Before you leave this chapter, here are important terminology concepts and information that you should thoroughly understand. Check the box next to each item when you know you’ve “got” it!

1. **Antigens, antibodies, and antibiotics**: Antigens are foreign substances (bacteria, viruses, fungi) that stimulate white blood cells to make antibodies, which destroy the antigens. Antibiotics, however, are medications produced outside the body to kill or inhibit the growth of antigens such as bacteria and other microorganisms.

2. **Primary malignant tumor and metastasis**: A primary malignant tumor originates and grows in a tissue or specific organ, such as the lung, breast, or liver. A metastasis, however, is a malignant tumor that has traveled from a primary location to a secondary site, such as a lymph node or a vital organ. For example, a tumor located in the lung may be a primary adenocarcinoma of the lung or a metastasis that has spread to the lung from another organ. Analysis of the biopsy sample will reveal this distinction.

3. **Remission and relapse**: A remission is the lessening or absence of disease symptoms during an illness. Patients who have no signs or symptoms of illness are described as being in remission. A relapse is the return of disease symptoms (LAPSE meaning to fall or slide), after a period of time.

4. **Paralysis and -plegia**: Paralysis is the loss of muscle function. It can be caused by a cerebrovascular accident (stroke) or nerve damage in any part of the body. The suffix -plegia means paralysis. For example, hemiplegia is paralysis of one half or one side of the body, as occurs with a stroke. Quadruplegia is paralysis of all four (QUADR- means four) limbs of the body when spinal nerves in the neck are damaged.

5. **Syndrome and disease**: A syndrome is a group of signs and symptoms that occur together indicating a particular condition, the cause of which is not always known. An example is chronic fatigue syndrome. A disease is a specific medical condition often marked by an identifiable cause. Synonyms for disease are illness, sickness, and morbidity.
Introduction

This chapter reviews many of the terms you have learned in previous chapters and adds others related to medical specialists. In the following section, the training of physicians is described and specialists are listed with their specialties. Next, on page 175, useful combining forms are presented with terminology to increase your medical vocabulary. Finally, short case reports beginning on page 180 illustrate the use of the medical language in context. As you read these reports, I guarantee that you will be impressed with your ability to understand medical terminology!

Medical Specialists

Doctors complete 4 years of medical school and then pass national medical board examinations to receive an MD degree (MD stands for Latin Medicina Doctor, “teacher [doctor] of medicine”). They may then begin postgraduate training, which lasts at least 3 years and in some cases longer. This postgraduate training is known as residency training. Examples of residency programs are

- Anesthesiology
  - Administration of agents capable of bringing about a loss of sensation

- Dermatology
  - Diagnosis and treatment of skin disorders

- Emergency medicine
  - Care of patients that requires sudden and immediate action

- Family practice
  - Primary care of all members of the family on a continuing basis

- Internal medicine
  - Diagnosis and treatment of usually complex, nonsurgical disorders in adults

- Ophthalmology
  - Diagnosis and treatment of eye disorders

- Pathology
  - Diagnosis of the cause and nature of disease

- Pediatrics
  - Diagnosis and treatment of children’s disorders

- Psychiatry
  - Diagnosis and treatment of disorders of the mind

- Radiology
  - Diagnosis using x-ray studies including ultrasound and magnetic resonance imaging (MRI)

- Surgery
  - Treatment by manual (SURG- means hand) or operative methods

Examinations are administered after the completion of each residency program to certify the doctor’s competency in that specialty area.

A physician may then choose to specialize further by doing fellowship training. Fellowship programs (lasting 2 to 5 years) train doctors in clinical (patient care) and research (laboratory) skills. For example, an internist (specialist in internal medicine) may choose fellowship training in internal medicine specialties such as neurology, nephrology, endocrinology, and oncology. A surgeon interested in further specialization may do fellowship training in thoracic surgery, neurosurgery, or plastic surgery. On completion of training and examinations, the doctor is then recognized as a specialist in one of these fields.

Medical specialists and an explanation of their specialties are listed below:

**MEDICAL SPECIALIST**  **AREA OF PRACTICE**

- allergist
  - Treatment of hypersensitivity reactions

- anesthesiologist
  - Administration of agents to prevent pain and unpleasant awareness during surgical and other procedures

- cardiologist
  - Treatment of heart disease

- cardiovascular surgeon
  - Surgery on the heart and blood vessels

- colorectal surgeon
  - Surgery on the colon and rectum

- dermatologist
  - Treatment of skin disorders

- emergency practitioner
  - Immediate evaluation and treatment of acute injury and illness in a hospital setting

- endocrinologist
  - Treatment of endocrine gland disorders

- family practitioner
  - Primary care and treatment for families on a continuing basis

- gastroenterologist
  - Treatment of stomach and intestinal disorders

- geriatrician
  - Treatment of diseases of old age

- gynecologist
  - Surgery and treatment for diseases of the female reproductive system

- hematologist
  - Treatment of blood disorders

- hospitalist
  - General medical care of hospitalized patients

- infectious disease specialist
  - Treatment of diseases caused by microorganisms (bacteria, viruses, fungi, others)

- internist
  - Comprehensive care for adults in an office or a hospital setting

- nephrologist
  - Treatment of kidney diseases

- neurologist
  - Treatment of nerve disorders

- neurosurgeon
  - Surgery on the brain, spinal cord, and nerves

- obstetrician
  - Treatment of pregnant women; delivery of babies

- oncologist
  - Diagnosis and medical treatment of malignant and benign tumors

- ophthalmologist
  - Surgical and medical treatment of eye disorders

- orthopedist
  - Surgical treatment of bone, muscle, and joint conditions

- otorhinolaryngologist
  - Surgical treatment of ear, nose, and throat disorders

