

# Medical Terminology

Barbara -Janson-Cohen

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Selection for **midwifery students**



## **Chapter 1**

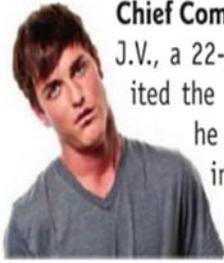
### **Introduction to Medical Terminology**

#### **Objectives**

**After study of this chapter you should be able to:**

- 1. Explain the purpose of medical terminology.**
- 2. Define the terms root, suffix, and prefix.**
- 3. Explain what combining forms are and why they are used.**
- 4. Name the languages from which most medical word parts are derived.**
- 5. Pronounce words according to the pronunciation guide used in this text.**
- 6. Analyze a case study with regard to some concepts of medical terminology.**

## Case Study: J.V.'s Digestive Problems



### Chief Complaint

J.V., a 22-year-old (y/o) college student, visited the university health clinic and stated he had a four-month history of a burning pain in the middle of his chest. He notices it more at night and has difficulty sleeping because of the pain. He also states that the pain seems to occur more frequently following late-night college gatherings where pizza, spicy chicken wings, and beer are served.

### Examination

A well-nourished 22-year-old male complaining of (c/o) epigastric (upper abdominal) pain no longer relieved by antacids; orthopnea—currently sleeping with three pillows to aid in breathing; occasional swallowing problems, or dysphagia; ETOH (alcohol) consumption is six to eight beers per week; nonsmoker; no neurologic, musculoskeletal, genitourinary, or respiratory deficits. Referred to a

gastroenterologist for ↑ acid production and gastroesophageal reflux disease (GERD).

### Clinical Course

The gastroenterologist saw J.V. and ordered an x-ray study of his upper gastrointestinal (GI) system. Results demonstrated reflux disease, and J.V. underwent an esophageal gastroduodenoscopy (EGD) to visually examine his digestive organs from his esophagus to his small intestine. Results showed no evidence of bleeding, ulcerations, or strictures. The student was given educational material on GERD, including dietary recommendations. He was started on Prevacid and will be reevaluated in six months.

In this chapter, you learn about how medical words are constructed and also learn about the use of abbreviations and other types of shorthand in medical writing. Later in the chapter, we revisit J.V. and see how he is progressing under treatment.

Medical terminology is a special vocabulary used by health care professionals for effective and accurate communication. Because it is based mainly on Greek and Latin words, medical terminology is consistent and uniform throughout the world.

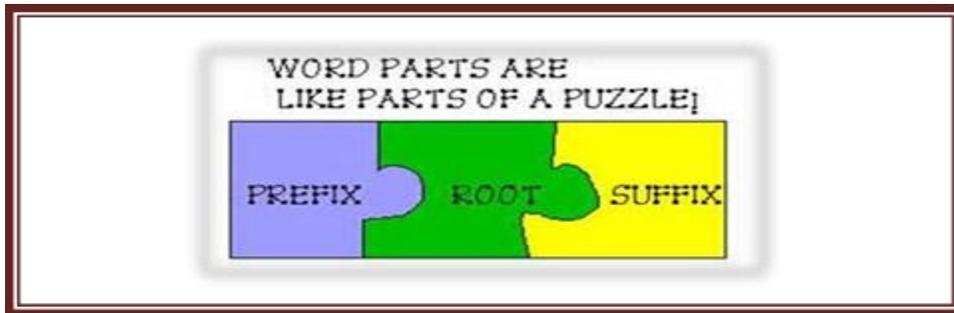
## Word Parts

The fundamental unit of each medical word is the root. This establishes the basic meaning of the word and is the part to which modifying prefixes and suffixes are added.

**A suffix** is a short word part or series of parts added at the end of a root to modify its meaning. In this book suffixes are indicated by a dash before the suffix, such as -itis.

**A prefix** is a short word part added before a root to modify its meaning. In this book prefixes are indicated by a dash after the prefix, such as pre-. Shown diagrammatically:

Words are formed from roots, prefixes, and suffixes.



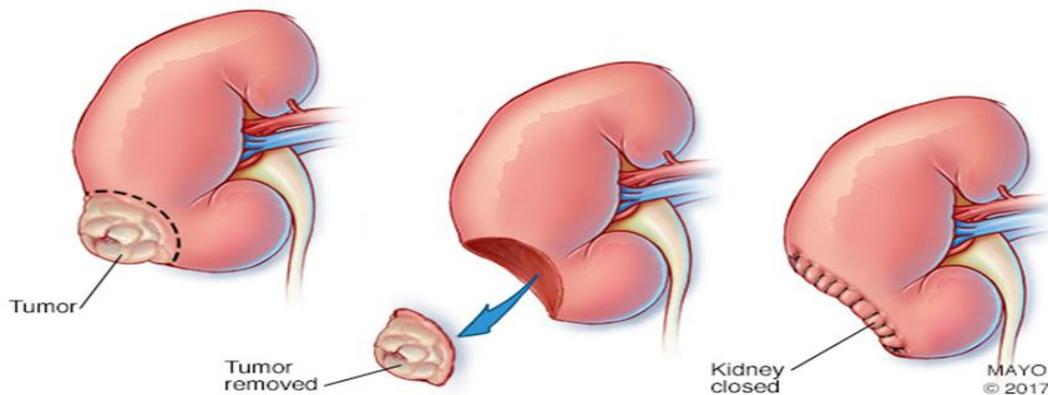
The simple word learn can be used as a root to illustrate. If we add the suffix -er to form learner, we have “one who learns.” If we add the prefix re- to form relearn, we have “to learn again.”

Learner : “one who learns.” ..... prefix re- + learn...= relearn= “to learn again.”

Not all roots are complete words. In fact, most medical roots are derived from other languages and are meant to be used in combinations. The Greek word **kardia**, for example, meaning “heart,” gives us the root **cardi**. The Latin word **pulmo**, meaning “lung,” gives us the root **pulm**. In a few instances, both the Greek and Latin roots are used. We find both the Greek root **nephr** and the Latin root **ren** used in words pertaining to the **kidney**.

The root **scler** means “hard” but may also apply to the white of the eye.

**FIGURE 1-2: The Greek root nephr and the Latin root ren are used to refer to the kidney, an organ of the urinary system. Partial Nephrectomy and renal cell carcinoma**



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**Compound words** contain more than one root. The words eyeball, bedpan, and wheelchair are examples. Some compound medical words are cardiovascular (pertaining to the heart and blood vessels), urogenital (pertaining to the urinary and reproductive systems).

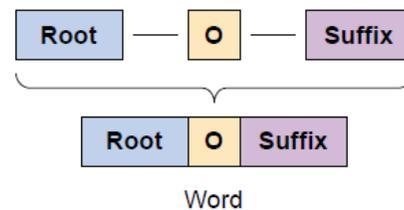
## Combining Forms

When a suffix beginning with a consonant is added to a root, a vowel (usually an o) is inserted between the root and the suffix to aid in pronunciation.

Thus, when the suffix -logy, meaning “study of,” is added to the root neur, meaning “nerve or nervous system,”

a combining vowel is added: neur + o + logy = neurology (study of the nervous system)

Roots shown with a combining vowel are called combining forms.



A combining vowel may be added between a root and a suffix.

## Acronym

An acronym is an abbreviation formed from the first letter of each word in a phrase. examples

UNICEF: The **U**nited **N**ations **I**nternational **C**hildren's **E**mergency **F**und

## Symbols

Symbols are commonly used in case histories as a form of shorthand. Some examples are L and R for left and right; ↑ and ↓ for increase and decrease

## Silent Letters and Unusual Pronunciations

A silent letter or unusual pronunciation can be a problem, especially if it appears at the start of a word that you are trying to look up in the dictionary. See Table 1-1 for some examples.

**TABLE 1-1 Silent Letters and Unusual Pronunciations**

LETTER(S)	PRONUNCIATION	EXAMPLE	DEFINITION OF EXAMPLE
ch	k	chemical <i>KEM-i-kl</i>	pertaining to chemistry
dys	dis	dystrophy <i>DIS-trō-fē</i>	poor nourishment of tissue
eu	u	euphoria <i>Ū-FOR-ē-a</i>	exaggerated feeling of well-being
gn	n	gnathic <i>NATH-ik</i>	pertaining to the jaw
ph	f	pharmacy <i>FAR-ma-sē</i>	a drug dispensary
pn	n	pneumonia <i>nŪ-MŌ-nē-a</i>	inflammation of the lungs
ps	s	pseudo- <i>SŪ-dō</i>	false
pt	t	ptosis <i>TŌ-sis</i>	dropping
rh	r	rheumatic <i>rŪ-MAT-ik</i>	pertaining to rheumatism, a disorder of muscles and joints

### Words Ending In x

When a word ending in x has a suffix added, the x is changed to a g or a c. For example, pharynx (throat) becomes pharyngeal (fa-RIN-je\_-al), to mean “pertaining to the throat”;

coccyx (terminal portion of the vertebral column) becomes coccygeal (kok-SIJ-e\_-al), to mean “pertaining to the coccyx”; thorax (chest) becomes thoracotomy (thor-a-KOT-o\_-me\_) to mean “an incision into the chest.”

### Suffixes Beginning With rh

When a suffix beginning with rh is added to a root, the r is doubled:

hem/o (blood) + -rhage (bursting forth) = hemorrhage (a bursting forth of blood)

Fill in the blanks:

١. A root with a vowel added to aid in pronunciation is called a(n) .....
  ٢. A word part that comes before a root is a(n) .....
  ٣. Combine the root psych, meaning “mind,” with the suffix -logy, meaning “study of,” to form a word meaning “study of the mind.” Multiple choice: Select the best answer.
- ١- Which of the following is a compound word?

- a. urinary      b. skeletal      c. gastrointestinal      d. coronary      e. artery

□ ۲- Endo- in endoscopic is a:

- a. root      b. suffix      c. combining form      d. prefix      e. derivation

## Word Building

Write words for the following definitions using the word parts provided. A combining vowel is included. Each word part can be used more than once.

-itis    -logy    -ptosis    nephr    -o    -gastr    cardi    neur-

26. Inflammation of the stomach \_\_\_\_\_
27. Study of the nervous system \_\_\_\_\_
28. Dropping of the kidney \_\_\_\_\_
29. Study of the kidney \_\_\_\_\_
30. Inflammation of a nerve \_\_\_\_\_
31. Downward displacement of the heart \_\_\_\_\_

### Word analysis

Define each of the following words and give the meaning of the word parts.

33. cardiologist (*kar-de-OL-o-jist*) \_\_\_\_\_
- a. cardi/o \_\_\_\_\_
- b. -log/o \_\_\_\_\_
- c. -ist \_\_\_\_\_
34. nephritis (*nef-RI-tis*) \_\_\_\_\_
- a. nephr/o \_\_\_\_\_
- b. -itis \_\_\_\_\_
35. renogastric (*re-no-GAS-trik*) \_\_\_\_\_
- a. ren/o \_\_\_\_\_
- b. gastr/o \_\_\_\_\_
- c. -ic \_\_\_\_\_

متن زیر را به انگلیسی خلاصه نمائید

### Treating Hot Flashes

Hot flashes are the most common bothersome symptom of menopause. Your hot flashes may occur during the day or at night (also known as night sweats). Your hot flashes may be mild and tolerable, moderate and troublesome, or severe and debilitating. Hot flashes get better with time. While most women have hot flashes for a few years, some women have them for decades. It is not known why

some women have severe hot flashes for many years, while others have no hot flashes, or mild ones that resolve quickly. If your hot flashes are mild or moderate, you may find relief by changing your lifestyle. If you have severe hot flashes, you may still benefit from lifestyle changes, but also may choose to take a nonprescription remedy or a prescription medication, including hormones to help you manage your symptoms.

## chapter 2

# Suffixes

### Objectives

After study of this chapter you should be able to:

1. Define a suffix.
2. Give examples of how suffixes are used.
3. Recognize and use some general noun, adjective, and plural suffixes used in medical terminology.

### Case Study: R.F.'s Encounter with a Cerebral Aneurysm



#### Chief Complaint

R.F., a 48-year-old financial analyst, has been complaining of atypical headaches for the past few weeks. With one of the headaches, she experienced vomiting that she could not attribute to the flu or something she had eaten. She does

not have a history of migraines. R.F. had an appointment with a neurologist, who referred her to the neurosurgery clinic for evaluation of a possible cerebral hemorrhage.

#### Examination

Patient is a 48 y/o female c/o sudden and severe headaches over the past three to four weeks; one headache was accompanied with vomiting. Patient admits to recent photophobia and intermittent blurred vision. She has a history of venous thrombi (clots) following an emergency hip surgery for a fracture she suffered two years ago when

she was in an automobile accident. Multiple vertebrae and her pelvis were also fractured. No other complications post-accident noted. Hypertensive with a BP of 154/86; neurologic and physical examination is otherwise normal. Diagnoses: hypertension and possible cerebral aneurysm.

#### Clinical Course

The neurologist ordered a CT scan that revealed a small saccular aneurysm measuring 4 mm near the cerebral arterial circle, the vascular pathway supplying the brain. R.F. was scheduled for a craniotomy and surgical insertion of a clip around the neck of the aneurysm to control bleeding and offer protection from rebleeding.

An aneurysm (*AN-yu-rizm*) is a bulge in a weakened arterial wall that can rupture and cause damage. An aneurysm is illustrated later in this chapter when we learn more about R.F.'s medical care. There is more information on aneurysms and their potential effects in Chapters 9 and 17.

## Introduction

A suffix is a word ending that modifies a root. A suffix may indicate that the word is a noun or an adjective and often determines how the definition of the word will begin (**Box 2-1**). For example, using the root *myello*, meaning “bone marrow,” the adjective ending *-oid* forms the word *myeloid*, which means “like or pertaining to bone marrow.” The ending *-oma* forms *myeloma*, which is a tumor of the bone marrow. Adding another root, *gen*, which represents genesis or origin, and the adjective ending *-ous* forms the word *myelogenous*, meaning “originating in bone marrow.”

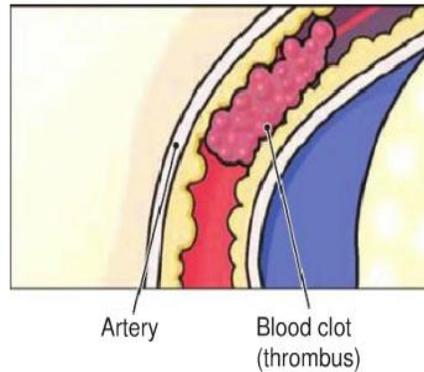
The suffixes given in this chapter are general ones that are used throughout medical terminology. They include endings that form:

- Nouns: a person, place, or thing
- Adjectives: words that modify nouns
- Plurals: endings that convert single nouns to multiples

Additional suffixes will be presented in later chapters as they pertain to disease states, medical treatments, or specific body systems.

## Noun Suffixes

The following general suffixes convert roots into nouns. **Table 2-1** lists suffixes that represent different conditions. Note that the ending *-sis* may appear with different



**Figure 2-1 Thrombosis.** This term refers to having a blood clot (thrombus) in a vessel. The word *thrombosis* has the noun suffix *-sis*, meaning “condition of.”

**TABLE 2-1 Suffixes That Mean “Condition Of”**

SUFFIX	EXAMPLE	DEFINITION OF EXAMPLE
-ia	phobia <i>FŌ-bē-a</i>	persistent and exaggerated fear
-ism	alcoholism <i>AL-kō-hol-izm</i>	impaired control of alcohol use
-sis*	acidosis <i>as-i-DŌ-sis</i>	acid condition of body fluids
-y	tetany <i>TET-a-nē</i>	sustained muscle contraction

\*The ending *-sis* may appear with a combining vowel, as *-osis*, *-iasis*, *-esis*, or *-asus*. The first two of these denote an abnormal condition.

## EXERCISE 2-1

Write the suffix that means “condition of” in the following words. Remember to use the phonetics to pronounce each word as you work through the exercises.

