Faculty of health sciences
"Medical Terminology"
1st Lecture

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ENT-HNS MD

It is a pleasure to be here ☺

You are the first generation !!

Not only in your families .. Rather in your community !!



What is “Medical Terminology”?

Medical terminology is a special vocabulary used by healthcare professionals for effective and accurate communication.

Every health-related field requires an understanding of medical terminology.

What is “Medical Terminology”?

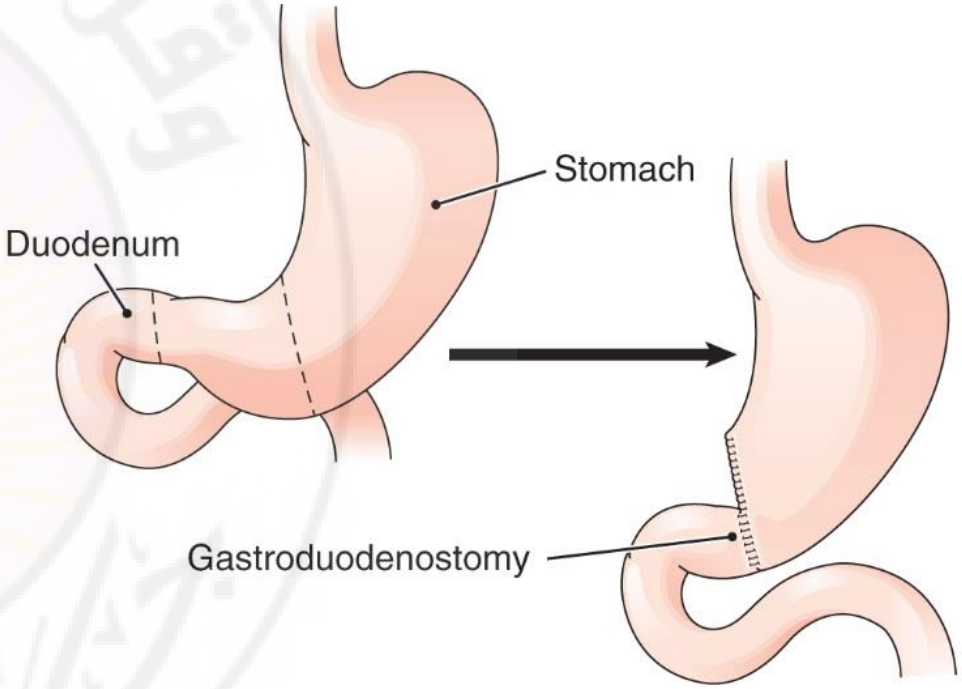
Because it is based mainly on Greek and Latin words, medical terminology is consistent and uniform throughout the world.

What is “Medical Terminology”?

- It is also efficient; although some of the terms are long, they often reduce an entire phrase to a single word.

- *gastroduodenostomy* means:

“a communication between the stomach and the first part of the small intestine”



As a radiologists.. Why to study medical terminology?!!

- Integration into Multidisciplinary approach.
- Keeping up-to-date and self-development.



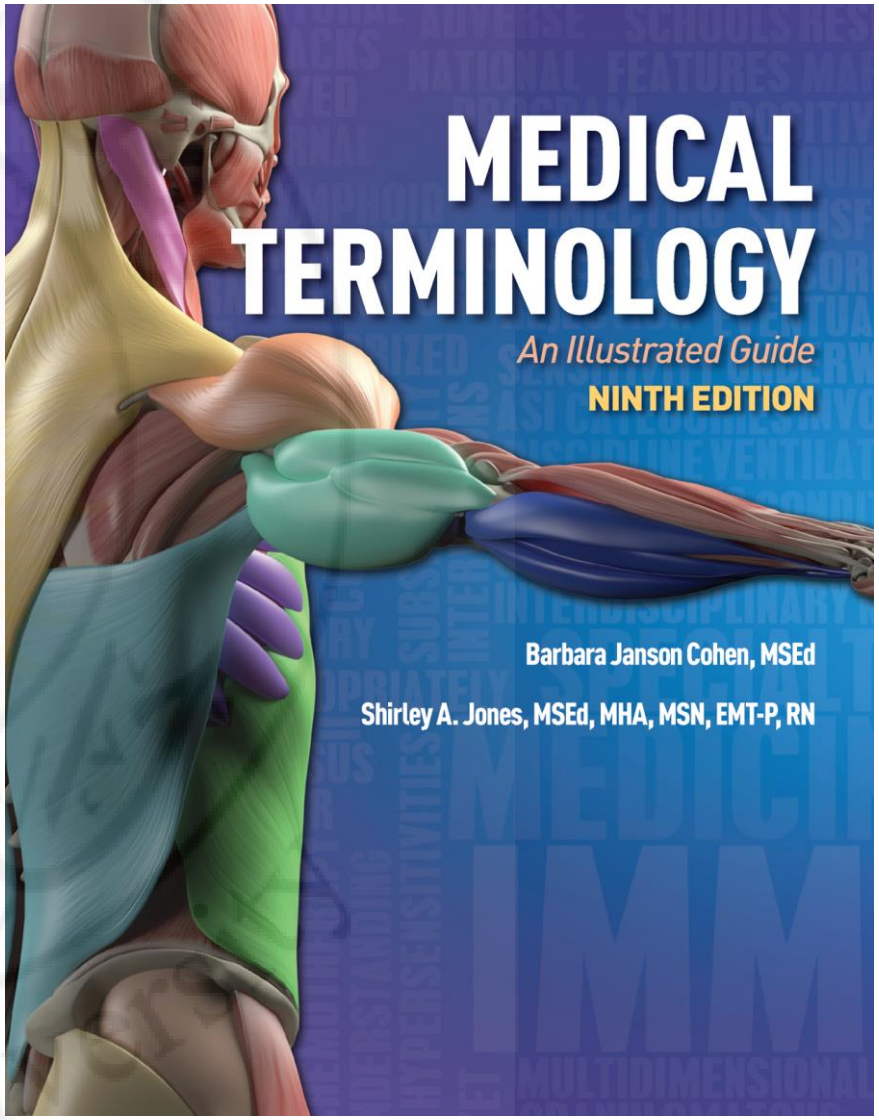
Lectures schedule

- 10 – 12 sessions
- 2 h (1.5 h lecture – 0.5 h presentations)



Your armamentarium

- lectures
- Medical dictionary
- Reference: medical terminology an illustrated guide 9th edtition.
- WHATSAPP Group : 0934 306 328



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Learning Medical terms !

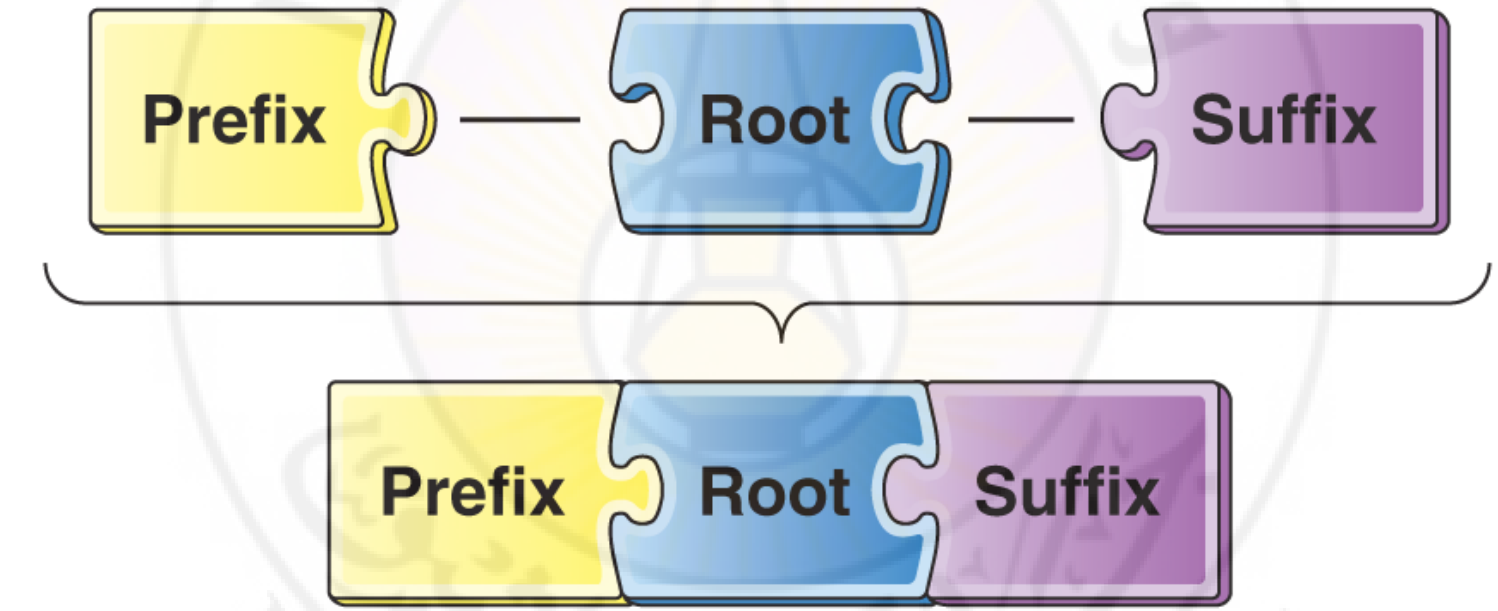
- The medical vocabulary is vast, and learning it may seem like learning the entire vocabulary of a foreign language. Moreover, like the jargon that arises in all changing fields, it is always expanding.



Learning Medical terms !

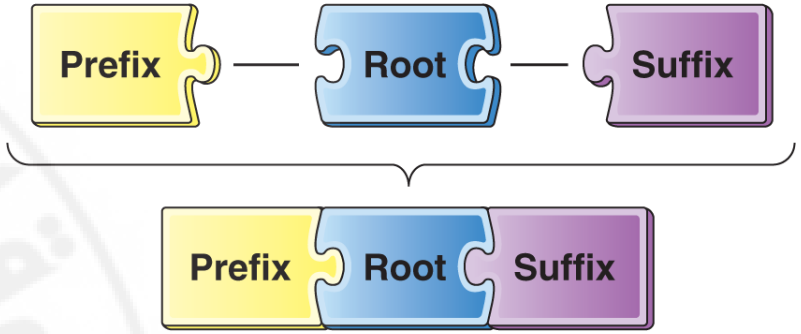
- there are methods to aid in learning and remembering words and even to help make informed guesses about unfamiliar words.
- Most medical terms can be divided into component parts—roots, prefixes, and suffixes—that maintain the same meaning whenever they appear. By learning these meanings, you can analyze and remember many words.

Learning Medical trems !



Words are formed from roots, suffixes, and prefixes.

Learning Medical trems !

