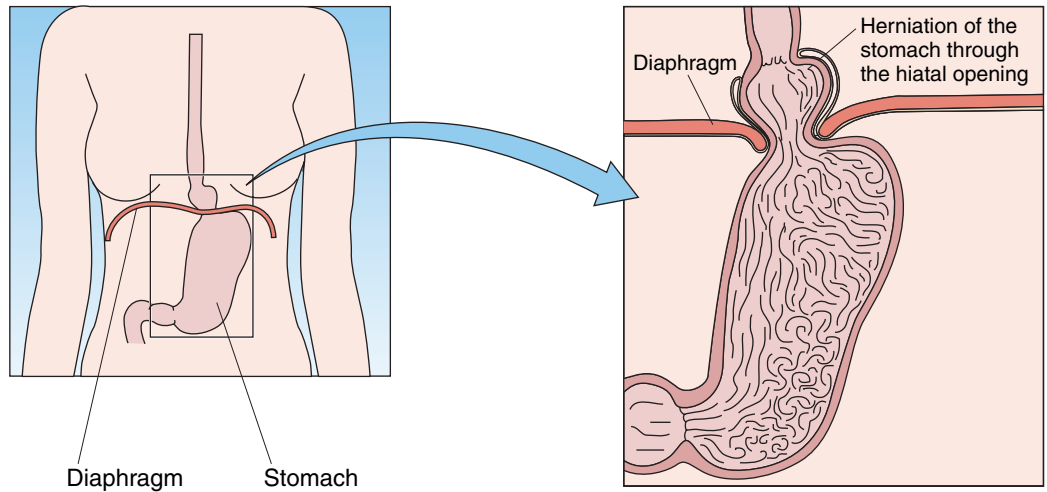


Figure 14.9 Diverticulosis.

Term	Meaning
appendicitis ă-pen-di-sī'tis	inflammation of the appendix
hernia her'nē-ă	protrusion of a part from its normal location
hiatal hernia hī-ă'tăl	protrusion of part of the stomach upward through the hiatal opening in the diaphragm (Fig. 14.10)
inguinal hernia ing'gwi-năl	protrusion of a loop of the intestine through layers of the abdominal wall in the inguinal region (see Fig. 14.10)
incarcerated hernia in-kar'ser-ă-ted	hernia that is swollen and fixed within a sac, causing an obstruction
strangulated hernia strang'gyū-lă-ted	hernia that is constricted, cut off from circulation, and likely to become gangrenous
umbilical hernia ŭm-bil'i-kăl	protrusion of the intestine through a weakness in the abdominal wall around the umbilicus (navel)
intussusception in'tŭs-sŭ-sep'shŭn	prolapse of one part of the intestine into the lumen of the adjoining part (intus = within; suscipiens = to take up) (Fig. 14.11)
volvulus vol'vŭ-lŭs	twisting of the bowel on itself, causing obstruction (volvo = to roll) (Fig. 14.12)
polyposis pol'i-pŏ'sis	multiple polyps in the intestine and rectum with a high malignancy potential (see Fig. 14.15)
polyp pol'ip	tumor on a stalk
proctitis prok-tī'tis	inflammation of the rectum and anus
anal fistula ă'năl fis'tyŭ-lă	abnormal tube-like passageway from the anus that may connect with the rectum (fistula = pipe) (Fig. 14.13)

Hiatal hernia



Inguinal hernia

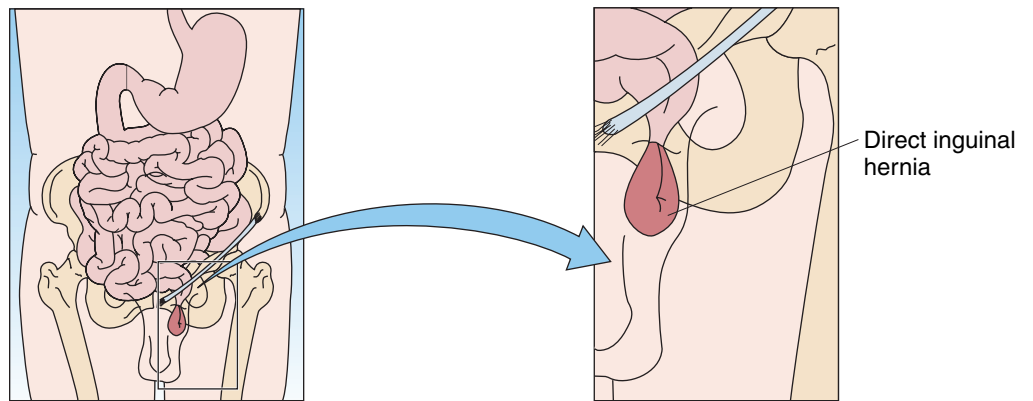


Figure 14.10 Common hernias.

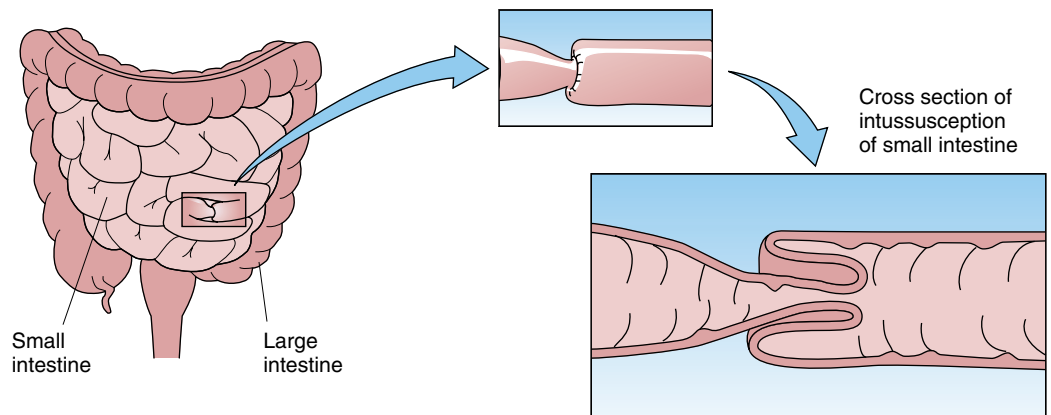


Figure 14.11 Intussusception.

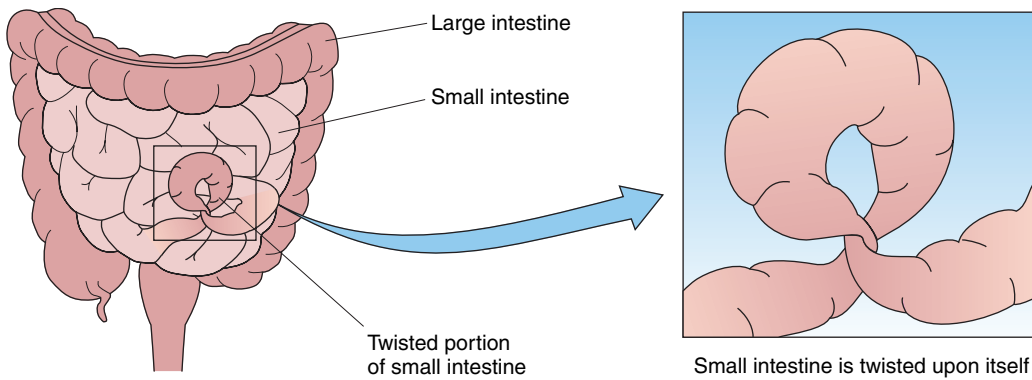


Figure 14.12 Volvulus.

Term	Meaning
hemorrhoid hem'ō-royd	swollen, twisted vein (varicosity) in the anal region (haimorrhōis = a vein likely to bleed)
peritonitis per'i-tō-nī'tis	inflammation of the peritoneum
hepatitis hep-ă-tī'tis	inflammation of the liver
hepatitis A	infectious inflammation of the liver caused by the hepatitis A virus (HAV), usually transmitted orally through fecal contamination of food or water
hepatitis B	infectious inflammation of the liver caused by the hepatitis B virus (HBV) that is transmitted sexually or by exposure to contaminated blood or body fluids
hepatitis C	inflammation of the liver caused by the hepatitis C virus (HCV) transmitted by exposure to infected blood (rarely contracted sexually)
cirrhosis sir-rō'sis	chronic disease characterized by degeneration of liver tissue, most often caused by alcoholism or a nutritional deficiency (cirrho = yellow)
cholangitis kō-lan-jī'tis	inflammation of the bile ducts
cholecystitis kō'lē-sis-tī'tis	inflammation of the gallbladder

CIRRHOSIS. A Greek word referring to a yellow condition, cirrhosis was first applied to the fibrosis of the liver in alcoholics because the granular deposits in the organ looked yellow.

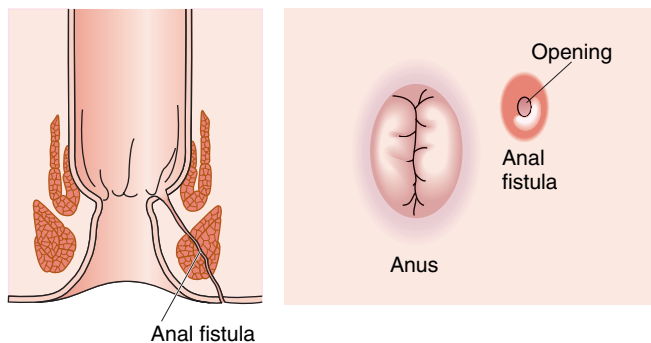


Figure 14.13 Anal fistula.

Term	Meaning
cholelithiasis kō'lē-li-thī'ă-sis	presence of stones in the gallbladder or bile ducts (Fig. 14.14; also see Fig. 14.21B)
choledocholithiasis kō-led'ō-kō-lith-ī'ă-sis	presence of stones in the common bile duct (see Figs. 14.14 and 14.15)
pancreatitis pan'krē-ă-tī'tis	inflammation of the pancreas

Diagnostic Tests and Procedures

Test or Procedure	Explanation
endoscopy en-dos'kō-pē	examination within a body cavity with a flexible endoscope for diagnosis or treatment; used in the gastrointestinal tract to detect abnormalities and perform procedures such as biopsies, excision of lesions, dilations of narrowed areas, and removal of swallowed objects (Fig. 14.15)
esophagoscopy ē-sof-ă-gos'kō-pē	examination of the esophagus with an esophagoscope
gastroscopy gas-tros'kō-pē	examination of the stomach with a gastroscope
upper gastrointestinal endoscopy gas'trō-in-tes'tin-ăl	examination of the lining of the esophagus, stomach, and duodenum with a flexible endoscope; also known as esophagogastroduodenoscopy (EGD) or panendoscopy (see Fig. 14.15)
endoscopic retrograde cholangiopancreatography (ERCP) en-dos'kōp'ik ret'rō-grād kō-lan'jē-ō-pan-krē-ă-tog'ră-fē	endoscopic procedure including x-ray fluoroscopy to examine the ducts of the liver, gallbladder, and pancreas (biliary ducts)

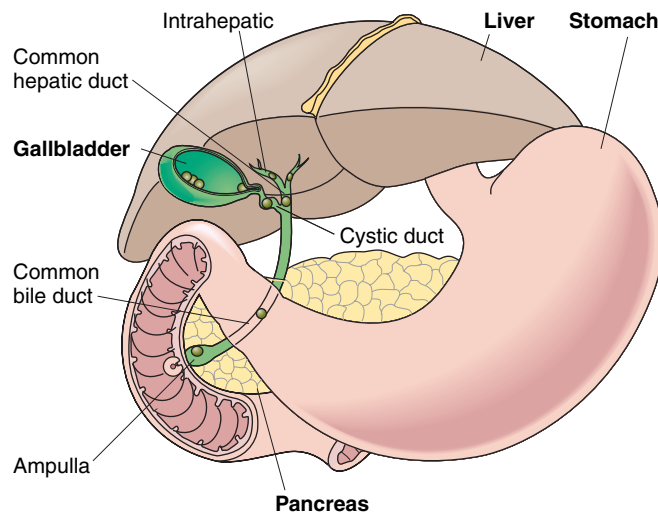
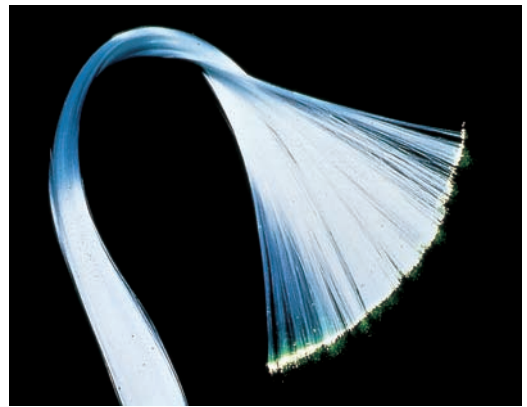
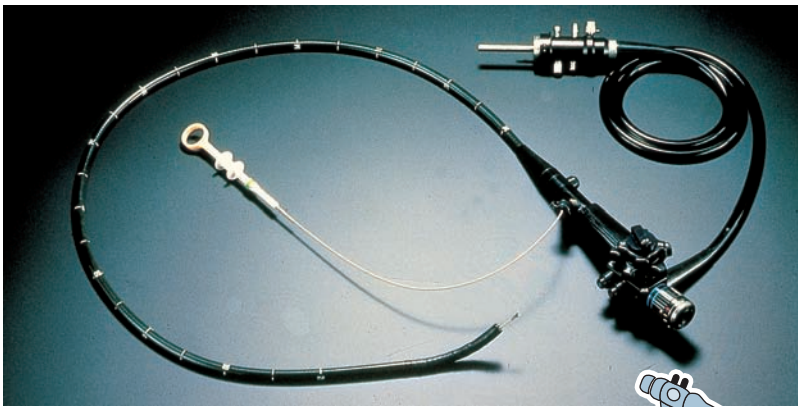


Figure 14.14 Sites of gallstones.



The endoscope, an instrument for viewing and photographing internal cavities of the body, is used for evaluating pathological conditions and performing minimally invasive corrective procedures.

Fiberoptics in the endoscope conduct bright, cool light along a curved path, allowing illumination of tissues and structures within the body. A color video camera converts the optical images into electrical signals, which are displayed on a monitor. The pictures below were taken endoscopically.

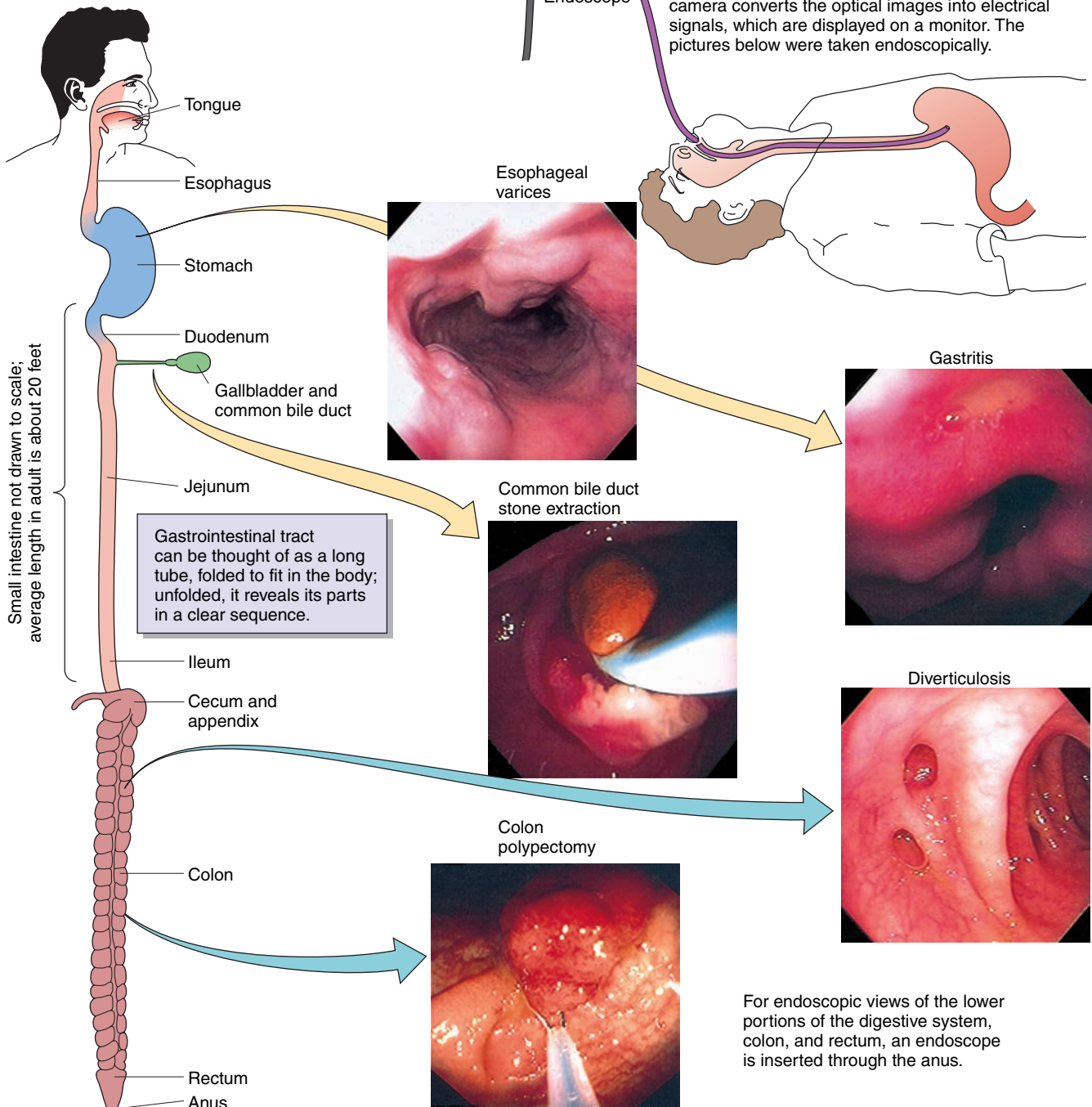


Figure 14.15 Endoscopy of gastrointestinal system.

For endoscopic views of the lower portions of the digestive system, colon, and rectum, an endoscope is inserted through the anus.

Test or Procedure	Explanation
laparoscopy lap-ă-ros'kŏ-pē	examination of the abdominal cavity with a laparoscope—often including interventional surgical procedures (Fig. 14.16)
peritoneoscopy per'i-tō-nē-os'kŏ-pē	examination of the peritoneal cavity with a peritoneoscope; often performed to examine the liver and obtain a biopsy specimen
capsule endoscopy kap'sool	examination of the small intestine made by a tiny video camera placed in a capsule and swallowed; images are transmitted to a waist-belt recorder and downloaded onto a computer for assessment of possible abnormalities; traditional endoscopy cannot completely access the small intestine because of its length and complexity
colonoscopy kŏ-lon-os'kŏ-pē	examination of the colon using a flexible colonoscope (see Fig. 14.15)
sigmoidoscopy sig'moy-dos'kŏ-pē	examination of the sigmoid colon with a rigid or flexible sigmoidoscope
proctoscopy prok-tos'kŏ-pē	examination of the rectum and anus with a proctoscope

DIAGNOSTIC IMAGING

magnetic resonance image of the abdomen	nonionizing imaging technique for visualizing the abdominal cavity to identify disease or deformity in the gastrointestinal tract
nuclear medicine	radionuclide organ imaging
liver scan	scan of the liver made after injection of radioactive tracers into the bloodstream; used to detect tumors and functional abnormalities

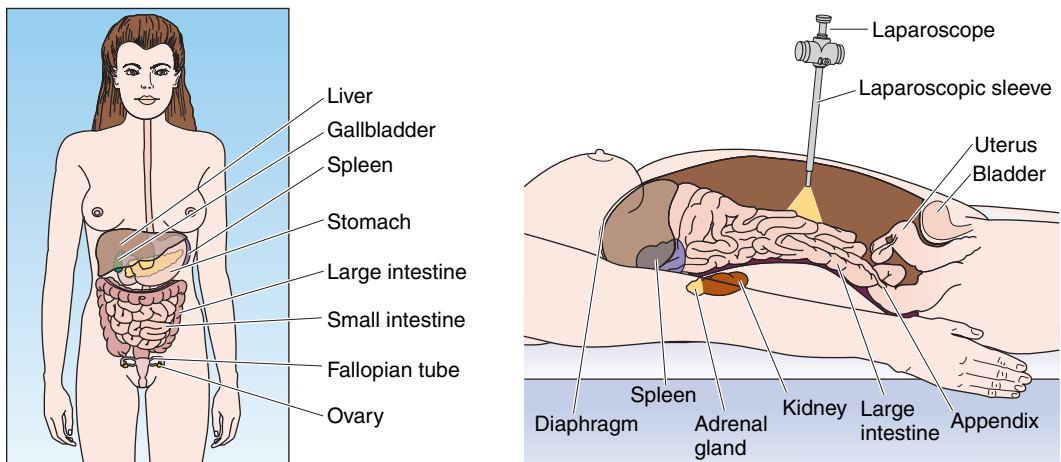


Figure 14.16 Laparoscopy.

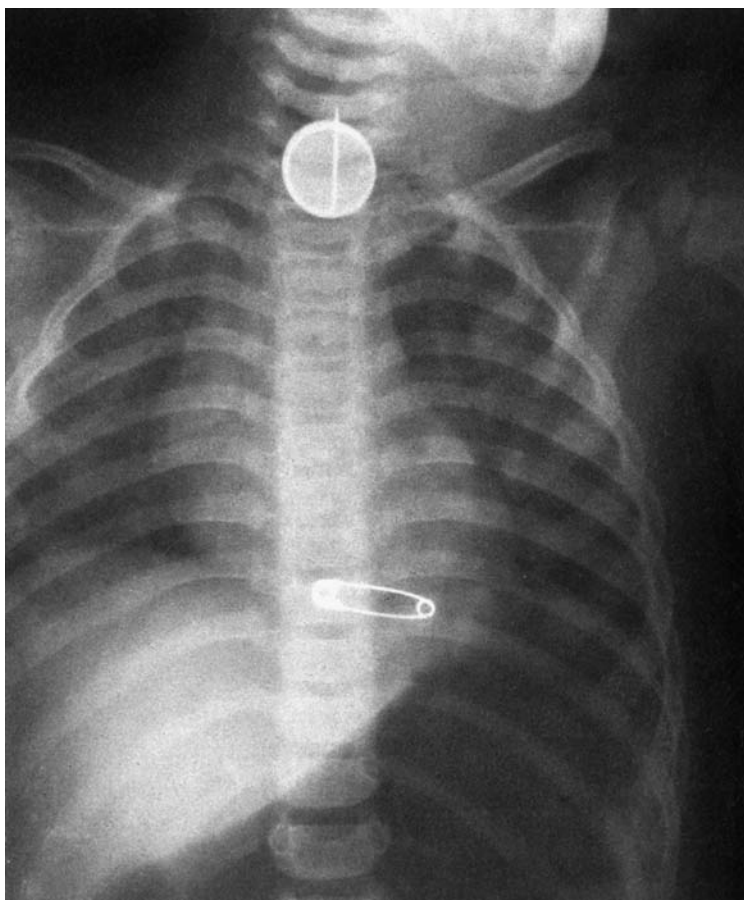


Figure 14.17 Plain radiograph (without contrast) showing two impacted foreign bodies in a child, aged 2 1/2 years. This child has ingested a safety pin and an ornamental pin. Endoscopic removal was required.

Test or Procedure	Explanation
radiography rā'dē-og'ră-fē	x-ray imaging (Fig. 14.17)
upper GI series	x-ray of the esophagus, stomach, and duodenum after the patient has swallowed a contrast medium (barium is most commonly used) (Fig. 14.18)
barium swallow ba'rē-ŭm	x-ray of the esophagus only; often used to locate swallowed objects
fluoroscopy flūr-os'kō-pe	x-ray using a fluorescent screen to visualize structures in motion (such as during a barium swallow)
small bowel series	x-ray exam of the small intestine—generally done in conjunction with an upper GI series
lower GI series barium enema en'ē-mă	x-ray of the colon after administration of an enema containing a contrast medium (Fig. 14.19)
cholangiogram kō-lan'jē-ō-gram	x-ray of the bile ducts; often performed during surgery
cholecystogram kō-lē-sis'tō-gram	x-ray of the gallbladder taken after oral ingestion of iodine

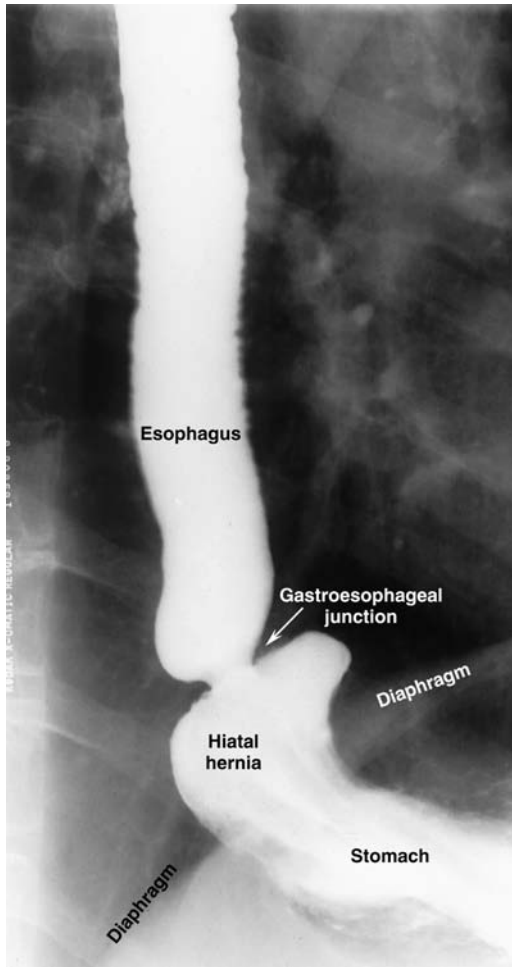


Figure 14.18 Upper gastrointestinal radiograph showing a hiatal hernia.



Figure 14.19 Barium enema radiograph of the colon showing a ruptured diverticulum. Its elongated appearance is similar to that of a deflated balloon.

Test or Procedure	Explanation
computed tomography (CT) of abdomen tō-mog'rä-fē	cross-sectional x-ray of the abdomen used to identify a condition or anomaly within the gastrointestinal tract (e.g., tumor, injury) (Fig. 14.20)
CT colonography	computed tomographic image of the colon performed as an alternative to traditional invasive colonoscopy; also known as virtual colonoscopy
sonography sō-nog'rä-fē	ultrasound imaging
abdominal sonogram son'ō-gram	ultrasound image of the abdomen to detect disease or deformity in organs and vascular structures (e.g., liver, pancreas, gallbladder, spleen, aorta) (Fig. 14.21)
endoscopic sonography en'dō-skōp'ik	endoscopic procedure using a sonographic transducer within an endoscope to examine a body cavity and make sonographic images of structures and tissues

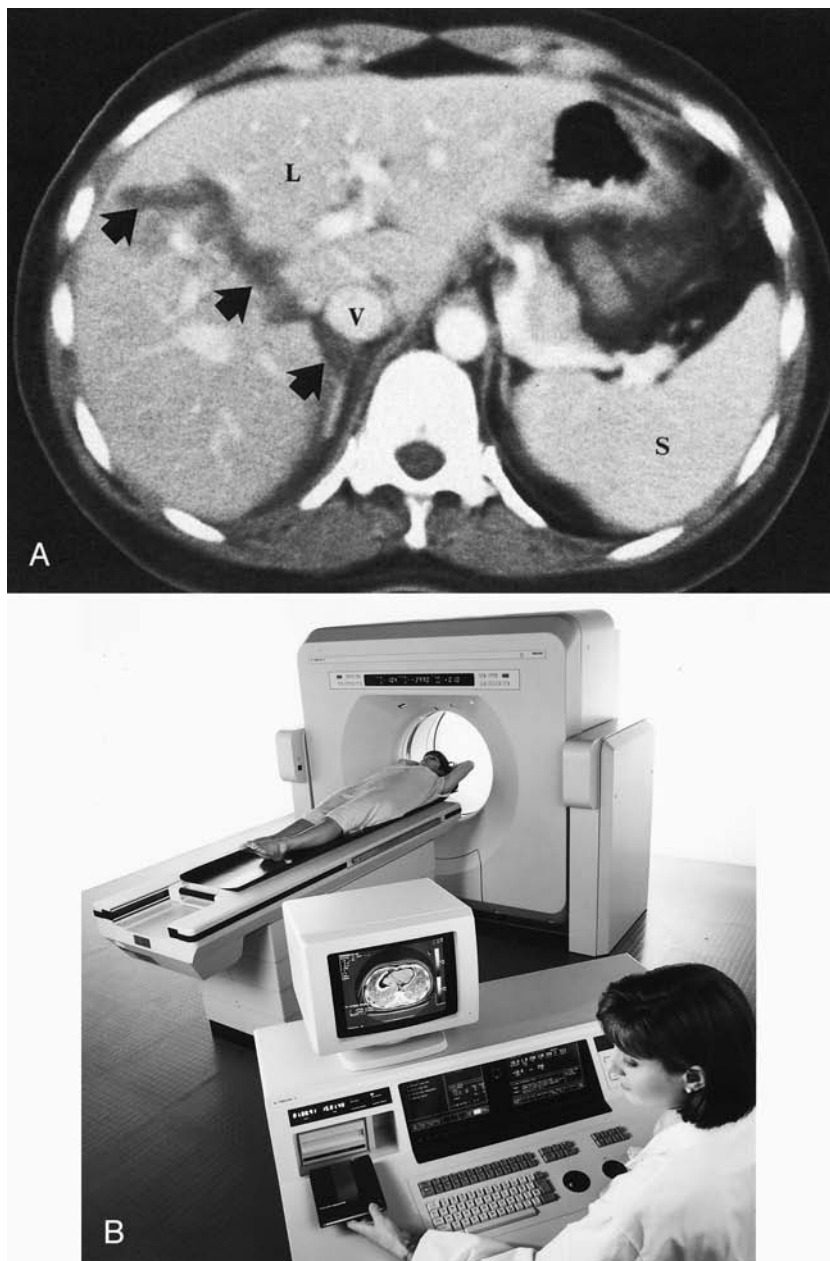


Figure 14.20 **A.** CT scan of a patient involved in a motor vehicle accident demonstrates a jagged laceration (arrows) extending from the posterior to inferior vena cava (V) through the right lobe of the liver (L). S, spleen. **B.** CT scanner.

Test or Procedure

Explanation

LABORATORY STUDIES

biopsy (Bx)
bī'op-sē

removal of tissue for microscopic pathological examination

endoscopic biopsy

removal of a specimen for biopsy during an endoscopic procedure (e.g., colonoscopy)

excisional biopsy
ek-sizh'ūn-āl

removal of an entire lesion for examination

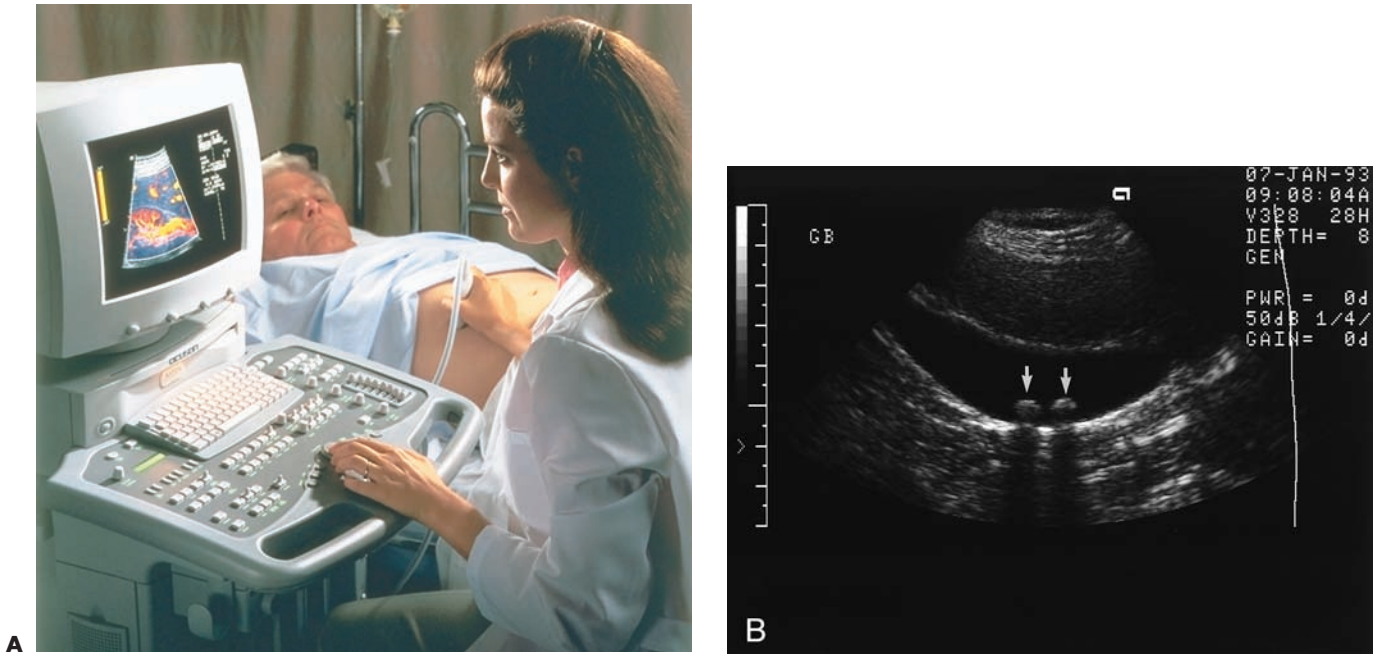


Figure 14.21 A. Abdominal sonography procedure. B. Abdominal sonogram of two stones present in the gallbladder (arrows).

Test or Procedure	Explanation
incisional biopsy in-sizh'ün-äl	removal of a portion of a lesion for examination
needle biopsy	percutaneous removal of a core specimen of tissue using a special hollow needle (e.g., liver biopsy) (Fig. 14.22)
stool culture and sensitivity (C&S)	isolation of a stool specimen in a culture medium to identify disease-causing organisms; if present, the drugs to which they are sensitive are listed
stool occult blood study	chemical test of a stool specimen to detect the presence of blood; positive findings indicate bleeding in the gastrointestinal tract

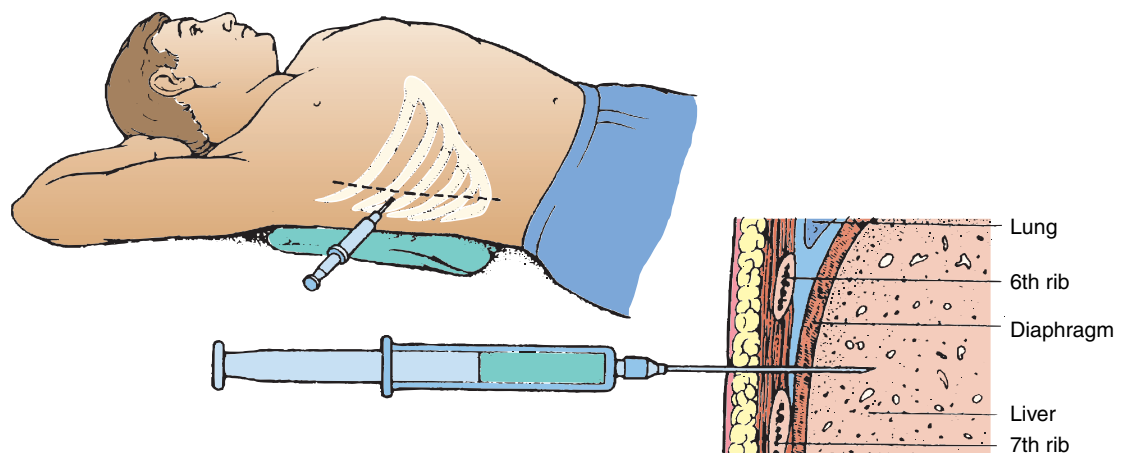


Figure 14.22 Liver biopsy procedure.

Operative Terms

Term	Meaning
bariatric surgery bar-ē-at'rik	treatment of morbid obesity by surgery to the stomach and/or intestines; procedures include restrictive techniques that limit the size of the stomach and malabsorptive techniques that limit the absorption of food (baros = weight; iatric = pertains to treatment)
cheiloplasty kī'lō-plas-tē	repair of the lip
glossectomy glo-sek'tō-mē	excision of all or part of the tongue
glossorrhaphy glo-sōr'ā-fē	suture of the tongue
esophagoplasty ē-sof'ā-gō-plas-tē	repair of the esophagus
gastrectomy gas-trek'tō-mē	partial or complete removal of the stomach
gastric resection gas'trik rē-sek'shūn	partial removal and repair of the stomach
abdominocentesis ab-dom'i-nō-sen-tē'sis	puncture of the abdomen for aspiration of fluid (e.g., fluid accumulated in ascites)
paracentesis par'ā-sen-tē'sis	
laparotomy lap'ā-rot'ō-mē	incision into the abdomen
laparoscopic surgery lap'ā-rō-skōp'ik	abdominal surgery using a laparoscope
herniorrhaphy her'nō-ōr'ā-fē	repair of a hernia
hernioplasty her'nē-ō-plas-tē	
colostomy kō-lostō-mē	creation of an opening in the colon through the abdominal wall to create an abdominal anus allowing stool to bypass a diseased portion of the colon; performed to treat ulcerative colitis, cancer, or obstructions (Fig. 14.23)
anastomosis ā-nas'tō-mō'sis	union of two hollow vessels; used in bowel surgery
ileostomy il'ē-ostō-mē	surgical creation of an opening on the abdomen to which the end of the ileum is attached, providing a passageway for ileal discharges; performed after removal of the colon (e.g., to treat chronic inflammatory bowel diseases such as ulcerative colitis)

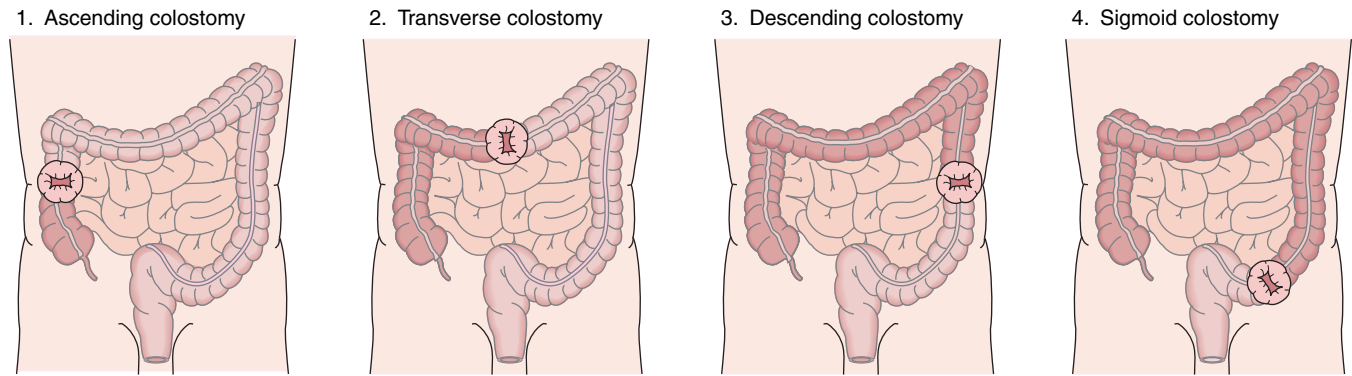


Figure 14.23 Common colostomy sites.

Term	Meaning
appendectomy ap-pen-dek'tō-mē	excision of a diseased appendix
incidental appendectomy	removal of the appendix during abdominal surgery for another procedure (e.g., a hysterectomy)
polypectomy pol-i-pek'tō-mē	excision of polyps
proctoplasty prok'tō-plas-tē	repair of the anus and rectum
anal fistulectomy fis-tyū-lek'tō-mē	excision of an anal fistula
hemorrhoidectomy hem'ō-roy-dek'tō-mē	excision of hemorrhoids
hepatic lobectomy he-pat'ik lō-bek'tō-mē	excision of a lobe of the liver
cholecystectomy kō'lē-sis-tek'tō-mē	excision of the gallbladder
laparoscopic cholecystectomy lap'ă-rō-sköp'ik	excision of the gallbladder through a laparoscope
cholelithotomy kō'le-li-thot'ō-mē	incision for removal of gallstones
choledocholithotomy kō-led'ō-kō-li-thot'ō-mē	incision of the common bile duct for extraction of gallstones
cholelithotripsy kō-lē-lith'ō-trip-sē	crushing of gallstones
pancreatectomy pan'krē-ă-tek'tō-mē	excision of the pancreas

Therapeutic Terms

Term	Meaning
gastric lavage gas'trik lă-vahzh'	oral insertion of a tube into the stomach for examination and treatment [e.g., to remove blood clots from the stomach and monitor bleeding (lavage = to wash)]
nasogastric (NG) intubation nā-zō-gas'trik in-tū-bā'shŭn	insertion of a tube through the nose into the stomach for various purposes (e.g., to obtain a gastric fluid specimen for analysis)

COMMON THERAPEUTIC DRUG CLASSIFICATIONS

antacid ant-as'id	drug that neutralizes stomach acid
antiemetic an'tē-ĕ-met'ik	drug that prevents or stops vomiting
antispasmodic an'tē-spaz-mod'ik	drug that decreases motility in the gastrointestinal tract to arrest spasm or diarrhea
cathartic kă-thar'tik	drug that causes movement of the bowels; also called a laxative

Summary of Chapter 14 Acronyms/Abbreviations

Bx biopsy	HBV hepatitis B virus
C&S culture and sensitivity	HCV hepatitis C virus
CT computed tomography	LLQ left lower quadrant
EGD esophagogastroduodenoscopy	LUQ left upper quadrant
ERCP endoscopic retrograde cholangiopancreatography	MRI magnetic resonance imaging
GERD gastroesophageal reflux disease	NG nasogastric
GI gastrointestinal	PUD peptic ulcer disease
HAV hepatitis A virus	RLQ right lower quadrant
	RUQ right upper quadrant



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

EXAMPLE

sublingual

_____/_____/_____
 P R S
sub/lingu/al
 P R S

DEFINITION: below or under/tongue/pertaining to

1. transabdominal

_____/_____/_____
 P R S

DEFINITION: _____

2. gastroenterostomy

_____/_____/_____
 CF CF S

DEFINITION: _____

3. sialolithotomy

_____/_____/_____
 CF CF S

DEFINITION: _____

4. glossorrhaphy

_____/_____
 CF S

DEFINITION: _____

5. hematemesis

_____/_____
 R S

DEFINITION: _____

6. cheilostomatoplasty

_____/_____/_____
 CF CF S

DEFINITION: _____

7. appendicitis

_____ / _____
R S

DEFINITION: _____

8. celiotomy

_____ / _____
CF S

DEFINITION: _____

9. cholangiogram

_____ / _____ / _____
R CF S

DEFINITION: _____

10. colonoscopy

_____ / _____
CF S

DEFINITION: _____

11. anorectal

_____ / _____ / _____
CF R S

DEFINITION: _____

12. enterocolitis

_____ / _____ / _____
CF R S

DEFINITION: _____

13. orolingual

_____ / _____ / _____
CF R S

DEFINITION: _____

14. proctosigmoidoscopy

_____ / _____ / _____
CF CF S

DEFINITION: _____

15. laparoscope

_____ / _____
CF S

DEFINITION: _____

16. dysphagia

_____ / _____ / _____
P R S

DEFINITION: _____

17. pancreatoduodenostomy

_____ / _____ / _____
 CF CF S

DEFINITION: _____

18. hernioplasty

_____ / _____
 CF S

DEFINITION: _____

19. biliary

_____ / _____
 R S

DEFINITION: _____

20. gastroesophageal

_____ / _____ / _____
 CF R S

DEFINITION: _____

21. choledochotomy

_____ / _____ / _____
 CF CF S

DEFINITION: _____

22. steatorrhea

_____ / _____
 CF S

DEFINITION: _____

23. dentalgia

_____ / _____
 R S

DEFINITION: _____

24. pylorospasm

_____ / _____
 CF S

DEFINITION: _____

25. hepatotoxic

_____ / _____ / _____
 CF R S

DEFINITION: _____

26. ileojejunitis

_____ / _____ / _____
 CF R S

DEFINITION: _____

27. peritoneocentesis

_____ / _____
CF S

DEFINITION: _____

28. buccogingival

_____ / _____ / _____
CF R S

DEFINITION: _____

29. cholecystectomy

_____ / _____ / _____
CF R S

DEFINITION: _____

30. perirectal

_____ / _____ / _____
P R S

DEFINITION: _____

Complete the medical term by writing the missing part or word:

31. hemi _____ ectomy = removal of half of the colon

32. _____ itis = inflammation of the appendix

33. _____ rrhaphy = suture of the lip

34. cholelitho _____ = incision for removal of gallstones

35. _____ plasty = surgical repair of the mouth

36. chol _____ gram = x-ray of bile ducts (vessels)

37. _____ bilirubin _____ = excessive level of bilirubin in the blood

38. gastric _____ = partial removal and repair of the stomach

39. diverticulo _____ = the presence of diverticula

For each of the following, circle the combining form that corresponds to the meaning given:

40. **abdomen** gastr/o lapar/o stomat/o

41. **tongue** gloss/o proct/o gingiv/o

42. **small intestine** col/o appendic/o enter/o

43. **teeth** dent/i chol/e lingu/o

44. stomach	lapar/o	stomat/o	gastr/o
45. cheek	bucc/o	or/o	proct/o
46. bile	col/o	celi/o	chol/e
47. mouth	gastr/o	stomat/o	lapar/o
48. liver	hepat/o	nephr/o	ren/o
49. eat	phas/o	phag/o	gloss/o
50. stone	scler/o	steat/o	lith/o
51. rectum	an/o	proct/o	col/o

Write the correct medical term for each of the following:

52. inflammation of the stomach _____
53. loss of appetite _____
54. inability to swallow _____
55. in the cheek _____
56. gas in the stomach or intestines _____
57. rupture or protrusion of a part from its normal location _____
58. black tarry stool _____
59. belch _____
60. instrument used to examine the rectum _____
61. inflammation of the large intestine _____
62. portion of upper GI series x-ray used to examine the esophagus only _____
63. accumulation of fluid in the peritoneal cavity _____
64. inflammation of the gallbladder _____
65. feces containing fat _____
66. presence of inflamed abnormal side pockets in gastrointestinal tract _____
67. peptic ulcer located in the stomach _____
68. enlargement of the liver _____
69. tongue-tie condition _____

Name the anatomical divisions of the abdomen:

70. lower lateral groin regions _____
71. upper lateral regions beneath the ribs _____
72. upper middle region below the sternum _____
73. region below the navel _____
74. middle lateral regions _____
75. region of the navel _____

Name the clinical divisions of the abdomen:

76. _____
77. _____
78. _____
79. _____

Match the following terms:

- | | |
|--------------------------------|---|
| 80. _____ cathartic | a. cholelithotripsy |
| 81. _____ herniorrhaphy | b. barium swallow |
| 82. _____ appendicitis | c. bariatric surgery |
| 83. _____ lower GI series | d. appendectomy |
| 84. _____ icterus | e. colostomy |
| 85. _____ peptic ulcer disease | f. hernioplasty |
| 86. _____ abdominocentesis | g. <i>H. pylori</i> bacterial infection |
| 87. _____ parotitis | h. barium enema |
| 88. _____ sublingual | i. mumps |
| 89. _____ upper GI series | j. paracentesis |
| 90. _____ ulcerative colitis | k. jaundice |
| 91. _____ cholelithiasis | l. hypoglossal |
| 92. _____ morbid obesity | m. laxative |

An endoscope is an instrument used to examine within the body. Name the specific type of endoscope used to examine the following body parts:

93. abdomen _____

94. anus _____

95. stomach _____

96. colon _____

97. peritoneal cavity _____

98. esophagus _____

99. Which type of hernia is swollen and fixed within a sac, causing obstruction?

100. Which type of biopsy involves the removal of an entire growth? _____

Write the full medical term for the following abbreviations:

101. NG tube _____

102. ERCP _____

103. GERD _____

104. LUQ _____

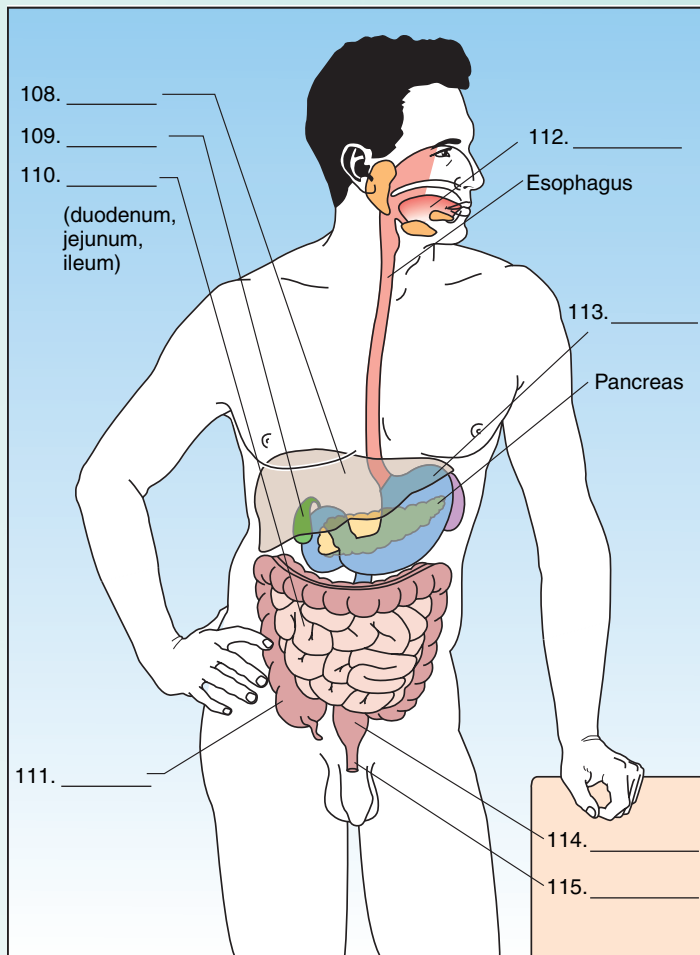
105. GI _____

106. MRI _____

107. EGD _____

Write in the term components related to each of the gastrointestinal organs on the blank lines provided in the following illustration.

108–115.



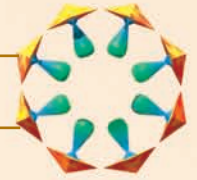
For each of the following, circle the correct spelling of the term:

- | | | |
|----------------------|---------------|------------------|
| 116. anorexia | annorexia | anorrexia |
| 117. asites | ascitis | ascites |
| 118. hematochesia | hemochezia | hematochezia |
| 119. icterus | ickterus | icteris |
| 120. ankeoglossia | ankyloglosia | ankyloglossia |
| 121. volvulis | volvulus | volvolus |
| 122. cirhosis | cirrhosus | cirrhosis |
| 123. glossectomy | glozectomy | glosectomy |
| 124. hernniorhaphy | hernniorraphy | hernniorrhaphy |
| 125. hemorroidectomy | hemroidectomy | hemorrhoidectomy |

126. antacid	anacid	antacid
127. antiemetic	antemetic	antaemetic
128. cathartik	cathartic	catarthic
129. melena	melenna	melana

Give the noun that was used to form the following adjectives:

- 130. fecal _____
- 131. icteric _____
- 132. ileal _____
- 133. endoscopic _____
- 134. hemorrhoidal _____
- 135. pancreatic _____



MEDICAL RECORD ANALYSES

MEDICAL RECORD 14.1

S: This is a 36 y.o. ♂ with a complaint of abdominal pain. He describes having lifted a 75# beam yesterday at work. He noticed a sharp pain in his navel but continued to work. The pain intensified as the day went on and persisted through last night and today. He claims his navel now bulges forward. He denies fever, chills, dysphagia, anorexia, or vomiting.

PMH: No hospitalizations or surgeries

Meds: none

Allergies: NKDA

O: T 97.5°F, P 87, R18, BP 128/86

WDWN male in moderate distress secondary to abdominal pain. Upon palpation, the abdomen is soft with spasm of the muscles in the periumbilical region, and there is an obvious bulge in the umbilicus. The omentum is also palpable. There is no hepatosplenomegaly.

A: Incarcerated umbilical hernia

P: Admit for STAT umbilical hernia repair

- Summarize the subjective information:
 - pain in stomach
 - pain in abdomen
 - pain in the groin area
 - generalized abdominal pain with chills and fever
 - stomach pain and has difficulty swallowing
- What kind of an appetite does the patient have?
 - normal
 - increased
 - decreased
- What is the condition of the patient's liver?
 - not stated
 - enlarged
 - not enlarged
 - inflamed
 - ruptured
- What were the objective findings?
 - involuntary contraction of the muscles around the navel
 - pouching of the muscles under the navel
 - contraction of abdominal muscles and enlargement of the spleen
 - protrusion of the navel and enlargement of the liver
 - pouching of the stomach and omentum
- Which of the following best describes the diagnosis?
 - portion of the bowel has protruded through the abdominal wall and has been cut off from circulation
 - prolapse of one part of the intestine into the lumen of the adjoining part
 - portion of the intestine has protruded through a weakness in the abdominal wall around the navel and is swollen and fixed in a sac
 - portion of the bowel has twisted on itself causing obstruction
 - inflammation of the stomach and small intestine
- Which of the following medical terms describes the planned surgery?
 - laparotomy
 - gastroenterostomy
 - hernioplasty
 - ileostomy
 - abdominocentesis

MEDICAL RECORD 14.2

Mr. Antonio Villata undergoes a comprehensive physical examination each year as part of a wellness program promoted by his employer. This year, after a routine sigmoidoscopic exam revealed a polyp in his intestine, he was referred to Dr. Blain, a gastroenterologist at Central Medical Center, for evaluation.

Directions

Read Medical Record 14.2 for Antonio Villata (page 475) and answer the following questions. This record is a procedure report dictated by Dr. Blain after his evaluation and treatment of Mr. Villata in the endoscopy suite at Central Medical Center.

QUESTIONS ABOUT MEDICAL RECORD 14.2

Write your answers in the spaces provided.

1. Below are medical terms used in the progress note you have not yet encountered in this text. Underline each where it appears in the record and define below:

cannulated _____

pediculated _____

verge _____

snare _____

2. Describe the screening procedure performed by Dr. Kolima prior to Mr. Villata's referral to Dr. Blain:

3. In your own words, not using medical terminology, briefly describe the procedure performed by Dr. Blain and the indications for which the patient was referred:

4. The procedure was performed with Mr. Villata in what position?

- a. lying flat, face down
- b. lying flat, face up
- c. lying on his side
- d. sitting

5. Put the following actions in order by numbering them 1 to 12:

- _____ location of the cecum was confirmed by internal and external landmarks
- _____ video colonoscope was inserted in the rectum and advanced carefully to the cecum
- _____ hemorrhoids were noted
- _____ terminal ileum was then cannulated
- _____ scope was straightened, air was aspirated, and scope was withdrawn
- _____ scattered diverticula were noted in the sigmoid colon
- _____ lining of the colon was thoroughly inspected
- _____ polyp was removed using a snare and submitted to pathology lab for biopsy
- _____ pediculated 4 mm polyp was seen in the sigmoid colon
- _____ scope was brought back to the rectum and retroflexed
- _____ patient was placed in the left lateral decubitus position
- _____ scope was brought back to the cecum and then gradually withdrawn

6. Translate the statement noting that “a pediculated 4-mm polyp was seen in the sigmoid colon”:

7. How many inches from the anal verge was the polyp? _____

8. Write the sentence that describes the polypectomy that was performed:

9. Name and describe the condition for which a high-fiber diet was indicated in the Plan:

10. Describe the third condition Dr. Blain listed in his assessment of Mr. Villata. Include the degree of severity and any treatment planned:

11. In your own words, describe the recommendations outlined in the Plan that will be made depending on the results of the biopsy:

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ENDOSCOPY LABORATORY REPORT

PATIENT: Villata, Antonio

DATE: 4/29/20xx

PROCEDURE PERFORMED: COLONOSCOPY WITH BIOPSY

INDICATIONS: This is a 54-year-old white male referred to me for evaluation of a polyp found during a screening sigmoidoscopy by Dr. Kolima. A complete colonoscopy is being done to remove the polyp and rule out other concurrent lesions.

CONSENT: The procedure and its risks including bleeding, infection, perforation, and sedative reaction have been explained to the patient, and informed consent was obtained.

INSTRUMENT USED: Olympus video colonoscope.

MEDICATIONS GIVEN: Demerol 50 mg and Versed 3 mg in divided doses. The patient had stable vital signs. A Fleets Phospho-Soda prep provided good visualization.

PROCEDURE: The patient was placed in the left lateral decubitus position. After adequate sedation, a rectal examination was performed. No masses were felt. The video colonoscope was inserted in the rectum and advanced carefully to the cecum. The location of the cecum was confirmed by internal and external landmarks, and photographic documentation was obtained. The terminal ileum was then cannulated. This was normal to about 2 cm. The scope was brought back to the cecum and then gradually withdrawn. The lining of the colon was thoroughly inspected. There were scattered diverticula noted in the sigmoid colon. A pediculated 4 mm polyp was seen in the sigmoid colon at 30 cm from the anal verge. This was removed using a snare and submitted to pathology lab for biopsy. The scope was brought back to the rectum and retroflexed. Minimal hemorrhoids were noted. The scope was straightened, air was aspirated, and the scope was withdrawn. The patient tolerated the procedure well.

IMPRESSION:

1. POLYP ON SIGMOID COLON AT 30 CM.
2. SIGMOID DIVERTICULAR DISEASE.
3. HEMORRHOIDS.

PLAN:

1. A high-fiber diet is indicated.
2. Await pathology results. If adenomatous, a full colonoscopy is indicated in 3 years. If hyperplastic or normal, a colonoscopy is indicated in 10 years.



Roger Blain, M.D.

RB:mw

D: 4/29/xx

T: 5/1/xx

cc: R. Kolima, M.D.

MEDICAL RECORD 14.3

At age 77, Kathleen Hillman has been in fairly good health. But 1 week ago, she developed what she called “stomach problems” that led to frequent vomiting. She refused to seek medical help at first, until her daughter coaxed her into calling her family practitioner, Dr. Shigeda. Once she learned how serious Ms. Hillman’s problem had become, Dr. Shigeda urged her to go to the emergency room immediately.

Directions

Read Medical Record 14.3 for Kathleen Hillman (pages 479–481) and answer the following questions. This record is the consultation report dictated by Dr. Flagstone after he examined her in the emergency room at Central Medical Center.

QUESTIONS ABOUT MEDICAL RECORD 14.3

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

rebound tenderness _____

abdominal guarding _____

dehydration _____

stasis dermatitis _____

intractable _____

- What was Ms. Hillman’s complaint that led her to call Dr. Shigeda, who then sent her to the emergency room at Central Medical Center?

- From the list of medications Ms. Hillman is taking, one includes an abbreviation that has been deemed error prone. Identify the abbreviation, potential problem, and preferred wording.

Abbreviation

Potential Problem

Preferred Wording

- According to Dr. Flagstone’s initial impression, which factor in Ms. Hillman’s present history might be a cause of her gastrointestinal symptoms?
 - her drinking
 - stress from living with her daughter
 - her allergies
 - her arthritis medications

5. Describe the two previous operations Ms. Hillman has had involving the musculoskeletal system:

6. Using nonmedical language, explain what Ms. Hillman does not remember exactly about her gastrointestinal history two decades ago:

7. Check all of the findings below that Dr. Flagstone noted in the physical examination of Ms. Hillman:

dehydration

pulse 98

icterus in the whites of the eyes

chronic stasis dermatitis

varicose veins

irregular heart rate

vaginal infection

possible atrial fibrillation

parotitis

yellowing of the skin

multiple ecchymoses

clear lungs

8. Does Ms. Hillman have blood in her stool? Write the phrase from the medical record that indicates this:

9. In your own words, explain the initial diagnoses, including the possibilities to eliminate:

a. _____

b. _____

c. _____

10. Dr. Flagstone's plan calls for administering medications, checking tests, and performing a procedure. Fill in the details below:

Administered to Ms. Hillman

a. _____

b. _____

c. _____

Check Ms. Hillman's

d. _____

e. _____

f. _____

Perform

g. _____

11. In your own words, describe stool culture and sensitivity:

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CONSULTATION**REASON FOR CONSULTATION:**

This 77-year-old female presented herself to the emergency room with a one-week history of rather severe nausea and vomiting and also diarrhea and epigastric pain; she was sent by Dr. Shigeda, her family practitioner. The most troubling symptom for her is the vomiting and nausea because she vomits everything she drinks and eats. The epigastric pains are tolerable. The diarrhea also has somewhat improved. The patient's bowel movements usually are normal without history of black or bloody stools. Her appetite has been down markedly, and she has lost at least two to three pounds in the last several days. Her urination is normal. She does not drink or smoke. Her last admission was about a month ago after a fall.

MEDICATIONS: Prednisone, 10 mg, 1 q.i.d.; Naprosyn, 250 mg, 1 q noc; Voltaren 1 q d; penicillamine t.i.d.; and Mylanta and Tylenol p.r.n.

ALLERGIES: Demerol, which gives her severe confusion lasting for days.

PAST MEDICAL HISTORY/REVIEW OF SYSTEMS:

The patient has reading glasses. There is no history of cephalalgia, diplopia, or tinnitus. There is no history of thyroid disease. **CARDIOPULMONARY:** There is no history of angina, dyspnea, hemoptysis, emphysema, hypertension, or heart murmurs. **GASTROINTESTINAL:** The patient had peptic ulcer disease about 20 years ago, nonbleeding, and does not remember whether it was gastric or duodenal. It was healed by diet and antacids. There has been no recurrence since. There is no history of gallbladder disease, hepatitis, pancreatitis, or colitis. However, years ago, she was told she had diverticulosis. **GENITOURINARY:** She is Gravida III Para III (3 pregnancies and 3 live births). Her last menstrual period was some 25 years ago. There is no history of dysuria, hematuria, or nephrolithiasis. **MUSCULOSKELETAL:** The patient has had severe rheumatoid arthritis for about 20 years and has been in treatment with Dr. Clemons. The disease is relatively well controlled with the above-mentioned medications. She had a right hip replacement in 20xx and left knee arthroscopy. **NEUROMUSCULAR:** There is no history of loss of consciousness or seizure disorder. **PSYCHIATRIC REVIEW:** Negative.

FAMILY HISTORY:

All siblings and parents died of old age.

SOCIAL HISTORY:

The patient is a widow. She lives with her daughter.

(continued)

CONSULTATION
Page 1
October 19, 20xx

PT. NAME: HILLMAN, KATHLEEN E.
ID NO: IP-990960
ROOM NO: 508
ATT. PHYS: R. FLAGSTONE, M.D.

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PHYSICAL EXAMINATION:

GENERAL: The patient appeared to be in moderate to severe distress, appearing pale, chronically ill, with dehydration.

VITAL SIGNS: Blood pressure, lying: 100/70. Blood pressure, sitting: 90/65. Temperature: 98°C. Pulse: 80; went to 100 on sitting up. Respirations: 12.

HEENT: Head: Normocephalic. Eyes: Pupils equal, round, reactive to light and accommodation. No scleral icterus. Fundi benign. Ears, nose, throat, and mouth were unremarkable.

NECK: Supple. No lymphadenopathy. No thyromegaly.

CHEST: Chest, costovertebral angle, and back were nontender.

LUNGS: Clear to percussion and auscultation.

HEART: There was an irregular rate, possibly atrial fibrillation, with a II/VI systolic ejection-type murmur mostly along the left sternal border.

ABDOMEN: Soft. There was moderate epigastric tenderness. There was no hepatosplenomegaly, no guarding, no rebound tenderness, no masses, no ascites, and no abdominal bruits.

VAGINAL EXAMINATION: Refused.

RECTAL EXAMINATION: Good sphincter tone. Light brown, semiformal stool in the rectal ampulla, which was occult blood negative.

EXTREMITIES: No edema. No varicose veins. Good peripheral pulses. No clubbing. No palmar erythema. There were, however, brownish changes of chronic stasis dermatitis.

SKIN: The skin showed 10–15% dehydration without jaundice. There were multiple ecchymoses secondary to the patient's prednisone.

(continued)

CONSULTATION
Page 2
October 19, 20xx

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CONSULTATION**INITIAL IMPRESSION:**

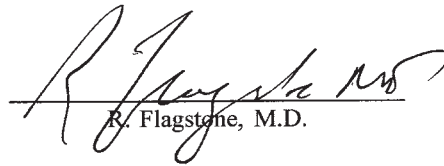
1. SEVERE NAUSEA AND VOMITING, INTRACTABLE, WITH DEHYDRATION, PROBABLY SECONDARY TO MEDICATION-INDUCED GASTRITIS OR POSSIBLE RECURRENT PEPTIC ULCER DISEASE.
2. R/O POSSIBLE PANCREATITIS SECONDARY TO PREDNISONE OR PENICILLAMINE.
3. R/O POSSIBLE VIRAL GASTROENTERITIS, THOUGH LESS LIKELY.