1. phobia (unfounded fear; from G. *phobos*: fear) \_\_\_\_\_  
*FO-be-ab*
2. psoriasis (skin disease) \_\_\_\_\_  
*so-RI-ab-sis*
3. egotism (exaggerated self-importance; from *ego*: self) \_\_\_\_\_  
*E-go-tizm*
4. dystrophy (changes due to lack of nourishment; root: troph/o) \_\_\_\_\_  
*DIS-tro-fe*
5. anesthesia (loss of sensation; root: esthesi/o) (Fig. 2-2) \_\_\_\_\_  
*an-es-THE-ze-ab*
6. parasitism (infection with parasites or behaving as a parasite) \_\_\_\_\_  
*PAR-ab-sit-izm*
7. stenosis (narrowing of a canal) \_\_\_\_\_

**TABLE 2-2 Suffixes for Medical Specialties**

SUFFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
-ian	specialist in a field of study	physician <i>fi-ZISH-un</i>	practitioner of medicine (from root <i>physi/o</i> , meaning “nature”)
-iatrics	medical specialty	geriatrics <i>jer-ē-AT-riks</i>	study and treatment of the aged (from root <i>ger/i</i> , meaning “old age”)
-iatry	medical specialty	podiatry <i>pō-DĪ-a-trē</i>	study and treatment of the foot (from root <i>pod/o</i> , meaning “foot”)
-ics	medical specialty	orthopedics <i>or-thō-PĒ-diks</i>	study and treatment of the skeleton and joints (from root <i>ped/o</i> , meaning “child,” and prefix <i>ortho</i> , meaning “straight”)
-ist	specialist in a field of study	cardiologist <i>kar-dē-OL-ō-jist</i>	specialist in the study and treatment of the heart (from root <i>cardi/o</i> , meaning “heart”)
-logy	study of	physiology <i>fiz-ē-OL-ō-jē</i>	Study of function in a living organism (from root <i>physi/o</i> , meaning “nature”)

Write the suffix in each of the following words that means “study of,” “medical specialty,” or “specialist in a field of study”:

1. dentist (one who treats the teeth and mouth) .....-ist .....

2. neurology (the study of the nervous system) .....

ƣ- technologist (specialist in a technical field) .....

€- psychiatry (study and treatment of mental disorders) .....

°-geriatrics ( study and treatment of the aged; root: ger/e).....

**Write a word for a specialist in the following fields.**

**7.** anatomy (study of body structure)  
*ah-NAT-o-me*

\_\_\_\_\_

**8.** pediatrics (care and treatment of children; root: ped/o) (see **Fig. 2-3**)  
*pe-de-AT-riks*

\_\_\_\_\_

**9.** radiology (use of radiation in diagnosis and treatment)  
*ra-de-OL-o-je*

\_\_\_\_\_

**10.** psychology (study of the mind; root: psych/o)  
*si-KOL-o-je*

\_\_\_\_\_

**11.** technology (practical application of science)  
*tek-NOL-o-je*

\_\_\_\_\_

**12.** obstetrics (medical specialty concerning pregnancy and birth)  
*ob-STET-riks*

\_\_\_\_\_

## Adjective Suffixes

The suffixes below are all adjective endings that mean “pertaining to” or “resembling” (Table 2-3). There are no rules for which ending to use for a given noun. Familiarity comes with practice.

**TABLE 2-3 Suffixes That Mean “Pertaining to” or “Resembling”**

SUFFIX	EXAMPLE	DEFINITION OF EXAMPLE
-ac	cardiac <i>CAR-dē-ak</i>	pertaining to the heart
-al	skeletal <i>SKEL-e-tal</i>	pertaining to the skeleton
-ar	muscular <i>MUS-kū-lar</i>	pertaining to muscles
-ary	dietary <i>dī-e-tar-ē</i>	pertaining to the diet
-form	muciform <i>MŪ-si-form</i>	like or resembling mucus
-ic*	metric <i>ME-trik</i>	pertaining to a meter (unit of measurement) (Fig. 2-3)
-ical (ic + al)	anatomical <i>an-a-TOM-i-kl</i>	pertaining to anatomy
-ile	febrile <i>FEB-rīl</i>	pertaining to fever
-oid	toxoid <i>TOK-soyd</i>	resembling toxin (poison)
-ory	respiratory <i>RES-pi-ra-tor-ē</i>	pertaining to respiration
-ous	venous <i>VĒ-nus</i>	pertaining to a vein

\*For words ending with the suffix *-sis*, the first *s* in the ending is changed to *t* before adding *-ic* to form the adjective, as in psychotic, pertaining to psychosis (a mental disorder), or diuretic, pertaining to diuresis (increased urination).

Identify the suffix meaning “pertaining to” or “resembling” in each of the following words:

1. salivary (pertaining to saliva) .....-ary.....
2. pelvic (pertaining to the pelvis) .....
3. neurotic (pertaining to neurosis) .....
4. fibrous (pertaining to fibers) .....
5. epileptiform (resembling epilepsy) .....
6. ovoid (resembling an egg) .....

## Forming Plurals

Many medical words have special plural forms based on the ending of the word. Table 2-4 gives some general rules for the formation of plurals along with examples. The plural endings listed in column 2 are substituted for the word endings in column 1.

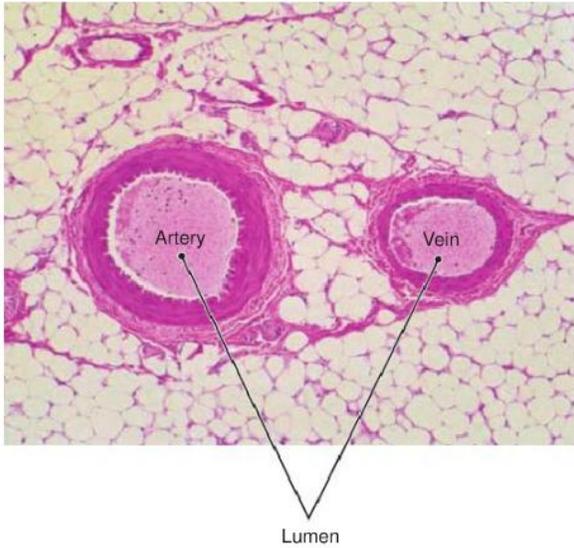
### Some Exceptions to the Rules

There are exceptions to the rules above for forming plurals, some of which will appear in later chapters. For example, the plural of virus is viruses, and serums is sometimes used instead of sera. An -es ending may be added to words ending in -ex or -ix to form a plural, as in appendixes, apexes, and indexes.

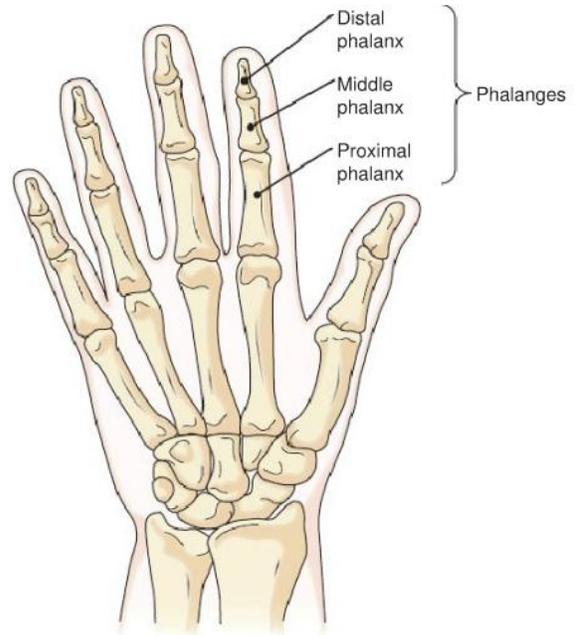
Words ending in -oma, meaning “tumor,” should be changed to -omata, but most people just add an s to form the plural. For example, the plural of carcinoma (a type of cancer) should be carcinomata, but carcinomas is commonly used.

**TABLE 2-4 Plural Endings**

WORD ENDING	PLURAL ENDING	SINGULAR EXAMPLE	PLURAL EXAMPLE
a	ae	gingiva (gum) <i>JIN-ji-va</i>	gingivae <i>JIN-ji-vē</i>
en	ina	foramen (opening) <i>fō-RĀ-men</i>	foramina <i>fō-RAM-i-na</i>
ex, ix, yx	ices	appendix (something added) <i>a-PEN-dix</i>	appendices <i>a-PEN-dī-sēz</i>
is	es	diagnosis (identification of disease) <i>dī-ag-NŌ-sis</i>	diagnoses <i>dī-ag-NŌ-sēz</i>
ma	mata	stigma (mark or scar) <i>STIG-ma</i>	stigmata stig-MAT-a
nx (anx, inx, ynx)	nges	phalanx (bone of finger or toe) <i>fa-LANKS</i>	phalanges <i>fa-LAN-jēz</i>
on	a	spermatozoon (male reproductive cell) <i>sper-ma-tō-ZŌ-on</i>	spermatozoa <i>sper-ma-tō-ZŌ-a</i>
um	a	ovum (egg) <i>Ō-vum</i>	ova <i>Ō-va</i>
us	ii	embolus <i>EM-bō-lus</i>	emboli <i>EM-bō-lī</i>



**Figure 2-9** A lumen is the central opening of an organ or vessel. Two blood vessels are shown, an artery and a vein. The plural of lumen is *lumina*.



**Figure 2-10** Bones of the right hand (anterior view). Each bone of a finger or toe is a phalanx. Each hand has 15 phalanges.

Identify the suffix that means “condition of” in each of the following words:

- ١. insomnia (in-som-ne-a) .....
- ٢. anemia (a-NE-me-a) .....
- ٣. psychosis (si-ko-sis) .....
- ٤. dystrophy (DIS-tro-fe-) .....
- ٥. acidosis (as-i-DO-sis) .....

Give the suffix in the following words that means “specialty” or “specialist”:

- ٦. psychiatry .....
- ٧. orthopedist .....
- ٨. obstetrician.....
- ٩. urology.....

Identify the adjective suffix in each of the following words that means “pertaining to” or “resembling”:

- ١. physiologic .....
- ٢. local.....
- ٣. cutaneous .....
- ٤. lymphoid.....
- ٥. cellular .....
- ٦. virile.....

Υ. anatomical .....

Λ. circular.....

## Word Building

Write a word for the following definitions using the word parts provided. Each may be used more than once.

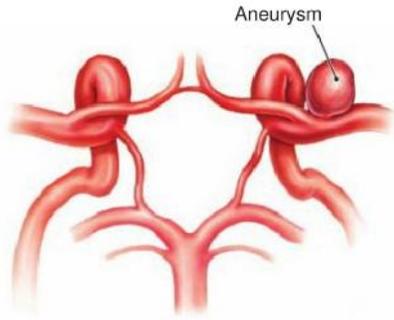
-ist   -ic   parasit   -ism   -y   log   -o-

- 48. pertaining to parasites \_\_\_\_\_
- 49. study of parasites \_\_\_\_\_
- 50. a condition of having parasites \_\_\_\_\_
- 51. One who studies parasites \_\_\_\_\_

## Case Study Revisited

### R.F.'s Postoperative Follow-Up

R.F. underwent a craniotomy in which a special clip was placed around the neck of the aneurysm. She was closely observed for postoperative neurologic deficits, including vascular spasm, a serious possible complication. She tolerated the procedure well with no complications.



Cerebral arterial circle

## Word Analysis

Define each of the following words, and give the meaning of the word parts in each. Use a dictionary if necessary.

52. geriatrician (*jer-e-ah-TRIH-shun*) \_\_\_\_\_
- a. ger/e \_\_\_\_\_
  - b. iatr/o \_\_\_\_\_
  - c. -ic \_\_\_\_\_
  - d. -ian \_\_\_\_\_
53. anesthesia (*an-es-THE-ze-ah*) \_\_\_\_\_
- a. an- \_\_\_\_\_
  - b. esthesi/o \_\_\_\_\_
  - c. -ia \_\_\_\_\_
54. photophobia (*fo-to-FO-be-ah*) \_\_\_\_\_
- a. phot/o \_\_\_\_\_
  - b. phob (from Greek *phobos*) \_\_\_\_\_
  - c. -ia \_\_\_\_\_

## Case Study: C.R.'s Job-Related Breathing Problems

### Chief Complaint

C.R., a 54 y/o woman, has been having difficulty breathing (dyspnea) that was originally attributed to a left upper lobe (LUL) pneumonia. She was treated with an antibiotic, and after no improvement was noted in her breathing, C.R. had a follow-up chest x-ray that revealed a small LUL pneumothorax. She was referred to the respiratory clinic and saw Dr. Williams, a pulmonologist.

### Past Medical History

C.R. has a history of smoking a pack a day for 30 years and stopped two years ago. She noticed an improvement in her breathing and tired less easily after she quit. About one month ago, she complained of general malaise, dyspnea, and a productive cough; she was expectorating pus-containing (purulent) sputum and was febrile. The chest radiograph and sputum cultures indicate that her symptoms had progressed into a bronchopneumonia with pulmonary edema complicated

by a small pneumothorax in the LUL. A pea-size mass was identified in the left lobe. Also noted, C.R. is a hairstylist as well as a manicurist and recently went back to work in a beauty salon. She has complained that the fumes from the hair chemicals and nail products affect her breathing.

### Clinical Course

Dr. Williams performed a bronchoscopic examination. During the examination, he took a biopsy of the mass, and the results were negative. Sputum cultures were also taken to determine the spectrum of action of an appropriate antibiotic. A respiratory therapist measured the patient's respiratory volumes and recorded any changes. The patient was told to drink plenty of liquids, get proper rest, and refrain from working for one week. She was told to wear a mask when she returned to work, avoid unventilated areas in the salon, and avoid the chemical fumes as much as possible. She is to return to the clinic in one month for follow-up.

### Case Study Questions

Multiple Choice. Select the best answer, and write the letter of your choice to the left of each number.

- |   |   |
|---|---|
| <p>_____ 1. The <i>gh</i> in the terms cough and radiograph is pronounced as</p> <ul style="list-style-type: none"><li>a. g</li><li>b. h</li><li>c. f</li><li>d. s</li></ul> <p>_____ 2. The <i>pn</i> in the term bronchopneumonia is pronounced as</p> <ul style="list-style-type: none"><li>a. p</li><li>b. n</li><li>c. f</li><li>d. s</li></ul> <p>_____ 3. Which of the following is a compound word?</p> <ul style="list-style-type: none"><li>a. pulmonary</li><li>b. pneumothorax</li><li>c. respiratory</li><li>d. antibiotic</li></ul> | <p>_____ 4. The suffix that means "condition of" in <i>pneumonia</i> is</p> <ul style="list-style-type: none"><li>a. -nia</li><li>b. -monia</li><li>c. -ia</li><li>d. -onia</li></ul> <p>_____ 5. The plural of <i>spectrum</i> is</p> <ul style="list-style-type: none"><li>a. spectra</li><li>b. spectria</li><li>c. spectrina</li><li>d. spectrums</li></ul> |
|---|---|

متن زیر را به انگلیسی خلاصه نمایند

#### Lifestyle changes in women with hot flashes

Researchers find that women with hot flashes have more sensitive thermostats in their brain, so are comfortable only in a small range of temperatures. Staying cool and reducing stress are the principal lifestyle changes to treat your hot flashes .

- Avoid warm rooms, hot drinks, hot foods, alcohol, caffeine, bright lights, excess stress, and cigarette smoking. Wear layers of clothing made from light, breathable fabrics, removing a layer or two when you're hot, and replacing them when you're cooler. Cooling products, including sprays, gels, cooling bed linens, wicking sleepwear, and the Chillow pillow may be helpful .

- To reduce stress and promote more restful sleep, exercise regularly, but not too close to bedtime.

Meditation, yoga, tai chi, biofeedback, acupuncture, or massage also will lower your stress levels .