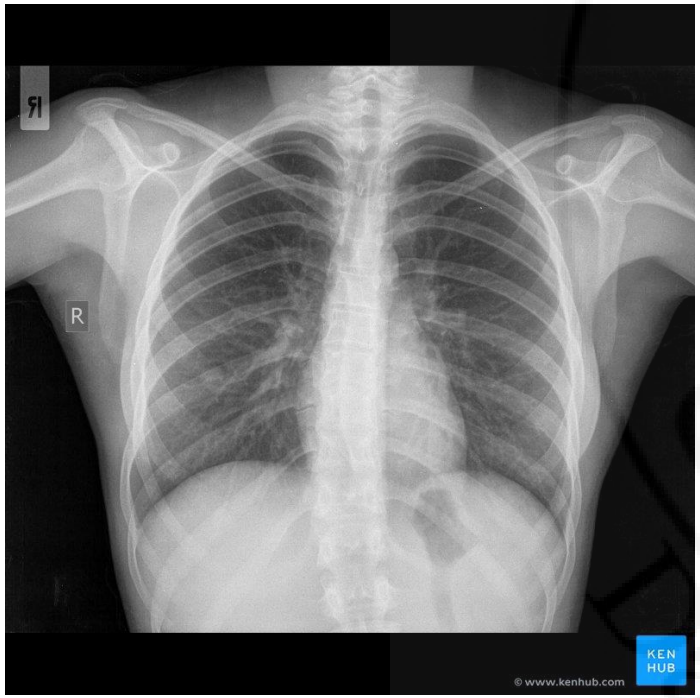


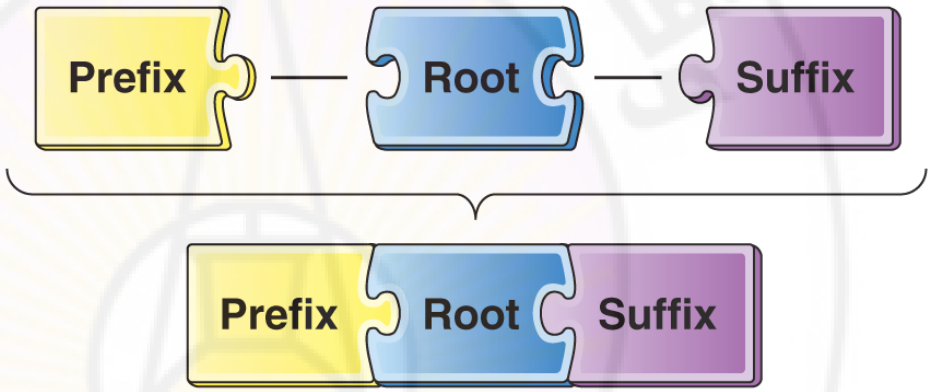
Word components fall into three categories:

- The **root** is the fundamental unit of each medical word. It establishes the basic meaning of the word and is the part to which modifying word parts are added.
- A **suffix** is a short word part or series of parts added at the end of a root to modify its meaning.
- A **prefix** is a short word part added before a root to modify its meaning.

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Learning Medical trems !

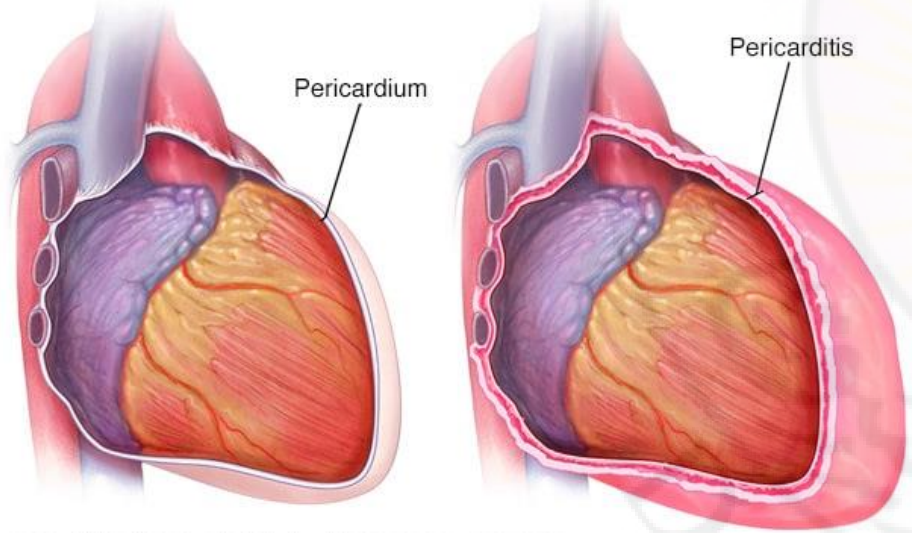


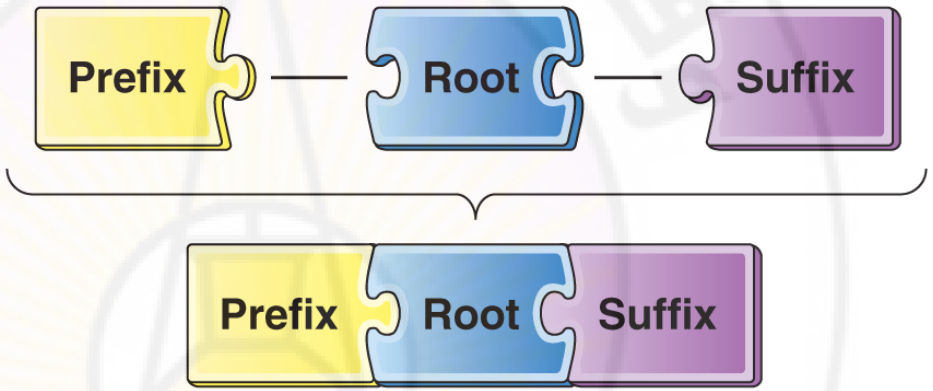


	Radi	-	: ray (شعاع)
		Logy	: study of (علم ال)

Radiology : The branch of medicine that uses radiation, such as x-rays, in the diagnosis and treatment of disease.

Learning Medical trems !

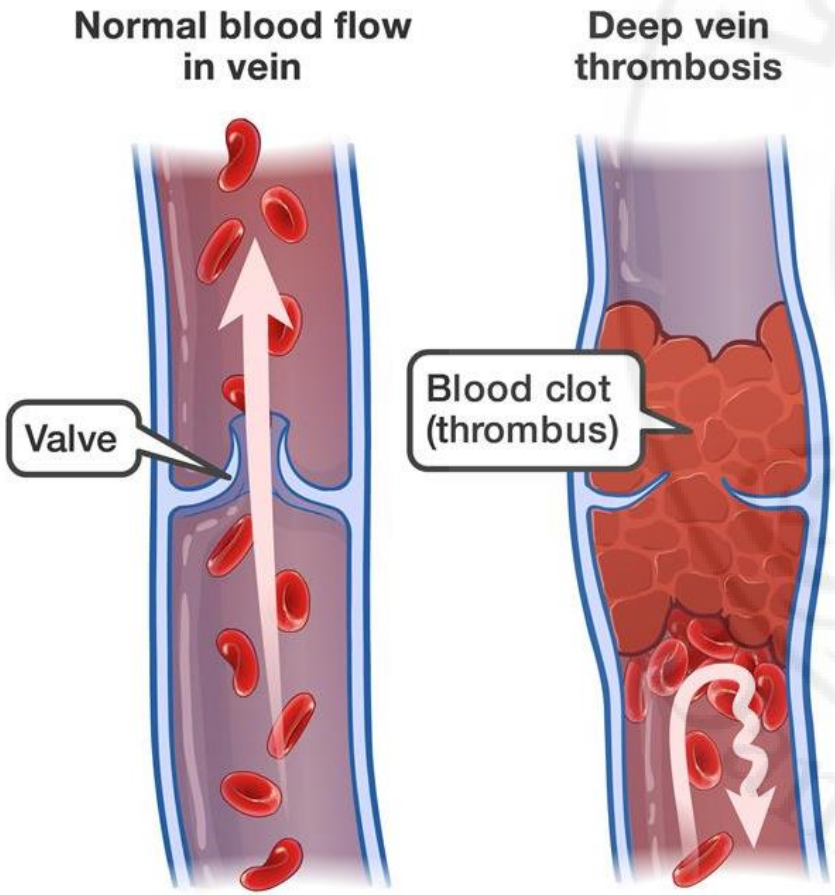


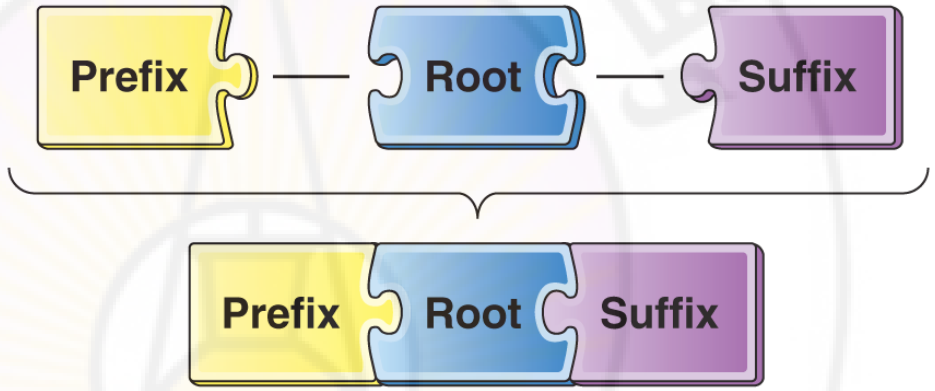


	cardi	itis	: heart (قلب)
peri -		-	: inflammation (التهاب)
			: around (ما حول)

***Pericarditis*: infalammation Of ther cover that envelops The heart !!**

Learning Medical trems !



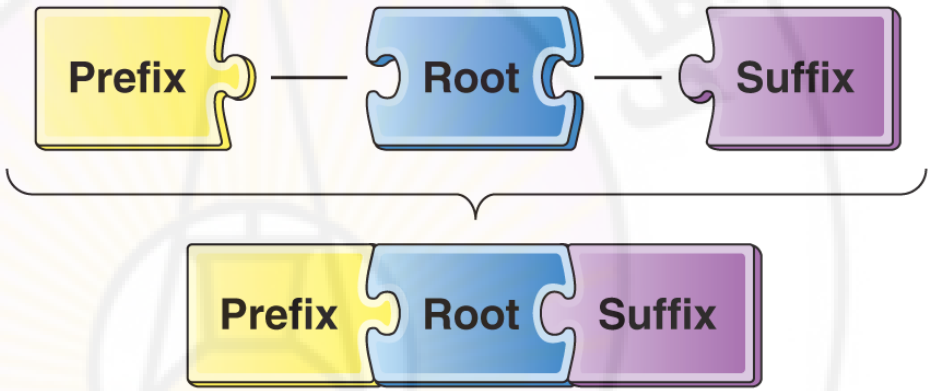


	thromb	- sis	: thrombus (خثرة)
			: condition of (حالة من ال)

thrombosis: This term refers to having a blood clot (thrombus) in a vessel.

Learning Medical trems !





	Neur	- itis	: nerve (عصب) : inflammation (التهاب)

neuritis: infalammation Of nervous tissue.