- pathologist
  - Diagnosis of disease by analysis of cells

- pediatrician
  - Treatment of diseases of children

- physiatrist
  - Treatment to restore function after illness; physical medicine and rehabilitation specialist

- psychiatrist
  - Treatment of mental disorders

- pulmonologist
  - Treatment of lung diseases

- radiologist
  - Examination of x-ray images to determine a diagnosis; interpretation of ultrasound, MRI, and nuclear medicine studies

- radiation oncologist
  - Treatment of disease with high-energy radiation

- rheumatologist
  - Treatment of systemic diseases affecting joints and muscles

- thoracic surgeon
  - Surgery on chest organs

- urologist
  - Surgery on the urinary tract and for treatment of male reproductive disorders
To help you identify medical specialists and what they do, select from the list of medical specialists to match the test or procedure described. Answers are found on page 201.

6. Match the medical specialists with the procedures and tests that they perform. Write the name of the specialist on the line provided.

<table>
<thead>
<tr>
<th>PROCEDURE/TEST</th>
<th>MEDICAL SPECIALIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Esophagoscopy and colonoscopy</td>
<td>cardiovascular surgeon</td>
</tr>
<tr>
<td>2. Blood cell counts; bone marrow biopsy</td>
<td>hematologist</td>
</tr>
<tr>
<td>3. Ultrasound examination of the heart; angioplasty</td>
<td>gynecologist</td>
</tr>
<tr>
<td>4. Skin testing to determine sensitivity to antigens</td>
<td>neurologist</td>
</tr>
<tr>
<td>5. Serum (blood) level of hormones</td>
<td>orthopedist</td>
</tr>
<tr>
<td>6. Vision tests; retinopathy</td>
<td>pathologist</td>
</tr>
<tr>
<td>7. Coronary artery bypass grafting (CABG)</td>
<td>psychiatrist</td>
</tr>
<tr>
<td>8. Catheter and IV line insertion for sedation during surgery</td>
<td>radiation oncologist</td>
</tr>
<tr>
<td>9. Pap smear (microscopic examination of cells from the cervix and organs); hysterectomy</td>
<td>urologist</td>
</tr>
</tbody>
</table>

8. Select from the list of medical specialists to match the test or procedure described.

<table>
<thead>
<tr>
<th>PROCEDURE/TEST</th>
<th>MEDICAL SPECIALIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nephrectomy; cystectomy; prostatectomy</td>
<td>allergist</td>
</tr>
<tr>
<td>2. Personality and mental function tests</td>
<td>anesthesiologist</td>
</tr>
</tbody>
</table>

3. Use of high-energy beams (photon and proton) to kill tumor cells
4. Fixation of bone fracture; arthroscopic surgery
5. Breathing function (spirometry) tests
6. Microscopic examination of biopsy samples; autopsies
7. CT scan; MRI; ultrasound examination
8. Kidney function tests; dialysis
9. Spinal and cranial nerve reflex tests

**COMBINING FORMS AND VOCABULARY**

The combining forms listed below should be familiar because they are found in the list of terms describing medical specialists. A medical term is included to illustrate the use of the combining form. Write the meaning of the medical term in the space provided. You can always check your answers with the *Mini-Dictionary: Glossary of Medical Terms* beginning on page 341.

<table>
<thead>
<tr>
<th>COMBINING FORM</th>
<th>MEANING</th>
<th>MEDICAL TERM</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>cardio/o</td>
<td>heart</td>
<td>cardiomegaly</td>
<td></td>
</tr>
<tr>
<td>col/o</td>
<td>colon (large intestine)</td>
<td>colitis</td>
<td></td>
</tr>
<tr>
<td>dermat/o</td>
<td>skin</td>
<td>dermatitis</td>
<td></td>
</tr>
<tr>
<td>endocrin/o</td>
<td>endocrine glands</td>
<td>endocrinology</td>
<td></td>
</tr>
</tbody>
</table>

**Ulcerative colitis and Crohn disease**

Both of these conditions are types of *inflammatory bowel disease (IBD)*, with similar signs and symptoms, such as abdominal pain, diarrhea, and bleeding from the rectum. While ulcerative colitis is confined to the colon, Crohn's commonly affects the last part of the small intestine and may involve other areas of the gastrointestinal tract. Lesions can be identified, but causes of both types of IBD are unknown. See the In Person feature on page 192.
enter/o intestines

esthesi/o sensation

gastr/o stomach

ger/o old age

gynec/o woman, female

hemat/o blood

iatr/o treatment

iatrogenic

IATR/O means treatment by a physician or with medicines. An iatrogenic illness is produced (-GENIC) adversely and unexpectedly by a treatment.

laryng/o voice box

laryngoal

lymph/o lymph

lymphadenopathy

Lymph "glands" are actually lymph nodes, located all over the body but especially in axillary (armpit), inguinal (groin), cervical (neck), and mediastinal (area between the lungs) regions. Lymphadenopathy often refers to the presence of malignant cells in lymph nodes.

nephro/o kidney

nephrostomy

A catheter (tube) is inserted into the kidney for drainage of fluid.

neur/o nerve

neuralgia

nos/o disease

nosocomial

A nosocomial infection is acquired during hospitalization (COM/O means to care for).

obstetr/o midwife

obstetric

don/o tooth

orthodontist

ORTH/O means straight.

onc/o tumor

oncogenic

Oncogenic viruses give rise to tumors.

ophthalm/o eye

ophthalmologist

opt/o eye

optometrist

An optometrist examines (METR/O means to measure) eyes and prescribes corrective lenses but cannot treat eye diseases.