•When a hot flash is starting, try “paced respiration”—slow, deep, abdominal breathing, in through your nose and out through your mouth. Breathe only ۶-۵ times per minute, much more slowly than usual .

•Try different strategies to stay cool while sleeping. Dress in light, breathable nightclothes. Use layered bedding that can be easily removed during the night. Cool down with a bedside fan. Keep a frozen cold pack or bag of frozen peas under your pillow, and turn the pillow often so that your head is always resting on a cool surface. If you wake at night, sip cool water. Try different techniques for getting back to sleep, such as meditation, paced respiration, or getting out of bed and reading until you become sleepy .

•Women who are overweight have more hot flashes, so maintain a healthy weight and exercise regularly to decrease bothersome hot flashes and improve your overall health .

یک مقاله کارآزمایی بالینی با موضوع دلخواه به انگلیسی پیدا کنید و در کلاس ارائه نمایند. مثال..

Effects of zinc supplementation on.....

## Chapter <sup>3</sup>

# Prefixes

### Objectives

After study of this chapter you should be able to:

1. Define a prefix and explain how prefixes are used.
2. Identify and define some of the prefixes used in medical terminology.
3. Use prefixes to form words used in medical terminology

### Case Study: *T.S.'s Diving Accident and Spinal Cord Injury*



#### Chief Complaint

A 12-year-old male, T.S., was transported to the emergency room after diving into a shallow backyard cement pool. He c/o severe head and neck pain and has minimal movement of his arms. He is not able to move his legs.

#### Examination

A well-nourished 12-year-old male is awake and oriented, initially hypotensive and bradycardic, but vital signs are stabilizing. He reports being at a backyard pool party for his friend's birthday and remembers diving into the pool head first. The next thing he recalls is waking up on the deck of the pool with his friends standing all around him. He has a large erythematous and bruised area centered on the upper part of the forehead. T.S. has full head and neck movement with fair muscle strength. He has weak shoulder movement and is able to slightly flex his elbows and extend his wrists. His legs are areflexic and flaccid. He has no finger movement. Past medical history is non-contributory.

#### Clinical Course

T.S. is diagnosed with a burst or comminuted fracture of the C6 vertebra that may potentially result in quadriplegia. After surgical stabilization of the cervical fracture, T.S. was transferred to the spinal cord unit where his vital signs could be monitored closely along with frequent assessments for orthostatic hypotension and possible complications following spinal surgery. He will be moved to a rehabilitation center in about two weeks for physical and occupational therapy. His medical team consists of his primary physician (pediatrician), a neurosurgeon, a neurologist, and a physical medicine and rehabilitation (PM&R) specialist. T.S.'s condition will require a full complement of healthcare team members, including nurses, psychologists, physical and occupational therapists, pharmacists, and social workers.

A spinal cord injury can result in psychologic as well as permanent physical damage, as noted in T.S.'s follow-up study later in this chapter. There is more information on the spinal cord and behavioral disorders in Chapter 17.

**A prefix** is a short word part added before a word or word root to modify its meaning. For example, the word lateral means "side." Adding the prefix uni-, meaning "one," forms unilateral, which means "affecting or involving one side." Adding the prefix contra-, meaning "against or opposite," forms contralateral, which refers to an opposite side. The term equilateral means "having equal sides." Prefixes in this book will be followed by a hyphen to show that other parts will be added to the prefix to form a word. This chapter introduces most of the prefixes used in medical terminology.



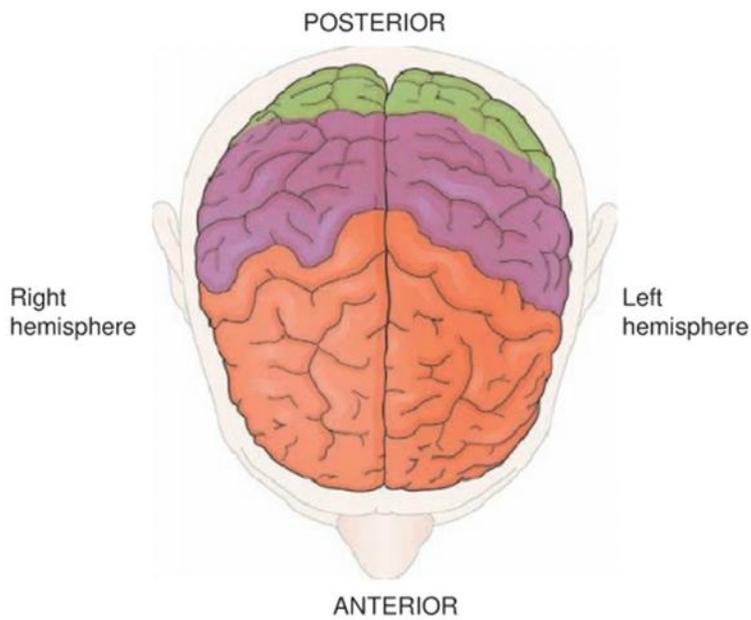
Unilateral cleft lip



Bilateral cleft lip

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Unilateral: affecting or involving one side



**Figure 3-1 Brain hemispheres.** Each half of the brain is a hemisphere. The prefix *hemi-* means half or one side.

**TABLE 3-1 Prefixes for Numbers\***

PREFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
prim/i-	first	primitive <i>PRIM-i-tiv</i>	occurring first in time
mon/o	one	monocular <i>mon-OK-ū-lar</i>	pertaining to one eye
uni-	one	unicellular <i>ū-ni-SEL-ū-lar</i>	composed of one cell (Fig. 3-1)
hemi-	half; one side	hemisphere <i>HEM-i-sfēr</i>	one half of a rounded structure
semi-	half; partial	semisolid <i>sem-ē-SOL-id</i>	partially solid
bi-	two, twice	bicuspid <i>bī-KUS-pid</i>	a tooth with two points (cusps)
di-	two, twice	dimorphous <i>dī-MOR-fus</i>	having two forms (morph/o)
dipl/o	double	diploid <i>DIP-loyd</i>	having two sets of chromosomes
tri-	three	triplet <i>TRIP-let</i>	one of three offspring produced in a single birth
quadr/i-	four	quadrant <i>KWOD-rant</i>	one-fourth of an area
tetra-	four	tetrahedron <i>tet-ra-HE-dron</i>	a figure with four surfaces
multi-	many	multiple <i>MUL-ti-pl</i>	consisting of many parts
poly-	many, much	polysaccharide <i>pol-ē-SAK-a-riid</i>	substance composed of many sugars

\*Prefixes pertaining to the metric system are in the appendix.

### Fill in the blanks:

١. Monoclonal refers to a colony (clone) derived from \_\_\_\_\_ cell(s).
٢. The quadriceps muscle has \_\_\_\_\_ part(s).
٣. To unify means to make two or more parts into \_\_\_\_\_ part(s).
٤. The term semilunar means \_\_\_\_\_ moon(s).
٥. A dichotomy has \_\_\_\_\_ part(s).
٦. A multicellular organism has \_\_\_\_\_ cell(s).

Give a prefix that is similar in meaning to each of the following:

١. bi- \_\_\_\_\_

٢. poly- \_\_\_\_\_

٣. semi- \_\_\_\_\_

٤. mon/o \_\_\_\_\_

Table 3-2		Prefixes for Colors	
Prefix	Meaning	Example	Definition of Example
cyan/o-	blue	cyanosis <i>si-ah-NO-sis</i>	bluish discoloration of the skin due to lack of oxygen (Fig. 3-4)
erythr/o-	red	erythrocyte <i>eh-RITH-ro-site</i>	red blood cell (-cyte)
leuk/o-	white, colorless	leukemia <i>lu-KE-me-ah</i>	cancer of white blood cells
melan/o-	black, dark	melanin <i>MEL-ah-nin</i>	the dark pigment that colors the hair and skin
xanth/o-	yellow	xanthoma <i>zan-THO-mah</i>	yellow growth (-oma) on the skin

Match the following terms and write the appropriate letter to the left of each number:

\_\_\_\_\_ ١. Melanocyte

a. pertaining to bluish discoloration

\_\_\_\_\_ ٢. xanthoma

b. redness of the skin

\_\_\_\_\_ ٣. cyanotic

c. yellow raised area on the skin

\_\_\_\_\_ ٤. erythroderma

d. cell that produces dark pigment

\_\_\_\_\_ ٥. leukemia

e. overgrowth of white blood cells

**Table 3-3**

**Negative Prefixes**

Prefix	Meaning	Example	Definition of Example
a-, an-	not, without, lack of, absence	anhydrous <i>an-HI-drus</i>	lacking water (hydr/o)
anti-	against	antiseptic <i>an-tih-SEP-tik</i>	agent used to prevent infection (sepsis)
contra-	against, opposite, opposed	contraindicated <i>kon-trah-IN-dih-ka-ted</i>	against recommendations, not advisable
de-	down, without, removal, loss	decalcify <i>de-KAL-sih-fi</i>	remove calcium (calc/i) from
dis-	absence, removal, separation	dissect <i>dih-SEKT</i>	to separate tissues for anatomic study
in- <sup>a</sup> , im- (used before b, m, p)	not	incontinent <i>in-KON-tih-nent</i>	not able to contain or control discharge of excretions
non-	not	noncontributory <i>non-kon-TRIB-u-tor-e</i>	not significant, not adding information to a medical diagnosis
un-	not	uncoordinated <i>un-ko-OR-dih-na-ted</i>	not working together, not coordinated

Identify and define the prefix in each of the following words:

	Prefix	Meaning of Prefix
١. amorphous (without form) (root morph/o)	a-	not, without, lack of
٢. antibody	.....	.....
٣. amnesia (loss of memory)	.....	.....
٤. disintegrate	.....	.....
٥. contralateral	.....	.....

Add a **prefix to form the negative** of each of the following words:

- |  |                    |
|--|--------------------|
| ١. coordinated .....uncoordinated                | ٢. adequate .....  |
| ٣. infect.....                                   | ٤. congestant..... |
| ٥. permeable (capable of being penetrated) ..... |                    |

**TABLE 3-4 Prefixes for Direction**

PREFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
ab-	away from	abduct <i>ab-DUKT</i>	to move away from the midline
ad-	toward; near	adhere <i>ad-HĒR</i>	to attach or stick together
dia-	through	dialysis <i>dī-AL-i-sis</i>	separation (-lysis) by passage through a membrane (Fig. 3-2)
per-	through	percutaneous <i>per-kū-TĀ-nē-us</i>	through the skin
trans-	through	transfusion <i>trans-FŪ-zhun</i>	introduction of blood or blood components into the bloodstream

Identify and define the prefix in each of the following words:

	Prefix	Meaning of Prefix
١. perforate	_____	_____
٢. adjacent	_____	_____
٣. abnormal	_____	_____
٤. diarrhea	_____	_____
٥. transfer	_____	_____

**TABLE 3-5 Prefixes for Degree**

PREFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
hyper-	over, excess, abnormally high, increased	hyperventilation <i>hī-per-ven-ti-LĀ-shun</i>	excess breathing
hypo-*	under; below	hypoxia <i>hī-POK-sē-a</i>	decreased oxygen in the tissues
olig/o-	few, scanty	oligomenorrhea <i>ol-i-gō-men-ō-RE-a</i>	a scanty menstrual flow (men/o)
pan-	all	panacea <i>pan-a-SĒ-a</i>	remedy that cures all ills; a cure-all
super-*	above, excess	supernumerary <i>su-per-NŪ-mer-ar-ē</i>	in excess number

\*May also show position, as in hypodermic, superficial.

### EXERCISE 3-5

Match the following terms, and write the appropriate letter to the left of each number.

- |   |   |
|---|---|
| _____ 1. hypotensive ( <i>hi-po-TEN-siv</i> )               | a. excess breathing                     |
| _____ 2. oligodontia ( <i>ol-ih-go-DON-she-ah</i> )         | b. something written above              |
| _____ 3. panplegia ( <i>pan-PLĒ-je-ah</i> )                 | c. having low blood pressure            |
| _____ 4. superscript ( <i>SU-per-skript</i> )               | d. total paralysis                      |
| _____ 5. hyperventilation ( <i>hi-per-ven-tih-LA-shun</i> ) | e. less than the normal number of teeth |

### TABLE 3-6 Prefixes for Size and Comparison

PREFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
equi-	equal, same	equilateral <i>e-kwi-LAT-er-al</i>	having equal sides
eu-	true, good, easy, normal	euthanasia <i>ū-tha-NĀ-zē-a</i>	easy or painless death (root thanat/o)
hetero-	other, different, unequal	heterosexual <i>het-er-ō-SEX-ū-al</i>	pertaining to the opposite sex
homo-, homeo-	same, unchanging	homothermic <i>hō-mō-THER-mik</i>	maintaining a constant body temperature (root therm/o); warm blooded
iso-	equal, same	isograft <i>ī-sō-graft</i>	graft between two genetically identical individuals
macro-	large, abnormally large	macrocyte <i>MAK-rō-sit</i>	extremely large red blood cell

PREFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
mega-,* megalo-	large; abnormally large	megabladder <i>meg-a-BLAD-er</i>	enlargement of the bladder
micro-	small	microscopic <i>mī-krō-SKOP-ik</i>	extremely small; visible only through a microscope
neo-	new	neonate <i>NĒ-ō-nāt</i>	a newborn infant (Fig. 3-3)
normo-	normal	normovolemia <i>nor-mō-vol-Ē-mē-a</i>	normal blood volume
ortho-	straight, correct, upright	orthotic <i>or-THOT-ik</i>	correcting or preventing deformities
poikilo-	varied; irregular	poikiloderma <i>poy-ki-lō-DER-ma</i>	mottled condition of the skin
pseudo-	false	pseudoplegia <i>sū-dō-PLĒ-jē-a</i>	false paralysis (suffix -plegia)
re-	again; back	regurgitation <i>rē-gur-ji-TĀ-shun</i>	backward or return flow, as of blood or stomach contents

Match the following terms and write the appropriate letter to the left of each number:

- |                         |  |
|-------------------------|--|
| _____ ١. reflux         | a. an irregularly shaped cell            |
| _____ ٢. orthodontic    | b. pertaining to normal body temperature |
| _____ ٣. Pseudoreaction | c. backward flow                         |
| _____ ٤. poikilocyte    | d. false response                        |
| _____ ٥. normothermic   | e. pertaining to straight teeth          |

Identify and define the prefix in each of the following words:

	Prefix	Meaning of Prefix
٦. equidistant	_____	_____
٧. orthopedics	_____	_____
٨. recuperate (recover from illness)	_____	_____
٩. euthyroidism	_____	_____
١٠. neocortex	_____	_____

اصل این مقاله کارآزمایی بالینی را پیدا و نتایج آن را بیان کنید

Use of sucrose as a treatment for infant colic.

**TABLE 3-7 Prefixes for Time and/or Position**

PREFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
ante-	before	antenatal <i>an-tē-NĀ-tal</i>	before birth
pre-	before, in front of	predisposing <i>prē-dis-PŌZ-ing</i>	leading toward a condition, such as disease
pro-	before, in front of	prodrome <i>prō-drōm</i>	symptom that precedes a disease
post-	after, behind	postmenopausal <i>pōst-men-ō-PAW-sal</i>	after menopause

Identify and define the prefix in each of the following words:

	Prefix	Meaning of Prefix
٦. premature	-----	-----
٧. post-traumatic	-----	-----
٨. progenitor	-----	-----
٩. antedate	-----	-----

**TABLE 3-8 Prefixes for Position**

PREFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
dextr/o-	right	dextrocardia <i>deks-trō-KAR-dē-a</i>	location of the heart (cardi/o) in the right side of the chest
sinistr/o-	left	sinistrad <i>sin-IS-trad</i>	toward the left
ec-, ecto-	out; outside	ectoderm <i>EK-tō-derm</i>	outermost layer of the developing embryo
ex/o-	away from; outside	excise <i>ek-SĪZ</i>	to cut out
end/o-	in; within	endoscope <i>EN-dō-skōp</i>	device for viewing the inside of a cavity or organ
mes/o-	middle	mesencephalon <i>mes-en-SEF-a-lon</i>	midbrain
syn-, sym- (used before b, m, p,)	together	synapse <i>SIN-aps</i>	a junction between two nerve cells (Fig. 3-4)
tel/e-, tel/o-	end	telangion	a terminal vessel (root angi/o)

Match the following terms and write the appropriate letter to the left of each number:

- |                    |   |
|--------------------|---|
| _____ ٦. Endonasal | a. placement of the heart outside its normal position |
| _____ ٧. syndrome  | b. middle layer of the developing embryo              |



## Word Analysis

Define each of the following words and give the meaning of the word parts in each. Use a dictionary if necessary.