SECONDARY DIAGNOSES:

1. HISTORY OF LONG-STANDING, ADVANCED RHEUMATOID ARTHRITIS WITH LEFT KNEE SURGERY AND RIGHT HIP REPLACEMENT.
2. HISTORY OF DIVERTICULOSIS AND PREVIOUS PEPTIC ULCER DISEASE.

PLAN:

The patient will be admitted at least for a 23-hour hold and is then to be reevaluated and will receive fluid volume replacement and potassium replacement; she will have her electrolytes checked, as well as her blood count, and will also be placed on Zantac intravenously. She will then have a gastroscopy in the morning. Her stools will also be checked, if they are still loose, for further occult blood, ova, and parasites, and a possible culture and sensitivity.



R. Flagstone, M.D.

RF:ti

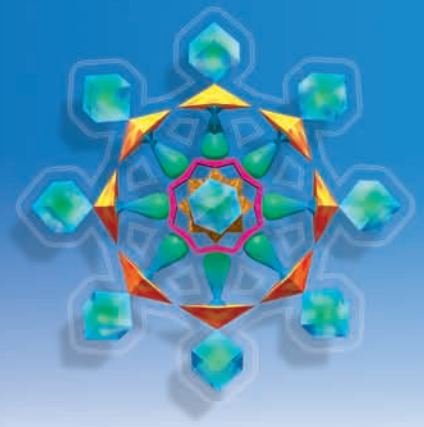
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CONSULTATION
Page 3
October 19, 20xx

PT. NAME: HILLMAN, KATHLEEN E.
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Urinary System



OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define common term components used in relation to the urinary system
- ◆ Describe the basic functions of the urinary system
- ◆ Define the basic anatomical terms referring to the urinary system
- ◆ Define common symptomatic and diagnostic terms referring to the urinary system
- ◆ List the common diagnostic tests and procedures related to the urinary system
- ◆ Define common operative terms referring to the male reproductive system
- ◆ Identify common therapeutic terms including drug classifications related to the urinary system
- ◆ Explain terms and abbreviations used in documenting medical records involving the urinary system

Combining Forms

Combining Form	Meaning	Example
albumin/o	protein	albuminoid al-byū'min-oyd
bacteri/o	bacteria	bacterium bak-tēr'ē-ŭm
cyst/o	bladder or sac	cystoscope sis'tō-skōp
vesic/o		vesicotomy ves'i-kot'ō-mē
dips/o	thirst	polydipsia pol-ē-dip'sē-ă
glomerul/o	glomerulus (little ball)	glomerular glō-mār'yū-lār
gluc/o	sugar	glucogenic gloo-kō-jen'ik
glucos/o		glucose glū'kōs
glyc/o		glycolysis glī-kol'i-sis

Combining Form	Meaning	Example
ket/o	ketone bodies	ketosis kē-tō'sis
keton/o		ketonuria kē-tō-nū'rē-ă
lith/o	stone	lithiasis li-thī'ă-sis
meat/o	meatus (opening)	meatal mē-ā'tăl
nephr/o	kidney	nephrosis ne-frō'sis
ren/o		renal rē'năl
pub/o	pubic bone (lower front portion of hip bone) (see Figs. 6.1 and 15.1)	suprapubic soo-pră-pyu'bik
pyel/o	renal pelvis (basin)	pyelonephrosis pī'ě-lō-ne-frō'sis
py/o	pus	pyonephritis pī'ě-lō-ne-frī'tis
ureter/o	ureter	ureterolithiasis yū-rē'ter-ō-li-thī'ă-sis
urethr/o	urethra	urethrodynea yū-rē-thrō-din'ē-ă
ur/o	urine	urologist yū-rol'ō-jist
urin/o		urinary yūr'i-nār-ē

Urinary System Overview

The urinary system includes the organs and structures involved in the secretion and elimination of urine: kidneys, ureters, urinary bladder, and urethra (Fig. 15.1). The principal organs of the urinary system, the *kidneys*, are located on each side of the lumbar region. They filter the blood and secrete water and nitrogenous wastes (e.g., urea, creatinine) in the form of *urine*.

The functional unit of the kidney is called the *nephron*. Each nephron consists of a *glomerulus*, the little ball-shaped cluster of capillaries at the top; *Bowman's capsule*, the top part that encloses the nephron; and a *renal tubule*, the stem portion of the nephron. Approximately one million nephrons make up the *cortex*, the outer part of each kidney. They gather waste substances by filtering the blood that enters the kidney through the *renal artery* at the *hilum*, the prominent indented portion. In the *medulla*, the inner portion of the kidney, the *calyces* collect urine from the tubules of the nephrons and drain their contents into the *renal pelvis*, the basin-like portion of the ureter within the kidney.

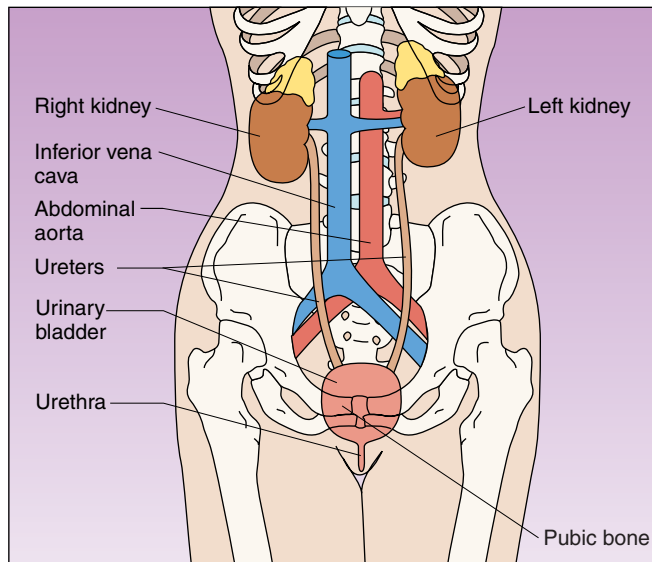


Figure 15.1 Urinary system.

The *ureters*, usually one for each kidney, are tubes that carry the urine from the kidney to the *urinary bladder*, where it is held until being expelled during *urination* (micturition). The *urethra* is the single canal that carries urine from the bladder to the outside of the body. The *urethral meatus* is the opening in the urethra to the outside of the body.

In addition to excreting waste products such as urea and creatinine, the kidneys play an essential life-sustaining role by regulating the levels of critical elements such as water, sodium, and potassium.

Anatomical Terms

Term	Meaning
kidneys kid'nēz	two structures located on each side of the lumbar region that filter blood and secrete impurities, forming urine (Fig. 15.2)
cortex kōr'teks	outer part of the kidney (cortex = bark)
hilum hī'lūm	indented opening in the kidney where vessels enter and leave
medulla me-dūl'ă	inner part of the kidney
calyces (calices) kal'i-sēz	system of ducts carrying urine from the nephrons to the renal pelvis (kalyx = cup of a flower)
nephron nef'ron	microscopic functional units of the kidney, comprised of kidney cells and capillaries, each capable of forming urine (see Fig. 15.2)
glomerulus glō-mār'yū-lūs	little ball-shaped cluster of capillaries located at the top of each nephron
Bowman's capsule bō-mēnz kap'sūl	top part of the nephron that encloses the glomerulus

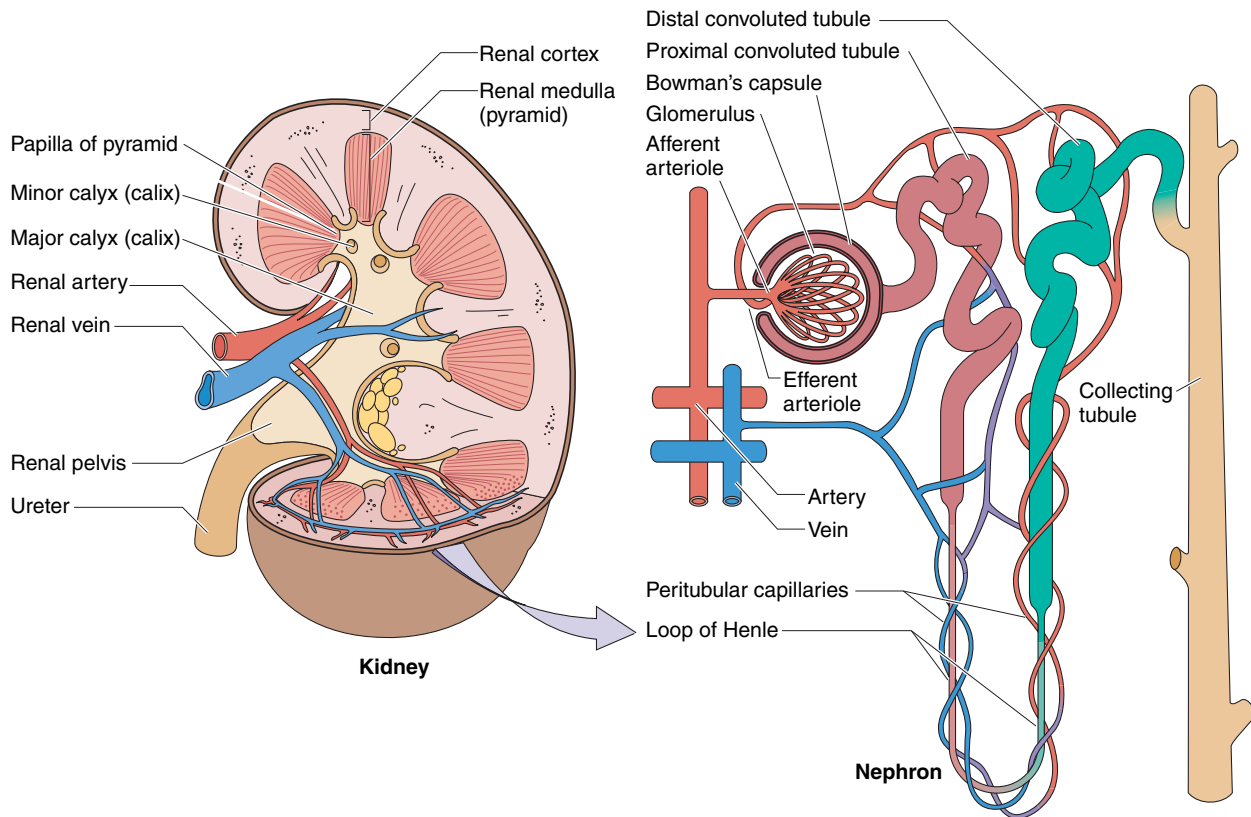


Figure 15.2 Kidney and nephron.

Term	Meaning
renal tubule rē'nāl tū'byūl	stem portion of the nephron
ureter ū-rē'ter	tube that carries urine from the kidney to the bladder
renal pelvis rē'nāl pel'vis	basin-like portion of the ureter within the kidney
ureteropelvic junction yū'rē'ter-ō-pel'vik	point of connection between the renal pelvis and ureter
urinary bladder yūr'i-nār-ē	sac that holds the urine
urethra yū-rē'thrā	single canal that carries urine to the outside of the body
urethral meatus mē-ā'tūs	opening in the urethra to the outside of the body
urine yūr'in	fluid produced by the kidneys containing water and waste products
urea yū-rē'ā	waste product formed in the liver, filtered out of the blood by the kidneys, and excreted in urine
creatinine krē-at'i-nēn	waste product of muscle metabolism filtered out of the blood by the kidneys and excreted in urine

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC	
albuminuria al-byū-mi-nū'rē-ă	presence of albumin in the urine; occurs in renal disease or in normal urine after heavy exercise
proteinuria prō-tē-nū'rē-ă	
anuria an-yū'rē-ă	absence of urine formation
bacteriuria bak-tēr-ē-ū'rē-ă	presence of bacteria in the urine
dysuria dis-yū'rē-ă	painful urination
enuresis en-yū-rē'sis	to void urine; involuntary discharge of urine, most often refers to a lack of bladder control
nocturnal enuresis nok-ter'nāl	bed wetting during sleep
hematuria hē-mă-tū'rē-ă	presence of blood in the urine (Fig. 15.3)
glucosuria gloo-kōs-yur'ē-ă	glucose (sugar) in the urine
incontinence in-kon'ti-nens	involuntary discharge of urine or feces
stress urinary incontinence (SUI)	involuntary discharge of urine at the time of cough, sneeze, and/or strained exercise
ketonuria kē-tō-nū'rē-ă	presence of ketone bodies in the urine
ketone bodies kē'tōn	acetone, beta-hydroxybutyric acid, and acetoacetic acid are products of metabolism that appear in the urine as a result of an abnormal utilization of carbohydrates; seen in uncontrolled diabetes and starvation
ketone compounds	



INCONTINENCE.

The Latin word continent means to hold in, and the prefix in- means not. In Shakespeare's time, incontinently was used to mean immediately. Today, incontinence specifically refers to the inability to prevent the discharge of excretions, especially urine or feces.

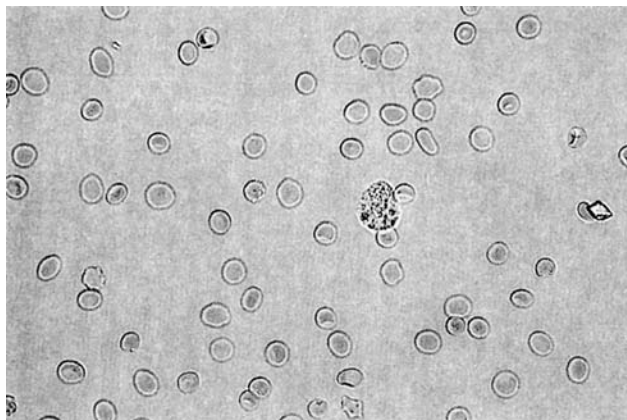


Figure 15.3 Hematuria. Microscopic urine showing a large number of red blood cells. One lone white blood cell is present in the center of the field.

Term	Meaning
nocturia nok-tū'rē-ă	urination at night
oliguria ol-i-gū'rē-ă	scanty production of urine
polyuria pol-ē-yū'rē-ă	condition of excessive urination
pyuria pī-yū'rē-ă	presence of white cells in the urine, usually indicating infection (Fig. 15.4)
urinary retention yūr'i-nār-ē rē-ten'shŭn	retention of urine owing to the inability to void (urinate) naturally because of spasm, obstruction, etc.
DIAGNOSTIC	
adult polycystic kidney disease (APKD)	inherited condition of multiple cysts that gradually form in the kidney, causing destruction of normal tissue that leads to renal failure—diagnosed in adults presenting with hypertension, kidney enlargement, and recurrent urinary tract infections
glomerulonephritis glō-mār'yū-lō-nef-rī'tis	form of nephritis involving the glomerulus
hydronephrosis hī'drō-ne-frō'sis	dilation and pooling of urine in the renal pelvis and calyces of one or both kidneys caused by an obstruction in the outflow of urine (Fig. 15.5)
nephritis ne-frī'tis	inflammation of the kidney
pyelonephritis pī'ē-lō-ne-frī'tis	inflammation of the renal pelvis

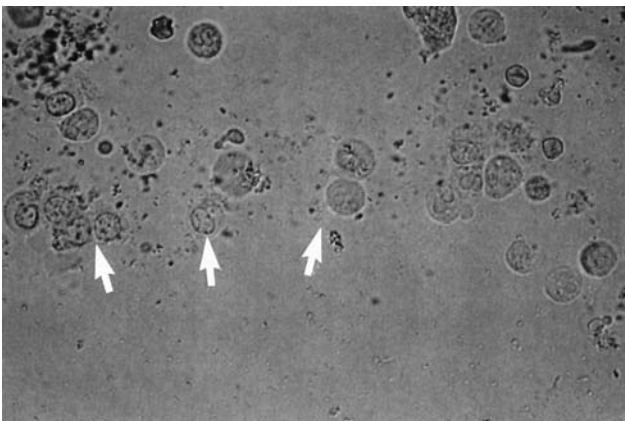


Figure 15.4 Pyuria. Microscopic urine showing the presence of white blood cells (arrows).

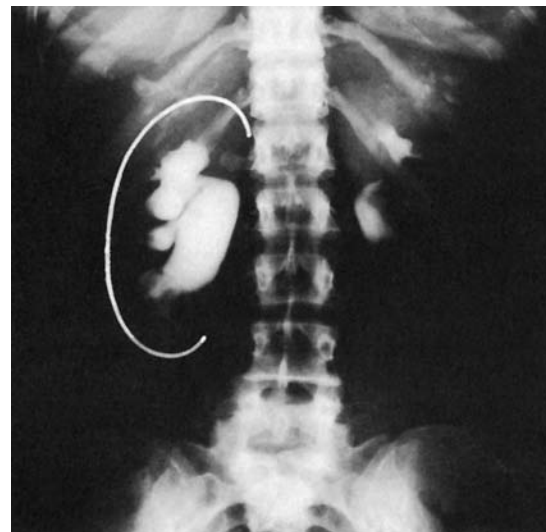


Figure 15.5 Collection of contrast media in the kidney displays an extraordinary amount of material, which indicates right-sided hydronephrosis caused by obstruction in the ureter.

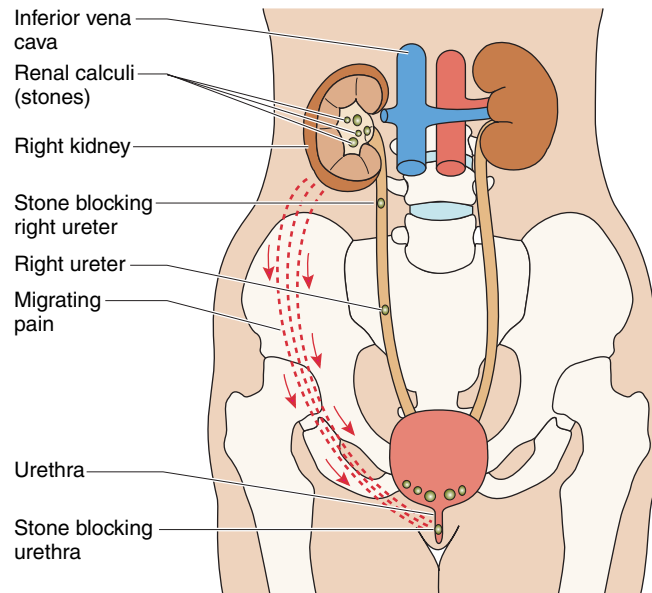


Figure 15.6 Kidney stone formation.

Term	Meaning
nephrosis ne-frō'sis	degenerative disease of the renal tubules
nephrolithiasis nef'rō-li-thī'ă-sis	presence of renal stone or stones caused by mineral buildup in the kidneys—most commonly as a result of hyperuricuria (excessive amount of uric acid in the urine) or hypercalciuria (excessive amount of calcium in the urine) (Fig. 15.6)
cystitis sis'tī'tis	inflammation of the bladder
urethritis yū-rē-thrī'tis	inflammation of the urethra
urethrocystitis yū-rē'thrō-sis-tī'tis	inflammation of the urethra and bladder
urethral stenosis yū-rē'thrāl ste-nō'sis	narrowed condition of the urethra
urinary tract infection (UTI)	invasion of pathogenic organisms (commonly bacteria) in the structures of the urinary tract, especially the urethra and bladder; symptoms include dysuria, urinary frequency, and malaise
uremia yū-rē'mē-ă	excess of urea and other nitrogenous waste in the blood as a result of kidney failure
azotemia az-ō-tē'mē-ă	

Diagnostic Tests and Procedures

Test or Procedure	Explanation
cystometrogram sis-tō-met'rō-gram	record that measures urinary volume, bladder pressure, and capacity to evaluate urinary dysfunction such as incontinence

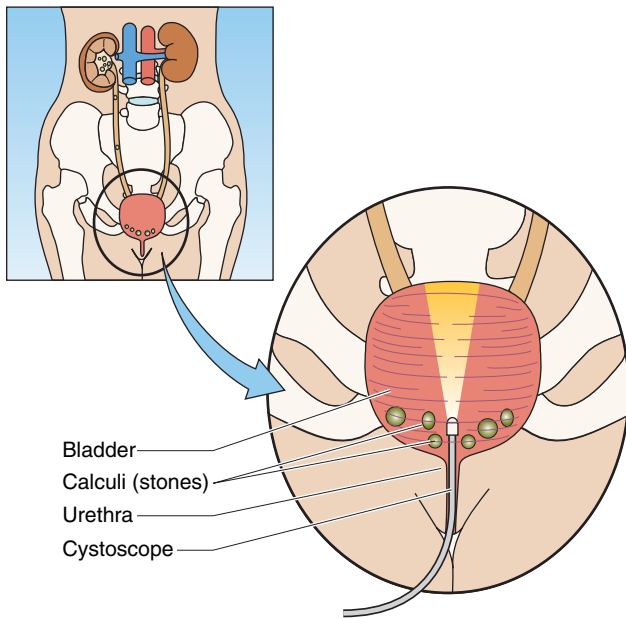


Figure 15.7. Cystoscopy.

Test or Procedure	Explanation
cystoscopy sis-tos'kō-pē	examination of the bladder using a rigid or flexible cystoscope (Fig. 15.7)
kidney biopsy (Bx) renal biopsy	removal of kidney tissue for pathological examination
radiography rā'dē-og'rā-fē	x-ray studies commonly used in urology
intravenous pyelogram (IVP) in'trā-vē'nūs pī'el-ō-gram intravenous urogram	x-rays of the urinary tract taken after iodine is injected into the bloodstream and as the contrast passes through the kidney, revealing obstruction, evidence of trauma, etc. (see Fig. 15.5)
kidney, ureter, bladder (KUB)	abdominal x-ray of kidney, ureter, and bladder typically used as a scout film before doing an IVP (Fig. 15.8)
scout film	plain x-ray taken to detect any obvious pathology before further imaging (e.g., a KUB before an IVP)
renal angiogram (arteriogram) an'jē-ō-gram	x-ray of the renal artery made after injecting contrast material into a catheter in the artery
retrograde pyelogram (RP) ret'rō-grād	x-ray of the upper urinary tract taken after contrast medium is injected up to the kidney by way of a small catheter passed through a cystoscope—done to detect the presence of stones or obstruction
voiding (urinating) cystourethrogram (VCU or VCUG) sis-tō-yū-rēth'rō-gram	x-ray of the bladder and urethra taken during urination
abdominal sonogram son'ō-gram	ultrasound image of the urinary tract including the kidney, ureters, and bladder



Figure 15.8 KUB showing kidney stones in ureters and bladder (arrows).

LABORATORY TESTING

Test or Procedure	Explanation
urinalysis (UA) yū-ri-nal'i-sis	physical, chemical, and microscopic examination of urine (Fig. 15.9)
specific gravity (SpGr)	measure of the kidney's ability to concentrate or dilute urine
pH	measure of the acidity or alkalinity of urine
glucose (sugar) glū'kōs	chemical test used to detect sugar in the urine, used most often to screen for diabetes
albumin (alb) al-byū'min	chemical test used to detect albumin in the urine
protein	
ketones	chemical test used to detect ketone bodies in the urine; if positive, fats are being utilized by the body instead of carbohydrates, which occurs in starvation or an unstable diabetic state

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MR# :	TEST-221			SEX: M
ACCT # :	H11111111			

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URINE BASIC

Color	STRAW		
Appearance	CLEAR		
Specific Gravity	1.010	[1.003 - 1.035]	
pH	5.5	[5.0 - 9.0]	
Protein	NEG	[0 - 10]	MG/DL
Glucose	NEG	[NEG]	
Ketones	NEG	[NEG]	
Bilirubin	NEG	[NEG]	
Urine Occult Blood	NEG	[NEG]	
Nitrites	NEG		

URINE MICROSCOPIC

Epithelial Cells	3 to 4	/HPF
WBCs	0 to 1	/HPF
RBCs	0	/HPF
Bacteria	0	
Mucous Threads	0	

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END OF REPORT

PAGE 1
INTERIM REPORT

Figure 15.9 Sample urinalysis report.

Test or Procedure	Explanation
occult blood, urine	chemical test used to detect hidden blood in the urine resulting from red blood cell hemolysis—indicates bleeding in the kidneys (occult = hidden)
bilirubin bil-i-rū'bin	chemical test used to detect bilirubin in the urine—seen in gallbladder and liver disease
urobilinogen yūr-ō-bī-lin'ō-jen	chemical test used to detect bile pigment in the urine—increased amounts seen in gallbladder and liver disease
nitrite nī'trīt	chemical test used to detect bacteria in the urine
microscopic findings mī-krō-skop'ik	microscopic identification of abnormal constituents in the urine (e.g., red blood cells, white blood cells, casts) as reported per high- or low-power field (hpf or lpf) (see Figs. 15.3 and 15.4)
urine culture and sensitivity (C&S)	isolation of a urine specimen in a culture medium that propagates the growth of microorganisms; organisms that grow in the culture are identified, and drugs to which they are sensitive are listed
blood urea nitrogen (BUN) yū-rē'ānī'trō-jen	blood test to determine the level of urea in the blood—a high BUN indicates the kidney's inability to excrete urea
creatinine, serum krē-at'i-nēn sēr'ŭm	test to determine the level of creatinine in the blood—useful in assessing kidney function
creatinine, urine	test to determine the level of creatinine in the urine
creatinine clearance testing	measurements of the level of creatinine in the blood and a 24-hour urine specimen to determine the rate that creatinine is “cleared” from the blood by the kidneys

Operative Terms

Term	Meaning
urologic endoscopic surgery yūr-ō-loj'ik-ăl	use of specialized endoscopes (e.g., resectoscope) within the urinary tract to perform various surgical procedures, such as resection of a tumor, repair of an obstruction, stone retrieval, or placement of a stent (Fig. 15.10)
resectoscope rē-sek'tō-skōp	urologic endoscope sent through the urethra to resect (cut and remove) lesions of the bladder, urethra, or prostate
intracorporeal lithotripsy in'tră-kōr-pō'rē-ăl lith'ō-trip-sē	method of destroying stones within the urinary tract using electrical energy discharges transmitted to a probe within a flexible endoscope—most commonly used to pulverize bladder stones (Fig. 15.11)
nephrotomy ne-frot'ō-mē	incision into the kidney

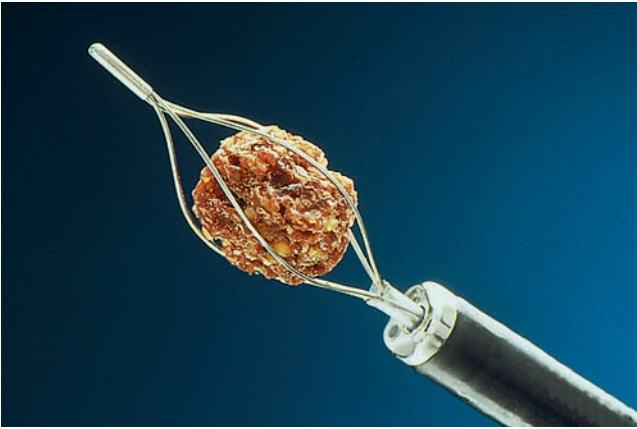


Figure 15.10 Stone basket used in kidney stone retrieval.

Term	Meaning
nephrorrhaphy nef-rōr'ā-fē	suture of an injured kidney
nephrolithotomy nef'rō-li-thot'ō-mē	incision into the kidney for the removal of stones
nephrectomy ne-frek'tō-mē	excision of a kidney
pyeloplasty pī'e-lō-plas-tē	surgical reconstruction of the renal pelvis
stent placement	use of a device to hold open vessels or tubes (e.g., an obstructed ureter) (Fig. 15.12)
kidney transplantation renal transplantation	transfer of a kidney from the body of one person (donor) to another (recipient) (Fig. 15.13)
urinary diversion	creation of a temporary or permanent diversion of the urinary tract to provide a new passage through which urine exits the body—used to treat defects or disease such as bladder cancer

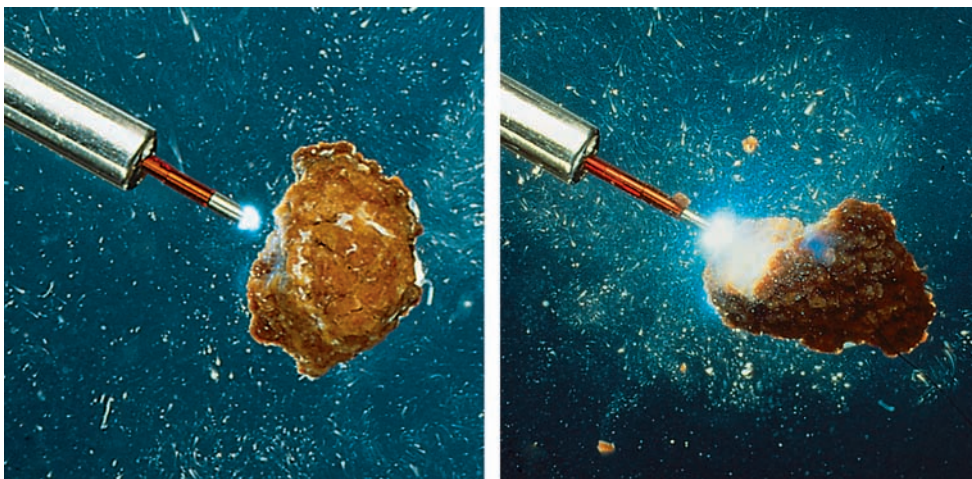


Figure 15.11 Simulation of the pulverizing of stones performed by intracorporeal lithotripsy.

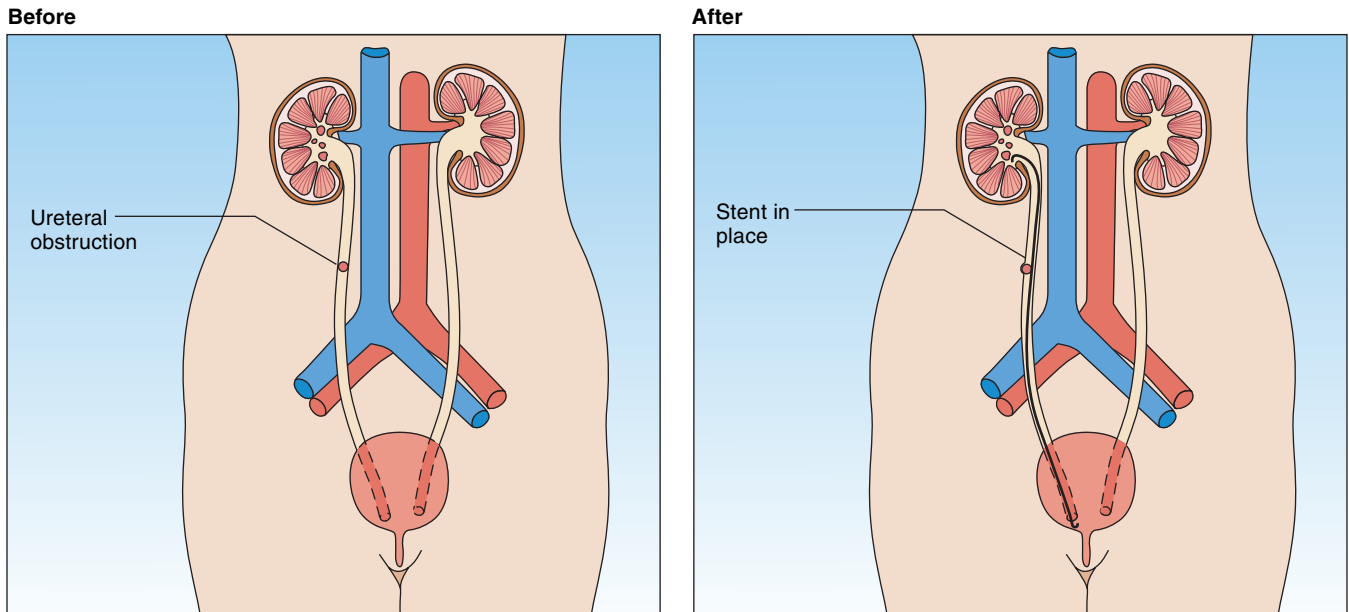


Figure 15.12 Placement of a double-J stent to relieve ureteral obstruction.

Term	Meaning
common types of urinary diversion:	
noncontinent ileal conduit non-kon'ti-nent il'ē-āl kon'dū-it	removal of a portion of the ileum to use as a conduit to which the ureters are attached at one end; the other end is brought through an opening (stoma) created in the abdomen—urine drains continually into an external appliance (bag) (Fig 15.14)
continent urostomy kon'ti-nent yūr-os'tō-mē	internal reservoir (pouch) constructed from a segment of intestine that diverts urine through an opening (stoma) that is brought through the abdominal wall; a valve is created internally to prevent leakage, and the patient empties the pouch by catheterization
orthotopic bladder (neobladder)	bladder constructed from portions of intestine connected to the urethra, allowing “natural” voiding

***Continent** refers to the ability to hold or retain urine. **Noncontinent** indicates that urine cannot be held and drains continually.

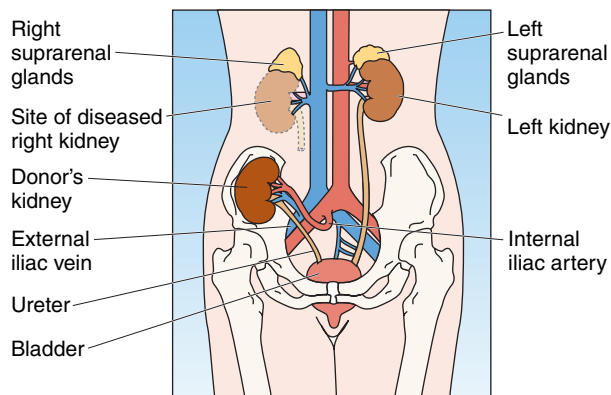


Figure 15.13 Common site for donor kidney transplantation.

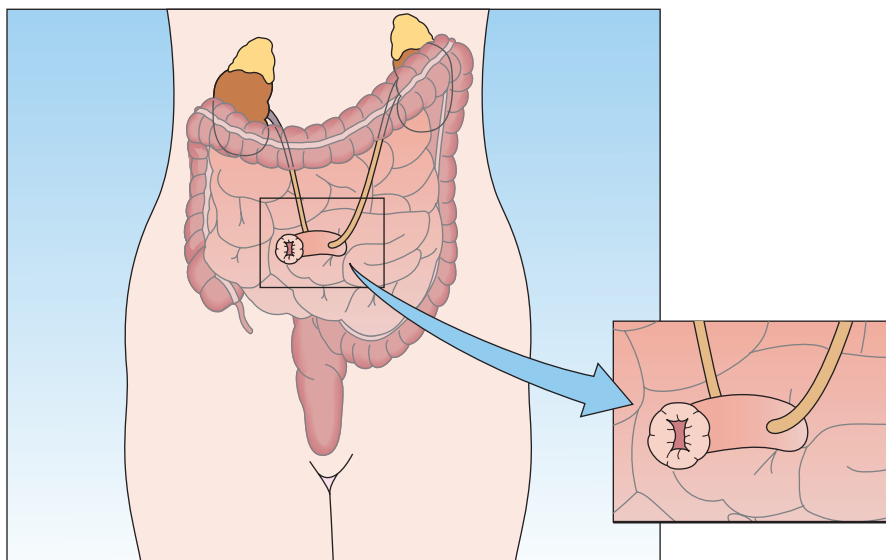


Figure 15.14 Urostomy: ileal conduit.

Therapeutic Terms

Term	Meaning
extracorporeal shock wave lithotripsy (ESWL) eks'tră-kōr-pō'rē-ăl lith'ō-trip-sē	procedure using ultrasound to penetrate the body from outside and bombard and disintegrate a stone within—most commonly used to treat urinary stones above the bladder (Fig. 15.15)
kidney dialysis dī-al'i-sis	methods of filtering impurities from the blood to replace the function of one or both kidneys due to renal failure
hemodialysis hē-mō-dī-al'i-sis	method to remove impurities by pumping the patient's blood through a dialyzer, the specialized filter of the artificial kidney machine (hemodialyzer)

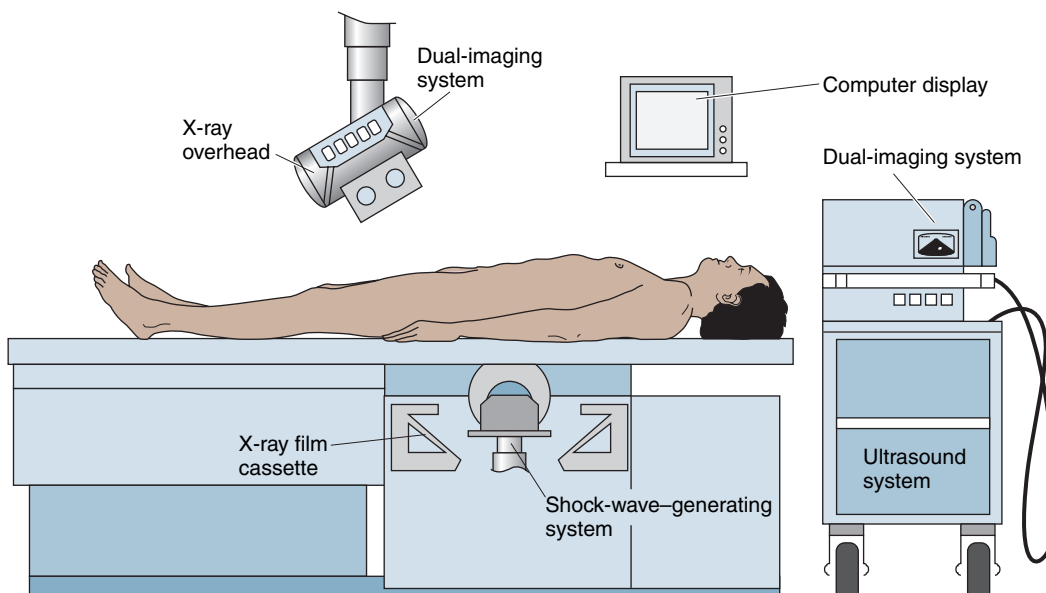


Figure 15.15 Shock wave system for extracorporeal lithotripsy of kidney stones.

Term	Meaning
peritoneal dialysis per-i-tō-nē'ăl	method of removing impurities using the peritoneum as the filter; catheter insertion in the peritoneal cavity is required to deliver cleansing fluid (dialysate) that is washed in and out in cycles
Kegel exercises	specific exercises that strengthen the muscles of the pelvic floor to maintain proper organ placement and retain urine
urinary catheterization	methods of placing a tube into the bladder to drain or collect urine
common types: straight catheter	inserted through the urethra into the bladder to relieve urinary retention or collect a sterile specimen of urine for testing—removed immediately after the procedure
Foley catheter	indwelling catheter inserted through the urethra into the bladder; includes a collection system that allows urine to be drained into a bag—can remain in place for an extended time
suprapubic catheter	indwelling catheter inserted directly into the bladder through an abdominal incision above the pubic bone; includes a collection system that allows urine to be drained into a bag—used in patients requiring long-term catheterization
COMMON THERAPEUTIC DRUG CLASSIFICATIONS	
analgesic an-ăl-jē'zik	drug that relieves pain
antibiotic an'tē-bī-ot'ik	drug that kills or inhibits the growth of microorganisms
antispasmodic an'tē-spaz-mod'ik	drug that relieves spasm
diuretic dī-yū-ret'ik	drug that increases the secretion of urine

Summary of Chapter 15 Acronyms/Abbreviations

alb .....albumin	KUB .....kidney, ureter, bladder
APKD .....adult polycystic kidney disease	RP .....retrograde pyelogram
BUN .....blood urea nitrogen	SpGr .....specific gravity
Bx .....biopsy	SUI .....stress urinary incontinence
C&S .....urine culture and sensitivity	UA .....urinalysis
ESWL .....extracorporeal shock wave lithotripsy	UTI .....urinary tract infection
IVP .....intravenous pyelogram	VCU, VCUG .....voiding cystourethrogram



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

example
 pericystitis
 _____ / _____ / _____
 P R S
peri/cyst/itis
 P R S

DEFINITION: around/bladder or sac/inflammation

1. vesicoureteric

_____ / _____ / _____
 CF R S

DEFINITION: _____

2. bacteriosis

_____ / _____
 R S

DEFINITION: _____

3. transurethral

_____ / _____ / _____
 P R S

DEFINITION: _____

4. urogram

_____ / _____
 CF S

DEFINITION: _____

5. urethrocystitis

_____ / _____ / _____
 CF R S

DEFINITION: _____

6. nephroptosis

_____ / _____
 CF S

DEFINITION: _____

7. polydipsia

_____ / _____ / _____
 P R S

DEFINITION: _____

8. glomerulosclerosis

_____ / _____ / _____
 CF R S

DEFINITION: _____

9. pyonephritis

_____ / _____ / _____
 CF R S

DEFINITION: _____

10. urology

_____ / _____
 CF S

DEFINITION: _____

11. ureterovesicostomy

_____ / _____ / _____
 CF CF S

DEFINITION: _____

12. glycorrhea

_____ / _____
 CF S

DEFINITION: _____

13. meatotomy

_____ / _____
 CF S

DEFINITION: _____

14. pyelonephrosis

_____ / _____ / _____
 CF R S

DEFINITION: _____

15. cystoscopy

_____ / _____
 CF S

DEFINITION: _____

16. suprarenal

_____ / _____ / _____
 P R S

DEFINITION: _____

17. nephrolithiasis

_____ / _____ / _____
 CF R S

DEFINITION: _____

18. ureterocele

_____ / _____
CF S

DEFINITION: _____

19. albuminous

_____ / _____
R S

DEFINITION: _____

20. pyelography

_____ / _____
CF S

DEFINITION: _____

Using nephr/o, the Greek combining form meaning kidney, identify the medical term for the following:

21. _____ inflammation of the kidney
22. _____ degenerative condition of the kidney
23. _____ incision in the kidney
24. _____ suture of a kidney
25. _____ removal of the kidney
26. _____ incision into the kidney for the removal of stones

Complete the following:

27. urethral _____osis = a narrowed condition of the urethra
28. extracorporeal shock wave _____ = procedure for disintegration of kidney stones
29. _____ catheter = indwelling catheter inserted in the bladder through an abdominal incision above the pubic bone
30. _____scope = specialized endoscope to remove lesions from the bladder, prostate gland, and urethra
31. _____ exercises = strengthen muscles of the pelvic floor to maintain proper organ placement and retain urine
32. _____ blood = hidden blood
33. _____ = a record that measures urinary volume, bladder pressure, and capacity
34. peritoneal _____ = method of replacing the function of the kidneys to removing impurities from the blood using the peritoneum as a filter
35. _____ film = plain x-ray taken to detect obvious pathology before further imaging

Identify the medical term for the following:

- 36. _____ inflammation of the bladder
- 37. _____ involuntary discharge of urine or feces
- 38. _____ involuntary discharge of urine
- 39. _____ bed wetting during sleep
- 40. _____ dilation and pooling of urine in the kidney caused by obstruction of outflow of urine
- 41. _____ inherited condition of multiple cysts that gradually form in the kidney in adult life

Using the suffix -uria, name the following conditions of urine:

- 42. _____ urinating at night
- 43. _____ scanty urination
- 44. _____ painful urination
- 45. _____ presence of ketone bodies in the urine
- 46. _____ presence of blood in the urine
- 47. _____ presence of pus (white cells/infection) in the urine

Match the following:

- | | |
|-----------------------------|-----------------|
| 48. _____ sugar | a. cyst/o |
| 49. _____ proteinuria | b. bacteriuria |
| 50. _____ uremia | c. renal Bx |
| 51. _____ ren/o | d. albuminuria |
| 52. _____ vesic/o | e. neobladder |
| 53. _____ diuretic | f. Foley |
| 54. _____ kidney biopsy | g. glyco |
| 55. _____ nitrite | h. nephro |
| 56. _____ catheter | i. azotemia |
| 57. _____ urinary diversion | j. urobilinogen |
| 58. _____ bile pigment | k. urination |

Define the following abbreviations:

59. alb _____

60. IVP _____

61. ESWL _____

62. UTI _____

63. SUI _____

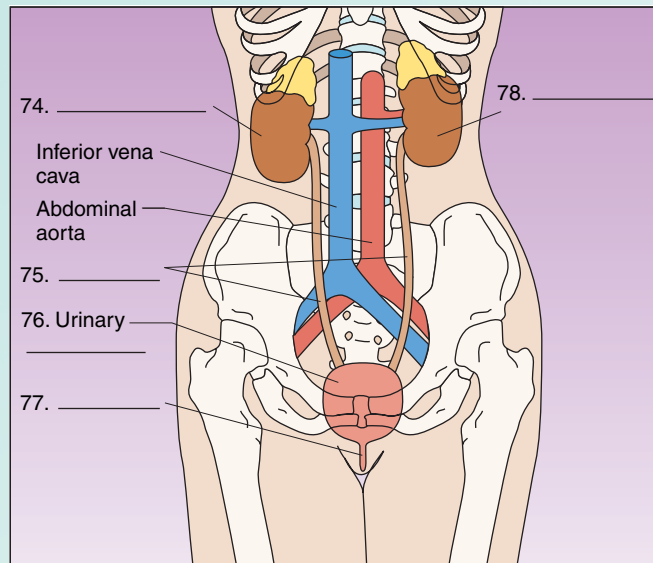
64. BUN _____

For each of the following, circle the combining form that corresponds to the meaning given:

- | | | | |
|--------------------|-----------|---------|-----------|
| 65. urine | hydr/o | ur/o | ren/o |
| 66. thirst | dips/o | crin/o | hidr/o |
| 67. pus | pyel/o | py/o | albumin/o |
| 68. bladder | cyt/o | vesic/o | nephr/o |
| 69. protein | albumin/o | lip/o | bacteri/o |
| 70. kidney | hepat/o | cyst/o | nephr/o |
| 71. opening | or/o | meat/o | orth/o |
| 72. basin | meat/o | vesic/o | pyel/o |
| 73. stone | scler/o | lip/o | lith/o |

Write in the missing words on the blank lines in the following illustration of the urinary anatomy.

74–78.



For each of the following, circle the correct spelling of the term:

- | | | |
|--------------------|-----------------|-----------------|
| 79. cystascope | cystoskope | cystoscope |
| 80. pyleogram | pyelogram | pielogram |
| 81. oliguria | oleguria | oligouria |
| 82. hydronefrosis | hidronephrosis | hydronephrosis |
| 83. azootemia | azothemia | azotemia |
| 84. urinalysis | urinelysis | uranalysis |
| 85. glowmerular | glomerular | glomarular |
| 86. nefrectomy | nephrecktomy | nephrectomy |
| 87. diuretic | dyuretic | diuretik |
| 88. hemodialysis | hemodialysis | hemidialysis |
| 89. cathetersation | catheterization | caththerization |

Give the noun that was used to form the following adjectives:

90. urinary _____
91. glomerular _____
92. meatal _____

93. uremic _____

94. urethral _____

95. nephrotic _____

Write the abbreviation for the following terms:

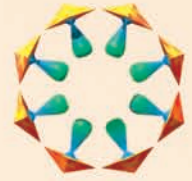
96. urinalysis _____

97. urine culture and sensitivity _____

98. retrograde pyelogram _____

99. x-ray of kidneys, ureters, and bladder _____

100. voiding cystourethrogram _____



MEDICAL RECORD ANALYSES

MEDICAL RECORD 15.1

S: This 70 y.o. female has had polyuria, nocturia, and dysuria \times 2-3 days. She had a similar infection 6 months ago and was treated with Macrobid, 50 mg, qid \times 3d. She has occasional stress incontinence with hard sneezing.

O: The patient is afebrile. UA shows a trace of leukocytes and blood

A: R/O recurrent UTI

P: C&S

Cipro 500 mg tab po bid pending culture

pt instructed to \uparrow fluid intake and call for culture results in 48 h

1. What is the patient's CC?
 - a. the presence of red and white blood cells in her urine
 - b. a urinary tract infection
 - c. pain when she urinates with the need to go often, even at night
 - d. urinary tract infection
2. What were the objective findings?
 - a. culture showed leukocytes and blood in the urine
 - b. urinalysis indicated red and white blood cells present in urine
 - c. bladder infection
 - d. return of bladder infection
3. What was the doctor's impression?
 - a. there were leukocytes and blood in the patient's urine
 - b. the patient has pain when she urinates with the need to go often, even at night
 - c. the pain has a bladder infection
 - d. the patient may have another bladder infection
4. Which medical terms describe the UA findings?
 - a. pyuria and hematuria
 - b. dysuria and enuresis
 - c. bacteriuria and hematuria
 - d. bacteriuria and nocturia
5. To what does C&S refer?
 - a. a condition of urinary stress
 - b. the isolation of microorganisms in the urine
 - c. inflammation of the bladder
 - d. physical, chemical, and microscopic study of urine
6. How should the Cipro be administered?
 - a. two, by mouth every day
 - b. one, by mouth two times a day
 - c. one, by mouth three times a day
 - d. one, by mouth four times a day
7. Was the patient's temperature elevated?
 - a. yes
 - b. no
 - c. nothing is stated about the patient's temperature

MEDICAL RECORD 15.2

Charles Mercier had urination problems and abdominal pain when he saw his doctor, who referred him to Central Medical Center for a possible kidney infection. Dr. Zlatkin performed surgery, and Mr. Mercier was soon doing fine and was discharged. As planned, he later returned for surgical removal of a device that had been temporarily placed during the first surgery.

Directions

Read Medical Record 15.2 for Mr. Mercier (pages 507–508) and answer the following questions. The first record is the discharge summary from the first surgery, dictated by Dr. Zlatkin. The second record is the operative report for Mr. Mercier’s return surgery 6 weeks later, also dictated by Dr. Zlatkin.

QUESTIONS ABOUT MEDICAL RECORD 15.2

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

stent (double J) _____

drain (Jackson-Pratt) _____

lithotomy position _____

ureteral catheter _____

patency _____

- In your own words, not using medical terminology, briefly describe the history of Mr. Mercier’s medical problems identified in the “Discharge Summary”:

- Put the following events reported in the “Discharge Summary” in chronological order by numbering them from 1 to 5:

_____ removal of drain

_____ reconstruction of renal pelvis

_____ difficulty with micturition

_____ urine test for microorganisms

_____ insertion of stent

4. While at home after the operation, Mr. Mercier is instructed to do two things and *not* to do three things. List them below:

Mr. Mercier should _____

Mr. Mercier should not _____

5. When Mr. Mercier returned 6 weeks later for follow-up surgery, describe in your own words the preoperative diagnosis:

6. During the second surgery, an endoscopic procedure and two different x-ray procedures were used to visualize internal structures. List and define each procedure and describe the findings:

<i>Procedure</i>	<i>Definition</i>	<i>Finding</i>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

7. The first surgery included insertion of a specialized device that was then removed in the second surgery. What was this device, and what function did it perform during the time between the two surgeries?

8. In the second surgery, did Mr. Mercier experience any complications? Write the sentence that supports your answer:

CENTRAL MEDICAL CENTER

211 Medical Center Drive • Central City, US 90000-1234

DISCHARGE SUMMARY

DATE OF ADMISSION: 10/25/20xx DATE OF DISCHARGE: 10/29/20xx

ADMITTING DIAGNOSIS:

Left ureteropelvic junction obstruction.

DISCHARGE DIAGNOSIS:

Left ureteropelvic junction obstruction.

PROCEDURE PERFORMED:

Left dismembered pyeloplasty and placement of stent.

BRIEF SUMMARY:

The patient is a 19-year-old male who was admitted to the hospital a month ago with left pyelonephritis. He was found to have a left ureteropelvic junction obstruction. The patient was brought to the hospital at this time for repair of the moderately to severely obstructed left kidney. A preoperative urine culture was sterile. The patient underwent the procedure without complication. A double-J stent was placed. The Jackson-Pratt drain was removed on the second postoperative day because of minimal drainage. The patient initially had urinary retention, but this resolved by the third postoperative day. He was doing fine at the time of discharge. His condition on discharge is good.

INSTRUCTIONS TO THE PATIENT:

1) Regular diet. 2) No heavy lifting, straining, or driving an automobile for six weeks from the day of surgery. He should also keep the incision relatively dry this week. 3) Follow-up in my office in three weeks. 4) It is anticipated the stent will remain indwelling for six weeks and then will be removed cystoscopically at that time. 5) Discharge medication is Tylenol #3, 1-2 q 4 h p.r.n. pain.



L. Zlatkin, M.D.

LZ:mr

D: 10/29/20xx

T: 10/30/20xx

DISCHARGE SUMMARY

PT. NAME: MERCIER, CHARLES F.
 ID NO: IP-392689
 ROOM NO: 444
 ATT. PHYS: L. ZLATKIN, M.D.

CENTRAL MEDICAL CENTER

211 Medical Center Drive • Central City, US 90000-1234

OPERATIVE REPORT

DATE: December 7, 20xx

PREOPERATIVE DIAGNOSIS: Congenital left ureteropelvic junction obstruction status post pyeloplasty. Indwelling left ureteral stent.

POSTOPERATIVE DIAGNOSIS: Congenital left ureteropelvic junction obstruction status post pyeloplasty. Indwelling left ureteral stent, removed.

OPERATION: Cystoscopy, removal of left ureteral stent, and left retrograde pyelogram.

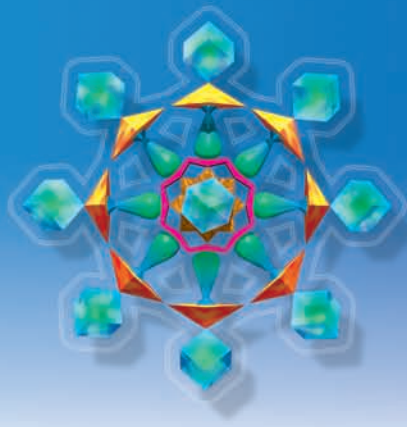
PROCEDURE: The patient was identified, was placed on the operating table, and was administered a general anesthetic. He was placed in the lithotomy position, and a KUB was obtained. The genitalia were prepped and draped in a sterile fashion. After reviewing the KUB, it was noted at this time that the position of the stent was normal. Cystoscopy was performed with a #22 French cystoscope. The stent was identified coming from the left ureteral orifice, and the end was grasped with forceps and removed through the cystoscope. A #8 French cone-tipped ureteral catheter was then placed in the left ureteral orifice and passed to 10 cm. Then, 20 cm³ of contrast was injected into a left collecting system. A film was exposed, and this showed patency without extravasation at the left ureteropelvic junction. There was some filling of calyces and partial filling of the dilated renal pelvis. A drainage film was subsequently obtained showing complete emptying of the pelvis and partial emptying of the mid and distal ureters. Dilated calyces were noted in the kidney. The patient was allowed to awaken and was returned to the recovery room in satisfactory condition. There were no intraoperative complications. He had no bleeding. The patient did receive 1 gm Ancef one-half hour prior to the onset of the procedure.


L. Zlatkin, M.D.

LZ:mr
D: 12/07/20xx
T: 12/08/20xx

OPERATIVE REPORT

PT. NAME: MERCIER, CHARLES F.
ID NO: OP-912689
ROOM NO: ASC
ATT. PHYS: L. ZLATKIN, M.D.



Male Reproductive System

OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define common term components used in relation to the male reproductive system
- ◆ Describe the basic functions of the male reproductive system
- ◆ Define the basic anatomical terms referring to the male reproductive system
- ◆ Define common symptomatic and diagnostic terms referring to the male reproductive system
- ◆ List the common diagnostic tests and procedures related to the male reproductive system
- ◆ Define common operative terms referring to the male reproductive system
- ◆ Identify common therapeutic terms including drug classifications related to the male reproductive system
- ◆ Explain terms and abbreviations used in documenting medical records involving the male reproductive system

Combining Forms

Combining Form	Meaning	Example
balan/o	glans penis	balanoplasty bal'an-ō-plas-tē
epididym/o	epididymis	epididymitis ep-i-did-i-mī'tis
orch/o	testis or testicle	orchitis ōr-kī'tis
orchi/o		orchiopexy ōr'kē-ō-pek'sē
orchid/o		orchidectomy ōr-ki-dek'tō-mē
test/o		testicle tes'tī-kl
perine/o	perineum	perineal per'i-nē'āl



ORCHIO.

Orchio is a Greek root for testicle, so named for the resemblance of the gland to the root of the orchid plant. At one time, orchid root was used to treat diseases of the testicle.

Combining Form	Meaning	Example
prostat/o	prostate	prostatodynia pros'tă-tō-din'ē-ă
sperm/o	sperm (seed)	oligospermia ol-i-gō-sper'mē-ă
spermat/o		spermatic sper-mat'ik
vas/o	vessel	vasorrhaphy vas-ōr'ă-fē

Male Reproductive System Overview

The male reproductive system includes the *scrotum*, *testes*, *epididymides*, *vas deferens*, *seminal vesicles*, *prostate gland*, *bulbourethral glands*, *urethra*, and *penis* (Fig. 16.1). These parts produce and maintain *sperm*, the male reproductive cells, and introduce them into the female reproductive tract for the purpose of fertilizing the female ovum. The male reproductive organs also secrete certain hormones necessary for the maintenance of secondary sexual characteristics in the male.



TESTICLE.

Testicle is from the Latin *testis*, a word that also meant a witness or one who testifies. The presence of the testicles was evidence of virility, and it is said that under Roman law, no man could witness in court unless his testicles were present. An oath was taken with a hand on the testicles. The testicles are also associated with the swearing of oaths in the Old Testament of the Bible.



PENIS.

Penis is a Latin word for tail. The name is also derived from *pendere*, meaning to hang down. The Romans had a great many terms for the male organ—e.g., *cauda* (tail), *clava* (club), *gladius* (sword), *radix* (root), *ramus* (branch), and *vomer* (plough). Penis was adopted as the anatomical term, and it has been used in English since the 17th century.

Anatomical Terms

Term	Meaning
scrotum skrō'tŭm	a bag; skin-covered pouch in the groin that is divided into two sacs, each containing a testis and an epididymis
testis (testicle) tes'tis	one of the two male reproductive glands, located in the scrotum, that produces sperm and the male hormone testosterone
sperm spermatozoon sper'mă-tō-zō'on	male gamete or sex cell produced in the testes that unites with the ovum in the female to produce offspring
epididymis ep-i-did'i-mis	coiled duct on top and at the side of the testis that stores sperm before emission
penis pē'nis	erectile tissue covered with skin that contains the urethra for urination and ducts for the secretion of seminal fluid (semen)
glans penis glanz	bulging structure at the distal end of the penis (glans = acorn)
prepuce prē'pūs	foreskin; loose casing covering the glans penis—removed by circumcision
vas deferens vas def'er-ens	duct that carries sperm from the epididymis to the ejaculatory duct (vas = vessel; deferens = carrying away)
seminal vesicle sem'i-năl	one of two sac-like structures lying behind the bladder and connected to the vas deferens on each side—secretes an alkaline substance into the semen to enable the sperm to live longer

THE MALE REPRODUCTIVE SYSTEM

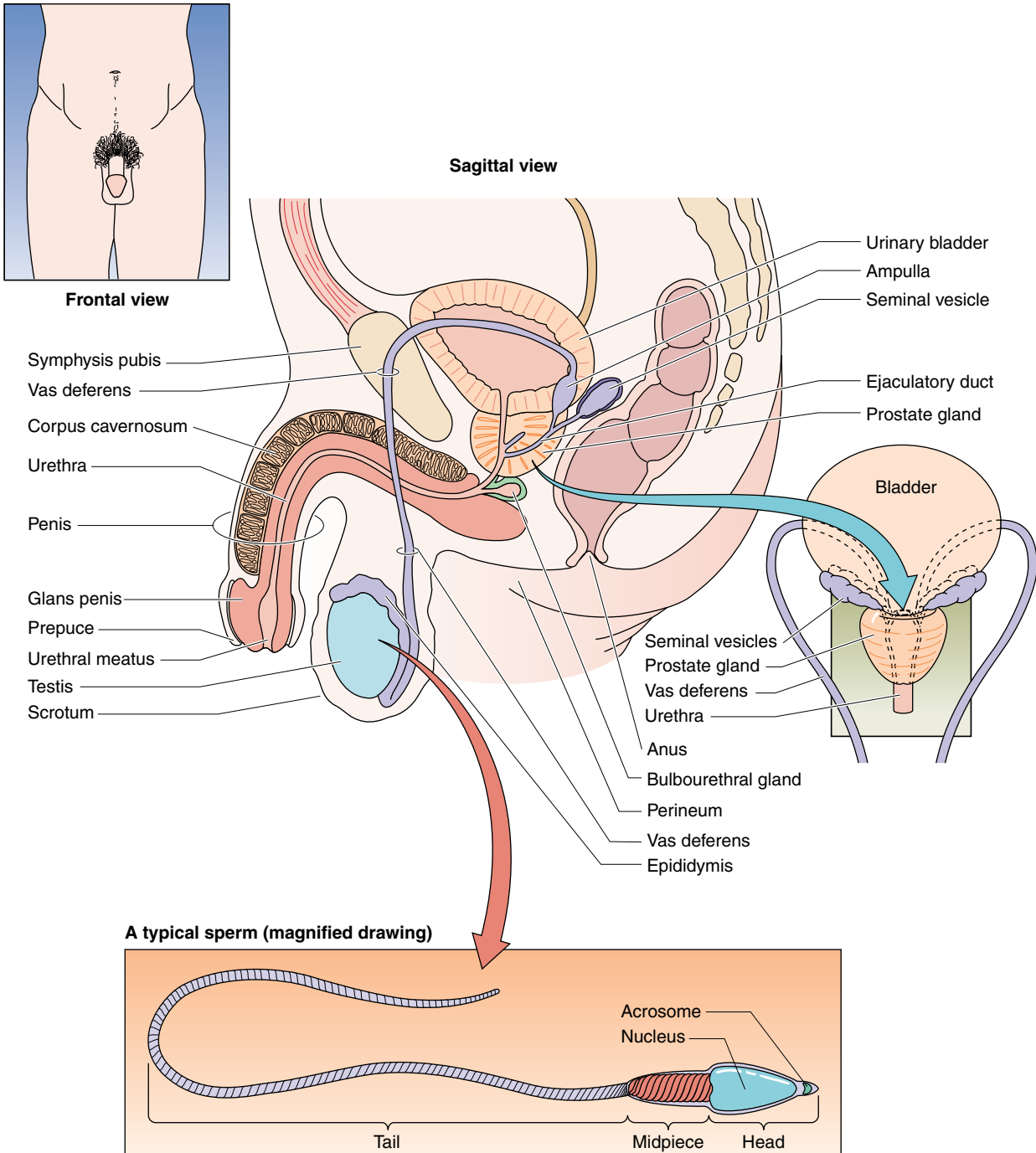


Figure 16.1 Male reproductive system.

Term	Meaning
semen sē'men	mixture of the secretions of the testes, seminal vesicles, prostate, and bulbourethral glands discharged from the male urethra during orgasm (semen = seed)
ejaculatory duct ē-jak'yū-lă-tōr-ē	duct formed by the union of the vas deferens with the duct of the seminal vesicle; its fluid is carried into the urethra

Term	Meaning
prostate gland pros'tāt	trilobular gland that encircles the urethra just below the bladder—secretes an alkaline fluid into the semen
bulbourethral glands (Cowper glands) bŭl'bō-yū-rē'thrāl	pair of glands below the prostate with ducts opening into the urethra—adds a viscid (sticky) fluid to the semen
perineum per'i-nē'ūm	external region between the scrotum and anus in a male and between the vulva and anus in a female
spermatic cord sper-mat'ik kōrd	cord containing the vas deferens, arteries, veins, lymph vessels, and nerves that extends from the internal inguinal ring through the inguinal canal to each testicle

Symptomatic and Diagnostic Terms

Term	Meaning
SYMPTOMATIC	
aspermia ā-sper'mē-ă	inability to secrete or ejaculate sperm
azoospermia ā-zō-ō-sper'mē-ă	semen without living spermatozoa, a sign of infertility in the male (zoo = life)
oligospermia ol-i-gō-sper'mē-ă	scanty production and expulsion of sperm
mucopurulent discharge myū-kō-pŭ'rŭ-lent	drainage of mucus and pus
DIAGNOSTIC	
anorchism an-ōr'kizm	absence of one or both testes
balanitis bal-ă-nī'tis	inflammation of glans penis
cryptorchism krip-tōr'kizm	undescended testicle; failure of a testis to descend into the scrotal sac during fetal development; it most often remains lodged in the abdomen or inguinal canal, requiring surgical repair (crypt = to hide) (Fig. 16.2)
epididymitis ep-i-did-i-mī'tis	inflammation of the epididymis
hydrocele hī'drō-sēl	hernia of fluid in the testis or tubes leading from the testis (Fig. 16.3B)
hypospadias hī'pō-spā'dē-ăs	congenital opening of the male urethra on the undersurface of the penis (spadias = to draw away) (Fig. 16.4)

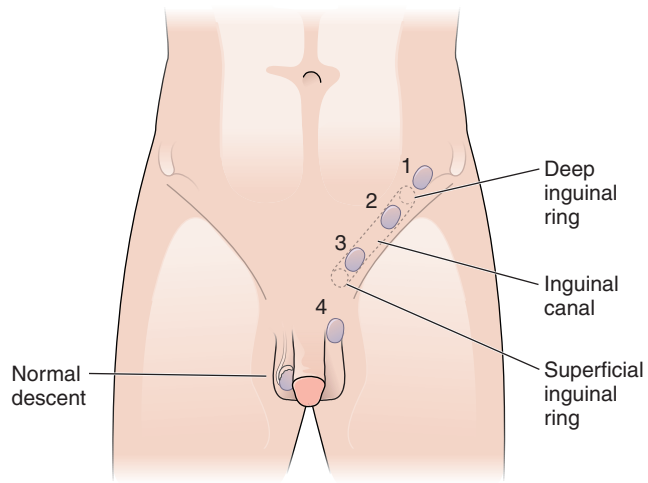


Figure 16.2 Cryptorchism. Four degrees of incomplete descent of the testis. 1. In the abdominal cavity close to the deep inguinal ring. 2. In the inguinal canal. 3. At the superficial inguinal ring. 4. In the upper part of the scrotum.