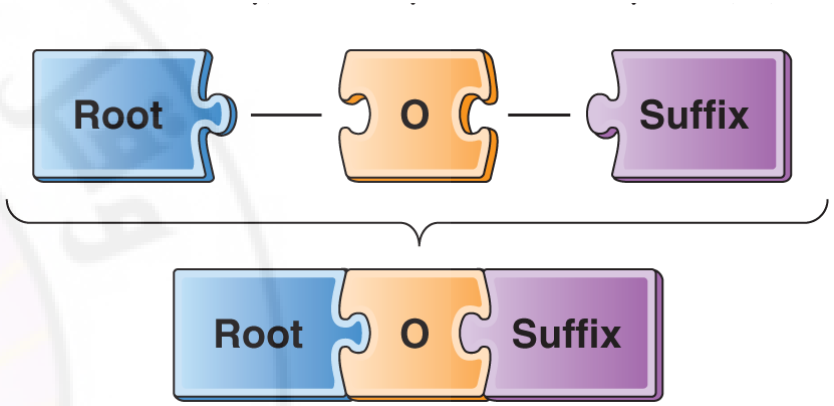
Word Derivations

- As mentioned, most medical word parts come from Greek (G.) and Latin (L.).
- Their meanings are interesting and may aid in learning.
- For example, *muscle* comes from a Latin word that means “mouse” because the movement of a muscle under the skin was thought to resemble the scampering of a mouse.

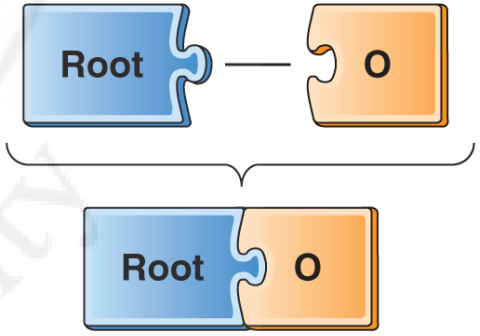


COMBINING FORMS

When a suffix or another root beginning with a consonant is added to a root, a vowel is inserted between the root and the next word part to aid in pronunciation.



Roots shown with a combining vowel are called **combining forms**.



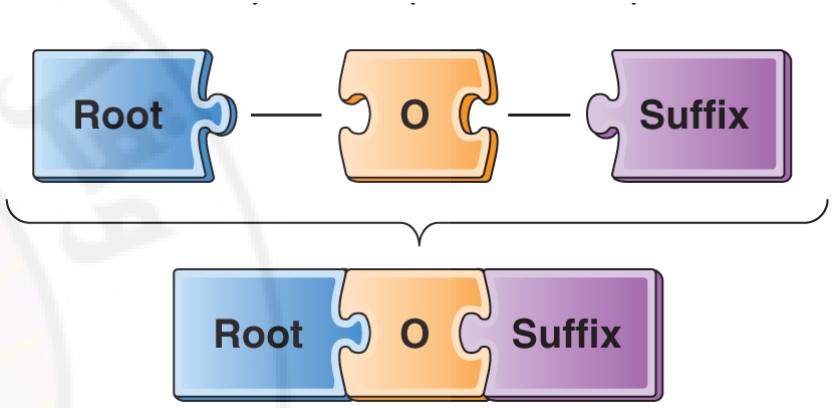
Combining form

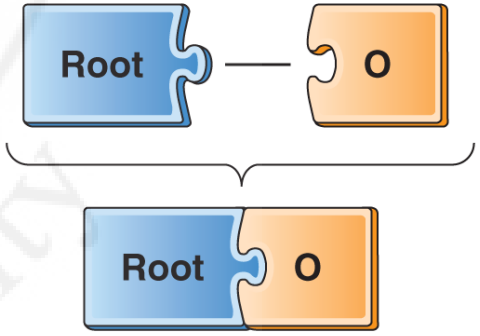
A root with a combining vowel is called a combining form.

COMBINING FORMS

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).





Combining form

A root with a combining vowel is called a combining form.

Abbreviations

Shortened words or initials can save time in writing medical reports and case histories.

TV : television

Jr : junior

F : Fahrenheit

UV : ultraviolet

Dr : doctor

Db : decibels, units of sound intensity

CA : cancer

Hgb : hemoglobin

ECG : electrocardiogram.

Abbreviations

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

MRI : Magnetic Resonance Imaging

CNS : Central Nervous System

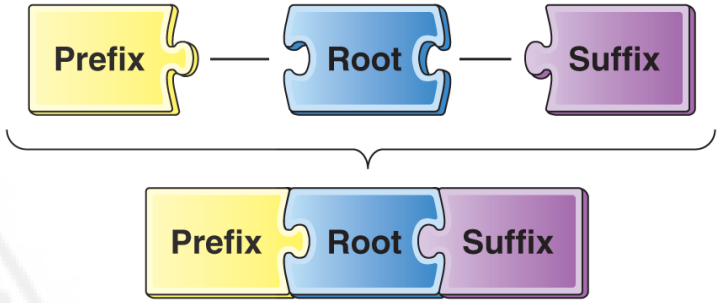
FDA : Food and Drug Administration

AIDS : Acquired Immunodeficiency Syndrome

Abbreviations

Symbols are commonly used as shorthand in case histories. Some examples are Ⓛ for left ® for right and ↑ and ↓ for increase and decrease.

Suffixes



- A suffix is a word ending that modifies a root definition.
- A suffix may indicate that the word is a noun, adjective or plural form.

*For example:

- The root *myel/o*, meaning "bone marrow,"
- ***Adjective :*** The adjective ending "*oid*" forms the word *myeloid* which means "like or pertaining to bone marrow."
- ***Noun :*** The ending "*oma*" forms *myeloma*, which is a tumor of the bone marrow.
- ***Plural :*** thrombus → thrombi

- In terminology, there are always exceptions.
- Carcinoma → Carcinomata But *carcinomas* is commonly used.



تم بحمده تعالى
بالتوفيق جميعاً

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Suffixes That Mean “Condition of”

(ia - ism – sis – y)

Suffixes That Mean “Condition of”

Examples :

ia :

- dementia : loss of (de) intellectual function (from L. *mentis*: mind).
- phobia (unfounded fear; from G. *phobos*: fear)
- anesthesia (loss of sensation; root: esthesi/o)

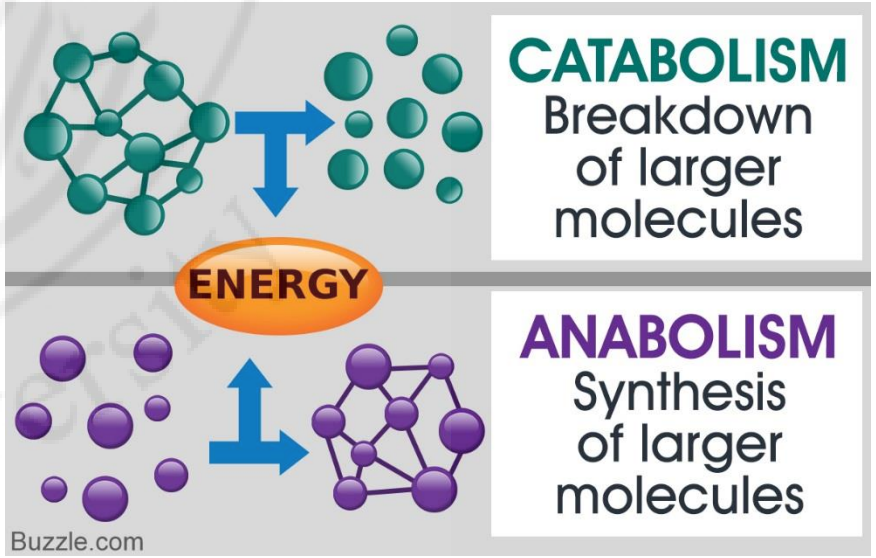
Suffixes That Mean “Condition of”

ism :

Anabolism : synthesis of larger molecules (requires energy)

Catabolism : breakdown of larger molecules (produces energy)

Metabolism : sum of all chemical reactions in the body



Suffixes That Mean “Condition of”

sis :

- thrombosis : having a blood clot (thrombus) in a vessel
- Psoriasis : skin disease
- stenosis : narrowing of a canal
- Diuresis : increased urination; root: ur/o

y :

- atony : lack (a) of muscle tone.
- tetany : sustained muscle contraction

Suffixes for Medical Specialties

- ian :specialist in a field of study .ex: physician (practitioner of medicine)
- ist :specialist in a field of study .ex: neurologist (one who studies and treats diseased of nervous system)

- iatrics :medical specialty .ex: pediatrics (care and treatment of children)
- iatry :medical specialty .ex: psychiatry (study and treatment of mental (psych/o) disorders)

- logy study of . ex: physiology study of function in a living organism (from root *physi/o*, meaning “nature”)

Suffixes for Medical Specialties

Geriatrics



FIGURE 1-7 Geriatrics is the care and treatment of the aged.
A specialist in this field, a geriatrician, is shown.

ADJECTIVE SUFFIXES :

The suffixes below are all adjective endings that mean “pertaining to,” “like,” or “resembling”

-Ac /– al /– ar /- ary /– form /- ic ical (ic + al) /– ile /– oid /– ory /– ous

Ex:

Cardiac	**venous**
Vocal	**topical**
Nuclear	**surgical**
Salivary	**muscular**
muciform (mucous)	**urinary**
Anatomic	**respiratory**
Electrical	**pelvic**
Virile	**cutaneous**
Lymphoid	

There are no rules for which ending to use for a given noun. Familiarity comes with practice.

ADJECTIVE SUFFIXES :

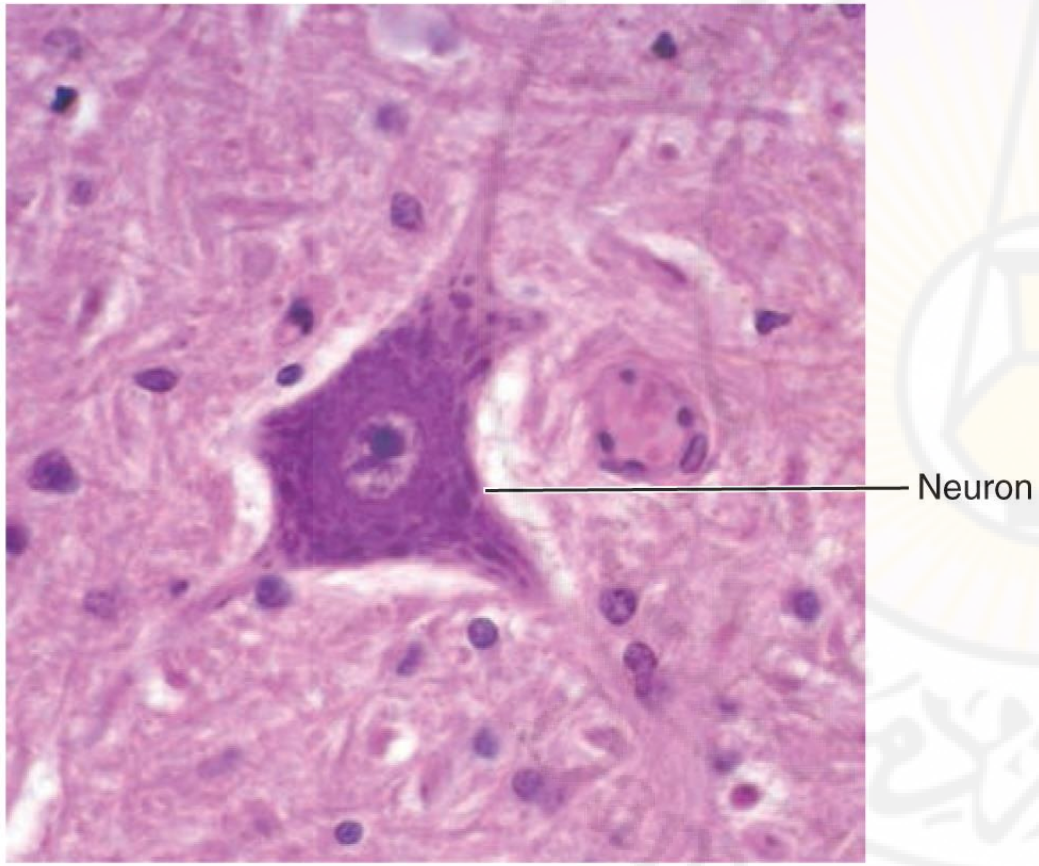


FIGURE 1-9 A neuron is a nerve cell. The adjective form of *neuron* is *neuronal*.