78. isometric (*i-so-MET-rik*) \_\_\_\_\_  
a. iso- \_\_\_\_\_  
b. metr/o \_\_\_\_\_  
c. -ic \_\_\_\_\_
79. symbiosis (*sim-be-O-sis*) \_\_\_\_\_  
a. sym- \_\_\_\_\_  
b. bio \_\_\_\_\_  
c. -sis \_\_\_\_\_
80. monoclonal (*mon-o-KLO-nal*) \_\_\_\_\_  
a. mon/o- \_\_\_\_\_  
b. clon(e) \_\_\_\_\_  
b. -al \_\_\_\_\_

### Translate this text to persian

### Exercise or exercise and diet for preventing type 2 diabetes mellitus

Type 2 diabetes is mainly characterised by a reduced ability of the hormone insulin to stimulate glucose uptake in body fat and muscles (insulin resistance) combined with insufficient insulin secretion that leads to increased blood glucose levels. It has been shown that weight reduction and an increase in daily energy expenditure decreases insulin resistance. There are some factors that are associated with an increased risk of type 2 diabetes: these are obesity, previous gestational diabetes, hypertension, family history of type 2 diabetes, dyslipidaemia and some ethnical groups are more at risk.

**Weight loss** — Many people with type 2 diabetes are overweight. Losing even a small amount of weight (5 to 10 percent of total body weight) can help the body to produce and use insulin more efficiently. Recommended calorie intake — The number of calories needed to maintain weight depends upon your age, sex, height, weight, and activity level. In general:

- Men, active women - 10 cal/lb
- Most women, sedentary men, and adults over 60 years - 12 cal/lb
- Sedentary women, obese adults - 10 cal/lb

There is not a single optimal diet or meal plan for people with diabetes. The proportion of carbohydrates, fat, and protein should be individualized based upon the metabolic status of the individual (weight loss needs, lipid levels, renal function, and blood pressure) and food preferences. A diet that includes carbohydrates from fruits, vegetables, whole grains, legumes, and low-fat milk is

encouraged. A diet that is high in fiber (20 to 30 grams per day) may help to control blood glucose levels and glycated hemoglobin (A1C).

**Exercise** — Exercising regularly can help to lose weight and keep it off. The recommended amount of exercise is 30 minutes per day most days of the week. People who take insulin or oral medications that lower blood sugar levels should check their blood glucose level before and after exercising. If exercise is vigorous and prolonged (more than 30 minutes), check the blood glucose every 10 minutes. Frequent monitoring can help to get a sense of what effect exercise has on the blood glucose level. If blood sugar level becomes low during exercise, eat a snack according to the guidelines below.

- If the blood glucose is 80 to 100 mg/dL, eat 10 to 15 grams of fast-acting carbohydrate (eg, 1/2 cup fruit juice, six to eight hard candies).

- If the level is less than 80 mg/dL, eat 20 to 30 grams of fast-acting carbohydrates.

## Chapter 4

# Body Structure, cells, tissues

### The Cell

The body can be studied from its simplest to its most complex level, beginning with the cell, the basic unit of living organisms.

### Tissues

Cells are organized into four basic types of tissues that perform specific functions.

Epithelial tissue covers and protects body structures and lines organs, vessels, and cavities.

- Connective tissue supports and binds body structures. It contains fibers and other nonliving material between the cells. Included are adipose (fat) tissue, cartilage, bone and blood
- Muscle tissue (root my/o) contracts to produce movement. There are three types of muscle tissue:
  - Skeletal or voluntary muscle moves the skeleton.
  - Cardiac muscle forms the heart. It functions without conscious control and is described as involuntary.
  - Smooth, or visceral, muscle forms the walls of the abdominal organs; it is also involuntary.
- Nervous tissue (root neur/o) makes up the brain, spinal cord, and nerves

## Organs and Organ Systems

Tissues are arranged into organs, which serve specific functions. The organs, in turn, are grouped into systems. Each of the body systems is discussed in Part 3. However, that the body functions as a whole—no system is independent of the others. They work together to maintain the body's state of internal stability, termed homeostasis.

**TABLE 4-1 Roots for Cells and Tissues**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
morph/o	form	polymorphic <i>pol-ē-MOR-fik</i>	having many forms
cyt/o, -cyte	cell	cytogenesis <i>sī-tō-JEN-e-sis</i>	the formation (-genesis) of cells
nucle/o	nucleus	nuclear <i>NŪ-klē-ar</i>	pertaining to a nucleus
kary/o	nucleus	karyotype (Fig. 4-6) <i>KAR-ē-ō-tīp</i>	picture of the chromosomes of a cell organized according to size
hist/o, histi/o	tissue	histologist <i>his-TOL-ō-jist</i>	specialist in the study of tissue
fibr/o	fiber	fibrosis <i>fī-BRŌ-sis</i>	abnormal formation of fibrous tissue

**TABLE 4-1 Roots for Cells and Tissues, continued**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
reticul/o	network	reticulum <i>re-TIK-ŭ-lum</i>	a network
aden/o	gland	adenoma <i>ad-e-NO-ma</i>	tumor (-oma) of a gland
papill/o	nipple	papilliform <i>pa-PIL-i-form</i>	resembling a nipple
myx/o	mucus	myxadenitis <i>miks-ad-e-NĪ-tis</i>	inflammation of a gland that secretes mucus
muc/o	mucus, mucous membrane	mucorrhea <i>mŭ-kō-RĒ-a</i>	increased flow (-rhea) of mucus
somat/o, -some	body	sō-MAT-ik	pertaining to the body (as compared with the germ cells or the mind)

Fill in the blanks:

1. Adenitis is inflammation (-itis) of a..... 2. Histogenesis is the formation (-genesis) of.....

3. A myxoma is a tumor of tissue that secretes.....

4. The study of tissues..... 5. The study of form.....

**TABLE 4-2 Roots for Cell Activity**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
blast/o, -blast	immature cell, productive cell, embryonic cell	leukoblast <i>LŪ-kō-blast</i>	an immature white blood cell
gen	origin, formation	genetics <i>je-NET-iks</i>	the science of genes and heredity
phag/o	eat, ingest	phagocyte <i>FAG-ō-sīt</i>	cell that ingests waste and foreign matter
phil	attract, absorb	acidophilic <i>a-sid-ō-FIL-ik</i>	attracting acid stain
plas	formation, molding, development	hyperplasia <i>hī-per-PLĀ-jē-a</i>	overdevelopment of an organ or tissue
trop	act on, affect	chronotropic <i>kron-o-TROP-ik</i>	affecting rate or timing
troph/o	feeding, growth, nourishment	atrophy <i>AT-rō-fē</i>	wasting away (lack of nourishment)

Match the following terms and write the appropriate letter to the left of each number:

- |                       |   |
|-----------------------|---|
| _____ 1. erythroblast | a. organism capable of manufacturing its own food |
| _____ 2. Hypertrophy  | b. formation of a nucleus                         |
| _____ 3. Phagocytosis | c. new formation of tissue                        |
| _____ 4. karyogenesis | d. ingestion of waste by a cell                   |
| _____ 5. autotroph    | e. immature red blood cell                        |
| _____ 6. neoplasia    | f. increased growth of tissue                     |

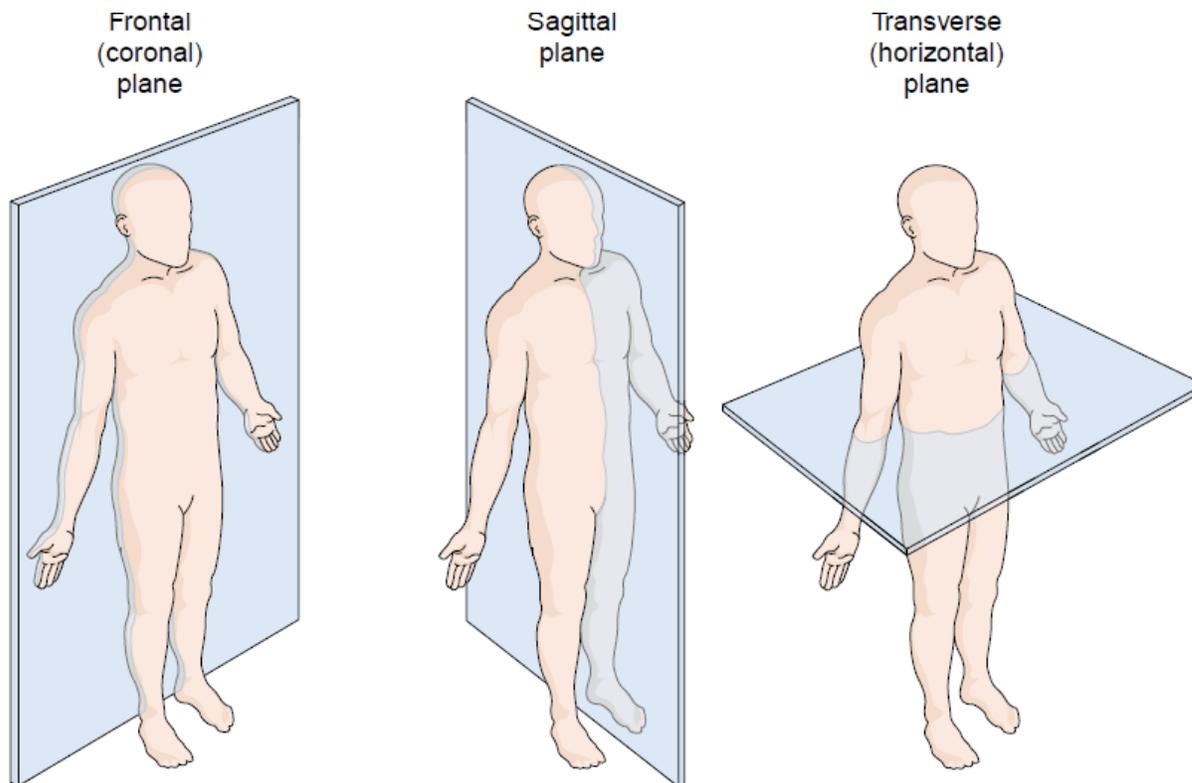
Identify and define the root in each of the following words:

	Root	Meaning of Root
7. esophagus (e-SOF-a-gus)	_____	_____
8. normoblast (NOR-mo _-blast)	_____	_____
9. dystrophy (DIS-tro _-f e _)	_____	_____
10. aplastic (a-PLAS-tik)	_____	_____

**Directional Terms** In describing the location or direction of a given point in the body, it is always assumed that the subject is in the anatomical position, that is, upright, with face front, arms at the sides with palms forward, and feet parallel, as shown in the small diagram.

planes of section,

that is, directions in which the body can be cut. A frontal plane, also called a coronal plane, is made at right angles to the midline and divides the body into anterior and posterior parts. A sagittal plane passes from front to back and divides the body into right and left portions. If the plane passes through the midline, it is a midsagittal or medial plane. A transverse plane passes horizontally, dividing the body into superior and inferior parts.



## DISPLAY 5-1 Anatomical Directions

TERM	DEFINITION
anterior (ventral)	toward the front (belly) of the body
posterior (dorsal)	toward the back of the body
medial	toward the midline of the body
lateral	toward the side of the body
proximal	nearer to the point of attachment or to a given reference point
distal	farther from the point of attachment or from a given reference point
superior	above
inferior	below
cephalad (cranial)	toward the head
caudal	toward the lower end of the spine (Latin <i>cauda</i> means "tail")
superficial (external)	close to the surface of the body
deep (internal)	close to the center of the body

## Word Parts Pertaining to Body Structure

**TABLE 5-1 Roots for Regions of the Head and Trunk**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
cephal/o	head	microcephaly <i>mī-krō-SEF-a-lē</i>	abnormal smallness of the head
cervic/o	neck	cervicofacial <i>ser-vi-kō-FĀ-shal</i>	pertaining to the neck and face
thorac/o	chest, thorax	extrathoracic <i>eks-tra-thō-RAS-ik</i>	outside the thorax
abdomin/o	abdomen	intra-abdominal <i>in-tra-ab-DOM-i-nal</i>	within the abdomen
celi/o	abdomen	celiac <i>SĒ-lē-ak</i>	pertaining to the abdomen
lapar/o	abdominal wall	laparoscope <i>LAP-a-rō-skōp</i>	instrument for viewing the peritoneal cavity through the abdominal wall
lumb/o	lumbar region, lower back	thoracolumbar <i>thō-rak-ō-LUM-bar</i>	pertaining to the chest and lumbar region
periton, peritone/o	peritoneum	peritoneal <i>per-i-tō-NĒ-al</i>	pertaining to the peritoneum

**TABLE 5-2 Roots for the Extremities**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
acro	extremity, end	acrodermatitis <i>ak-rō-der-ma-Tĭ-tis</i>	inflammation of the skin of the extremities
brachi/o	arm	antebrachium <i>an-tē-BRĀ-kē-um</i>	forearm
dactyl/o	finger, toe	polydactyly <i>pol-ē-DAK-til-ē</i>	having more than the normal number of fingers or toes
ped/o	foot	dextropedal <i>deks-TROP-e-dal</i>	using the right foot in preference to the left
pod/o	foot	podiatric <i>pō-dē-AT-rik</i>	pertaining to study and treatment of the foot

Write the adjective that fits each of the following definitions.

١. Pertaining to (-ic) the head..... Cephalic..... ٢. Pertaining to (-ic) the chest.....  
 ٣. Pertaining to (-al) the neck..... ٤. Pertaining to (-ar) the lower back.....  
 ٥. Pertaining to (-al) the abdomen.....

**TABLE 5-3 Prefixes for Position and Direction**

PREFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
circum-	around	circumoral <i>ser-kum-OR-al</i>	around the mouth
peri-	around	perivascular <i>per-ē-VAS-kū-lar</i>	around a vessel ( <i>vascul/o</i> )
intra-	in, within	intrauterine <i>in-tra-Ū-ter-in</i>	within the uterus
epi-	on, over	epithelium <i>ep-i-THĒ-lē-um</i>	tissue that covers surfaces
extra-	outside	extracellular <i>eks-tra-SEL-ū-lar</i>	outside a cell or cells
infra-*	below	infrapatellar <i>in-fra-pa-TEL-ar</i>	below the kneecap ( <i>patella</i> )
sub-*	below, under	sublingual <i>sub-LING-gwāl</i>	under the tongue ( <i>lingu/o</i> )
inter-	between	intercostal <i>in-ter-KOS-tal</i>	between the ribs ( <i>cost/o</i> )
juxta-	near, beside	juxtaposition <i>juks-ta-pō-ZI-shun</i>	a location near or beside another structure
para-	near, beside behind	parasagittal <i>par-a-SAJ-i-tal</i>	near or beside a sagittal plane
retro-	backward	retroperitoneal <i>re-trō-per-i-tō-NĒ-al</i>	behind the peritoneum
supra-	above	suprascapular <i>su-pra-SKAP-ū-lar</i>	above the scapula (shoulder blade)

**Synonyms.** Write a word that has the same meaning as each of the words below:

١. circumoral/ perioral

٢. subscapular

٣. circumocular

٤. infracostal

**Opposites.** Write a word that means the opposite of each of the following words:

٥. infrapatellar.....