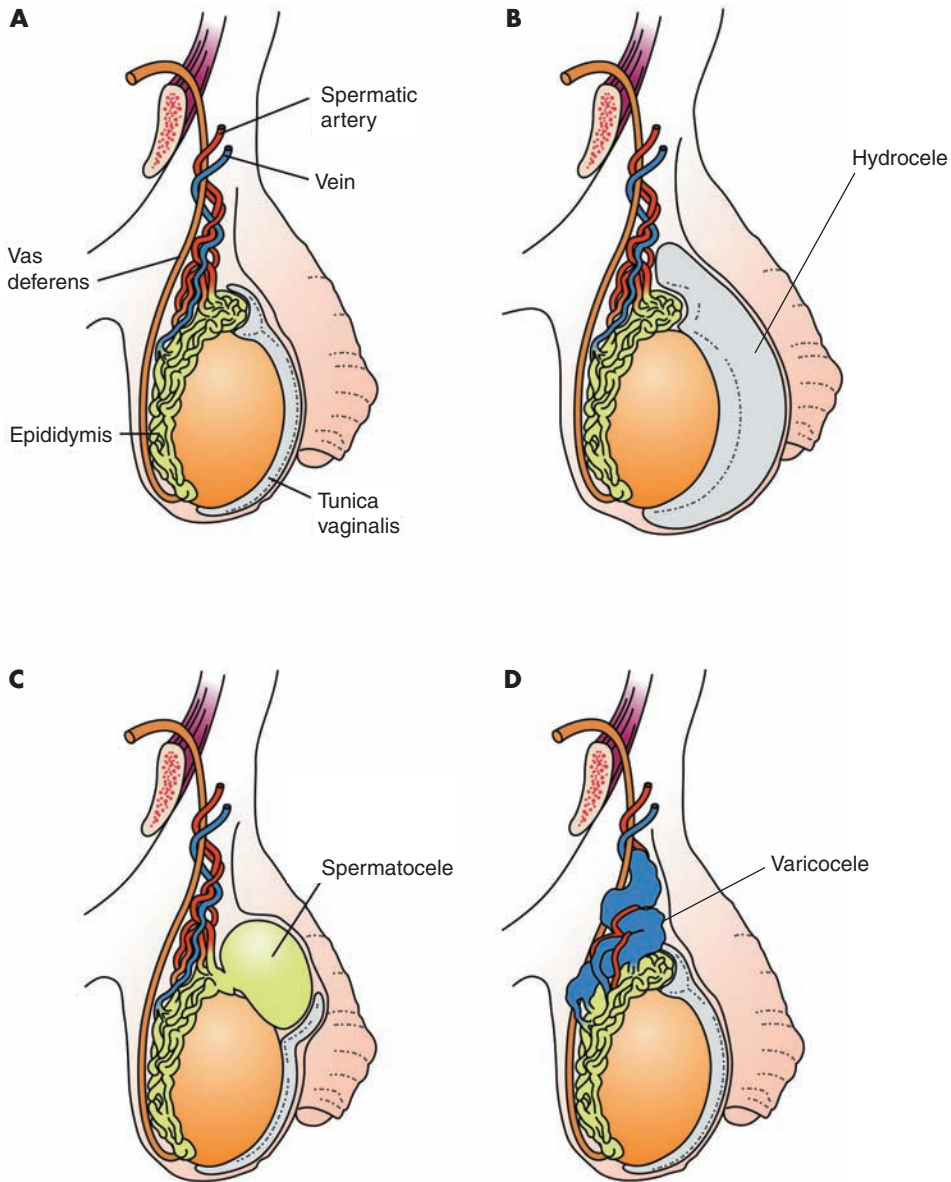
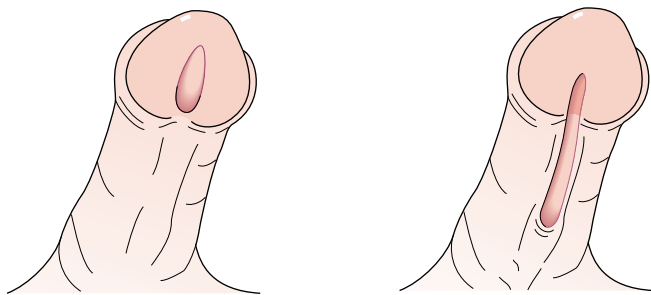


Figure 16.3 **A.** Normal testes and appendages. **B.** Hydrocele. **C.** Spermatocele. **D.** Varicocele.

Term	Meaning
erectile dysfunction (ED)	failure to initiate or maintain an erection until ejaculation because of physical or psychological dysfunction; formerly termed impotence (im = not; potis = able)
Peyronie disease pā-rōn'ē	disorder characterized by a buildup of hardened fibrous tissue in the corpus cavernosum causing pain and a defective curvature of the penis, especially during erection (Fig. 16.5)
phimosis fī-mō'sis	narrowed condition of the prepuce (foreskin) resulting in its inability to be drawn over the glans penis, often leading to infection—commonly requires circumcision (phimo means muzzle) (Fig. 16.6)
benign prostatic hyperplasia/hypertrophy (BPH) bē-nīn' pros-tat'ik hī-pēr-plā'zē-ă/hī-per'trō-fē	enlargement of the prostate gland; frequently seen in older men, causing urinary obstruction (Fig. 16.7)
prostate cancer	malignancy of the prostate gland
prostatitis pros-tā-tī'tis	inflammation of the prostate
spermatocele sper'mă-tō-sēl	painless, benign cystic mass containing sperm lying above and posterior to the testicle, but separate from it (see Fig. 16.3C)



Balanic hypospadias
Figure 16.4 Hypospadias.

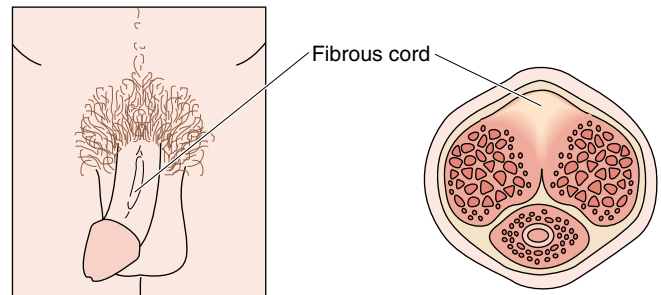


Figure 16.5 Peyronie disease.

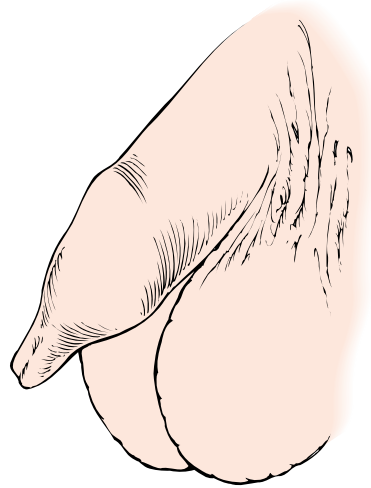


Figure 16.6 Phimosis.

Term	Meaning
testicular cancer tes-tik'yŭ-lăr	malignant tumor in one or both testicles commonly developing from the germ cells that produce sperm—classified in two groups according to growth potential
seminoma sem-i-nŏ'mă	most common type of testicular tumor, composed of immature germ cells—highly treatable with early detection
nonseminomas	testicular tumors arising from more mature germ cells that have a tendency to be more aggressive than seminomas; often develop earlier in life (includes choriocarcinoma, embryonal carcinoma, teratoma, and yolk sac tumors)
varicocele var'i-kŏ-sĕl	enlarged, swollen, herniated veins near the testis (varico = twisted vein) (Fig. 16.3D)

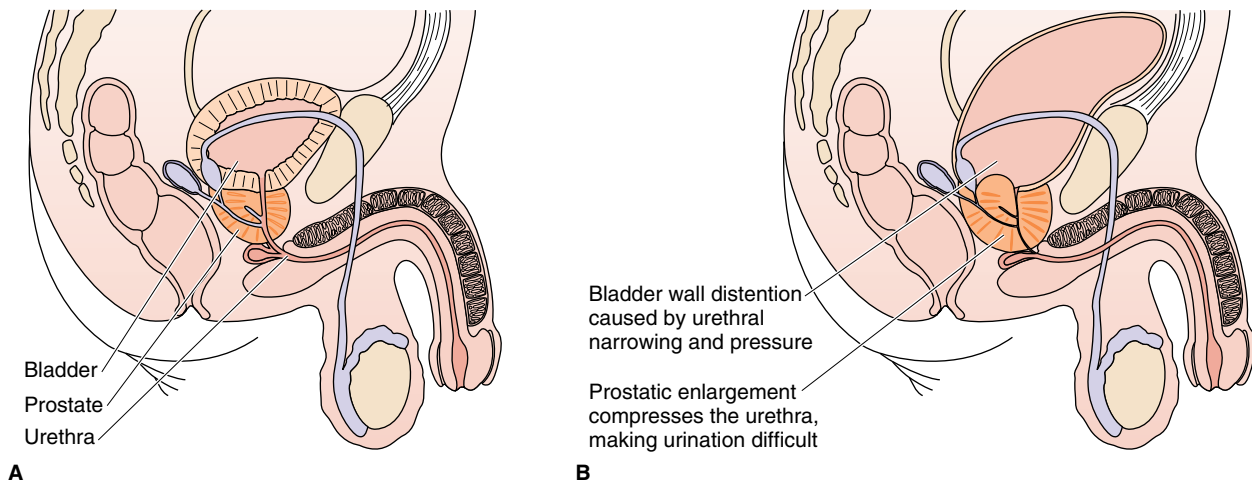


Figure 16.7 **A.** Normal prostate. **B.** Hypertrophic prostate.

**GONORRHEA.**

Derived from the Greek root

gono, meaning offspring or seed, and the suffix -rrhea, meaning flow or discharge, the word literally means flow of semen. It was once thought that the urethral discharge characteristic of the infection was a leakage of semen. Although the reasoning is wrong, attempts to change the term failed because its usage was too firmly established.

Term	Meaning
SEXUALLY TRANSMITTED DISEASE (STD)	
<i>Major Bacterial STDs</i> bak-tēr'ē-ăl	
chlamydia kla-mid'ē-ă	most common sexually transmitted bacterial infection in North America; often occurs with no symptoms and is treated only after it has spread
gonorrhea gon-ō-rē'ă	contagious inflammation of the genital mucous membranes caused by invasion of the gonococcus, <i>Neisseria gonorrhoeae</i> (gono = seed; rrhea = discharge)
sypphilis sif'i-lis	infectious disease caused by a spirochete transmitted by direct intimate contact that may involve any organ or tissue over time; usually manifested first on the skin with the appearance of small, painless red papules that erode and form bloodless ulcers called chancres (Fig. 16.8)
<i>Major Viral STDs</i> vī'răl	
hepatitis B virus (HBV) hep-ă-tī'tis	virus that causes inflammation of the liver as a result of transmission through any body fluid, including vaginal secretions, semen, and blood
herpes simplex virus type 2 (HSV-2) her'pēz	virus that causes ulcer-like lesions of the genital and anorectal skin and mucosa; after initial infection, the virus lies dormant in the nerve cell root and may recur at times of stress (see Fig. 17.9)



Figure 16.8 Syphilitic chancre.

Term	Meaning
human immunodeficiency virus (HIV) im'yū-nō-dē-fish'en-sē	virus that causes acquired immunodeficiency syndrome (AIDS), which permits various opportunistic infections, malignancies, and neurological diseases; contracted through exposure to contaminated blood or body fluid (e.g., semen, vaginal secretions)
human papilloma virus (HPV) pap-i-lō'mă condyloma acuminatum kon-di-lō'mah ă-kyū'mī-nāt'ŭm pl. condylomata acuminata kon-di-lō'mah'tă ă-kyū'mī-nah'tă	virus transmitted by direct sexual contact that causes an infection that can occur on the skin or mucous membranes of the genitals; on the skin, the lesions appear as cauliflower-like warts, and on the mucous membranes, they have a flat appearance (also known as venereal or genital warts) (see Fig. 17.10)

Diagnostic Tests and Procedures

Test or Procedure	Explanation
biopsy (Bx) biopsy of the prostate testicular biopsy tes-tik'yū-lăr	tissue sampling used to identify neoplasia needle biopsy of the prostate often performed using ultrasound guidance (see Fig. 16.10) biopsy of a testicle
digital rectal exam (DRE)	insertion of a finger into the male rectum to palpate the rectum and prostate (Fig. 16.9)

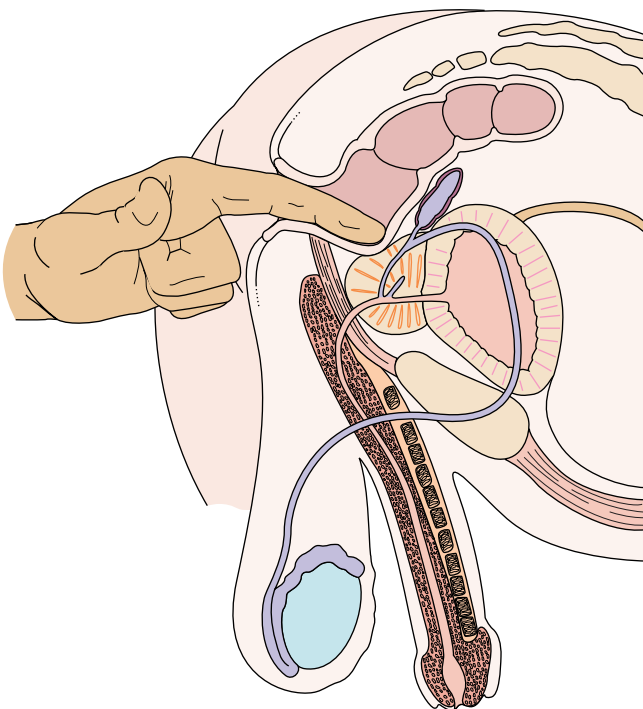


Figure 16.9 Digital rectal examination.

Test or Procedure	Explanation
prostate-specific antigen (PSA) test an'ti-jen	blood test used to screen for prostate cancer; an elevated level of the antigen indicates the possible presence of tumor
urethrogram yū-rē'thrō-gram	x-ray of the urethra and prostate
semen analysis sē'men	study of semen, including a sperm count, with observation of morphology (form) and motility; usually performed to rule out male infertility
endorectal (transrectal) sonogram of the prostate en'dō-rek'tāl trans-rek'tāl	scan of the prostate made after introducing an ultrasonic transducer into the rectum—also used to guide needle biopsy (Fig. 16.10)

Operative Terms

Term	Meaning
circumcision ser-kūm-sizh'ūn	removal of the foreskin (prepuce), exposing the glans penis
epididymectomy ep'i-did-i-mek'tō-mē	removal of an epididymis
orchiectomy ōr-kē-ek'tō-mē orchidectomy ōr-ki-dek'tō-mē	removal of a testicle

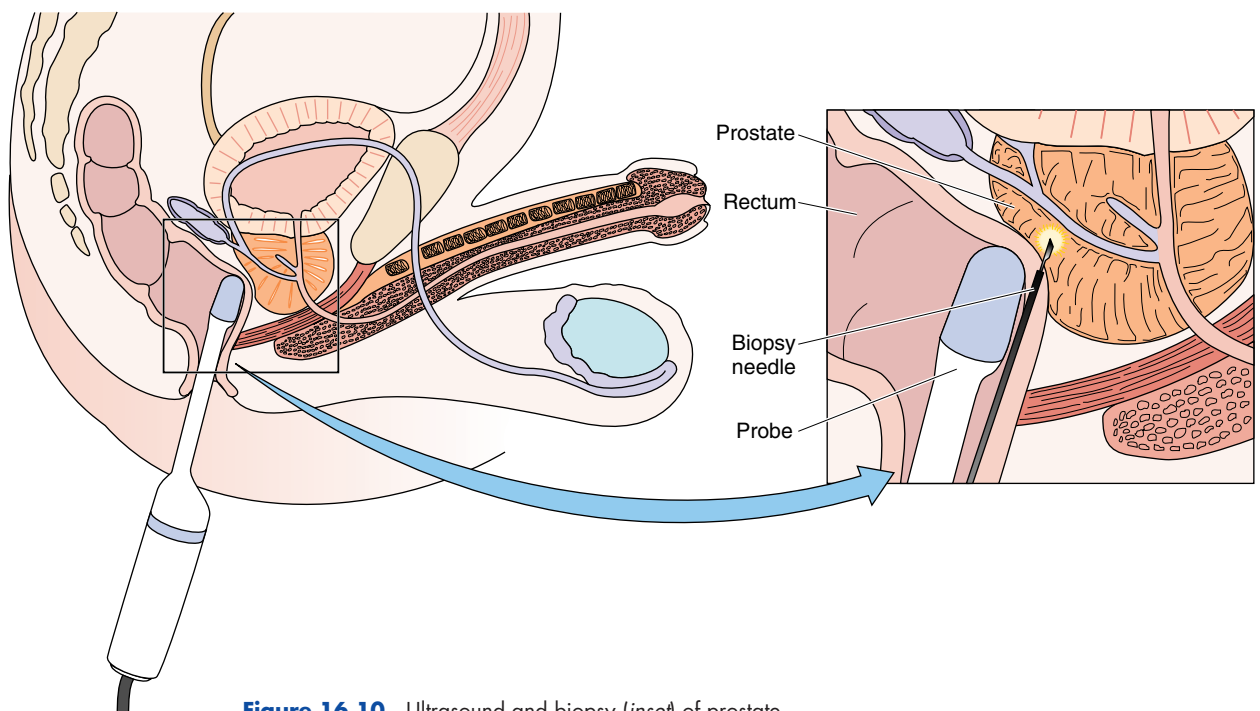


Figure 16.10 Ultrasound and biopsy (*inset*) of prostate.

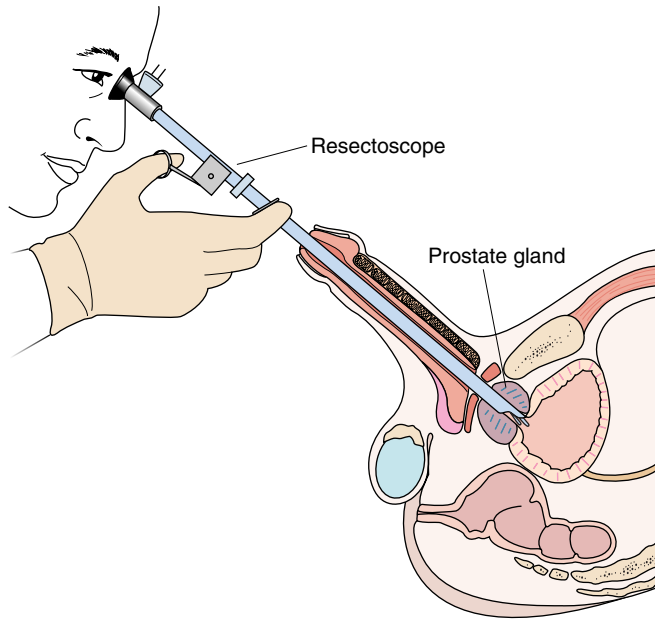


Figure 16.11 Transurethral resection of prostate (TURP).

Term	Meaning
orchioasty ōr'kē-ō-plas-tē	repair of a testicle
orchiopey ōr'kē-ō-pek'sē	fixation of an undescended testis in the scrotum
prostatectomy pros-tā-tek'tō-mē	excision of the prostate gland
transurethral resection of the prostate (TURP) trans-yū-rē'thrāl re-sek'shūn	removal of prostatic gland tissue through the urethra using a resectoscope, a specialized urological endoscope—common treatment for benign prostatic hyperplasia/hypertrophy (BPH) (Fig. 16.11)

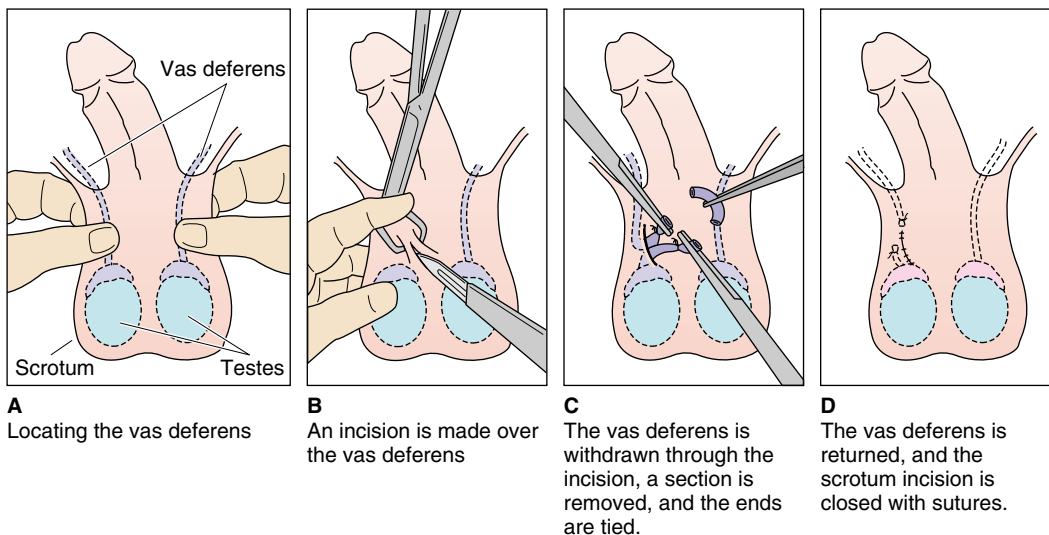


Figure 16.12 Vasectomy.

Term	Meaning
vasectomy va-sek'tō-mē	removal of a segment of the vas deferens to produce sterility in the male (Fig. 16.12)
vasovasostomy vā'sō-vă-sos'tō-mē	restoration of the function of the vas deferens to regain fertility after vasectomy

Therapeutic Terms

Term	Meaning
chemotherapy kem'ō-thār-ă-pē	treatment of malignancies, infections, and other diseases with chemical agents that destroy selected cells or impair their ability to reproduce
cancer immunotherapy im'ū-nō-thār-ă-pē	treatment of cancer by stimulating the patient's own immune response by transfer of immune components such as antibodies or T cells from an outside source to kill cancer cells
radiation therapy rā'dē-ā'shŭn	treatment of neoplastic disease by using radiation to deter the proliferation of malignant cells
brachytherapy	radiation technique involving internal implantation of radioactive isotopes, such as radioactive seeds to treat prostate cancer (brachy, meaning <i>short distance</i> , refers to localized application)
hormone replacement therapy (HRT)	use of a hormone to remedy a deficiency or regulate production (e.g., testosterone)
penile prosthesis pē'nīl pros'thē-sis	implantation of a device designed to provide an erection of the penis—used to treat physical impotence
penile self-injection	intracavernosal injection therapy causing an erection—used in treatment of erectile dysfunction

Summary of Chapter 16 Acronyms/Abbreviations

BPH.....benign prostatic hyperplasia/hypertrophy	HPV.....human papilloma virus
Bx.....biopsy	HRT.....hormone replacement therapy
DRE.....digital rectal exam	HSV-2.....herpes simplex virus type 2
ED.....erectile dysfunction	PSA.....prostate-specific antigen
HBV.....hepatitis B virus	STD.....sexually transmitted disease
HIV.....human immunodeficiency virus	TURP.....transurethral resection of the prostate



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

EXAMPLE

synorchism

_____ / _____ / _____
P R S

syn/orch/ism

P R S

DEFINITION: together/testis or testicle/condition of

1. oligospermia

_____ / _____ / _____
P R S

DEFINITION: _____

2. perineoplasty

_____ / _____
CF S

DEFINITION: _____

3. testalgia

_____ / _____
R S

DEFINITION: _____

4. balanitic

_____ / _____
R S

DEFINITION: _____

5. prostatomegaly

_____ / _____
CF S

DEFINITION: _____

6. orchidectomy

_____ / _____
R S

DEFINITION: _____

7. anorchism

_____ / _____ / _____
P R S

DEFINITION: _____

8. vasectomy

_____ / _____
R S

DEFINITION: _____

9. aspermia

_____ / _____ / _____
P R S

DEFINITION: _____

10. cystoprostatectomy

_____ / _____ / _____
CF R S

DEFINITION: _____

11. balanitis

_____ / _____
R S

DEFINITION: _____

12. orchioplasty

_____ / _____
CF S

DEFINITION: _____

13. spermatocele

_____ / _____
CF S

DEFINITION: _____

14. epididymotomy

_____ / _____
CF S

DEFINITION: _____

15. vasovasostomy

_____ / _____ / _____
CF CF S

DEFINITION: _____

Identify the medical term for the following:

16. _____ absence of a testicle
17. _____ inflammation of the glans penis
18. _____ enlarged, herniated veins near the testicle
19. _____ specialized endoscope used to approach the prostate when performing a TURP
20. _____ enlargement of the prostate
21. _____ removal of a portion of the vas deferens to produce male sterility
22. _____ disorder that causes a buildup of hardened fibrous tissue in the corpus cavernosa in the penis

Match the following:

- | | |
|---------------------------------|------------------|
| 23. _____ fertility restoration | a. prostatectomy |
| 24. _____ phimosis | b. seminoma |
| 25. _____ BPH | c. STD |
| 26. _____ cryptorchism | d. ED |
| 27. _____ testicular cancer | e. orchiopexy |
| 28. _____ penile self-injection | f. TURP |
| 29. _____ prostate cancer | g. circumcision |
| 30. _____ condyloma acuminata | h. vasovasostomy |

Complete the following:

31. _____ orchism = undescended testicle
32. _____ sonogram of prostate = ultrasound scan of the prostate made after introduction of a transducer into the rectum
33. _____ cele = fluid hernia in the testis
34. _____ spadias = condition of congenital opening of the male urethra on the undersurface of the penis
35. _____ exam = insertion of a finger into the male rectum to palpate the rectum and prostate
36. _____ therapy = radiation technique involving implantation of radioactive “seeds”

Match the following terms related to sperm:

- | | |
|--------------------------|-------------------------------|
| 37. _____ semen analysis | a. semen without living sperm |
| 38. _____ oligospermia | b. inability to secrete sperm |
| 39. _____ azoospermia | c. sperm morphology |
| 40. _____ aspermia | d. scanty production of sperm |

Write the term for the following abbreviations:

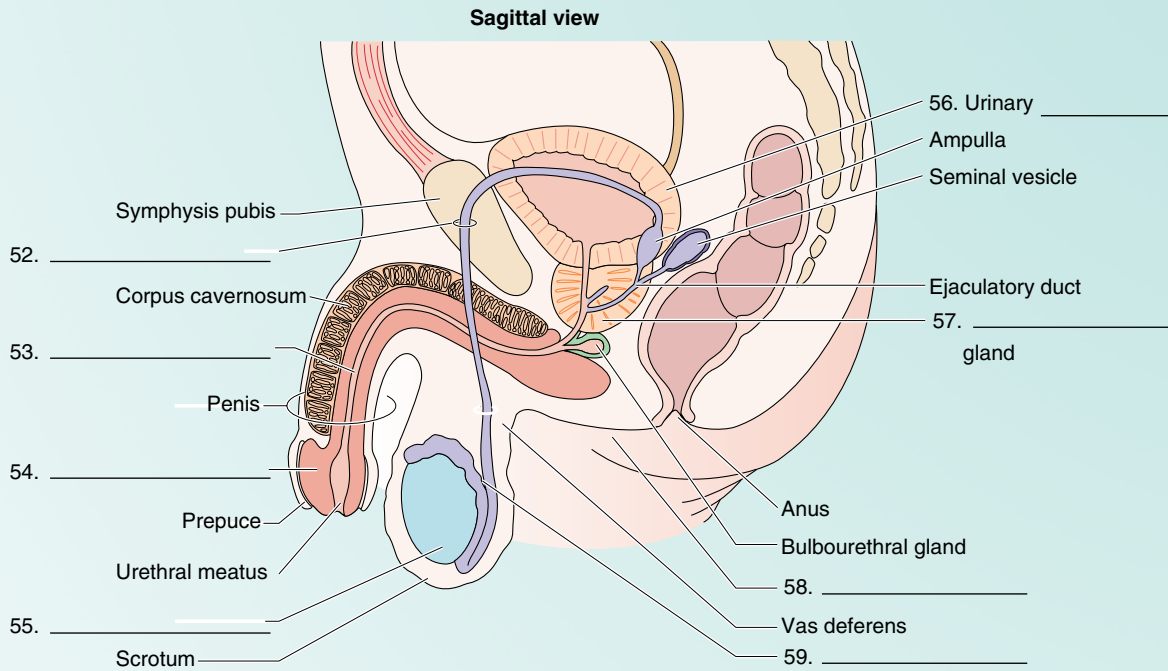
41. PSA _____
42. Bx _____
43. TURP _____
44. DRE _____
45. ED _____

For each of the following, circle the combining form that corresponds to the meaning given:

- | | | | |
|------------------------|------------|------------|------------|
| 46. testis | prostat/o | epididym/o | orchi/o |
| 47. perineum | peritone/o | perine/o | prostat/o |
| 48. sperm | test/o | orchi/o | spermat/o |
| 49. vessel | aden/o | angin/o | vas/o |
| 50. glans penis | prostat/o | orchid/o | balan/o |
| 51. epididymis | sperm/o | vas/o | epididym/o |

Write in the missing words on the blank lines in the following illustration of the male anatomy.

52–59.



For each of the following, circle the correct spelling of the term:

- | | | |
|------------------|--------------|--------------|
| 60. epididymis | epididymus | epedidimis |
| 61. oligospermia | oligospermia | oligispermia |
| 62. azospermia | asospermia | azoospermia |
| 63. anorchism | anorchism | anorschizm |
| 64. balanitis | balanitus | balantis |
| 65. cryptorchism | criptorchism | cryptorchism |
| 66. hypospadias | hyospadeas | hypespadias |
| 67. clamidia | chlamidya | chlamydia |
| 68. syphilis | syphillis | syphyllis |
| 69. fimosis | phimosi | phymosis |

Give the noun that was used to form the following adjectives:

70. prostatic _____

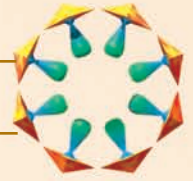
71. epididymal _____

72. perineal _____

73. penile _____

74. gonorrheal _____

75. testicular _____



MEDICAL RECORD ANALYSES

MEDICAL RECORD 16.1

Chart Note

S: Twelve days ago this 34 y.o. male had a flu-like syndrome that lasted about 2–3 hours. For the past two days, he has felt lousy again and is experiencing left testicular pain and swelling s avoiding Sx

Allergies: none

PH: negative

Habits: smoking—no
alcohol—occasional beer

ROS: otherwise negative

O: Slightly small testes bilaterally; tender (L) epididymis; normal circumcised penis
UA: WNL

A: (L) epididymitis

P: Rx: Maxaquin 400 mg #16

Sig: $\ddot{\uparrow}\uparrow$ STAT, then \uparrow q.d. \times 14 d; return in two weeks for follow-up

- What was the patient's diagnosis?
 - testicular pain and swelling
 - inflammation of the testicle
 - swollen veins near the testis
 - inflammation of the coiled duct that stores sperm
 - fluid hernia in a testicle
- What was the condition of the patient's penis?
 - small but normal
 - prepuce had been excised
 - inflamed
 - swollen and tender
 - not stated
- What was the Sig: on the prescription?
 - two every other day for fourteen days
 - two immediately, then one a day for fourteen days
 - one immediately, then one a day for fourteen days
 - one as needed every day for fourteen days
 - two a day for fourteen days
- Did the patient have any trouble urinating?
 - yes
 - no
- What was the condition of the right testicle?
 - inflamed
 - enlarged
 - small
 - normal
 - had been excised
- What was the result of the urinalysis?
 - not stated
 - normal
 - not performed because the patient could not void
 - hematuria
 - glucosuria

MEDICAL RECORD 16.2

Larry Phelps, age 31, has been happily married to his wife Nancy for almost 5 years. They have two children. The second child caused some health problems for Nancy, and her obstetrician recommended that they have no more children because of the risk to her health. After trying different forms of birth control, Nancy and Larry decided that he would have a vasectomy. His doctor referred him to Dr. Jerard Derrick in the urology department at Central Medical Group.

Directions

Read Medical Record 16.2 for Larry Phelps (pages 530–531) and answer the following questions. This record is a series of three chart notes written by Dr. Derrick after first meeting with Mr. Phelps to schedule surgery, after the surgery and discharge, and after seeing Mr. Phelps in a follow-up 10 days later.

QUESTIONS ABOUT MEDICAL RECORD 16.2

Write your answers in the spaces provided.

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:
 - sterility _____
 - infiltrated _____
 - resect _____
 - ejaculation _____
 - induration _____
- The medical record suggests that Mr. Phelps signed which of these before surgery?
 - last will and testament
 - consent form
 - application to sperm bank
 - none of the above
- In your own words, not using medical terminology, briefly summarize the procedure Dr. Derrick performed:

- Complications of the surgery included the following:
 - sterility
 - fever
 - nausea and vomiting
 - bleeding
 - all of the above
 - none of the above

5. Translate the instruction for the immediate postoperative medication (how much, how often):

6. Mark any of the following that were symptoms Mr. Phelps reported to Dr. Derrick on his follow-up visit 10 days after surgery:

- a. fever
- b. bleeding
- c. pain in the scrotum
- d. impotence
- e. suture loosening

7. Dr. Derrick carefully examined Mr. Phelps in the follow-up visit and noted the following objective findings (mark all that are appropriate):

- a. minor bruising in the scrotum
- b. small area of hard tissue at left vasectomy site
- c. bleeding at left vasectomy site
- d. pain at left vasectomy site
- e. very sore elevated mass at right vasectomy site
- f. bleeding at right vasectomy site
- g. pain at right vasectomy site
- h. hard tissue areas along upper scrotum
- i. black and blue penis

8. In your own words, define the diagnosis Dr. Derrick made in the follow-up visit:

9. Translate Dr. Derrick's medication instructions after the follow-up visit:

<i>Medication</i>	<i>Amount</i>	<i>How Often</i>
<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>

CENTRAL MEDICAL GROUP, INC.

Department of Urology

201 Medical Center Drive • Central City, US 90000-1234

PROGRESS NOTES

PHELPS, LAWRENCE

June 4, 20xx

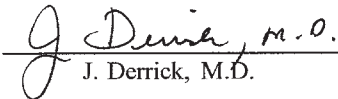
SUBJECTIVE: This 31-year-old male desires vasectomy for sterility. He and his wife have two children. He states that another pregnancy would put his wife at health risk.

OBJECTIVE: Normal genitalia with single vas bilaterally.

ASSESSMENT: The procedure, goals, and risks were thoroughly discussed with the aid of pictures. The vasectomy booklet and consent form were provided to the patient.

PLAN: Schedule bilateral vasectomy.

DL:ti T:6/7/xx


J. Derrick, M.D.


June 10, 20xx

PROCEDURE: Bilateral vasectomy.

The patient was placed supine on the table; and the scrotum was shaved, prepped, and draped in the usual fashion. The right testicle was grasped, and the right vas was brought to the skin and was infiltrated with 1% Xylocaine. The vas was freed through a small incision. A segment was resected, and the ends were cauterized and tied with 3-0 silk suture. The skin was closed with 4-0 chromic suture. The same procedure was repeated on the left. There were no complications or bleeding.

PLAN: The patient is discharged to the care of his wife with an Rx for Darvocet-N, 100 mg, 1 q 4 h p.r.n. pain. He has been given a postvasectomy instruction sheet. He is asked to call if there are any problems. He was also instructed to submit a semen specimen for analysis after 15-20 ejaculations.

DL:ti T:6/12/xx


J. Derrick, M.D.

CENTRAL MEDICAL GROUP, INC.*Department of Urology*201 Medical Center Drive • Central City, US 90000-1234

PROGRESS NOTES

PHELPS, LAWRENCE

June 20, 20xx

SUBJECTIVE: The patient has had pain in the right scrotum since surgery, which became worse yesterday with pain in his right back. He states he has had no fevers, nausea, or vomiting.

OBJECTIVE:

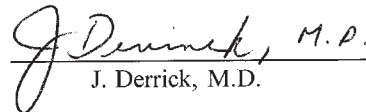
- 1) Mild scrotal ecchymoses inferiorly. Normal testes and epididymides.
- 2) Small induration at left vasectomy site without tenderness.
- 3) Exquisitely tender 1.5 cm nodule at right vasectomy site; no induration in upper scrotum or cord.

ASSESSMENT: Probable small hematoma at right vasectomy site.

PLAN: Rx: Cipro 500 mg b.i.d. x 5 d
Darvocet-N 100 mg q 4 h p.r.n. pain
ibuprofen p.r.n.

RTO in one week.

DL:ti T:6/22/xx



J. Derrick, M.D.

MEDICAL RECORD 16.3

James Easley was having some difficulty urinating fully and was feeling gradually increasing pain in the perineal area. He went to see his personal physician, who after a digital rectal examination referred him to Dr. Lentz, a urologist at Central Medical Center.

Directions

Read Medical Record 16.3 for James Easley (page 534) and answer the following questions. This record is the ultrasound report dictated by Dr. Lentz after his session with Mr. Easley in the ultrasound suite at Central Medical Center.

QUESTIONS ABOUT MEDICAL RECORD 16.3

Write your answers in the spaces provided:

1. Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

needle biopsy _____

MHz _____

bifocal _____

2. In your own words, not using medical terminology, briefly describe the ultrasound procedure Mr. Easley underwent:

3. In your own words, describe the position Mr. Easley was put in for the ultrasound:

4. Mark any of the following that are abnormal findings in Dr. Lentz's report:

- a. enlarged prostate gland
- b. hemorrhage
- c. hypoechoic lesion
- d. obstructed urethra
- e. prostatic calculi
- f. multiplanar rectum

5. Because of the results of the ultrasound, Dr. Lentz decided to perform an additional diagnostic procedure while Mr. Easley was in the ultrasound suite. In your own words, describe that procedure:

6. Explain why Dr. Lentz's report does not include a plan or recommendations for further actions:

7. When and for how long should Mr. Easley take the Noroxin?

CENTRAL MEDICAL CENTER

21 Medical Center Drive Central City, US 90000-1234

PROSTATIC ULTRASOUND

EXAMINATION: Transrectal ultrasound of the prostate gland with biopsy.

DIGITAL RECTAL EXAMINATION: Grade enlarged prostate gland, benign-feeling.

PSA: 5.7 ng/ml

PROCEDURE: An ultrasound unit with a 7.5 MHz bifocal multiplanar rectal transducer was used to scan the prostate gland. The patient was placed in the left lateral decubitus position. The prostate and seminal vesicles were thoroughly scanned in the transverse and sagittal modes.

The abnormal findings included a hypoechoic lesion at the right base of the prostate gland in the central zone. There were numerous prostatic calculi. The prostatic volume was 22 cc, and the PSA density was 0.25 (calculation based on PSA value and size of prostate). A prostatic needle biopsy was performed because of the increased PSA density and the hypoechoic lesion. This was accomplished without incident.

The patient tolerated the procedure well and had minimal bleeding and discomfort. The patient left the ultrasound suite in satisfactory condition. The patient was placed on Noroxin 400 mg b.i.d. x 3 days.

Further recommendations will be made following the biopsy report.


R. Lentz, M.D.

RL.kj

D: 9/11/xx

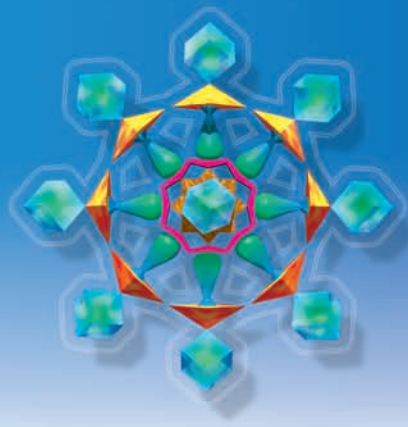
T: 9/14/xx

PROSTATIC UI TRASOUND

PT NAME: EASLEY JAMES R.

ID NO: SI-350013

ATT PHYS: R. LENTZ, M.D.



Female Reproductive System

OBJECTIVES

After completion of this chapter you will be able to

- ◆ Define common term components used in relation to the female reproductive system
- ◆ Describe the basic functions of the female reproductive system
- ◆ Define the basic anatomical terms referring to the female reproductive system
- ◆ Define common gynecological symptomatic and diagnostic terms
- ◆ List the common gynecological diagnostic tests and procedures
- ◆ Define common gynecological operative and therapeutic terms
- ◆ Define common obstetrical symptomatic and diagnostic terms
- ◆ List the common obstetrical diagnostic tests and procedures
- ◆ Define common obstetrical operative and therapeutic terms
- ◆ Explain terms and abbreviations used in documenting medical records involving the female reproductive system

Combining Forms

Combining Form	Meaning	Example
cervic/o	neck or cervix	cervical ser'vī-kal
colp/o	vagina (sheath)	colposcope kol'pō-skōp
vagin/o		vaginal vaj'i-nāl
episi/o	vulva (covering)	episiotomy e-piz-ē-ot'ō-mē
vulv/o		vulvar vŭl'vār
gynec/o	woman	gynecology gī-nē-kol'ō-jē
hyster/o	uterus	hysteroscopy his-ter-os'kō-pē
metr/o		metrorrhagia mē-trō-rā'jē-ă
uter/o		uterus ū'ter-ŭs

Combining Form	Meaning	Example
lact/o	milk	lactogenic lak-tō-jen'ik
mast/o	breast	mastodynia mas-tō-din'ē-ă
mamm/o		mammogram mam'ō-gram
men/o	menstruation	menopause men'ō-pawz
obstetr/o	midwife	obstetric ob-stet'rik
oophor/o	ovary	oophoritis ō-of-ōr-ī'tis
ovari/o		ovarian ō-var'ē-an
ov/i	egg	ovigenesis ō-vi-jen'ē-sis
ov/o		ovum ō'vūm
pelv/i	pelvic cavity	pelvimetry pel-vim'ē-trē
salping/o	uterine (fallopian) tube	salpingitis sal-pin-jī'tis
toc/o	labor or birth	dystocia dis-tō'sē-ă
ADDITIONAL SUFFIX		
-arche	beginning	menarche me-nar'kē

Female Reproductive System Overview

The female reproductive system consists of the *uterus*, *ovaries*, *uterine (fallopian) tubes*, *vagina*, and *vulva* (Fig. 17.1). These structures are responsible for producing and maintaining female ova and providing a place for the implantation and nurturing of the fertilized ovum until birth. Treatment of the female reproductive system involves two medical specialties: *gynecology* and *obstetrics*.

Anatomical Terms

Term	Meaning
uterus ū'ter-ŭs	womb; pear-shaped organ in the pelvic cavity in which the embryo develops
fundus fŭn'dŭs	upper portion of the uterus above the entry to the uterine tubes

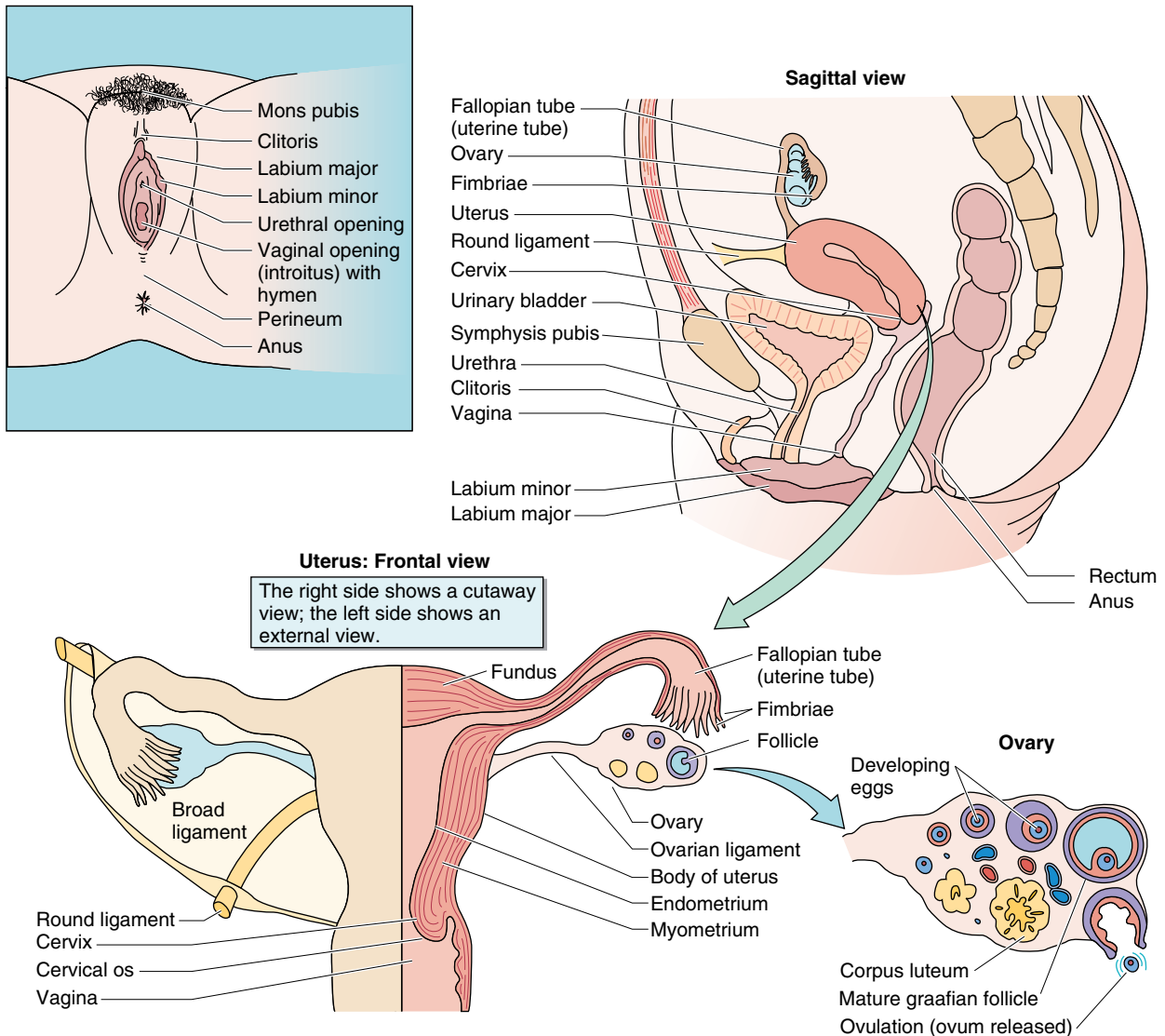


Figure 17.1 Female reproductive system.

Term	Meaning
endometrium en'dō-mē'trē-ŭm	lining of the uterus that is shed approximately every 28–30 days in the nonpregnant female during <i>menstruation</i> (see Table 17.1 on page 538)
myometrium mī'ō-mē'trē-ŭm	muscular wall of the uterus
uterine or fallopian tubes yū'ter-in fa-lō'pē-an	tubes extending from each side of the uterus toward the ovary that provide a passage for ova to the uterus
adnexa ad-nek'să	uterine tubes and ovaries (uterine appendages)
right uterine appendage left uterine appendage	right tube and ovary left tube and ovary
ovary ō'vă-rē	one of two glands located on each side of the pelvic cavity that produce ova and female sex hormones



FALLOPIUS.

Gabriele Fallopius, a

16th-century Italian anatomist, made many important observations, especially concerning the female reproductive organs. His classical descriptions resulted in his name being associated with the uterine tubes. He compared the abdominal end of each tube to a trumpet.

Table 17.1 Menstrual Cycle

The menarche is the time in puberty when the female **menstrual cycle** begins and continues in a 28–30-day cycle throughout reproductive life, except at times of pregnancy, until menopause (generally occurring between 45 and 55 years of age).

Hormones secreted by the anterior pituitary gland control the four stages of the menstrual cycle:

Menstrual stage (period) Days 1–5

Shedding of unused endometrial tissue in a bloody discharge

Follicular stage Days 6–13

Secretion of follicle-stimulating hormone (FSH), initiating growth of an ovum in the graafian follicle, and release of estrogen by the maturing follicle, causing thickening and revitalization of the endometrial lining

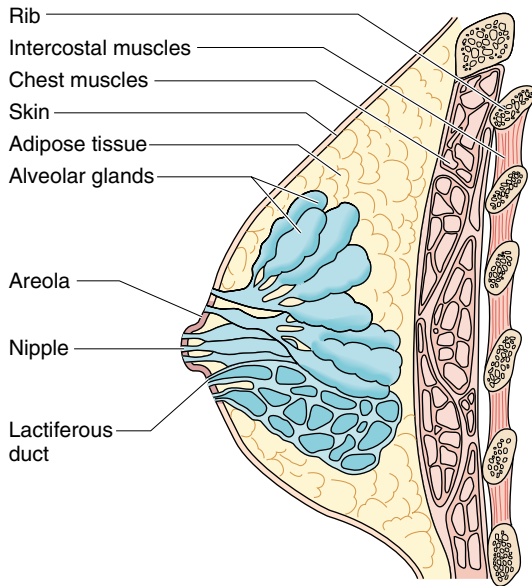
Ovulatory stage Days 14–16

Secretion of luteinizing hormone causes the follicle to rupture and release the mature ovum into the uterine tube; the ruptured follicle, remaining in the ovary, transforms into the corpus luteum, which then secretes progesterone and estrogen to further nourish the endometrium.

Premenstrual stage Days 17–28

If conception does not take place, the corpus luteum stops secreting progesterone and estrogen, thinning of the endometrial lining occurs, and tissue breakdown culminates in menstruation.

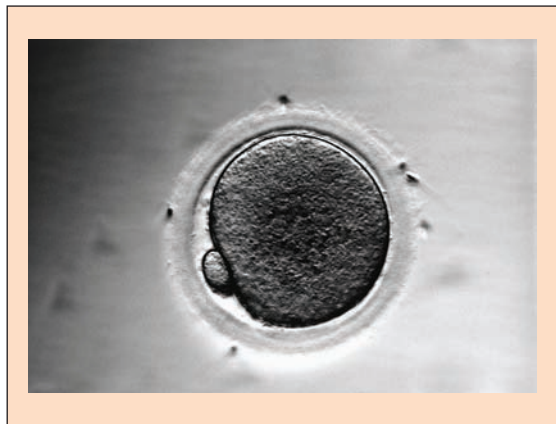
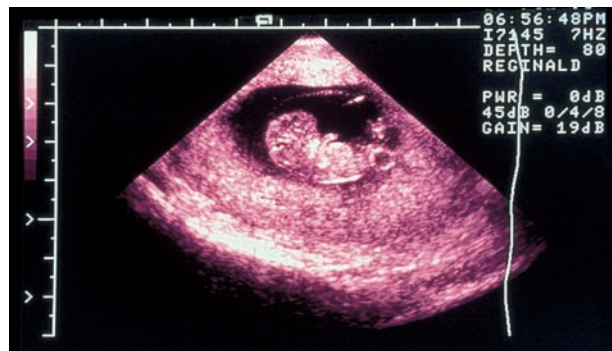
Term	Meaning
cervix ser'viks	neck of the uterus
cervical os ser'vī-kāl os	opening of the cervix to the uterus
vagina vā-jī'nā	tubular passageway from the cervix to the outside of the body
vulva vūl'vă	external genitalia of the female
labia lā'bē-ă	folds of tissue on either side of the vaginal opening known as the labia majora and labia minora
clitoris klit'ō-ris	female erectile tissue situated in the anterior portion of the vulva
hymen hī'men	fold of mucous membrane that encircles the entrance to the vagina
introitus in-trō'i-tūs	entrance to the vagina
Bartholin glands	two glands located on either side of the vaginal opening that secrete a lubricant during intercourse
perineum per'i-nē'ūm	region between the vulva and anus

Breast anatomy**Figure 17.2** Breast.

Term	Meaning
mammary glands mam'ă-rē	two glands of the female breasts capable of producing milk (Fig. 17.2)
mammary papilla pă-pil'ă	nipple
areola ă-rē'ō-lă	dark pigmented area around the nipple
embryo em'brē-ō	developing organism from fertilization to the end of the eighth week (Fig. 17.3)
fetus fē'tūs	developing organism from the ninth week to birth (Fig. 17.4)
placenta plă-sen'tă	vascular organ that develops in the uterine wall during pregnancy that provides nourishment for the fetus (placenta = cake)

**MAMMA.**

Mamma is Latin for breast; the word is said to come from the cry of the infant for “mama,” which is a sound common to most languages and is the root for mother in many. The word “breast” is derived from the German word for “bursting forth” or “budding.”

Sperm and ovum**A****B****Figure 17.3** **A.** Sperm and ovum. **B.** Two-dimensional sonogram of 8-week embryo.

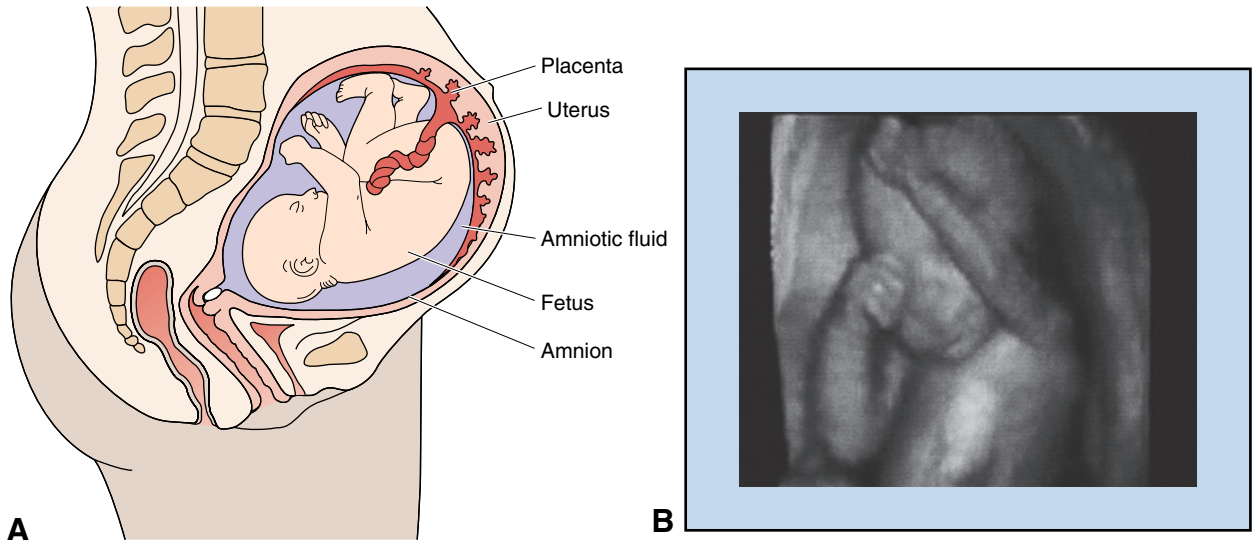


Figure 17.4 A. Fetus in utero. B. Three-dimensional sonogram of fetus “waking up.”

Term	Meaning
amnion am'nē-on	innermost of the membranes surrounding the embryo in the uterus filled with amniotic fluid
amniotic fluid	fluid within the amnion that surrounds and protects the fetus
meconium mē-kō'nē-ŭm	intestinal discharges of the fetus that form the first stools in the newborn

Gynecological Symptomatic Terms

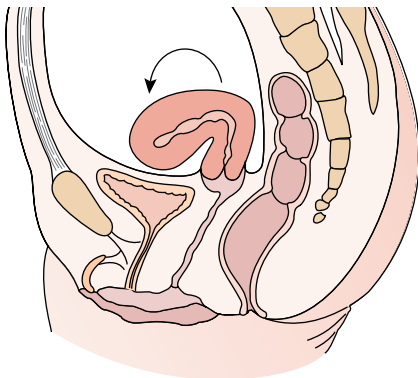
gī'nē-kō-loj'i-kāl

Term	Meaning
amenorrhea ă-men-ō-re'ă	absence of menstruation
anovulation an-ov-yū-lă'shŭn	absence of ovulation
dysmenorrhea dis-men-ōr-ē'ă	painful menstruation
dyspareunia dis-pa-rū'nē-ă	painful intercourse (coitus) (dys = painful; para = alongside of; eunia = a lying)
leukorrhea lū-kō-rē'ă	abnormal white or yellow vaginal discharge
menorrhagia men-ō-ră'jē-ă	excessive bleeding at the time of menstruation (menses)
metrorrhagia mē-trō-ră'jē-ă	bleeding from the uterus at any time other than normal menstruation
oligomenorrhea ol'i-gō-men-ō-rē'ă	scanty menstrual period
oligo-ovulation ol'i-gō-ov'yū-lă'shŭn	irregular ovulation

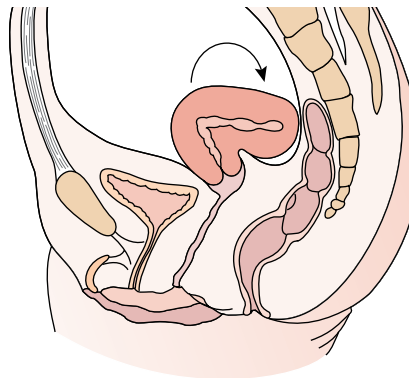
Gynecological Diagnostic Terms

Term	Meaning
cervicitis ser-vi-sī'tis	inflammation of the cervix
congenital anomalies (irregularities) kon-jen'i-tāl ă-nom'ă-lēz	birth defects causing the abnormal development of a female organ or structure (e.g., double uterus, absent vagina)
dermoid cyst der'moyd sist	congenital tumor composed of displaced embryonic tissue (teeth, bone, cartilage, and hair) more commonly found in an ovary; it is usually benign
displacement of uterus	displacement of the uterus from its normal position (Fig. 17.5)
anteflexion an-tē-flek'shŭn	abnormal forward bending of the uterus (ante = before; flexus = bend)
retroflexion re-trō-flek'shŭn	abnormal backward bending of the uterus
retroversion re-trō-ver'zhŭn	backward turn of the whole uterus—also called tipped uterus

Anteflexion



Retroflexion



The three degrees of retroversion

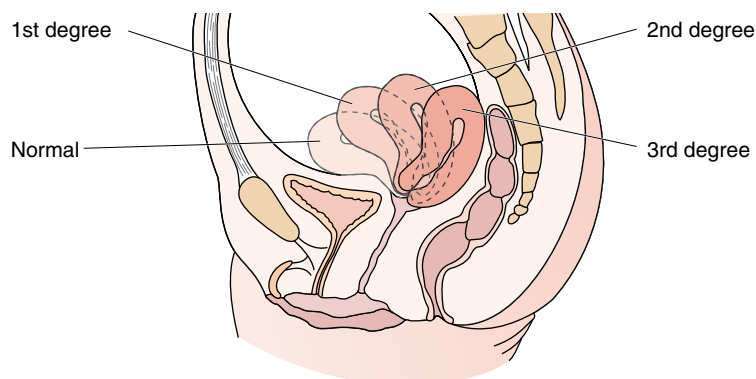


Figure 17.5 Displacements of the uterus.

Term	Meaning
endometriosis en'dō-mē-trē-ō'sis	condition characterized by migration of portions of endometrial tissue outside the uterine cavity
endometritis en'dō-mē-trī'tis	inflammation of the endometrium
fibroid fī'broyd fibromyoma fī'brō-mī-ō'mă leiomyoma lī'ō-mī-ō'mă	benign tumor in the uterus composed of smooth muscle and fibrous connective tissue (Fig. 17.6)
fistula fis'tyū-lă	abnormal passage such as from one hollow organ to another (fistula = pipe) (Fig. 17.7)
rectovaginal fistula rek-tō-vaj'i-năl	abnormal opening between the vagina and rectum
vesicovaginal fistula ves-i-kō-vaj'i-năl	abnormal opening between the bladder and vagina
cervical neoplasia	abnormal development of cervical tissue cells
cervical intraepithelial neoplasia (CIN) in'tră-ep-i-thē'lē-ăl nē-ō-plă'zē-ă cervical dysplasia dis-plă'zē-ă	potentially cancerous abnormality of epithelial tissue of the cervix, graded according to the extent of abnormal cell formation: CIN 1 mild dysplasia CIN 2 moderate dysplasia CIN 3 severe dysplasia (see Fig. 17.13B)

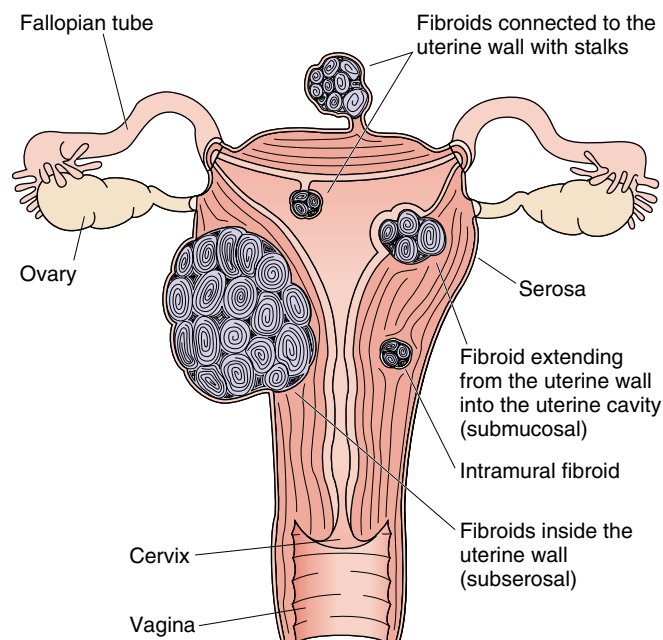
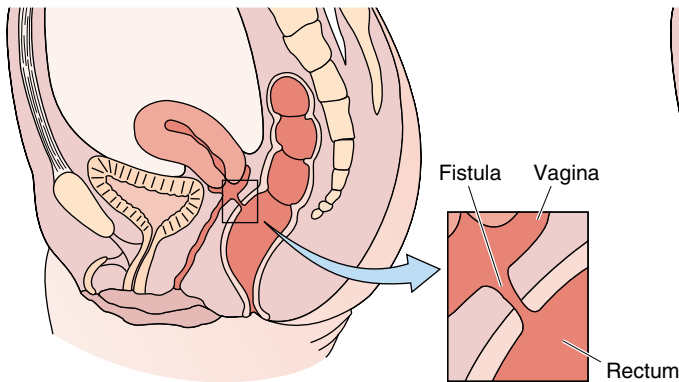


Figure 17.6 Fibroids.

Rectovaginal fistula



Vesicovaginal fistula

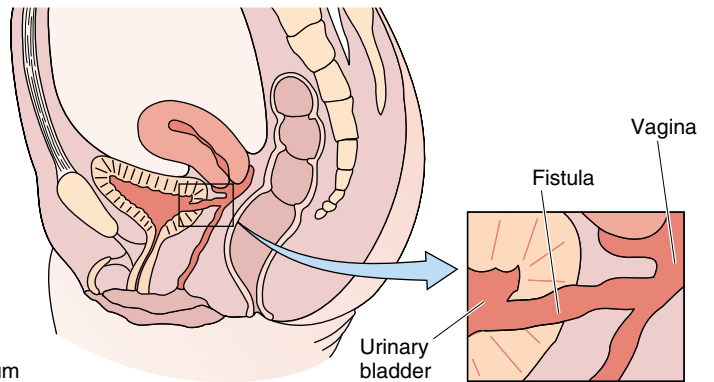


Figure 17.7 Fistulas.