optic/o eye

optician

Opticians grind lenses and fit glasses, and may treat eye diseases.

orth/o straight

orthopedist

PED/O comes from paidos, the Greek word for "child." In the past, orthopedists were concerned with straightening bone deformities in children. Today, they treat bone, muscle, and joint disorders in adults as well.

t/o ear

otitis

path/o disease

pathology

ped/o child

pediatrics

psych/o mind

psychosis

pulmon/o lung

pulmonary

Dental specialists

The following are other specialists in dental medicine:

Dental Specialist | Area of Expertise
--- | ---
periodontist | Gums (PERI- means surrounding)
endodontist | Root canal therapy (the root canal is the inner part of a tooth containing blood vessels and nerves)
pedodontist | Children (PED/O means child)
prosthodontist | Replacement of missing teeth with artificial appliances (PROSTH/O = artificial replacement)
Figure 5-1: Radiation therapy. The patient is positioned under a radiation therapy machine (containing a linear accelerator) to receive treatment for a lesion in the posterior portion of his hip. (Courtesy Dr. Arthur Brinberg, Riverhill 21st Century Radiation Oncology, Yonkers, New York.)

radi/o x-rays radiotherapy
The walls of the rectum weaken and bulge forward toward the vagina. See Figure 5-2.

rect/o rectum rectocele
-CELE means a hernia or protrusion. The walls of the rectocele

Figure 5-2: Rectocele. (Modified from Chobner D-E. The Language of Medicine, ed 9, Philadelphia, 2011, Saunders.)

Figure 5-3: Differences between a normal joint and rheumatoid arthritis.
rheumat/o flow, fluid rheumatology
Joints can fill with fluid when diseased—hence, RHEUMATOLOGY indicates a problem with a swollen joint.

Rheumatoid arthritis is a chronic inflammatory disease of joints and connective tissues that leads to deformation of joints. See Figures 5-3 and 5-4.

Rheumatoid arthritis and osteoarthritis
Rheumatoid arthritis first appears when patients (often women) are young, and it has an autoimmune component (antibodies are found that destroy joint tissue). Osteoarthritis most often appears in older patients (both men and women) and is marked by degenerative changes that cause destruction of the joint space. Knee and hip replacements may be helpful treatments for patients with osteoarthritis.

Figure 5-4: Advanced rheumatoid arthritis of the hands. Notice the soft tissue swelling and deformed joints—fingers, knuckles, and wrist. Atrophy of muscles and tendons (connecting muscles to bones) allows one joint surface to slip past the other (subluxation). (From Lewis SM, Heitkemper MM, Dirksen SR. Medical-Surgical Nursing: Assessment and Management of Clinical Problems, ed 6, St Louis, 2014.)
rhin/o  

nose  

rhinorrhea  

thorac/o  

chest  

thoracotomy  

ur/o  

urinary tract  

urology  

vascul/o  

blood vessels  

vasculitis  

---

Case Reports

Here are short case reports related to medical specialties. Many of the terms will be familiar to you; others are explained in the Mini-Dictionary: Glossary of Medical Terms (beginning on page 941). For every case report, write the meaning of the boldface terms in the spaces provided.

**CASE 1 Cardiology**

Mr. Rose was admitted to the cardiac care unit (CCU) with angina and a history of hypertension.

A coronary angiogram (Figure 5-5, A) showed spasm of the right coronary artery (closed arrow), causing acute myocardial ischemia. The electrocardiogram (ECG) showed ventricular arrhythmias as well.

Nitroglycerin was administered, and within minutes, the angiogram showed reversal of the spasm (Figure 5-5, B). The ECG recorded reversal of the life-threatening arrhythmias as well. To prevent further ischemia and myocardial infarction, Mr. Rose’s treatment will include antiarrhythmic, diuretic, and anticoagulant drugs. In the future, he may need an additional procedure to place a stent in his coronary artery to keep it open.

*Continued on following page*
CASE 2 Gynecology

Ms. Sessions has had dysmenorrhea and menorrhagia for several months. She is also anemic. Because of the presence of a large fibroid, as seen on a pelvic ultrasound image (sonogram) (see Figure 5-6, A), a hysterectomy was recommended. After it was removed, the uterus was opened to reveal multiple fibroids (leiomyomas) bulging into the uterine cavity and displaying a firm, white appearance. See Figure 5-6, B.

Figure 5-6 • A, Pelvic sonogram. B, Fibroids (leiomyomas). These are benign tumors of the uterus. (A, From Salem S: The uterus and adnexa. In Rumack CM, Wilson SR, Chaboneau JW, editors: Diagnostic Ultrasound, ed 2, St Louis, 1998, Mosby; B, From Cotran RS, Kumar V, Collins T: Robbins’ Pathologic Basis of Disease, ed 6, Philadelphia, 1999, Saunders.)

CASE 3 Oncology

John Smith, a 26-year-old law student, was admitted to the hospital after experiencing several months of fatigue, low-grade fevers, chest pain, and night sweats. A chest MRI scan (see Figure 5-7) revealed large mediastinal masses, as shown by arrows. Needle biopsy confirmed a diagnosis of Hodgkin disease. There was no evidence of lymphadenopathy or hepatic involvement. Treatment included chemotherapy followed by radiotherapy to the chest. Mr. Smith’s prognosis is good.