٦. Intracellular.....

Define each of the following terms:

٧. paranasal (par-a-NA\_-zal)

٨. retrouterine (re-tro\_-U\_-ter-in)

٩. suprapelvic (su\_-pra-PEL-vik)

١٠. intravascular (in-tra-VAS-ku\_-lar)

Match the following terms and write the appropriate letter to the left of each number:

\_\_\_\_\_ ١. Abrachia

a. incision into the chest

\_\_\_\_\_ ٢. Acrocyanosis

b. absence of an arm

\_\_\_\_\_ ٣. Laparotomy

c. absence of a finger or toe

\_\_\_\_\_ ٤. Adactyly

d. bluish discoloration of the extremities

\_\_\_\_\_ ٥. thoracotomy

e. incision through the abdominal wall

**Opposites.** Write a word that has the opposite meaning of each of the following words:

١. macrocephaly \_\_\_\_\_ ٢. extracellular \_\_\_\_\_

٣. proximal \_\_\_\_\_ ٤. superior \_\_\_\_\_

٥. infrapubic \_\_\_\_\_ ٦. superficial \_\_\_\_\_

**Emergency Care** B.R., a ٢٠-year-old woman, lost control of her bike while descending a hill at approximately ٤٠ mph. As she fell, two other cyclists collided with her, sending all three crashing to the ground.

At the scene, B.R. complained of pain in her head, back, chest, and leg. She also had numbness and tingling in her legs and feet. Other injuries included a cut on her face and on her right arm and an obvious deformity to both her shoulder and knee. She had slight difficulty breathing.

The paramedic did a rapid cephalocaudal assessment and immobilized B.R.'s neck in a cervical collar. She was secured on a backboard and given oxygen. After her bleeding was controlled and her injured extremities were immobilized, she was transported to the nearest emergency department.

During transport, the paramedic in charge radioed ahead to provide a prehospital report to the charge nurse. His report included the following information: occipital and frontal head pain; laceration to right temple, superior and anterior to right ear; lumbar pain; bilateral thoracic pain on inspiration at midclavicular line on right and midaxillary line on the left; dull aching pain of the posterior proximal right thigh; bilateral paresthesia (numbness and tingling) of distal lower legs circumferentially; and posterior displacement deformity of left shoulder. At the hospital, the emergency department physician ordered radiographs for B.R.

### **CASE STUDY QUESTIONS**

**Multiple choice: Select the best answer and write the letter of your choice to the left of each number.**

\_\_\_\_\_ 1. The term for the time span between injury and admission to the emergency department is:

- a. preoperative
- b. prehospital
- c. pre-emergency
- d. pretrauma
- e. intrainjury

\_\_\_\_\_ 2. A cephalocaudal assessment goes from \_\_\_\_\_ to

- a. stem to stern
- b. front to back
- c. head to toe
- d. side to side
- e. skin to bone

\_\_\_\_\_ 3. The victim's injured extremities were immobilized before transport. Immobilized means:

- a. abducted as far as they will go
- b. internally rotated and flexed
- c. adducted so that the limbs are crossed
- d. rotated externally

e. held in body alignment to keep them from moving

4. A cervical collar was placed on the victim to stabilize and immobilize the \_\_\_\_\_.

a. chest

b. shoulders

c. chin

d. neck

e. pelvis

\_\_\_\_\_. The singular form of acetabula is:

a. acetyl

b. acetabulum

c. acetabia

d. acetab

e. acetabulae

## Chapter 6

# Disease

### Objectives

After study of this chapter you should be able to:

1. List the major categories of diseases.
2. Compare the common types of infectious organisms, and list some diseases caused by each.
3. Define and give examples of neoplasia.
4. Identify and use word parts pertaining to diseases.
5. Define the major terms describing types of diseases.
6. List and define the major manifestations of diseases.
7. Analyze the disease terminology in several case studies

**A** disease is any alteration from the normal structure or function of any part of the body. Diseases can be grouped into a number of different but often overlapping categories. These include:

- Infectious diseases—caused by microorganisms and other parasites that live at the expense of another organism. Any disease-causing organism is described as a pathogen.
- Degenerative diseases—resulting from wear and tear, aging, or trauma (injury) that can result in a lesion (wound) and perhaps necrosis (death) of tissue. Common examples include arthritis
- Neoplasia—abnormal and uncontrolled growth of tissue.
- Immune disorders—failures of the immune system, allergies, and autoimmune diseases, in which the body makes antibodies to its own tissues, fall into this category.
- Metabolic disorders—resulting from lack of enzymes or other factors needed for cellular functions.

Many hereditary disorders fall into this category. Malnutrition caused by inadequate intake of nutrients or inability of the body to absorb and use nutrients also upsets metabolism.

- Hormonal disorders—caused by underproduction or overproduction of hormones or by inability of the hormones to function properly.
- Mental and emotional disorders—disorders that affect the mind and adaptation of an individual to his or her environment.)

### **Diseases get their names in a variety of ways.**

Some are named for the places where they were first found, such as Lyme disease for Lyme, Connecticut; West Nile disease and Rift Valley fever for places in Africa; and hantavirus fever for a river in Korea. Others are named for people who first described them, such as Cooley anemia; Crohn disease, an inflammatory bowel disease; and Hodgkin disease of the lymphatic system.

Many diseases are named on the basis of the symptoms they cause. Tuberculosis causes small lesions known as tubercles in the lungs and other tissues. Skin anthrax produces lesions that turn black, and its name comes from the same root as anthracite coal. In sickle cell anemia, red blood cells become distorted into a crescent shape when they give up oxygen. Having lost their smooth, round form, the cells jumble together, blocking small blood vessels and depriving tissues of oxygen.

## Responses to Disease

### Inflammation

is A common response to infection and to other forms of disease is inflammation. When cells are injured, they release chemicals that allow blood cells and fluids to move into the tissues. This inflow of blood results in the four signs of inflammation: heat, pain, redness, and swelling. The suffix -itis indicates inflammation, as in appendicitis (inflammation of the appendix) and tonsillitis (inflammation of the tonsils).

### Neoplasia

neoplasm is an abnormal and uncontrolled growth of tissue—a tumor or growth. A neoplasm that does not spread, that is, in situ, is described as **benign**, although it may cause damage at the site where it grows. A neoplasm that metastasizes to other tissues is termed **malignant**, and is commonly called cancer. A malignant tumor that involves epithelial tissue is a carcinoma. If the tumor arises in glandular epithelium, it is an adenocarcinoma (the root aden/o means “gland”)

 Key Terms	
acute <i>a-KŪT</i>	Sudden, severe; having a short course
benign <i>bē-NIN</i>	Not recurrent or malignant; favorable for recovery; describing tumors that do not spread
carcinoma <i>kar-si-NŌ-ma</i>	A malignant neoplasm composed of epithelial cells (from Greek root <i>carcino</i> , meaning “crab”) (adjective, carcinomatous)
chronic <i>KRON-ik</i>	Of long duration; progressing slowly
cyst <i>sist</i>	A filled sac or pouch that is usually abnormal (see Fig. 6-4). Used as a root meaning a normal bladder or sac, such as the urinary bladder or gallbladder (root <i>cyst/o</i> , <i>cyst/i</i> ).
etiology <i>ē-tē-OL-ō-jē</i>	The cause of a disease
Gram stain	A laboratory staining procedure that divides bacteria into two groups: gram-positive, which stain blue, and gram-negative, which stain red (see Fig. 6-1)
hernia <i>HER-nē-a</i>	Protrusion of an organ through an abnormal opening; a rupture (Fig. 6-5)

### Key terms

<b>toxin</b>	A poison (adjective, toxic; roots <i>tox/o</i> , <i>toxic/o</i> )
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<b>trauma</b>	A physical or psychological wound or injury
<b>sepsis</b>	The presence of harmful microorganisms or their toxins in the blood or other tissues (adjective, septic)
<b>pus</b>	A product of inflammation consisting of fluid and white blood cells (root py/o)
<b>prolapse</b>	A dropping or downward displacement of an organ or part; ptosis
<b>neoplasm</b>	An abnormal and uncontrolled growth of tissue, namely, a tumor; may be benign or malignant (root onc/o, suffix -oma)
<b>lesion</b>	A distinct area of damaged tissue; an injury or wound
<b>metastasize</b>	To spread from one part of the body to another; characteristic of cancer. The noun is metastasis .

**TABLE 6-1 Roots for Disease**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
alg/o, algi/o, algesi/o	pain	algesia <i>al-JĒ-zē-a</i>	condition of having pain
carcin/o	cancer, carcinoma	carcinogen <i>kar-SIN-ō-jen</i>	substance that produces cancer
cyst/o, cyst/i	filled sac or pouch, cyst, bladder	cystic <i>SIS-tik</i>	pertaining to or having cysts
lith	calculus, stone	lithiasis <i>lith-l̄-a-sis</i>	stone formation
onc/o	tumor	oncogene <i>ON-kō-jēn</i>	gene that causes a tumor
path/o	disease	pathogen <i>PATH-ō-jen</i>	organism that produces disease
py/o	pus	pyocyst <i>PI-ō-sist</i>	a sac or cyst containing pus
pyr/o, pyret/o	fever, fire	pyretic <i>pī-RET-ik</i>	pertaining to fever
scler/o	hard	sclerosis <i>skle-RŌ-sis</i>	hardening of tissue
tox/o, toxic/o	poison	exotoxin <i>eks-ō-TOK-sin</i>	toxin secreted by bacterial cells

Identify and define the root in each of the following words:

	Root	Meaning of Root
١. pyrexia	_____	_____
٢. intoxicate	_____	_____

- ϣ. empyema \_\_\_\_\_  
 ξ. pathology \_\_\_\_\_

**Fill in the blanks.**

5. Arteriosclerosis (*ar-te-re-o-skleh-RO-sis*) is a(n) \_\_\_\_\_ of the arteries.
6. A urolith (*U-ro-lith*) is a(n) \_\_\_\_\_ in the urinary tract (ur/o).
7. A cystotome (*SIS-to-tome*) is an instrument for incising the \_\_\_\_\_.
8. The term pathogenic (*path-o-JEN-ik*) means producing \_\_\_\_\_.
9. A carcinogen (*kar-SIN-o-jen*) is a substance that causes \_\_\_\_\_.
10. An exotoxin (*ek-so-TOK-sin*) is a(n) \_\_\_\_\_ secreted by bacterial cells.
11. Pyoderma (*pi-o-DER-mab*) is a skin disease associated with \_\_\_\_\_.
12. An algometer (*al-jeb-SIM-eb-ter*) is used to measure sensitivity to \_\_\_\_\_.
13. An oncogene (*ON-ko-jene*) is a gene that causes a(n) \_\_\_\_\_.
14. A pyrogenic (*pi-ro-JEN-ik*) agent induces \_\_\_\_\_.

**TABLE 6-2 Prefixes for Disease**

PREFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
brady-	slow	bradypnea <i>brad-ip-NĒ-a</i>	slow breathing (-pnea)
dys-	abnormal, painful, difficult	dysplasia <i>dis-PLĀ-jĒ-a</i>	abnormal development of tissue
mal-	bad, poor	maladaptive <i>mal-a-DAP-tiv</i>	poorly suited to a specific use or to the environment
pachy-	thick	pachyemia <i>pak-Ē-Ē-mĒ-a</i>	thickness of the blood (-emia)
tachy-	rapid	tachycardia <i>tak-i-KAR-dĒ-a</i>	rapid heart (cardi) rate
xero-	dry	xerosis <i>zĒ-RŌ-sis</i>	dryness of the skin or membranes

Match the following terms and write the appropriate letter to the left of each number:

- |                      |                               |
|----------------------|-------------------------------|
| _____ 1. dystrophy   | a. dryness of the skin        |
| _____ 2. tachypnea   | b. rapid breathing            |
| _____ 3. bradycardia | c. difficulty in swallowing   |
| _____ 4. xeroderma   | d. slow heart rate            |
| _____ 5. dysphagia   | e. poor nourishment of tissue |

The root gastr/o means “stomach.” Define the following terms:

- ١١. gastromegaly .....enlargement of the stomach.....
- ١٢. gastritis .....
- ١٣. gastropathy .....
- ١٤. gastrocele .....

**The root my/o means “muscle.” Define the following terms.**

- 11. myalgia (*mi-AL-je-ab*) \_\_\_\_\_
- 12. myopathy (*mi-OP-ab-the*) \_\_\_\_\_
- 13. myorrhexis (*mi-o-REK-sis*) \_\_\_\_\_
- 14. myodynia (*mi-o-DIN-e-ab*) \_\_\_\_\_
- 15. myoma (*mi-O-mah*) \_\_\_\_\_

**TABLE 6-3 Suffixes for Disease**

SUFFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
-algia, -algnesia	pain	myalgia <i>mī-AL-jē-a</i>	pain in a muscle (my/o)
-cele	hernia, localized dilation	hydrocele <i>HĪ-drō-sēl</i>	localized dilation containing fluid
-clasis, -clasia	breaking	osteoclasia <i>os-tē-OK-la-sis</i>	breaking of a bone (oste/o)
-itis	inflammation	meningitis <i>men-in-JĪ-tis</i>	inflammation of the membranes around the brain (meninges)
-megaly	enlargement	hepatomegaly <i>hep-a-tō-MEG-a-lē</i>	enlargement of the liver (hepat/o)
-odynia	pain	urodynia <i>ū-rō-DIN-ē-a</i>	pain on urination (ur/o)
-oma*	tumor	blastoma <i>blas-TŌ-ma</i>	tumor of immature cells
-pathy	any disease of	cardiopathy <i>kar-dē-OP-a-thē</i>	any disease of the heart (cardi/o)
-rhage <sup>†</sup> , -rhagia <sup>†</sup>	bursting forth, profuse flow, hemorrhage	hemorrhage <i>HEM-or-ij</i>	profuse flow of blood

-rhea <sup>†</sup>	flow, discharge	mucorrhea <i>mū-kō-rē-a</i>	discharge of mucus
-rhexis <sup>†</sup>	rupture	amniorrhesis <i>am-nē-ō-REK-sis</i>	rupture of the amniotic sac (bag of waters)
-schisis	fissure, splitting	retinoschisis <i>ret-i-NOS-ki-sis</i>	splitting of the retina of the eye

\*Plural: -omas, -ornata.

<sup>†</sup>Remember to double the r when adding this suffix to a root.

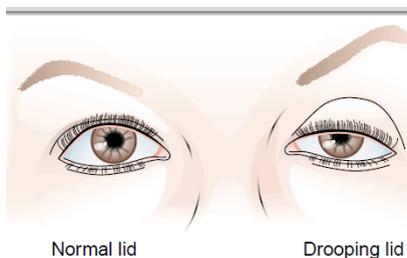
Match the following terms and write the appropriate letter to the left of each number:

- |                  |  |
|------------------|--|
| ١. hemorrhagic   | a. rupture of the liver                  |
| ٢. hepatorrhesis | b. substance that counteracts fever      |
| ٣. analgesia     | c. absence of pain                       |
| ٤. antipyretic   | d. pain in a gland                       |
| ٥. adenodynia    | e. pertaining to a profuse flow of blood |

**TABLE 6-4 Words for Disease Used as Suffixes**

WORD	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
dilation*, dilatation*	expansion, widening	vasodilation <i>vas-ō-dī-LĀ-shun</i>	widening of blood vessels (vas/o)
ectasia, ectasis	dilation	bronchiectasis <i>brong-kē-EK-ta-sis</i>	chronic dilation of a bronchus (bronchi/o)
edema	accumulation of fluid, swelling (Fig. 6-6)	lymphedema <i>lim-fe-DĒ-ma</i>	swelling of tissues as a result of lymphatic blockage
lysis*	separation, loosening, dissolving, destruction	dialysis <i>dī-AL-i-sis</i>	separation of substances by passage through a membrane
malacia	softening	splenomalacia <i>splē-nō-ma-LĀ-shē-a</i>	softening of the spleen (splen/o)

Blepharoptosis (drooping of the eyelid).