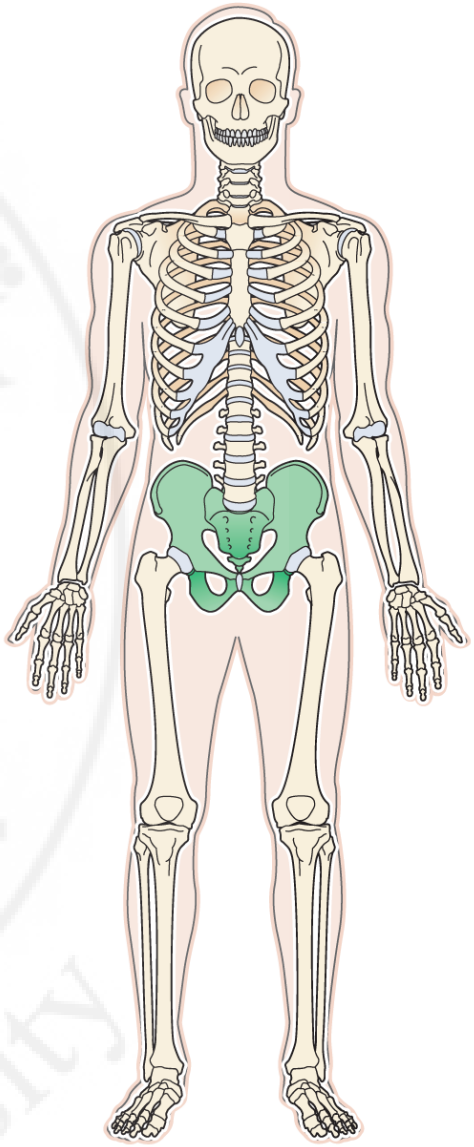


FIGURE 1-10 The pelvis is the bony hip girdle. The adjective form of pelvis is *pelvic*.

Forming Plurals

Many medical words have special plural forms based on the ending of the word.

Forming Plurals

Table 1-4 Plural Endings

Word Ending	Plural Ending	Singular Example	Plural Example
a	ae	vertebra (bone of the spine) *VER-teh-brah*	vertebrae **(FIG. 1-11)** *VER-teh-bre*
en	ina	lumen (central opening) *LU-men*	lumina **(FIG. 1-12)** *LU-min-ah*
ex, ix, yx	ices	matrix (background substance; mold) *MA-triks*	matrices *MA-trih-seze*
is	es	diagnosis (determination of a disease or defect) *di-ag-NO-sis*	diagnoses *di-ag-NO-seze*
ma	mata	stigma (mark or scar) *STIG-mah*	stigmata *stig-MAT-ah*
nx (anx, inx, ynx)	nges	phalanx (bone of finger or toe) *fah-LANKS*	phalanges **(FIG. 1-13)** *fah-LAN-jeze*
on	a	ganglion (mass of nervous tissue) *GANG-le-on*	ganglia *GANG-le-ah*
um	a	serum (thin fluid) *SE-rum*	sera *SE-rah*
us	i	thrombus (see **FIG. 1-4**) *THROM-bus*	thrombi *THROM-bi*

Forming Plurals

More examples:

Alveolus → alveoli

Embolus → emboli

Fungus → fungi

Phenomenon → phenomena

Foramen → foramina

Adenoma →adenomata

Forming Plurals

There are exceptions to the rules given for forming plurals, some of which will appear in later chapters. For example, the plural of *sinus* (space) is *sinuses*, the plural of *virus* is *viruses*, and *serums* (thin fluids) is sometimes used instead of *sera*.

Suffixes for Medical Specialties

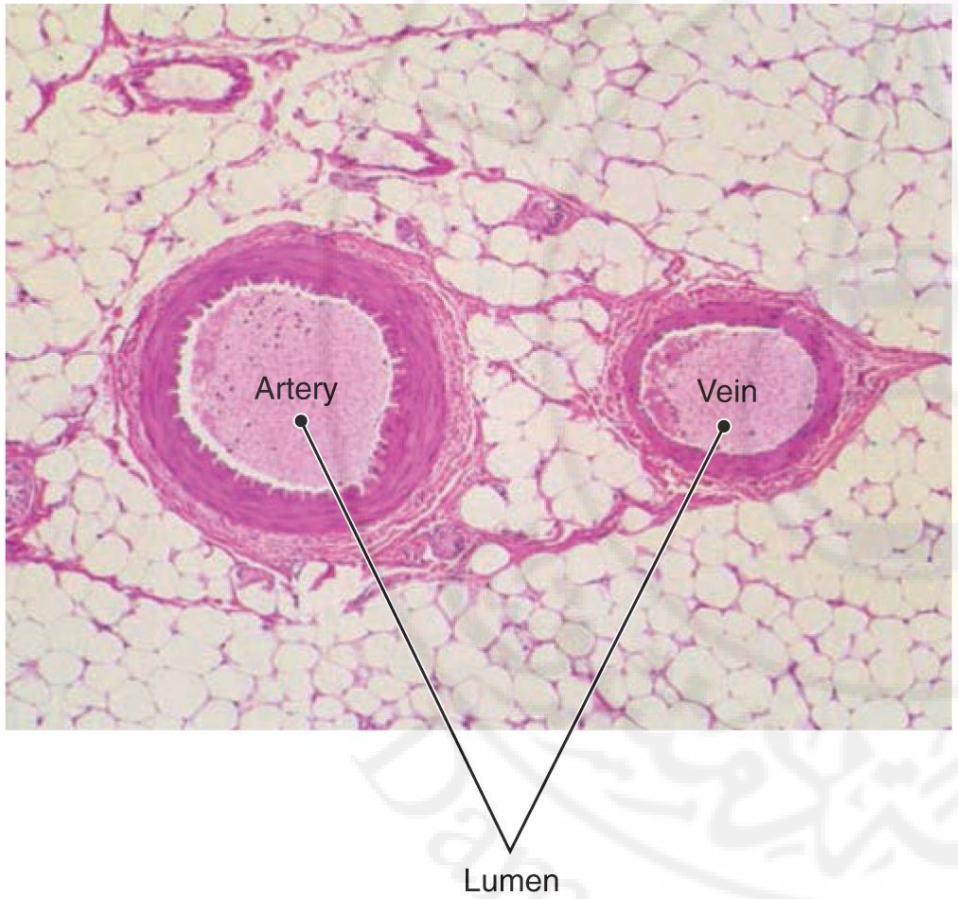


FIGURE 1-12 A lumen is the central opening of an organ or vessel. Two blood vessels are shown, an artery and a vein. The plural of lumen is *lumina*.

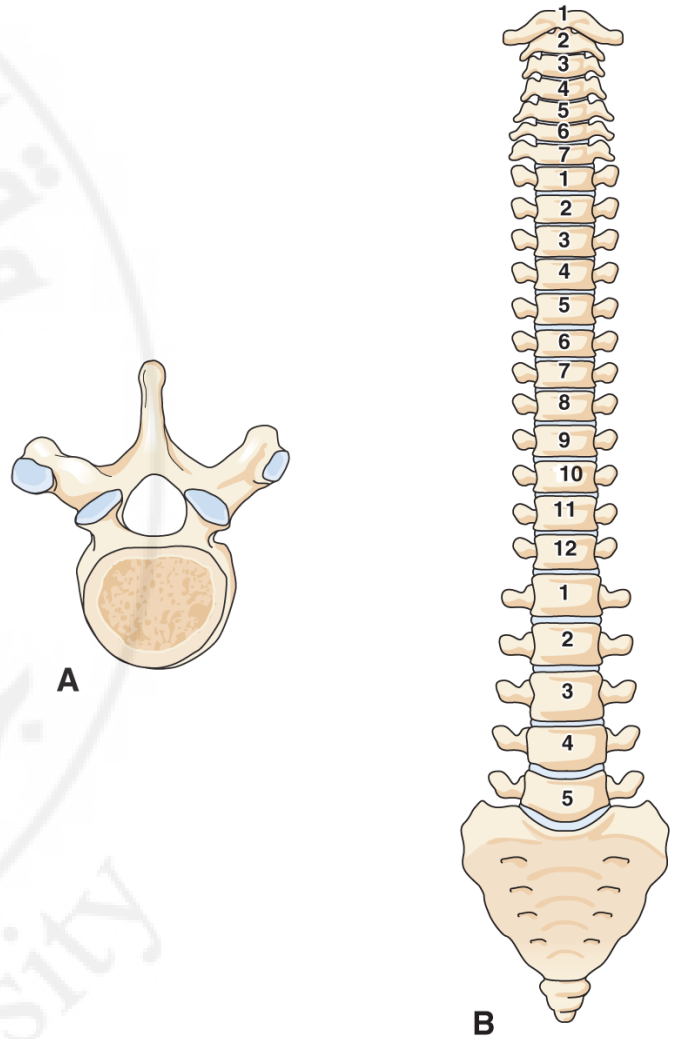


FIGURE 1-11 Bones of the spine. A. Each bone of the spine is a vertebra. **B.** The spinal column is made of 26 vertebrae.

Prefixes

Prefixes for Numbers

Table 1-5 Prefixes for Numbers[a]

Prefix	Meaning	Example	Definition of Example
prim/i-	first	primary *PRI-mar-e*	first
mon/o-	one	monocular *mon-OK-u-lar*	having one eyepiece or affecting one eye
uni-	one	unite *u-NITE*	form into one part
hemi-	half, one side	hemisphere *HEM-ih-sfere*	one-half of a rounded structure **(FIG. 1-14)**
semi-	half, partial	semipermeable *sem-e-PER-me-ah-bl*	partially permeable (capable of being penetrated)
bi-	two, twice	binary *BI-nar-e*	made up of two parts
di-	two, twice	diatomic *di-ah-TOM-ik*	having two atoms
dipl/o-	double	diplococci *dip-lo-KOK-si*	round bacteria (cocci) that grow in groups of two
tri-	three	tricuspid *tri-KUS-pid*	having three points or cusps **(FIG. 1-15)**
quadr/i-	four	quadruplet *kwah-DRUPE-let*	one of four babies born together
tetra-	four	tetralogy *tet-RAL-o-je*	a group of four
multi-	many	multicellular *mul-ti-SEL-u-lar*	consisting of many cells **(FIG. 1-16)**
poly-	many, much	polymorphous *pol-e-MOR-fus*	having many forms (morph/o)

[a]Prefixes pertaining to the metric system are in Appendix 8-2.