Term	Meaning
carcinoma in situ (CIS) of the cervix kar-si-nō'mă in sī'tū	malignant cell changes of the cervix that are localized without any spread to adjacent structures
menopause men'ō-pawz	cessation of menstrual periods owing to a lack of ovarian hormones
oophoritis ō-of-ōr-ī'tis	inflammation of one or both ovaries
parovarian cyst par-ō-var'ē-an	cyst of the fallopian tube
pelvic adhesions pel'vik ad-hē'zhūnz	scarring of tissue within the pelvic cavity as a result of endometriosis, infection, or injury
pelvic inflammatory disease (PID)	inflammation of organs in the pelvic cavity usually including the fallopian tubes, ovaries, and endometrium—most often caused by bacteria
pelvic floor relaxation	relaxation of supportive ligaments of the pelvic organs (Fig. 17.8)
cystocele sis'tō-sēl	pouching of the bladder into the vagina
rectocele rek'tō-sēl	pouching of the rectum into the vagina
enterocele en'ter-ō-sēl	pouching sac of peritoneum between the vagina and rectum
urethrocele yū-rē'thrō-sēl	pouching of the urethra into the vagina
prolapse prō-laps'	descent of the uterus down the vaginal canal
salpingitis sal-pin-jī'tis	inflammation of a fallopian tube

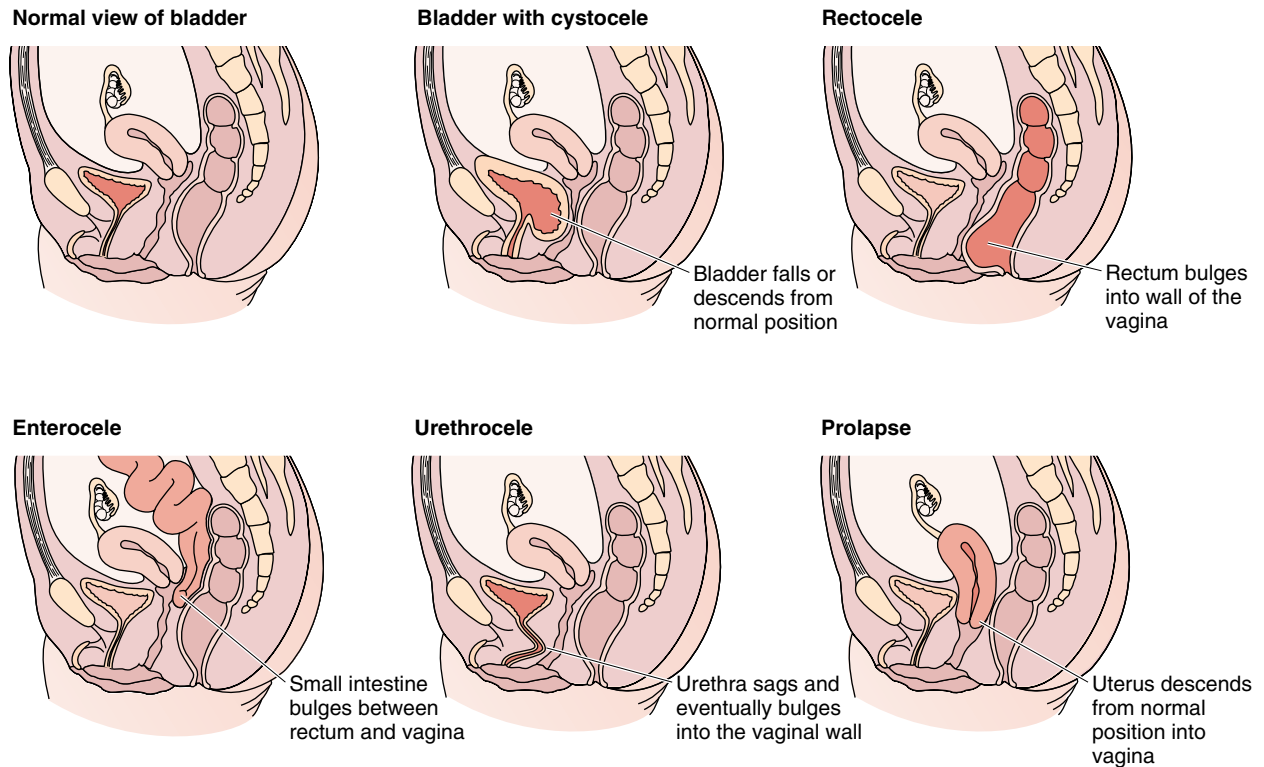


Figure 17.8 Pelvic floor relaxation.

SEXUALLY TRANSMITTED DISEASES (STDs)

Term

Meaning

Major Bacterial STDs

chlamydia
kla-mid'ē-ă

most common sexually transmitted bacterial infection in North America; often occurs with no symptoms and is treated only after it has spread, such as to cause pelvic inflammatory disease

gonorrhea
gon-ō-rē'ă

contagious inflammation of the genital mucous membranes caused by invasion of the gonococcus, *Neisseria gonorrhoeae* (gono = seed; rhea = discharge)

syphilis
sif'i-lis

infectious disease caused by a spirochete transmitted by direct intimate contact that may involve any organ or tissue over time; usually manifested first on the skin with the appearance of small, painless red papules that erode and form bloodless ulcers called *chancres*

Major Viral STDs

hepatitis B virus (HBV)
hep-ă-tī'tis

virus that causes an inflammation of the liver as a result of transmission through any body fluid, including vaginal secretions, semen, and blood

herpes simplex virus type 2 (HSV-2)
her'pēz

virus that causes ulcer-like lesions of the genital and anorectal skin and mucosa; after initial infection, the virus lies dormant in the nerve cell root and may recur at times of stress (Fig. 17.9)



Figure 17.9 Herpes simplex virus type 2.

Term	Meaning
human immunodeficiency virus (HIV) im'yū-nō-dē-fish'en-sē	virus that causes acquired immunodeficiency syndrome (AIDS), permitting various opportunistic infections, malignancies, and neurological diseases—contracted through exposure to contaminated blood or body fluid (e.g., semen, vaginal secretions)
human papilloma virus (HPV) pap-i-lō'mă condyloma acuminatum kon-di-lō'mah ä-kyū'mī-nāt'üm pl. condylomata acuminata kon-di-lō'mah'tă ä-kyū'mī-nah'tă	virus transmitted by direct sexual contact that causes an infection that can occur on the skin or mucous membranes of the genitals; on the skin, the lesions appear as cauliflower-like warts, and on the mucous membranes, they have a flat appearance (also known as venereal or genital warts) (Fig. 17.10)



Figure 17.10 Condylomata acuminata (genital warts) caused by HPV.

Term	Meaning
vaginitis vaj-i-nī'tis	inflammation of the vagina with redness, swelling, and irritation—often caused by a specific organism, such as <i>Candida</i> (yeast) or <i>Trichomonas</i> (sexually transmitted parasite)
atrophic vaginitis ă-trof'ik	thinning of the vagina and loss of moisture owing to depletion of estrogen, which causes inflammation of tissue
vaginosis vaj'i-nō-sis	infection of the vagina with little or no inflammation characterized by a milk-like discharge and an unpleasant odor—also known as nonspecific vaginitis
BREASTS	
adenocarcinoma of the breast ad'ě-nō-kar-si-nō'mă	malignant tumor of glandular breast tissue
amastia ă-mas'tē-ă	absence of a breast
fibrocystic breasts fī-brō-sis'tik	benign condition of the breasts consisting of fibrous and cystic changes that render the tissue more dense—patient feels painful lumps that fluctuate in size during the menstrual cycle
gynecomastia gī'ně-kō-mas'tē-ă	development of mammary glands in the male, caused by altered hormone levels (Fig. 17.11)

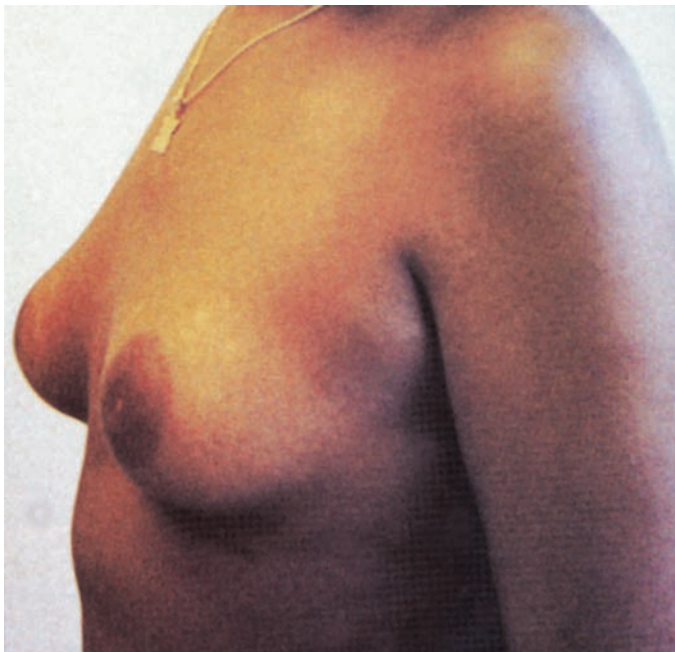


Figure 17.11 This 15-year-old boy presented with a 3-year history of gradual, bilateral breast enlargement known as *gynecomastia*. He was otherwise healthy and showed normal pubertal development. The cause in his case was idiopathic, but most are related to hormone imbalance as seen in tumors of the pituitary or adrenal glands. For cosmetic reasons and because of functional impairment (breast pain with running), he underwent breast reduction mammoplasty.

Term	Meaning
hypermastia hī-per-mas'tē-ă	abnormally large breasts
macromastia mak-rō-mas'tē-ă	
hypomastia hī'po-mas'tē-ă	unusually small breasts
micromastia mī'kro-mas'tē-ă	
mastitis mas-tī'tis	inflammation of the breast—most common in women when breast-feeding
polymastia pol-ē-mas'tē-ă	presence of more than two breasts
polythelia pol-ē-thē'lē-ă	presence of more than one nipple on a breast
supernumerary nipples sū-per-nū'mer-ār-ē	

Gynecological Diagnostic Tests and Procedures

Test or Procedure	Explanation
biopsy (Bx) bī'op-sē	removal of tissue for microscopic pathological examination (Fig. 17.12)
aspiration Bx as-pi-rā'shŭn	needle draw of tissue or fluid from a cavity for cytological examination—also called needle biopsy
endoscopic Bx en'dō-skōp'ik	removal of a specimen for biopsy during an endoscopic procedure (e.g., colposcopy)
excisional Bx ek-sizh'ŭn-ăl	removal of an entire lesion for microscopic examination
incisional Bx in-sizh'ŭn-ăl	removal of a piece of suspicious tissue for microscopic examination (e.g., cervical or endometrial biopsy)
needle Bx	removal of a core specimen of tissue using a special hollow needle
stereotactic breast Bx ster'ē-ō-tak'tik	use of x-ray or ultrasound imaging, a specialized stereotactic frame, and a computer to calculate, precisely locate, and direct a needle into a breast lesion for the removal of a core specimen for biopsy
sentinel node breast Bx sen'tin'l nōd	biopsy of the sentinel node (the first lymph node to receive lymphatic drainage from a tumor) in a breast with early cancer to determine metastases and, if no malignancy is found, avoid the extensive removal of axillary nodes that causes lymphedema (swelling under the arms); includes radionuclide imaging to locate the sentinel node (sentinel refers to <i>guarding</i> a point of entry)

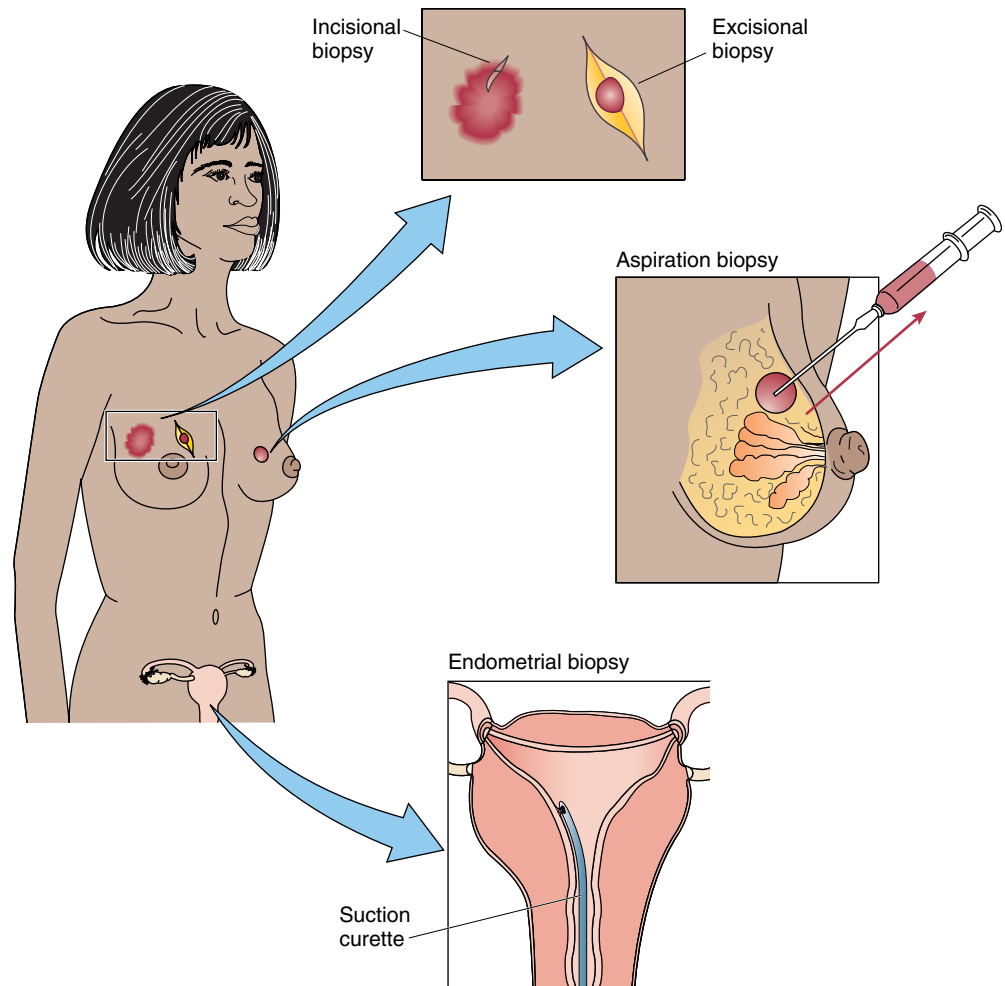
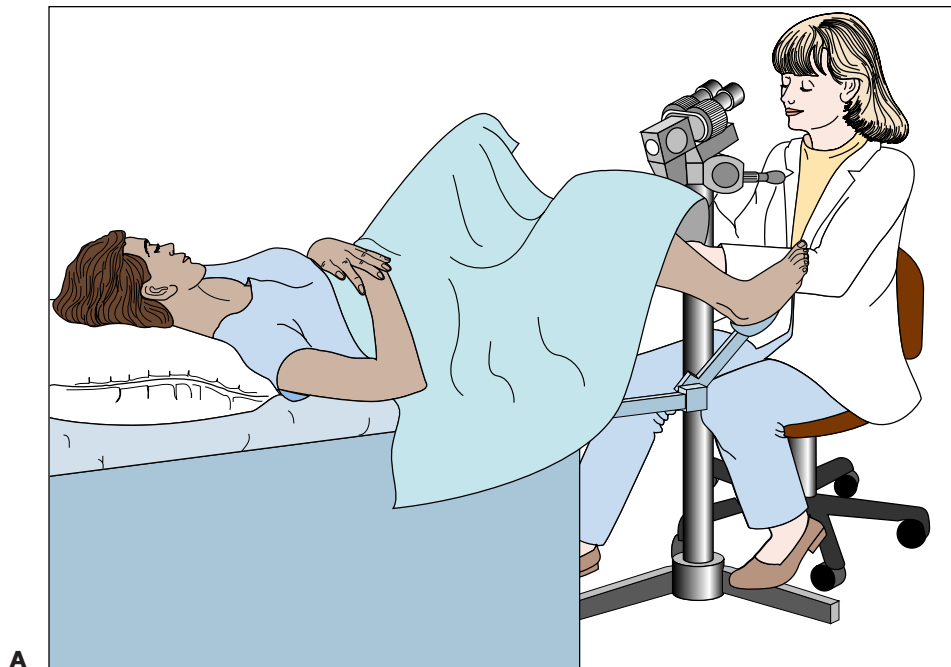
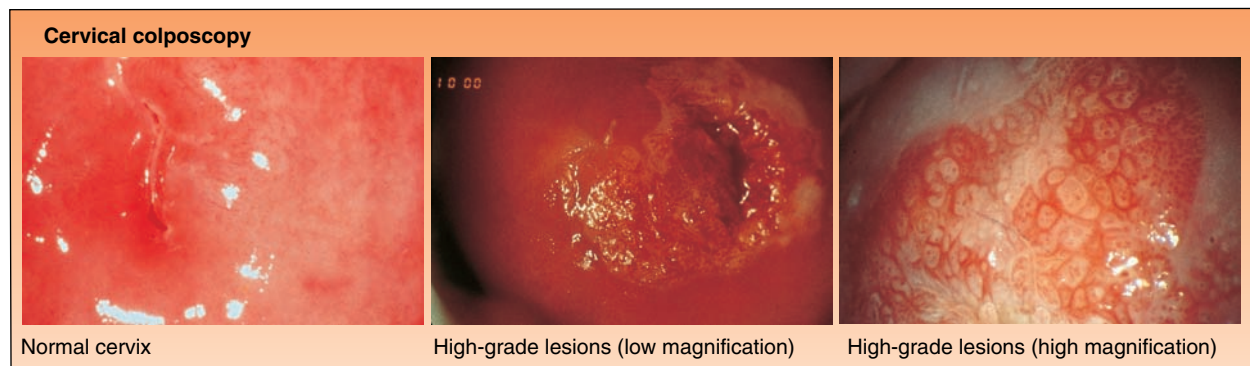


Figure 17.12 Biopsy.

Test or Procedure	Explanation
<p>colposcopy kol-pos'kō-pē</p>	<p>examination of the vagina and cervix using a colposcope, a specialized microscope used to examine the vagina and cervix, often with a camera attachment for photographs—used to document findings and follow-up treatments (Fig. 17.13)</p>
<p>hysteroscopy his-ter-os'kō-pē</p>	<p>use of a hysteroscope to examine the intrauterine cavity for the assessment of abnormalities (e.g., polyps, fibroids, anomalies) (Fig. 17.14)</p>
<p>magnetic resonance imaging (MRI) rez'ō-nans</p>	<p>use of nonionizing images to detect gynecological conditions (e.g., anomalies of the pelvis or soft tissues of the breast) or stage tumors arising from the endometrium or cervix</p>
<p>Papanicolaou smear (Pap) pa-pē-nē'kē-low</p>	<p>study of cells collected from the cervix to screen for cancer and other abnormalities</p>

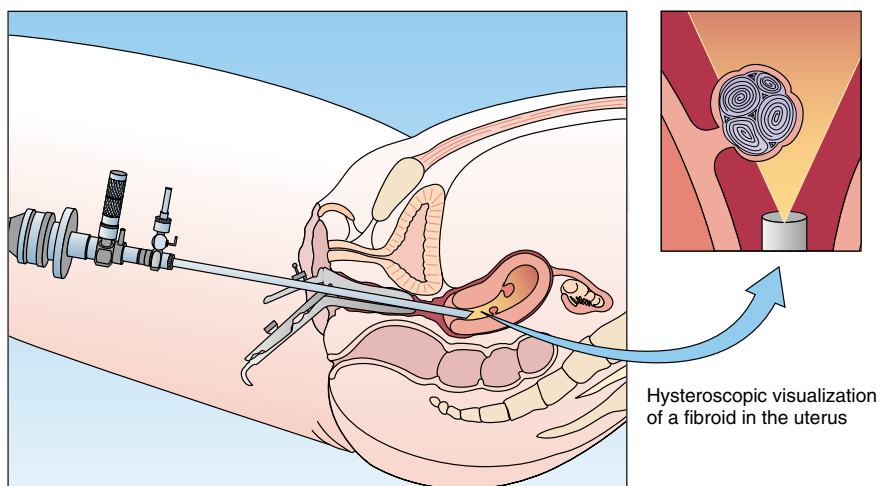


A



B

Figure 17.13 A. Colposcopy. B. Photographs taken during cervical colposcopy. Biopsy of the high-grade lesions revealed CIN 3 (severe dysplasia).



Hysteroscopic visualization of a fibroid in the uterus

Figure 17.14 Hysteroscopy.

Test or Procedure	Explanation
radiography rā'dē-og'rā-fē	x-ray imaging
hysterosalpingogram his'ter-ō-sal-ping-ō-gram	x-ray of the fallopian tubes after injection of a contrast medium through the cervix—used to determine tubal patency
mammogram mam'ō-gram	low-dose x-ray of breast tissue done to detect neoplasms (Fig. 17.15)
pelvic sonography sō-nog'rā-fē	ultrasound imaging of the female pelvis (Fig. 17.16)
endovaginal sonogram en'dō-vaj'i-nāl	ultrasound image of the uterus, tubes, and ovaries made after introduction of an ultrasonic transducer within the vagina to detect conditions such as ectopic pregnancy or missed abortion
transvaginal sonogram trans-vaj'i-nāl son'ō-gram	
hysterosonogram (saline infusion sonogram)	transvaginal sonographic image made as sterile saline is injected into the uterus; used to assess uterine pathology or determine tubal patency; also known as sonohysterogram
transabdominal sonogram trans-ab-dom'i-nāl	ultrasound image of the lower abdomen including the bladder, uterus, tubes, and ovaries to detect conditions such as cysts and tumors

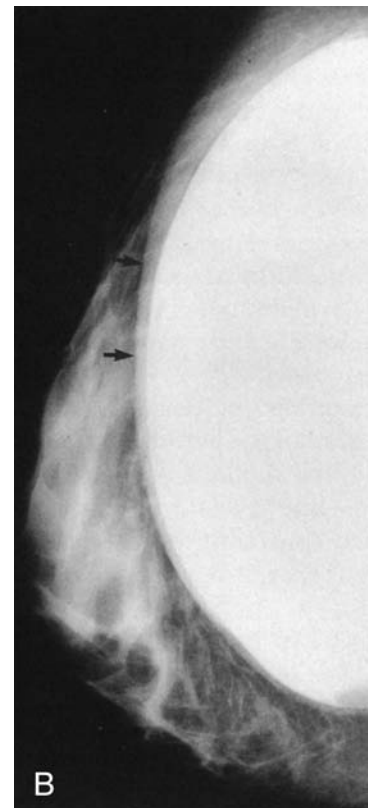
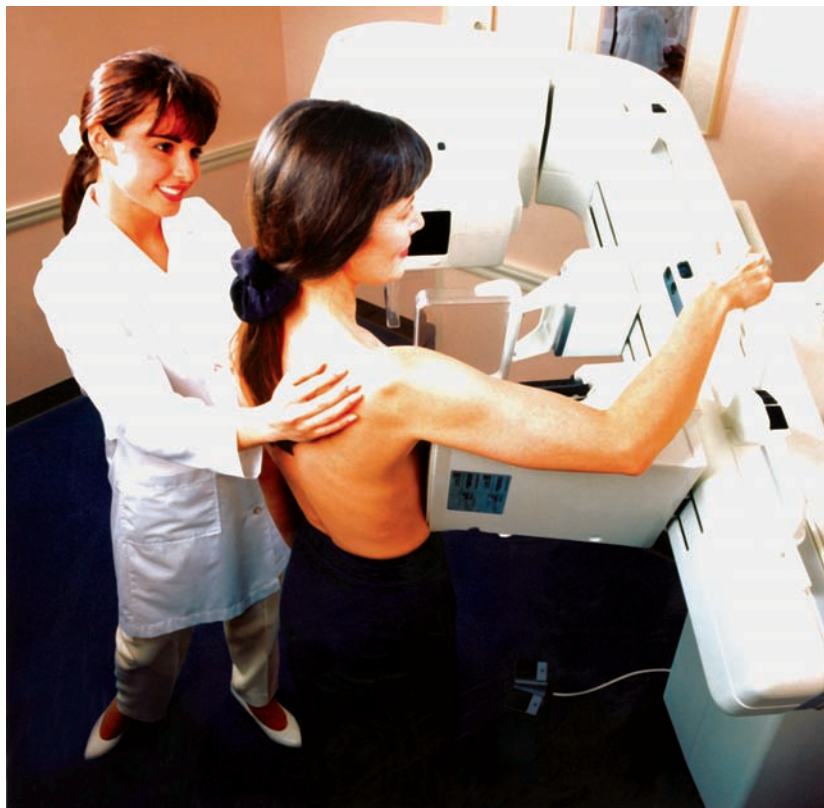


Figure 17.15 **A.** Mammography procedure. **B.** Mammogram of a patient with an implant. Arrows, pectoralis muscle anterior to the implant.

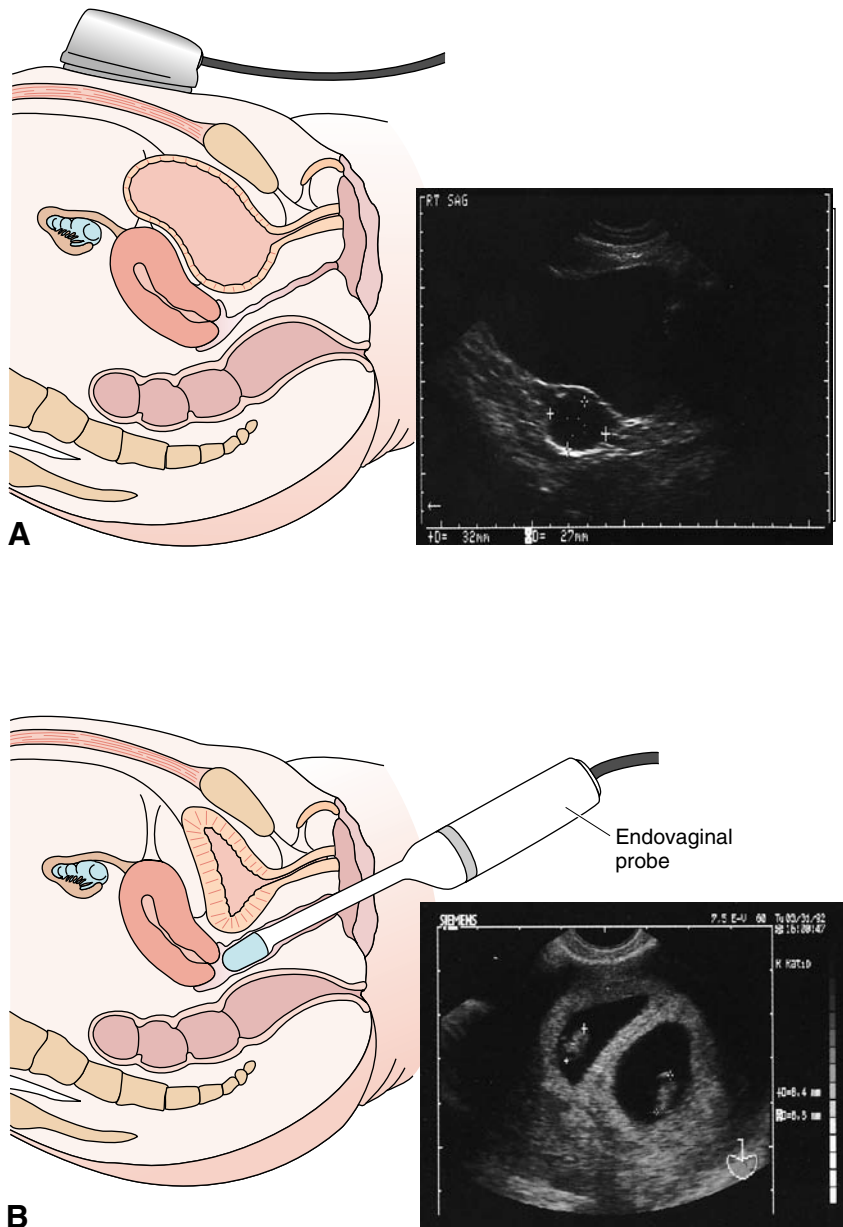
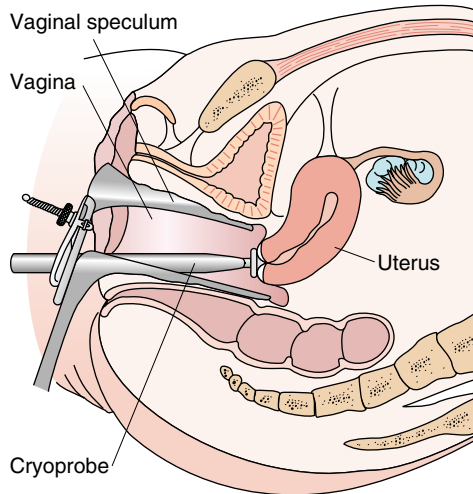


Figure 17.16 Pelvic sonography. **A.** Transabdominal imaging procedure. *Inset,* simple ovarian cyst. **B.** Transvaginal imaging procedure. *Inset,* twin pregnancies.

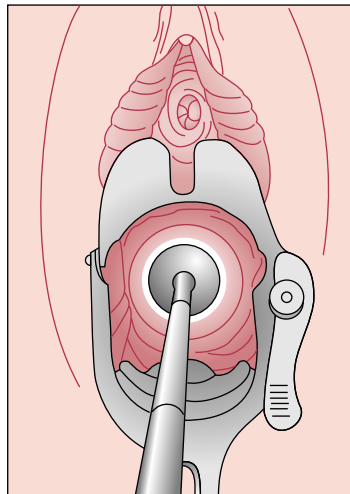
Gynecological Operative Terms

Term	Meaning
adhesiolysis ad-hē'zē-ōl'i-sis adhesiotomy ad-hē-sē-ot'-ōmē	breaking down or severing of pelvic adhesions
cervical conization ser'vī-kal kō-nī-zā'shŭn	removal of a cone-shaped portion of the cervix



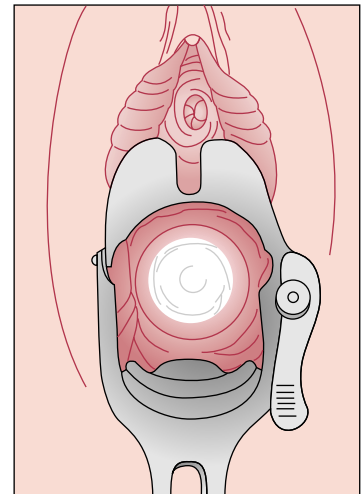
Insertion of speculum and introduction of cryoprobe into the vagina

A



Placement of cryosurgical probe at treatment site

B



Ice crystals seen immediately after freezing treatment

C

Figure 17.17 Cryosurgical procedure: cryoconization of the cervix.

Term	Meaning
colporrhaphy kol-pōr'ă-fē	suture to repair the vagina
anterior repair	repair of a cystocele
posterior repair	repair of a rectocele
A&P repair	anterior and posterior repair of a cystocele and rectocele
cryosurgery krī-ō-ser'jer-ē	method of destroying tissue by freezing—used for treating dysplasia and early cancers (Fig. 17.17)

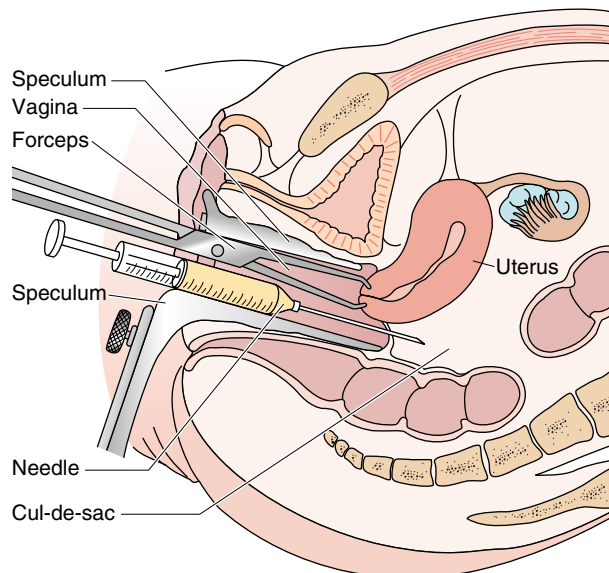
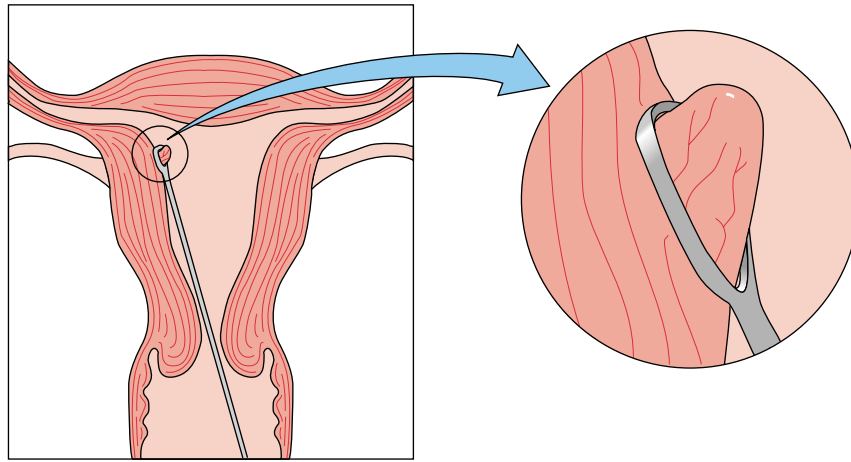


Figure 17.18 Culdocentesis.



A **curette** (a spoon-shaped cutting instrument) is inserted after dilating the cervix.

Curettage (scraping) the endometrium

Figure 17.19 Dilation and curettage.

Term	Meaning
culdocentesis kŭl-dō-sen-tē'sis	aspiration of fluid from the cul-de-sac (cavity that lies between the rectum and posterior wall of the uterus)—used for diagnosing ectopic pregnancy and pelvic inflammatory disease (Fig. 17.18)
dilation and curettage (D&C) dī-lā'shŭn kyū-rĕ-tahzh'	dilation of the cervix and scraping of the endometrium to control bleeding, obtain tissue for biopsy, or remove polyps or products of conception (Fig. 17.19)
hysterectomy his-ter-ek'tō-mē	removal of the uterus
abdominal hysterectomy	removal of the uterus through an incision in the abdomen
vaginal hysterectomy	removal of the uterus through the vagina
total hysterectomy	removal of the uterus and cervix
laparoscopy lap-ă-ros'kō-pē	inspection of the abdominal or pelvic cavity with a laparoscope, an endoscope used to examine the abdominal and pelvic regions
laparoscopic surgery	surgical procedures within the abdominal or pelvic region using a laparoscope
laser surgery lā'zer	use of a laser to destroy lesions or dissect or cut tissue—used frequently in gynecology
loop electrosurgical excision procedure (LEEP) large loop excision of the transformation zone (LLETZ)	use of electrosurgical or radio waves transformed through a loop-configured electrosurgical device to treat precancerous lesions by simultaneous excisional biopsy and treatment of affected tissue (e.g., cervical dysplasia, human papilloma virus lesions); note that the transformation zone is the area of the cervix where neoplasia (abnormal cell formation) is most likely to arise (Fig. 17.20)



HYSTERIA.

Hysteria is a Greek word meaning a uterine condition. Ancient Greeks believed that nervous symptoms were due to the uterus and therefore were experienced only by women. Plato described the uterus as an animal endowed with spontaneous sensation and emotion that was lodged in a woman, ardently desiring to produce children. If the uterus remained sterile long after puberty, it became ill-tempered and caused a general disturbance in the body until it became pregnant. The common prescription for the hysterical female in those days was marriage and childbirth!

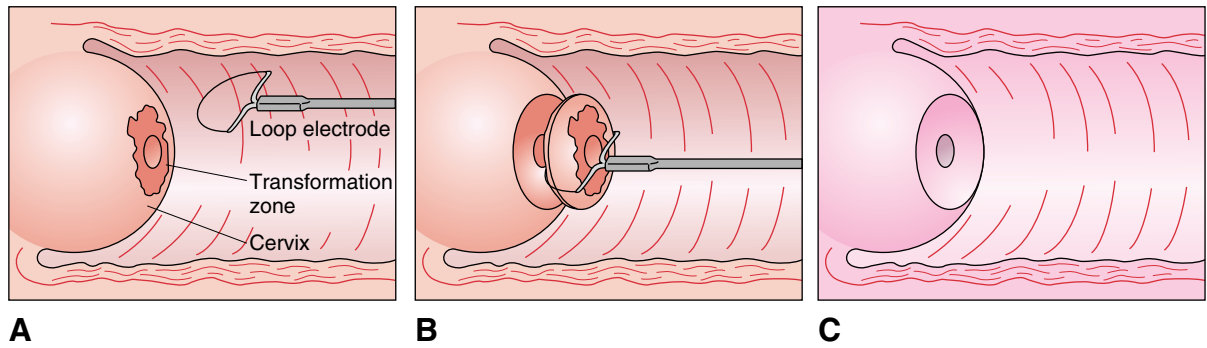


Figure 17.20 Loop electroexcisional excision procedure (LEEP) or large loop excision of the transformation zone (LLETZ). **A.** Electrode approach. **B.** Removal of the transformation zone. **C.** Excision site (region between the endocervix and ectocervix).

Term	Meaning
myomectomy mī-ō-mek'tō-mē	excision of fibroid tumors
oophorectomy ō-of-ōr-ek'tō-mē	excision of an ovary
ovarian cystectomy ō-var'ē-an sis-tek'tō-mē	excision of an ovarian cyst
salpingectomy sal-pin-jek'tō-mē	excision of a uterine tube
bilateral salpingo-oophorectomy bī-lat'er-āl sal-ping'gō-ō-of-ō-rek'tō-mē	excision of both uterine tubes and ovaries
salpingotomy sal-pin-got'tō-mē	incision into a fallopian tube—often performed to remove an ectopic pregnancy (Fig. 17.21)
salpingostomy sal-ping-gos'tō-mē	creation of an opening in the fallopian tube to open a blockage
tubal ligation lī-gā'shūn	sterilization of a woman by cutting and tying (ligating) the uterine tubes

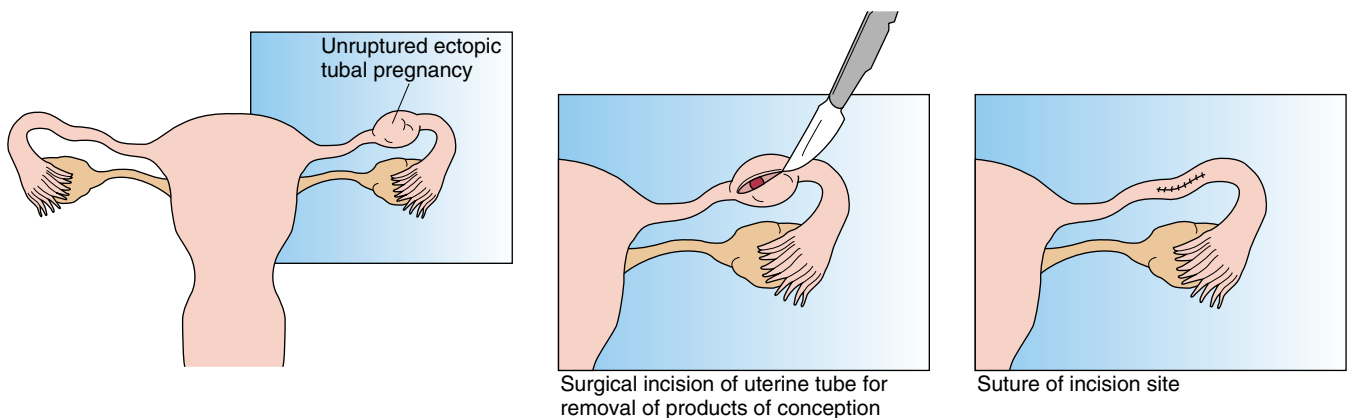
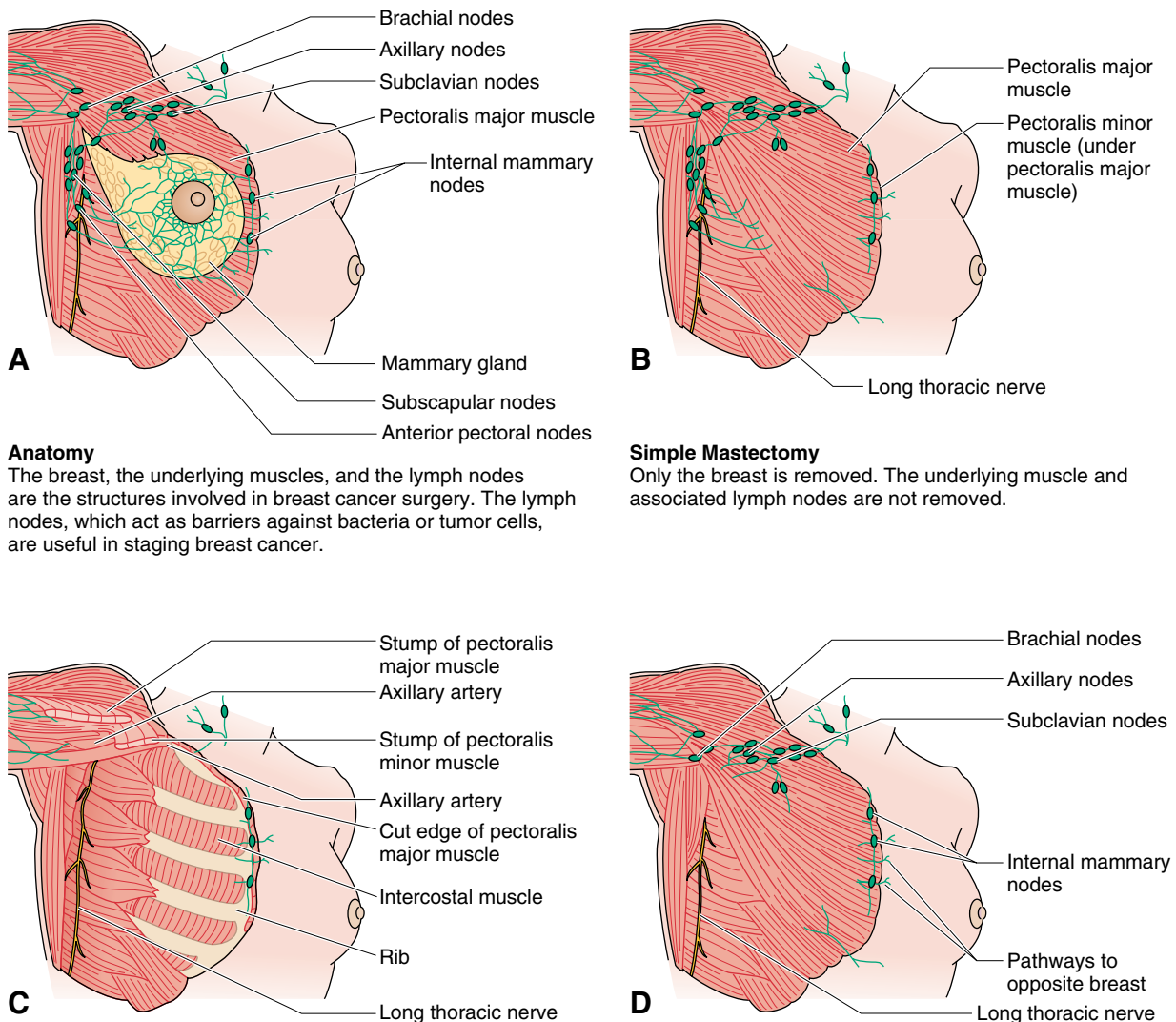


Figure 17.21 Salpingotomy.

Term	Meaning
BREASTS	
lumpectomy lŭm-pek'tō-mē	excision of a breast tumor without removing any other tissue or lymph nodes; most often followed by radiation and/or chemotherapy if cancerous
mastectomy mas-tek'tō-mē	removal of a breast (Fig. 17.22)
simple mastectomy	removal of an entire breast with underlying muscle and axillary lymph nodes left intact
radical mastectomy	removal of an entire breast, underlying chest muscles, and axillary lymph nodes
modified radical mastectomy	removal of an entire breast and axillary lymph nodes (Fig. 17.23A)

**Anatomy**

The breast, the underlying muscles, and the lymph nodes are the structures involved in breast cancer surgery. The lymph nodes, which act as barriers against bacteria or tumor cells, are useful in staging breast cancer.

Simple Mastectomy

Only the breast is removed. The underlying muscle and associated lymph nodes are not removed.

Radical Mastectomy

The breast, pectoralis muscles, and contents of the axilla (including lymph nodes and adipose tissue) are removed.

Modified Radical Mastectomy

The breast and lymph nodes of the axilla are removed. Occasionally, the pectoralis minor muscle is transected or removed to approach the lymph nodes.

Figure 17.22 A. Anatomy of the breast. B–D. Mastectomy alternatives.



Figure 17.23 Augmentation mammoplasty. **A.** Left modified radical mastectomy in a 53-year-old woman (3 months postoperation). **B.** Same patient 10 months after augmentation mammoplasty.

Term	Meaning
mammoplasty mam'ō-plas-tē	surgical reconstruction of a breast
augmentation mammoplasty	reconstruction to enlarge the breast, often by insertion of an implant (see Fig. 17.23A and B)
reduction mammoplasty	reconstruction to remove excessive breast tissue (Fig. 17.24)
mastopexy mas'tō-pek-sē	elevation of pendulous breast tissue (see Fig. 17.24B)

Therapeutic Terms

Term	Meaning
chemotherapy kem'ō-thār-ă-pē	treatment of malignancies, infections, and other diseases with chemical agents that destroy selected cells or impair their ability to reproduce
radiation therapy	treatment of neoplastic disease by using radiation, usually from a cobalt source, to deter the proliferation of malignant cells
hormone replacement therapy (HRT)	use of a hormone (e.g., estrogen, progesterone) to replace a deficiency or regulate production

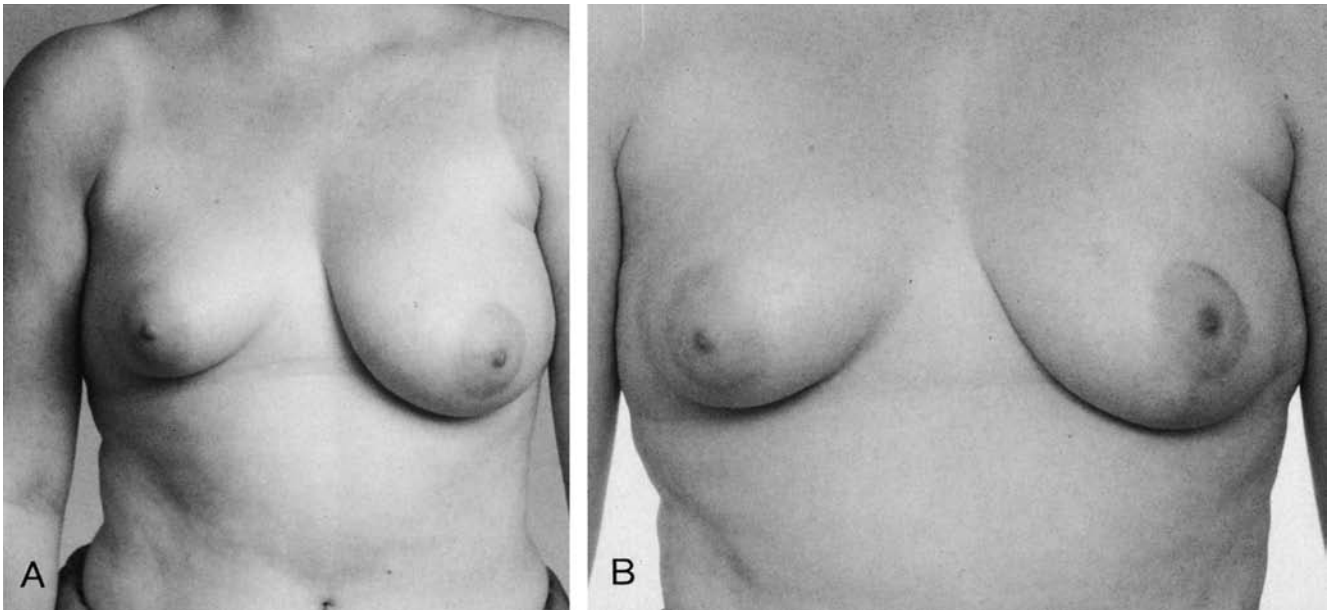


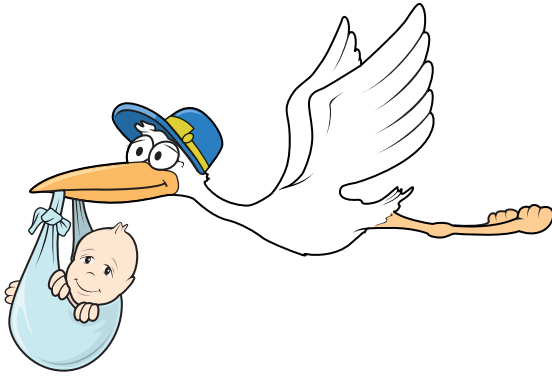
Figure 17.24 Mammoplasty and mastopexy. **A.** Micromastia of one breast and macromastia of the opposite breast in a 22-year-old patient. **B.** Same patient 15 months postreduction mammoplasty and mastopexy.

Term	Meaning
hormonal contraceptives	hormones used to prevent conception by suppressing ovulation
oral contraceptive pill (OCP)	birth control pill
contraceptive injection	injection of a hormone such as Depo-Provera into the body
contraceptive implant	insertion of a contraceptive capsule under the skin that provides a continual infusion over an extended time
barrier contraceptives	products that provide a physical barrier that prevents conception (e.g., condoms, diaphragms)
intrauterine device (IUD) in'tră-yū'ter-in	contraceptive device inserted into the uterus that prevents implantation of the fertilized egg
spermicidals sper-mi-sī'dălz	creams, jellies, lotions, or foams containing agents that kill sperm (cido = to kill)
uterine fibroid embolization (UFE)	catheter-guided injection of embolic agents into the arteries supplying blood to fibroid tumors, blocking circulation and causing shrinkage; minimally invasive procedure performed by a vascular and interventional radiologist in a angiographic laboratory

Obstetrical (OB) Symptomatic and Diagnostic Terms

ob-stet'ri-kal

Term	Meaning
SYMPTOMATIC	
gravida grav'i-dă	pregnant woman [Note: In an obstetrical history, gravida, or G, followed by a numeral indicates the number of pregnancies (Fig. 17.25).]
nulligravida nŭl-i-grav'i-dă	having never been pregnant
primigravida prī-mi-grav'i-dă	first pregnancy
para par'ă	to bear; a woman who has produced one or more viable (live outside the uterus) offspring [Note: In an obstetrical history, para, or P, followed by a numeral indicates the number of times a pregnancy has resulted in a single or multiple birth (see Fig. 17.25).]
nullipara nŭl-i-par'ă	woman who has not borne a child (nulli = none; para = to bear)
primipara pri-mip'ă-ră	first delivery (primi = first; para = to bear)
multipara mŭl-tip'ă-ră	woman who has given birth to two or more children (multi = many; para = to bear)
cervical effacement ĕ-fās'ment	progressive obliteration of the endocervical canal during delivery
estimated date of confinement (EDC) kon-fīn'ment	expected date for delivery of the baby—normally 280 days or 40 weeks from conception
estimated date of delivery (EDD)	
meconium staining mē-kō'nē-ŭm	presence of meconium in amniotic fluid
ruptured membranes rŭp'chŭrd	rupture of the amniotic sac, usually at the onset of labor
macrosomia mak-rō-sō'mē-ă	large-bodied baby commonly seen in diabetic pregnancies (macro = large; soma = body)
polyhydramnios pol'ē-hī-dram'nē-os	excessive amniotic fluid
DIAGNOSTIC	
abortion (AB) ă-bŏr'shŭn	expulsion of the product of conception before the fetus can be viable (live outside the uterus)
spontaneous abortion (SAB) spon-tă'nē-ŭs	miscarriage; expulsion of products of conception occurring naturally



The following abbreviations are used in recording an obstetrical history.

GPA terms:

- G gravida number of pregnancies
- P para number of viable birth experiences (may include multiple births)
- AB abortus abortions
 - SAB spontaneous abortion
 - TAB therapeutic abortion

Arabic numerals are placed after each abbreviation to indicate the number of pregnancies, viable births, or abortions.

Example:

Obstetric history: G2, P1, AB1 or gravida 2, para 1, abortus 1.
 [The patient has been pregnant twice, had one birth experience that resulted in the delivery of at least one viable offspring, and had one abortion.]

TPAL terms:

- T term infants
- P premature infants
- A abortions
- L living children

Example:

Obstetric history: 5 term infants, 0 premature infants, 0 abortions, 5 living children
 or Obstetric history: 5-0-0-5.
 [The patient has delivered five term infants, no premature infants, no abortions and has five living children.]

Occasionally, combined GPA and TPAL abbreviations are used. For example:

Obstetrical history: gravida 3, 4-0-0-4
 [The patient has been pregnant three times, had four term infants, no premature infants, no abortions, and has 4 living children. (Numbers indicate one twin birth.)]

Figure 17.25 Obstetrical history abbreviations.

Term	Meaning
habitual abortion	spontaneous abortion occurring in three or more consecutive pregnancies
incomplete abortion	incomplete expulsion of products of conception
missed abortion	death of a fetus or embryo within the uterus that is not naturally expelled after death
threatened abortion	bleeding with threat of miscarriage



ECLAMPSIA.

Eclampsia is a Greek word meaning to flash out or shine forth suddenly, first used in the 18th century for any sudden convulsion. Today, it particularly refers to toxemia of pregnancy.

Term	Meaning
cephalopelvic disproportion (CPD) sef'ă-lō-pel'vik	conditions preventing normal delivery through the birth canal—either the baby's head is too large or the birth canal is too small
eclampsia ek-lamp'sē-ă	true toxemia of pregnancy characterized by high blood pressure, albuminuria, edema of the legs and feet, severe headaches, dizziness, convulsions, and coma
preeclampsia prē-ē-klamp'sē-ă	toxemia of pregnancy characterized by high blood pressure, albuminuria, edema of the legs and feet, and puffiness of the face, without convulsion or coma
pregnancy-induced hypertension (PIH)	
ectopic pregnancy ek-top'ik	implantation of the fertilized egg outside the uterine cavity, often in the tube, ovary, or (rarely) the abdominal cavity (Fig. 17.26)
erythroblastosis fetalis ě-rith'rō-blas-tō'sis fē'tā'lis	disorder that results from the incompatibility of a fetus with an Rh-positive blood factor and a mother who is Rh negative, causing red blood cell destruction in the fetus—necessitates a blood transfusion to save the fetus
Rh factor	presence, or lack, of antigens on the surface of red blood cells that may cause a reaction between the blood of the mother and fetus, resulting in fetal anemia (which causes erythroblastosis fetalis)
Rh positive	presence of antigens
Rh negative	absence of antigens

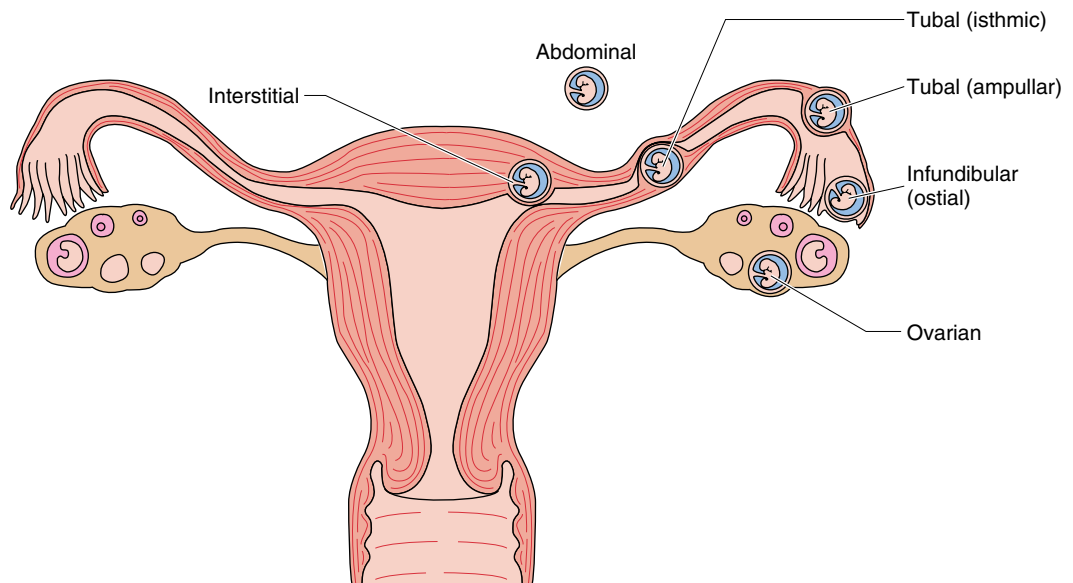


Figure 17.26 Ectopic pregnancy: sites of extrauterine implantation.

Term	Meaning
hyperemesis gravidarum hī-per-em'ě-sis grav-i-dā'rŭm	severe nausea and vomiting in pregnancy that can cause severe dehydration in the mother and fetus (emesis = vomit)
meconium aspiration mē-kō'nē-ŭm as-pi-rā'shŭn	fetal aspiration of amniotic fluid containing meconium
placenta previa plă-sen'tă prē'vē-ă	displaced attachment of the placenta in the lower region of the uterine cavity (Fig. 17.27)
abruptio placentae ab-rŭp'shē-ō pla-sen'tē	premature detachment of a normally situated placenta

Obstetrical Diagnostic Tests and Procedures

Test or Procedure	Explanation
chorionic villus sampling (CVS) kō-rē-on'ik vil'us	sampling of placental tissue for microscopic and chemical examination to detect fetal abnormalities (Fig. 17.28A)
amniocentesis am'nē-ō-sen-tē'sis	aspiration of a small amount of amniotic fluid for analysis of possible fetal abnormalities (Fig. 17.28B)
fetal monitoring	use of an electronic device for simultaneous recording of fetal heart rate and uterine contractions
pelvimetry pel-vim'ě-trē	obstetrical measurement of the pelvis to evaluate proper conditions for vaginal delivery
pregnancy test	test performed on urine or blood to detect the presence of human chorionic gonadotropin hormone (secreted by the placenta) that indicates pregnancy

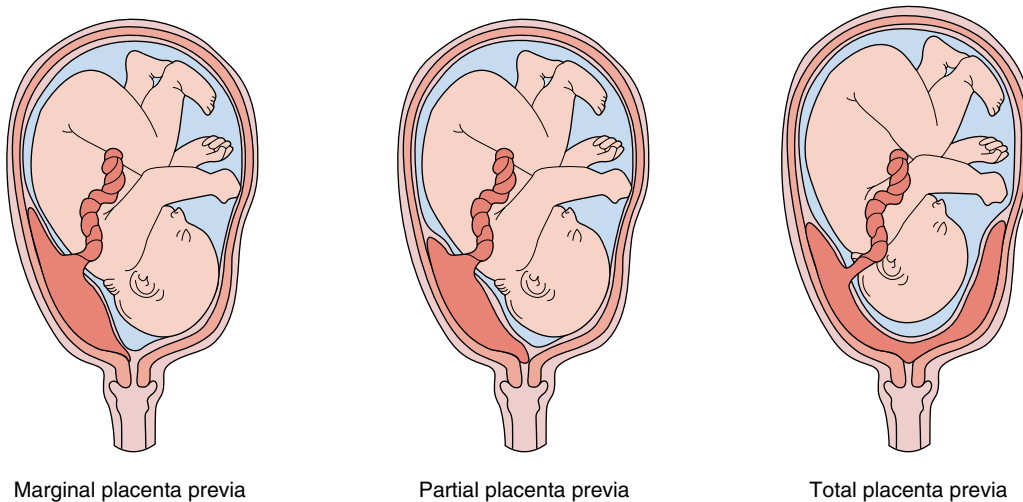


Figure 17.27 Placenta previa.

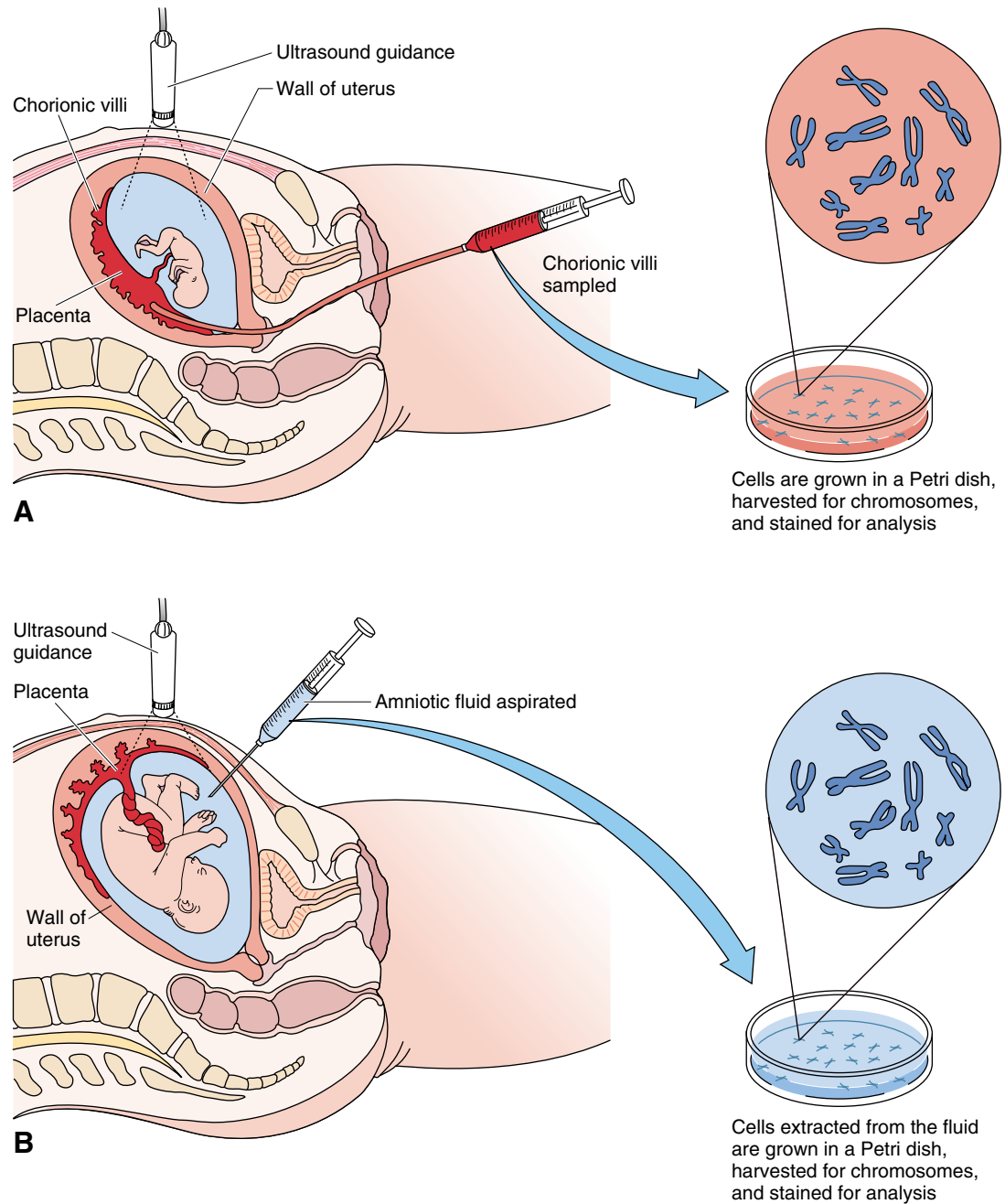


Figure 17.28 **A.** Chorionic villus sampling (9–11 weeks). **B.** Amniocentesis (15–18 weeks).