## Supplementary Terms

<b>iatrogenic</b>	Caused by the effects of treatment (from Greek root iatro-, meaning “physician”)
<b>idiopathic</b>	Having no known cause
<b>exacerbation</b>	Worsening of disease; increase in severity of a disease or its symptom
<b>in situ</b>	Localized, noninvasive (literally “in position”); said of tumors that do not spread, such as carcinoma in situ (CIS)
<b>nosocomial</b>	Describing an infection acquired in a hospital (root nos/o means “disease,” and comial refers to a hospital).
<b>remission</b>	A lessening of disease symptoms; the period during which such lessening occurs
<b>abscess</b>	A localized collection of pus.
<b>adhesion</b>	A uniting of two surfaces or parts that may normally be separated
<b>anaplasia</b>	Lack of normal differentiation, as shown by cancer cells
<b>fistula</b>	An abnormal passage between two organs or from an organ to the surface of the body
<b>fissure</b>	A groove or split
<b>purulent</b>	Forming or containing pus
<b>suppuration</b>	Pus formation

## Suffixes for surgery

-centesis	puncture, tap	thoracentesis <i>thor-ah-sen-TE-sis</i>	puncture of the chest (thorac/o)
-desis	binding, fusion	pleurodesis <i>plu-ROD-eh-sis</i>	binding of the pleura (membranes around the lungs)
-ectomy	excision, surgical removal	hepatectomy <i>hep-ah-TEK-to-me</i>	excision of liver tissue (hepat/o)
-pexy	surgical fixation	hysteropexy <i>HIS-ter-o-pek-se</i>	surgical fixation of the uterus (hyster/o)
-plasty	plastic repair, plastic surgery, reconstruction	rhinoplasty <i>RI-no-plas-te</i>	plastic surgery of the nose (rhin/o)
-rhaphy	surgical repair, suture	herniorrhaphy <i>her-ne-OR-ah-fe</i>	surgical repair of a hernia (herni/o)
-stomy	surgical creation of an opening	tracheostomy <i>tra-ke-OS-to-me</i>	creation of an opening into the trachea (trache/o)
-tome	instrument for incising (cutting)	microtome <i>MI-kro-tome</i>	instrument for cutting thin sections of tissue for microscopic study
-tomy	incision, cutting	laparotomy <i>lap-ah-ROT-o-me</i>	surgical incision of the abdomen (lapar/o)
-tripsy	crushing	neurotripsy <i>nu-ro-TRIP-se</i>	crushing of a nerve (neur/o)

Match the following terms, and write the appropriate letter to the left of each number.

- |  |                                    |
|--|------------------------------------|
| _____ 1. nephropexy ( <i>nef-ro-PEK-se</i> )         | a. crushing of a stone             |
| _____ 2. rhinoplasty ( <i>RI-no-plas-te</i> )        | b. surgical fixation of the kidney |
| _____ 3. lithotripsy ( <i>LITH-o-trip-se</i> )       | c. puncture of the abdomen         |
| _____ 4. adenectomy ( <i>ad-eh-NEK-to-me</i> )       | d. excision of a gland             |
| _____ 5. celiocentesis ( <i>se-le-o-sen-TE-sis</i> ) | e. plastic surgery of the nose     |

Match the following terms and write the appropriate letter to the left of each number:

- |                   |                               |
|-------------------|-------------------------------|
| ١. Apyrexia       | a. incision to remove a stone |
| ٢. detoxification | b. hardened                   |
| ٣. sclerotic      | c. absence of a fever         |
| ٤. oncolysis      | d. destruction of a tumor     |
| ٥. lithotomy      | e. removal of poisons         |
| ٦. xerotic        | f. dry                        |
| ٧. dyskinesia     | j. thickness of the blood     |

- |                 |                                    |
|-----------------|------------------------------------|
| ⋈. pachyemia    | k. swelling of the fingers or toes |
| ⋉. pyorrhea     | n. abnormal movement               |
| ⋊⋋. dactyledema | m. discharge of pus                |

**SUPPLEMENTARY TERMS**

- |                      |                                   |
|----------------------|-----------------------------------|
| _____ ⋊⋌. purulent   | a. having no known cause          |
| _____ ⋊⋍. Idiopathic | b. hospital-acquired              |
| _____ ⋊⋎. Adhesion   | c. union of two surfaces or parts |
| _____ ⋊⋏. nosocomial | d. forming or containing pus      |

Use the root **oste/o**, meaning **“bone,”** to form words with the following meanings:

- ⋊. Softening of a bone \_\_\_\_\_
- ⋋. Tumor of a bone \_\_\_\_\_
- ⋌. Destruction of bone tissue \_\_\_\_\_

**WORD BUILDING**

Use the word parts given to build words for the following definitions.

tox   pyr   gen   o   py   -oma   -y   path   nephr   -logy   -ic

- |                                      |       |
|--------------------------------------|-------|
| <b>68.</b> poisonous for the kidney  | _____ |
| <b>69.</b> producing pus             | _____ |
| <b>70.</b> tumor of the kidney       | _____ |
| <b>71.</b> study of disease          | _____ |
| <b>72.</b> producing fever           | _____ |
| <b>73.</b> study of the kidney       | _____ |
| <b>74.</b> producing disease         | _____ |
| <b>75.</b> any disease of the kidney | _____ |
| <b>76.</b> producing kidney tissue   | _____ |

## WORD BUILDING

Write words for the following definitions using the word parts provided.

lith/o   -rhaply   neur/o   -tripsy   -tome   r   -pexy   -scopy   cyst/o

61. Crushing of a nerve \_\_\_\_\_
62. Surgical repair of the bladder \_\_\_\_\_
63. Surgical fixation of the bladder \_\_\_\_\_
64. Surgical repair of a nerve \_\_\_\_\_
65. Crushing of a stone \_\_\_\_\_
66. Bladder stone \_\_\_\_\_
67. Endoscopic examination of the bladder \_\_\_\_\_
68. Instrument used to incise a nerve \_\_\_\_\_
69. Instrument used to incise the bladder \_\_\_\_\_

# Chapter 7

## The Female Reproductive System

### The Ovaries

The female gonads are the paired ovaries (singular, ovary) that are held by ligaments in the pelvic cavity on either side of the uterus (Fig. 7-10). It is within the ovaries that the female gametes, the eggs or ova (singular, ovum), develop. Every month several ova ripen, each within a cluster of cells called a graafian follicle.

At the time of ovulation, usually only one ovum is released from the ovary and the remainder of the ripening ova degenerate. The follicle remains behind and continues to function for about 7 weeks if there is no fertilization of the ovum and for about 3 months if the ovum is fertilized. After ovulation, the ovum travels into an oviduct (also called the uterine tube or fallopian tube), one of the two tubes attached to the upper lateral portions of the uterus. These tubes arch above the ovaries and have fingerlike projections (fimbriae) that sweep the released ovum into the oviduct.

The **uterus** is the organ that nourishes the developing offspring. It is pear-shaped, with an upper rounded fundus, a triangular cavity, and a lower narrow **cervix** that projects into the vagina. The innermost layer of the uterine wall, the **endometrium**, has a rich blood supply. It receives the fertilized ovum and becomes part of the placenta during pregnancy.

### The Menstrual Cycle

The average menstrual cycle lasts 28 days, with the first day of menstruation taken as day 1 and ovulation occurring on about day 14. Throughout the cycle, estrogen and progesterone feed back to the

pituitary to regulate the production of FSH and LH. Hormonal methods of birth control act by supplying estrogen and progesterone, which inhibit the pituitary and prevent ovulation, while not interfering with menstruation.

## Menopause

Menopause is the cessation of monthly menstrual cycles. This generally occurs between the ages of 40 and 50 years. Levels of reproductive hormones decline, and egg cells in the ovaries gradually degenerate. Some women experience unpleasant symptoms, such as hot flashes, headaches, insomnia, mood swings, and urinary problems. There is also some atrophy of the reproductive tract with vaginal dryness. Most importantly, decline in estrogen is associated with weakening of the bones (osteoporosis). Hormone replacement therapy (HRT), usually consisting of estrogen in combination with progestin, has been recommended to alleviate menopausal symptoms.

## The Placenta

During development, the fetus is nourished by the placenta, an organ formed from the outermost layer of the embryo, the chorion, and the innermost layer of the uterus, the endometrium. Here, exchanges take place between the bloodstreams of the mother and the fetus through fetal capillaries. The umbilical cord contains the blood vessels that link the fetus to the placenta.

## Childbirth

The length of pregnancy, from fertilization of the ovum to birth, is about 38 weeks or 266 days. In practice, it is calculated as approximately 280 days or 40 weeks from the first day of the last menstrual period (LMP). For study purposes, pregnancy is divided into 3-month periods (trimesters), during which defined changes can be observed in the fetus. Childbirth or parturition occurs in three stages: (1) onset of regular uterine contractions and dilation of the cervix; (2) expulsion of the fetus; (3) delivery of the placenta and fetal membranes.

## Contraception

Contraception is the use of artificial methods to prevent fertilization of the ovum or its implantation in the uterus. Methods can be used to block sperm penetration of the uterus (condom, diaphragm), prevent implantation (intrauterine device [IUD]), or prevent ovulation (hormonal methods). Surgical sterilization for the male is a vasectomy; for the female, surgical sterilization is a tubal ligation, in which the fallopian tubes are cut and tied on both sides.

<b>fertilization</b>	The union of an ovum and a spermatozoon
<b>fetus</b>	The developing child in the uterus from the third month to birth (adjective, fetal) (root fet/o)
<b>gestation</b>	The period of development from conception to birth

<b>parturition</b>	Childbirth; labor (root toc/o, nat/i)
<b>umbilical cord</b>	The structure that connects the fetus to the placenta. It contains vessels that carry blood between the mother and the fetus.

## Roots Pertaining to the Female Reproductive System

**TABLE 15-1 Roots for Female Reproduction and the Ovaries**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
gyn/o, gynec/o*	woman	gynecology <i>gī-ne-KOL-ō-jē</i>	study of diseases of women
men/o, mens	month, menstruation	premenstrual <i>prē-MEN-strū-al</i>	before a menstrual period
oo	ovum, egg cell	oocyte <i>ō-ō-sīt</i>	cell that gives rise to an ovum
ov/o	ovum, egg cell	ovulation <i>ov-ū-LĀ-shun</i>	release of an ovum from the ovary
ovari/o	ovary	ovarian <i>ō-VAR-ē-an</i>	pertaining to an ovary
oophor/o	ovary	oophorotomy <i>ō-of-ō-ROT-ō-mē</i>	incision of an ovary

\*This root may also be pronounced with a soft g, as in *jīn-e-KOL-ō-jē*.

### EXERCISE 15-1

**Define the following words.**

1. gynecopathy (*gi-neb-KOP-ab-the*) \_\_\_\_\_
2. intermenstrual (*in-ter-MEN-stru-al*) \_\_\_\_\_
3. oogenesis (*o-o-JEN-eh-sis*) \_\_\_\_\_
4. ovulation (*ov-u-LĀ-shun*) \_\_\_\_\_
5. ovarian (*o-VAR-e-an*) \_\_\_\_\_
6. oophoritis (*o-of-o-RI-tis*) \_\_\_\_\_

**Write a word for the following definitions.**

7. rupture (-rhesis) of an ovary \_\_\_\_\_
8. pertaining to ovulation \_\_\_\_\_
9. profuse bleeding (-hagia) at the time of menstruation \_\_\_\_\_

The word **menorrhoea** means “menstruation.” Add a prefix to **menorrhoea** to form words for the following definitions.

- 10. scanty menstrual flow \_\_\_\_\_
- 11. absence of menstruation \_\_\_\_\_
- 12. painful or difficult menstruation \_\_\_\_\_

Use the root **ovari/o** to write words for the following.

- 13. incision into an ovary \_\_\_\_\_
- 14. surgical puncture of an ovary \_\_\_\_\_
- 15. hernia of an ovary \_\_\_\_\_

Use the root **oophor/o** to write words for the following.

- 16. surgical repair of an ovary \_\_\_\_\_
- 17. malignant tumor of the ovary \_\_\_\_\_

**TABLE 15-2 Roots for the Oviducts, Uterus, and Vagina**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
salping/o	oviduct, tube	salpingectomy <i>sal-pin-JEK-tō-mē</i>	excision of an oviduct
uter/o	uterus	uterine <i>Ū-ter-in</i>	pertaining to the uterus
metr/o, metr/i	uterus	metrorrhagia <i>mē-trō-RĀ-jē-a</i>	abnormal uterine bleeding
hyster/o	uterus	hysteroscopy <i>his-ter-OS-kō-pē</i>	endoscopic examination of the uterus
cervic/o	cervix, neck	endocervical <i>en-dō-SER-vi-kal</i>	pertaining to the lining of the cervix
vagin/o	vagina	vaginoplasty <i>vaj-i-nō-PLAS-tē</i>	plastic repair of the vagina
colp/o	vagina	colpocele <i>KOL-pō-sēl</i>	hernia of the vagina

Define the following terms.

- 1. hystorography (*his-ter-OG-rah-fe*) \_\_\_\_\_
- 2. metromalacia (*me-tro-mab-LA-she-ab*) \_\_\_\_\_
- 3. vaginoplasty (*vaj-ib-no-PLAS-te*) \_\_\_\_\_
- 4. colpodynia (*kol-po-DIN-e-ab*) \_\_\_\_\_
- 5. salpingectomy (*sal-pin-JEK-to-me*) \_\_\_\_\_

**Write a word that has the same meaning as each of the following definitions:**

15. surgical fixation of an oviduct \_\_\_\_\_

16. radiographic study of the oviduct \_\_\_\_\_

The root **salping/o** is taken from the word salpinx, which means "tube." Add a prefix to salpinx to write a word that has the same meaning as each of the following definitions:

17. Presence of pus in an oviduct..... 18. Collection of fluid in an oviduct .....

Note how the roots **salping/o** and **oophor/o** are combined to form **salpingo-oophoritis** (inflammation of an oviduct and ovary). Write a word with the following meaning:

19. surgical removal of an oviduct and ovary \_\_\_\_\_

Use the roots indicated to write a word that has the same meaning as each of the following definitions:

20. within (intra-) the uterus (uter/o) \_\_\_\_\_

21. radiograph of the uterus (hyster/o) and oviducts \_\_\_\_\_

22. surgical fixation of the uterus (hyster/o) \_\_\_\_\_

23. prolapse of the uterus (metr/o) \_\_\_\_\_

24. softening of the uterus (metr/o) \_\_\_\_\_

25. inflammation of the cervix \_\_\_\_\_

26. within (intra-) the cervix \_\_\_\_\_

27. inflammation of the vagina (vagin/o) \_\_\_\_\_

28. narrowing of the vagina (colp/o) \_\_\_\_\_

**TABLE 15-3 Roots for the Female Accessory Structures**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
vulv/o	vulva	vulvar <i>VUL-var</i>	pertaining to the vulva
episi/o	vulva	episiotomy <i>e-piz-ē-OT-ō-mē</i>	incision of the vulva
perine/o	perineum	perineal <i>per-i-NĒ-al</i>	pertaining to the perineum
clitor/o, clitorid/o	clitoris	clitorectomy <i>kĪ-tō-REK-tō-mē</i>	excision of the clitoris
mamm/o	breast, mammary gland	mammoplasty <i>mam-ō-PLAS-tē</i>	plastic surgery of the breast
mast/o	breast, mammary gland	amastia <i>a-MAS-tē-a</i>	absence of the breasts