Prefixes

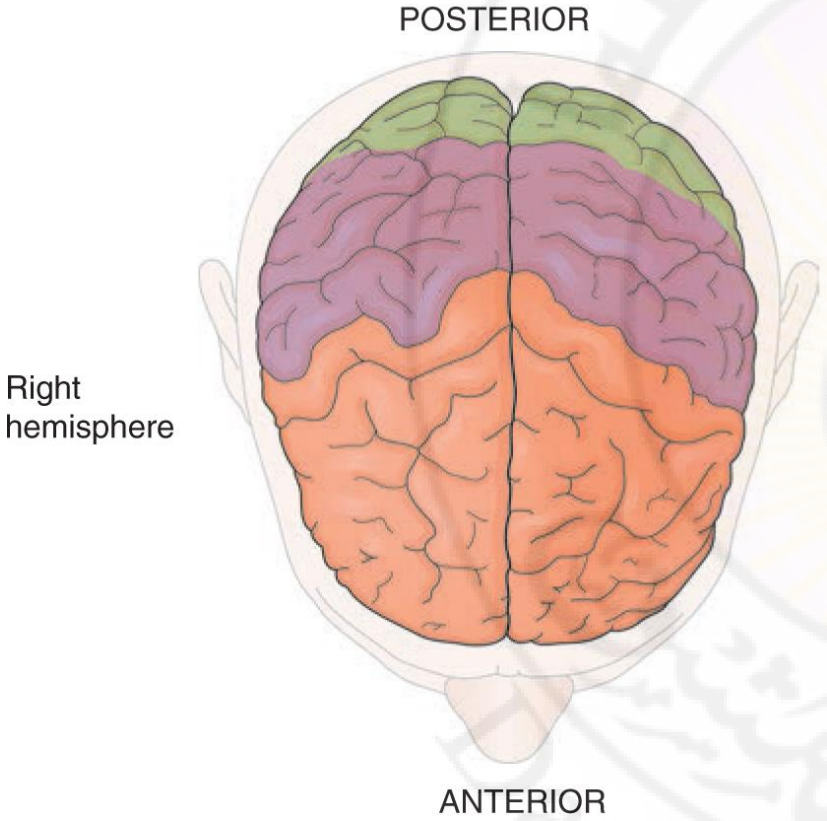


FIGURE 1-14 Brain hemispheres. Each half of the brain is a hemisphere. The prefix *hemi-* means half or one side.

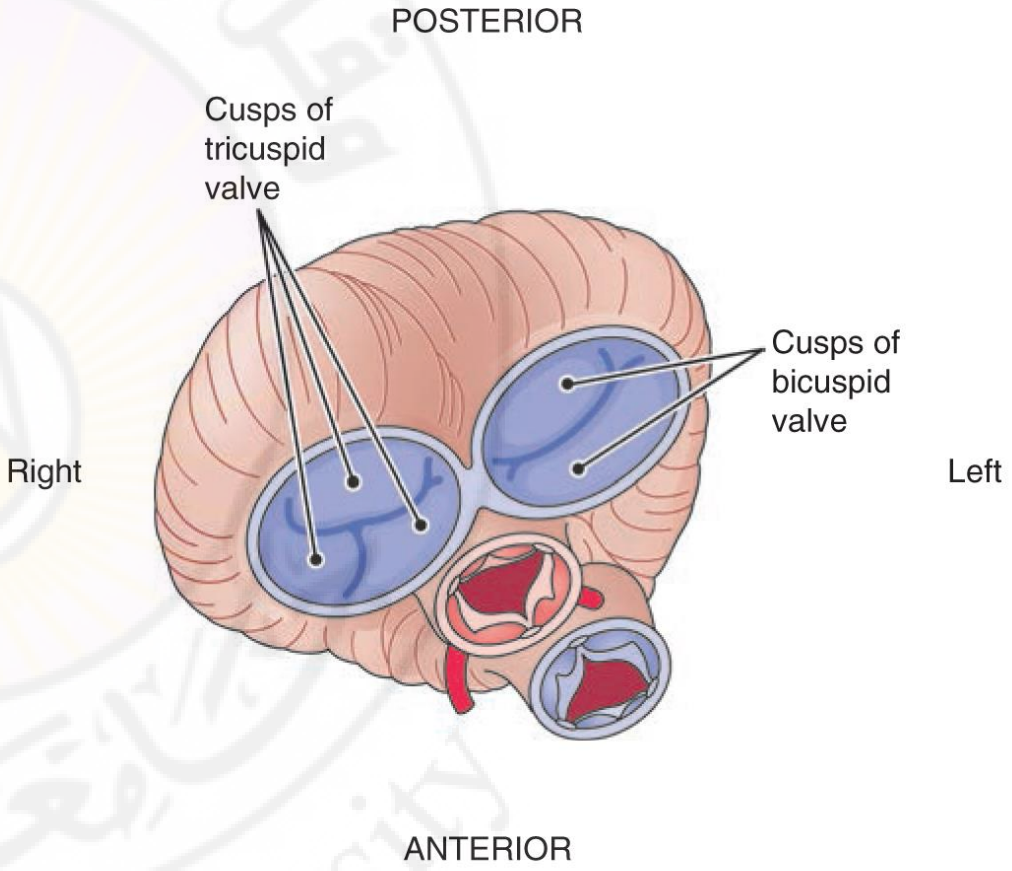


FIGURE 1-15 Heart valves. The valve on the heart's right side, the tricuspid, has three cusps (flaps); the valve on the heart's left side, the bicuspid, has two cusps. The prefixes *bi-* and *tri-* indicate number.

Prefixes

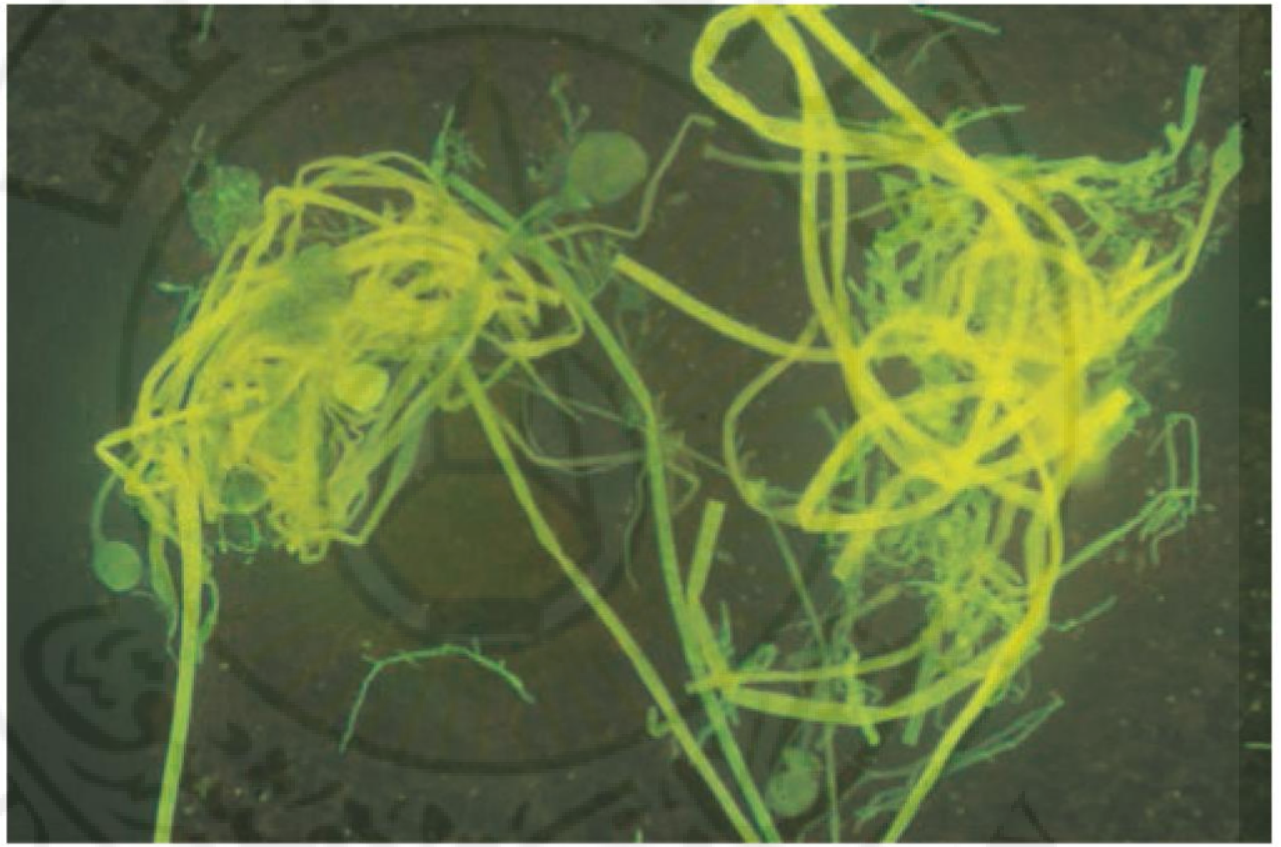


FIGURE 1-16 A multicellular organism. This fungus has more than one cell. It is a simple multicellular organism.

Prefixes for Colors

Table 1-6 Prefixes for Colors

Prefix	Meaning	Example	Definition of Example
cyan/o-	blue	cyanosis *si-ah-NO-sis*	bluish discoloration of the skin due to lack of oxygen **(FIG. 1-17)**
erythr/o-	red	erythrocyte *eh-RITH-ro-site*	red blood cell (-cyte)
leuk/o-	white, colorless	leukemia *lu-KE-me-ah*	cancer of white blood cells
melan/o-	black, dark	melanin *MEL-ah-nin*	the dark pigment that colors the hair and skin
xanth/o-	yellow	xanthoma *zan-THO-mah*	yellow growth (-oma) on the skin

Prefixes for Colors



FIGURE 1-17 Cyanosis, a bluish discoloration. This abnormal coloration is seen in the toenails and toes, as compared to the normal coloration of the fingertips. The prefix *cyan/o-* means "blue."

Suffixes for Medical Specialties

Exercise 1-6

Complete the exercise. To check your answers go to Appendix 11.

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

____ 1. melanocyte (*MEL-ah-no-site*)	a. pertaining to bluish discoloration
____ 2. xanthoderma (*zan-tho-DER-mah*)	b. redness of the skin
____ 3. cyanotic (*si-ah-NOT-ik*)	c. yellow coloration of the skin
____ 4. erythema (*eh-RIH-the-mah*)	d. cell that produces dark pigment
____ 5. leukocyte (*LU-ko-site*)	e. white blood cell

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Negative Prefixes

Table 1-7 Negative Prefixes

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

[a]May also mean "in" or "into" as in inject, inhale.