Term	Meaning
endovaginal sonogram transvaginal sonogram	ultrasound image of the uterus, tubes, and ovaries made after introduction of an ultrasonic transducer within the vagina—useful in detecting pathology (e.g., ectopic pregnancy, missed abortion) (see Fig. 17.16)
obstetrical sonogram	ultrasound image of the pregnant uterus to determine fetal development (see Figs. 17.3B, 17.4B, and 17.16B)

Obstetrical Operative and Therapeutic Terms

Term	Meaning
OPERATIVE	
cesarean section (C-section) se-zā'rē-ăn	surgical delivery of a baby by making an incision through the abdomen and into the uterus
episiotomy e-piz-ē-ot'ō-mē	incision of the perineum to facilitate delivery
THERAPEUTIC	
amnioinfusion am'nē-ō-in-fyū'zhŭn	introduction of a solution into the amniotic sac—most commonly an isotonic solution used to relieve fetal distress
therapeutic abortion (TAB)	abortion induced by mechanical means or by drugs for medical consideration
version	manual method reversing the position of the fetus, usually done to facilitate delivery
external version	abdominal manipulation
internal version	intravaginal manipulation
COMMON THERAPEUTIC DRUG CLASSIFICATIONS	
abortifacient ă-bōr-ti-fā'shent	drug that causes abortion (e.g., RU-486)
oxytocin ok-sē-tō'sin	hormone secreted by the pituitary gland that causes myometrial contraction—used for induction of labor
Rh immune globulin glob'yū-lin	immunizing agent given to an Rh-negative mother within 72 hours after delivering an Rh-positive baby to suppress the Rh immune response
tocolytic agent tō-kō-lit'ik	drug used to stop labor contractions



CESAREAN SECTION. The fetus is removed from the uterus through an incision in the abdomen. The procedure was first used to save the baby when the mother had died. Julius Caesar is said to have been born in this manner.

Summary of Chapter 17 Acronyms/Abbreviations

AB.....abortion	IUD.....intrauterine device
Bx.....biopsy	LEEP.....loop electrosurgical excision procedure
CIS.....carcinoma in situ	LLETZ.....large loop excision of the transformation zone
CIN.....cervical intraepithelial neoplasia	MRI.....magnetic resonance imaging
CPD.....cephalopelvic disproportion	OB.....obstetrics
C-section.....cesarean section	OCP.....oral contraceptive pill
CVS.....chorionic villus sampling	Pap.....Papanicolaou smear
D&C.....dilation and curettage	PID.....pelvic inflammatory disease
EDC.....estimated date of confinement	PIH.....pregnancy-induced hypertension
EDD.....estimated date of delivery	SAB.....spontaneous abortion
GYN.....gynecology	STD.....sexually transmitted disease
HIV.....human immunodeficiency virus	TAB.....therapeutic abortion
HPV.....human papilloma virus	UFE.....uterine fibroid embolization
HRT.....hormone replacement therapy	
HSV-2.....herpes simplex virus type 2	



PRACTICE EXERCISES

For the following terms, on the lines below the term, write out the indicated word parts: prefixes (P), combining forms (CF), roots (R), and suffixes (S). Then define the word.

EXAMPLE

ectocervical

_____/_____/_____
 P R S
ecto/cervic/al
 P R S

DEFINITION: outside/cervix or neck/pertaining to

1. vulvitis

_____/_____
 R S

DEFINITION: _____

2. polymastia

_____/_____/_____
 P R S

DEFINITION: _____

3. ovoid

_____/_____
 R S

DEFINITION: _____

4. tocolysis

_____/_____
 CF S

DEFINITION: _____

5. salpingotomy

_____/_____
 CF S

DEFINITION: _____

6. mammoplasty

_____/_____
 CF S

DEFINITION: _____

7. transvaginal

_____ / _____ / _____
P R S

DEFINITION: _____

8. hysterorrhexis

_____ / _____
CF S

DEFINITION: _____

9. colposcopy

_____ / _____
CF S

DEFINITION: _____

10. mammography

_____ / _____
CF S

DEFINITION: _____

11. metrorrhagia

_____ / _____
CF S

DEFINITION: _____

12. ovariocentesis

_____ / _____
CF S

DEFINITION: _____

13. menarche

_____ / _____
R S

DEFINITION: _____

14. oophorectomy

_____ / _____
R S

DEFINITION: _____

15. oligomenorrhea

_____ / _____ / _____
P CF S

DEFINITION: _____

16. dystocia

_____ / _____ / _____
P R S

DEFINITION: _____

17. gynecologist

_____ / _____
 CF S

DEFINITION: _____

18. pelvimeter

_____ / _____
 CF S

DEFINITION: _____

19. episiotomy

_____ / _____
 CF S

DEFINITION: _____

20. colporrhaphy

_____ / _____
 CF S

DEFINITION: _____

21. hysterospasm

_____ / _____
 CF S

DEFINITION: _____

22. lactorrhea

_____ / _____
 CF S

DEFINITION: _____

23. ovigenesis

_____ / _____
 CF S

DEFINITION: _____

24. endocervical

_____ / _____ / _____
 P R S

DEFINITION: _____

25. uterotomy

_____ / _____
 CF S

DEFINITION: _____

Complete the following:

26. _____ pause = cessation of menstruation

27. _____ menorrhoea = painful menstruation

28. _____ menorrhoea = absence of menstruation
29. _____ menorrhoea = scanty menstruation
30. _____ rrhagia = excessive bleeding at time of menstruation
31. _____ rrhagia = bleeding from the uterus at any time other than the normal period
32. _____ mastia = development of mammary glands in male
33. _____ mastia = absence of a breast
34. _____ mastia = unusually small breasts—a common surgical remedy is _____ mammoplasty
35. _____ mastia = unusually large breasts—a common surgical remedy is _____ mammoplasty
36. masto_____ = surgical fixation of a pendulous breast
37. _____ ectomy = removal of a breast
38. _____ ectomy = removal of a breast lump

For each of the following, circle the combining form that corresponds to the meaning given:

- | | | | |
|---------------------------|----------|----------|-----------|
| 39. birth or labor | tox/o | toc/o | troph/o |
| 40. vagina | uter/o | metr/o | colp/o |
| 41. uterine tube | vagin/o | oophor/o | salping/o |
| 42. menstruation | men/o | mamm/o | mast/o |
| 43. cervix | colp/o | cervic/o | salping/o |
| 44. egg | oophor/o | ov/i | ovari/o |
| 45. vulva | episi/o | vagin/o | metr/o |
| 46. uterus | vagin/o | metr/o | oophor/o |
| 47. milk | lact/o | leuk/o | lip/o |
| 48. ovary | ov/o | oophor/o | salping/o |
| 49. breast | men/o | metr/o | mast/o |
| 50. woman | gen/o | gynec/o | hyster/o |

Match the following:

- | | |
|---|--------------------------|
| 51. _____ removal of a uterine tube and an ovary | a. PID |
| 52. _____ white vaginal discharge | b. chlamydia |
| 53. _____ condition when the baby's head is too big for the birth canal | c. colporrhaphy |
| 54. _____ presence of more than one nipple on a breast | d. LEEP |
| 55. _____ implantation of a fertilized egg outside the uterus | e. CPD |
| 56. _____ most common bacterial STD in North America | f. leukorrhea |
| 57. _____ excisional biopsy | g. polythelia |
| 58. _____ painful intercourse | h. ectopic pregnancy |
| 59. _____ surgical repair of a cystocele | i. salpingo-oophorectomy |
| 60. _____ inflammation of entire female pelvic cavity | j. dyspareunia |

Give the medical term for the following:

61. condition of benign lumps in the breast that fluctuate in size during the menstrual cycle _____
62. abnormal opening between the bladder and vagina _____
63. cutting and tying the uterine tubes _____
64. having more than two breasts _____
65. bacterial STD caused by a spirochete _____
66. study of cervical cells to screen for cancer _____
67. condition of migration of endometrial tissue _____
68. abnormal opening between the rectum and vagina _____
69. surgical remedy for a rectocele _____

Define the following abbreviations:

70. IUD _____
71. HPV _____
72. CVS _____

73. D&C _____
74. HBV _____
75. EDC _____
76. HSV _____
77. STD _____
78. TAB _____
79. HRT _____

Identify terms related to abortion:

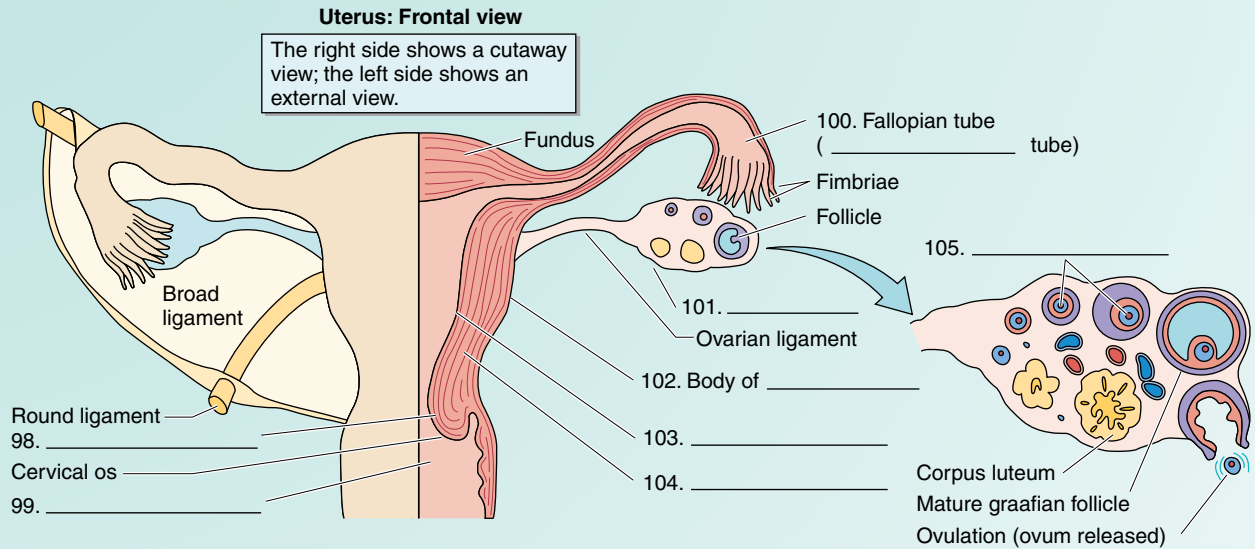
80. _____ a naturally occurring miscarriage
81. _____ a miscarriage occurring in three or more consecutive pregnancies
82. _____ fetal expulsion with parts of the placenta remaining with bleeding
83. _____ fetal death within the uterus
84. _____ abortion induced by mechanical means or by drugs
85. _____ bleeding with the threat of miscarriage

Match the following:

- | | |
|------------------------|---|
| 86. _____ retroflexion | a. forward bend of uterus |
| 87. _____ condylomata | b. toxemia of pregnancy |
| 88. _____ para 2 | c. backward bend of uterus |
| 89. _____ prolapse | d. a pregnant woman |
| 90. _____ cystocele | e. cancer |
| 91. _____ gravida | f. genital warts |
| 92. _____ rectocele | g. woman who has given birth twice |
| 93. _____ eclampsia | h. first delivery |
| 94. _____ CIN 2 | i. protrusion of the rectum into the vagina |
| 95. _____ primipara | j. descent of the uterus from its normal position |
| 96. _____ antelexion | k. cervical dysplasia |
| 97. _____ CIS | l. pouching of the bladder into the vagina |

Write in the missing words on the blank lines in the following illustration of the female reproductive anatomy.

98–105.



For each of the following, circle the correct spelling of the term:

- | | | |
|--------------------|---------------|---------------|
| 106. gonoorhea | gonorrhea | ghonarhea |
| 107. dyspareunia | dyspariunia | dysparunia |
| 108. tokolytic | toecolytic | tocolytic |
| 109. polithelia | polythelia | polytelia |
| 110. meterorrhagia | metrorrhagia | metrorhagia |
| 111. dialation | dyelayshun | dilation |
| 112. salpingotomy | salpingotomy | salpigotomy |
| 113. nulligravida | nuligravida | nulligraveda |
| 114. meconium | meconium | meconeum |
| 115. macrosomia | macrosomnia | macrasomia |
| 116. cureitage | curettage | curetage |
| 117. eclampshea | eclampsia | eclampsia |
| 118. amenorrhea | amennorhea | amenorhea |
| 119. abortifacient | abortafacient | abortofacient |

Give the noun that was used to form the following adjectives:

120. chlamydial _____

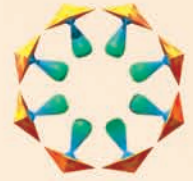
121. areolar _____

122. syphilitic _____

123. cervical _____

124. dysplastic _____

125. endometrial _____



MEDICAL RECORD ANALYSES

MEDICAL RECORD 17.1

GYN Chart Note

- S:** This 44 y.o. female, gravida 2, para 2, c/o extremely heavy periods for the past several years that have been getting worse for the past 2 months and have been accompanied by moderately severe cramps. Pap smears have been normal. She has no bladder or bowel complaints.
- O:** On pelvic exam, the uterus is found to be retroverted and irregularly enlarged with several large fibroids palpable. There are no adnexal masses.
- A:** Leiomyomata uteri with secondary menorrhagia
- P:** Schedule vaginal hysterectomy; donate 1 pint of blood for autologous transfusion, if necessary

- What is the patient's OB history?
 - never been pregnant
 - been pregnant only once
 - had two miscarriages
 - has been pregnant four times
 - has had two live births
- Identify the patient's most significant symptom:
 - amenorrhea
 - dyspareunia
 - leukorrhea
 - menorrhagia
 - metrorrhagia
- Which of the following was one of the objective findings?
 - tipped uterus
 - forward-bending uterus
 - backward-bending uterus
 - presence of several ovarian tumors
 - migration of portions of endometrial tissue
- What was the condition of the patient's uterine tubes?
 - not stated
 - normal
 - inflamed
 - enlarged
 - had been previously removed
- What was the Dx?
 - congenital tumor composed of displaced embryonic tissue
 - cyst of the uterine tube
 - inflammation of the organs of the pelvic cavity
 - smooth muscle tumors in the uterus
 - ovarian tumors
- What surgical procedure is planned?
 - incision into uterine tube to remove the cyst
 - excision of uterus
 - excision of ovaries
 - dilation of cervix and scraping of endometrium
 - excision of tubes and ovaries

MEDICAL RECORD 17.2

Jane Foley has seen her gynecologist, Dr. Phyllis Widetick, yearly for a routine examination and Pap smear. Every year, the results have been normal. Jane is generally a healthy, active woman. This year, however, Dr. Widetick's examination and Pap smear found a problem. When the test results were in, Jane returned for additional testing.

Directions

Read Medical Record 17.2 for Ms. Foley (pages 575–576) and answer the following questions. This record is the history and physical report dictated by Dr. Widetick after her examination.

QUESTIONS ABOUT MEDICAL RECORD 17.2

Write your answers in the spaces provided.

1. In your own words, not using medical terminology, briefly describe the patient's chief complaint:

2. In your own words, not using medical terminology, briefly describe what a Pap smear is:

3. Explain the result of Ms. Foley's Pap smear:

4. Because of this result, Dr. Widetick used colposcopy for further testing. Translate into nonmedical language what she discovered with this diagnostic procedure:

5. What was the positive finding from the biopsy? Define this in your own words:

6. Ms. Foley underwent all the following procedures. Put these in correct sequence by numbering them 1 to 6 in the order they were performed:

- ____ follow-up examination
- ____ visualization with colposcope
- ____ ultrasound
- ____ Pap smear
- ____ routine physical examination
- ____ Bx

7. The sonogram *definitely* showed what finding?

What were the *possible* findings?

8. In nonmedical language, define the two previous surgeries Ms. Foley has had:

9. How many children has Ms. Foley had?

10. Mark any of the following abnormal findings from the present physical examination:

- a. enlarged uterus
- b. gross reflexes
- c. eroded cervix
- d. hypertension
- e. enlarged thyroid
- f. mobile right ovarian cyst

11. Define Dr. Widetick's final diagnosis, and explain what she will do next to treat Ms. Foley:

CENTRAL MEDICAL CENTER

211 Medical Center Drive • Central City, US 90000-1234

TO BE ADMITTED: 9/3/20xx

HISTORY**CHIEF COMPLAINT:**

Right ovarian cyst.

HISTORY OF PRESENT ILLNESS:

This is a 32-year-old Caucasian female who had a routine examination on June 21, 20xx, at which time the examination revealed the right ovary to be approximately two to three times normal size. Otherwise, all was normal. The Papanicolaou smear revealed atypical cells of undetermined significance. The patient returned for a colposcopy, and this revealed what appeared to be squamous epithelial lesions CIN 1–2. Biopsies were performed, which revealed chronic cervicitis and no evidence of CIN. The patient was placed on Lo-Ovral for two cycles and then was rechecked. The right ovary continued to enlarge and got to the point where it was approximately 4 x 5 cm, floating anteriorly in the pelvis, and was fairly firm to palpation. A pelvic sonogram corroborated the clinical findings in that superior to the right adnexa was a 4 x 5 cm mass, possibly with hemorrhage into either a paraovarian cyst or possibly a dermoid cyst. The patient is to be admitted now for an exploratory laparotomy.

PAST HISTORY:

There is no history of severe medical illnesses. The patient had the usual childhood diseases and has had good health as an adult.

PREVIOUS SURGERY: The patient had a hymenotomy and dilation and curettage in 20xx.

MENSTRUAL HISTORY: Menstrual cycle is 30 days, averaging a 4–7 day flow.

OBSTETRICAL HISTORY: The patient is a gravida 0.


FAMILY HISTORY:

Diabetes in the family. Mother and father are living and well.

REVIEW OF SYSTEMS:

Noncontributory.

(continued)


P. Widetick, M.D.

PW:bst

D: 9/1/20xx T: 9/2/20xx

HISTORY AND PHYSICAL
Page 1

PT. NAME: FOLEY, JANE J.
ID NO: IP-751014
ROOM NO: 331
ATT. PHYS: P. WIDETICK, M.D.

CENTRAL MEDICAL CENTER

211 Medical Center Drive • Central City, US 90000-1234

PHYSICAL EXAMINATION

GENERAL:

The patient is a well-developed, well-nourished Caucasian female who is anxious but in no acute distress.

VITAL SIGNS:

HEIGHT: 5 feet 5 inches. WEIGHT: 154 pounds. BLOOD PRESSURE: 110/82.

HEENT:

Normal.

NECK:

Supple; the trachea is in the midline. The thyroid is not enlarged.

CHEST:

LUNGS: Clear to percussion and auscultation. HEART: Regular sinus rhythm with no murmur. BREASTS: Normal to palpation.

ABDOMEN:

Soft and flat. No scars or masses.

PELVIC:

The outlet and vagina are normal. The cervix is moderately eroded. The uterus is normal size and anterior. The left adnexa is negative. The right adnexa has a firm, irregular cystic ovary that is anterior and approximately 5 x 5 cm. This is mobile and nontender.

EXTREMITIES:

Normal. Reflexes are grossly intact.

DIAGNOSIS:

Right ovarian cyst.

PLAN:

The patient is to be admitted for laparoscopy and probable ovarian cystectomy.

P. Widetick, M.D.
P. Widetick, M.D.

PW:bst

D: 9/1/20xx T: 9/2/20xx

HISTORY AND PHYSICAL
PAGE 2

PT. NAME: FOLEY, JANE J.
ID NO: IP-751014
ROOM NO: 331
ATT. PHYS: P. WIDETICK, M.D.

MEDICAL RECORD 17.3

Kathleen Montegrando is pregnant with her first child. She has regularly seen her obstetrician, Dr. Linda Fenton, throughout the pregnancy. The pregnancy has gone well so far, although the fetus is in a breech presentation. She has come for a routine obstetrical examination by Dr. Fenton, which confirms the breech presentation. She then reports to Central Medical Center when labor begins.

Directions

Read Medical Record 17.3 for Ms. Montegrando (pages 579–581) and answer the following questions. The first record is the history and physical examination report dictated by Dr. Fenton after Ms. Montegrando's last routine examination and before delivery. The second record is the discharge summary dictated from Central Medical Center by Dr. Fenton after Ms. Montegrando had her baby.

QUESTIONS ABOUT MEDICAL RECORD 17.3

Write your answers in the spaces provided:

- Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

Apgar score _____

rubella vaccination _____

- In your own words, not using medical terminology, briefly describe a breech presentation:

- Which two tests that Dr. Fenton performed confirmed the breech presentation?

- sonography
- cesarean
- amniocentesis
- Bx
- pelvic examination
- colposcopy
- Pap smear

- Mark any possible negative findings included in PMH:

- rheumatic fever
- closed cervix
- heart murmur
- mitral valve prolapse

- Where did the autologous blood come from?

6. Explain what is important about the possibility of Ms. Montegrande's baby being Rh positive:

7. In your own words, explain what "80% effaced" means:

8. What is the main reason for Dr. Fenton's plan to perform a primary cesarean section?

9. What two occurrences brought Ms. Montegrande to the Central Medical Center on March 6?

10. In your own words, describe the surgery Ms. Montegrande underwent:

11. What kind of suture did Dr. Fenton use to close the incision?

12. Two other doctors were present in the surgical suite with Dr. Fenton:

Dr. Nelson was there to help care for (whom?) _____

Dr. O'Brien was there to help care for (whom?) _____

13. Mark any of the following surgical complications that occurred:

- a. uterine hemorrhage
- b. postop fever
- c. cervical erosion
- d. all of the above
- e. none of the above

CENTRAL MEDICAL CENTER

211 Medical Center Drive • Central City, US 90000-1234

HISTORY**HISTORY OF PRESENT ILLNESS:**

The patient is a 31-year-old female, gravida 1 para 0, whose estimated date of confinement is March 8, 20xx. The patient has had a relatively normal pregnancy with normal blood pressures and approximately a 53-pound weight gain during her pregnancy. The infant has been noted to be in a breech position since mid-December 20xx and has remained in that position without any change. This position was confirmed by ultrasound and pelvic examination within the past few days. This patient is scheduled at this time to have a primary cesarean section because of the breech presentation. There is a small amount of amniotic fluid; and external version, I believe, would be injudicious at this time.

PAST MEDICAL HISTORY:

MEDICAL: Entirely negative except for possible mitral valve prolapse in this patient. She has never had any rheumatic fever and has had no other heart disease. She has had no high blood pressure, diabetes, thyroid trouble, varicose veins, or epilepsy. She has never had a blood transfusion. The patient specifically had requested to have one unit of autologous blood drawn earlier in her pregnancy, which is available. The patient is Rh negative, and she is not immune to rubella; therefore, she will need a RhoGAM shot if her baby is Rh positive and will need a rubella vaccination before leaving the hospital. The patient was given RhoGAM in our office on December 18, 20xx.

Her additional past medical history is noncontributory.

(continued)


L. Fenton, M.D.

LF:pn

D: 3/4/20xx

T: 3/5/20xx

HISTORY AND PHYSICAL
Page 1

PT. NAME: MONTEGRANDE, KATHLEEN L
ID NO: IP-692580
ROOM NO: 377
ADM. DATE: March 8, 20xx
ATT. PHYS: L. FENTON, M.D.

CENTRAL MEDICAL CENTER

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PHYSICAL EXAMINATION

HEENT:

Essentially normal.

NECK:

The thyroid is not enlarged. There is no lymphadenopathy in the neck or supraclavicular region.

CHEST:

Clear to percussion and auscultation.

CARDIAC: There are no murmurs or irregularities. There are no heaves, thrills, or thrusts.

BREASTS: Examination fails to reveal any masses.

ABDOMEN:

The uterus measures 42 cm by tape measurement. The infant is still in a breech position.

PELVIC:

The cervix is closed, approximately 80% effaced, and soft.

IMPRESSION:

TERM BREECH PREGNANCY IN PRIMIGRAVIDA FEMALE WHO IS RH NEGATIVE.

PLAN:

Primary cesarean section. I have explained the pros and cons of surgery and the possible alternatives. The patient and her husband do understand and have accepted the risks. The patient has one unit of autologous blood available, and she is in need of a rubella immunization prior to discharge from the hospital.


L. Fenton, M.D.

LF:pn

D: 3/4/20xx

T: 3/5/20xx

HISTORY AND PHYSICAL
Page 2

PT. NAME: MONTEGRANDE, KATHLEEN L.
ID NO: IP-692580
ROOM NO: 377
ADM. DATE: March 8, 20xx
ATT. PHYS: L. FENTON, M.D.

CENTRAL MEDICAL CENTER

211 Medical Center Drive • Central City, US 90000-1234

DISCHARGE SUMMARY**DATE OF ADMISSION:** March 6, 20xx**DATE OF DISCHARGE:** March 9, 20xx**SUMMARY:**

Mrs. Montegrando was scheduled to be admitted to this facility on March 8, 20xx, because of a primiparous breech presentation and came in on March 6, 20xx, at 0345 hours with a history of spontaneous rupture of the membranes and labor. She is a 31-year-old gravida 1 para 0 abortus 0 with an EDC of March 8, 20xx, and spontaneous ruptured membranes at approximately 0200 hours with onset of contractions probably before that, with a breech presentation confirmed on ultrasound. The cervix is posterior, 3 cm, and soft. There is some meconium staining. The patient was therefore set up for a primary cesarean section. The patient was taken to the operating room, where the primary cesarean section was accomplished; and she was delivered out of a frank breech presentation of a 7 lb 8 oz male infant, Apgars 9 and 9, with Dr. O'Brien, the pediatrician, in attendance. The assistant surgeon was Dr. Nelson.

The patient and infant are discharged on this date to home with full instructions; the patient will take Tylenol Double Strength for pain and will be seen in the office in two weeks for staple removal. She is to call if she has any problems with excessive bleeding or fever.

FINAL DIAGNOSIS:

PREGNANCY, UTERINE, DELIVERED.

COMPLICATIONS:

Primiparous breech.

TREATMENT RENDERED:

Low cesarean section.



L. Fenton, M.D.

LF:ti

D: 3/9/20xx

T: 3/10/20xx

DISCHARGE SUMMARY

PT. NAME: MONTEGRANDE, KATHLEEN L.
 ID NO: IP-692580
 ROOM NO: 377
 ATT. PHYS: L. FENTON, M.D.

MEDICAL RECORD 17.4

Carla Woodward has been healthy all her life but is bothered by the unbalanced shape of her breasts. Finally, at age 23, she has chosen to see Dr. Karen McNeil, a plastic surgeon recommended by her personal physician.

Directions

Read Medical Record 17.4 for Ms. Woodward (page 584) and answer the following questions. This record is the consultation report dictated by Dr. McNeil after meeting with and examining Ms. Woodward.

QUESTIONS ABOUT MEDICAL RECORD 17.4

Write your answers in the spaces provided:

1. Below are medical terms used in this record you have not yet encountered in this text. Underline each where it appears in the record and define below:

saline-filled _____

silicone walled _____

2. In your own words, not using medical terminology, describe Ms. Woodward's chief complaint:

3. Summarize the two past surgeries Ms. Woodward has had. For each, identify the primary body system involved:

4. Ms. Woodward told Dr. McNeil that she has never had a mammogram, a diagnostic procedure used primarily for what purpose?

5. Dr. McNeil's physical examination focuses on Ms. Woodward's breasts. Describe the findings related to the breasts (first give the medical term for the finding, then define it):

<i>Medical Finding</i>	<i>Definition</i>
Left breast _____ _____	_____ _____
Right breast _____ _____	_____ _____

6. In your own words, not using medical language, describe the surgery Dr. McNeil has proposed to Ms. Woodward:

CENTRAL MEDICAL GROUP, INC.

Department of Plastic Surgery

201 Medical Center Drive • Central City, US 90000-1234

INITIAL CONSULTATION

PATIENT: WOODWARD, Carla S.

DATE: October 2, 20xx

HPI: This is a 23-year-old white female in general good health who has significant bilateral breast asymmetry with macromastia on the left breast and deformity and hypoplasia of the right breast. The patient denies having had any other problems except that her right thumb is shorter than her left thumb.

PMH: A left inguinal herniorrhaphy at age 15 and a laminectomy on March 1, 20xx, for treatment of a ruptured disk. The rest of her history is unremarkable.

MEDS: Vicodin 2-3 q d for the past 7 months secondary to her surgery.

ALLERGIES: None.

SH: The patient denies history of smoking or alcohol use and has never had a mammogram.

PE: The patient has a sternal nipple-notch distance of 27 cm on the left side and 22 cm on the right side. There are no breast masses or nipple discharge noted. The right breast is atrophic in the medial half of the breast, and the entire breast is hypoplastic. The left breast is large and ptotic. The patient reports being approximately an A-B cup on the right side and a C-D cup on the left side. She feels the right side is much too small and deformed, and the left side is too big.

PLAN: The patient would do well with a left breast reduction and a right breast augmentation/reconstruction of the deformity and atrophy. The risks and benefits of this surgery were discussed with the patient along with the risks and benefits of saline-filled, silicone-wall implants. The patient will think about our discussion today and contact me with a date.


K. McNeil, M.D.

KM:mar

D: 10/2/20xx

T: 10/3/20xx

APPENDIX A

Glossary of Prefixes, Suffixes, and Combining Forms



Term Component to English

a-	without	balan/o	glans penis	coron/o	circle or crown
ab-	away from	bi-	two or both	cost/o	rib
abdomin/o	abdomen	bil/i	bile	crani/o	skull
-ac	pertaining to	-blast	germ or bud	crin/o	to secrete
acus/o	hearing	blast/o	germ or bud	cutane/o	skin
acr/o	extremity or topmost	blephar/o	eyelid	cyan/o	blue
-acusis	hearing condition	brachi/o	arm	cyst/o	bladder or sac
ad-	to, toward, or near	brady-	slow	cyt/o	cell
aden/o	gland	bronch/o	bronchus (airway)	dacry/o	tear
adip/o	fat	bronchi/o	bronchus (airway)	dactyl/o	digit (finger or toe)
adren/o	adrenal gland	bronchiol/o	bronchiole (little airway)	de-	from, down, or not
aer/o	air or gas	bucc/o	cheek	dent/i	teeth
-al	pertaining to	capn/o	carbon dioxide	derm/o	skin
albumin/o	protein	carb/o	carbon dioxide	dermat/o	skin
-algia	pain	carcin/o	cancer	-desis	binding
allo-	other	cardi/o	heart	dextr/o	right, or on the right side
alveol/o	alveolus (air sac)	cata-	down	dia-	across or through
ambi-	both	-cele	pouching or hernia	diaphor/o	profuse sweat
an-	without	celi/o	abdomen	dips/o	thirst
ana-	up, apart	-centesis	puncture for aspiration	dis-	separate from or apart
an/o	anus	cephal/o	head	doch/o	duct
andr/o	male	cerebell/o	cerebellum (little brain)	duoden/o	duodenum
angi/o	vessel	cerebr/o	cerebrum (largest part of brain)	-dynia	pain
ankyl/o	crooked or stiff	cerumin/o	wax	dys-	painful, difficult, or faulty
ante-	before	cervic/o	neck or cervix	-e	noun marker
anti-	against or opposed to	cheil/o	lip	e-	out or away
aort/o	aorta	chir/o	hand	-eal	pertaining to
appendic/o	appendix	chol/e	bile	ec-	out or away
aque/o	water	chondr/o	cartilage (gristle)	-ectasis	expansion or dilation
-ar	pertaining to	chrom/o	color	ecto-	outside
-arche	beginning	chromat/o	color	-ectomy	excision (removal)
arteri/o	artery	chyl/o	juice	-emesis	vomiting
arthr/o	joint, articulation	circum-	around	-emia	blood condition
articul/o	joint	cis/o	cut	en-	within
-ary	pertaining to	col/o	colon	encephal/o	entire brain
-ase	enzyme	colon/o	colon	endo-	within
-asthenia	weakness	colp/o	vagina (sheath)	enter/o	small intestine
ather/o	fatty paste	con-	together or with	epi-	upon
-ation	process	conjunctiv/o	conjunctiva (to join together)	epididym/o	epididymis
atri/o	atrium	contra-	against or opposed to	episi/o	vulva (covering)
audi/o	hearing	corne/o	cornea	erythr/o	red
aur/i	ear			esophag/o	esophagus
auto-	self				
bacteri/o	bacteria				

esthesi/o	sensation	infra-	below or under	meta-	beyond, after, or change
eu-	good or normal	inguin/o	groin	-meter	instrument for measuring
ex-	out or away	inter-	between	metr/o	uterus
exo-	outside	intra-	within	-metry	process of measuring
extra-	outside	ir/o	iris (colored circle)	micro-	small
fasci/o	fascia (a band)	irid/o	iris (colored circle)	mono-	one
femor/o	femur	-ism	condition of	morph/o	form
fibr/o	fiber	iso-	equal, like	multi-	many
gangli/o	ganglion (knot)	-ist	one who specializes in	muscul/o	muscle
gastr/o	stomach	-itis	inflammation	my/o	muscle
-gen	origin or production	-ium	structure or tissue	myc/o	fungus
-genesis	origin or production	jejun/o	jejunum (empty)	myel/o	bone marrow or spinal cord
gen/o	origin or production	kerat/o	hard or cornea	myos/o	muscle
ger/o	old age	ket/o	ketone bodies	myring/o	eardrum
gingiv/o	gums	keton/o	ketone bodies	narc/o	stupor, sleep
gli/o	glue	kinesi/o	movement	nas/o	nose
glomerul/o	glomerulus (little ball)	kyph/o	humpback	nat/i	birth
gloss/o	tongue	lacrim/o	tear	necr/o	death
glott/o	opening	lact/o	milk	neo-	new
gluc/o	sugar	lapar/o	abdomen	nephro-	kidney
glyc/o	sugar	laryng/o	larynx (voice box)	neur/o	nerve
glycos/o	sugar	lei/o	smooth	obstetr/o	midwife
gnos/o	knowing	-lepsy	seizure	ocul/o	eye
-gram	record	leuc/o	white	-oid	resembling
-graph	instrument for recording	leuk/o	white	-ole	small
-graphy	process of recording	lex/o	word or phrase	olig/o	few or deficient
gynec/o	woman	lingu/o	tongue	-oma	tumor
hem/o	blood	lip/o	fat	onych/o	nail
hemat/o	blood	lith/o	stone or calculus	oophor/o	ovary
hemi-	half	lob/o	lobe (a portion)	ophthalm/o	eye
hepat/o	liver	-logist	one who specializes in the study or treatment of	-opia	condition of vision
hepatic/o	liver	-logy	study of	opt/o	eye
herni/o	hernia	lord/o	bent	or/o	mouth
hetero-	different	lumb/o	loin (lower back)	orch/o	testis (testicle)
hidr/o	sweat	lymph/o	clear fluid	orchi/o	testis (testicle)
hist/o	tissue	-lysis	breaking down or dissolution	orchid/o	testis (testicle)
histi/o	tissue	macro-	large or long	orth/o	straight, normal, or correct
homo-	same	-malacia	softening	-osis	condition or increase
hormon/o	hormone (an urging on)	mamm/o	breast	oste/o	bone
hydr/o	water	-mania	abnormal impulse (attraction)	ot/o	ear
hyper-	above or excessive	mast/o	breast	-ous	pertaining to
hypn/o	sleep	meat/o	opening	ov/i	egg
hypo-	below or deficient	mega-	large	ov/o	egg
hyster/o	uterus	megal/o	large	ovari/o	ovary
-ia	condition of	-megaly	enlargement	ox/o	oxygen
-iasis	formation of or presence of	melan/o	black	pachy-	thick
iatr/o	treatment	men/o	menstruation	palat/o	palate
-iatics	treatment	mening/o	meninges (membrane)	pan-	all
-iatry	treatment	meningi/o	meninges (membrane)	pancreat/o	pancreas
-ic	pertaining to	meso-	middle	para-	alongside of or abnormal
-icle	small			-paresis	slight paralysis
ile/o	ileum			patell/o	knee cap
immun/o	safe			path/o	disease
				pector/o	chest

ped/o	child or foot
pelv/i, pelv/o	hip bone
-penia	abnormal reduction
per-	through
peri-	around
perine/o	perineum
peritone/o	peritoneum
-pexy	suspension or fixation
phac/o	lens (lentil)
phag/o	eat or swallow
phak/o	lens (lentil)
pharyng/o	pharynx (throat)
phas/o	speech
-phil	attraction for
-philia	attraction for
phleb/o	vein
phob/o	exaggerated fear or sensitivity
phon/o	voice or sound
phor/o	to carry or bear
phot/o	light
phren/o	diaphragm (also mind)
physi/o	physical, nature
plas/o	formation
-plasia	formation
-plasty	surgical repair or reconstruction
-plegia	paralysis
pleur/o	pleura
-pnea	breathing
pneum/o	air or lung
pneumon/o	air or lung
pod/o	foot
-poiesis	formation
poly-	many
post-	after or behind
pre-	before
presby/o	old age
pro-	before
proct/o	anus and rectum
prostat/o	prostate
psych/o	mind
-ptosis	falling or downward displacement
pulmon/o	lung
purpur/o	purple
py/o	pus
pyel/o	basin
pylor/o	pylorus (gatekeeper)
quadri-	four
radi/o	radius (a bone of the forearm); radiation (espe- cially x-ray)
re-	again or back
rect/o	rectum
ren/o	kidney
reticul/o	a net
retin/o	retina
retro-	backward or behind
rhabd/o	rod shaped or striated (skeletal)
rhin/o	nose
-rrhage	to burst forth
-rrhagia	to burst forth
-rrhaphy	suture
-rrhea	discharge
-rrhexis	rupture
salping/o	uterine (fallopian) tube; also eustachian tube
sarc/o	flesh
schiz/o	split, division
scler/o	hard or sclera
scoli/o	twisted
-scope	instrument for examination
-scopy	examination
seb/o	sebum (oil)
semi-	half
sial/o	saliva
sigmoid/o	sigmoid colon
sinistr/o	left, or on the left side
sinus/o	hollow (cavity)
somat/o	body
somn/i	sleep
somn/o	sleep
son/o	sound
-spasm	involuntary contraction
sperm/o	sperm (seed)
spermat/o	sperm (seed)
sphygm/o	pulse
spin/o	spine (thorn)
spir/o	breathing
splen/o	spleen
spondyl/o	vertebra
squam/o	scale
-stasis	stop or stand
steat/o	fat
sten/o	narrow
stere/o	three-dimensional or solid
stern/o	sternum (breastbone)
steth/o	chest
stomat/o	mouth
-stomy	creation of an opening
sub-	below or under
super-	above or excessive
supra-	above or excessive
sym-	together or with
syn-	together or with
tachy-	fast
tax/o	order or coordination
ten/o	tendon (to stretch)
tend/o	tendon (to stretch)
tendin/o	tendon (to stretch)
test/o	testis (testicle)
thalam/o	thalamus (a room)
therm/o	heat
thorac/o	chest
thromb/o	clot
thym/o	thymus gland
thyr/o, thyroid/o	thyroid gland (shield)
-tic	pertaining to
toc/o	labor or birth
tom/o	to cut
-tomy	incision
ton/o	tone or tension
tonsill/o	tonsil (almond)
top/o	place
tox/o	poison
toxic/o	poison
trache/o	trachea (windpipe)
trans-	across or through
tri-	three
trich/o	hair
-tripsy	crushing
troph/o	nourishment or development
tympan/o	eardrum
-ula, -ule	small
uln/o	ulna (a bone of the forearm)
ultra-	beyond or excessive
uni-	one
ur/o	urine
ureter/o	ureter
urethr/o	urethra
urin/o	urine
uter/o	uterus
vagin/o	vagina (sheath)
varic/o	swollen or twisted vein
vas/o	vessel
vascul/o	vessel
ven/o	vein
ventricul/o	ventricle (belly or pouch)
vertebr/o	vertebra
vesic/o	bladder or sac
vesicul/o	bladder or sac
vitre/o	glassy
vulv/o	vulva (covering)
xanth/o	yellow
xeno-	strange
xer/o	dry
-y	condition or process of

English to Term Component

abdomen	abdomin/o, celi/o, lapar/o	bone	oste/o	disease	path/o
abnormal	para-	bone marrow	myel/o	dissolution	-lysis
abnormal impulse (attraction) toward	-mania	both	ambi-, bi-	division	schiz/o
abnormal reduction	-penia	brain	cerebr/o (largest part), encephal/o (entire brain)	down	cata-, de- downward
above	hyper-, super-, supra-	breaking down	-lysis	displacement	-ptosis
across	dia-, trans-	breast	mamm/o, mast/o	dry	xer/o
adrenal gland	adren/o, adrenal/o	breathing	-pnea, spir/o	duct	doch/o
after	meta-, post-	bronchus	bronch/o, bronchi/o	duodenum	duoden/o
again	re-	bud	-blast, blast/o	ear	aur/i, ot/o
against	anti-, contra-	burst forth	-rrhage, -rrhagia	eardrum	myring/o, tympan/o
air	aer/o, pneum/o, pneumon/o	calculus	lith/o	eat, swallow	phag/o
air sac	alveol/o	cancer	carcin/o	egg	ov/i, ov/o
airway	bronch/o, bronchi/o	carbon dioxide	capn/o, carb/o	enlargement	-megaly
all	pan-	carry	phor/o	enzyme	-ase
alongside of	para-	cartilage	chondr/o	epididymis	epididym/o
alveolus	alveol/o	cavity (sinus)	atri/o, sin/o	equal	iso-
anus	an/o	cell	cyt/o	esophagus	esophag/o
anus and rectum	proct/o	cerebellum	cerebell/o	eustachian tube	salping/o
aorta	aort/o	cerebrum	cerebr/o	examination	-scopy
apart	ana-, dis-	cervix	cervic/o	excessive	hyper-, super-, supra-, ultra-
appendix	appendic/o	change	meta-	excision (removal)	-ectomy
arm	brachi/o	cheek	bucc/o	expansion or dilation	-ectasis
around	circum-, peri-	chest	pectoro, steth/o, thorac/o	extremity	acr/o
artery	arteri/o	child	ped/o	eye	ocul/o, ophthalm/o, opt/o
articulation	arthr/o	circle	coron/o	eyelid	blephar/o
atrium	atri/o	clear fluid	lymph/o	falling	-ptosis
attraction for	-phil, -philia	clot	thromb/o	fallopian tube	salping/o
away	e-, ec-, ex-	colon	col/o, colon/o	fascia	fasci/o
away from	ab-	colon, sigmoid	sigmoid/o	fast	tachy-
back	re-	color	chrom/o, chromat/o	fat	adip/o, lip/o, steat/o
backward	retro-	colored circle	ir/o, irid/o	fatty paste	ather/o,
bacteria	bacteri/o	condition	-osis	faulty	dys-
basin	pyel/o	condition of	-ia, -ism, ium, -y	fear, exaggerated	phob/o
bear	phor/o	contraction, involuntary	-spasm	femur	femor/o
before	ante-, pre-, pro-	coordination	tax/o	few	olig/o
beginning	-arche	cornea	corne/o, kerat/o	fiber	fibr/o
behind	post-, retro-	correct	ortho-	fixation	-pexy
below	hypo-, infra-, sub-	creation of an opening	-stomy	flesh	sarc/o
bent	lord/o	crooked	ankyl/o	foot	ped/o, pod/o
between	inter-	crown	coron/o	form	morph/o
beyond	meta-, ultra-	crushing	-tripsy	formation	plas/o, -plasia, -poiesis
bile	bil/i, chol/e	cut	cis/o, tom/o	formation of	-iasis
bile duct	choledoch/o	death	necr/o	four	quadri-
binding	-desis	deficient	hypo-, olig/o	from	de-
birth	nat/i, toc/o	development	troph/o	fungus	myc/o
black	melan/o	diaphragm	phren/o	ganglion	gangli/o
bladder	cyst/o, vesic/o, vesicul/o	different	hetero-	gas	aer/o
blood	hem/o, hemat/o	difficult	dys-	germ or bud	-blast, blast/o
blood condition	-emia	digit (finger or toe)	dactyl/o	gland	aden/o
blue	cyan/o	dilation or expansion	-ectasis	glans penis	balan/o
body	somat/o	discharge	-rrhea	glassy	vitre/o
				glomerulus	glomerul/o

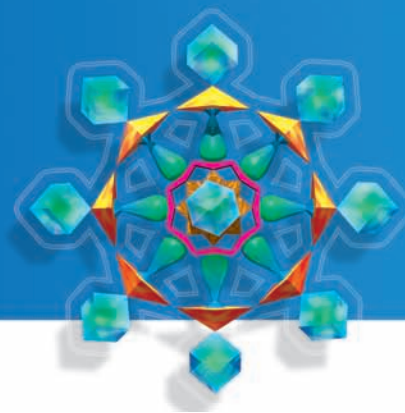
spinal cord.....myel/o
 spinespin/o
 spleen.....splen/o
 splitschiz/o
 sternumstern/o
 stiff.....ankyl/o
 stomachgastr/o
 stonelith/o
 stop or stand-stasis
 straightorth/o
 strangexeno-
 striated.....rhabd/o
 structure-ium
 study of-logy
 study of,
 one who
 specializes in-logist
 stupornarc/o
 sugargluc/o, glyc/o,
 glycos/o
 surgical repair or
 reconstruction ...-plasty
 suspension.....-pexy
 suture.....-rrhaphy
 swallowphag/o
 sweathidr/o
 sweat, profusediaphor/o
 tear.....dacry/o, lacrim/o
 teeth.....dent/i
 tendonten/o, tend/o,
 tendin/o
 tensionton/o
 testis (testicle)orch/o, orchid/o,
 orchid/o, test/o

thalamusthalam/o
 thick.....pachy-
 thirstdips/o
 three.....tri-
 three-
 dimensional
 or solidstere/o
 throatpharyng/o
 throughdia-, per-, trans-
 thymus gland.....thym/o
 thyroid gland.....thyr/o, thyroid/o
 tissuehist/o, -ium
 to or toward.....ad-
 togethercon-, sym-, syn-
 toneton/o
 tonguegloss/o, lingu/o
 tonsiltonsill/o
 topmostacr/o
 trachea.....trache/o
 treatment.....iatr/o, -iatics,
 -iatry
 treatment,
 one who
 specializes in-logist
 trop/oto turn
 tumor.....-oma
 turntrop/o
 twistedscoli/o
 twobi-
 ulnauln/o
 underinfra-, sub-
 upana-
 upon.....epi-
 ureterureter/o

urethraurethr/o
 urineur/o, urin/o
 uterine tubesalping/o
 uterus.....hyster/o, metr/o,
 uter/o
 vaginacolp/o, vagin/o
 veinphleb/o, ven/o
 vein, swollen or
 twistedvaric/o
 ventricleventricul/o
 vertebravertebr/o,
 spondyl/o
 vesselangi/o, vas/o,
 vascul/o
 vision,
 condition of-opia
 voice.....phon/o
 voice boxlaryng/o
 vomiting-emesis
 vulvaepisi/o, vulv/o
 wateraque/o, hydr/o
 wax.....cerumin/o
 weakness-asthenia
 whiteleuc/o, leuk/o
 windpipetrache/o
 withcon-, sym-, syn-
 withinen-, endo-, intra-
 withouta-, an-
 womangynec/o
 word.....lex/o
 yellow.....xanth/o

APPENDIX B

Abbreviations and Symbols

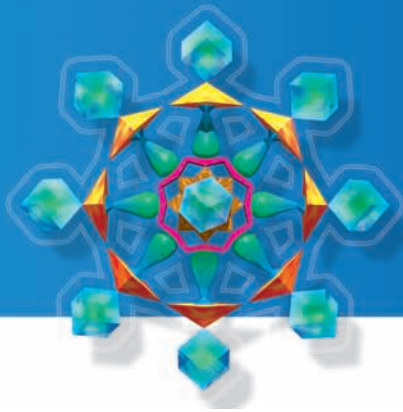


Abbreviations deemed error prone are printed in red.

ā	before	AST	aspartate aminotransferase (enzyme)	c/o	complains of
A	anterior; assessment	AU	both ears	COPD	chronic obstructive pulmonary disease
A&P	auscultation and percussion	AV	atrioventricular	CP	chest pain; cerebral palsy
A&W	alive and well	ⓑ	bilateral	CPAP	continuous positive airway pressure
AB	abortion	BAEP	brainstem auditory evoked potentials	CPD	cephalopelvic disproportion
ABG	arterial blood gas	BCC	basal cell carcinoma	CPR	cardiopulmonary resuscitation
a.c.	before meals	BD	bipolar disorder	CSF	cerebrospinal fluid
ACE	angiotensin-converting enzyme	b.i.d.	twice a day	C-section	cesarean section
ACP	American College of Physicians	BKA	below-knee amputation	CSII	continuous subcutaneous insulin infusion
ACS	American College of Surgeons	BM	black male; bowel movement	CT	computed tomography
ACTH	adrenocorticotrophic hormone	BP	blood pressure	cu mm	cubic millimeter
AD	right ear	BPH	benign prostatic hyperplasia/hypertrophy	CVA	cerebrovascular accident
ADH	antidiuretic hormone	BRP	bathroom privileges	CVS	chorionic villus sampling
ADHD	attention-deficit/hyperactivity disorder	BS	blood sugar	CXR	chest x-ray
ad lib.	as desired	BUN	blood urea nitrogen	d	day
AIDS	acquired immunodeficiency syndrome	Bx	biopsy	D&C	dilation and curettage
AKA	above-knee amputation	c	with	DC	Doctor of Chiropractic Medicine
alb.	albumin	C	Celsius; centigrade	DC, D/C	discharge; discontinue
ALS	amyotrophic lateral sclerosis	C&S	culture and sensitivity	DDS	Doctor of Dental Surgery
ALT	alanine aminotransferase (enzyme)	CABG	coronary artery bypass graft	DEXA	dual-energy x-ray absorptiometry
a.m.	morning	CAD	coronary artery disease	DJD	degenerative joint disease
AMBS	American Board of Medical Specialties	cap	capsule	DKA	diabetic ketoacidosis
amt.	amount	CAT	computed axial tomography	DM	diabetes mellitus
ANS	autonomic nervous system	CBC	complete blood count	DO	Doctor of Osteopathic Medicine
AOA	American Osteopathic Association	cc	cubic centimeter	DPM	Doctor of Podiatric Medicine
AP	anterior posterior	CC	chief complaint; cardiac catheterization	dr	dram
APKD	adult polycystic kidney disease	CCU	coronary (cardiac) care unit; critical care unit	DRE	digital rectal examination
aq	water	CHF	congestive heart failure	DTR	deep tendon reflex
AS	left ear	CIN	cervical intraepithelial neoplasia	DVT	deep vein thrombosis
ASD	atrial septal defect	CIS	carcinoma in situ	Dx	diagnosis
ASHD	arteriosclerotic heart disease	cm	centimeter	ECG	electrocardiogram
		CNS	central nervous system		
		CO	cardiac output		
		CO ₂	carbon dioxide		

ECHO	echocardiogram	HCV	hepatitis C virus	MD	muscular dystrophy; Medical Doctor
ECT	electroconvulsive therapy	HD	Huntington disease	mg	milligram
ECU	emergency care unit	HEENT	head, eyes, ears, nose, throat	MI	myocardial infarction
ED	erectile dysfunction	HGB or Hgb	hemoglobin	ml, mL	milliliter
EDC	estimated date of confinement	HIV	human immuno- deficiency virus	mm	millimeter
EDD	estimated date of delivery	HPI	history of present illness	MRA	magnetic resonance angiography
EEG	electroencephalogram	HPV	human papilloma virus	MRI	magnetic resonance imaging
EGD	esophagogastro- duodenoscopy	HRT	hormone replacement therapy	MS	multiple sclerosis; musculoskeletal
EIA	enzyme immunoassay	h.s.	bedtime (hour of sleep); half strength	MSH	melanocyte- stimulating hormone
EKG	electrocardiogram	HSV-1	herpes simplex virus type 1	MVP	mitral valve prolapse
EMG	electromyogram	HSV-2	herpes simplex virus type 2	NCV	nerve conduction velocity
ENT	ear, nose, throat	Ht	height	NG	nasogastric
EPS	electrophysiological study	HTN	hypertension	NKA	no known allergy
ER	emergency room	Hx	history	NKDA	no known drug allergy
ERCP	endoscopic retrograde cholangio- pancreatography	I&D	incision and drainage	noc.	night
ESR	erythrocyte sedimentation rate	ICD	implantable cardioverter defibrillator	NPO	nothing by mouth
ESWL	extracorporeal shock wave lithotripsy	ICU	intensive care unit	NSAID	nonsteroidal anti- inflammatory drug
ETOH	ethyl alcohol	ID	intradermal	NSR	normal sinus rhythm
F	Fahrenheit	Ig	immunoglobulins	O	objective
FACP	Fellow of the American College of Physicians	IM	intramuscular	O ₂	oxygen
FACS	Fellow of the American College of Surgeons	IMP	impression	OA	osteoarthritis
FBS	fasting blood sugar	IOL	intraocular lens implant	OB	obstetrics
Fe	iron (ferrous)	IP	inpatient	OB/GYN	obstetrics and gynecology
FH	family history	IUD	intrauterine device	OCD	obsessive-compulsive disorder
fl oz	fluid ounce	IV	intravenous	OCP	oral contraceptive pill
FS	frozen section	IVP	intravenous pyelogram	OD	right eye; Doctor of Optometry
FSH	follicle-stimulating hormone	kg	kilogram	OH	occupational history
Fx	fracture	KUB	kidney, ureter, bladder	OP	outpatient
g	gram	L	left; liter	OR	operating room
GAD	generalized anxiety disorder	L&W	living and well	ORIF	open reduction, internal fixation
GERD	gastroesophageal reflux disease	LASIK	laser-assisted in situ keratomileusis	OS	left eye
GH	growth hormone	lb	pound	OU	both eyes
GI	gastrointestinal	LEEP	loop electrosurgical excision procedure	oz	ounce
gm	gram	LH	luteinizing hormone	̄	after
gr	grain	LLETZ	large loop excision of transformation zone	P	plan; posterior; pulse
gt	drop	LLQ	left lower quadrant	PA	posterior anterior
gtt	drops	LP	lumbar puncture	PaCO ₂	arterial partial pressure of carbon dioxide
GTT	glucose tolerance test	LTB	laryngotracheo- bronchitis	PACU	postanesthetic care unit
GYN	gynecology	LUQ	left upper quadrant	PaO ₂	arterial partial pressure of oxygen
h	hour	m	meter	PAP	Papanicolaou test (smear)
H&H	hemoglobin and hematocrit	Ⓜ	murmur	PAR	postanesthetic recovery
H&P	history and physical	MCH	mean corpuscular (cell) hemoglobin	p.c.	after meals
HAV	hepatitis A virus	MCHC	mean corpuscular (cell) hemoglobin concentration	PD	panic disorder
HBV	hepatitis B virus	MCV	mean corpuscular (cell) volume	PDA	patent ductus arteriosus
HCT or Hct	hematocrit				

Commonly Prescribed Drugs



The following alphabetical list of commonly prescribed drugs (trade and generic) is based on listings of prescriptions dispensed in the United States in 2003. The classification and major therapeutic uses for each are also provided. Trade name drugs begin with a capital letter; their generic names accompany them in parentheses. All generic names are set in lowercase.

Name	Classification	Major Therapeutic Uses
Accupril (quinapril hydrochloride)	angiotensin-converting enzyme (ACE) inhibitor	hypertension, congestive heart failure (CHF)
Accutane (isotretinoin)	retinoid	acne
acetaminophen and codeine	analgesic/antipyretic and opiate (narcotic) combination	moderate to severe pain, fever
Aciphex (rabeprazole)	proton pump inhibitor (PPI) (gastric acid secretion inhibitor)	peptic ulcer disease (PUD), gastroesophageal reflux disease (GERD)
Actonel (risedronate)	bisphosphonate (bone resorption inhibitor)	osteoporosis, Paget disease
Actos (pioglitazone)	oral antidiabetic	type 2 diabetes mellitus
Adderall XR (amphetamine mixed salts)	amphetamine	attention-deficit/hyperactivity disorder (ADHD)
Advair Diskus (salmeterol/fluticasone)	adrenergic agonist (bronchodilator) and glucocorticoid (anti-inflammatory)	asthma
albuterol	adrenergic agonist (bronchodilator)	asthma, bronchitis
Allegra (fexofenadine)	antihistamine	allergy
Allegra D (fexofenadine/pseudoephedrine)	antihistamine and decongestant combination	allergy with nasal congestion
allopurinol	xanthine oxidase inhibitor	gout
Alphagan P (brimonidine) ophthalmic solution	α_2 -adrenergic agonist (antihypertensive)	glaucoma
alprazolam	benzodiazepine (anxiolytic, sedative, hypnotic)	anxiety

Name	Classification	Major Therapeutic Uses
Altace (ramipril)	angiotensin-converting enzyme (ACE) inhibitor	hypertension, congestive heart failure (CHF)
Amaryl (glimepiride)	oral antidiabetic	type 2 diabetes mellitus
Ambien (zolpidem)	hypnotic	insomnia
amitriptyline	antidepressant	depression
amoxicillin	penicillin (antibiotic)	bacterial infections
amoxicillin/clavulanate	penicillin (antibiotic) and β -lactamase inhibitor combination	bacterial infections
Apri (desogestrel/ ethinyl estradiol)	oral contraceptive	birth control
Aricept (donepezil)	acetylcholinesterase inhibitor	Alzheimer disease
Atacand (candesartan)	angiotensin receptor blocker (antihypertensive)	hypertension
atenolol	cardioselective β blocker/ β_1 -adrenergic antagonist (antihypertensive, antiarrhythmic, antianginal)	hypertension, angina pectoris, cardiac arrhythmias
Atrovent (ipratropium)	anticholinergic (bronchodilator)	chronic obstructive pulmonary disease (COPD)
Augmentin (amoxicillin/clavulanate)	penicillin (antibiotic) and β -lactamase inhibitor combination	bacterial infections
Avalide (irbesartan/hydrochlorothiazide)	angiotensin receptor blocker (antihypertensive) and diuretic combination	hypertension
Avandia (rosiglitazone)	oral antidiabetic	type 2 diabetes mellitus
Avapro (irbesartan)	angiotensin receptor blocker (antihypertensive)	hypertension
Avelox (moxifloxacin)	fluoroquinolone (antibiotic)	bacterial infections
Aviane (levonorgestrel/ethinyl estradiol)	oral contraceptive	birth control
Bactrim (trimethoprim/sulfamethoxazole)	antibacterial and sulfonamide (antibiotic) combination	bacterial infections
Bactroban (mupirocin)	topical antibiotic	bacterial skin infections
Bextra (valdecoxib)	cox-2 inhibitor (nonsteroidal anti-inflammatory drug [NSAID])	pain, inflammation, fever, arthritis
Biaxin (clarithromycin)	macrolide (antibiotic)	bacterial infections
carisoprodol	skeletal muscle relaxant	skeletal muscle spasms and spasticity
Cartia XT (diltiazem)	calcium channel blocker	hypertension, angina pectoris, cardiac arrhythmias

Name	Classification	Major Therapeutic Uses
Cefzil (cefprozil)	cephalosporin (antibiotic)	bacterial infections
Celebrex (celecoxib)	cox-2 inhibitor (nonsteroidal anti-inflammatory drug [NSAID])	pain, inflammation, fever, arthritis
Celexa (citalopram)	selective serotonin reuptake inhibitor (SSRI) (antidepressant)	depression
cephalexin	cephalosporin (antibiotic)	bacterial infections
Cipro (ciprofloxacin)	fluoroquinolone (antibiotic)	bacterial infections
ciprofloxacin	fluoroquinolone (antibiotic)	bacterial infections
clonazepam	benzodiazepine (sedative/hypnotic, anticonvulsant, anxiolytic)	epilepsy, seizures, anxiety (panic disorder)
clonidine	α_2 -adrenergic agonist (antihypertensive)	hypertension
clotrimazole and betamethasone	topical antifungal and anti-inflammatory combination	fungal infections, some parasites
Combivent (ipratropium/albuterol) inhalation aerosol	anticholinergic and adrenergic agonist combination (bronchodilators)	asthma, chronic bronchitis, emphysema
Concerta (methylphenidate) extended release	central nervous system stimulant	attention-deficit/hyperactivity disorder (ADHD)
Coreg (carvedilol)	cardioselective β blocker/ β_1 -adrenergic antagonist (antihypertensive, antiarrhythmic, antianginal)	hypertension, congestive heart failure (CHF)
Coumadin (warfarin sodium)	anticoagulant	thromboembolic disorders
Cozaar (losartan)	angiotensin receptor blocker (antihypertensive)	hypertension
cyclobenzaprine	skeletal muscle relaxant	skeletal muscle spasms and spasticity
Depakote (divalproex)	anticonvulsant	epilepsy, migraine prophylaxis, bipolar mania
Detrol LA (tolterodine)	anticholinergic	overactive bladder
diazepam	benzodiazepine (sedative/hypnotic, anticonvulsant, anxiolytic)	anxiety, skeletal muscle spasm, epilepsy, seizures
Diflucan (fluconazole)	antifungal	fungal infections
Digitek (digoxin)	cardiac glycoside	congestive heart failure (CHF), cardiac tachyarrhythmias
Dilantin (phenytoin)	hydantoin (anticonvulsant)	epilepsy, seizures
diltiazem hydrochloride	calcium channel blocker	hypertension, angina pectoris, cardiac arrhythmias

Name	Classification	Major Therapeutic Uses
Diovan (valsartan)	angiotensin receptor blocker (antihypertensive)	hypertension
Diovan HCT (valsartan/hydrochlorothiazide)	angiotensin receptor blocker and diuretic combination (antihypertensive)	hypertension
Ditropan XL (oxybutynin)	anticholinergic (urinary antispasmodic)	overactive bladder
doxycycline	tetracycline (antibiotic)	bacterial, rickettsial, and chlamydial infections
Duragesic (fentanyl)	analgesic, opiate (narcotic)	pain, sedation
Effexor XR (venlafaxine)	antidepressant	depression
Elidel (pimecrolimus) topical cream	immunosuppressant agent	atopic dermatitis
enalapril	angiotensin-converting enzyme (ACE) inhibitor	hypertension, congestive heart failure (CHF)
Endocet (oxycodone/acetaminophen)	opiate (narcotic) and nonsteroidal anti-inflammatory (NSAID) (analgesic/antipyretic) combination	moderate to severe pain
Evista (raloxifene)	selective estrogen receptor modulator (SERM)	prevention and treatment of osteoporosis
Flomax (tamsulosin)	α_1 -adrenergic antagonist (antihypertensive, vasodilator)	benign prostatic hypertrophy (BPH)
Flonase (fluticasone) nasal spray	glucocorticoid (anti-inflammatory, immunosuppressant)	allergic rhinitis
Flovent (fluticasone) oral inhalation	glucocorticoid (anti-inflammatory, immunosuppressant)	asthma control
fluoxetine	selective serotonin reuptake inhibitor (SSRI) (antidepressant)	depression
folic acid	vitamin	nutritional supplement
Fosamax (alendronate)	bisphosphonate (bone resorption inhibitor)	osteoporosis, Paget disease
furosemide	diuretic	hypertension, edema associated with congestive heart failure (CHF) or renal disease
gemfibrozil	antihyperlipidemic	hypertriglyceridemia, hyperlipidemia
Glucophage XR (metformin)	oral antidiabetic	type 2 diabetes mellitus
Glucotrol XL (glipizide)	oral antidiabetic	type 2 diabetes mellitus
Glucovance (glyburide/metformin)	oral antidiabetic (combination product)	type 2 diabetes mellitus

Name	Classification	Major Therapeutic Uses
glyburide	oral antidiabetic	type 2 diabetes mellitus
Humalog (insulin lispro)	insulin; antidiabetic	type 1 and 2 diabetes mellitus
Humulin (insulin preparation)	insulin; antidiabetic	type 1 and 2 diabetes mellitus
hydrochlorothiazide	diuretic	hypertension, edema associated with congestive heart failure (CHF) or renal disease
hydrocodone and acetaminophen	opiate (narcotic) and nonsteroidal anti-inflammatory drug (NSAID) (analgesic/antipyretic) combination	moderate to severe pain
Hyzaar (losartan/hydrochlorothiazide)	angiotensin receptor blocker and diuretic combination (antihypertensive)	hypertension
ibuprofen	analgesic; nonsteroidal anti-inflammatory drug (NSAID)	pain, inflammation, fever
Imitrex (sumatriptan succinate)	triptan (antimigraine agent)	migraine headache
Inderal LA (propranolol)	β blocker (antihypertensive, antiarrhythmic, antianginal)	hypertension, angina pectoris, cardiac arrhythmias, migraine headache prophylaxis
isosorbide mononitrate	coronary vasodilator (antianginal)	angina pectoris
Kariva (desogestrel/ethinyl estradiol)	oral contraceptive	birth control
Klor-Con (potassium chloride)	potassium salt; electrolyte supplement	potassium deficiency
Lanoxin (digoxin)	cardiac glycoside	congestive heart failure (CHF), cardiac tachyarrhythmias
Lantus (insulin glargine)	insulin; antidiabetic	type 1 and 2 diabetes mellitus
Lescol XL (fluvastatin)	HMG-CoA reductase inhibitor (statin)	hyperlipidemia, hypercholesterolemia
Levaquin (levofloxacin)	fluoroquinolone (antibiotic)	bacterial infections
Levothroid (levothyroxine)	thyroid hormone	hypothyroidism
Levoxyl (levothyroxine sodium)	thyroid hormone	hypothyroidism
Lexapro (escitalopram)	selective serotonin reuptake inhibitor (SSRI) (antidepressant)	depression
Lipitor (atorvastatin)	HMG-CoA reductase inhibitor (statin)	hyperlipidemia, hypercholesterolemia