Figure 5-7 • Magnetic resonance imaging of the upper body. (From Chabner BA: The Language of Medicine, ed 9, Philadelphia, 2011, Saunders.)

chemotherapy

diagnosis

fatigue

hepatic

Hodgkin disease

lymphadenopathy

mediastinal

MRI

needle biopsy

prognosis

radiotherapy
CASE 4  Urology

Scott Jones has a history of lower back pain, associated with hematuria and dysuria. An abdominal x-ray film (Figure 5-8, A) shows a renal calculus (black arrow) in the right upper quadrant. His doctor tells him that renal calculi should be suspected any time a calcification is seen within the renal outline or along the expected course of the ureter (dotted lines).

Treatment with shock wave lithotripsy (Figure 5-8, B) is expected to crush the stone and relieve his symptoms.

Figure 5-8  A, An abdominal x-ray image showing a renal calculus (arrow). B, Lithotripsy. (A, From Mettler FA: Essentials of Radiology, ed 2, Philadelphia, 2005, Saunders; B, from Rakel D: Integrative Medicine, ed 2, Philadelphia, 2007, Saunders.)

dysuria
hematuria
lithotripsy
renal calculus
symptoms
ureter

CASE 5  Gastroenterology

Mr. Pepper suffers from dyspepsia, acid reflux, and sharp abdominal pain. A recent episode of hematemesis has left him very weak and anemic. Gastroscopy and an upper GI series with barium revealed the presence of a large ulcer. Figure 5-9 shows a photograph of a peptic ulcer located in the stomach. Mr. Pepper will be admitted to the hospital, treated with medication to reduce gastric acid output and with antibiotics to control a bacterium (Helicobacter or H. pylori) known to cause ulcers. He will also be scheduled for a partial gastrectomy.

Figure 5-9  Peptic (gastric) ulcer. (From Lewis SM, Heitkemper MM, Dirksen SR: Medical-Surgical Nursing: Assessment and Management of Clinical Problems, ed 5, St Louis, 2004, Mosby)

abdominal
anemic
barium
dyspepsia
gastrectomy
gastroscopy
hematemesis
ulcer
upper GI series
CASE 6 Radiology

Evaluation of David Green's posteroanterior chest x-ray film (Figure 5-10, A, arrows) shows an ill-defined mass near the right hilum. The lateral view (Figure 5-10, B, arrows) also shows the mass, and its shaggy outline is very suggestive of carcinoma. Further evaluation by CT scan (Figure 5-10, C) clearly shows the mass in relation to the mediastinal structures such as the pulmonary artery (PA) and aorta (Ao).

Impression: Lung cancer

Figure 5-10  A. Posteroanterior chest x-ray shows an ill-defined mass (arrows). B. Lateral chest x-ray view clearly shows the mass to be posterior to the hilum. C. Computed tomography image clearly shows the mass (arrow) in relation to the mediastinal structures. (A-C, From Mettee PA: Essentials of radiology, ed 2, Philadelphia, 2005, Saunders.)

Continued on following page
CASE 7 Orthopedics

A 20-year-old male patient was admitted to the hospital after a motorcycle accident. He was found to have fractures of the right fibula (see Figure 5-11, A), right femur, and pelvis and intra-abdominal injuries. He was taken to surgery, and internal fixation of the right femur was performed. A cast was applied to the femur for immobilization, and the fibula healed on its own with callus formation (Figure 5-11, B).

Figure 5-11 • A, Fracture of the fibula. B, Callus formation, 6 weeks later. (Courtesy Dr. Barbara Weissman, Brigham and Women’s Hospital, Boston, Massachusetts. A and B, from Coiran RS, Kumar V, Collins T: Robbins’ Pathologic Basis of Disease, ed 6, Philadelphia, 1999, Saunders.)

callus
femur
fibula
fixation
fracture
intra-abdominal
pelvis

CASE 8 Nephrology

A 52-year-old woman with chronic renal failure secondary to long-standing hypertension has been maintained on hemodialysis for the past 18 months. An arteriovenous fistula (Figure 5-12) was created surgically to provide long-term vascular access for hemodialysis. For the past 3 weeks, during the dialysis sessions, she has become moderately hypotensive, with symptoms of dizziness. Consequently, we have decided to withhold her antihypertensive medications before dialysis.

Figure 5-12 • Arteriovenous fistula created for hemodialysis. (From Chatner D-E: The Language of medicine, ed 9, Philadelphia, 2011, Saunders.)

antihypertensive
arteriovenous fistula
chronic
hemodialysis
hypertension
hypotensive
renal failure
CASE 9 Endocrinology

A 36-year-old woman known to have type 1 diabetes mellitus was brought to the emergency department after being found collapsed at home. She had experienced 3 days of extreme weakness, polyuria, and polydipsia. It was discovered that a few days before her admission, she had discontinued use of her external insulin pump (see Figure 5-13) in a suicide attempt.

![External insulin pump](image)

**Figure 5-13** - External insulin pump.
(From Mosby's Dictionary of Medicine, Nursing & Health Professions, ed 7, St Louis, 2006, Mosby.)

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CASE 10 Neurology

Ms. Kindrick is admitted with severe, throbbing unilateral frontal cephalgia that has lasted for 2 days. Light makes her cringe, and she has nausea. Before the onset of these symptoms, she saw zigzag lines for about 20 minutes and a scotoma (see Figure 5-14). Diagnosis is acute migraine with aura. A vasoconstrictor is prescribed, and Ms. Kindrick's condition is improving. (Migraine headaches are thought to be caused by sudden dilation of blood vessels.)

![Scotoma](image)

**Figure 5-14** - Scotoma. This abnormal area of the visual field is both "positive" (consisting of bright flickering imagery) and "negative" (displaying a relatively dark area that obscures the visual field). It is called a scintillating scotoma. (From Yanoff M, Duker JS: Ophthalmology, ed 2, St Louis, 2004, Mosby.)