**TABLE 15-4 Roots Pertaining to Pregnancy and Birth**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
amnio	amnion, amniotic sac	diamniotic <i>dī-am-nē-OT-ik</i>	developing in separate amniotic sacs
embryo/o	embryo	embryonic <i>em-brē-ON-ik</i>	pertaining to the embryo
fet/o	fetus	fetoscope <i>FĒ-tō-skōp</i>	endoscope for examining the fetus
toc	labor	eutocia <i>ū-TŌ-sē-a</i>	normal labor
nat/i	birth	neonate <i>NĒ-ō-nāt</i>	newborn
lact/o	milk	lactation <i>lak-TĀ-shun</i>	secretion of milk
galact/o	milk	galactagogue <i>ga-LAK-tō-gog</i>	agent that promotes (-agogue) the flow of milk
gravida	pregnant woman	multigravida <i>mul-ti-GRAY-i-da</i>	woman who has been pregnant two or more times

**Define each of the following words:**

1. embryology \_\_\_\_\_ 2. postnatal \_\_\_\_\_  
 3. neonatal \_\_\_\_\_ 4. monoamniotic) \_\_\_\_\_  
 5. fetometry \_\_\_\_\_ 6. hyperlactation \_\_\_\_\_  
 7. agalactia \_\_\_\_\_

**Use the appropriate roots to form a word with each of the following definitions:**

- . rupture of the amniotic sac \_\_\_\_\_ . any disease of an embryo \_\_\_\_\_  
 . incision of the amnion (to induce labor) \_\_\_\_\_ cell found in amniotic fluid \_\_\_\_\_  
 . instrument for examination of the embryo \_\_\_\_\_ . before birth \_\_\_\_\_  
 . study of the newborn \_\_\_\_\_ . woman who has never been pregnant \_\_\_\_\_  
 . endoscopic examination of the fetus \_\_\_\_\_ . woman who is pregnant for the first (primi-) time \_\_\_\_\_  
 . woman who has given birth two or more times \_\_\_\_\_  
 . woman who has given birth to one (primi-) child \_\_\_\_\_

Use the suffix *-tocia*, meaning “condition of labor,” to write a word that has the same meaning as each of the following definitions:

١. dry labor \_\_\_\_\_

٢. slow labor \_\_\_\_\_

Use the root *galact/o* to write a word that has the same meaning as each of the following definitions:

٣. cystic enlargement (-cele) of a milk duct \_\_\_\_\_

٤. discharge of milk \_\_\_\_\_

## Infection

The major organisms that cause sexually transmitted diseases in both males and females are given in . Pelvic inflammatory disease (PID) is the spread of infection from the reproductive organs into the pelvic cavity. It is most often caused by the gonorrhea organism or by chlamydia, although bacteria normally living in the reproductive tract may also be responsible when conditions allow. PID is a serious disorder that may result in septicemia or shock. Inflammation of the oviducts, called **salpingitis**, may close off these tubes and cause infertility.

## Menstrual Disorders

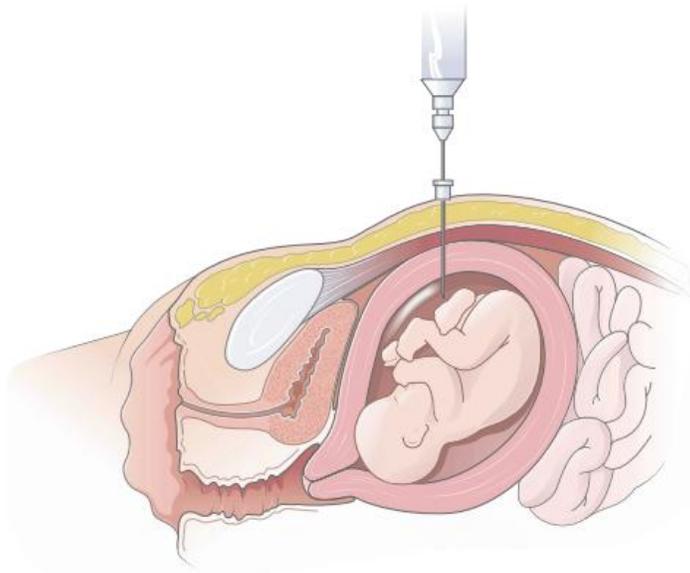
Menstrual abnormalities include flow that is too scanty (oligomenorrhea) or too heavy (menorrhagia), and the absence of monthly periods (amenorrhea). Dysmenorrhea, when it occurs, usually begins at the start of menstruation and lasts ١ to ٢ days. Together these disorders are classified as dysfunctional uterine bleeding (DUB). These responses may be caused by hormone imbalances, systemic disorders, or uterine problems.

They are most common in adolescence or near menopause. At other times they are often related to life changes and emotional upset.

Premenstrual syndrome (PMS) describes symptoms that appear during the second half of the menstrual cycle and includes emotional changes, fatigue, bloating, headaches, and appetite changes. Possible causes of **PMS** are under study. Symptoms may be relieved by hormone therapy, antidepressants, or antianxiety medications. Exercise, dietary control, rest, and relaxation strategies may also be helpful.

## abortion

For a variety of reasons, a pregnancy may terminate before the fetus is capable of surviving outside the uterus. An **abortion** is loss of an embryo or fetus before the ٣٠th week of pregnancy or before a weight of ٥٠٠ g. Most spontaneous abortions occur within the first ٣ months of pregnancy. Causes include poor maternal health, hormone imbalance, incompetence (weakness) of the cervix, immune reactions, tumors, and, most commonly, fetal abnormalities



**FIGURE 15-16.** Amniocentesis. A sample is removed from the amniotic sac. Cells and fluid are tested for fetal abnormalities.

**DEFINITIONS**

*Define the following terms.*

- 49. retrouterine (*reh-tro-U-ter-in*) \_\_\_\_\_
- 50. hysteropathy (*his-teh-ROP-ah-the*) \_\_\_\_\_
- 51. metromalacia (*me-tro-mah-LA-she-ah*) \_\_\_\_\_
- 52. pyosalpinx (*pi-o-SAL-pinx*) \_\_\_\_\_
- 53. colpostenosis (*kol-po-steh-NO-sis*) \_\_\_\_\_
- 54. vulvodynia (*vul-vo-DIN-e-ah*) \_\_\_\_\_
- 55. postnatal (*post-NA-tal*) \_\_\_\_\_

*Write words for the following.*

- 60. hernia of a uterine tube \_\_\_\_\_
- 61. suture of the vulva (episi/o) \_\_\_\_\_
- 62. narrowing of the uterus (metr/o) \_\_\_\_\_
- 63. surgical removal of the uterus (hyster/o) and uterine tubes \_\_\_\_\_
- 64. radiograph of the breast (mamm/o) \_\_\_\_\_
- 65. abnormal or difficult labor \_\_\_\_\_
- 66. rupture of the amniotic sac \_\_\_\_\_
- 67. study of the embryo \_\_\_\_\_
- 68. measurement of a fetus \_\_\_\_\_

# Heart

## Roots Pertaining to the Cardiovascular and Lymphatic Systems

**TABLE 9-1 Roots for the Heart**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
cardi/o	heart	cardiomyopathy* <i>kar-dē-ō-mī-OP-a-thē</i>	any disease of the heart muscle
atri/o	atrium	atriotomy <i>ā-trē-OT-ō-mē</i>	surgical incision of an atrium
ventricul/o	cavity, ventricle	supraventricular <i>SŪ-pra-ven-TRIK-ū-lar</i>	above a ventricle
valv/o, valvul/o	valve	valvectomy <i>val-VEK-tō-mē</i>	surgical removal of a valve

\*Preferred over myocardioathy.

**TABLE 9-2 Roots for the Blood Vessels**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
angi/o*	vessel	angiopathy <i>an-jē-OP-a-thē</i>	any disease of blood vessels
vas/o, vascul/o	vessel, duct	vasodilation <i>vas-ō-dī-LĀ-shun</i>	widening of a blood vessel
arter/o, arteri/o	artery	endarterial <i>end-ar-TĒ-rē-al</i>	within an artery
arteriol/o	arteriole	arteriolar <i>ar-tē-rē-ō-lar</i>	pertaining to an arteriole
aort/o	aorta	aortoptosis <i>a-or-top-TŌ-sis</i>	downward displacement of the aorta
ven/o, ven/i	vein	venous <i>VĒ-nus</i>	pertaining to a vein
phleb/o	vein	phlebectasia <i>fleb-ek-TĀ-zē-a</i>	dilatation of a vein

\*The root *angi/o* usually refers to a blood vessel but is used for other types of vessels as well. *Hemangi/o* refers specifically to a blood vessel.

**WORD BUILDING**

Write words for the following definitions using the word parts given.

-pathy    phleb    lymph/o    -oma    angi/o    -itis    aden/o    -plasty

- 88. inflammation of a vein \_\_\_\_\_
- 89. any disease of a lymph node \_\_\_\_\_
- 90. neoplasm involving the lymphatic system \_\_\_\_\_
- 91. plastic repair of any vessel \_\_\_\_\_
- 92. inflammation of a lymphatic vessel \_\_\_\_\_
- 93. any disease of a vessel \_\_\_\_\_
- 94. inflammation of a lymph node \_\_\_\_\_
- 95. plastic repair of a vein \_\_\_\_\_
- 96. neoplasm of a lymph node \_\_\_\_\_
- 97. tumor involving any vessels \_\_\_\_\_

Fill in the blanks:

- ١. Vasospasm means sudden contraction of a(n) \_\_\_\_\_
- ٢. Angioedema is localized swelling caused by changes in \_\_\_\_\_
- ٣. Arteriolitis is inflammation of an \_\_\_\_\_.

**Define the following terms.**

- 1. thrombocytopenia (*throm-bo-si-to-PE-ne-ah*) \_\_\_\_\_
- 2. bacteremia (*bak-ter-E-me-ah*) \_\_\_\_\_
- 3. leukocytopenia (*lu-ko-si-to-PE-ne-ah*) \_\_\_\_\_
- 4. erythropoiesis (*eh-rith-ro-poy-E-sis*) \_\_\_\_\_
- 5. toxemia (*tok-SE-me-ah*) \_\_\_\_\_
- 6. hypoproteinemia (*bi-po-pro-tene-E-me-ah*) \_\_\_\_\_
- 7. hyperalbuminemia (*bi-per-al-bu-mih-NE-me-ah*) \_\_\_\_\_

**TABLE 10-3 Roots for Chemistry**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
azot/o	nitrogen compounds	azoturia <i>az-ō-TŪ-rē-a</i>	increased nitrogen compounds in the urine (-uria)
calc/i	calcium (symbol Ca)	calcareous <i>kal-KAR-ē-us</i>	containing calcium
ferr/o, ferr/i	iron (symbol Fe)	ferric <i>FER-ik</i>	pertaining to or containing iron
sider/o	iron	sideroblast <i>SID-er-ō-blast</i>	an immature red blood cell containing iron granules
kali	potassium (symbol K)	hypokalemia* <i>hī-per-ka-LĒ-mē-a</i>	decrease of potassium in the blood
natri	sodium (symbol Na)	natriuresis <i>nā-trē-ū-RĒ-sis</i>	excretion of sodium in the urine (ur/o)
ox/y	oxygen (symbol O)	hypoxemia <i>hī-pok-SĒ-mē-a</i>	deficiency of oxygen in the blood

\*The i in the root is dropped.

Use the suffix **-emia** to form words with the following meanings:

٦. Presence of sodium in the blood \_\_\_\_\_
٧. Presence of nitrogen compounds in the blood \_\_\_\_\_
٨. Presence of calcium in the blood \_\_\_\_\_

٩. The "ferrous" in ferrous sulfate represents:

- a. electrolytes                      b. RBCs                      c. iron                      d. oxygen                      e. B vitamins

## Case Study: Nurse Anesthetist M.R. with Latex Allergy



### Chief Complaint

M.R., a 36-year-old certified registered nurse anesthetist (CRNA), noticed that her hands had a red patchy rash when she removed her gloves following cases in the OR. They began to itch after a few minutes of donning the gloves, so she figured she might have developed an allergy to the latex they contained. When she began to have a runny nose and itchy swollen eyes, she was worried and sought medical advice from her primary care physician, who referred her to an allergist.

### Examination

The allergist examined M.R.'s hands and observed a localized red crusty rash that stopped at the wrists. There were a few blisters spread over the hand region. Along with the examination, a history indicated M.R. had noticed the contact dermatitis for a while when she wore powdered latex gloves in the OR, and she more recently had noted generalized

allergic symptoms during surgical cases. During a recent case, she experienced some tachycardia, urticaria (hives) and rhinitis when she came in contact with latex gloves.

### Clinical Course

M.R. was diagnosed with a type I hypersensitivity, IgE, T cell-mediated latex allergy, as shown by both immunologic and skin-prick tests. Although M.R. is a CRNA, she was educated on the course of latex allergies. She was reminded that there is no cure and that the only way to prevent an allergic reaction is to avoid coming into contact with latex.

This chapter describes the composition and characteristics of blood, the life-sustaining fluid that circulates throughout the body. A discussion of immunity is included because many components of the immune system are carried in the blood. M.R.'s case of allergy is an example of immunologic hyperactivity. One of the symptoms, tachycardia, was discussed in Chapter 9 and rhinitis will be introduced in the next chapter on the respiratory system.

## Word Parts Pertaining to Respiration

**TABLE 11-1 Suffixes for Respiration**

SUFFIX	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
-pnea	breathing	orthopnea <i>or-THOP-nē-a</i>	difficulty in breathing except in an upright (-ortho) position
-oxia*	level of oxygen	hypoxia <i>hī-POK-sē-a</i>	decreased amount of oxygen in the tissues
-capnia*	level of carbon dioxide	hypercapnia <i>hī-per-KAP-nē-a</i>	increased carbon dioxide in the tissues
-phonia	voice	dysphonia <i>dis-FŌ-nē-a</i>	difficulty in speaking

\*When referring to levels of oxygen and carbon dioxide in the blood, the suffix *-emia* is used, as in hypoxemia, hypercapnemia.

Use the suffix *-pnea* to build a word with each of the following meanings:

1. painful or difficult breathing .....dyspnea.....
2. easy, normal (eu-) breathing \_\_\_\_\_
3. lack of (a-) of breathing \_\_\_\_\_
4. rapid rate of breathing \_\_\_\_\_

**TABLE 11-2 Roots for the Respiratory Passageways**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
nas/o	nose	nasal NĀ-zal	pertaining to the nose
rhin/o	nose	rhinorrhea rī-NŌ-rē-a	discharge from the nose
pharyng/o	pharynx	pharyngeal* fa-RIN-jē-al	pertaining to the pharynx
laryng/o	larynx	laryngoscopy lar-ing-GOS-kō-pē	endoscopic examination of the larynx
trache/o	trachea	tracheotome trā-kē-ō-TŌM	instrument used to incise the trachea
bronch/o, bronch/i	bronchus	bronchogenic brong-kō-GEN-ik	originating in a bronchus
bronchiol	bronchiole	bronchiolectasis brong-kē-ō-LEK-ta-sis	dilatation of the bronchioles

\*Note addition of e before adjective ending -al.

pulm/o, pulmon/o	lung	extrapulmonary EKS-trah-pul-mo-nar-e	outside the lungs
pneumon/o	lung	pneumonitis nu-mo-NI-tis	inflammation of the lung; pneumonia
pneum/o, pneumat/o	air, gas; also respiration, lung	pneumothorax nu-mo-THO-raks	presence of air in the thorax (pleural space)
spir/o	breathing	spirometer spi-ROM-eh-ter	instrument for measuring breathing volumes

# Roots Pertaining to Digestion

**TABLE 12-1 Roots for the Mouth**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
or/o	mouth	perioral <i>per-ē-OR-al</i>	around the mouth
stoma, stomat/o	mouth	stomatitis <i>stō-ma-ŦĪ-tis</i>	inflammation of the mouth
gnath/o	jaw	prognathous <i>PROG-na-thus</i>	having a projecting jaw
labi/o	lip	labiodental <i>lā-bē-ō-DEN-tal</i>	pertaining to the lip and teeth (dent/o)
bucc/o	cheek	buccoconversion <i>buk-kō-VER-zhun</i>	turning toward the cheek
dent/o, dent/i	tooth, teeth	dentifrice <i>DEN-ti-fris</i>	a substance used to clean the teeth
odont/o	tooth, teeth	periodontist <i>per-ē-ō-DON-tist</i>	dentist who treats the tissues around the teeth
gingiv/o	gum (gingiva)	gingivectomy <i>jin-ji-VEK-tō-mē</i>	excision of gum tissue
lingu/o	tongue	sublingual <i>sub-LING-gwal</i>	under the tongue
gloss/o	tongue	glossopharyngeal	pertaining to the tongue and pharynx

Use the adjective suffix -al to write a word that has the same meaning as each of the following:

- ١. pertaining to the mouth .....oral.....
- ٢. pertaining to the teeth \_\_\_\_\_ ٣. pertaining to the gums \_\_\_\_\_
- ٤. pertaining to the tongue \_\_\_\_\_ ٥. pertaining to the cheek \_\_\_\_\_
- ٦. pertaining to the lip \_\_\_\_\_

Fill in the blanks:

- ٧. Micrognathia is excessive smallness of the .....
- ٨. Hemiglossal means pertaining to one half of the.....
- ٩. Stomatosis is any disease condition of the .....
- ١٠. The oropharynx is the part of the pharynx that is located behind the.....
- ١١. A sialolith is a stone formed in a .....gland or duct.
- ١٢. Orthodontics is the branch of dentistry that deals with straightening (ortho-) of the.....