Name	Classification	Major Therapeutic Uses
lisinopril	angiotensin-converting enzyme (ACE) inhibitor	hypertension
lorazepam	benzodiazepine (sedative/hypnotic, anticonvulsant, anxiolytic)	anxiety, preop sedation, epilepsy, seizures
Lotensin (benazepril)	angiotensin-converting enzyme (ACE) inhibitor	hypertension
Lotrel (amlodipine/benazepril)	calcium channel blocker and angiotensin-converting enzyme (ACE) inhibitor combination	hypertension
Low-Ogestrel (norgestrel/ethinyl estradiol)	oral contraceptive	birth control
Macrobid (nitrofurantoin)	antibiotic	bacterial infections of urinary tract
meclizine	anticholinergic	motion sickness, vertigo
metformin	oral antidiabetic	type 2 diabetes mellitus
methylprednisolone	glucocorticoid (anti-inflammatory, immunosuppressant)	inflammation, immunological disorders, allergies
metoprolol	cardioselective β blocker (β_1 -adrenergic antagonist)	hypertension, angina pectoris
Miacalcin (calcitonin)	hormone	osteoporosis, Paget disease
Microgestin Fe (norethindrone ethinyl estradiol)	oral contraceptive	birth control
MiraLax (polyethylene glycol)	laxative	constipation
Mobic (meloxicam)	nonsteroidal anti-inflammatory drug (NSAID)	osteoarthritis
Monopril (fosinopril)	angiotensin-converting enzyme (ACE) inhibitor	hypertension
naproxen	analgesic, nonsteroidal anti-inflammatory drug (NSAID)	pain, fever, arthritis
Nasacort (triamcinolone) AQ topical nasal spray	glucocorticoid (anti-inflammatory, immunosuppressant)	allergic rhinitis
Nasonex (mometasone) topical nasal spray	glucocorticoid (anti-inflammatory, immunosuppressant)	allergic rhinitis
Necon (ethinyl estradiol/norethindrone)	oral contraceptive	birth control
Neurontin (gabapentin)	anticonvulsant	postherpetic neuralgia, epilepsy (partial seizures)
Nexium (esomeprazole)	proton pump inhibitor (PPI) (gastric acid secretion inhibitor)	peptic ulcer disease (PUD), gastroesophageal reflux disease (GERD)

Name	Classification	Major Therapeutic Uses
Niaspan (niacin)	vitamin	dyslipidemia
nifedipine	calcium channel blocker	hypertension, angina pectoris
NitroQuick (nitroglycerin)	antianginal	coronary vasodilator
Norvasc (amlodipine)	calcium channel blocker	hypertension, angina pectoris
omeprazole	proton pump inhibitor (PPI) (gastric acid secretion inhibitor)	peptic ulcer disease (PUD), gastroesophageal reflux disease (GERD)
Omnicef (cefdinir)	cephalosporin (antibiotic)	bacterial infections
Ortho Evra (norelgestromin/ ethinyl estradiol)	contraceptive patch	birth control
Ortho Novum (norethindrone/ ethyl estradiol)	oral contraceptive	birth control
Ortho Tri-Cyclen (norgestimate/ ethyl estradiol)	oral contraceptive	birth control
oxycodone and acetaminophen	opiate (narcotic) and nonsteroidal anti- inflammatory drug (NSAID) (analgesic/ antipyretic) combination	moderate to severe pain
OxyContin (oxycodone)	opiate (narcotic) analgesic	moderate to severe pain
Patanol (olopatadine)	ophthalmic antihistamine	allergic conjunctivitis
Paxil (paroxetine)	selective serotonin reuptake inhibitor (SSRI) (antidepressant)	depression
Penicillin VK (penicillin V potassium)	penicillin (antibiotic)	bacterial infections
Percocet (oxycodone and acetaminophen)	opiate (narcotic) and nonsteroidal anti- inflammatory drug (NSAID) (analgesic/ antipyretic) combination	moderate to severe pain
phenobarbital	barbiturate (sedative/ hypnotic, anticonvulsant, anxiolytic)	insomnia, epilepsy, seizures, anxiety
phenytoin	hydantoin (anticonvulsant)	epilepsy, seizures
Plavix (clopidogrel)	antiplatelet agent	reduction in stroke or myo- cardial infarction risk by excessive clot prevention
Plendil (felodipine)	calcium channel blocker	hypertension, angina pectoris
potassium chloride	potassium salt; electrolyte supplement	potassium deficiency
Pravachol (pravastatin)	HMG-CoA reductase inhibitor (statin)	hyperlipidemia, hypercholesterolemia

Name	Classification	Major Therapeutic Uses
prednisone	glucocorticoid (anti-inflammatory, immunosuppressant)	inflammation, immunological disorders, allergy
Premarin (conjugated estrogens)	estrogen derivative	hormone replacement
Prempro (estrogen/medroxyprogesterone)	estrogen/progestin	hormone replacement
Prevacid (lansoprazole)	proton pump inhibitor (PPI) (gastric acid secretion inhibitor)	peptic ulcer disease (PUD), gastroesophageal reflux disease (GERD)
Prilosec (omeprazole)	proton pump inhibitor (PPI) (gastric acid secretion inhibitor)	peptic ulcer disease (PUD), gastroesophageal reflux disease (GERD)
promethazine	antihistamine; sedative and antiemetic	allergy; motion sickness, nausea
promethazine and codeine	antihistamine and opiate (narcotic) antitussive combination	cold and cough
propoxyphene and acetaminophen	opiate (narcotic) analgesic and nonsteroidal anti-inflammatory drug (NSAID) (analgesic/antipyretic) combination	mild to moderate pain
propranolol	β blocker (antihypertensive, antiarrhythmic, antianginal)	hypertension, angina pectoris, cardiac arrhythmias, migraine headache prophylaxis
Proscar (finasteride)	5 α -reductase inhibitor	benign prostatic hyperplasia (BPH)
Protonix (pantoprazole)	proton pump inhibitor (PPI) (gastric acid secretion inhibitor)	peptic ulcer disease (PUD), gastroesophageal reflux disease (GERD)
Pulmicort (budesonide) inhalant	glucocorticoid (anti-inflammatory, immunosuppressant)	asthma
ranitidine hydrochloride	H ₂ receptor antagonist	peptic ulcer disease (PUD), gastroesophageal reflux disease (GERD)
Remeron (mirtazapine)	atypical antidepressant	depression
Rhinocort Aqua (budesonide) nasal spray	glucocorticoid (anti-inflammatory, immunosuppressant)	allergic rhinitis
Risperdal (risperidone)	atypical antipsychotic (neuroleptic)	psychoses (e.g., schizophrenia)
Roxicet (oxycodone and acetaminophen)	opiate (narcotic) and nonsteroidal anti-inflammatory drug (NSAID) (analgesic/antipyretic) combination	moderate to severe pain

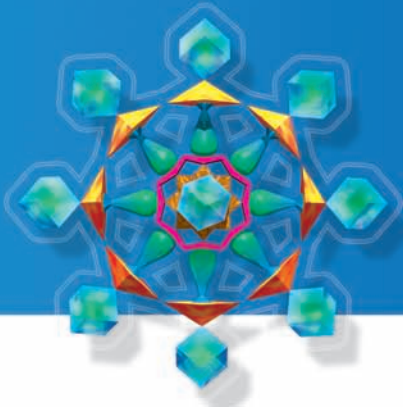
Name	Classification	Major Therapeutic Uses
Seroquel (quetiapine)	atypical antipsychotic (neuroleptic)	psychoses (e.g. schizophrenia)
Singulair (montelukast)	leukotriene receptor antagonist	asthma
Skelaxin (metaxalone)	skeletal muscle relaxant	skeletal muscle spasms and spasticity
spironolactone	potassium sparing diuretic	hypertension, edema
Strattera (atomoxetine)	selective norepinephrine reuptake inhibitor (SNRI)	attention-deficit/hyperactivity disorder (ADHD)
Synthroid (levothyroxine)	thyroid product	hypothyroidism
temazepam	benzodiazepine (hypnotic)	insomnia
terazosin	α_1 -adrenergic antagonist (antihypertensive, vasodilator)	hypertension, benign prostatic hypertrophy
timolol	β blocker (antihypertensive, antiarrhythmic, antianginal)	hypertension, angina pectoris, cardiac arrhythmias, glaucoma (ophthalmic solution)
TobraDex (tobramycin and dexamethasone) ophthalmic solution	antibiotic and corticosteroid combination	external ocular bacterial infections
Topamax (topiramate)	anticonvulsant	epilepsy (partial seizures)
Toprol-XL (metoprolol)	cardioselective β blocker (β_1 -adrenergic antagonist)	hypertension, angina pectoris, congestive heart failure (CHF)
trazodone	atypical antidepressant	depression
triamcinolone	glucocorticoid (anti-inflammatory, immunosuppressant)	inflammation, immunological disorders, allergy
triamterene and hydrochlorothiazide (HCTZ)	diuretic combination	hypertension, edema in congestive heart failure (CHF)
Tricor (fenofibrate)	fibric acid derivative	hyperlipidemia, hypertriglyceridemia, hypercholesterolemia
trimethoprim/sulfamethoxazole (TMP-SMX or co-trimoxazole)	antibacterial and sulfonamide (antibiotic) combination	bacterial infections
Trimox (amoxicillin)	penicillin (antibiotic)	bacterial infections
Trivora-28 (levonorgestrel/ethinyl estradiol)	oral contraceptive	birth control
Tussionex (hydrocodone and chlorpheniramine)	narcotic antitussive and antihistamine combination	cough and cold

Name	Classification	Major Therapeutic Uses
Ultracet (tramadol/ acetaminophen)	opioid analgesic and nonsteroidal anti- inflammatory drug (NSAID) (analgesic/ antipyretic) combination	pain
Valtrex (valacyclovir)	antiviral	herpes viruses
verapamil	calcium channel blocker	hypertension, cardiac arrhythmias, angina pectoris
Viagra (sildenafil)	phosphodiesterase (type 5) enzyme inhibitor	erectile dysfunction (ED)
Vioxx (rofecoxib)	cox-2 inhibitor (nonsteroidal anti-inflammatory drug [NSAID])	pain, inflammation, fever, arthritis
warfarin	anticoagulant	thromboembolic disorders
Wellbutrin SR (bupropion)	atypical antidepressant	depression
Xalatan (latanoprost) ophthalmic solution	prostaglandin	glaucoma
Yasmin 28 (drospirenone/ ethinyl estradiol)	oral contraceptive	birth control
Zetia (ezetimibe)	cholesterol absorption inhibitor	hypercholesterolemia
Zithromax (azithromycin dihydrate)	macrolide (antibiotic)	bacterial infections
Zocor (simvastatin)	HMG-CoA reductase inhibitor (statin)	hyperlipidemia, hypercholesterolemia
Zoloft (sertraline)	selective serotonin reuptake inhibitor (SSRI) (antidepressant)	depression
Zyprexa (olanzapine)	atypical antipsychotic (neuroleptic)	psychoses (e.g., schizophrenia)
Zyrtec (cetirizine)	antihistamine	allergy

References

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- RxList Top 200 Drugs of 2003, www.rxlist.com/top200.htm.
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Answers to Practice Exercises



CHAPTER 1 (PP. 7–8)

1. personal commitment
2. Answers will vary.
3.
 - a. Act immediately to focus on goals.
 - b. Don't try to take on too much at once.
 - c. Divide materials into smaller, more manageable portions.
 - d. Celebrate progress along the way, and look forward to future benefits for learning (note: class discussion will bring out other good ideas).
4. It promotes positive thinking and self-confidence that lead to success.
5. Answers will vary.
6.
 - a. Find a comfortable place to study, and organize your study area.
 - b. Listen to enjoyable music while studying.
 - c. Replace negative self-talk with "can do" affirmatives.
 - d. Think positively, and visualize yourself as a successful learner.
7. stress reduction and mental stamina
8. see it, say it, write it.
9. Preparation and the use of flash cards provide visual, kinesthetic, and auditory reinforcement of the senses helpful in memorization. Flash cards are portable and can be carried at all times.
10. When you annotate text material, you make notes in the margin as you read. This includes drawing lines to separate component parts of key terms and writing out their meanings.
11.
 - a. Draw pictures of word components.
 - b. Listen to audiotapes/pronunciations on CD-ROM.
 - c. Make up songs or rhymes.
 - d. Find a person or group to study with.

CHAPTER 2 (PP. 30–37)

1. pan / cyto / penia
P CF S
DEFINITION: all / cell / abnormal reduction
2. leuk / emia
R S
DEFINITION: white / blood condition
3. tox / oid
R S
DEFINITION: poison / resembling
4. meso / morph / ic
P R S
DEFINITION: middle / form / pertaining to
5. acro / dynia
CF S
DEFINITION: extremity / pain
6. meta / stasis
P S
DEFINITION: beyond, after, or change / stop or stand
7. ultra / sono / graphy
P CF S
DEFINITION: beyond or excessive / sound / process of recording
8. tachy / card / ia
P R S
DEFINITION: fast / heart / condition of
9. pyo / poiesis
CF S
DEFINITION: pus / formation
10. aden / itis
R S
DEFINITION: gland / inflammation
11. macro / cephal / ous
P R S
DEFINITION: large or long / head / pertaining to
12. para / centesis
P S
DEFINITION: alongside of / puncture for aspiration
13. micro / lith / iasis
P R S
DEFINITION: small / stone / formation or presence of
14. ortho / ped / ic
CF R S
DEFINITION: straight, normal, or correct / foot / pertaining to

15. angio / megaly
CF S
DEFINITION: vessel / enlargement
16. psych / iatry
R S
DEFINITION: mind / treatment
17. carcino / genesis
CF S
DEFINITION: cancer / origin or production
18. nephro / logist
CF S
DEFINITION: kidney / one who specializes in the study or treatment of
19. rhino / sten / osis
CF R S
DEFINITION: nose / narrow / condition or increase
20. hypo / hydr / ation
P R S
DEFINITION: below or deficient / water / process
21. aero / gastr / algia
CF R S
DEFINITION: air or gas / stomach / pain
22. fibr / oma
R S
DEFINITION: fiber / tumor
23. necro / philia
CF S
DEFINITION: death / attraction for
24. scler / osis
R S
DEFINITION: hard / condition or increase
25. hemo / lysis
CF S
DEFINITION: blood / breaking down or dissolution
26. acro / phob / ia
CF R S
DEFINITION: topmost (or extremity) / exaggerated fear or sensitivity / condition of
27. cyto / meter
CF S
DEFINITION: cell / instrument for measuring
28. cyano / tic
CF S
DEFINITION: blue / pertaining to
29. extra / vascul / ar
P R S
DEFINITION: outside / vessel / pertaining to
30. hyper / troph / y
P R S
DEFINITION: above or excessive / nourishment or development / condition or process of
31. c. supra
32. d. re
33. c. pre
34. b. de
35. e. trans
36. c. super
37. b. infra
38. a. exo
39. b. dys
40. b. ab
41. b. pro
42. d. circum
43. c. hemi
44. f. ab-
45. g. inter-
46. h. para-
47. b. peri-
48. a. retro-
49. j. intra-
50. c. anti-
51. i. an-
52. d. ecto-
53. e. dia-
54. many
55. below or deficient
56. few or deficient
57. one
58. all
59. beyond or excessive
60. two or both
61. four
62. half
63. below or under
64. above or excessive
65. c. ante-
66. d. post-
67. e. tachy-
68. a. brady-
69. b. re-
70. d. without
71. b. foot
72. d. mouth
73. d. new
74. a. surgical repair
75. e. process
76. c. crushing
77. c. expansion
78. c. right
79. f. melan/o
80. a. tri-
81. j. erythr/o
82. g. quadri-
83. b. leuk/o
84. e. uni-
85. c. cyan/o
86. k. bi-
87. i. oligo-
88. d. dextr/o
89. h. sinistr/o
90. c. -gram
91. c. -osis
92. c. -ectomy
93. b. -ar
94. d. -rrhexis
95. c. -ula
96. a. -ism
97. nephritis
98. nephrolysis
99. nephrotomy
100. nephrogenous
101. nephropexy

102. nephrostomy
103. nephrectomy
104. nephrolithiasis
105. nephroma
106. nephrocele
107. nephrorrhaphy
108. nephroptosis
109. d. colostomy
110. a. vasorrhaphy
111. c. abdominocentesis

112. ovaries, ova
113. metastases
114. verrucae
115. condyloma
116. index
117. thrombi
118. c. nephrorrhaphy
119. a. abdominoscopy
120. b. pericardium

CHAPTER 3 (PP. 50–53)

1. onco / logy
CF S
DEFINITION: tumor / study of
2. immuno / logist
CF S
DEFINITION: safe / one who specializes in the study or treatment of
3. oto / laryngo / logy
CF CF S
DEFINITION: ear / voice box / study of
4. opto / metry
CF S
DEFINITION: eye / process of measuring
5. gyneco / logy
CF S
DEFINITION: woman / study of
6. patho / logy
CF S
DEFINITION: disease / study of
7. ortho / ped / ic
CF R S
DEFINITION: straight, normal, or correct / foot / pertaining to
8. uro / logist
CF S
DEFINITION: urine / one who specializes in the study or treatment of
9. neuro / logy
CF S
DEFINITION: nerve / study of
10. psycho / logist
CF S
DEFINITION: mind / one who specializes in the study or treatment of
11. osteo / path / y
CF R S
DEFINITION: bone / disease / condition or process of
12. ophthalmo / logist
CF S
DEFINITION: eye / one who specializes in the study or treatment of
13. obstetr / ic
R S
DEFINITION: midwife / pertaining to
14. an / esthesio / logy
P CF S
DEFINITION: without / sensation / study of

15. cardio / logy
CF S
DEFINITION: heart / study of
16. dermato / logy
CF S
DEFINITION: skin / study of
17. ped / iatrics
R S
DEFINITION: child / treatment
18. endo / crino / logist
P CF S
DEFINITION: within / to secrete / one who specializes in the study or treatment of
19. nephro / logist
CF S
DEFINITION: kidney / one who specializes in the study or treatment of
20. gastro / entero / logy
CF CF S
DEFINITION: stomach / small intestine / study of
21. hemato / logist
CF S
DEFINITION: blood / one who specializes in the study or treatment of
22. j
23. q
24. l
25. p
26. f
27. n
28. o
29. e
30. b
31. d
32. i
33. h
34. g
35. a
36. k
37. c
38. m
39. obstetrics and gynecology
40. Doctor of Dental Surgery
41. ears, nose, and throat
42. American Board of Medical Specialties
43. Doctor of Optometry
44. Fellow of the American College of Surgeons

45. American College of Physicians
46. Doctor of Chiropractic Medicine
47. Doctor of Podiatric Medicine
48. Doctor of Osteopathic Medicine
- 49–53.
 - gynecologist
 - ophthalmologist
 - otolaryngologist
 - orthopaedist
 - urologist

54. c
55. a
56. e
57. g
58. f
59. b
60. d

CHAPTER 4 (pp. 97–101)

1. chief complaint
2. occupational history
3. per rectum
4. bathroom privileges
5. postanesthetic recovery unit
6. past history
7. *discontinue or discharge
8. instructions to patient
9. emergency room
10. intensive care unit
11. rule out
12. nothing by mouth
13. living and well
14. blood pressure
15. *both ears
16. symptom
17. vital signs
18. review of systems
19. patient
20. *right eye
21. subcutaneous
22. history and physical
23. treatment or traction
24. diagnosis
25. history of present illness
26. female
27. decreased
28. d
29. e
30. g
31. a
32. j
33. i
34. b
35. c
36. f
37. h
38. d
39. h
40. f
41. i
42. g
43. j
44. b
45. c
46. a
47. e
48. vital signs every hour for 4 hours, then every 2 hours
49. one by mouth, 4 times a day, after meals and at bed-time
50. two and one-half grains of aspirin
51. 650 milligrams by mouth every 4 hours as needed for temperature more than 101°
52. one suppository through the rectum every night as needed
53. one drop in both eyes 3 times a day for 7 days
54. two capsules immediately, then one every 6 hours
55. tab $\dot{\uparrow}$ po tid $\times 7$ d or $\dot{\uparrow}$ tab po tid $\times 7$ d
56. suppos $\dot{\uparrow}$ PV hs or $\dot{\uparrow}$ suppos PV hs
57. 5 mL po qid
58. $\dot{\uparrow}$ or $\dot{\uparrow}\dot{\uparrow}$ po q 3–4 h prn
59. gtt $\dot{\uparrow}\dot{\uparrow}$ AS q 3 h or $\dot{\uparrow}\dot{\uparrow}$ gtt AS q 3 h
60. cap $\dot{\uparrow}$ po bid am and pm or $\dot{\uparrow}$ cap po bid am and pm
61. $\dot{\uparrow}\dot{\uparrow}$ po STAT, then $\dot{\uparrow}$ q 6 h
62. 30 mg po hs prn
63. 0100 hours
64. 1430 hours
65. 2400 hours
66. 1300 hours
67. 1900 hours
68. 0450 hours
69. e
70. h
71. g
72. f
73. i
74. d
75. b
76. j
77. a
78. c
79. every day, daily
80. every other day, every other day
81. left eye, left eye
82. right ear, right ear
83. both ears, both ears
84. greater than, greater than
85. discharge or discontinue, discharge or discontinue
86. yes
87. no
88. yes
89. yes
90. no
91. e
92. d
93. a
94. b
95. c

CHAPTER 5 (PP. 125–133)

1. dermat / ologist
CF S
DEFINITION: skin / one who specializes in the study or treatment of
2. ichthy / oid
R S
DEFINITION: fish / resembling
3. onycho / lysis
CF S
DEFINITION: nail / breakdown or dissolution
4. histo / troph / ic
CF R S
DEFINITION: tissue / nourishment of development / pertaining to
5. dys / plas / ia
P R S
DEFINITION: painful, difficult, or faulty / formation / condition of
6. hyper / kerat / osis
P R S
DEFINITION: above or excessive / hard / condition or increase
7. leuko / trich / ia
CF R S
DEFINITION: white / hair / condition of
8. myco / logy
CF S
DEFINITION: fungus / study of
9. epi / derm / al
P R S
DEFINITION: upon / skin / pertaining to
10. lip / oma
R S
DEFINITION: fat / tumor
11. sub / cutane / ous
P R S
DEFINITION: below or under / skin / pertaining to
12. an / hidr / osis
P R S
DEFINITION: without / sweat / condition or increase
13. histo / patho / logy
CF CF S
DEFINITION: tissue / disease / study of
14. par / onych / ia
P R S
DEFINITION: alongside of / nail / condition of
15. adip / osis
R S
DEFINITION: fat / condition or increase
16. squam / ous
R S
DEFINITION: scale / pertaining to
17. erythro / dermat / itis
CF R S
DEFINITION: red / skin / inflammation
18. de / squam / ation
P R S
DEFINITION: from, down, or not / scale / process
19. histo / tox / ic
CF R S
DEFINITION: tissue / poison / pertaining to
20. melano / cyt / e
CF R S
DEFINITION: black / cell / noun marker
21. xer / osis
R S
DEFINITION: dry / condition or increase
22. purpur / ic
R S
DEFINITION: purple / pertaining to
23. sebo / rhea
CF S
DEFINITION: sebum (oil) / discharge
24. xanth / oma
R S
DEFINITION: yellow / tumor
25. a / steat / osis
P R S
DEFINITION: without / fat / condition or increase
26. melanoma
27. hypodermic
28. cherry angioma
29. excoriation
30. frozen section
31. closed comedo
32. antipruritic
33. onychomycosis
34. excisional biopsy
35. autograft
36. sclerotherapy
37. hyperpigmentation
38. steat/o
39. melan/o
40. myc/o
41. onych/o
42. erythr/o
43. trich/o
44. xer/o
45. seb/o
46. gangrene
47. pruritus
48. carbuncle
49. alopecia
50. curettage
51. acne
52. psoriasis
53. cellulitis
54. f
55. i
56. h
57. g
58. j
59. c
60. a
61. d
62. b
63. e
64. leukoderma
65. xanthoderma
66. xeroderma
67. erythroderma
68. scleroderma

69. rubella
 70. varicella
 71. rubeola
 72. f
 73. i
 74. c
 75. h
 76. d
 77. g
 78. a
 79. j
 80. b
 81. e
 82. Bx
 83. I&D
 84. BCC
 85. HSV-1
 86. C&S
 87. SLE
 88. m
 89. k
 90. g
 91. l
 92. d
 93. h
 94. j
 95. b
 96. i
 97. e
 98. a
 99. f
 100. c
 101. keratoses
 102. bullae
 103. nevi
 104. maculae
 105. ecchymoses
 106. **electrodesiccation**—use of short, high-frequency, electric currents to destroy tissue by drying; the active electrode makes direct contact with the skin lesion; **fulguration**—use of long, high-frequency, electric sparks to destroy tissue; the active electrode does *not* touch the skin
 107. **actinic keratoses**—localized thickening of the skin caused by excessive exposure to sunlight; **seborrheic keratoses**—benign, wart-like lesions seen especially on elderly skin
 108. **vitiligo**—condition caused by the destruction of melanin that results in the appearance of white patches on the skin; **albinism**—a hereditary condition characterized by a partial or total lack of melanin pigment
109. **cicatrix**—scar; mark left by the healing of a sore or wound showing the replacement of destroyed tissue by fibrous tissue; **keloid**—an abnormal overgrowth of scar tissue that is thick and irregular
 110. **dermatosis**—any disorder of the skin; **dermatitis**—inflammation of the skin
 111. **incisional biopsy**—removal of a selected portion of a lesion for microscopic pathological analysis; **excisional biopsy**—removal of an entire lesion for analysis
 112. **heterograft**—graft transfer from one animal species to one of another species; **allograft**—donor transfer between individuals of the same species such as human to human
 113. **closed comedo**—below the skin surface with a white center; **open comedo**—open to the skin surface with a black center caused by the presence of melanin exposed to air
 114. **cutaneous lupus**—lupus limited to the skin; evidenced by a characteristic rash especially on the face, neck, and scalp; **systemic lupus erythematosus**—more severe form of lupus involving the skin, joints, and often vital organs
 115. **dysplastic nevus**—mole with precancerous changes; **malignant melanoma**—cancerous tumor composed of melanocytes; most develop from a pigmented nevus over time
116. squamous layer (stratum corneum)
 117. basal layer (stratum germinativum)
 118. epidermis
 119. dermis
 120. subcutaneous tissue
 121. cicatrix
 122. pruritus
 123. petechia
 124. verruca
 125. ecchymosis
 126. excision
 127. psoriasis
 128. impetigo
 129. eczema
 130. debridement
 131. keratosis
 132. bulla
 133. nodule
 134. seborrhea
 135. petechia
 136. ecchymosis
 137. urticaria
 138. eczema
 139. macula (macule)
 140. suppuration

CHAPTER 6 (PP. 175–184)

1. thorac / ic
 R S
 DEFINITION: chest / pertaining to
2. myo / fasci / al
 CF R S
 DEFINITION: muscle / fascia (a band) / pertaining to
3. arthro / path / y
 CF R S
 DEFINITION: joint / disease / condition or process of
4. spondylo / lysis
 CF S
 DEFINITION: vertebra / breaking down or dissolution

5. osteo / penia
CF S
DEFINITION: bone / abnormal reduction
6. a / chondro / plas / ia
P CF R S
DEFINITION: without / cartilage / formation / condition of
7. oste / algia
R S
DEFINITION: bone / pain
8. poly / myos / itis
P R S
DEFINITION: many / muscle / inflammation
9. leio / myo / sarc / oma
CF CF R S
DEFINITION: smooth / muscle / flesh / tumor
10. myelo / cyt / e
CF R S
DEFINITION: bone marrow or spinal cord / cell / noun marker
11. costo / vertebr / al
CF R S
DEFINITION: rib / vertebra / pertaining to
12. musculo / tendin / ous
CF R S
DEFINITION: muscle / tendon / pertaining to
13. orth / osis
R S
DEFINITION: straight, normal, or correct / condition or increase
14. kypho / plasty
CF S
DEFINITION: humpback / surgical repair or reconstruction
15. crani / ectomy
R S
DEFINITION: skull / excision (removal)
16. arthr / desis
CF S
DEFINITION: joint / binding
17. fibro / my / algia
CF R S
DEFINITION: fiber / muscle / pain
18. rhabdo / my / oma
CF R S
DEFINITION: rod-shaped or striated (skeletal) / muscle / tumor
19. sterno / cost / al
CF R S
DEFINITION: sternum (breastbone) / rib / pertaining to
20. intra / articul / ar
P R S
DEFINITION: within / joint / pertaining to
21. syn / dactyl / ism
P R S
DEFINITION: together or with / digit (finger or toe) / condition of
22. lumbo / dynia
CF S
DEFINITION: loin (lower back) / pain
23. cervico / brachi / al
CF R S
DEFINITION: neck / arm / pertaining to
24. arthro / scopy
CF S
DEFINITION: joint / process of examination
25. lord / osis
R S
DEFINITION: bent / condition or increase
26. intercostal
27. arthralgia
28. myotomy
29. spondylosyndesis
30. leiomyoma
31. osteomalacia
32. spondylolisthesis
33. arthrogram or arthrograph
34. osteotomy
35. epiphysitis
36. cervical
37. bony necrosis
38. chondroma
39. arthrocentesis
40. osteoplasty
41. chondr/o
42. spondyl/o
43. myel/o
44. cervic/o
45. arthr/o
46. thorac/o
47. my/o
48. cost/o
49. scoliosis
50. osteoma
51. crepitation or crepitus
52. sequestrum
53. sagittal
54. traction
55. gout or gouty arthritis
56. subluxation
57. proximal
58. rickets
59. radiologist
60. h
61. f
62. c
63. e
64. a
65. g
66. b
67. d
68. **arthrogram**—x-ray of a joint; **arthroscopy**—procedure using an arthroscope to examine, diagnose, and repair a joint from within
69. **rhabdomyoma**—skeletal (striated) muscle tumor; **rhabdomyosarcoma**—malignant skeletal muscle tumor
70. **osteoarthritis**—most common form of arthritis that especially affects weight-bearing joints characterized by the erosion of articular cartilage; **rheumatoid arthritis**—most crippling form of arthritis characterized by a chronic, systemic inflammation affecting joints and synovial membranes causing ankylosis and deformity

71. **osteomalacia**—disease marked by softening of the bone; **osteoporosis**—condition of decreased bone density and increased porosity
72. **orthosis**—use of an orthopedic appliance to maintain a bone's position or provide limb support; **prosthesis**—an artificial replacement for a diseased or missing body part such as a hip, joint, or limb
73. **closed reduction, external fixation of a Fx**—external manipulation of a fracture to regain alignment along with application of an external device to protect and hold the bone in place while healing; **open reduction internal fixation of a Fx**—internal surgical repair of a fracture by bringing bones back into alignment and fixing them into place, often utilizing plates, screws, and pins
74. **ankylosis**—stiff joint condition; **spondylosis**—stiff, immobile condition of vertebrae
75. **leiomyoma**—smooth muscle tumor; **leiomyosarcoma**—malignant smooth muscle tumor
76. **lordosis**—abnormal anterior curvature of the lumbar spine (sway-back condition); **kyphosis**—abnormal posterior curvature of the thoracic spine (humpback condition)
77. **spondylolisthesis**—diagnostic term describing a forward slipping of a lumbar vertebra; **spondylosyndesis**—operative (surgical) term for spinal fusion
78. b
79. d
80. a
81. c
82. computed tomography
83. physical therapy
84. traction
85. range of motion
86. fracture
87. electromyogram
88. spondylosis
89. scoliosis
90. arthrodynia
91. ostealgia
92. sagittal
93. flaccid
94. sequestrum
95. ankylosis
96. chondral
97. dorsiflexion
98. osteoporosis
99. rhabdomyoma
100. medial
101. sagittal
102. anterior
103. frontal
104. posterior
105. superior
106. inferior
107. transverse
108. flexion
109. extension
110. abduction
111. adduction
112. rotation
113. eversion
114. inversion
115. pronation
116. supination
117. dorsiflexion
118. plantar flexion
119. skull
120. cranium
121. phalanges
122. clavicle
123. scapula
124. sternum
125. xiphoid process
126. humerus
127. ilium
128. ischium
129. ulna
130. radius
131. carpals
132. metacarpals
133. trochanter
134. femur
135. patella
136. tibia
137. fibula
138. tarsals
139. metatarsals
140. phalanges
141. sacrum
142. coccyx
143. calcaneus
144. orthosis
145. hypertrophy
146. radius
147. kyphosis
148. bursa
149. dystrophy
150. necrosis
151. osteoporosis
152. lordosis
153. ulna
154. scoliosis
155. prosthesis

CHAPTER 7 (PP. 222–228)

1. angio / graphy
CF S
DEFINITION: vessel / process of recording
2. varic / osis
R S
DEFINITION: swollen, twisted vein / condition or increase
3. pector / al
R S
DEFINITION: chest / pertaining to
4. vaso / spasm
CF S
DEFINITION: vessel / involuntary contraction

5. ven / ous
R S
DEFINITION: vein / pertaining to
6. aorto / coron / ary
CF R S
DEFINITION: aorta / circle or crown / pertaining to
7. thrombo / phleb / itis
CF R S
DEFINITION: clot / vein / inflammation
8. peri / cardio / centesis
P CF S
DEFINITION: around / heart / puncture for aspiration
9. vasculo / path / y
CF R S
DEFINITION: vessel / disease / condition or process of
10. athero / genesis
CF S
DEFINITION: fatty (lipid) paste / origin or production
11. stetho / scope
CF S
DEFINITION: chest / instrument for examination
12. myo / card / ium
CF R S
DEFINITION: muscle / heart / structure or tissue
13. aorto / plasty
CF S
DEFINITION: aorta / surgical repair or reconstruction
14. veno / stomy
CF S
DEFINITION: vein / creation of an opening
15. arterio / sten / osis
CF R S
DEFINITION: artery / narrow / condition or increase
16. phlebo / tomy
CF S
DEFINITION: vein / incision
17. cardio / aort / ic
CF R S
DEFINITION: heart / aorta / pertaining to
18. ventriculo / gram
CF S
DEFINITION: ventricle / record
19. phleb / itis
R S
DEFINITION: vein / inflammation
20. angio / plasty
CF S
DEFINITION: vessel / surgical repair or reconstruction
21. endo / vascul / ar
P R S
DEFINITION: within / vessel / pertaining to
22. cardio / tox / ic
CF R S
DEFINITION: heart / poison / pertaining to
23. arterio / gram
CF S
DEFINITION: artery / record
24. ather / ectomy
R S
DEFINITION: fatty (lipid) paste / excision removal
25. athero / thromb / osis
CF R S
DEFINITION: fatty (lipid) paste / clot / condition or increase
26. congenital anomalies
27. arteriosclerosis
28. arrhythmia or dysrhythmia
29. cardiomyopathy
30. anastomosis
31. gallop
32. echocardiogram
33. cor pulmonale
34. coronary angiogram
35. stress ECG
36. intracardiac catheter ablation
37. pector/o
38. phleb/o
39. angi/o
40. cardi/o
41. ather/o
42. coron/o
43. sphygm/o
44. thromb/o
45. arteri/o
46. ventricul/o
47. h
48. o
49. n
50. i
51. g
52. j
53. a
54. c
55. l
56. e
57. m
58. d
59. k
60. f
61. b
62. premature ventricular contraction
63. patent ductus arteriosus
64. arteriosclerotic heart disease
65. implantable cardioverter-defibrillator
66. congestive heart failure
67. coronary artery disease
68. hypertension
69. mitral valve prolapse
70. magnetic resonance angiography
71. ventricular septal defect
72. atrial septum
73. right atrium
74. tricuspid valve
75. right ventricle
76. left atrium
77. aortic valve
78. pulmonary semilunar valve
79. left ventricle
80. ventricular septum
81. e
82. h
83. b

- 84. a
- 85. j
- 86. c
- 87. i
- 88. d
- 89. f
- 90. g
- 91. ventricle
- 92. aorta
- 93. thrombus
- 94. myocardial
- 95. hypotension
- 96. diastole
- 97. ischemia

- 98. occlusion
- 99. infarct
- 100. aneurysm
- 101. atherosclerotic
- 102. thrombophlebitis
- 103. angiogram
- 104. defibrillation
- 105. antiarrhythmic
- 106. vasodilation
- 107. anticoagulant
- 108. hypertension
- 109. tachycardia
- 110. systole

CHAPTER 8 (PP. 256–263)

1. erythro / blast / osis
CF R S
DEFINITION: red / germ or bud / condition or increase
2. myelo / dys / plas / ia
CF P R S
DEFINITION: bone marrow / faulty (bad, difficult) / formation / condition of
3. hemo / cyto / meter
CF CF S
DEFINITION: blood / cell / instrument for measuring
4. spleno / rrhagia
CF S
DEFINITION: spleen / to burst forth
5. lymph / aden / itis
R R S
DEFINITION: clear fluid / gland / inflammation
6. immuno / tox / ic
CF R S
DEFINITION: safe / poison / pertaining to
7. reticulo / cyt / osis
CF R S
DEFINITION: a net / cell / condition or increase
8. thymo / path / y
CF R S
DEFINITION: thymus gland / disease / condition or process of
9. leuko / cyt / ic
CF R S
DEFINITION: white / cell / pertaining to
10. lymph / angio / gram
R CF S
DEFINITION: clear fluid / vessel / record
11. spleno / megaly
CF S
DEFINITION: spleen / enlargement
12. pro / myelo / cyt / e
P CF R S
DEFINITION: before / bone marrow / cell / noun marker
13. leuko / cyto / penia
CF CF S
DEFINITION: white / cell / abnormal reduction
14. splen / ectomy
R S
DEFINITION: spleen / excision (removal)
15. chylo / poiesis
CF S
DEFINITION: juice / formation
16. lymph / oma
R S
DEFINITION: clear fluid / tumor
17. cyto / morpho / logy
CF CF S
DEFINITION: cell / form / study of
18. hemo / lysis
CF S
DEFINITION: blood / breaking down or dissolution
19. an / emia
P S
DEFINITION: without / blood condition
20. meta / stasis
P S
DEFINITION: beyond, after, or change / stop or stand
21. neutropenia
22. leukocyte
23. hematopoiesis
24. splenomegaly
25. erythropenia, erythrocytopenia
26. thymic
27. agranulocytes
28. eosinophil
29. erythrocyte
30. pancytopenia
31. phag/o
32. thromb/o
33. chyl/o
34. plas/o
35. chrom/o
36. hem/o
37. immun/o
38. blast/o
39. white blood count, WBC
40. hemoglobin, HGB or Hgb
41. hematocrit, HCT or Hct
42. differential count

43. mean corpuscular (cell) volume, mean corpuscular (cell) hemoglobin, mean corpuscular (cell) hemoglobin concentration, anemia
44. phlebotomy
45. lymphoma
46. prothrombin time
47. erythrocyte sedimentation rate
48. partial thromboplastin time
49. complete blood count
50. l
51. j
52. k
53. g
54. c
55. e
56. f
57. b
58. d
59. i
60. h
61. a
62. immunosuppression
63. cross matching
64. acquired immunodeficiency syndrome (AIDS)
65. mononucleosis
66. plasmapheresis
67. **plasma**—liquid portion of the blood and lymph containing water, proteins, salts, nutrients, hormones, vitamins, and cellular components; **serum**—liquid portion of the blood left after the clotting process
68. **anemia**—condition affecting red blood cells that results in their diminished ability to transport oxygen to the tissues; **leukemia**—cancer of the blood-forming organs marked by abnormal white blood cells in the blood and bone marrow
69. **autologous blood**—blood donated by a person and stored for his or her future use; **homologous blood**—blood voluntarily donated by any person for transfusion
70. **antibody**—substance produced by the body that destroys or inactivates an antigen that has entered the body; **antigen**—a substance that, when introduced into the body, causes the formation of antibodies against it
71. **vasoconstrictor**—drug that causes a narrowing of blood vessels, decreasing blood flow; **vasodilator**—drug that causes dilation of blood vessels, increasing blood flow
72. **anticoagulant**—drug that prevents clotting of the blood; **hemostatic**—drug that stops the flow of blood within the vessels
73. **polycythemia**—increase in the number of erythrocytes and hemoglobin in the blood; **hemochromatosis**—hereditary disorder that results in an excessive buildup of iron deposits in the body
74. plasma
75. leukocytes
76. erythrocytes
77. thrombocytes
78. serum
79. right lymphatic duct
80. thymus gland
81. thoracic duct
82. lymphatic vessels
83. cervical lymph nodes
84. spleen
85. hematopoiesis
86. platelets
87. anisocytosis
88. poikilocytosis
89. hemolysis
90. lymphadenopathy
91. myelodysplasia
92. thrombocytopenia
93. hematocrit
94. splenectomy
95. plasmapheresis
96. vasodilator
97. venipuncture
98. leukemia
99. immunosuppression
100. thymus
101. hematopoiesis
102. spleen
103. septicemia
104. hemophilia
105. myelodysplasia

CHAPTER 9 (pp. 289–296)

1. pulmono / logy
CF S
DEFINITION: lung / study of
2. thoraco / centesis
CF S
DEFINITION: chest / puncture for aspiration
3. naso / sinus / itis
CF R S
DEFINITION: nose / sinus / inflammation
4. hyp / ox / emia
P R S
DEFINITION: below or deficient / oxygen / blood condition
5. pleur / itis
R S
DEFINITION: pleura / inflammation
6. hyper / carb / ia
P R S
DEFINITION: above or excessive / carbon dioxide / condition of
7. alveol / ar
R S
DEFINITION: alveolus (air sac) / pertaining to
8. tracheo / tomy
CF S
DEFINITION: trachea / incision

9. oro / nas / al
CF R S
DEFINITION: mouth / nose / pertaining to
10. rhino / rrhea
CF S
DEFINITION: nose / discharge
11. thoraco / stomy
CF S
DEFINITION: chest / creation of an opening
12. tonsill / ectomy
R S
DEFINITION: tonsil / excision (removal)
13. tracheo / bronch / itis
CF R S
DEFINITION: trachea (windpipe) / bronchus (airway) / inflammation
14. broncho / spasm
CF S
DEFINITION: bronchus (airway) / involuntary contraction
15. laryngo / sten / osis
CF R S
DEFINITION: larynx (voice box) / narrow / condition or increase
16. spiro / gram
CF S
DEFINITION: breathing / record
17. lob / ectomy
R S
DEFINITION: lobe (a portion) / excision (removal)
18. peri / pleur / al
P R S
DEFINITION: around / pleura / pertaining to
19. stetho / scope
CF S
DEFINITION: chest / instrument for examination
20. pneumon / ic
R S
DEFINITION: air or lung / pertaining to
21. naso / pharyngo / scopy
CF CF S
DEFINITION: nose / pharynx (throat) / process of examination
22. bronchiol / ectasis
R S
DEFINITION: bronchiole (little airway) / expansion or dilation
23. phreno / ptosis
CF S
DEFINITION: diaphragm / falling or downward displacement
24. pector / al
R S
DEFINITION: chest / pertaining to
25. uvulo / palato / pharyngo / plasty
CF CF CF S
DEFINITION: uvula (grape) / palate / throat / surgical repair or reconstruction
26. pneumoconiosis
27. bronchiectasis
28. thoracoplasty
29. pneumonitis
30. spirometry
31. hypoventilation
32. eupnea
33. bradypnea
34. dyspnea
35. orthopnea
36. apnea
37. tachypnea
38. rhin/o
39. pneum/o
40. pharyng/o
41. thorac/o
42. laryng/o
43. spir/o
44. phren/o
45. or/o
46. pneumothorax
47. empyema, pyothorax
48. hemothorax
49. auscultation
50. bronchoscope
51. expectoration
52. pleurisy, pleuritis
53. percussion
54. thoracentesis, thoracocentesis
55. dysphonia
56. laryngitis
57. hypoxia
58. emphysema
59. epistaxis
60. bronchogenic carcinoma
61. cystic fibrosis
62. atelectasis
63. sputum
64. stridor
65. pulmonary embolism
66. tracheostomy
67. asthma
68. hyperventilation
69. pneumocystis pneumonia
70. chronic obstructive pulmonary disease (COPD)
71. peak expiratory flow rate
72. vital capacity
73. tuberculosis
74. cardiopulmonary resuscitation
75. chronic obstructive pulmonary disease
76. partial pressure of carbon dioxide
77. upper respiratory infection
78. tidal volume
79. pulmonary function testing
80. polysomnography
81. continuous positive airway pressure
82. k
83. h
84. g
85. f
86. i
87. l
88. d
89. e

90. b
91. a
92. j
93. c
94. CXR
95. ABGs
96. T&A
97. nasopharynx
98. trachea
99. pleura
100. upper lobe of lung
101. diaphragm
102. frontal sinus
103. larynx with vocal cords
104. left main bronchus
105. auscultation
106. tachypnea
107. eupnea

108. pleurisy
109. hemothorax
110. stethoscope
111. epistaxis
112. rhonchi
113. hemoptysis
114. rhinorrhea
115. emphysema
116. atelectasis
117. bronchodilator
118. orthopnea
119. pleura
120. hypoxia
121. dyspnea
122. pharynx
123. apnea
124. trachea
125. asthma

CHAPTER 10 (PP. 338–346)

1. gangli / oma
R S
DEFINITION: ganglion (knot) / tumor
2. a / topo / gnos / ia
P CF R S
DEFINITION: without / place / knowing / condition of
3. cata / ton / ic
P R S
DEFINITION: down / tone or tension / pertaining to
4. dys / tax / ia
P R S
DEFINITION: painful, difficult, or faulty / order or coordination / condition of
5. brady / kines / ia
P R S
DEFINITION: slow / movement / condition of
6. meningo / cele
CF S
DEFINITION: meninges (membrane) / pouching or hernia
7. dys / thym / ia
P R S
DEFINITION: painful, difficult, or faulty / mind / condition of
8. poly / somno / gram
P CF S
DEFINITION: many / sleep / record
9. spondylo / syn / desis
CF P S
DEFINITION: vertebra / together or with / binding
10. hemi / plegia
P S
DEFINITION: half / paralysis
11. cranio / tomy
CF S
DEFINITION: skull / incision
12. thalam / ic
R S
DEFINITION: thalamus (a room) / pertaining to
13. neuro / gli / al
CF R S
DEFINITION: nerve / glue / pertaining to
14. dys / lex / ia
P R S
DEFINITION: painful, difficult, or faulty / word or phrase / condition of
15. somni / path / y
CF R S
DEFINITION: sleep / disease / condition or process of
16. hydro / cephal / ic
CF R S
DEFINITION: water / head / pertaining to
17. dys / arthr / ia
P R S
DEFINITION: difficult, painful, or faulty / articulation / condition of
18. acro / phob / ia
CF R S
DEFINITION: topmost / exaggerated fear / condition of
19. hypno / tic
CF S
DEFINITION: sleep / pertaining to
20. eu / phor / ia
P R S
DEFINITION: good or normal / carry or bear / condition of
21. para / somn / ia
P R S
DEFINITION: abnormal / sleep / condition of
22. narco / lepsy
CF S
DEFINITION: stupor (sleep) / seizure
23. stereo / tax / y
CF R S
DEFINITION: three-dimensional or solid / order or coordination / condition or process of
24. hemi / paresis
P S
DEFINITION: half / slight paralysis

25. neur / asthenia
R S
DEFINITION: nerve / weakness
26. myelo / path / y
CF R S
DEFINITION: spinal cord / disease / condition or process of
27. intra / crani / al
P R S
DEFINITION: within / skull / pertaining to
28. a / phas / ia
P R S
DEFINITION: without / speech / condition of
29. schizo / phren / ia
CF R S
DEFINITION: split / mind / condition of
30. cerebro / spin / al
CF R S
DEFINITION: cerebrum / spine / pertaining to
31. electroencephalogram
32. spondylosyndesis
33. craniectomy
34. cerebral atherosclerosis
35. hyperesthesia
36. dysphasia
37. analgesia
38. astereognosis
39. encephal/o
40. kinesi/o
41. lex/o
42. somat/o
43. myel/o
44. thym/o
45. esthesi/o
46. top/o
47. hypn/o
48. gnos/o
49. meningitis
50. discectomy (discectomy)
51. Parkinson disease
52. Babinski sign
53. paresthesia
54. coma
55. spina bifida
56. e
57. j
58. i
59. k
60. b
61. g
62. h
63. f
64. c
65. d
66. a
67. computed tomography
68. magnetic resonance image or imaging
69. positron emission tomography
70. multiple sclerosis
71. central nervous system
72. cerebral palsy
73. transient ischemic attack
74. electroencephalogram
75. deep tendon reflexes
76. cerebrospinal fluid
77. magnetic resonance angiography
78. cerebrovascular accident
79. pons
80. cerebellum
81. spinal
82. callosum
83. thalamus
84. cranium
85. meninges
86. cerebrum
87. j
88. d
89. h
90. f
91. a
92. e
93. b
94. i
95. g
96. c
97. generalized anxiety disorder
98. attention-deficit/hyperactivity disorder
99. obsessive-compulsive disorder
100. electroconvulsive therapy
101. panic disorder
102. bipolar disorder
103. posttraumatic stress disorder
104. c
105. a
106. f
107. e
108. g
109. b
110. d
111. c
112. e
113. b
114. d
115. a
116. Alzheimer
117. schizophrenia
118. polysomnography
119. paranoia
120. atopognosis
121. dementia
122. epilepsy
123. catatonia
124. delusion
125. hallucination
126. poliomyelitis
127. epilepsy
128. euphoria
129. delusion
130. syncope
131. autism
132. psychosis
133. cerebrum
134. dysphasia
135. paranoia

CHAPTER 11 (PP. 372–377)

1. aden / itis
R S
DEFINITION: gland / inflammation
2. eu / glyc / emia
P R S
DEFINITION: good or normal / sugar / blood condition
3. thyro / toxic / osis
CF R S
DEFINITION: thyroid gland (shield) / poison / condition or increase
4. poly / dips / ia
P R S
DEFINITION: many / thirst / condition of
5. hormon / al
R S
DEFINITION: hormone (an urging on) / pertaining to
6. ket / osis
R S
DEFINITION: ketone bodies / condition or increase
7. poly / ur / ia
P R S
DEFINITION: many / urine / condition of
8. endo / crin / e
P R S
DEFINITION: within / to secrete / noun marker
9. thyro / ptosis
CF S
DEFINITION: thyroid gland (shield) / falling or downward displacement
10. thym / oma
R S
DEFINITION: thymus gland / tumor
11. acro / megal
CF S
DEFINITION: extremity / enlargement
12. andr / oid
R S
DEFINITION: male / resembling
13. adreno / troph / ic
CF R S
DEFINITION: adrenal gland / nourishment or development / pertaining to
14. pancreato / gen / ic
CF R S
DEFINITION: pancreas / origin or production / pertaining to
15. glycos / ur / ia
R R S
DEFINITION: sugar / urine / condition of
16. dipso / gen / ic
CF R S
DEFINITION: thirst / origin or production / pertaining to
17. hypersecretion
18. hypoglycemia
19. Cushing syndrome
20. hyposecretion
21. hyperglycemia
22. sonography or ultrasonography
23. adrenal gland
24. shield
25. secrete
26. sugar
27. thirst
28. thymus gland
29. urging on
30. gland
31. hyperthyroidism or thyrotoxicosis
32. exophthalmos or exophthalmus
33. acromegaly
34. goiter
35. pituitary dwarfism
36. thyroid uptake and image
37. e
38. h
39. l
40. f
41. i
42. k
43. j
44. g
45. a
46. m
47. c
48. d
49. b
50. blood sugar
51. hormone replacement therapy
52. fasting blood sugar
53. diabetes mellitus
54. postprandial blood sugar
55. glucose tolerance test
56. diabetic ketoacidosis
57. para
58. thymus
59. adrenal
60. pituitary
61. thyroid
62. pancreas
63. hirsutism
64. exophthalmos
65. myxedema
66. goiter
67. androgenous
68. virilism
69. epinephrine
70. hypoglycemic
71. acromegaly
72. exophthalmos
73. metabolism
74. diabetes
75. hypoglycemia

CHAPTER 12 (PP. 403–408)

1. blepharo / ptosis
CF S
DEFINITION: eyelid / falling or downward displacement
2. irido / tomy
CF S
DEFINITION: iris / incision
3. ophthalmo / logy
CF S
DEFINITION: eye / study of
4. vitr / ectomy
R S
DEFINITION: glassy / excision (removal)
5. dacryo / lith / iasis
CF R S
DEFINITION: tear / stone / formation or presence of
6. lacrim / al
R S
DEFINITION: tear / pertaining to
7. photo / phob / ia
CF R S
DEFINITION: light / sensitivity / condition of
8. kerato / plasty
CF S
DEFINITION: cornea / surgical repair or reconstruction
9. aque / ous
R S
DEFINITION: water / pertaining to
10. ir / itis
R S
DEFINITION: iris / inflammation
11. corne / al
R S
DEFINITION: cornea / pertaining to
12. phaco / lysis
CF S
DEFINITION: lens (lentic) / breaking down or dissolution
13. retino / path / y
CF R S
DEFINITION: retina / disease / condition or process of
14. ocul / ar
R S
DEFINITION: eye / pertaining to
15. conjunctiv / itis
R S
DEFINITION: conjunctiva (to join together) / inflammation
16. presby / opia
R S
DEFINITION: old age / condition of vision
17. opto / metry
CF S
DEFINITION: eye / process of measuring
18. a / phak / ia
P R S
DEFINITION: without / lens (lentic) / condition or process of
19. hyper / opia
P S
DEFINITION: above or excessive / condition of vision
20. sclero / malacia
CF S
DEFINITION: sclera / softening
21. aphakia
22. exophthalmos
23. blepharochalasis or dermatochalasis
24. scleral buckling
25. blepharospasm
26. opt/o
27. presby/o
28. vitre/o
29. phot/o
30. scler/o
31. phac/o
32. irid/o
33. dacry/o
34. blephar/o
35. aque/o
36. conjunctivitis
37. blepharitis
38. asthenopia
39. mydriatic
40. hordeolum
41. cataract
42. macular degeneration
43. e
44. c
45. a
46. f
47. d
48. b
49. inward turning of the rim of the eyelid
50. instrument to measure intraocular pressure
51. outward turning of the rim of the eyelid
52. involuntary, rapid oscillating movement of the eyeball
53. f
54. h
55. a
56. e
57. i
58. b
59. j
60. d
61. c
62. g
63. eyelid
64. cornea
65. lens
66. sclera
67. vitreous
68. ciliary
69. retina
70. optic
71. asthenopia
72. pterygium
73. hordeolum
74. nystagmus
75. chalazion
76. mydriatic
77. scotoma

- 78. epiphora
- 79. dacryocyst
- 80. ophthalmoscope
- 81. conjunctiva

- 82. myopia
- 83. sclera
- 84. macula
- 85. exophthalmos or exophthalmus

CHAPTER 13 (PP. 426–429)

- 1. acous / tic
R S
DEFINITION: hearing / pertaining to
- 2. oto / rrhea
CF S
DEFINITION: ear / discharge
- 3. myringo / plasty
CF S
DEFINITION: eardrum / surgical repair or reconstruction
- 4. aer / ot / itis
R R S
DEFINITION: air or gas / ear/inflammation
- 5. oto / tox / ic
CF R S
DEFINITION: ear / poison / pertaining to
- 6. cerumino / lysis
CF S
DEFINITION: wax / breaking down or dissolution
- 7. salpingo / scope
CF S
DEFINITION: eustachian tube / instrument for examination
- 8. hyper / acusis
P S
DEFINITION: above or excessive / hearing condition
- 9. audio / metry
CF S
DEFINITION: hearing / process of measuring
- 10. tympano / centesis
CF S
DEFINITION: eardrum / puncture for aspiration
- 11. oto / dynia
CF S
DEFINITION: ear / pain
- 12. aur / icle
R S
DEFINITION: ear / small
- 13. myringo / tomy
CF S
DEFINITION: eardrum / incision
- 14. cerumin / osis
R S
DEFINITION: wax / condition or increase
- 15. audio / logy
CF S
DEFINITION: hearing / study of
- 16. otosclerosis
- 17. otoscope
- 18. Ménière disease
- 19. acoustic neuroma
- 20. myring/o
- 21. audi/o
- 22. cerumin/o
- 23. salping/o
- 24. ot/o
- 25. aer/o
- 26. j
- 27. i
- 28. g
- 29. h
- 30. f
- 31. a
- 32. e
- 33. d
- 34. c
- 35. b
- 36. labyrinthitis
- 37. vertigo
- 38. tinnitus
- 39. stapedectomy
- 40. cerumen impaction
- 41. audiology
- 42. lavage
- 43. auricle
- 44. eustachian
- 45. pharynx
- 46. malleus
- 47. incus
- 48. stapes
- 49. cochlea
- 50. tympanic
- 51. aerotitis
- 52. cerumen
- 53. myringotomy
- 54. presbycusis
- 55. vertigo
- 56. antihistamine
- 57. tinnitus
- 58. stapedectomy
- 59. deafness
- 60. eustachian

CHAPTER 14 (PP. 462–470)

1. trans / abdomin / al
P R S
DEFINITION: across or through / abdomen / pertaining to
2. gastro / entero / stomy
CF CF S
DEFINITION: stomach / small intestine / creation of an opening
3. sialo / litho / tomy
CF CF S
DEFINITION: saliva / stone / incision
4. glosso / rrhaphy
CF S
DEFINITION: tongue / suture
5. hemat / emesis
R S
DEFINITION: blood / vomiting
6. cheilo / stomato / plasty
CF CF S
DEFINITION: lip / mouth / surgical repair or reconstruction
7. appendic / itis
R S
DEFINITION: appendix / inflammation
8. celio / tomy
CF S
DEFINITION: abdomen / incision
9. chol / angio / gram
R CF S
DEFINITION: bile / vessel / record
10. colono / scopy
CF S
DEFINITION: colon / process of examination
11. ano / rect / al
CF R S
DEFINITION: anus / rectum / pertaining to
12. entero / col / itis
CF R S
DEFINITION: small intestine / colon / inflammation
13. oro / lingu / al
CF R S
DEFINITION: mouth / tongue / pertaining to
14. procto / sigmoido / scopy
CF CF S
DEFINITION: anus and rectum / sigmoid colon / process of examination
15. laparo / scope
CF S
DEFINITION: abdomen / instrument for examination
16. dys / phag / ia
P R S
DEFINITION: painful, difficulty, or faulty / eat or swallow / condition of
17. pancreato / duodeno / stomy
CF CF S
DEFINITION: pancreas / duodenum / creation of an opening
18. hernio / plasty
CF S
DEFINITION: hernia / surgical repair or reconstruction
19. bili / ary
R S
DEFINITION: bile / pertaining to
20. gastro / esophag / eal
CF R S
DEFINITION: stomach / esophagus / pertaining to
21. chole / docho / tomy
CF CF S
DEFINITION: bile / duct / incision
22. steato / rrhea
CF S
DEFINITION: fat / discharge
23. dent / algia
R S
DEFINITION: teeth / pain
24. pyloro / spasm
CF S
DEFINITION: pylorus (gatekeeper) / involuntary contraction
25. hepato / tox / ic
CF R S
DEFINITION: liver / poison / pertaining to
26. ileo / jejun / itis
CF R S
DEFINITION: ileum / jejunum / inflammation
27. peritoneo / centesis
CF S
DEFINITION: peritoneum / puncture for aspiration
28. bucco / gingiv / al
CF R S
DEFINITION: cheek / gum / pertaining to
29. chole / cyst / ectomy
CF R S
DEFINITION: bile / bladder or sac / excision (removal)
30. peri / rect / al
P R S
DEFINITION: around / rectum / pertaining to
31. hemicolec~~to~~my
32. appendicitis
33. cheilorrhaphy
34. cholelithotomy
35. stomatoplasty
36. cholangiogram
37. hyperbilirubinemia
38. gastric resection
39. diverticulosis
40. lapar/o
41. gloss/o
42. enter/o
43. dent/i
44. gastr/o
45. bucc/o
46. chol/e
47. stomat/o
48. hepat/o
49. phag/o
50. lith/o
51. proct/o
52. gastritis
53. anorexia

- | | |
|---|--|
| <ul style="list-style-type: none"> 54. aphagia 55. buccal 56. flatulence 57. hernia 58. melena 59. eructation 60. proctoscope or rectoscope 61. colitis 62. barium swallow 63. ascites 64. cholecystitis 65. steatorrhea 66. diverticulitis 67. gastric ulcer 68. hepatomegaly 69. ankyloglossia 70. inguinal regions 71. hypochondriac regions 72. epigastric region 73. hypogastric region 74. lumbar regions 75. umbilical region 76. right upper quadrant 77. right lower quadrant 78. left upper quadrant 79. left lower quadrant 80. m 81. f 82. d 83. h 84. k 85. g 86. j 87. i 88. l 89. b 90. e 91. a 92. c 93. laparoscope 94. anoscope or proctoscope | <ul style="list-style-type: none"> 95. gastroscope 96. colonoscope 97. peritoneoscope 98. esophagoscope 99. incarcerated hernia 100. excisional biopsy 101. nasogastric tube 102. endoscopic retrograde cholangiopancreatography 103. gastroesophageal reflux disease 104. left upper quadrant 105. gastrointestinal 106. magnetic resonance imaging 107. esophagogastroduodenoscopy 108. hepat/o or hepatic/o 109. cholecyst 110. enter/o 111. col/o or colon/o 112. gloss/o or lingu/o 113. gastr/o 114. proct/o or rect/o 115. an/o 116. anorexia 117. ascites 118. hematochezia 119. icterus 120. ankyloglossia 121. volvulus 122. cirrhosis 123. glossectomy 124. herniorrhaphy 125. hemorrhoidectomy 126. antacid 127. antiemetic 128. cathartic 129. melena 130. feces 131. icterus 132. ileum 133. endoscopy, endoscope 134. hemorrhoid 135. pancreas |
|---|--|

CHAPTER 15 (PP. 497–503)

- | | |
|--|---|
| <ul style="list-style-type: none"> 1. vesico / ureter / ic
CF R S
DEFINITION: bladder / ureter / pertaining to 2. bacteri / osis
R S
DEFINITION: bacteria / condition or increase 3. trans / urethr / al
P R S
DEFINITION: across or through / urethra / pertaining to 4. uro / gram
CF S
DEFINITION: urine / record 5. urethro / cyst / itis
CF R S
DEFINITION: urethra / bladder / inflammation | <ul style="list-style-type: none"> 6. nephro / ptosis
CF S
DEFINITION: kidney / falling or downward displacement 7. poly / dips / ia
P R S
DEFINITION: many / thirst / condition of 8. glomerulo / scler / osis
CF R S
DEFINITION: glomerulus (little ball) / hard / condition or increase 9. pyo / nephr / itis
CF R S
DEFINITION: pus / kidney / inflammation |
|--|---|

10. uro / logy
CF S
DEFINITION: urine / study of
11. uretero / vesico / stomy
CF CF S
DEFINITION: ureter / bladder / creation of an opening
12. glyco / rrhea
CF S
DEFINITION: sugar / discharge
13. meato / tomy
CF S
DEFINITION: meatus (opening) / incision
14. pyelo / nephro / osis
CF R S
DEFINITION: renal pelvis (basin) / kidney / condition or increase
15. cysto / scopy
CF S
DEFINITION: bladder / process of examination
16. supra / ren / al
P R S
DEFINITION: above / kidney / pertaining to
17. nephro / lith / iasis
CF R S
DEFINITION: kidney / stone / formation or presence of
18. uretero / cele
CF S
DEFINITION: ureter / pouching or hernia
19. albumin / ous
R S
DEFINITION: protein / pertaining to
20. pyelo / graphy
CF S
DEFINITION: renal pelvis (basin) / process of recording
21. nephritis
22. nephrosis
23. nephrotomy
24. nephrorrhaphy
25. nephrectomy
26. nephrolithotomy
27. urethral stenosis
28. extracorporeal shock wave lithotripsy
29. suprapubic catheter
30. resectoscope
31. Kegel exercises
32. occult blood
33. cystometrogram
34. peritoneal dialysis
35. scout film
36. cystitis
37. incontinence
38. enuresis
39. nocturnal enuresis
40. hydronephrosis
41. adult polycystic kidney disease
42. nocturia
43. oliguria
44. dysuria
45. ketonuria
46. hematuria
47. pyuria
48. g
49. d
50. i
51. h
52. a
53. k
54. c
55. b
56. f
57. e
58. j
59. albumin
60. intravenous pyelogram
61. extracorporeal shock wave lithotripsy
62. urinary tract infection
63. stress urinary incontinence
64. blood urea nitrogen
65. ur/o
66. dips/o
67. py/o
68. vesic/o
69. albumin/o
70. nephro/o
71. meat/o
72. pyel/o
73. lith/o
74. right kidney
75. ureters
76. urinary bladder
77. urethra
78. left kidney
79. cystoscope
80. pyelogram
81. oliguria
82. hydronephrosis
83. azotemia
84. urinalysis
85. glomerular
86. nephrectomy
87. diuretic
88. hemodialysis
89. catheterization
90. urine
91. glomerulus
92. meatus
93. uremia
94. urethra
95. nephrosis
96. UA
97. C&S
98. RP
99. KUB
100. VCU or VCUG

CHAPTER 16 (PP. 521–526)

1. oligo / sperm / ia
P R S
DEFINITION: few or deficient / sperm / condition of
2. perineo / plasty
CF S
DEFINITION: perineum / surgical repair or reconstruction
3. test / algia
R S
DEFINITION: testis or testicle / pain
4. balan / ic
R S
DEFINITION: glans penis / pertaining to
5. prostatic / megalia
CF S
DEFINITION: prostate / enlargement
6. orchid / ectomy
R S
DEFINITION: testis or testicle / excision (removal)
7. an / orch / ism
P R S
DEFINITION: without / testis or testicle / condition of
8. vas / ectomy
R S
DEFINITION: vessel / excision (removal)
9. a / sperm / ia
P R S
DEFINITION: without / sperm (seed) / condition of
10. cysto / prostat / ectomy
CF R S
DEFINITION: bladder / prostate / excision (removal)
11. balan / itis
R S
DEFINITION: glans penis / inflammation
12. orchio / plasty
CF S
DEFINITION: testis or testicle / surgical repair or reconstruction
13. spermato / cele
CF S
DEFINITION: sperm (seed) / pouching or hernia
14. epididymo / tomy
CF S
DEFINITION: epididymis / incision
15. vaso / vaso / stomy
CF CF S
DEFINITION: vessel / vessel / creation of an opening
16. anorchism
17. balanitis
18. varicocele
19. resectoscope
20. benign prostatic hyperplasia or hypertrophy
21. vasectomy
22. Peyronie disease
23. h
24. g
25. f
26. e
27. b
28. d
29. a
30. c
31. cryptorchism
32. endorectal or transrectal sonogram of prostate
33. hydrocele
34. hypospadias
35. digital rectal exam
36. brachytherapy
37. c
38. d
39. a
40. b
41. prostate-specific antigen
42. biopsy
43. transurethral resection of the prostate
44. digital rectal examination
45. erectile dysfunction
46. orchi/o
47. perine/o
48. spermat/o
49. vas/o
50. balan/o
51. epididym/o
52. vas deferens
53. urethra
54. glans penis
55. testis
56. urinary bladder
57. prostate gland
58. perineum
59. epididymis
60. epididymis
61. oligospermia
62. azoospermia
63. anorchism
64. balanitis
65. cryptorchism
66. hypospadias
67. chlamydia
68. syphilis
69. phimosis
70. prostate
71. epididymis
72. perineum
73. penis
74. gonorrhoea
75. testicle or testis

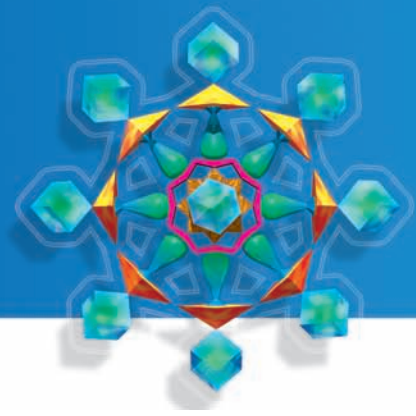
CHAPTER 17 (PP. 564–571)

1. vulv / itis
R S
DEFINITION: vulva (covering) / inflammation
2. poly / mast / ia
P R S
DEFINITION: many / breast / condition of
3. ov / oid
R S
DEFINITION: egg / resembling
4. toco / lysis
CF S
DEFINITION: birth or labor / breaking down or dissolution
5. salpingo / tomy
CF S
DEFINITION: uterine (fallopian) tube / incision
6. mammo / plasty
CF S
DEFINITION: breast / surgical repair or reconstruction
7. trans / vagin / al
P R S
DEFINITION: across or through / vagina (sheath) / pertaining to
8. hystero / rrhexis
CF S
DEFINITION: uterus / rupture
9. colpo / scopy
CF S
DEFINITION: vagina (sheath) / process of examination
10. mammo / graphy
CF S
DEFINITION: breast / process of recording
11. metro / rrhagia
CF S
DEFINITION: uterus / to burst forth
12. ovario / centesis
CF S
DEFINITION: ovary / puncture for aspiration
13. men / arche
R S
DEFINITION: menstruation / beginning
14. oophor / ectomy
R S
DEFINITION: ovary / excision (removal)
15. oligo / meno / rrhea
P CF S
DEFINITION: few or deficient / menstruation / discharge
16. dys / toc / ia
P R S
DEFINITION: painful, difficult, or faulty / labor or birth / condition of
17. gyneco / logist
CF S
DEFINITION: woman / one who specializes in the study or treatment of
18. pelvi / meter
CF S
DEFINITION: pelvic cavity / instrument to measure
19. episio / tomy
CF S
DEFINITION: vulva (covering) / incision
20. colpo / rrhaphy
CF S
DEFINITION: vagina (sheath) / suture
21. hystero / spasm
CF S
DEFINITION: uterus / involuntary contraction
22. lacto / rrhea
CF S
DEFINITION: milk / discharge
23. ovi / genesis
CF S
DEFINITION: egg / origin or production
24. endo / cervic / al
P R S
DEFINITION: within / cervix / pertaining to
25. utero / tomy
CF S
DEFINITION: uterus / incision
26. menopause
27. dysmenorrhea
28. amenorrhea
29. oligomenorrhea
30. menorrhagia
31. metrorrhagia
32. gynecomastia
33. amastia
34. hypomastia or micromastia; augmentation mammoplasty
35. hypermastia or macromastia; reduction mammoplasty
36. mastopexy
37. mastectomy
38. lumpectomy
39. toc/o
40. colp/o
41. salping/o
42. men/o
43. cervic/o
44. ov/i
45. episi/o
46. metr/o
47. lact/o
48. oophor/o
49. mast/o
50. gynec/o
51. i
52. f
53. e
54. g
55. h
56. b
57. d
58. j
59. c
60. a
61. fibrocystic breasts
62. vesicovaginal fistula
63. tubal ligation
64. polymastia
65. syphilis
66. Papanicolaou (Pap) smear

- 67. endometriosis
- 68. rectovaginal fistula
- 69. colporrhaphy—posterior repair
- 70. intrauterine device
- 71. human papilloma virus
- 72. chorionic villus sampling
- 73. dilation and curettage
- 74. hepatitis B virus
- 75. estimated date of confinement
- 76. herpes simplex virus
- 77. sexually transmitted disease
- 78. therapeutic abortion
- 79. hormone replacement therapy
- 80. spontaneous abortion
- 81. habitual abortion
- 82. incomplete abortion
- 83. missed abortion
- 84. therapeutic abortion
- 85. threatened abortion
- 86. c
- 87. f
- 88. g
- 89. j
- 90. l
- 91. d
- 92. i
- 93. b
- 94. k
- 95. h
- 96. a

- 97. e
- 98. cervix
- 99. vagina
- 100. uterine
- 101. ovary
- 102. uterus
- 103. endometrium
- 104. myometrium
- 105. developing eggs (ova)
- 106. gonorrhea
- 107. dyspareunia
- 108. tocolytic
- 109. polythelia
- 110. metrorrhagia
- 111. dilation
- 112. salpingotomy
- 113. nulligravida
- 114. meconium
- 115. macrosomia
- 116. curettage
- 117. eclampsia
- 118. amenorrhea
- 119. abortifacient
- 120. chlamydia
- 121. areola
- 122. syphilis
- 123. cervix
- 124. dysplasia
- 125. endometrium

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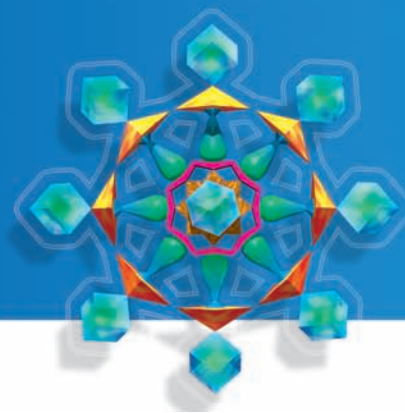


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- Figure 5.5** From Goodheart HP. *Goodheart's Photoguide of Common Skin Disorders*, 2nd ed. Philadelphia: Lippincott Williams & Wilkins, 2003.
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- Figure 5.8** Sauer GC: *Manual of Skin Diseases*, 5th ed. Philadelphia: JB Lippincott, 1985.
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- Figure 14.22** From Smeltzer SC, Bare BG. Textbook of Medical-Surgical Nursing, 9th ed. Philadelphia: Lippincott Williams & Wilkins, 2000.
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- Figure 17.10** From Micha JP. Genital warts: Treatable warning of cancer. Female Patient 1984; 9:31; Belle Mead, NJ: Excerpta Medica.
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- Figure 17.13** **B.** Photographs courtesy of Cabbott Medical/Cryomedics, Langhorne, PA.
- Figure 17.15** **A.** Courtesy of General Electric Medical Systems, Milwaukee, WI. **B.** From Brant WE, Helms CA. Fundamentals of Diagnostic Radiology. Baltimore: Williams & Wilkins, 1994:548.
- Figure 17.16** *Insets.* Courtesy of Siemens Medical Systems, Inc., Danvers, MA.
- Figure 17.23** Georgiade GS, et al. Textbook of Plastic, Maxillofacial and Reconstructive Surgery, 2nd ed. Baltimore: Williams & Wilkins, 1992:853, 863.
- Figure 17.24** Georgiade GS, et al. Textbook of Plastic, Maxillofacial and Reconstructive Surgery, 2nd ed. Baltimore: Williams & Wilkins, 1992:795.