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Negative Prefixes

Exercise 1-7

Complete the exercise. To check your answers go to Appendix 11.

Identify and define the prefix in the following words.

	Prefix	Meaning of Prefix
1. aseptic	a	not, without, lack of, absence
2. antidote		
3. amnesia		
4. disintegrate		
5. contraception		
6. inadequate		

(continued)

Negative Prefixes

Table 1-8 Prefixes for Direction

Prefix	Meaning	Example	Definition of Example
ab-	away from	abduct *ab-DUKT*	to move away from the midline **(FIG. 1-18)**
ad-	toward, near	adduct *ad-DUKT*	to move toward the midline (see **FIG. 1-18**)
dia-	through	diarrhea *di-ah-RE-ah*	frequent discharge of fluid fecal matter
per-	through	percutaneous *per-ku-TA-ne-us*	through the skin
trans-	through	transected *tran-SEKT-ed*	cut (sectioned) through or across

Negative Prefixes



FIGURE 1-18 Abduction and adduction. The prefix *ab-* means "away from"; the leg is moved away from the body in abduction. The prefix *ad-* means "toward"; the leg is moved toward the body in adduction.

Prefixes of degree

Table 1-9 Prefixes for Degree

Prefix	Meaning	Example	Definition of Example
hyper-	over, excess, abnormally high, increased	hyperthermia *hi-per-THER-me-ah*	high body temperature
hypo-[a]	under, below, abnormally low, decreased	hyposecretion *hi-po-se-KRE-shun*	underproduction of a substance
olig/o-	few, scanty	oligospermia *ol-ih-go-SPER-me-ah*	abnormally low number of sperm cells in semen
pan-	all	pandemic *pan-DEM-ik*	disease affecting an entire population
super-[a]	above, excess	supernumerary *su-per-NU-mer-ar-e*	in excess number

[a]May also indicate position, as in hypodermic, superficial.

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Prefixes of degree

Exercise 1-9

Complete the exercise. To check your answers go to Appendix 11.

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

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

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Prefixes for size and comparison

Table 1-10 Prefixes for Size and Comparison

Prefix	Meaning	Example	Definition of Example
equi-	equal, same	equilibrium *e-kwih-LIB-re-um*	a state of balance, state in which conditions remain the same
eu-	true, good, easy, normal	euthanasia *u-thah-NA-ze-ah*	easy or painless death (thanat/o)
hetero-	other, different, unequal	heterogeneous *het-er-o-JE-ne-us*	composed of different materials, not uniform
homo-, homeo-	same, unchanging	homograft *HO-mo-graft*	tissue transplanted to another of the same species
iso-	equal, same	isocellular *i-so-SEL-u-lar*	composed of similar cells
macro-	large, abnormally large	macroscopic *mak-ro-SKOP-ik*	large enough to be seen without a microscope
mega-[a], megal/o	large, abnormally large	megacolon *meg-ah-KO-lon*	enlargement of the colon
micro-[a]	small	microcyte *MI-kro-site*	very small cell (-cyte)
neo-	new	neonate *NE-o-nate*	a newborn infant **(FIG. 1-19)**
normo-	normal	normovolemia *nor-mo-vol-E-me-ah*	normal blood volume
ortho-	straight, correct, upright	orthodontics *or-tho-DON-tiks*	branch of dentistry concerned with correction and straightening of the teeth (odont/o)
poikilo-	varied, irregular	poikilothermic *poy-kih-lo-THER-mik*	having variable body temperature (therm/o)
pseudo-	false	pseudoplegia *su-do-PLE-je-ah*	false paralysis (-plegia)
re-	again, back	reflux *RE-flux*	backward flow

[a]Mega- also means 1 million, as in megahertz. Micro- also means 1 millionth, as in microsecond.

Prefixes for size and comparison

- neonate
- Neonatology
- Neonatologist



FIGURE 1-19 A neonate or newborn. The prefix *neo-* means "new."

Prefixes for time and position

Table 1-11 Prefixes for Time and/or Position

Prefix	Meaning	Example	Definition of Example
ante-	before	antenatal *an-te-NA-tal*	before birth (nat/i)
pre-	before, in front of	premature *pre-mah-CHUR*	occurring before the proper time
pro-	before, in front of	prodrome *PRO-drome*	symptom that precedes a disease
post-	after, behind	postnasal *post-NA-sal*	behind the nose (nas/o)

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Prefixes for time and position

Table 1-12 Prefixes for Position

Prefix	Meaning	Example	Definition of Example
dextr/o-	right	dextrogastria *deks-tro-GAS-tre-ah*	displacement of the stomach (gastr/o) to the right
sinistr/o-	left	sinistromanual *sin-is-tro-MAN-u-al*	left-handed
ec-, ecto-	out, outside	ectopic *ek-TOP-ik*	out of normal position
ex/o-	away from, outside	excise *ek-SIZE*	to cut out
end/o-	in, within	endoderm *EN-do-derm*	inner layer of a developing embryo
mes/o-	middle	mesencephalon *mes-en-SEF-ah-lon*	middle portion of the brain (encephalon), midbrain
syn-, sym- (used before b, m, p)	together	synapse *SIN-aps*	a junction between two nerve cells (**FIG. 1-20**)
tel/e-, tel/o-	end, far, at a distance	teletherapy *tel-eh-THER-ah-pe*	radiation therapy delivered at a distance from the body

Prefixes for time and position

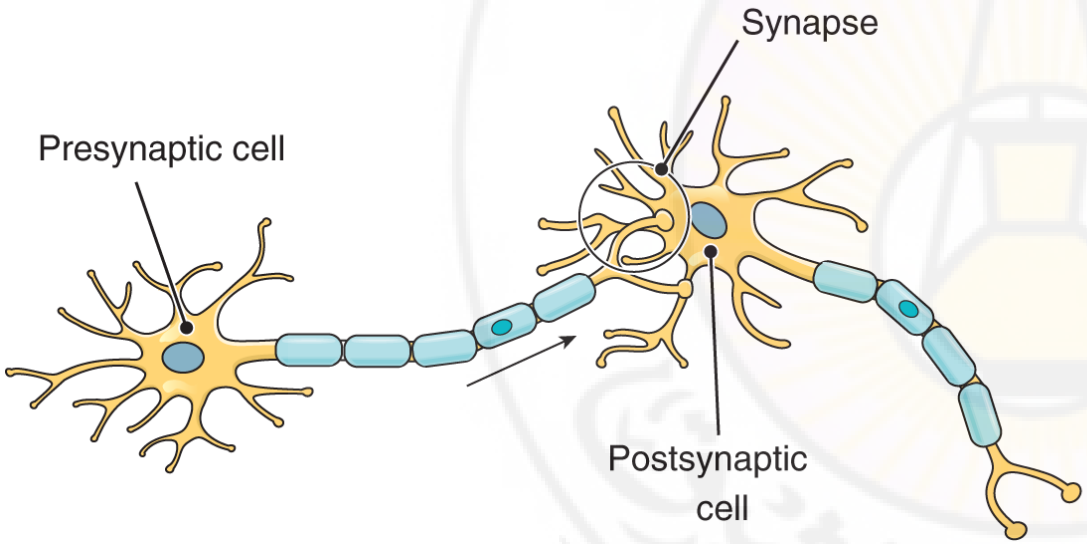


FIGURE 1-20 A synapse. Nerve cells come together at a synapse, as shown by the prefix *syn-*. The presynaptic cell is located before (prefix *pre-*) the synapse; the postsynaptic cell is located after (prefix *post-*) the synapse.

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Faculty of health sciences

”Medical Terminology“

3nd Lecture

Dr. Hamza Omar Shasho

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Carbohydrates The category of organic compounds that includes sugars and starches

Cell The basic structural and functional unit of the living organism, a microscopic unit that combines with other cells to form tissues

Chromosome A thread-like body in a cell's nucleus that contains genetic information

Cytology Study of cells

cytoplasm The fluid that fills a cell and holds the organelles

deoxyribonucleic acid (DNA) The genetic compound of the cell, makes up the genes

Enzyme An organic substance that speeds the rate of a metabolic reaction

gene A hereditary unit composed of DNA and combined with other genes to form the chromosomes

glucose A simple sugar that circulates in the blood, the main energy source for metabolism

histology Study of tissues

Homeostasis A steady state, a condition of internal stability and constancy

Lipid A category of organic compounds that includes fats (root: lip/o)

membrane A simple, very thin, and pliable sheet of tissue that might cover an organ, line a cavity, or separate structures

Metabolism The sum of all the physical and chemical reactions that occur within an organism

mitosis Cell division

Mucus A thick fluid secreted by cells in membranes and glands that lubricates and protects tissues (roots: muc/o, myx/o); the adjective is mucous

Nucleus The cell's control center; directs all cellular activities based on the information contained in its chromosomes

Organ A part of the body with a specific function, a component of a body system

Organelle A specialized structure in the cytoplasm of a cell

protein A category of organic compounds that includes structural materials, enzymes, and some hormones

ribonucleic acid (RNA) An organic compound involved in the manufacture of proteins within cells

tissue A group of cells that acts together for a specific purpose; types include epithelial tissue, connective tissue, muscle tissue, and nervous tissue

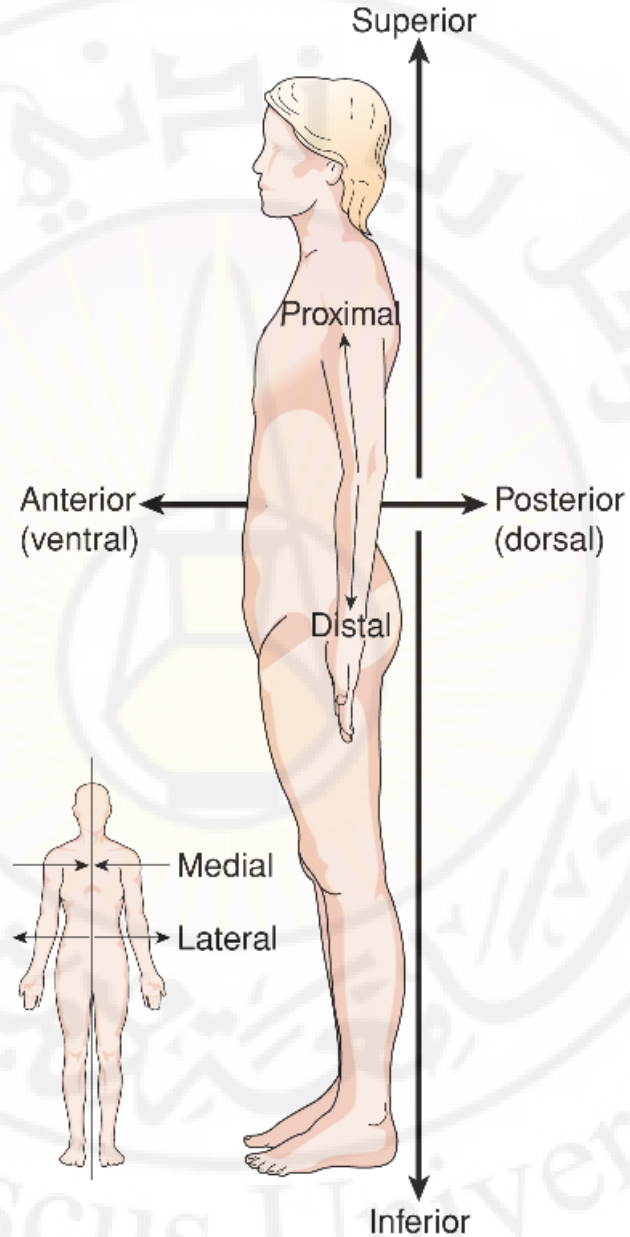


FIGURE 2-11 **Directional terms.**



FOR YOUR REFERENCE

Anatomic Directions

BOX 2-4

Term	Definition
anterior (ventral)	toward or at the front (belly) of the body
posterior (dorsal)	toward or at the back (dorsum) 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, in a higher position
inferior	below, in a lower position
cranial (cephalad)	toward the head
caudal	toward the lower end of the spine (Latin *cauda* means "tail"); in humans, in an inferior direction
superficial (external)	closer to the surface of the body
deep (internal)	closer to the center of the body