## Word Parts Pertaining to the Nervous System

**TABLE 17-1 Roots for the Nervous System and the Spinal Cord**

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
neur/o, neur/i	nervous system, nervous tissue, nerve	neurotoxic <i>nū-rō-TOK-sik</i>	harmful or poisonous to a nerve or nervous tissue
gli/o	neuroglia	glioma <i>glī-ō-ma</i>	a neuroglial tumor
gangli/o, ganglion/o	ganglion	ganglionectomy <i>gang-glē-o-NEK-tō-mē</i>	surgical removal of a ganglion
mening/o, meninge/o	meninges	meningocele <i>me-NING-gō-sēl</i>	hernia of the meninges through the skull or spinal column
myel/o	spinal cord (also bone marrow)	myelodysplasia <i>mī-e-lō-dis-PLĀ-sē-a</i>	abnormal development of the spinal cord
radicul/o	root of a spinal nerve	radiculopathy <i>ra-dik-ū-LOP-a-thē</i>	any disease of a spinal nerve root

Fill in the blanks:

١. hematomyelia is hemorrhage into the \_\_\_\_\_ ٢. neurolysis is destruction of a(n) .....

٣. meningococci are bacteria that infect the \_\_\_\_\_

Write a word that has the same meaning as each of the following definitions:

٤. pain in a nerve \_\_\_\_\_ ٥. any disease of the nervous system \_\_\_\_\_

٦. inflammation of the spinal cord \_\_\_\_\_ ٧. tumor of a ganglion \_\_\_\_\_

٨. radiographic study of the spinal cord \_\_\_\_\_ ٩. inflammation of the meninges.....

### Anxiety Disorders

Anxiety is a feeling of fear, worry, uneasiness, or dread. It may be associated with physical problems or drugs and is often prompted by feelings of helplessness or loss of self-esteem. Generalized anxiety disorder (GAD) is characterized by chronic excessive and uncontrollable worry about various life circumstances, often with no basis. It may be accompanied by muscle tensing, restlessness, dyspnea, palpitations, insomnia, irritability, or fatigue.

Panic disorder is a form of anxiety disorder marked by episodes of intense fear. A person with panic disorder may isolate himself or herself or avoid social situations for fear of having a panic attack or in response to attacks. A phobia is an extreme, persistent fear of a specific object or situation. It may center on social situations; particular objects, such as animals or blood; or activities, such as flying or driving through tunnels.

## Depression

Depression is a mental state characterized by profound feelings of sadness, emptiness, hopelessness, and lack of interest or pleasure in activities, often accompanied by suicidal tendencies. Depression frequently coexists with other physical or emotional conditions. Dysthymia is a mild form of depression that is triggered by a serious event and lasts for several months to years. Bipolar disorder (formerly called manic depressive illness) is characterized by depression with episodes of mania, a state of elation, which may include agitation, hyperexcitability, or hyperactivity. Most of the drugs used to treat depression affect the level of neurotransmitters in the brain.

**Word building. Write a word for each of the following definitions:**

70. study of the nervous system \_\_\_\_\_
71. any disease of the nervous system \_\_\_\_\_
72. inflammation of the spinal cord and meninges \_\_\_\_\_
73. excision of a ganglion \_\_\_\_\_
74. incision into a brain ventricle \_\_\_\_\_
75. paralysis of one side of the body \_\_\_\_\_
76. within (intra-) the cerebellum \_\_\_\_\_
77. difficulty in reading \_\_\_\_\_
78. fear of water \_\_\_\_\_

### مقالات پژوهشی اصیل\* (Original Articles)

مقالات پژوهشی اصیل مدارک علمی حاصل از پروژه های تحقیقاتی میباشند. این تحقیقات ممکن است بر روی انسان، حیوانات، سلولها، میکروبیها، مواد آزمایشگاهی و ... به عنوان سوژه تحقیق انجام گیرند. اجزاء اصلی ساختاری يك مقاله تحقیقاتی عبارتند از: مقدمه (Introduction)، مواد و روشها (Materials & Methods)، یافته ها (Results)، بحث و نتیجه گیری (Discussion & Conclusion) که اختصار IMRAD را برای اجزاء مقاله اصیل به کار میبرند.

۱. عنوان:
۲. نام نویسندگان:
۳. سابقه و هدف (یا مقدمه):
۴. \* هدف از نگارش این قسمت معرفی موضوع مطالعه، بسط و رفع ابهام از عنوان و بیان دلیل انجام مطالعه میباشد. در این بخش باید به این سه سوال پاسخ داده شود: «چه میدانیم؟»، «چه نمیدانیم؟»، «چرا داریم این مطالعه را انجام میدهیم؟»
۵. مواد و روشها: نوع مطالعه (مقطعی، مورد-شاهدی، همگروهی، مداخله ای، تحقیقات آزمایشگاهی، کارآزمایی بالینی و ...) باید در اولین جمله ذکر گردد ویژگیهای اصلی جامعه مورد مطالعه، معیارهای ورود به مطالعه، معیارهای خروج از مطالعه در قدم بعدی باید ذکر گردد.
۶. یافته ها: یافته های مطالعه بدون تفسیر گزارش می گردد.

۷: نتیجه گیری: در این قسمت نویسنده باید در چند جمله و به طور مختصر تفسیر نهایی حاصل از بررسی یافته های مطالعه خود را بیان کند

۸. واژه های کلیدی: کلمات مهم و محوری آن پژوهش هستند که نویسنده مقاله از عنوان و نیز محتوای اصلی مقاله برداشت کرده و به کمک آن موضوع مقاله را بیان میکند.

### یک مثال از مقاله پژوهشی اصیل

عنوان نشریه: مجله علمی دانشگاه علوم پزشکی گرگان. دوره ۱۷، شماره ۲ - (تابستان ۱۳۹۴)

عنوان مقاله: ارتباط سطح سرمی ویتامین D با بیماری میگرن

نویسنده مقاله: طیبه متقی، فریبرز خوروش، غلامرضا عسکری، بیژن ایرج، رضا غیاثوند

زمینه و هدف: بیماری میگرن در سراسر جهان شایع است. در سالیان اخیر کمبود ویتامین D به عنوان مشکل سلامت عمومی شناخته شده است. این مطالعه به منظور تعیین ارتباط سطح سرمی ویتامین D با بیماری میگرن انجام شد.

روش بررسی: این مطالعه توصیفی تحلیلی روی ۷۶ بیمار (۲۱ نفر مذکر و ۵۵ نفر مونث) مبتلا به میگرن در محدوده سنی ۱۰-۶۱ سال انجام شد. متغیرهای سن، جنس، دور کمر، شاخص توده بدنی، تعداد بیماری های مزمن و سطح تحصیلات تعدیل شد. سطح سرمی ویتامین D مورد سنجش قرار گرفت. یافته ها: کاهش ویتامین D در ۱۳.۲٪ از بیماران تعیین شد. بین سطح سرمی ویتامین D با شدت میگرن ارتباط آماری معنی داری مشاهده نشد.

یافته ها: گزارش عددی یافته ها که در اینجا حذف شده است.

نتیجه گیری: بین سطح ویتامین D با شدت بیماری میگرن ارتباطی وجود نداشت.

کارآزمایی بالینی (clinical trials)

یکی از انواع مطالعات پزشکی است که بر روی جمعیت های انسانی انجام می شود. کاربرد مهم کارآزمایی های بالینی در مطالعه اثرات داروها و شیوه های درمانی جدید است.

THE Effect of oral peppermint extract on migraine

Author(s): MOHAMMAD TAHERI FARIDEH\*, TAVAKOL KAMRAN, GHEYSARI REZVAN, MORADI YOUSOF, AKHLAGHDOOST MEISAM

JOURNAL OF ANESTHESIOLOGY AND PAIN (PERSIAN) WINTER ۲۰۱۷, Volume ۷, Number ۲;  
Page(s) ۱ To ۱۲.

**Aim and Background:** Different types of drugs are used as pharmacologic prophylaxis for migraine headache. Each of them has its own efficacy and side effects. In addition to pharmacological drugs, some studies have also suggested the use of the alternate and herbal remedy in migraine. Peppermint has a long history of use in some disorders, including headache. In this study we evaluate the effectiveness of oral peppermint extract (menthol) in migraine.

**Materials and methods:** This study is a randomized clinical trial held in Sadaf pain clinic, Pars Hospital and Amir-al-momenin Hospital in Tehran. In this study 40 patients, aged between 18 to 60 years with 2 to 8 attacks per month who were on prophylactic treatment, have been observed for one month. Oral menthol 2% was also added for 1 month to their usual treatment (2 drops after lunch and dinner). Patients were followed for frequency of attacks, headache severity, and duration of attacks and associated symptoms of attacks, one month before and one month after consumption of the peppermint extracts.

**Findings:** Peppermint caused a significant decrease in frequency, severity and duration of attacks ( $P\text{-value} < 0.05$ ). Among symptoms, photophobia and phono-phobia were improved significantly ( $P\text{-value} < 0.05$ ), whereas no significant change was observed in nausea and vomiting ( $P\text{-value} > 0.05$ ).

**Conclusion:** Our study showed that peppermint extract (menthol) could significantly reduce the intensity, duration and frequency of migraine attacks in combination with prophylactic pharmacologic therapy.

Keyword(s): EFFECTIVENESS, PEPPERMINT, MIGRAINE

با توجه به مطالب بالا مقاله پژوهشی (کارآزمایی بالینی) ذیل را مطالعه و به این سوالات پاسخ دهید

۱- عنوان مقاله چیست؟ در کدام ژورنال چاپ شده است؟

۲- چه مداخله ای و روی چند نفر صورت گرفت؟

۳- نتیجه نهایی این پژوهش چیست؟

## مقالات مروری (Review Articles)

مقالات مروری مقالاتی هستند که از پژوهش بر روی مقالات دیگر حاصل میگردند. به عبارت دیگر در مقالات مروری سوژه ها و واحدهای مطالعه به جای انسان، حیوان، سلول و ... مقالات هستند. زیر بنای اصلی این نوع مقالات، مروری جامع و کامل پیرامون اطلاعات و مقالات موجود در مورد یک موضوع خاص است تا سوالات پاسخ داده نشده و توافق و تفاوت نظرها در یک ظرف جمع گردد و یک پاسخ و جمع بندی نهایی برای آنها حاصل گردد. برای دستیابی به این هدف پژوهشگر با جستجو در منابع موجود مقالات مرتبط را مییابد، آنها را غربال میکند، اطلاعات لازم را از مقالات استخراج کرده و در نهایت با تفسیر و قضاوت بین آنها به یک جواب و نتیجه گیری نهایی دست مییابد. مقالات مروری را به سه دسته کلی میتوان تقسیم کرد:

مقالات مروری تشریحی یا روایتی (Narrative review articles)

مقالات مروری سیستماتیک (Systematic review articles): چنانچه نویسنده یا نویسندگان برای یافتن پاسخ سؤال مورد نظر، صرفاً براساس ذهنیت قبلی خود از موضوع مورد بحث به جستجوی مقالات و مطالعات مرتبط بپردازند، آنگاه این جستجو

را تا رسیدن به مقالات مورد نظر و انتخاب مطالعات مناسب ادامه دهند، سپس با جمع‌بندی نتایج به دست آمده و تلفیق آن با تجربیات خویش، نتیجه‌گیری نهایی را در قالب یک مقاله ارائه دهند، به آن مرور غیرسیستماتیک یا روایتی می‌گویند. در مقابل، مرور سیستماتیک یا جامع، انجام همین مراحل اما براساس پروتکلی کاملاً دقیق و از قبل تنظیم شده می‌باشد.

مرور سیستماتیک در اغلب موارد با بهره‌گیری از روش‌های آماری در ترکیب نتایج، به برآوردی واحد و مشخص در پاسخ به سؤال مربوطه دست می‌یابد و لذا از توان و اعتبار بالایی در نتیجه‌گیری و تصمیم‌سازی برخوردار است.

(Meta analysis articles) متآنالیز مقالات: متآنالیز عبارت است از ترکیب داده‌ها و نتایج بدست آمده از یک مرور سیستماتیک با بهره‌گیری از روش‌های آماری، یعنی پس از انجام مرور سیستماتیک- که لازمه متآنالیز است- و براساس نتایج، به یک تخمین واحد برای حل مشکل یا سؤال مورد نظر دست پیدا می‌کنیم. البته هر مرور سیستماتیکی به متآنالیز منجر نمی‌شود. چنانچه داده‌ها و برآوردهای خام حاصل از مرور سیستماتیک بیش از اندازه غیرهمسان نباشد و بتوان آنها را با روش‌های خاص آماری با هم ترکیب کرد، متآنالیز قابل انجام خواهد بود.

### یک مثال از مقاله مروری روایتی

نقش حجامت در درمان بیماریها: مقاله مروری نظام مند که نویسندگان آن (حسین خیر اندیش و همکاران با مرور ۹۹ مطالعه انجام شده از پژوهش‌های داخلی و خارجی و بررسی ۵۰ مورد بیماری به این نتیجه رسیدند که حجامت بر درمان بعضی بیماریها (اسکلزی عضلانی و پوستی) موثر است

### متن زیر را به انگلیسی خلاصه نمائید

#### Lifestyle changes in women with hot flashes

Researchers find that women with hot flashes have more sensitive thermostats in their brain, so are comfortable only in a small range of temperatures. Staying cool and reducing stress are the principal lifestyle changes to treat your hot flashes.

- Avoid warm rooms, hot drinks, hot foods, alcohol, caffeine, bright lights, excess stress, and cigarette smoking. Wear layers of clothing made from light, breathable fabrics, removing a layer or two when you're hot, and replacing them when you're cooler. Cooling products, including sprays, gels, cooling bed linens, wicking sleepwear, and the Chillow pillow may be helpful.

- To reduce stress and promote more restful sleep, exercise regularly, but not too close to bedtime.

Meditation, yoga, tai chi, biofeedback, acupuncture, or massage also will lower your stress levels.

- When a hot flash is starting, try “paced respiration”—slow, deep, abdominal breathing, in through your nose and out through your mouth. Breathe only 6-7 times per minute, much more slowly than usual.
- Try different strategies to stay cool while sleeping. Dress in light, breathable nightclothes. Use layered bedding that can be easily removed during the night. Cool down with a bedside fan. Keep a frozen cold pack or bag of frozen peas under your pillow, and turn the pillow often so that your head is always resting on a cool surface. If you wake at night, sip cool water. Try different techniques for getting back to sleep, such as meditation, paced respiration, or getting out of bed and reading until you become sleepy.
- Women who are overweight have more hot flashes, so maintain a healthy weight and exercise regularly to decrease bothersome hot flashes and improve your overall health.