---

**Acronyms and Terms**

- insulin pump
- polydipsia
- polyuria
- type 1 diabetes mellitus
- acute
- aura
- cephalgia
- dilation
- frontal
- migraine
- nausea
- scotoma
- unilateral
- vasoconstrictor
young children, I would lie on the couch watching life swirl around me, feeling guilty that I could not take part.

There was a silver lining to those flare-ups, and that is the tender affection of those around me—husband, family, and friends. When you have Crohn’s, no one knows you have it until things get unbearable. It’s not the kind of illness you discuss, but when you have pain and fever, you can kind of approximate those times of being felled by the flu. Yet you know that it will take more than a dose of Nyquil or a night’s sleep to get “better.” You know you’ll face another course of medications—often untried ones—or that you will likely end up in the hospital undergoing yet another surgery.

Nancy J. Brandao is a writer, editor, and food columnist.

EXERCISES AND ANSWERS

Complete these exercises and check your answers. An important part of your success in learning medical terminology is checking your answers carefully with the Answers to Exercises beginning on page 200.

A Match each of the following residency programs to its description below.

- anesthesiology
- internal medicine
- psychiatry
- dermatology
- ophthalmology
- radiology
- emergency medicine
- pathology
- surgery
- family practice
- pediatrics

1. Treatment by operation or manual (hand) methods

2. Diagnosis and treatment of often complex medical disorders in adult patients

3. Diagnosis and treatment of disorders of the mind

4. Primary care of all family members on a continuing basis

5. Diagnosis and treatment of skin disorders

6. Diagnosis and treatment of eye disorders

7. Diagnosis of disease using x-rays

8. Diagnosis and treatment of children’s disorders

9. Care of patients with illness that requires immediate action

10. Administration of agents that produce loss of sensation/awareness

11. Diagnosis of disease by examining cells and tissues
B) Name the physician who treats the following problems (first letters are given).

1. kidney diseases: n_________________________
2. tumors: o_______________________________
3. broken bones: o__________________________
4. female diseases: g________________________
5. eye disorders: o__________________________
6. heart disorders: c________________________
7. nerve disorders: e________________________
8. lung disorders: p_________________________
9. mental disorders: p________________________
10. stomach and intestinal disorders: g________

C) Match the medical specialists in Column I to their specialties in Column II.

<table>
<thead>
<tr>
<th>COLUMN I</th>
<th>COLUMN II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. urologist</td>
<td>A. operates on the large intestine</td>
</tr>
<tr>
<td>2. thoracic surgeon</td>
<td>B. treats blood disorders</td>
</tr>
<tr>
<td>3. radiation oncologist</td>
<td>C. treats thyroid and pituitary gland disorders</td>
</tr>
<tr>
<td>4. colorectal surgeon</td>
<td>D. rehabilitates after spinal injuries</td>
</tr>
<tr>
<td>5. endocrinologist</td>
<td>E. treats disorders of childhood</td>
</tr>
<tr>
<td>6. obstetrician</td>
<td>F. operates on the urinary tract</td>
</tr>
<tr>
<td>7. radiologist</td>
<td>G. treats disorders of the skin</td>
</tr>
<tr>
<td>8. pediatrician</td>
<td>H. delivers babies</td>
</tr>
<tr>
<td>9. hematologist</td>
<td>I. operates on the chest</td>
</tr>
<tr>
<td>10. dermatologist</td>
<td>J. examines x-ray images to diagnose disease</td>
</tr>
</tbody>
</table>

D) Complete each of the sentences below using a term from the following list.

clinical          oncologist          pathologist
geriatrician      ophthalmologist    surgeon
hospitalist       optician            orthopedist
infectious disease specialist optometrist    research

1. A doctor who diagnoses and treats diseases that are caused by microorganisms is a/an ____________________________
2. A doctor who performs bone surgery is a/an ____________________________
3. A doctor who takes care of patients practices ____________________________ medicine.
4. A medical professional who grinds lenses and fills prescriptions for eye glasses is a/an ____________________________
5. A doctor who reads biopsy samples and performs autopsies is a/an ____________________________
6. A doctor who treats cancerous tumors is a/an ____________________________
7. A medical professional (non-physician) who examines eyes, prescribes eyeglasses, and treats eye disorders is a/an ____________________________
8. A doctor who operates on patients is a/an ____________________________
9. A doctor who does experiments with test tubes and laboratory equipment is interested in ____________________________ medicine.
10. A doctor who specializes in surgery and medical treatment of disorders of the eye is a/an ____________________________
11. A doctor who specializes in the treatment of older people is a/an ____________________________
12. A physician who cares for hospitalized patients is a/an ____________________________
1. Arthritis: r
2. Otitis media: o
3. Anemia: h
4. Urinary bladder displacement: u
5. Chronic bronchitis: p
6. Cerebrovascular accident: n
7. Breast cancer: o
8. Coronary artery blockages (bypass surgery): c
9. Dislocated shoulder bone: o
10. Thyroid gland enlargement: e
11. Kidney disease: n
12. Acne (skin disorder): d
13. Hay fever (hypersensitivity reaction): a
14. Viral and bacterial diseases: i
15. Rehabilitation after herniated disk: p

Give the meaning for each of the following medical terms:

1. neuralgia
2. pathology
3. cardiomegaly
4. nephrostomy
5. thoracotomy
6. laryngeal
7. otitis
8. colitis
9. pulmonary
10. iatrogenic
11. gastroscopy
12. radiotherapy
13. anesthesiology
14. enteritis
15. nosocomial
2. Pauline noticed a rash over most of her body. First she saw Dr. Cole, her (family practitioner, oncolist, radiologist), who performs her yearly physicals. Dr. Cole, who is not a/an (endocrinologist, orthopedist, dermatologist) by training, referred her to a skin specialist to make the proper diagnosis and treat the rash.