Index



Numbers in *italics* denote figures.

A

- Abbreviations/acronyms, 592–593
blood and lymph system, 255
cardiovascular system, 221
ear, 425
endocrine system, 371
error-prone, 79–80, 92
eye, 402
female reproductive system, 563
for history and physical, 55–57
hospital, 79–80
integumentary system, 124
male reproductive system, 520
medical record, 79–80
medical specialties, 49
musculoskeletal system, 174
nervous system, 337
pharmaceutical, 88–90
prescription
common, 91, 91, 93–94
error-prone, 92, 93–94
respiratory system, 288
urinary system, 496
- Abdomen
anatomical divisions, 443–444
clinical divisions, 444–445
- Abdominal hysterectomy, 553
- Abdominal sonography, 456, 458
- Abdominocentesis, 459
- Abduction, 148, 157
- ABGs (arterial blood gases), 280
- Ablation, intracardiac catheter, 212
- ABMS (American Board of Medical Specialties), 42–43
- Abortifacient, 563
- Abortion, 558–559
habitual, 559
- Abruptio placentae, 561
- Abscess, skin, 117
- Absence seizures, 322
- Absorption, 439
- Abstract, discharge (*see* Discharge summaries)
- Accent, primary, 18
- Accommodation, visual, 391
- Accupril, 594
- Accutane, 594
- ACE (angiotensin-converting enzyme) inhibitors, 219
- Acetaminophen/codeine, 594
- Aciphex, 594
- Acne, 115, 116
- Acoustic neuroma, 419
- Acquired immunodeficiency syndrome (AIDS), 248, 545
- Acromegaly, 366
- Acronyms/abbreviations (*see* Abbreviations/acronyms)
- ACTH (adrenocorticotrophic hormone), 361, 362
- Actinic keratoses, 118, 118
- Actonel, 594
- Actos, 594
- Acuity
auditory, 421, 422
visual, 396
- Adderall XR, 594
- Adduction, 148, 157
- Adenocarcinoma, of breast, 546
- Adenohypophysis (anterior pituitary gland), 360, 361, 362
- Adenoidectomy, 285
- Adenoids, 272
- ADH (antidiuretic hormone, vasopressin), 361, 363
- ADHD (attention deficit/hyperactivity disorder), 335
- Adhesiolysis, 551
- Adhesions, pelvic, 543
- Adhesiotomy, 551
- Adjective endings, 28
- Adnexa, uterine, 537
- Adrenalectomy, 370
- Adrenal (suprarenal) glands, 359, 360, 361, 365
- Adrenocorticotrophic hormone (ACTH), 361, 362
- Adult polycystic kidney disease (APKD), 487
- Advair Diskus, 594
- Affect, 333
flat, 333
- Agnosia, 320
- AIDS (acquired immunodeficiency syndrome), 248, 545
- Albinism, 115
- Albuminuria, 486, 490
- Albuterol, 594
- Alcoholic cardiomyopathy, 207
- Alimentary canal, 439, 440
- Allegra, 594
- Allegra D, 594
- Allergy and immunology, 44
- Allografts, 123
- Allopurinol, 594
- Alopecia (baldness), 114
- Alphagan P, 594
- Alprazolam, 594
- ALS (amyotrophic lateral sclerosis, Lou Gehrig disease), 320, 328
- Altace, 595
- Alveoli, 271, 273
normal vs. obstructed, 275
- Alzheimer disease, 320, 328
- Amaryl, 595
- Amastia, 546
- Ambien, 595
- Amblyopia, 391
- Amenorrhea, 540
- American College of Physicians (ACP), 42–43
- American College of Surgeons (ACS), 42–43
- American Osteopathic Association (AOA), 43
- Amitriptyline, 595
- Amniocentesis, 561, 562
- Amnion, 540
- Amniotic fluid, 540
- Amoxicillin, 595
- Amoxicillin/clavulanate, 595
- Ampulla, rectal, 440, 442
- Amputation, 169
- Amyotrophic lateral sclerosis (ALS, Lou Gehrig disease), 320, 328
- Anal fistula, 449, 451
- Anal fistulectomy, 460
- Analgesics, 174, 333, 496

- Anastomosis, 215, 459
- Anatomical positions and points of reference, 155–158
- Anatomical terms
- blood and lymph systems
 - blood, 242–244
 - lymph, 246–247
- cardiovascular system, 195, 196, 197, 197, 198, 199
- ear, 417–418
- female reproductive system, 536–540
- gastrointestinal system, 441–443
- integumentary system, 110–111
- male reproductive system, 510–512
- musculoskeletal system
- bones, 146–148
 - joints and muscles, 153–155
- nervous system, 313–318
- respiratory system, 272–273
- Ancillary reports, 63
- Androgens, 359, 361
- Anemia, 248
- Anesthesia, 44
- Anesthesiologist's reports, 64
- Anesthesiology, 44
- Anesthetic, 123
- Aneurysm, 204, 204
- cerebral, 320
- Angina pectoris, 204
- Angiogram/angiography, 213
- cerebral, 329
 - fluorescein, 396, 397
 - magnetic resonance (MRA), 212, 327, 328
 - pulmonary, 81, 84, 169, 284, 284
 - renal, 489
- Angioma
- cherry, 113, 114
 - spider, 113, 114
- Angioplasty, percutaneous transluminal coronary (PTCA), 196, 218
- Angioscopy, 217
- Angiotensin-converting enzyme (ACE)
- inhibitors, 219 (*see also individual drugs*)
- Anisocytosis, 247
- Ankle, 153
- Ankyloglossia (tongue-tie), 447
- Ankylosis, 160
- Annotation, as learning tool, 4–5
- Anorchism, 512
- Anorexia nervosa, 336
- Anovulation, 540
- ANS (autonomic nervous system), 318
- Antacid, 461
- Anteflexion, of uterus, 541, 541
- Anterior chamber, of eye, 388
- Anterior (ventral) direction, 155
- Anterior pituitary gland (adenohypophysis), 360, 361, 362
- Anterior-posterior (AP), 155
- Antianginal agents, 219
- Antianxiety agents, 337
- Antiarrhythmics, 220
- Antibiotic ophthalmic solution, 402
- Antibiotics, 123, 288, 424, 496 (*see also individual drugs*)
- Antibodies, 246
- Anticoagulants, 220, 255, 288, 333
- Anticonvulsants, 334
- Antidiuretic hormone (ADH, vasopressin), 361, 363
- Antiemetic, 461
- Antifungal, 124
- Antigens, 246
- Antihistamines, 124, 288, 424
- Antihyperglycemic drugs, 371
- Antihypertensives, 220
- Antihypoglycemic drugs, 371
- Anti-inflammatories, 124, 174, 424
- Antipruritics, 124
- Antipyretics, 174
- Antiseptics, 124
- Antispasmodics, 461, 496
- Antithyroid drugs, 371
- Anuria, 486
- Anus, 440, 442
- Anxiety disorders, 334–335
- Anxiolytic agents, 337
- AOA (American Osteopathic Association), 43
- Aorta, 197, 198
- arch of, 198
 - coarctation of, 207, 207
- Aortic valve, 195, 196
- Aortogram, 213
- Apathy, 333
- Aphakia, 391
- Aphasia, 318
- APKD (adult polycystic kidney disease), 487
- Aplasia, of inner ear, 419
- Aplastic anemia, 248
- Apnea, 273
- Appendectomy, 460
- Appendicitis, 449
- Appendicular skeleton, 146
- Appendix, vermiform, 440, 442
- Apri, 595
- Aqueous humor, 387, 388
- Arch of aorta, 198
- Areola, 539
- Aricept, 595
- Arrhythmia (dysrhythmia), 205, 206
- Arterial blood gases (ABGs), 280
- Arteries, 197, 198
- coronary, 196
 - pulmonary, 195
 - renal, 483, 485
- Arteriogram, 213
- renal (renal angiogram), 489
- Arterioles, 199
- Arteriosclerosis, 203
- Arteriosclerotic heart disease (ASHD), 205
- Arthralgia, 159
- Arthritis, 160–161
- degenerative, 160
 - degenerative joint disease (DJD), 160
 - gouty, 161
 - osteo- (OA), 160
 - rheumatoid (RA), 161, 161
- Arthrocentesis, 169
- Arthrodesis, 169
- Arthrogram, 168
- Arthroplasty, 169
- Arthroscopy, 169, 170
- Articular cartilage, 153
- Articulation, 153, 154, 318
- Ascending colon, 440, 442
- Ascites, 445, 445
- ASD (atrial septal defect), 207
- ASHD (arteriosclerotic heart disease), 205
- Aspermia, 512
- Aspiration biopsy, 547, 548
- Assessment, 57
- Astereognosis, 320
- Asthenopia, 390
- Asthma, 276, 276
- Astigmatism, 391
- Astrocytes, 312, 313
- Atacand, 595
- Atelectasis, 276
- Atenolol, 595
- Atherectomy, 217, 218
- Atheromatous plaque, 203, 203
- Atherosclerosis, 203
- Athlete's foot (tinea pedis), 119
- Atopic dermatitis (eczema), 116, 117
- Atopognosis, 320
- Atrial septal defect (ASD), 207
- Atrioventricular node (AV node), 201, 202
- Atrium (atria), of heart, 193, 194, 195
- Atrophic vaginitis, 546
- Atrophy, 159
- Atrovent, 595
- Attention deficit/hyperactivity disorder (ADHD), 335
- Attitude, 2
- Audiogram, 421
- Audiologist, 421
- Audiometer, 421
- Audiometry, 421, 421
- Auditory acuity, 421, 422
- Auditory meatus (canal), external, 417
- Auditory ossicles, 416, 417
- Auditory prosthesis, 424
- Auditory sense, 2
- Auditory tube, 416, 417
- Augmentation mammoplasty, 556
- Augmentin, 595
- Auricle (pinna), 416, 417
- Auscultation, 209, 210, 282
- Autism, 335
- Autografts, 123
- Autoimmune disease, 248
- Autologous blood, 254
- Autonomic nervous system (ANS), 318
- Avalide, 595
- Avandia, 595
- Avapro, 595
- Avalex, 595
- Aviane, 595
- AV node, 201, 202
- Axial skeleton, 146
- Axis (axes), 157
- Azoospermia, 512
- Azotemia, 488
- B**
- Babinski sign (Babinski reflex), 329, 329
- Bacterial endocarditis, 204, 205
- Bacteriuria, 486
- Bactrim, 595
- Bactroban, 595

- BAEP (brainstem auditory evoked potentials), 422
- Balanitis, 512
- Baldness (alopecia), 114
- Band neutrophils, 244
- Bariatric surgery, 459
- Barium enema (lower GI series), 455, 456
- Barium swallow (upper GI series), 455
- Barrier contraceptives, 557
- Bartholin glands, 537, 538
- Basal cell carcinoma, of skin, 118
- Basic metabolic panel, 250
- Basic term components, 9, 9–37 (*see also* Term components)
- Basophils, 243, 244
- Behavioral therapy, 337
- Belching (eructation), 446
- Benign prostatic hyperplasia/hypertrophy (BPH), 514, 517
- Benign vs. malignant, as terms, 86
- Beta-adrenergic blocking agents (beta blockers), 220
- Bextra, 595
- Biaxin, 595
- Bicuspid (mitral) valve, 195, 196
- Biliary ducts, 440, 443
- Bilirubin, 492
- Biopsy (Bx), 457
 - bone marrow, 253
 - breast, 547, 548
 - endoscopic, 457
 - excisional, 457
 - gynecological procedures, 547, 548, 548
 - incisional, 458
 - kidney (renal), 489
 - liver, 458, 458
 - lung, 282
 - needle, 458
 - prostate, 517
 - skin, 120, 120
 - testicular, 517
 - types, 547–548
- Bipolar disorder (manic depression), 334
- Birth control (oral contraceptive) pill, 557
- Blackheads (comedos), 114, 115
- Bladder inflammation (cystitis), 488
- Blepharitis, 391
- Blepharochalasis, 391
- Blepharoplasty, 397
- Blepharoptosis, 391
- Blepharospasm, 390
- Blood
 - autologous, 254
 - cellular components, 242–244, 248
 - fluid-related terms, 242
 - homologous, 254
 - in stool (melena, hematochezia), 446, 458
 - symptomatic terms, 247
 - in urine (hematuria), 486, 492
 - vomiting (hematemesis), 446
- Blood and lymph system, therapeutic terms, 254–255
- Blood and lymph systems, 241–268 (*see also* Blood entries; Lymph entries)
 - abbreviations/acronyms, 255
 - anatomical terms
 - blood, 242–244
 - lymph, 246–247
 - combining forms, 241–242
 - diagnostic terms, 248–249
 - diagnostic tests and procedures, 250–253
 - drug classifications, 255
 - operative terms, 253–254
 - overview
 - blood system, 242–244
 - lymphatic system, 244–245
 - practice exercises, 256–263
 - symptomatic terms, 247–248
- Blood chemistry, 250
- Blood chemistry panels, 250
- Blood component therapy, 254
- Blood culture, 250
- Blood flow, through heart, 193, 194, 195
- Blood flow reduction, 203–204, 203
- Blood indices, 251
- Blood pressure, 199, 201, 201
- Blood studies, 250–253
- Blood sugar/blood glucose testing, 369
- Blood transfusion, 254
- Blood urea nitrogen (BUN), 492
- Blood vessels, 197, 198, 199
- Board certified, 42
- Body cavities, 156
- Body movements, 157–158, 158
- Body planes, 155, 156
- Body positions, 155, 157
- Boils, 117
- Bone grafting, 169
- Bone marrow, 153
- Bone marrow aspiration, 253, 254
- Bone marrow biopsy, 253
- Bone marrow transplant, 253
- Bones
 - classification, 147
 - compact, 146
 - flat, 147
 - irregular, 147
 - long, 153
 - sesamoid, 147
 - short, 147
 - spongy (cancellous), 146
 - tissue types, 146
- Bony necrosis, 162
- Bowman's capsule, 483, 484, 485
- Braces, splint, 172
- Brachial artery, 198
- Bradycardia, 205, 206
- Bradypnea, 273, 274
- Brain, 313–316 (*see also* Cerebral and Cerebro-entries)
- Brainstem, 314, 315
- Brainstem auditory (BAEP) evoked potentials, 422, 422
- Breasts (mammary glands), 539, 539
 - adenocarcinoma of, 546
 - biopsy, 547–548, 548
 - diagnostic terms, 546–547
 - fibrocystic, 546
 - operative terms, 555–556
- Breathing (respiration), 271, 272 (*see also* Respiratory system)
 - mechanical ventilation, 286, 287
 - symptomatic terms of, 273–275
- Breve, 18
- Bronchial tree, 271, 272
- Bronchiectasis, 276, 277
- Bronchioles, 271, 272
- Bronchitis, 276
- Bronchodilators, 288
- Bronchogenic carcinoma, 276
- Bronchoscopy, 280, 281
- Bronchus (bronchi), 271, 272
- Bruit, 211
- Buccal administration, 89
- Bulbourethral (Cowper's) glands, 511, 512
- Bulimia nervosa, 336
- Bullae, skin, 111, 112, 113
- BUN (blood urea nitrogen), 492
- Bundle of His, 201, 202
- Bunions, 162
- Burns, 115–116
- Bursa (bursae), 153, 154
- Bursectomy, 169
- Bx (*see* Biopsy)
- C**
- CABG (coronary artery bypass graft), 215, 216
- CAD (coronary artery disease), 208
- Caduceus, 43, 43
- Calcitonin, 361, 363
- Calcium channel blockers, 221
- Calyces (calices), 483, 485
- Canal of Schlemm, 388
- Cancellous bone, 146
- Cancer, 86 (*see also* Carcinoma)
 - cervical, 543
 - prostate, 514
 - signs of melanoma, 109
 - skin, 109, 118
 - as term, 23
 - testicular, 515
- Candida* vaginitis, 546
- Capillaries
 - blood, 199
 - lymph, 246
- Capsule
 - Bowman's, 483, 484, 485
 - joint, 154
 - lens, 389
- Capsule endoscopy, 454
- Carbuncles, 117
- Carcinoma
 - bronchogenic, 276
 - of skin
 - basal cell, 118
 - squamous cell, 118
- Carcinoma in situ, cervical, 543
- Cardiac catheterization, 213, 214, 239–240
- Cardiac conduction, 201, 202
- Cardiac muscle, 152, 154
- Cardiac output (CO), 213
- Cardiac sphincter, 440, 442
- Cardiac tamponade, 205
- Cardiology, 44
- Cardiomyopathy, 207
- Cardiopulmonary resuscitation (CPR), 286
- Cardiotonics, 221
- Cardiovascular system, 192–240
 - abbreviations/acronyms, 221

- Cardiovascular system (*continued*)
 anatomical terms, 195, 196, 197, 198, 199
 blood pressure, 199, 201
 cardiac conduction, 201, 202
 combining forms, 192–193
 diagnostic terms, 205–209
 diagnostic tests and procedures, 209–215
 drug classifications, 219–221
 medical record analyses, 229–240
 operative terms, 215–218
 overview, 193, 194, 195
 practice exercises, 222–228
 symptomatic terms, 203–204
 therapeutic terms, 218–221
- Cardioversion, 219
- Carisoprodol, 595
- Carotid arteries, 198
- Carotid TIA, 321, 322
- Carpal tunnel syndrome, 162, 162
- Cartia XT, 595
- Cartilage, articular, 153
- Caseous necrosis, 274
- Casting, of fracture, 171, 172
- CAT (*see* Computed tomography)
- Cataract, 392, 393, 394
- Cataract extraction, 397
- Catatonia, 333
- Catatonic schizophrenia, 336
- Cathartics, 461
- Catheter ablation, intracardiac, 212
- Catheters, common types, 496
- Caudal (inferior) direction, 155
- Cautery, 121
- Cavity (cavities)
 body, 156
 medullary, 153
 oral, 441
 pericardial, 195
 peritoneal, 440, 443
 pleural, 271, 273
 thoracic, 156
- CBC (complete blood count), 250
- CD4 cell count, 250
- Cecum, 440, 442
- Cefzil, 596
- Celebrex, 596
- Cells
 ependymal, 312, 313
 glial, 313
- Cellular blood components, 242–244
- Cellulitis, 116
- Central nervous system (CNS), 313–316
- Cephalexin, 596
- Cephalic (superior) direction, 155
- Cephalic vein, 200
- Cephalopelvic disproportion, 560
- Cerebellum, 314, 315
- Cerebral aneurysm, 320
- Cerebral angiography, 329
- Cerebral arteriosclerosis, 320
- Cerebral atherosclerosis, 320
- Cerebral cortex, 314
- Cerebral hemispheres, 313, 314
- Cerebral palsy, 320
- Cerebral thrombosis, 320
- Cerebrospinal fluid (CSF), 312, 316
- Cerebrovascular accident (CVA, stroke), 320, 321
- Cerebrovascular disease, 320
- Cerebrum, 313, 314
- Cerumen, 416
- Cerumen impaction, 418
- Cervical carcinoma in situ, 543
- Cervical conization, 551
- Cervical dysplasia, 542
- Cervical effacement, 558
- Cervical intraepithelial neoplasia (CIN), 542–543, 549
- Cervical neoplasia, 542–543, 549
- Cervical os, 537, 538
- Cervicitis, 541
- Cervix, 537, 538
- Cesarean section (C-section), 563
- Chalazion, 392, 392
- Chambers
 anterior of eye, 388
 of heart, 193, 194
 posterior of eye, 390
- Chancre, syphilitic, 516
- Chart, 54
- Chart notes, 136–139
- Cheeks, 440, 441
- Cheilitis, 447
- Cheiloplasty, 459
- Chemical drug name, 90
- Chemical peel, 121
- Chemosurgery, 121
- Chemotherapy, 123, 254, 332, 556
- Cherry angioma, 113, 114
- Chest x-ray (CXR), 284, 284
- Cheyne-Stokes respiration, 274, 274
- CHF (congestive heart failure), 207
- Chief complaint, 55
- Childhood psychiatric disorders, 335
- Chiropractic medicine, 47
- Chiropractor, 47
- Chlamydia, 516, 544
- Cholangiogram, 455
- Cholangiopancreatography, endoscopic retrograde (ERCP), 452
- Cholangitis, 451
- Cholecystectomy, 460
- Cholecystitis, 451
- Cholecystogram, 455
- Choledocholithiasis, 452
- Choledocholithotomy, 460
- Cholelithiasis (gallstones), 452
- Cholelithotomy, 460
- Cholelithotripsy, 460
- Chondromalacia, 162
- Chorionic villus sampling (CVS), 561, 562
- Choroid, 387, 388
- Chronic obstructive pulmonary disease (COPD), 276
- Chyle, 246
- Cicatrix of skin, 114
- Cilia, 271, 273
- Ciliary body, 387, 388
- Ciliary muscle, 388
- Ciliary processes, 388
- CIN (cervical intraepithelial neoplasia), 542–543, 549
- Cipro, 596
- Ciprofloxacin, 596
- Circulation
 arterial, 198
 coronary, 199
 of heart, 193, 194, 195
 pulmonary, 195, 199
 systemic, 195, 199
 venous, 200
- Circumcision, 518
- Cirrhosis, 451
- Claudication, 204
- Clinical psychologist, 48
- Clinical resume, 64
- Clinical summary, 64
- Clitoris, 537, 538
- Clonazepam, 596
- Clonidine, 596
- Closed fracture, 163
- Closed reduction
 external fixation, 171
 percutaneous fixation, 171, 173
- Clotrimazole/betamethasone, 596
- CNS (central nervous system), 313–316
- CO (cardiac output), 213
- Coarctation of aorta, 207
- Cochlear implant, 424, 425
- Cognitive therapy, 337
- Colitis, 448
 ulcerative, 448
- Colon, 440, 442
- Colon and rectal surgery, 44
- Colonoscopy, 453, 454
- Colostomy, 459, 460
- Colporrhaphy, 551–552
- Colposcopy, 548, 549
- Coma, 318, 319
- Combining, forms, 10
- Combining forms, 23–25
 blood and lymph systems, 241–242
 cardiovascular system, 192–193
 ear, 415–436
 endocrine system, 358–359
 eye, 386–387
 gastrointestinal system, 436–439
 glossary, 585–590
 integumentary system, 107–108
 male reproductive system, 509–510
 for medical specialties, 38–40
 musculoskeletal system, 144–146
 nervous system, 310–312
 respiratory system, 269–270
 urinary system, 482–483
- Combining vowels, 10, 11–12
- Combivent, 596
- Comedos, 114, 115
- Comminuted fracture, 163, 164
- Commitment, 1
- Compact bone, 146
- Complete blood count (CBC), 250, 252
- Complex fracture, 163
- Components, basic term, 9–37 (*see also* Term components)
- Comprehensive metabolic panel, 250, 251
- Computed tomography (CT, CAT [computed axial tomography]), 81, 82, 84, 169, 253, 284
 of abdomen, 456, 457
 of head, 329, 369
 single photon emission (SPECT), 327

- Concerta, 596
 Conductive hearing loss, 420
 Condylomata acuminata (genital warts), 517, 545, 545
 Cones, visual, 390
 Confinement, estimated date of (EDC), 558
 Congenital anomalies, female reproductive system, 541
 Congenital anomalies of heart, 207
 Congestive heart failure (CHF), 207
 Conization, cervical, 551
 Conjunctiva, 388
 Conjunctivitis (pinkeye), 392
 Consent form, 63
 Constipation, 446
 Constriction, 203, 203
 Consultation reports, 59, 63, 300–302, 356–357, 479–481
 Contact dermatitis, 116, 116
 Contact lens, 401
 Continuous positive airway pressure (CPAP), 286, 287
 Continuous subcutaneous (CSII) insulin infusion, 370, 371
 Contraceptive implants, 557
 Contraceptives, 557
 Contrast medium, 84
 Convulsions, 319
 COPD (chronic obstructive pulmonary disease), 276
 Coreg, 596
 Cornea, 388, 389
 Coronal (frontal) plane, 155, 156
 Coronary angiogram, 213
 Coronary arteries, 196
 Coronary artery bypass graft (CABG), 215, 216
 Coronary artery disease (CAD), 208
 Coronary circulation, 199
 Cor pulmonale, 207
 Corpus callosum, 313, 314
 Correction, of medical record, 96, 96
 Cortex, cerebral, 314
 Corti, organ of, 416, 417
 Corticosteroids, mineral, 359, 361
 Coumadin, 596
 Cowper's (bulbourethral) glands, 511, 512
 Cozaar, 596
 CPAP (continuous positive airway pressure), 286, 287
 CPR (cardiopulmonary resuscitation), 286
 Crabs (pediculosis pubis), 119, 120
 Crackles, 274
 Cranial nerves, 316, 317
 Craniectomy, 330
 Craniotomy, 330
 Creatinine, 485, 492
 Creatinine clearance testing, 492
 Crepitation, 159
 Crepitus, 159
 Cretinism, 366, 368
 Crossed eyes (strabismus), 395
 Crossmatching, 254
 Croup, 277
 Crusts, skin, 113, 114
 Cryopexy, 397
 Cryoretinopexy, 397
 Cryosurgery, 121, 552, 552
 Cryptorchism, 512, 513
 C & S (see Culture and sensitivity)
 C-section (cesarean section), 563
 CSF (cerebrospinal fluid), 312, 316
 CT (see Computed tomography)
 Culdocentesis, 552, 552
 Culture, blood, 250
 Culture and sensitivity (C & S), 120
 stool, 458
 urine, 492
 Curettage, 121
 Cushing syndrome, 365, 365
 Cutaneous lupus, 118
 CVA (cerebrovascular accident, stroke), 320, 321
 CVS (chorionic villus sampling), 561, 562
 Cyclobenzaprine, 596
 Cycloplegic, 402
 Cystectomy, ovarian, 554
 Cystic fibrosis, 276
 Cystitis (bladder inflammation), 488
 Cystocele, 543, 544
 Cystometrogram, 488
 Cystoscopy, 488, 488
 Cysts
 dermoid, 541
 parovarian, 543
- D**
 Dacryoadenitis, 392
 Dacryocystectomy, 397
 Dacryocystitis, 392
 Database, of medical record, 60
 Date and time recording, 95, 95
 D & C (dilation and curettage), 553, 553
 D.C. (Doctor of Chiropractic Medicine), 47
 D.D.S. (Doctor of Dental Surgery), 47
 Deafness, 420
 Debridement, 121
 Decongestants, 424
 Decubitus position, 157
 Deep tendon reflexes (DTR), 329
 Deep vein thrombosis (DVT), 200, 209
 Defecation, 443
 Defibrillation, 218, 219
 Defibrillator, 218
 implantable cardioverter (ICD), 219
 Degenerative arthritis, 160
 Degenerative joint disease (DJD), 160
 Delirium, 318
 Delivery, estimated date of (EDC), 558
 Delusions, 333
 Dementia, 318
 Dendrites, 312, 313
 Depakote, 596
 Depigmentation, 115
 Depolarization, 202
 Depression, 334
 Dermabrasion, 121
 Dermatitis
 atopic (eczema), 116, 117
 contact, 116
 seborrheic, 116
 Dermatology, 44
 Dermatoses, 116
- Dermis, 109, 110
 Dermoid cyst, 541
 Descending colon, 440, 442
 Detrol LA, 596
 DEXA (dual-energy x-ray absorptiometry), 169
 Dexter, as term, 93
 Diabetes insipidus, 367
 Diabetes mellitus (DM), 365
 type 1, 365
 type 2, 366
 Diabetic ketoacidosis (DKA), 364
 Diabetic retinopathy, 392, 394
 Diagnostic imaging (see Imaging modalities)
 Diagnostic suffixes, 26–27
 Diagnostic terms
 blood and lymph system, 248–249
 cardiovascular system, 205–209
 ear, 418–420
 endocrine system, 368
 eye, 391–396
 female reproductive system
 gynecological, 541–547
 obstetrical, 558–561
 gastrointestinal system, 447–452
 integumentary system, 115–120
 male reproductive system, 512–517
 nervous system, 320–325
 pancreas, 365–366
 parathyroid glands, 366
 pituitary gland, 366
 psychiatric, 334–337
 thyroid gland, 367–368
 urinary system, 487–488
 Diagnostic tests and procedures, 63, 81, 82, 83, 84, 85, 86
 blood and lymph system, 250–253
 cardiovascular system, 209–215
 ear, 421–423
 eye, 396–397
 female reproductive system
 gynecological, 547–551
 obstetrical, 561–563
 gastrointestinal system, 452–458
 integumentary system, 120–121
 male reproductive system, 517
 musculoskeletal system, 167–169
 nervous system, 326–329
 respiratory system, 280–284
 Dialysis
 hemo-, 495
 kidney (renal), 495–496
 peritoneal, 496
 Diaphoresis, 204
 Diaphragm, 271, 273
 Diaphysis, 147, 153
 Diarrhea, 446
 Diastole, 199
 Diazepam, 596
 Diencephalon (thalamus), 314
 Differential blood count, 252
 Differential diagnosis, 57
 Diflucan, 596
 Digestion, 439
 Digitalis, 145
 Digital rectal exam (DRE), 517, 517
 Digitek, 596

- Digits, 145
 Dilantin, 596
 Dilation and curettage (D & C), 553, 553
 Diltiazem hydrochloride, 596
 Diminutive endings, 28
 Diovan, 597
 Diovan HCT, 597
 Diplopia, 390
 Directional terms, 155–157
 Discharge, mucopurulent, 512
 Discharge summaries, 64, 78, 308, 384–385, 507, 581
 Disease-related terms, medical record, 86–88
 Disk (disc)
 herniated, 163
 intervertebral, 150, 153
 herniated, 322
 optic, 387, 388, 390
 Discectomy (discectomy), 330, 330
 Diskogram, 168
 Disposition (treatment plan), 57
 Dissecting aneurysm, 204
 Distal aspect, 157
 Ditropan XL, 597
 Diuretics, 221, 496
 Diverticulitis, 448, 449
 Diverticulosis, 448, 449
 Diverticulum (diverticula), 448, 449
 DKA (diabetic ketoacidosis), 364
 D.O. (Doctor of Osteopathic Medicine), 41–42
 Doctor of Chiropractic Medicine (D.C.), 47
 Doctor of Dental Surgery (D.D.S.), 47
 Doctor of Medicine (M.D.), 41
 Doctor of Optometry (O.D.), 47
 Doctor of Osteopathic Medicine (D.O.), 41–42
 Doctor of Podiatric Medicine (D.P.M.), 47
 Doctor of Psychology (Ph.D.), 48
 Documentation (*see* Medical record; Medical record analyses)
 Doppler imaging, femoral vein thrombus, 200
 Doppler sonography, 215 (*see also* Sonography)
 carotid arteries, 198
 Dorsal (posterior) direction, 155
 Dorsiflexion, 158
 Double r's, 29
 Doxycycline, 597
 D.P.M. (Doctor of Podiatric Medicine), 47
 DRE (digital rectal exam), 517
 Drug classifications, 123–124
 blood and lymph system, 255
 cardiovascular system, 219–221
 ear, 424
 endocrine system, 371
 eye, 402
 female reproductive system
 gynecological, 567
 obstetrical, 563
 gastrointestinal system, 461
 musculoskeletal system, 174
 psychiatric, 337
 respiratory system, 288
 urinary system, 496
 Drug forms, 89
 Drug names, 90
 Drugs
 commonly prescribed, 594–603
 routes of administration, 89–90
 as term, 88
 Dual-energy x-ray absorptiometry (DEXA), 169
 Duchenne muscular dystrophy, 163
 Ducts
 biliary, 440, 443
 lacrimal, 388, 389
 lymph, 246
 nasolacrimal, 390
 thoracic, 246
 Duodenal ulcer, 447, 448
 Duragesic, 597
 DVT (deep vein thrombosis), 200, 209
 Dwarfism, pituitary, 366
 Dysarthria, 318
 Dysentery, 448, 449
 Dyslexia, 335
 Dysmenorrhea, 540
 Dyspareunia, 540
 Dyspepsia, 446
 Dysphagia, 446
 Dysphasia, 318
 Dysphonia, 274
 Dysphoria, 333
 Dysplasia, cervical, 542
 Dysplastic nevus, 114
 Dyspnea, 273
 Dysrhythmia (arrhythmia), 205, 206
 Dysthymia, 334
 Dysuria, 486
- E**
 Ear, 415–436
 abbreviations/acronyms, 425
 anatomical terms, 417–418
 combining forms, 415
 diagnostic terms, 418–420
 diagnostic tests and procedures, 421–423
 drug classifications, 424
 medical record analyses, 430–436
 operative terms, 423
 overview, 416–417
 practice exercises, 426–429
 symptomatic terms, 418
 therapeutic terms, 424
 Ear instillation, 424
 Ear lavage, 424
 Eating disorders, 336
 Ecchymosis (bruising), 114
 ECG (EKG), 206, 211, 211, 212
 Echocardiography (ECHO), 213, 215
 Eclampsia, 560
 ECT (electroconvulsive therapy), 336
 Ectopic pregnancy, 560, 560
 Ectropion, 392, 395
 Eczema (atopic dermatitis), 116, 117
 EDC (estimated date of confinement), 558
 EDD (estimated date of delivery), 558
 Edema, pulmonary, 275
 EEG (electroencephalogram), 326–329, 326
 Effacement, cervical, 558
 Effexor XR, 597
 Ejection fraction, 213
 Elbow, 146
 Electrocardiogram (ECG, EKG), 206, 211, 211, 212
 Electrocautery, 121, 123
 Electroconvulsive therapy (ECT), 336
 Electrodesiccation, 121
 Electroencephalogram (EEG), 326–329, 326
 Electrolytes, 369
 Electromyogram (EMG), 167
 Elidel, 597
 Embolization, uterine fibroid, 557
 Embolus (emboli), 203, 203
 Embryo, 539
 Emergency medicine, 44
 EMG (electromyogram), 167
 Emphysema, 275, 276
 Empyema, 277
 Enalapril, 597
 Encephalitis, 322
 Endarterectomy, 215
 Endocarditis, 204, 205
 Endocardium, 195
 Endocet, 597
 Endocrine pancreas (islets of Langerhans), 362
 Endocrine system, 358–385
 abbreviations/acronyms, 371
 anatomical terms, 359–363
 combining forms, 358–359
 diagnostic terms, 365–368
 diagnostic tests and procedures, 369, 370
 drug classifications, 371
 medical record analyses, 378–385
 operative terms, 370
 overview, 359, 360, 361
 practice exercises, 372–377
 symptomatic terms, 363–364
 therapeutic terms, 370–371
 Endocrinology, 44
 Endolymph, 416, 418
 Endometriosis, 542
 Endometritis, 542
 Endometrium, 537
 Endorectal (transrectal) sonogram, of prostate, 518
 Endoscopic biopsy, 457, 547
 Endoscopic retrograde cholangiopancreatography (ERCP), 452
 Endoscopic sonography, 456
 Endoscopy, 280, 285, 452, 453
 capsule, 454
 laboratory reports, 475
 Endosteum, 153
 Endothelium
 blood vessel, 198
 venous, 200
 Endotracheal intubation, 296
 Endovaginal sonogram (ultrasound), 550, 551, 562
 Endovascular surgery, 217, 218
 Enema, barium (lower GI series), 455, 456
 Enteritis, 448
 Enterocoele, 543, 544

- ENT physician, 46
 Entropion, 392, 396
 Enucleation, 399
 Enuresis, 486
 Eosinophils, 243, 244
 Ependymal cells, 312, 313
 Epicardium, 195
 Epidermis, 109, 110
 Epididymectomy, 518
 Epididymis, 510, 511
 Epididymitis, 512
 Epigastric region, 444
 Epilepsy, 322 (*see also* Seizures)
 Epinephrine, 359, 361
 Epiphora, 392
 Epiphysis, 147, 153
 Epiphysitis, 162
 Episiotomy, 563
 Epistaxis, 274
 Epithelium, 110
 EPS (electrophysiological study), 211
 Epstein-Barr virus, 249
 ERCP (endoscopic retrograde cholangiopancreatography), 452
 Erectile dysfunction (impotence), 514
 Erect position, 157
 Erosions, skin, 112, 113
 Error-prone abbreviations (*see under* Abbreviations/acronyms)
 Eructation (belching), 446
 Eruption, of skin lesion, 115
 Erythema, 115
 Erythroblastosis fetalis, 249, 560
 Erythrocytes (red blood cells, RBCs), 242, 248
 Erythrocyte sedimentation rate (ESR), 253
 Erythropenia, 247
 Esophageal varices, 447, 453
 Esophagitis, 447
 Esophagoplasty, 459
 Esophagostomy, 452
 Esophagus, 440, 442
 Esotropia, 395
 ESR (erythrocyte sedimentation rate), 253
 Essential hypertension, 208
 Estimated date
 of confinement (EDC), 558
 of delivery (EDD), 558
 Estrogen, 361, 362
 ESWL (extracorporeal shock wave lithotripsy), 495
 Etymology, 9
 Euphoria, 333
 Eupnea, 273, 274
 Eustachian obstruction, 419
 Eustachian tube, 416, 417
 Eversion, 148, 157
 Evista, 597
 Evoked potentials, 326–329
 Excisional biopsy, 457, 547, 548
 Excoriation, skin, 113, 113
 Excretion, 439
 Exhalation (expiration), 270, 271
 Exocrine pancreas, 440, 443
 Exophthalmos, 363, 367, 390
 Exostosis, 159
 Exotropia, 395
 Expectorants, 288
 Expectoration, 274
 Expiration (exhalation), 270, 271
 Extension, 148, 157
 External auditory meatus (canal), 417
 Extracorporeal shock wave lithotripsy (ESWL), 495
 Extracranial MRA, 327, 328
 Eye, 386–414
 abbreviations/acronyms, 402
 anatomical terms, 388–390
 combining forms, 386–387
 diagnostic terms, 391–396
 diagnostic tests and procedures, 396–398
 drug classifications, 402
 medical record analyses, 409–414
 operative terms, 398–400
 overview, 387–388
 practice exercises, 403–408
 symptomatic terms, 390–391
 therapeutic terms, 401–402
 Eye instillation, 401
 Eye irrigation, 401
 Eyelid (palpebra), 388, 389
 Eyelid abnormalities, 395
- F**
 F.A.C.P. (Fellow of American College of Physicians), 42
 F.A.C.S. (Fellow of American College of Surgeons), 42
 Fainting (syncope), 319
 Fallopian (uterine) tubes, 537
 Fallopius, Gabriele, 537
 Family history, 56
 Family practice, 44
 Fascia, 155
 Fasting blood sugar (FBS), 369
 Fatty paste, 588
 Feces, 442
 Female reproductive system, 535–584
 abbreviations/acronyms, 563
 anatomical terms, 536–540
 combining forms, 535–536
 diagnostic terms
 gynecological, 541–547
 obstetrical, 558–562
 diagnostic tests and procedures
 gynecological, 547–551
 obstetrical, 561–563
 drug classifications
 gynecological, 567
 obstetrical, 563
 medical record analyses, 572–584
 operative terms
 gynecological, 551–556
 obstetrical, 563
 overview, 536, 537
 practice exercises, 564–571
 sexually transmitted diseases (STDs), 544–546
 symptomatic terms
 gynecological, 540
 obstetrical, 558
 therapeutic terms
 gynecological, 556–557
 obstetrical, 563
 Femoral artery, 198
 Femoral vein, 200
 Femoral vein thrombus, 200
 Fetal monitoring, 561
 Fetus, 539, 540
 Fibrillation, 205, 206
 Fibrocystic breast disease, 546
 Fibroids, uterine, 542
 Fibromyoma, 542, 542
 Fissures
 of brain, 314
 skin, 113, 113
 Fistula
 anal, 449, 453
 vaginal, 542, 543
 Fistulectomy, anal, 460
 Fitness, 2
 Flaccid (term), 159
 Flaccid paralysis, 319
 Flash cards, 3–4, 3, 4, 5
 Flat affect, 333
 Flat bones, 147
 Flatulence, 446
 Flexion, 148, 157
 plantar, 158
 Flomax, 597
 Flonase, 597
 Flovent, 597
 Fluid administration, 89
 Fluoroscopy, 455
 Fluoxetine, 597
 Flutter, 205, 206
 Foley catheter, 496
 Folic acid, 597
 Follicle-stimulating hormone (FSH), 361, 362
 Fosamax, 597
 Fovea centralis, 388, 389
 Fracture (Fx), 163
 open reduction, internal fixation (ORIF), 169, 171
 types of common, 164
 Fracture line, 163
 Frequency abbreviations, 93
 Frontal lobe, 313, 314
 Frontal (coronal) plane, 155, 156
 Frozen section (FS), 120
 FSH (follicle-stimulating hormone), 361, 362
 Fulguration, 121
 Fundus of eyeball, 388, 389
 Furosemide, 597
 Furuncles, 117
 Fusiform aneurysm, 204
- G**
 Gabapentin, 599
 GAD (generalized anxiety disorder), 334
 Gamma camera, 81, 83, 84
 Gallstones (cholelithiasis), 452, 452
 Gangrene, 117
 Gastric lavage, 461
 Gastric resection, 459
 Gastric ulcer, 447, 448
 Gastritis, 447, 453
 Gastroenteritis, 448
 Gastroenterology, 45

- Gastroesophageal reflux disease (GERD), 447
- Gastrointestinal system, 436–481
- abbreviations/acronyms, 461
 - abdominal divisions, 443–445
 - anatomical terms, 441–443
 - combining forms, 437–439
 - diagnostic terms, 447–452
 - diagnostic tests and procedures, 452–458
 - drug classifications, 461
 - medical record analyses, 471–481
 - operative terms, 459–460
 - overview, 439–441
 - practice exercises, 462–470
 - symptomatic terms, 445–447
 - therapeutic terms, 461
- Gastroscopy, 452
- Gemfibrozil, 597
- Generalized anxiety disorder (GAD), 334
- General prefixes, 22
- General suffixes, 27–28
- General surgery, 47
- Generic drug name, 90
- Genetics, medical, 45
- Genital warts (venereal warts, condylomata acuminata), 517, 545
- GERD (gastroesophageal reflux disease), 447
- Geriatric medicine, 45
- Gigantism, pituitary, 366
- Gingivitis, 447
- GI system (*see* Gastrointestinal system)
- Gland(s) (*see also* Endocrine system)
- adrenal (suprarenal), 359, 360, 361
 - Bartholin, 537, 538
 - bulbourethral (Cowper's), 511, 512
 - lacrimal, 389
 - mammary (breasts), 539, 546–547
 - meibomian, 388, 389
 - parathyroid, 360, 361
 - pituitary, 360, 361
 - prostate, 512
 - salivary, 440, 441
 - sebaceous, 109, 110
 - sudoriferous, 109, 110
 - thymus, 246, 359, 360, 361
 - thyroid, 359, 360, 361
 - of Zeis, 388, 389
- Glans penis, 510, 511
- Glasgow Coma Scale, 318, 319
- Glaucoma, 392, 394
- Glial cells, 313
- Glioma, 322
- Glomerulonephritis, 487
- Glomerulus (glomeruli), 484, 485
- Glossary, of prefixes, suffixes, and combining forms, 585–590
- Glossectomy, 459
- Glossitis, 447
- Glossorrhaphy, 459
- Glucagon, 361, 362
- Glucocorticoids, 359, 361
- Glucophage XR, 597
- Glucose, in urine, 490
- Glucose tolerance test (GTT), 369
- Glucosuria, 364
- Glucotrol XL, 597
- Glucovance, 597
- Glyburide, 598
- Glycohemoglobin, 369
- Glycosuria, 364, 486
- Glycosylated hemoglobin, 369
- Goiter, 367
- Goniometer, 158, 159
- Gonorrhea, 516, 544
- Gout, 161
- Gouty arthritis, 161
- Grandiose delusions, 333
- Grand mal seizures, 322
- Granulocytes, 243, 244
- Graves disease, 367
- Gravida, 558, 559
- Greenstick fracture, 163, 164
- Growth hormone (GH), 361, 363
- GTT (glucose tolerance test), 369
- Gums (gingivae), 440, 441
- Gustatory sense, 2
- Gynecological terms (*see also* Female reproductive system)
- diagnostic, 541–547
 - diagnostic tests and procedures, 547–551
 - operative, 551–556
 - symptomatic, 540
 - therapeutic, 556–557
- Gynecology, 46, 536 (*see also* Female reproductive system)
- Gynecomastia, 546, 546
- Gyrus (gyri), 314
- H**
- Habitual abortion, 559
- Halitosis, 446
- Hallucinations, 333
- HBV (hepatitis B virus), 516, 544
- HCT/Hct (hematocrit), 250
- Headache, migraine, 323
- Health care professions, 48–49
- Hearing aid, 424
- Hearing loss
- conductive, 420
 - mixed, 420
 - sensorineural, 420
- Heart, 193, 194 (*see also* Cardiovascular system)
- circulation of, 193, 194, 195
 - congenital anomalies of, 207
 - septa and layers, 193, 194, 195
- Heart block, 205, 206
- Heart failure, congestive (CHF), 207
- Heart murmur, 204
- Heart valve replacement, 217, 217
- Heart valves, 195, 196, 197
- Hematemesis, 446
- Hematochezia, 446, 492
- Hematocrit (HCT, Hct), 250
- Hematology, 45
- Hematology lab report, 268
- Hematuria, 486, 486, 492
- Hemiparesis, 319
- Hemiplegia, 324
- Hemispheres, cerebral, 313, 314
- Hemochromatosis, 249
- Hemodialysis, 495
- Hemoglobin (HGB, Hgb), 250
- Hemoglobin A_{1c}, 369
- Hemolysis, 247
- Hemophilia, 249
- Hemoptysis, 274
- Hemorrhoid, 451
- Hemostatics, 255
- Hemothorax, 277
- Hepatitis, 451
- Hepatitis B virus (HBV), 516, 544
- Hepatomegaly, 446
- Hernia, 449, 450
- Herniated intervertebral disk, 163, 322, 322
- Hernioplasty, 459
- Herniorrhaphy, 459
- Herpes simplex virus (HSV), 117
- Herpes simplex virus type 2 (HSV-2), 516, 544, 545
- Herpes zoster (shingles), 117, 322, 323
- Heterografts, 123
- Heterotropia, 395
- HGB/Hgb (hemoglobin), 250
- Hiatal hernia, 449, 450
- Hilum, of kidney, 483, 485
- Hippocrates, 40, 40
- Hippocratic Oath, 40
- Hirsutism, 364
- Histamine, 124, 288, 424
- History
- cardiovascular, 233–234
 - consultation, 59, 300
 - ear, 434
 - family, 56
 - gynecological, 575
 - hospital records of, 63, 65–66
 - of medicine, 40
 - nervous system, 351–352
 - obstetrical, 579
 - occupational, 56
 - past medical, 56
 - preoperative, 65–66
 - of present illness, 55
 - respiratory, 306, 307
 - social, 56
- History and physical, 54–58, 58, 59, 63, 65–66
- cardiovascular, 235–236
 - ear, 434–435
 - eye, 414–415
 - gynecological, 575–576
 - medical record analyses, 185–186
 - obstetric, 579–580
 - preoperative, 65–66
- HIV (human immunodeficiency virus), 248, 517, 545
- Hives (urticaria), 115
- Holter ambulatory monitor, 211
- Homografts, 123
- Homologous blood, 254
- Hordeolum (sty), 392, 395
- Hormonal contraceptives, 557
- Hormone, 359, 361
- Hormone replacement therapy (HRT), 371, 556
- Hospital abbreviations, 79–80
- Hospitals, 41, 41
- HPV (human papilloma virus), 517, 545

- HRT (hormone replacement therapy), 556
- HSV-2 (herpes simplex type 2), 544, 545
- HSV (herpes simplex virus), 516
- Humalog, 598
- Human immunodeficiency virus (HIV), 248, 517, 545
- Human papilloma virus (HPV), 517, 545
- Humulin, 598
- Huntington chorea, 322
- Huntington disease, 322
- Hydrocele, 512, 513
- Hydrocephalus, 323, 324, 325
- Hydrocephaly, 323, 324, 325
- Hydrochlorothiazide, 598
- Hydrocodone/acetaminophen, 598
- Hydronephrosis, 487, 487
- Hymen, 537, 538
- Hyperbilirubinemia, 446
- Hypercalcemia, 364
- Hypercapnia, 275
- Hypercarbia, 275
- Hyperemesis gravidarum, 561
- Hyperesthesia, 320
- Hyperglycemia, 364
- Hyperinsulinism, 366
- Hyperkalemia, 364
- Hypermastia, 547
- Hypernatremia, 364
- Hyperopia, 391, 391
- Hyperparathyroidism, 366
- Hyperpigmentation, 115
- Hyperplasia
 - benign prostatic (BPH), 514, 517
 - as term, 159
- Hyperpnea, 273, 274
- Hypersecretion, 364
- Hypertension (high blood pressure), 199, 208
 - pregnancy-induced (PIH), 560
- Hyperthyroidism, 367, 367, 368
- Hypertrophy
 - benign prostatic (BPH), 514, 515
 - as term, 159
- Hyperventilation, 275
- Hypnotics, 334
- Hypocalcemia, 364
- Hypochondriac, 444
- Hypochondriac regions, 444
- Hypochondriasis, 335
- Hypogastric region, 445
- Hypoglossal, 447
- Hypoglycemia, 364
- Hypoglycemic antihyperglycemic drugs, 371
- Hypokalemia, 364
- Hypolipidemics, 221
- Hypomastia, 547
- Hyponatremia, 364
- Hypoparathyroidism, 366
- Hypophysectomy, 370
- Hypophysis (pituitary gland), 362
- Hypopigmentation, 115
- Hypopnea, 273, 274
- Hyposecretion, 364
- Hypospadias, 512, 514
- Hypotension, 199
- Hypothalamus, 318
- Hypothyroidism, 368, 368
- Hypotonia, 159
- Hypoventilation, 275
- Hysterectomy, 553
- Hysteria, 553
- Hysterosalpingogram, 550
- Hysteroscopy, 548, 549
- Hysterosonogram, 550, 551
- Hyzaar, 598
- I**
- Ibuprofen, 598
- ICD (implantable cardioverter defibrillator), 219
- Ichthyosis, 117
- Icterus (jaundice), 446
- Ideation, 333
- Ig (immunoglobulin), 246
- Ileal conduit, 494, 495
- Ileitis, 448
- Ileostomy, 459
- Imaging modalities, 81, 82, 83, 84, 85, 86
 - (see also *specific modalities*)
 - bone and lymph systems, 253
 - contrast medium in, 84
 - endocrine system, 369, 370
 - gastrointestinal tract, 454–457
 - ionizing, 81, 82, 83, 84
 - musculoskeletal system, 167–169
 - nonionizing, 84, 85, 86
- Imitrex, 598
- Immunity, 246–247
 - active, 247
 - passive, 247
- Immunocompromise, 247
- Immunoglobulins (Ig), 246
- Immunology, 44
- Immunosuppression, 247
- Impetigo, 117
- Implantable cardioverter defibrillator (ICD), 219
- Implant administration, 89
- Impotence (erectile dysfunction), 514
- Incarcerated hernia, 449
- Incentive spirometry, 286, 287
- Incisional biopsy, 458, 547–548
- Incision and drainage (I & D), 121
- Incomplete abortion, 559
- Incontinence, 486
- Incus, 416, 417
- Infarct, 203, 204
- Inferior (caudal) direction, 155
- Inferior vena cava, 200
- Information
 - objective, 57
 - subjective, 55–56
- Informed consent, 63
- Inguinal hernia, 449, 450
- Inguinal region, 445
- Inhalation, administration by, 89
- Inhalation (inspiration), 270, 271
- Initial plan, 60
- Insertion, of muscle, 154, 155
- Inspiration (inhalation), 270, 271
- Insulin, 361, 362, 365
- Insulin infusion, continuous subcutaneous (CSII), 370, 371
- Insulin pump, 370, 371
- Integumentary system, 107–143
 - anatomical terms, 110–111
 - combining forms, 107–108
 - diagnostic terms, 115–120
 - diagnostic tests and procedures, 120–121
 - operative terms, 121–123
 - overview, 108, 110
 - symptomatic terms, 111–115
 - therapeutic terms, 123–124
- Interatrial septum, 193, 194, 195
- Internal medicine, 44–45
- Interventricular septum, 193, 194, 195
- Intervertebral disk (disc), 150, 153
 - herniated, 163, 322
- Intestines, 440, 442
- Intracardiac catheter ablation, 212
- Intracardiac electrophysiological study (EPS), 211
- Intracorporeal lithotripsy, 492, 493
- Intracranial MRA, 327, 328
- Intradermal administration, 89, 90
- Intramuscular administration (IM), 89, 90
- Intraocular lens implant (IOL), 400, 401
- Intrauterine device (IUD), 557
- Intravascular sonography, 215
- Intravascular stent, 218
- Intravenous administration (IV), 89, 90
- Intravenous pyelogram (IVP), 489
- Intravenous urogram, kidney, urine, bladder (KUB), 489, 490
- Introitus, vaginal, 537, 538
- Intussusception, 449, 450
- Inversion, 148, 157
- Ionizing imaging modalities, 81, 82, 83, 84
- Iridectomy, 399
- Iridotomy, 399
- Iris, 388, 389
- Iritis, 392
- Iron deficiency anemia, 248, 248
- Irregular bones, 147
- Ischemia, 203, 203
- Islets of Langerhans (endocrine pancreas), 360, 361, 362
- Isosorbide mononitrate, 598
- Itching (pruritus), 115
- IUD (intrauterine device), 557
- IVP (intravenous pyelogram), 489
- J**
- Jaundice (icterus), 446, 446
- Joint capsule, 154
- Joint disease, degenerative (DJD), 160
- Joints,
 - anatomy of, 147
 - knee, 154
 - of lower limb, 147
- Jugular vein, 200
- Junction, ureteropelvic, 485
- K**
- Kaposi sarcoma, 118, 119
- Kariva, 598
- Kegel exercises, 496
- Keloid, 113, 114
- Keratitis, 392
- Keratoplasty, 399