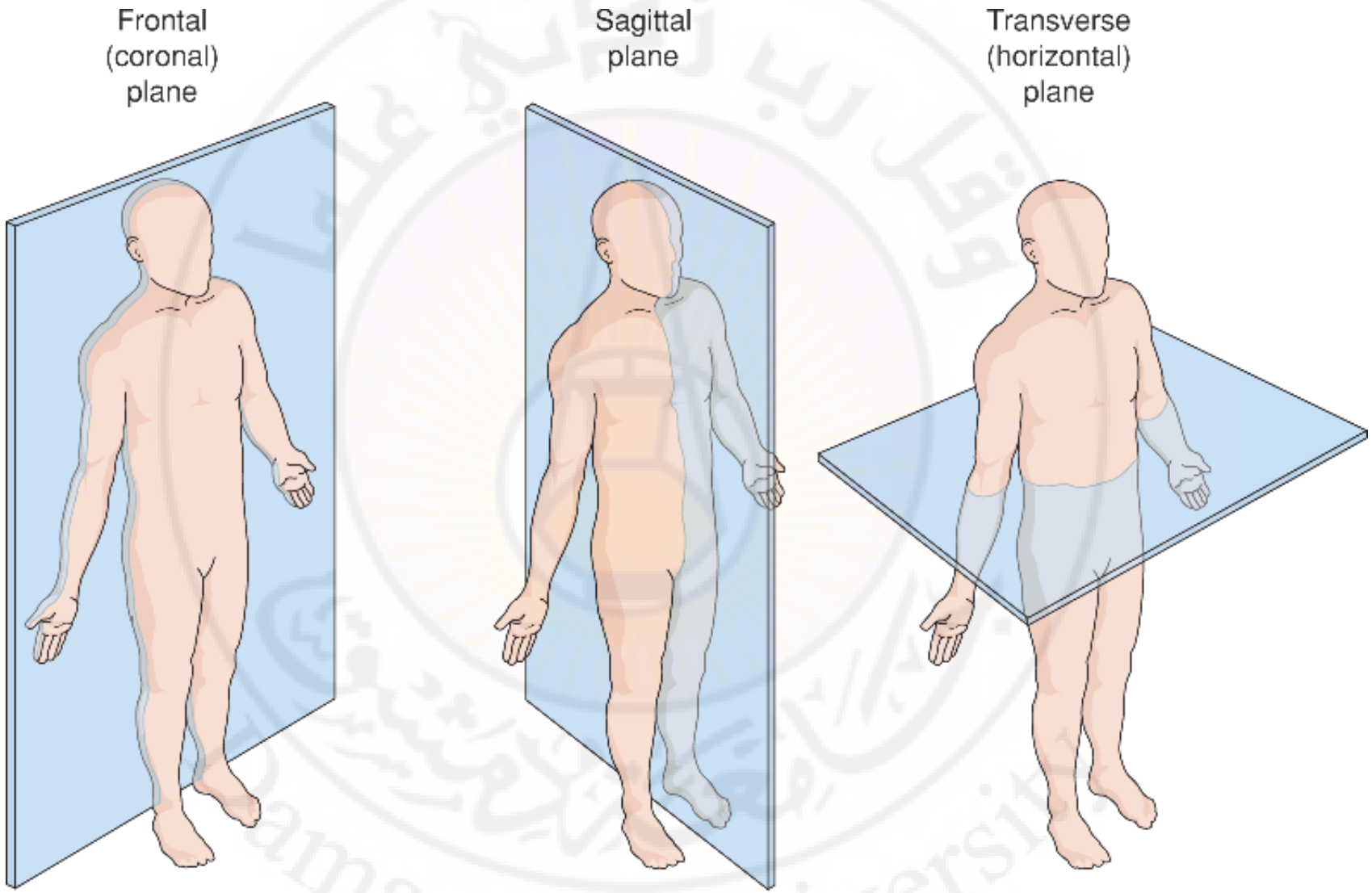


FIGURE 2-12 **Planes of division.**

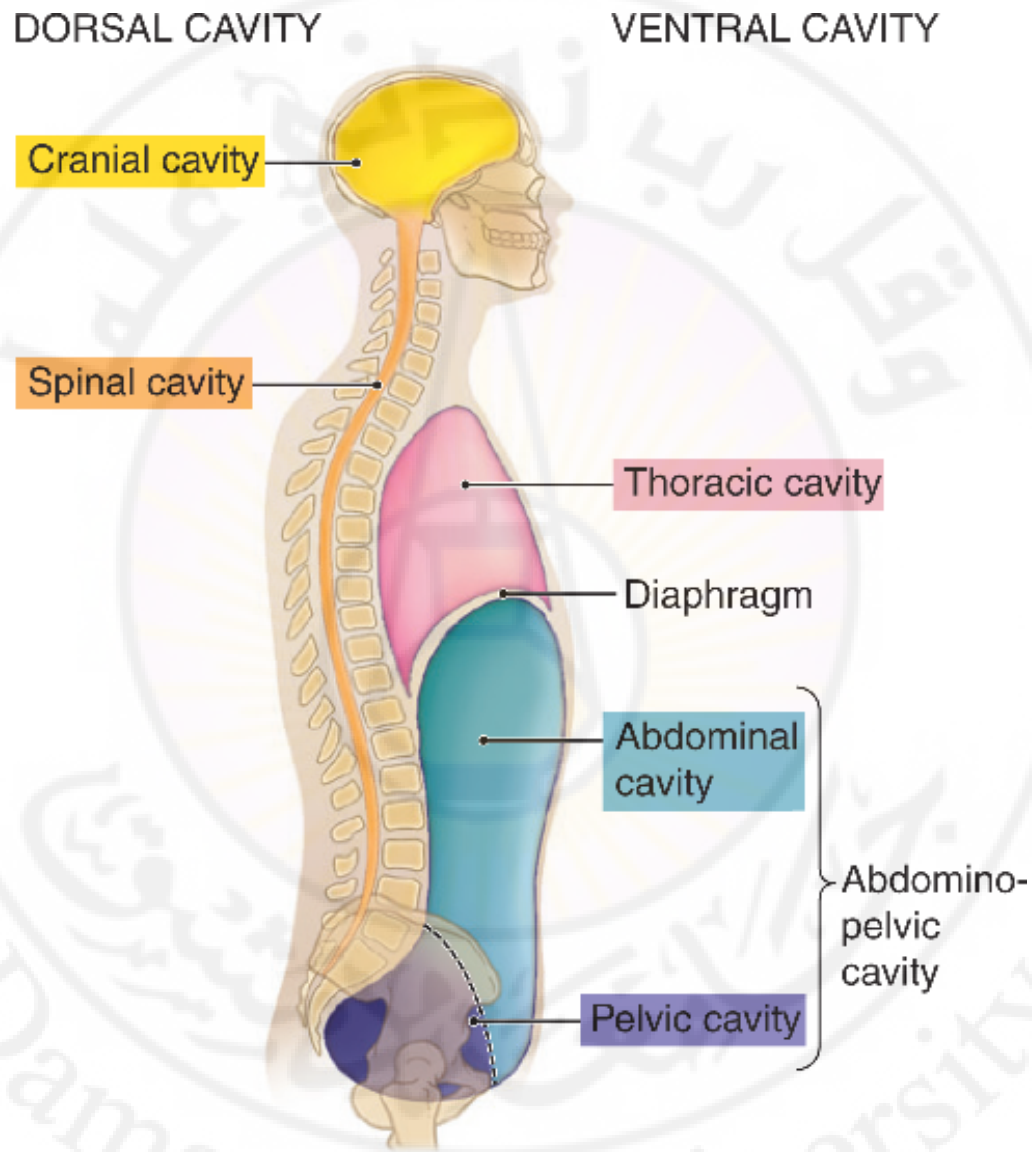


FIGURE 2-13 Body cavities, lateral view. Shown are the dorsal and ventral cavities with their subdivisions.

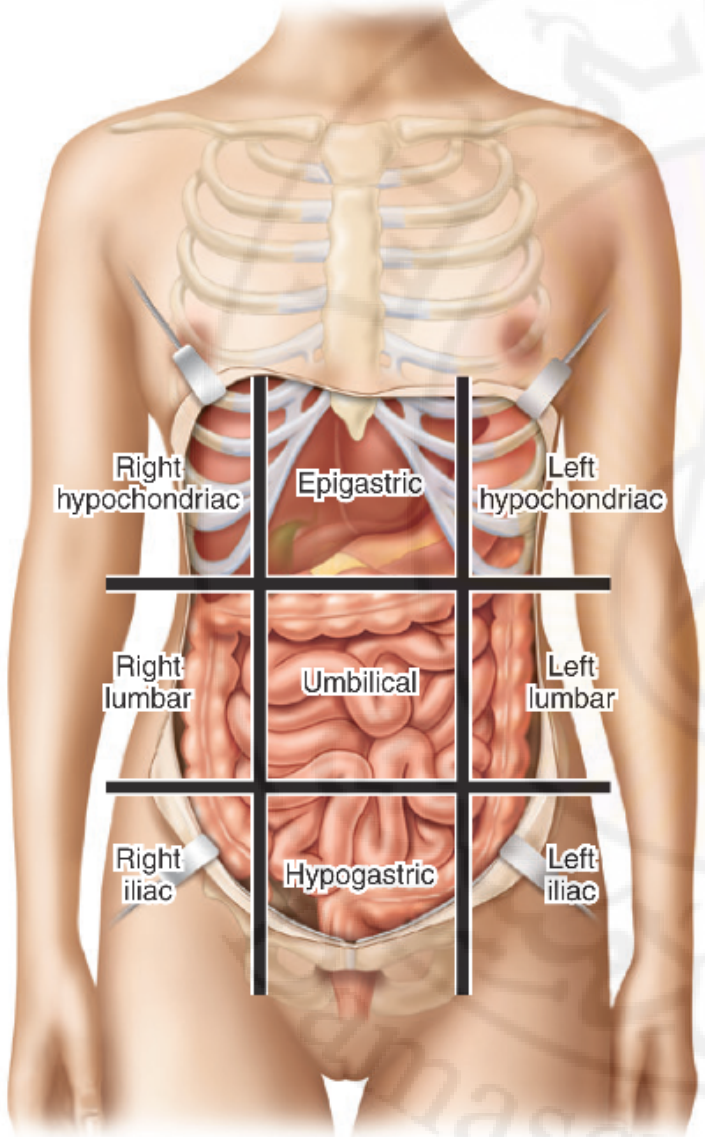


FIGURE 2-14 The nine regions of the abdomen.