3. Dr. Liu is a/an (internist, obstetrician, pediatrician) as well as a/an (nephrologist, urologist, gynecologist) and can take care of her female patients before, during, and after their pregnancies.

4. After her sixth pregnancy, Sally developed an abnormal condition at the lower end of her colon. She went to a/an (gastroenterologist, hematologist, optometrist), who made the diagnosis of protrusion of the rectum into the vagina. She then consulted colorectal and gynecologic surgeons to make an appropriate treatment plan for her condition, known as a (vasculitis, rectocele, colostomy).

5. In the cancer clinic, patients often see a medical (oncologist, orthopedist, rheumatologist), who prescribes and monitors chemotherapy, and a/an (psychiatrist, radiation oncologist, radiologist), who prescribes and supervises (drugs, surgery, radiation therapy) to treat tumors with high-energy beams.

6. During a lengthy hospitalization, Janet developed a cough and fever (unrelated to any treatment or procedure she received). Her surgeon ordered a chest x-ray, which showed a/an (oncogenic, nosocomial, iatrogenic) pneumonia. A/an (anesthesiologist, neurologist, infectious disease specialist) was called in to diagnose and treat the hospital-acquired disease condition.

7. Sam had noticed bright red rectal bleeding for several days when he finally saw his family practitioner. This physician referred him to a/an (endocrinologist, urologist, gastroenterologist). A (laparoscopy, colonoscopy, bronchoscopy) was scheduled, which revealed a large pedunculated (on a stalk) polyp (benign growth) in the descending colon. See Figure 5-15. The polyp was resected and sent to the (pathology, hematology, infectious disease) department for evaluation. Fortunately, it was a noncancerous or (malignant, metastatic, benign) lesion. Sam will need follow-up (laparotomy, endoscopy, laparoscopy) in a year.

---

(iii) Circle the bold term that best completes the meaning of the sentences in the following medical vignettes.

1. Dr. Butler is a physician who operates on hearts. He trained as a (neurologic, cardiovascular, pulmonary) surgeon. Often, his procedures require that Dr. Smith, a/an (gynecologic, ophthalmic, thoracic) surgeon, assist him when the
### ANSWERS TO EXERCISES

<table>
<thead>
<tr>
<th>A</th>
<th>surgery</th>
<th>5. dermatology</th>
<th>9. emergency medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>1. nephrologist or cardiovascular surgeon</td>
<td>6. cardiologist (internist)</td>
<td>8. pulmonary specialist</td>
</tr>
<tr>
<td></td>
<td>2. oncologist</td>
<td>7. neurologist</td>
<td>9. psychiatrist</td>
</tr>
<tr>
<td></td>
<td>3. orthopedist</td>
<td>10. anesthesiologist</td>
<td>10. palliative medicine</td>
</tr>
<tr>
<td></td>
<td>4. gynecologist</td>
<td>11. pathology</td>
<td>11. pathologist</td>
</tr>
</tbody>
</table>

### PRONUNCIATION OF TERMS

The terms that you have learned in this chapter are presented here with their pronunciations. The capitalized letters in **BOLDFACE** represent the accented syllable. Pronounce each word out loud; then write the meaning in the space provided. Meanings of all terms can be checked with the **Mini-Dictionary: Glossary of Medical Terms** beginning on page 341 and on the audio section of the **Evolve website** (http://evolve.elsevier.com/Chabner/multimodal).

<table>
<thead>
<tr>
<th>TERM</th>
<th>PRONUNCIATION</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>anesthesiology</td>
<td>an-es-the-ze-OL-o-je</td>
<td>medical specialty</td>
</tr>
<tr>
<td>cardiologist</td>
<td>kar-de-OL-o-jist</td>
<td>physician who specializes in the heart</td>
</tr>
<tr>
<td>cardiovascular surgeon</td>
<td>kar-de-o-VAS-ku-lar SUR-jun</td>
<td>surgeon who specializes in the heart and blood vessels</td>
</tr>
<tr>
<td>clinical</td>
<td>KLIN-ih-kal</td>
<td>relating to medicine or health</td>
</tr>
<tr>
<td>colitis</td>
<td>ko-LI-tis</td>
<td>inflammation of the colon</td>
</tr>
<tr>
<td>colorectal surgeon</td>
<td>ko-lo-REK-tal SUR-jun</td>
<td>surgeon who specializes in the large intestine</td>
</tr>
<tr>
<td>dermatologist</td>
<td>der-mah-TOL-o-jist</td>
<td>physician who diagnoses and treats skin disorders</td>
</tr>
<tr>
<td>dermatology</td>
<td>der-mah-TOL-o-je</td>
<td>study of the skin</td>
</tr>
<tr>
<td>emergency medicine</td>
<td>em-ER-jen-se MED-ih-sin</td>
<td>medical care provided in a crisis</td>
</tr>
<tr>
<td>endocrinologist</td>
<td>en-do-krih-NOL-o-jist</td>
<td>physician who specializes in the endocrine system</td>
</tr>
<tr>
<td>enteritis</td>
<td>en-ter-RI-tis</td>
<td>inflammation of the intestines</td>
</tr>
<tr>
<td>family practitioner</td>
<td>FAM-ih-le prak-TIH-shun-er</td>
<td>physician who provides primary care</td>
</tr>
<tr>
<td>gastroenterologist</td>
<td>gas-tro-en-ter-OL-o-jist</td>
<td>physician who specializes in the gastrointestinal tract</td>
</tr>
<tr>
<td>nephrologist</td>
<td>nep-FOH-lo-jist</td>
<td>physician who specializes in the kidneys</td>
</tr>
<tr>
<td>oncologist</td>
<td>ON-koh-lo-jist</td>
<td>physician who specializes in the diagnosis and treatment of cancer</td>
</tr>
<tr>
<td>orthopedist</td>
<td>OR-thoh-PED-ist</td>
<td>physician who specializes in bone and joint disorders</td>
</tr>
<tr>
<td>otolaryngologist</td>
<td>oh-toh-LAR-in-goh-list</td>
<td>physician who specializes in the ear, nose, and throat</td>
</tr>
<tr>
<td>pulmonologist</td>
<td>pul-MOHN-ol-o-jist</td>
<td>physician who specializes in the lung and respiratory system</td>
</tr>
<tr>
<td>radiologist</td>
<td>ray-dee-OH-lo-jist</td>
<td>physician who specializes in imaging and interpreting images of the body</td>
</tr>
<tr>
<td>rheumatologist</td>
<td>RHEE-muh-tah-lo-jist</td>
<td>physician who specializes in the diagnosis and treatment of diseases of the joints and muscles</td>
</tr>
<tr>
<td>urologist</td>
<td>YOO-roh-lo-jist</td>
<td>physician who specializes in the urinary tract and male reproductive organs</td>
</tr>
<tr>
<td>urologist</td>
<td>YOO-roh-lo-jist</td>
<td>physician who specializes in the urinary tract and male reproductive organs</td>
</tr>
</tbody>
</table>