- Keratoses, 118, 118
 actinic, 118, 118
 seborrheic, 118, 118
 solar, 118, 118
- Ketone bodies, 486
- Ketone compounds, 486
- Ketones, 490
- Ketonuria, 486
- Ketosis, 364
- Kidney, 483, 484, 485
- Kidney (renal) biopsy, 489
- Kidney (renal) transplantation, 493, 494
- Kidney stones (calculi)
 (nephrolithiasis), 488, 488
- Kidney, urine, bladder (KUB) intravenous urogram, 489, 490
- Kinesthetic sense, 2
- Klor-Con, 598
- Knee joint, 154
- KUB (kidney, urine, bladder urogram), 489, 490
- Kyphosis, 165, 166
- L**
- Labia, 537, 538
- Laboratory reports, 63, 71–72
 endoscopy, 475
- Laboratory testing, urinary system, 490–492
- Labyrinth, 416, 418
- Labyrinthitis, 419
- Lacrimal ducts, 388, 389, 389
- Lacrimal glands, 389, 389
- Lacrimal sac, 388, 389, 389
- Lacrimation, 390
- Lacteals, 246
- Lactogenic hormone (prolactin), 361, 363
- Lamina, vertebral, 330
- Laminectomy, 330
- Langerhans, islets of (endocrine pancreas), 360, 361, 362
- Lanoxin, 598
- Lantus, 598
- Laparoscopic cholecystectomy, 460
- Laparoscopic surgery, 459, 553
- Laparoscopy, 454, 454
- Laparotomy, 459
- Large intestine, 440, 442
- Large loop excision, of transformation zone (LLETZ), 553
- Laryngitis, 276
- Laryngopharynx, 271, 272
- Laryngospasm, 277
- Laryngotracheobronchitis, 277
- Laser-assisted in situ keratomileusis (LASIK), 399
- Lasers, 121
- Laser surgery, 121, 553
 of eye, 399, 400
- Lateral aspect, 157
- Lavage
 ear, 424
 gastric, 461
- Learning, personal aspects of
 successful, 1–2
- Learning tools, 2–6
 annotation, 4–5
- flash cards, 3–4, 3, 4, 5
- mnemonics, 5–6, 5
- senses, 2–3
- study tips, 6
- LEEP (loop electrosurgical excision procedure), 553, 554
- Left ventricular failure (congestive heart failure), 207
- Legal considerations, for medical record, 96
- Leiomyoma, 163, 542
- Leiomyosarcoma, 163
- Lens capsule, 389
- Lescol XL, 598
- Lesions, skin, 111–112
- Leukemia, 249
- Leukocytes (white blood cells, WBCs), 243, 244
- Leukorrhea, 540
- Levaquin, 598
- Levothyroid, 598
- Levoxyl, 598
- Lexapro, 598
- LH (luteinizing hormone), 361, 362
- Lice (pediculosis capitis), 119, 120
- Ligaments, 153, 154
- Ligation, tubal, 554
- Light therapy, 336
- Lines, fracture, 163
- Lipitor, 598
- Lips, 440, 441
- Liquid drug forms, 89
- Lisinopril, 599
- Lithotripsy
 extracorporeal shock wave (ESWL), 495
 intracorporeal, 492, 493
- Liver, 440, 443
- Liver biopsy, 458, 458
- Liver scan, 454
- LLETZ (large loop excision of transformation zone), 553
- Lobectomy, 285
- Lobes
 frontal, of brain, 313, 314, 314
 of lung, 271, 273
 occipital, 314, 314
 parietal, of brain, 313, 314
 temporal, 314
- Long bones, 147, 148, 153
- Loop electrosurgical excision procedure (LEEP), 553, 554
- Lorazepam, 599
- Lordosis, 165, 166
- Lotensin, 599
- Lotrel, 599
- Lou Gehrig disease (ALS, amyotrophic lateral sclerosis), 320, 328
- Lower GI series (barium enema), 455, 456
- Low-Ogestrel, 599
- Lumbar puncture (spinal tap), 328
- Lumbar region, 444
- Lumpectomy, 555
- Lungs, 271, 273
- Lung sounds, 274
- Lupus, cutaneous, 118
- Lupus erythematosus, systemic (SLE), 118
- Luteinizing hormone (LH), 361, 362
- Lymph, 246
 symptomatic terms, 247–248
- Lymphadenectomy, 253
- Lymphadenopathy, 247
- Lymphadenotomy, 253
- Lymphatic system (*see also* Blood and Lymph system)
 overview
 immunity, 246
 lymph organs, 245, 246
 lymph structures, 245, 246
- Lymph capillaries, 246
- Lymph ducts (lymphatic ducts), 246
- Lymph node dissection, 253
- Lymph nodes, 246
- Lymphocytes, 243, 244
- Lymphocytopenia, 247
- Lymphoma, 249
- Lymph vessels, 246
- M**
- Macrobid, 599
- Macrocytosis, 247
- Macromastia, 547
- Macron, 18
- Macrosomia, 558
- Macula lutea, 387, 388, 389
- Macular degeneration, 394, 394
- Macules, 111, 112, 113
- Magnetic resonance angiography (MRA), 212, 327, 328
- Magnetic resonance imaging (MRI), 84, 85, 167, 253, 282, 327, 327, 369, 454, 549
- Major affective disorder, 334
- Male reproductive system, 509–534
 abbreviations/acronyms, 520
 anatomical terms, 510–512
 combining forms, 509–510
 diagnostic terms, 512–517
 diagnostic tests and procedures, 517–518
 medical record analyses, 527–535
 operative terms, 518–520
 overview, 510, 511
 practice exercises, 521–526
 sexually transmitted diseases (STDs), 516–517
 symptomatic terms, 512
 therapeutic terms, 520
- Malignant melanoma, 118
- Malleus, 416, 417
- Mammary glands (breasts), 539, 546–547
 fibrocystic disease of, 546
 operative terms, 555–556
- Mammary papilla (nipple), 539
 supernumerary, 547
- Mammogram, 550, 550
- Mammoplasty, 556, 556
- Mania, 333
- Manic depression (bipolar disorder), 334
- Marrow, bone, 153
- Mastectomy, 555, 555
- Mastitis, 547
- Mastoiditis, 419
- Mastoid process, 417
- Mastopexy, 556, 557

- MCHC (mean corpuscular [cell] hemoglobin concentration), 251
- MCV (mean corpuscular volume), 251
- M.D. (Doctor of Medicine), 41
- Mean corpuscular volume (MCV), 251
- Measurement, prefixes of, 21–22
- Mechanical ventilation (breathing), 286, 287
- Meclizine, 599
- Meconium, 540
- Meconium aspiration, 561
- Meconium staining, 558
- Medial aspect, 157
- Medical genetics, 45
- Medical record (*see also* Medical record analysis and subtopics)
 - correction of, 96, 96
 - date and time recording, 95, 95
 - disease-related terms, 86–88
 - history and physical, 54–58, 58, 59
 - hospital, 63–79 (*see also* Hospital records)
 - medication administration, 89–90
 - pharmaceutical
 - abbreviations/acronyms and symbols, 88–90
 - prescriptions, 90–94, 91
 - problem-oriented, 60–63, 60
 - regulations and legal considerations, 96
- Medical record analyses
 - blood and lymph system, 264–268
 - cardiovascular system, 229–240
 - chart notes, 136–139
 - ear, 430–436
 - endocrine system, 378–385
 - eye, 408–414
 - gastrointestinal tract, 471–481
 - history and physical examination, 185–186
 - integumentary system, 134–143
 - male reproductive system, 527–535
 - musculoskeletal system, 185–191
 - nervous system and psychiatric disorders, 347–357
 - operative reports, 140–143, 187–189
 - postop meds for laparotomy, 103
 - progress notes, 61, 61–62, 75, 102, 229, 264, 267, 430, 530–531, 572
 - respiratory system, 297–309
 - SOAP notes, 105–106
 - urinary system, 504–508
 - x-ray report, 190–191
- Medical specialties, 38–53
 - American Board of Medical Specialties (ABMS), 42–43
 - combining forms, 38–40
 - internal medicine, 45–46
 - physicians, 40–42
 - scope of practice, 44–47
- Medication (*see also* Drugs)
 - administration, 89–90
 - medical record analyses, 103
- Medicine (science), historical aspects, 40
- Medulla, of kidney (renal medulla), 483, 485
- Medullary cavity, 153
- Meibomian glands, 388, 389
- Melanocyte-stimulating hormone (MSH), 361, 363
- Melanoma
 - malignant, 118
 - signs of, 109
- Melatonin, 361, 362
- Melena, 446
- Membranes
 - mucous, respiratory tract, 271, 273
 - ruptured uterine, 558
 - synovial, 153, 154
 - tympanic, 417, 420
- Ménière disease, 419
- Meninges, 316
- Meningioma, 323
- Meningitis, 323
- Meniscus (kneecap), 154
- Menopause, 543
- Menorrhagia, 540
- Menstrual cycle, 538
- Mental retardation, 335
- Metabolic panel
 - basic, 250
 - comprehensive, 250, 251
- Metabolism, 364
- Metaphysis, 153
- Metastasis, 249
- Metformin, 599
- Methylprednisolone, 599
- Metoprolol, 599
- Metrorrhagia, 540
- MI (myocardial infarction, heart attack), 209, 209
- Miacalcin, 599
- Microcytosis, 247
- Microgestin Fe, 599
- Micromastia, 547
- Microsurgery, 331, 423
- Migraine headache, 323
- Military time, 95, 95
- Mineral corticosteroids, 359, 361
- Miotic, 402
- MiraLax, 599
- Miscarriage (spontaneous abortion), 558
- Missed abortion, 559
- Mitral (bicuspid) valve, 195, 196
- Mitral valve prolapse, 208
- Mixed hearing loss, 420
- Mnemonics, 5–6
- Mobic, 599
- Modified radical mastectomy, 555–556
- Mohs surgery, 123
- Monitoring, fetal, 561
- Monocytes, 243, 244
- Mononucleosis, 249
- Monopril, 599
- Mood disorders, 334
- Motor deficit, 318
- Motor nerves, 317
- Mouth, 440, 441
- MRA (magnetic resonance angiography), 212, 327, 328
- MRI (magnetic resonance imaging), 84, 85, 167, 253, 282, 369, 454, 549
- MS (multiple sclerosis), 323, 324
- MSH (melanocyte-stimulating hormone), 361, 363
- Mucopurulent discharge, 512
- Mucous membranes, respiratory tract, 271, 273
- Multipara, 558
- Multiple sclerosis (MS), 323, 324
- Muscle, 151, 152, 154
 - cardiac, 152, 154
 - ciliary, 388
 - insertion of, 154, 155
 - origin of, 152, 154
 - skeletal, 152
 - smooth, 152, 154
 - striated (skeletal), 152, 154
- Muscular dystrophy, 163
- Musculoskeletal system, 144–191
 - anatomical positions and points of reference, 155–158
 - body planes, 155, 156
 - anatomical terms
 - for bones, 146–148
 - joints and muscles, 153–155
 - combining forms, 144–146
 - diagnostic terms, 160–167
 - diagnostic tests and procedures, 167–169
 - drug classifications, 174
 - operative terms, 169–170
 - overview, 146–152, 154
 - symptomatic terms, 159–160
 - therapeutic terms, 171–174
- Myalgia, 159
- Myasthenia gravis, 323
- Mydriatic, 402
- Myelin, 312, 313
- Myelitis, 323
- Myelodysplasia, 249
- Myelogram, 329
- Myeloma, 163
- Myelomeningocele, 325
- Myocardial infarction (MI, heart attack), 209, 209
- Myocardial radionuclide perfusion
 - scan, 212
- Myocardial radionuclide perfusion stress
 - scan, 212
- Myocarditis, 209
- Myocardium, 195
- Myodynia, 159
- Myomas, 163
- Myomectomy, 554
- Myometrium, 537
- Myopia, 391, 391
- Myoplasty, 169
- Myositis, 163
- Myringitis, 418
- Myringotomy, 423
- Myxedema, 368
- N**
- Naproxen, 599
- Narcolepsy, 324
- Narcotics, 174
- Nasacort, 599
- Nasal polypectomy, 285
- Nasal polyposis, 277
- Nasogastric (NG) intubation, 461
- Nasolacrimal duct, 390
- Nasonex, 599
- Nasopharyngoscopy, 280

- Nasopharynx, 271, 272
 Nausea, 446
 NCV (nerve conduction velocity), 327
 Necon, 599
 Needle (aspiration) biopsy, 458, 547, 548
 Negation, prefixes of, 20
Neisseria gonorrhoeae, 516, 544
 Neoplasia, cervical, 542–543, 549
 Neoplasms (*see also* Cancer; Tumors)
 malignant cutaneous, 118
 Nephrectomy, 493
 Nephritis, 487
 Nephrolithiasis (kidney stones), 488
 Nephrolithotomy, 493
 Nephrology, 45
 Nephrons, 483, 484, 485
 Nephrorrhaphy, 493
 Nephrosis, 488
 Nephrotomy, 492
 Nerve conduction velocity (NCV), 327
 Nerves
 cranial, 316, 317 (*see also* Nervous system)
 motor, 317
 optic, 387, 388
 sensory, 317
 spinal, 317
 Nervous system, 310–357
 abbreviations/acronyms, 337
 anatomical terms, 313–318
 autonomic (ANS), 318
 central (CNS), 313–316
 combining forms, 310–312
 diagnostic terms, 320–325
 diagnostic tests and procedures, 325–329, 330
 drug classifications, 333
 medical record analyses, 347–357
 operative terms, 330–331
 overview, 312, 313
 parasympathetic, 318
 peripheral (PNS), 316–318
 practice exercises, 338–346
 psychiatric terms, 333–337
 sympathetic, 318
 symptomatic terms, 318–320
 therapeutic terms, 332, 333
 Neuralgia, 319
 Neuroendovascular surgery, 331
 Neuroglia, 312, 313
 Neurohypophysis (posterior pituitary gland), 360, 361, 363
 Neuroleptic agents, 337
 Neurological surgery, 45
 Neurology, 45
 Neuroma, acoustic, 419
 Neurons, 312, 313
 Neurontin, 599
 Neuroplasty, 331
 Neurosis, 333
 Neurotransmitters, 312
 Neutropenia, 247
 Neutrophils, 243, 244
 Nevus (nevi), 114
 dysplastic, 114
 Nexium, 599
 Niaspan, 600
 Nifedipine, 600
 Nipple (mammary papilla), 539
 supernumerary, 547
 NitroQuick, 600
 Nocturia, 487
 Nocturnal enuresis, 486
 Nodes
 atrioventricular (AV node), 201, 202
 lymph, 246
 sinoatrial (SA node), 201, 202
 Nodules, skin, 111, 112, 113
 Noncontinent ileal conduit, 494, 495
 Nonionizing imaging modalities, 84, 85
 Nonseminomas, 515
 Nonsteroidal anti-inflammatory drugs (NSAIDs), 174
 Norepinephrine, 359, 361
 Normal, as term, 86
 Normal sinus rhythm (NSR), 202
 Normotension, 199
 Norvasc, 600
 Nose, 271, 272
 Notes
 chart, 527, 572
 nurse's, 63, 73–74
 physician's progress, 63, 75
 progress, 61–62, 75, 102, 229, 264, 267, 430, 530–531, 572
 SOAP format for, 61–62
 NSAIDs (nonsteroidal anti-inflammatory drugs), 174
 Nuclear medicine (*see* Radionuclide imaging)
 Nucleus pulposus, 150, 153
 Nulligravida, 558, 559
 Nullipara, 558
 Nurse, 48
 Nurse's notes, 63, 73–74
 Nystagmus, 390
- O**
- Oblique fracture, 164
 Obsessive-compulsive disorder (OCD), 335
 Obstetrical sonogram (ultrasound), 562
 Obstetrical terms (*see also* Female reproductive system)
 diagnostic, 558–561
 diagnostic tests and procedures, 561–563
 drug classifications, 563
 symptomatic, 558, 559
 therapeutic, 563
 Obstetrics, 536
 Obstetrics and Gynecology (OB/GYN), 45
 Obstructive lung disorder, 275
 Occipital lobe, 314
 Occlusion, 203, 203
 Occult blood, in urine, 492
 Occupational history, 56
 OCD (obsessive-compulsive disorder), 335
 O.D. (Doctor of Optometry), 47
 Olfactory sense, 2
 Oligodendroglia, 312, 313
 Oligomenorrhea, 540
 Oligo-ovulation, 540
 Oligospermia, 512
 Oliguria, 487
 Omentum, 440, 443
 Omeprazole, 600
 Omnicef, 600
 Oncology, 45
 Onychia, 118
 Oophorectomy, 554
 Oophoritis, 543
 Open fracture, 163, 164
 Open reduction, internal fixation (ORIF), 169, 171
 Operative reports, 64, 76, 140–143, 142, 187–189, 189, 436, 508
 Operative suffixes, 27
 Operative terms
 blood and lymph system, 253–254
 breasts (mammary glands), 555–556
 cardiovascular system, 215–218
 ear, 423
 endocrine system, 370
 eye, 397–400
 female reproductive system
 gynecological, 551–556
 obstetrical, 563
 gastrointestinal system, 459–460
 male reproductive system, 518–520
 musculoskeletal system, 169–170, 171
 urinary system, 492–495
 Ophthalmic solution, antibiotic, 402
 Ophthalmology, 46
 Ophthalmoscopy, 396, 397
 Optic disk (disc), 387, 388, 390
 Optic nerve, 387, 388
 Optometrist, 47
 Oral cavity, 441, 441
 Oral contraceptive pill (birth control pill), 557
 Orchidectomy, 518
 Orchiectomy, 518
 Orchiopexy, 519
 Orchioplasty, 519
 Orders, physician's, 63, 67–70, 383
 Organ of Corti, 416, 417
 Oropharynx, 271, 272
 Ortho Evra, 600
 Ortho Novum, 600
 Orthopedic surgery, 46
 Orthosis, 172, 173
 Orthotopic bladder (neobladder), 494–495
 Ortho Tri-Cyclen, 600
 Os, cervical, 537, 538
 Ossicles, auditory, 416, 417
 Ostealgia, 159
 Osteoarthritis (OA), 160, 160
 Osteodynia, 159
 Osteoma, 163
 Osteomalacia, 163
 Osteomyelitis, 165
 Osteoplasty, 169
 Osteoporosis, 165, 165
 Osteosarcoma, 163
 Osteotomy, 170
 Otagia, 418
 Otitis externa, 418, 419
 Otitis media, 419, 420
 Otodynia, 418
 Otolaryngology, 46
 Otoplasty, 423

- Otorrhagia, 418
 Otorrhea, 418
 Otosclerosis, 419
 Otoscopy, 422–423, 423
 pneumatic, 420
 pneumonic, 423
 Oval window, 416, 417
 Ovarian cystectomy, 554
 Ovaries, 359, 360, 361, 537
 Oxycodone/acetaminophen, 600
 OxyContin, 600
 Oxytocin, 361, 363, 563
- P**
- Pacemaker, 219, 220
 PaCO₂, 280
 Palate, 271, 272, 440, 441
 Palpebra (eyelid), 388, 389
 Palpitation, 204
 Palsy, cerebral, 320
 Pancreas
 diagnostic terms, 365–366
 endocrine (islets of Langerhans), 360, 361, 362
 exocrine, 440, 443
 Pancreatectomy, 370, 460
 Pancreatitis, 366, 452
 Pancytopenia, 247
 Panic disorder, 334
 PaO₂, 280
 Papanicolaou (Pap) smear, 548
 Papilla, mammary (nipple), 539, 547
 Papules, 111, 112, 113
 Para, 558
 Paracentesis, 459
 Paralysis, 319, 324
 Paranoid schizophrenia, 336
 Paraplegia, 324
 Parasympathetic nervous system, 318
 Parathyroidectomy, 370
 Parathyroid glands, 360, 361, 362
 diagnostic terms, 366
 Parathyroid hormone (PTH), 361, 362
 Parenchyma, 273
 Parenteral administration, 89, 90
 Paresthesia, 320
 Parietal lobe, 313, 314
 Parietal pericardium, 195
 Parkinson disease, 324
 Paronychia, 119, 119
 Parotitis (parotiditis), 447
 Parovarian cyst, 543
 Partial seizures, 322
 Partial thromboplastin time (PTT), 253
 Patanol, 600
 Patches, skin, 111, 112, 113
 Patch test, 121
 Patella, 154
 Patent ductus arteriosus (PDA), 207, 208
 Pathology, 46
 Pathology reports, 64, 77
 Paxil, 600
 PBH (benign prostatic hyperplasia/hypertrophy), 514, 517
 PDA (patent ductus arteriosus), 207, 208
 PE (pulmonary embolism), 278, 282, 284
 Peak expiratory flow rate (PEFR), 283
 Peak flow (PF), 283
 Pediatrics, 46
 Pediculosis capitis (head lice), 119, 120
 Pediculosis pubis (crabs), 119, 120
 PEFR (peak expiratory flow rate), 283
 Pelvic adhesions, 543
 Pelvic floor relaxation, 543, 544
 Pelvic inflammatory disease (PID), 543
 Pelvic sonography, 550, 551
 Pelvimetry, 561
 Pelvis, renal, 483, 485
 Penicillin VK, 600
 Penis, 510, 511
 Peptic ulcer disease (PUD), 447, 448
 Percocet, 600
 Percutaneous transluminal coronary angioplasty (PTCA), 196, 218
 Perfusion deficit, 204
 Pericardial cavity, 195
 Pericarditis, 209
 Pericardium, 195
 Perilymph, 416, 418
 Perineum
 female, 537, 538
 male, 511, 512
 Periosteum, 153
 Peripheral nervous system (PNS), 316–318, 317
 Peritoneal cavity, 440, 443
 Peritoneal dialysis, 496
 Peritoneoscopy, 454
 Peritoneum, 440, 443
 Peritonitis, 451
 Pernicious anemia, 248, 248
 PERRLA, 57
 Persecutory delusions, 333
 Personal commitment, 1
 PET (positron emission tomography), 328, 328
 of heart, 212
 Petechia(e), 113, 114
 Petit mal seizures, 322
 Peyronie disease, 514, 514
 PF (peak flow), 283
 PFT (pulmonary function testing), 282, 283
 pH, 280, 490
 Phacoemulsification, 400
 Pharmaceutical abbreviations and symbols, 88–90
 Pharyngitis, 277
 Pharynx, 271, 272, 440, 442
 Phenobarbital, 600
 Phenytoin, 600
 Phimosis, 514, 515
 Phlebitis, 209
 Phlebotomy, 253
 Phobia, 335
 Phonetic system, 18
 Phoropter, 396
 Photophobia, 390
 Psychiatry, rehabilitation, 46
 Physical examination, 57 (*see also* History and physical)
 cardiovascular, 235–236
 ear, 435
 eye, 414–415
 gynecological, 575–576, 576
 nervous system, 352–353
 obstetrical, 580
 preoperative, 66
 pulmonary, 301–302
 respiratory, 282, 306, 307, 309
 Physical medicine, 46
 Physical therapy (PT), 172
 Physicians, 40–42
 Doctor of Medicine (M.D.), 41
 Doctor of Osteopathic Medicine (D.O.), 41–42
 specialty fields and scope of practice, 44–47
 Physician's orders, 63, 67–70, 383
 Physician's progress notes, 63, 75
 PID (pelvic inflammatory disease), 543
 Pigmentation, skin, 115
 Pineal body, 360, 361
 Pineal gland, 362
 Pinna (auricle), 416, 417
 Pituitary dwarfism, 366
 Pituitary gigantism, 367
 Pituitary gland, 360, 361
 anterior (adenohypophysis), 360, 361, 362
 diagnostic terms, 366
 posterior (neurohypophysis), 360, 361, 363
 Placenta, 539, 540
 Placenta previa, 561, 561
 Plan
 initial, 60
 treatment, 57
 Planes of body, 155, 156
 Plantar flexion, 158
 Plasma, 242
 Plasmapheresis, 254
 Plastic surgery, 46
 Platelet count (PLT), 252
 Platelets, 243, 244
 Plavix, 600
 Plegia, 324
 Plendil, 600
 Pleura, 271, 273
 Pleural cavity, 271, 273
 Pleural effusion, 277, 278
 Pleurisy, 277
 Pleuritis, 277
 Plural and singular forms, 19
 PMN (polymorphonuclear leukocyte), 243, 244
 Pneumatic otoscopy, 420
 Pneumoconiosis, 275, 278
Pneumocystis carinii, 278
 Pneumocystis pneumonia, 278, 279
 Pneumothorax, 278
 Pneumectomy, 285
 Pneumonic otoscopy, 423
 Pneumonitis, 278
 Pneumothorax, 278, 279
 PNS (peripheral nervous system), 316–318, 317
 Podiatry, 47
 Poikilocytosis, 247
 Polarization, 202
 Poliomyelitis, 324
 Polycystic kidney disease, adult (APKD), 487
 Polycythemia, 249

- Polydipsia, 364
 Polyhydramnios, 558
 Polymastia, 547
 Polymorphonuclear (PMN) leukocytes, 243, 244
 Polyneuritis, 325
 Polypectomy, 460
 Polyposis, 449, 453
 Polyps, 277, 449, 453
 Polysomnography (PSG), 282, 326, 327, 327
 Polythelia, 547
 Polyuria, 364, 487
 Positional terms, 155–157
 Position/direction, prefixes of, 20–21
 Positron emission tomography (PET), 328, 328
 of heart, 212
 Posterior chamber, of eye, 390
 Posterior (dorsal) direction, 155
 Posterior pituitary gland (neurohypophysis), 360, 361, 363
 Postprandial blood sugar (PPBS), 369
 Posttraumatic stress disorder (PTSD), 335
 Potassium chloride, 600
 PPBS (postprandial blood sugar), 369
 Practice exercises
 answers to, 604–626
 basic term components, 30–37
 blood and lymph system, 256–263
 cardiovascular system, 222–228
 ear, 426–429
 endocrine system, 372–377
 eye, 403–408
 female reproductive system, 564–571
 fields of medical practice, 50–53
 gastrointestinal tract, 462–470
 getting started, 7–8
 integumentary system, 125–133
 male reproductive system, 521–526
 medical record, 97–101
 musculoskeletal system, 175–184
 nervous system and psychiatric terms, 338–346
 respiratory system, 289–296
 urinary system, 497–503
 Pravachol, 600
 Prednisone, 601
 Preeclampsia, 560
 Prefixes
 common, 20–22
 defined, 10
 general, 22
 glossary, 585–590
 of negation, 20
 of position/direction, 20–21
 of quantity or measurement, 21–22
 of time, 22
 Pregnancy (*see also* *Obstetrical entries*)
 ectopic, 560
 Pregnancy-induced hypertension (PIH), 560
 Pregnancy test, 561
 Premarin, 601
 Premature ventricular contraction (PVC), 205, 206
 Prempro, 601
 Preoperative history and physical, 65–66
 Preoperative physician's orders, 67–70
 Prepuce, 510, 511
 Presbycusis, 420
 Presbycusis, 420
 Presbyopia, 391
 Prescriptions, 90–94, 91
 Prevacid, 601
 Preventive medicine, 46
 Prilosec, 601
 Primary accent, 18
 Prime time, 1–2
 Primigravida, 558, 559
 Primipara, 558
 Problem list, 60
 Problem-oriented medical record (POMR), 60–63, 60
 Processes
 ciliary, 388
 mastoid, 417
 Procrastination, 2
 Proctitis, 449, 453
 Proctoplasty, 460
 Progesterone, 361
 Progress notes, 229, 264, 267, 347–348, 430, 530–531, 572
 physician's, 63, 75
 SOAP format for, 61–62
 Prolactin (lactogenic hormone), 361, 363
 Promethazine, 601
 Promethazine/codeine, 601
 Pronation, 158
 Prone position, 157
 Pronunciation, 17–18
 phonetic system, 18
 Propoxyphene/acetaminophen, 601
 Propranolol, 601
 Proscar, 601
 Prostate
 endorectal (transrectal) sonogram of, 518
 transurethral resection of (TURP), 519
 Prostate biopsy, 517
 Prostate cancer, 514
 Prostatectomy, 519
 Prostate gland, 512
 Prostate-specific antigen (PSA) test, 518
 Prostatitis, 514
 Prosthesis
 auditory, 424
 limb, 172, 173
 Proteinuria, 486
 Prothrombin, 253
 Prothrombin time (PT), 253
 Protonix, 601
 Proximal aspect, 157
 Pruritus (itching), 115
 PSA (prostate-specific antigen) test, 518
 Pseudophakia, 394
 PSG (polysomnography), 326, 327
 Psoriasis, 119, 120
 Psychiatric terms, 333–337
 drug classifications, 337
 symptomatic, 333
 therapeutic, 336–337
 Psychiatry, 46
 Psychologist, 48
 Psychosis, 333
 Psychotherapy, 337
 Psychotic disorders, 336
 Psychotropic agents, 337
 PT (prothrombin time), 253
 PTCA (percutaneous transluminal coronary angioplasty), 196, 218
 Pterygium, 394, 395
 PTH (parathyroid hormone), 361, 362
 Ptosis, 391
 PTSD (posttraumatic stress disorder), 335
 PTT (partial thromboplastin time), 253
 PUD (peptic ulcer disease), 447, 448
 Pulmicort, 601
 Pulmonary angiography, 81, 84, 169, 284, 284
 Pulmonary artery, 195, 198
 Pulmonary circulation, 195, 199
 Pulmonary consultation report, 300–302
 Pulmonary edema, 275
 Pulmonary embolism (PE), 278, 282, 284
 Pulmonary function testing (PFT), 282, 283
 Pulmonary infiltrate, 275
 Pulmonary semilunar valve, 197
 Pulmonary tuberculosis (TB), 278, 280
 Pulse oximetry, 284, 284
 Pupil, of eye, 387, 388, 390
 Purkinje fibers, 202, 202
 Purpuric lesions, 113, 114
 Pus (suppuration), 115
 Pustules, 111, 112, 113
 PVC (premature ventricular contraction), 205, 206
 Pyelogram, retrograde (RP), 489
 Pyelonephritis, 487
 Pyeloplasty, 493
 Pyloric sphincter, 440, 442
 Pyloric stenosis, 447
 Pyothorax, 277
 Pyuria, 487, 487
Q
 Quadriplegia, 324
 Quantity, prefixes of, 21–22
R
 Radiation therapy, 123, 332, 332, 556
 Radical mastectomy, 555
 modified, 555–556
 Radiography (x-rays), 47, 81, 82 (*see also* *X-rays and specific modalities*)
 Radioiodine therapy, 370
 Radionuclide imaging (nuclear medicine), 45, 81, 83, 84, 168, 282, 454
 of heart, 212
 SPECT brain scan, 327
 thyroid uptake, 369, 370, 380
 Radiosurgery, stereotactic (stereotaxic), 332
 Rales, 274
 Range of motion (ROM), 158
 Ranitidine hydrochloride, 601
 Rashes, 115
 RBC (red blood count), 250
 RBCs (red blood cells, erythrocytes), 242, 248
 Recommendation (treatment plan), 57
 Rectal ampulla, 440, 442
 Rectal exam, digital (DRE), 517

- Rectocele, 543, 544
 Rectovaginal fistula, 542, 543
 Rectum, 440, 442
 Recumbent position, 157
 Red blood cells (RBCs, erythrocytes), 242, 248
 Red blood count (RBC), 250
 Red cell morphology, 252
 Reduction, of fractures, 171, 171
 Reduction mammoplasty, 556
 Reflex sympathetic dystrophy (RSD), 325
 Reflex testing, 329, 329
 Reflux, gastrointestinal (GERD), 447
 Refraction, 396
 of light, 387
 Refractive errors, 391
 Regulations, for medical record, 96
 Rehabilitation physiatry, 46
 Relaxation, 2
 Remeron, 601
 Renal angiogram, 489
 Renal artery, 483, 485
 Renal (kidney) biopsy, 489
 Renal (kidney) dialysis, 495
 Renal medulla, 483, 485
 Renal pelvis, 483, 485
 Renal transplantation, 493, 494
 Renal tubules, 483, 485
 Repolarization, 202
 Reports
 ancillary, 63
 anesthesiologist's, 64
 consultation, 584
 consultation, 63, 300–302, 479–481
 endoscopy laboratory, 475
 laboratory, 63, 71–72
 operative, 64, 76, 142, 189, 436, 508
 pathology, 64, 77
 urinalysis, 491
 Reproductive system
 female, 535–584 (*see also* Female reproductive system)
 male, 509–534 (*see also* Male reproductive system)
 Resectoscope, 492
 Respiration (breathing), 271, 272
 Cheyne-Stokes, 274
 Respiratory system, 270–309
 abbreviations/acronyms, 288
 anatomical terms, 272–273
 combining forms, 269–270
 diagnostic terms, 276–280
 diagnostic tests and procedures, 280–284
 drug classifications, 288
 medical record analyses, 297–309
 overview, 270–272
 practice exercises, 289–296
 symptomatic terms, 273–276
 Restrictive lung disorder, 275
 Resuscitation, cardiopulmonary (CPR), 286
 Reticulocytosis, 247
 Retina, 387, 388, 390
 Retinal detachment, 394, 397
 Retinitis, 394
 Retinopathy, diabetic, 392, 394
 Retroflexion, of uterus, 541, 541
 Retrograde pyelogram (RP), 489
 Retroversion, of uterus (tipped uterus), 541
 Review of systems (ROS), 56
 Rhabdomyoma, 163
 Rhabdomyosarcoma, 163
 Rheumatic heart disease, 209
 Rheumatology, 45
 Rh factor, 249, 560
 Rh immune globulin, 563
 Rhinocort Aqua, 601
 Rhinorrhea, 275
 Rh positive/negative, 249
 Rickets, 163
 Right ventricular failure (cor pulmonale), 207
 Rigor/rigidity, 159
 Ringworm (tinea corporis), 119
 Rinne test, 422
 Risperdal, 601
 Rod of Aesculapius (caduceus), 43, 43
 Rods, 390
 ROM (range of motion), 158
 Root, of term, 10
 Rotation, 148, 157
 Routes of administration, 89–90
 Roxicet, 601
 RSD (reflex sympathetic dystrophy), 325
 Rubella, 117
 Rubeola, 117
 Rule out (R/O), 57
 Rupture, of uterine membranes, 558
 Rx symbol, 94
- S**
- Sac, lacrimal, 389
 Saccular aneurysm, 204
 Saccule, 418
 SAD (seasonal affective disorder), 334
 Sagittal plane, 155, 156
 Salivary glands, 440, 441
 Salpingectomy, 554, 554
 Salpingitis, 543
 Salpingostomy, 554
 Salpingotomy, 554
 Scabies, 119
 Scala vestibuli, 416, 418
 Scales, skin, 113, 114
 Schizoaffective disorder, 336
 Schizophrenia, 336
 Schlemm, canal of, 388
 Sciatica, 319
 Sclera, of eye, 387, 388, 390
 Scleral buckling, 400
 Scleritis, 395
 Sclerotherapy, 123
 Scoliosis, 165, 166
 Scotoma, 391
 Scout film, 489
 Scratch test, 121
 Seasonal affective disorder (SAD), 334
 Sebaceous glands, 109, 110
 Seborrhea, 119
 Seborrheic dermatitis, 116
 Seborrheic keratoses, 118, 118
 Secondary hypertension, 208
 Sedatives, 334
 Seizures, 319, 322
- Semen analysis, 518
 Semicircular canals, 418
 Seminoma testicular cancer, 515
 Sensorineural hearing loss, 420
 Sensory deficit, 318
 Sensory nerves, 317
 Sentinel node breast biopsy, 547
 Septicemia, 249
 Septum (septa)
 interatrial, 193, 194, 195
 interventricular, 193, 194, 195
 Sequestrum, 162
 Seroquel, 602
 Serotonin, 361, 362
 Serum, of blood, 242
 Sesamoid bones, 147
 Sexually transmitted diseases (STDs), 451
 female reproductive system, 544–546
 male reproductive system, 516–517
 Shingles (herpes zoster), 117, 322, 323
 Short bones, 147
 Sialoadenitis, 447
 Sigmoid colon, 440, 442
 Sign, Babinski (Babinski reflex), 329
 Simple fracture, 163
 Simple mastectomy, 555
 Single photon emission computed tomography (SPECT), 327
 Singulair, 602
 Singular and plural forms, 19
 Sinister, as term, 93
 Sinoatrial node (SA node), 201, 202
 Sinuses, 271, 272
 Sinusitis, 278
 Skelaxin, 602
 Skeletal muscle, 151, 152, 154
 Skeleton, 146, 147 (*see also* Bone[s])
 appendicular, 146
 axial, 146
 Skin (*see also* Integumentary system)
 Skin cancer, 109
 Skin grafting, 123
 Skin pigmentation, 115
 Skin plaque, 111, 112, 113
 Skull (cranium), 149
 SLE (systemic lupus erythematosus), 118
 Sleep apnea, 279, 286, 325
 Slit-lamp biomicroscopy, 398, 398
 Small bowel series, 455
 Small intestine, 440, 442
 Smooth muscle, 152, 154
 Snellen chart, 396
 SOAP notes, 61–62, 229, 264, 267, 430, 530–531, 572
 medical record analyses, 105–106, 132–136
 Social history, 56
 Solar keratoses, 118, 118
 Solid/semisolid drug forms, 89
 Solutions, antibiotic ophthalmic, 402
 Soma, of neuron, 312, 313
 Sonogram
 endorectal (transrectal) of prostate, 518
 prostatic, 534
 Sonogram (ultrasound), 84, 86
 abdominal, 489
 endovaginal, 562
 obstetrical, 562

- Sonogram (ultrasound), (*continued*)
 pelvic, 550, 551
 transcranial, 329, 330
 transvaginal, 562
- Sonography
 Doppler, 215
 intravascular, 215
- Sonography (ultrasound), 84, 86, 169
 abdominal, 456, 458
 cardiac, 213, 215
 endocrine system, 369
 endoscopic, 456
 of eye, 397
- Spasm, 160
- Spastic paralysis, 319
- Spastic/spasticity, 160
- Specialty boards, 42–43
- Specific gravity (SpGr), of urine, 490
- SPECT (single photon emission computed tomography), 327
- Spelling, 16–17
- Sperm (spermatozoon), 510, 511
- Spermatic cord, 511, 512
- Spermatocele, 514
- Spermicidals, 557
- Sphincter
 cardiac, 440, 442
 pyloric, 440, 442
- Spider angioma, 113, 114
- Spina bifida, 325, 325
- Spinal cord, 316
- Spinal curvatures, 165, 166
- Spinal nerves, 317
- Spinal tap (lumbar puncture), 328
- Spiral fracture, 164
- Spirometry, 282, 283
 incentive, 286, 287
- Spirolactone, 602
- Spleen, 246
- Splenectomy, 254
- Splenomegaly, 248
- Splinting, of fracture, 171, 172
- Spondylolisthesis, 167, 167
- Spondylosis, 167
- Spondylosyndesis, 170, 331, 331
- Spontaneous abortion (miscarriage), 558
- Sprain, 167
- Sputum, 274
- Squamous cell carcinoma (SCC), of skin, 118
- Staff of Mercury (caduceus), 43, 43
- Stapedectomy, 423
- Stapes, 416, 417
- Statins, 221
- Steatorrhea, 446
- Stents, 218, 493, 494
- Stereotactic breast biopsy, 547
- Stereotactic (stereotaxic) frame, 332, 332
- Stereotactic (stereotaxic) radio-surgery, 332
- Steroid hormones, 359, 361
- Stethoscope, 282
- Stomach, 440, 442
- Stomatitis, 447
- Stool culture and sensitivity, 458
- Stool occult blood study, 458
- Strabismus (crossed eyes), 395, 396
- Strangulated hernia, 449
- Strattera, 602
- Stress echocardiogram (stress ECHO), 213
- Stress electrocardiogram, 211, 212
- Stress urinary incontinence (SUS), 486
- Striated (skeletal) muscle, 151, 152, 154
- Stridor, 274
- Stroke (cerebrovascular accident, CVA), 320, 321
- Stroke volume (SV), 213
- Sty (hordeolum), 392, 394
- Subclavian vein, 200
- Subcutaneous administration (Sub-Q), 89, 90
- Subcutaneous tissue, 109, 110, 111
- Subjective information, 55–56
- Sublingual administration, 89, 447
- Subluxation, 167, 168
- Substance abuse disorders, 336
- Sudoriferous glands, 109, 110
- Suffixes
 common, 25–29t
 defined, 10
 diagnostic, 26–27
 with double rr's, 29
 general, 27–28
 glossary, 585–590
 operative, 27
 symptomatic, 26
- Sulcus (sulci), 314
- Superior-anterior (SA), 155
- Superior (cephalic) direction, 155
- Superior vena cava, 200
- Supernumerary nipples, 547
- Supination, 158
- Supine position, 157, 157
- Suppositories, 89
- Suppuration (pus), 115
- Suprapubic catheter, 496
- Suprarenal (adrenal) glands, 359, 360, 361
- Surgeon's operative reports, 76, 142, 189
- Surgery, 47 (*see also* Operative terms and specific procedures)
 neuroendovascular, 331
 thoracic, 47
- Surgical suffixes, 27
- SUS (stress urinary incontinence), 486
- Suture, 122
 definitions, 120
- SV (stroke volume), 213
- Symbols, 592–593 (*see also* Abbreviations)
 pharmaceutical, 88–90
 Rx, 94
- Sympathetic nervous system, 318
- Symptomatic suffixes, 26
- Symptomatic terms
 blood and lymph systems, 247–248
 cardiovascular system, 203–204
 ear, 418
 endocrine system, 363–364
 eye, 390–391
 female reproductive system
 gynecological, 540
 obstetrical, 558, 559
 gastrointestinal system, 445–447
 integumentary system, 111–115
 male reproductive system, 512
 musculoskeletal system, 159–160
- Symptoms (Sx), 56
- Synapses, 312, 313
- Syncope (fainting), 319
- Synovial fluid, 153
- Synovial membranes, 153
- Synthroid, 602
- Syphilis, 516, 544
- Syphilitic chancre, 516
- Systemic circulation, 199
- Systemic lupus erythematosus (SLE), 118
- Systems review (SR), 56
- Systole, 199
- ## T
- T₃ (triiodothyronine), 361, 363
- T₄ (thyroxine), 361, 363
- Tachycardia, 205, 206
- Tachypnea, 273, 274
- Tactile stimulation, 319
- TEE (transesophageal echocardiogram), 215
- Teeth, 440, 441
- Telangiectasia, 114
- Temazepam, 602
- Temporal lobe, 314
- Tendinitis (tenonitis), 167
- Tendons, 155
- Tenotomy, 170
- Terazosin, 602
- Term components, 9, 9–37
 additional roots, 10
 analysis of, 9–11
 combining forms, 23–25
 combining vowels/combining forms, 10
 forming words from, 14–16
 prefixes, 10, 20–22
 quick review, 11
 root and suffix, 10
 rules for using, 11–12
 structure analysis, 13–14
 suffixes, 25–29t
 in term formation, 14–16
- Term formation, 14–16
- Terms
 acceptable formations, 17
 blood pressure, 199, 201
 common prefixes, 20–22
 forming from components, 14–16
 pronunciation, 17–18
 singular and plural forms, 19
 spelling, 16–17
- Testicular biopsy, 517
- Testis (testicle), 360, 361, 510, 511
- Testosterone, 361
- Tests and procedures, diagnostic (*see* Diagnostic tests and procedures)
- Tetany, 160
- Tetralogy of Fallot, 207
- Thalamus (diencephalon), 314
- Therapeutic terms
 blood and lymph system, 254–255
 cardiovascular system, 218–221
 ear, 424
 endocrine system, 370–371
 eye, 401–402
 female reproductive system

- gynecological, 556–557
 obstetrical, 563
 gastrointestinal system, 461
 integumentary system, 123–124
 psychiatric, 336–337
 urinary system, 495–496
- Thoracentesis, 285, 285
 Thoracic cavity, 156
 Thoracic duct, 246
 Thoracic surgery, 47
 Thoracoplasty, 285
 Thoracoscopy, 285
 Thoracostomy, 285, 285
 Thoracotomy, 285
 Thought disorder, 333
 Threatened abortion, 559
 Thrombocytopenia, 249
 Thrombolytic therapy, 219, 221, 332
 Thrombophlebitis, 209
 Thromboplastin, 253
 Thrombus, 203, 203
 Thymectomy, 254, 370
 Thymosin, 361, 363
 Thymus gland, 246, 359, 360, 361, 363
 Thyroidectomy, 370
 Thyroid function study, 369
 Thyroid gland, 359, 360, 361, 363, 367–368
 Thyroid-stimulating hormone (TSH), 361, 362
 Thyroid uptake and imaging study, 369, 370, 370, 380
 Thyrotoxicosis, 367, 368
 Thyroxine (T₄), 361, 363
 TIA (transient ischemic attack), 320, 321, 322
 Tidal volume (TV, V_T), 283
 Time
 abbreviations for, 93
 prefixes of, 22
 Time and date recording, 95, 95
 Time management, 1–2
 Timolol, 602
 Tinea, 119
 Tinnitus, 418
 Tipped uterus (uterine retroversion), 541
 Tissue, subcutaneous, 109, 111, 118
 Tissue plasminogen activator (tPA, TPA), 221, 332
 TMR (transmyocardial revascularization), 217
 Tobradex, 602
 Tocolytic agents, 563
 Tomography (*see also* Computed tomography [CT])
 positron emission (PET), 212, 328
 Tongue, 440, 441
 Tongue-tie (ankyloglossia), 447
 Tonic-clonic epilepsy, 322
 Tonometry/tonometer, 399, 399
 Tonsillectomy, 285
 Tonsillectomy and adenectomy, 285
 Tonsillitis, 279
 Tonsils, 271, 272
 Topamax, 602
 Topical administration, 89
 Toprol-XL, 602
 Total hysterectomy, 553
 Toxemia of pregnancy (eclampsia), 560
 TPA (tissue plasminogen activator, tPA), 221, 332
 Trabecular meshwork, 390
 Trabeculectomy, 400
 Trachea (windpipe), 271, 272
 Tracheostomy, 285, 286
 Tracheotomy, 285, 286
 Traction (Tx), on fracture, 171, 172
 Trade (brand) drug name, 90
 Transabdominal sonogram, 550, 551
 Transcranial sonogram, 329, 330
 Transdermal administration, 89
 Transesophageal echocardiogram (TEE), 215
 Transformation zone, large loop excision of (LLETZ), 553
 Transient ischemic attack (TIA), 320, 321, 322
 Transmyocardial revascularization (TMR), 217
 Transplantation
 bone marrow, 253
 kidney (renal), 493, 494
 Transrectal (endorectal) sonogram, of prostate, 518
 Transurethral resection, of prostate (TURP), 519
 Transvaginal sonogram (ultrasound), 562
 Transverse colon, 440, 442
 Transverse fracture, 164
 Transverse plane, 155, 156
 Trazodone, 602
 Treatment plan, 57
 Tremor, 160
 Triamcinolone, 602
 Triamterene/hydrochlorothiazide (HCTZ), 602
 Trichiasis, 395
Trichomonas vaginitis, 546
 Tricuspid valve, 196, 197
 Triiodothyronine (T₃), 361, 363
 Trimethoprim/sulfamethoxazole, 602
 Trimox, 602
 Trivora-28, 602
 TSH (thyroid-stimulating hormone), 361, 362
 Tubal ligation, 554
 Tubes
 auditory, 416, 417
 eustachian, 416, 417
 uterine (fallopian), 537
 Tubules, renal, 483, 485
 Tumors
 epidermal, 114 (*see also* Neoplasia and specific types)
 fibroid, 542
 skin, 111, 112, 113
 Tunic, of eye, 387, 388
 Tunica externa, 198, 200
 Tunica intima, 198, 200
 Tunica media, 198, 200
 Tuning fork tests, 421, 422
 TURP (transurethral resection of prostate), 519
 Tussionex, 602
 TV (tidal volume), 283
 Tympanic membrane, 417, 420
 Tympanitis, 418
 Tympanometry, 423
 Tympanoplasty, 423
 Tympanostomy, 423
 Tympanum, 416
- U**
 UFE (uterine fibroid embolization), 557
 Ulcerative colitis, 448
 Ulcers
 duodenal, 447, 448
 gastric, 447, 448
 peptic, 447, 448
 skin, 113
 Ultracet, 603
 Ultrasound (*see* Sonogram)
 Ultrasound (sonogram), 169
 endocrine system, 369
 of eye, 397
 Ultraviolet (UV) therapy, 123
 Umbilical hernia, 449
 Umbilical region, 445
 Unipolar disorder, 334
 Upper gastrointestinal endoscopy, 452, 453
 Upper GI series, 455, 456
 Upper respiratory infection (URI), 280
 Urea, 485
 Uremia, 488
 Ureteropelvic junction, 485
 Ureters, 484, 485
 Urethra, 484
 Urethral meatus (canal), 485
 Urethral stenosis, 488
 Urethritis, 488
 Urethrocele, 543, 544
 Urethrocystitis, 488
 Urethrogram, 518
 URI (upper respiratory infection), 280
 Urinalysis (UA), 490, 491
 Urinalysis report, 491
 Urinary bladder, 484, 485
 inflammation of (cystitis), 488
 Urinary catheterization, 496
 Urinary diversion, 493–494
 Urinary retention, 487
 Urinary stones (calculi), 495
 Urinary system, 482–508
 abbreviations/acronyms, 496
 anatomical terms, 484–485
 combining forms, 482–483
 diagnostic terms, 487–488
 diagnostic tests and procedures, 488–494
 drug classifications, 496
 medical record analyses, 504–508
 operative terms, 492–495
 overview, 483–485
 practice exercises, 497–503
 symptomatic terms, 486–487
 therapeutic terms, 495–496
 Urinary tract infection (UTI), 488
 Urination, 484
 Urine, 483, 485
 microscopic findings in, 492, 496, 497
 Urine culture and sensitivity (C & S), 492, 496, 497
 Urine sugar and ketone studies, 369
 Urobilinogen, 492

Urologic endoscopic surgery, 492, 493
 Urology, 47
 Urostomy, continent/noncontinent, 494
 Urticaria (hives), 115
 Usual childhood diseases (UCHD), 56
 Uterine adnexa, 537
 Uterine fibroid embolization (UFE), 557
 Uterine fibroids, 542
 Uterine fundus, 536–537
 Uterine prolapse, 543
 Uterine (fallopian) tubes, 537
 Uterus, 536–537
 displacement of, 541
 UTI (urinary tract infection), 488
 Utricle, 418
 Uvula, 272, 440, 441

V

Vagina, 537, 538
 Vaginal fistula, 542
 Vaginal hysterectomy, 553
 Vaginal introitus, 537, 538
 Vaginitis, 546
 atrophic, 546
 Vaginosis, 546
 Valtrex, 603
 Valves, heart, 193, 194, 195, 196, 197
 Valvuloplasty, 217
 Varicella (chickenpox), 117
 Varices, esophageal, 447, 453
 Varicocele, 513, 515
 Varicose veins, 209, 210
 Vascular lesions, of skin, 113, 114
 Vas deferens, 510, 511
 Vasectomy, 519, 520
 Vasoconstrictors, 221, 255
 Vasodilators, 221, 255
 Vasopressin (antidiuretic hormone, ADH), 363
 Vasovasostomy, 520
 VC (vital capacity), 283
 VCU, VCUG (voiding cystourethrogram), 489
 Vegetations, valvular, 204, 205
 Veins, 199, 200
 Vena cava, 200

Venereal warts (condylomata acuminata), 517, 545
 Venipuncture, 253
 Venogram, 213
 Venous circulation, 200
 Ventilation (breathing) (*see also* Respiratory system)
 mechanical, 286, 287
 normal, 271, 272
 Ventral (anterior) direction, 155
 Ventricles
 of brain, 314, 316
 of heart, 193, 194, 195
 Ventricular failure
 left (congestive heart failure), 207
 right (cor pulmonale), 207
 Ventricular septal defect (VSD), 207
 Ventriculogram, 213
 Venules, 199
 Verapamil, 603
 Vermiform appendix, 440, 442
 Verruca (wart), 114, 115
 Vertebrae, 150
 Vertebral lamina, 330
 Vertebrobasilar TIA, 321, 322
 Vertigo, 418
 Vesicles
 seminal, 510, 511
 skin, 111, 112, 113
 Vesicovaginal fistula, 542, 543
 Vessels
 blood, 197, 197, 198, 199
 lymph, 246
 Vestibule, of ear, 418
 Viagra, 603
 Viral diseases
 sexually transmitted, 516–517, 544–545
 of skin, 117
 Visceral pericardium, 195
 Visual acuity, 396
 Visual sense, 2
 Vital capacity (VC), 283
 Vital signs record, 74
 Vitiligo, 119
 Vitreous, 390

Voiding cystourethrogram (VCU, VCUG), 489
 Volvulus, 449, 451
 Vowels, combining, 10, 11–12
 VSD (ventricular septal defect), 207
 V_T, 283
 Vulva, 537, 538

W

Warfarin, 603
 Warts, genital (venereal warts, condylomata acuminata), 517, 545
 Warts (verrucae), 114, 115
 WBC (white blood count), 250
 Weber test, 422
 Wellbutrin SR, 603
 Wheals, skin, 111, 112, 113
 Wheezes, 274
 White blood count (WBC), 250
 Windpipe (trachea), 271, 272
 Word structure analysis, 13–14

X

Xalatan, 603
 Xenografts, 123
 X-ray report analyses, 190–191
 X-rays, 81, 82
 cardiovascular, 213, 214
 chest (CXR), 284, 284
 gastrointestinal tract, 455, 455, 456
 gynecological/pelvic, 550
 musculoskeletal system, 168–169
 nervous system, 329

Y

Yasmin 28, 603

Z

Zeis, glands of, 388, 389
 Zetia, 603
 Zithromax, 603
 Zocor, 603
 Zolof, 603
 Zyprexa, 603
 Zyrtec, 603

Medical Terminology: The Language of Health Care

Second Edition

Marjorie Canfield Willis

QUICK STUDY REFERENCE

Term Basics

Most medical terms have three basic components: **root**, **suffix**, and **prefix**.

The **root** is the **foundation** or **subject** of the term. All medical terms have one or more roots.

The **suffix** is the term **ending** that modifies and gives essential meaning to the root. All terms have a suffix.

The **prefix** is a term **beginning** used only when needed to further modify the root or roots. Not all medical terms have a prefix.

A **combining vowel** (usually **o** or **i**) connects a root to another root or to a suffix (term ending). A combining vowel is not used if the suffix begins with a vowel, but is retained when the suffix begins with a consonant.

A **combining form** is a **root plus** a combining **vowel**. Remembering combining forms makes it easy to form and spell medical terms.

Most medical terms can be defined by determining the meaning of the **suffix** first, then the **prefix** (if present), then the **root** or **roots**. Consult a good medical dictionary for the meaning of terms that are exceptions to this general rule.

Rules for Forming and Spelling Medical Terms

1 A combining vowel is used to join root to root as well as root to any suffix beginning with a consonant, e.g., *electr/o*/*cardi/o*/*gram*.

2 A combining vowel is *not* used before a suffix that begins with a vowel, e.g., *vas/ectomy*.

3 If the root ends in a vowel and the suffix begins with the same vowel, drop the final vowel from the root and do not use a combining vowel, e.g., *card/itis*.

4 Most often, a combining vowel is inserted between two roots even when the second root begins with a vowel, e.g., *cardi/o*/*esophageal*.

5 Occasionally, when a prefix ends in a vowel and the root begins with a vowel, the final vowel is dropped from the prefix, e.g., *par/enter/al*.

Term Component to English

a-	without
ab-	away from
abdomin/o	abdomen
-ac	pertaining to
acus/o	hearing
acr/o	extremity or topmost
-acusis	hearing condition
ad-	to, toward, or near
aden/o	gland
adip/o	fat
adren/o	adrenal gland
aer/o	air or gas
-al	pertaining to
albumin/o	protein
-algia	pain
allo-	other
alveol/o	alveolus (air sac)
ambi-	both
an-	without
ana-	up, apart
an/o	anus
andr/o	male
angi/o	vessel
ankyl/o	rooked or stiff
ante-	before
anti-	against or opposed to
aort/o	aorta
appendic/o	appendix
aque/o	water
-ar	pertaining to
-arche	beginning
arteri/o	artery
arthr/o	joint, articulation
articul/o	joint
-ary	pertaining to
-ase	enzyme
-asthenia	weakness
ather/o	fatty paste
-ation	process
atri/o	atrium
audi/o	hearing
aur/i	ear
auto-	self
bacteri/o	bacteria
balan/o	glans penis
bi-	two or both
bil/i	bile
-blast	germ or bud
blast/o	germ or bud
blephar/o	eyelid
brachi/o	arm
brady-	slow
bronch/o	bronchus (airway)
bronchi/o	bronchus (airway)
bronchiol/o	bronchiole (little airway)
bucc/o	cheek
capn/o	carbon dioxide
carb/o	carbon dioxide
carcin/o	cancer

cardi/o	heart
cata-	down
-cele	pouching or hernia
celi/o	abdomen
-centesis	puncture for aspiration
cephal/o	head
cerebell/o	cerebellum (little brain)
cerebr/o	cerebrum (largest part of brain)
cerumin/o	wax
cervic/o	neck or cervix
cheil/o	lip
chir/o	hand
chol/e	bile
chondr/o	cartilage (gristle)
chrom/o	color
chromat/o	color
chyl/o	juice
circum-	around
cis/o	cut
col/o	colon
colon/o	colon
colp/o	vagina (sheath)
con-	together or with
conjunctiv/o	conjunctiva (to join together)
contra-	against or opposed to
corne/o	cornea
coron/o	circle or crown
cost/o	rib
crani/o	skull
crin/o	to secrete
cutane/o	skin
cyan/o	blue
cyst/o	bladder or sac
cyt/o	cell
dacry/o	tear
dactyl/o	digit (finger or toe)
de-	from, down, or not
dent/i	teeth
derm/o	skin
dermat/o	skin
-desis	binding
dextr/o	right, or on the right side
dia-	across or through
diaphor/o	profuse sweat
dips/o	thirst
dis-	separate from or apart
doch/o	duct
duoden/o	duodenum
-dynia	pain
dys-	painful, difficult, or faulty
-e	noun marker
e-	out or away
-eal	pertaining to
ec-	out or away
-ectasis	expansion or dilation
ecto-	outside
-ectomy	excision (removal)
-emesis	vomiting

-emia	blood condition
en-	within
encephal/o	entire brain
endo-	within
enter/o	small intestine
epi-	upon
epididym/o	epididymis
episi/o	vulva (covering)
erythr/o	red
esophag/o	esophagus
esthesi/o	sensation
eu-	good or normal
ex-	out or away
exo-	outside
extra-	outside
fasci/o	fascia (a band)
femor/o	femur
fibr/o	fiber
gangli/o	ganglion (knot)
gastr/o	stomach
-gen	origin or production
gen/o	origin or production
ger/o	old age
-genesis	origin or production
gingiv/o	gums
gli/o	glue
glomerul/o	glomerulus (little ball)
gloss/o	tongue
glott/o	opening
gluc/o	sugar
glyc/o	sugar
glycos/o	sugar
gnos/o	knowing
-gram	record
-graph	instrument for recording
-graphy	process of recording
gynec/o	woman
hem/o	blood
hemat/o	blood
hemi-	half
hepat/o, hepatic/o	liver
herni/o	hernia
hetero-	different
hidr/o	sweat
hist/o	tissue
histi/o	tissue
homo-	same
hormon/o	hormone (an urging on)
hydr/o	water
hyper-	above or excessive
hypn/o	sleep
hypo-	below or deficient
-hyster/o	uterus
-ia	condition of
-iasis	formation of or presence of
iatr/o	treatment
-iatrics	treatment
-iatry	treatment
-ic	pertaining to

Term Component to English

-icle	small	myos/o	muscle	-plasty	surgical repair or reconstruction	-stasis	stop or stand
ile/o	ileum	myring/o	eardrum	-plegia	paralysis	steat/o	fat
immun/o	safe	narc/o	stupor, sleep	pleur/o	pleura	sten/o	narrow
infra-	below or under	nas/o	nose	-pnea	breathing	stere/o	three dimensional or solid
inguin/o	groin	nat/i	birth	pneum/o	air or lung	stern/o	sternum (breastbone)
inter-	between	necr/o	death	pneumon/o	air or lung	steth/o	chest
intra-	within	neo-	new	pod/o	foot	stomat/o	mouth
ir/o	iris (colored circle)	neph/r/o	kidney	-poiesis	formation	-stomy	creation of an opening
irid/o	iris (colored circle)	neur/o	nerve	poly-	many	sub-	below or under
-ism	condition of	obstetr/o	midwife	post-	after or behind	super-	above or excessive
iso-	equal, like	ocul/o	eye	pre-	before	supra-	above or excessive
-ist	one who specializes in	-oid	resembling	presby/o	old age	sym-	together or with
-itis	inflammation	-ole	small	pro-	before	syn-	together or with
-ium	structure or tissue	olig/o	few or deficient	proct/o	anus and rectum	tachy-	fast
jejun/o	jejunum (empty)	-oma	tumor	prostat/o	prostate	tax/o	order or coordination
kerat/o	hard or cornea	onych/o	nail	psych/o	mind	ten/o	tendon (to stretch)
ket/o	ketone bodies	oophor/o	ovary	-ptosis	falling or downward displacement	tend/o	tendon (to stretch)
keton/o	ketone bodies	ophthalm/o	eye	pulmon/o	lung	tendin/o	tendon (to stretch)
kinesi/o	movement	-opia	condition of vision	purpur/o	purple	test/o	testis (testicle)
kyph/o	humped	opt/o	eye	py/o	pus	thalam/o	thalamus (a room)
lacrim/o	tear	orch/o	testis (testicle)	pyel/o	basin	therm/o	heat
lact/o	milk	orchi/o	testis (testicle)	pylor/o	pylorus (gatekeeper)	thorac/o	chest
lapar/o	abdomen	orchid/o	testis (testicle)	quadri-	four	thromb/o	clot
laryng/o	larynx (voice box)	or/o	mouth	radi/o	radius (a bone of the forearm); radiation (especially x-ray)	thym/o	mind, thymus gland
lei/o	smooth	orth/o	straight, normal, or correct	re-	again or back	thyr/o, thyroid/o	thyroid gland (shield)
-lepsy	seizure	-osis	condition or increase	rect/o	rectum	-tic	pertaining to
leuc/o	white	oste/o	bone	ren/o	kidney	toc/o	labor or birth
leuk/o	white	ot/o	ear	reticul/o	a net	tom/o	to cut
lex/o	word or phrase	-ous	pertaining to	retin/o	retina	-tomy	incision
lingu/o	tongue	ovari/o	ovary	retro-	backward or behind	ton/o	tone or tension
lip/o	fat	ov/i	egg	rhabd/o	rod shaped or striated (skeletal)	tonsill/o	tonsil (almond)
lith/o	stone or calculus	ov/o	egg	rhin/o	nose	top/o	place
lob/o	lobe (a portion)	ox/o	oxygen	-rrhage	to burst forth	tox/o	poison
-logist	one who specialized in the study or treatment of	pachy-	thick	-rrhagia	to burst forth	toxic/o	poison
-logy	study of	palat/o	palate	-rrhaphy	suture	trache/o	trachea (windpipe)
lord/o	bent	pan-	all	-rrhea	discharge	trans-	across or through
lumb/o	loin (lower back)	pancreat/o	pancreas	-rrhexis	rupture	tri-	three
lymph/o	clear fluid	para-	alongside of or abnormal	salping/o	uterine (fallopian) tube; also eustachian tube	trich/o	hair
-lysis	breaking down or dissolution	-paresis	slight paralysis	sarc/o	flesh	-tripsy	crushing
macro-	large or long	patell/o	knee cap	schiz/o	split, division	troph/o	nourishment or development
-malacia	softening	path/o	disease	scler/o	hard or sclera	tympan/o	eardrum
mamm/o	breast	pector/o	chest	scoli/o	twisted	-ula, -ule	small
-mania	abnormal impulse (attraction) toward	ped/o	child or foot	-scope	instrument for examination	uln/o	ulna (a bone of the forearm)
mast/o	breast	pelv/i, pelv/o	hip bone	-scopy	examination	ultra-	beyond or excessive
meat/o	opening	-penia	abnormal reduction	seb/o	sebum (oil)	uni-	one
mega-	large	per-	through	semi-	half	ur/o	urine
megal/o	large	peri-	around	sial/o	saliva	ureter/o	ureter
-megaly	enlargement	perine/o	perineum	sigmoid/o	sigmoid colon	urethr/o	urethra
melan/o	black	peritone/o	peritoneum	sinistr/o	left, or on the left side	urin/o	urine
men/o	menstruation	-pexy	suspension or fixation	sinus/o	hollow (cavity)	uter/o	uterus
mening/o	meninges (membrane)	phac/o	lens (lenticil)	somat/o	body	vagin/o	vagina (sheath)
meningi/o	meninges (membrane)	phag/o	eat or swallow	somn/o	sleep	varic/o	swollen or twisted vein
meso-	middle	phak/o	lens (lenticil)	somn/i	sleep	vas/o	vessel
meta-	beyond, after, or change	pharyng/o	pharynx (throat)	son/o	sound	vascul/o	vessel
-meter	instrument for measuring	phas/o	speech	-spasm	involuntary contraction	ven/o	vein
metr/o	uterus	-phil	attraction for	sperm/o	sperm (seed)	ventricul/o	ventricle (belly or pouch)
-metry	process of measuring	-philia	attraction for	spermat/o	sperm (seed)	vertebr/o	vertebra
micro-	small	physi/o	physical, nature	sphygm/o	pulse	vesic/o	bladder or sac
mono-	one	phleb/o	vein	spin/o	spine (thorn)	vesicul/o	bladder or sac
morph/o	form	phob/o	exaggerated fear or sensitivity	spir/o	breathing	vitre/o	glassy
multi-	many	phon/o	voice or sound	splen/o	spleen	vulv/o	vulva (covering)
muscul/o	muscle	phor/o	to carry or bear	spondyl/o	vertebra	xanth/o	yellow
my/o	muscle	phot/o	light	squam/o	scale	xeno-	strange
myc/o	fungus	phren/o	diaphragm (also mind)			xer/o	dry
myel/o	bone marrow or spinal cord	plas/o	formation			-y	condition or process of
		-plasia	formation				