### Medical Specialties Matching Exercises (on pages 174-175)

**A**
- 1. gastroenterologist
- 2. hematologist
- 3. cardiologist
- 4. allergist
- 5. endocrinologist
- 6. ophthalmologist
- 7. cardiovascular surgeon
- 8. anesthesiologist
- 9. gynecologist
- 10. orthopedist
- 11. neuropathologist
- 12. radiation oncologist
- 13. pathologist
- 14. surgeon (surgeon)
- 15. urologist
- 16. psychiatrist
- 17. neurologist
- 18. ophthalmologist
- 19. dermatologist
- 20. obstetrician, gynecologist
- 21. gynecologist
- 22. urologist
- 23. cardiologist
- 24. neurologist
- 25. anesthesiologist
- 26. ophthalmologist
- 27. endocrinologist
- 28. hematologist
- 29. gastroenterologist
urologist  u-ROL-ist
vasculitis  vas-ku-LI-tis

PRACTICAL APPLICATIONS

This section provides three groups of exercises on allied health specialists and their job descriptions. Answers are on page 207. Appendix 4 on page 331 lists health professions with education requirements, national association information, and certificate and licensing requirements.

A Match each allied health specialist to the appropriate job description: Write your answer on the blank line.

- audiologist
- blood bank technologist
- chiropractor
- clinical laboratory technician
- dental assistant
- dental hygienist
- diagnostic medical technologist
- dietitian/nutritionist
- nurse anesthetist
- nurse practitioner

1. Treats health problems associated with the muscular, nervous, and skeletal systems, especially the spine
2. Examines, diagnoses, and treats patients under the direct supervision of a physician
3. Works with people who have hearing problems by using testing devices to measure hearing loss
4. Provides preventive dental care and teaches the practice of good oral hygiene
5. Collects, types, and prepares blood and its components for transfusions
6. Aids in the delivery of anesthesia during surgery
7. Assists a dentist with dental procedures
8. Performs diagnostic ultrasound procedures
9. Plans nutrition programs and supervises the preparation and serving of meals
10. Performs tests to examine and analyze body fluids, tissues, and cells

B Select from the list of specialists to match the job description.

- ECG technician
- emergency medical technician/paramedic
- health information management professional
- home health aide
- licensed practical nurse
- medical assistant
- medical laboratory technician
- nuclear medicine technologist
- nursing aide
- occupational therapist

1. Cares for elderly, disabled, and ill persons in their own homes, helping them live there instead of in an institution
2. Performs routine tests and laboratory procedures
3. Designs, manages, and administers the use of health care data and information
4. Operates an electrocardiograph to record ECGs and for Holter monitoring and stress tests
5. Performs radioactive tests and procedures under the supervision of a nuclear medicine physician, who interprets the results
6. Gives immediate care to acutely ill or injured persons and transports them to medical facilities
7. Helps physicians examine and treat patients and performs tasks to keep offices running smoothly
8. Cares for the sick, injured, convalescing, and handicapped, under the direct supervision of physicians and registered nurses; provides basic bedside care
9. Helps individuals with mentally, physically, developmentally, or emotionally disabling conditions to develop, recover, or maintain daily living and working skills
10. Helps care for physically or mentally ill, injured, or disabled patients confined to nursing, hospital, or residential care facilities; also known as nursing assistants or hospital attendants
Match the specialist to the appropriate job description.

- ophthalmic medical technician
- phlebotomist
- physical therapist
- physician assistant
- radiation therapist
- radiographer/radiologic technologist
- registered nurse
- respiratory therapist
- speech-language pathologist
- surgical technologist

1. Evaluates, treats, and cares for patients with breathing disorders

2. Draws and tests blood under the supervision of a medical technologist or laboratory manager

3. Cares for sick and injured people by assessing and recording symptoms, assisting physicians during treatments and examinations, and administering medications

4. Prepares cancer patients for treatment and administers prescribed doses of ionizing radiation to specific areas of the body

5. Helps ophthalmologists provide medical eye care

6. Examines, diagnoses, and treats patients under the direct supervision of a physician

7. Assists in operations under the supervision of surgeons or registered nurses

8. Improves mobility, relieves pain, and prevents or limits permanent physical disabilities in patients suffering from injuries or disease

9. Produces x-ray images of parts of the body for use in diagnosing medical problems

10. Assesses and treats persons with speech, language, voice, and fluency disorders

ANSWERS TO PRACTICAL APPLICATIONS

A 1. chiropractor
2. nurse practitioner
3. audiologist
4. dental hygienist
5. blood bank technologist
6. nurse anesthetist
7. dental assistant
8. diagnostic medical sonographer
9. dietitian/nutritionist
10. clinical laboratory technican

B 1. home health aide
2. medical laboratory technician
3. health information management professional
4. ECG technician
5. nuclear medicine technologist
6. emergency medical technician/paramedic
7. medical assistant
8. licensed practical nurse
9. occupational therapist
10. nursing aide

C 1. respiratory therapist
2. phlebotomist
3. registered nurse
4. radiation therapist
5. ophthalmic medical technician
6. physician assistant
7. surgical technologist
8. physical therapist
9. radiographer/radiologic technologist
10. speech-language pathologist
### COMBINING FORMS

<table>
<thead>
<tr>
<th>COMBINING FORM</th>
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<tr>
<td>aden/o</td>
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<tr>
<td>cardi/o</td>
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<td>col/o</td>
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<tr>
<td>dermat/o</td>
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<td>endocrin/o</td>
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<td>enter/o</td>
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<td>esthesi/o</td>
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<td>gas/o</td>
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<td>gen/o</td>
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<td>gynec/o</td>
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<td>neur/o</td>
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### SUFFIXES

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<td>-therapy</td>
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### ANSWERS TO REVIEW

### COMBINING FORMS

1. gland
2. heart
3. colon
4. skin
5. endocrine glands
6. intestines
7. sensation
8. stomach
9. old age
10. woman
11. blood
12. treatment

### SUFFIXES

1. pain
2. pertaining to
3. hernia, protrusion
4. pertaining to
5. pertaining to producing
6. specialist
7. inflammation
8. study of
9. enlargement
10. mass, tumor
11. abnormal condition
12. disease, emotion
13. flow
14. process of visual examination
15. opening
16. treatment
17. incision
TERMINOLOGY CHECKUP

Before you leave this chapter, here are important concepts that you should understand. Check the box next to each item when you know you've "got" it!

1. Medical specialists: Note the differences between the following medical doctors:
   - **orthopedist and rheumatologist.** An *orthopedist* is a surgeon who diagnoses and treats bone, muscle, and joint conditions, while a *rheumatologist* is an internal medicine specialist who primarily diagnoses and treats disorders of joints.
   - **nephrologist and urologist.** A *nephrologist* is an internal medicine specialist who diagnoses and treats disorders of the kidneys, while a *urologist* is a surgeon who operates on the kidneys, urinary tract, and male reproductive organs.
   - **cardiologist and cardiovascular surgeon.** A *cardiologist* is an internal medicine specialist who diagnoses and treats disorders of the heart, while a *cardiovascular surgeon* operates on the heart and blood vessels.
   - **pulmonologist, otolaryngologist, and thoracic surgeon.** A *pulmonologist* is an internal medicine specialist who diagnoses and treats diseases of the lungs, while an *otolaryngologist* is a surgeon who operates on the ear, nose, throat, head, and neck. A *thoracic surgeon*, however, operates on organs in the chest, such as the heart, lungs, and esophagus.
   - **neurologist and neurosurgeon.** A *neurologist* is an internal medicine specialist who diagnoses and treats disorders of the brain, spinal cord, and nerves, while a *neurosurgeon* operates on the brain, nerves, and spinal cord.
   - **pathologist and oncologist.** A *pathologist* is an internal medicine specialist who examines dead bodies (performs autopsies) and specimens of living cells (biopsies) to determine the correct diagnosis. An *oncologist*, also a specialist in internal medicine, diagnoses and treats malignant tumors.
   - **radiologist and radiation oncologist.** A *radiologist* is primarily a diagnostic physician who examines images from x-ray, CT, ultrasound, and MRI studies, while a *radiation oncologist* treats malignancies with high-energy radiation (photons and protons).

2. Specialists and conditions they treat: Carefully review Exercises A to E beginning on page 193. It is important to identify physicians and their areas of expertise to gain proper perspective on the medical community as a whole.

3. Case reports: Read over the cases beginning on page 180 and congratulate yourself on how much medical terminology you are able to decipher on your own.

---

Body Systems

APPENDIX 1

This appendix contains full-color diagrams of body systems. For each system, the material presented is divided into seven sections. *Anatomy* shows major organs and structures with labels and combining forms (in parentheses) for each body part. The parts of the body are defined and explained in the *Mini-Dictionary: Glossary of Medical Terms* (beginning on page 341). *Terminology* reviews combining forms and their meanings and gives examples of medical terminology using each combining form. *Pathology* explains terms related to common pathological conditions. *Laboratory Tests and Diagnostic Procedures* presents common tests and procedures, which can be cross-referenced for additional information in *Appendix 2, Diagnostic Tests and Procedures*. *Treatment Procedures* explains procedures that treat abnormal conditions in each system. *Useful Abbreviations* lists selected abbreviations for easy reference. *Matching Exercises* review the terminology to test your understanding; answers to all exercises are provided at the end of the appendix, beginning on page 288.

Use this appendix both as a study guide for classroom work and as a reference for your work in the medical field.

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