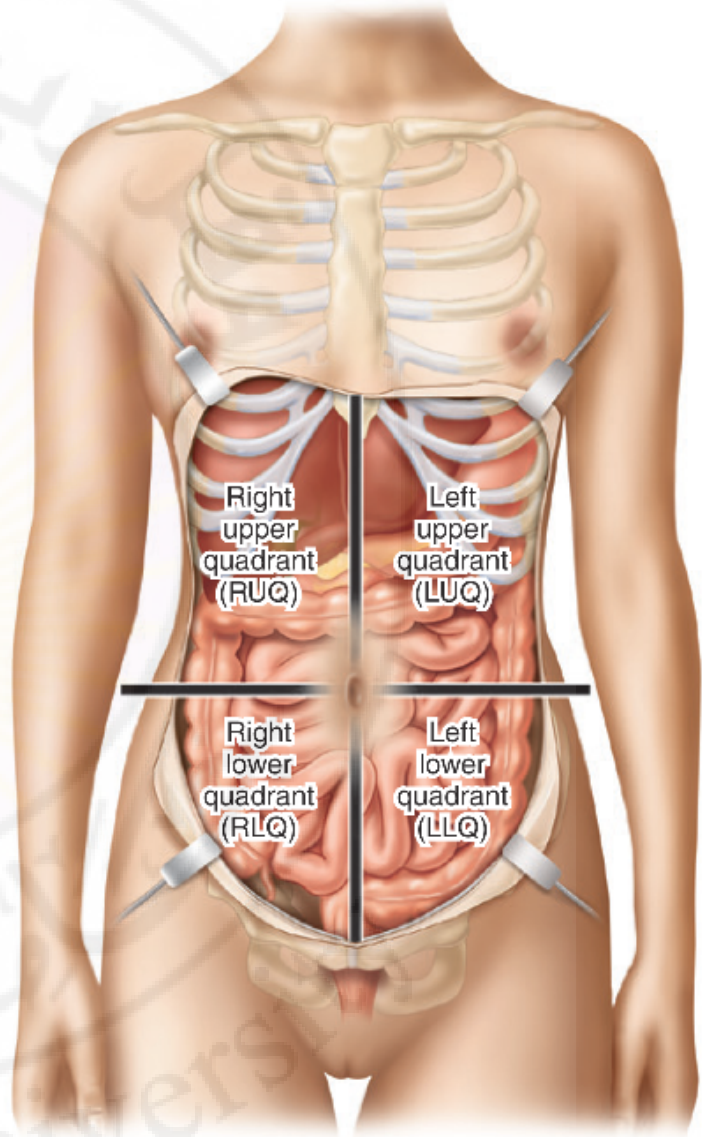


FIGURE 2-15 Quadrants of the abdomen. Some organs within the quadrants are indicated.

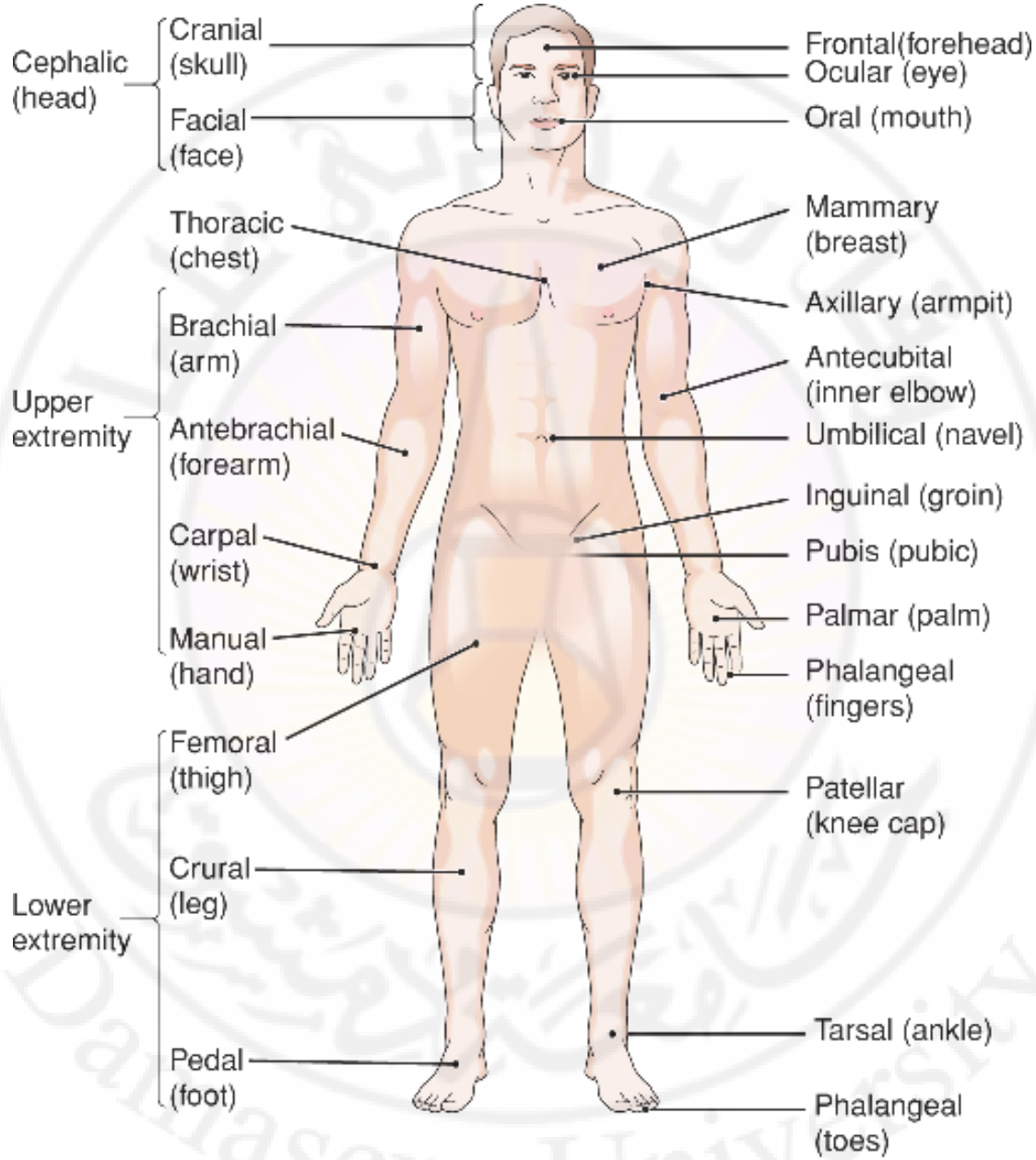


FIGURE 2-16 Common terms for body regions, anterior view. Anatomic adjectives for regions are in parentheses.

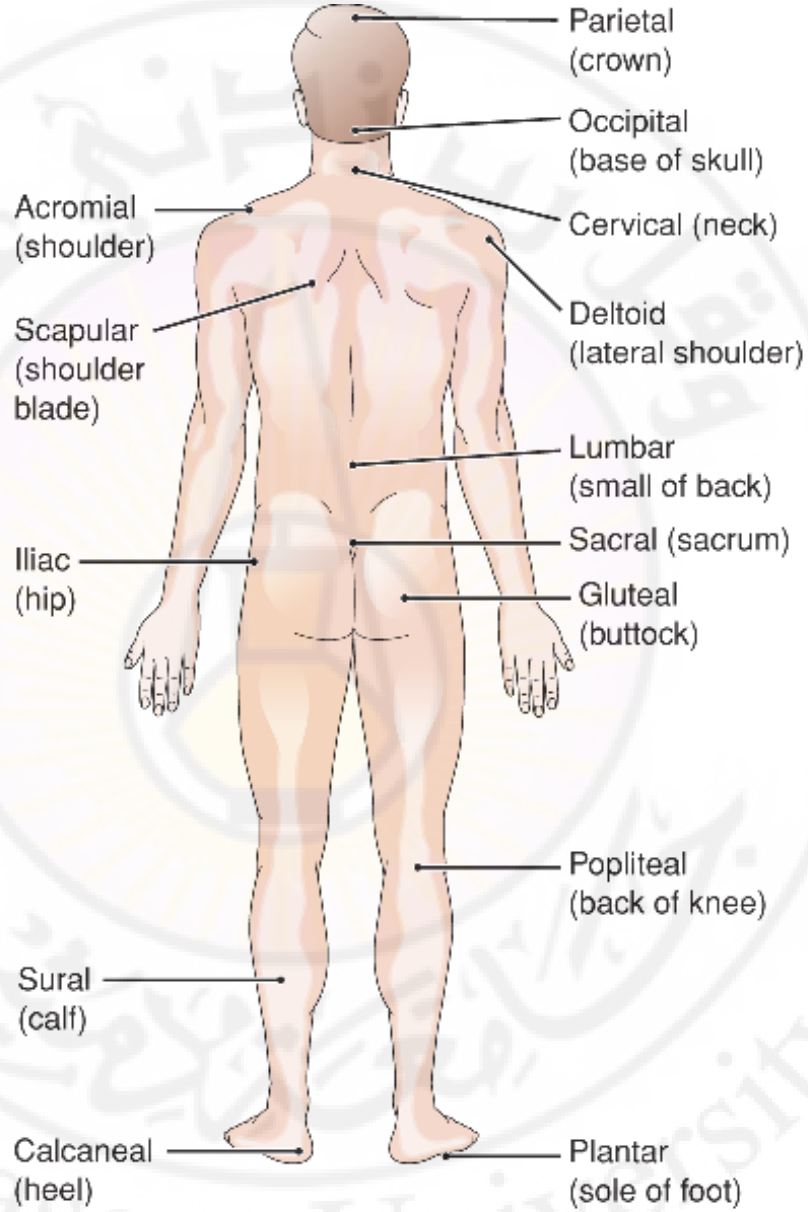


FIGURE 2-17 Common terms for body regions, posterior view. Anatomic adjectives for regions are in parentheses.

Table 2-6 Prefixes for Position and Direction

Prefix	Meaning	Example	Definition of Example
circum-	around	circumoral *ser-kum-OR-al*	around the mouth
peri-	around	periorbital *per-e-OR-bit-al*	around the orbit (eye socket)
intra-	in, within	intravascular *in-trah-VAS-ku-lar*	within a vessel (vascul/o)
epi-	on, over	epithelial *ep-ih-THE-le-al*	referring to epithelium, tissue that covers surfaces
extra-	outside	extrathoracic *eks-trah-tho-RAS-ik*	outside the thorax
infra-[a]	below	infrascapular *in-frah-SKAP-u-lar*	below the scapula (shoulder blade)
sub-[a]	below, under	sublingual *sub-LING-gual*	under the tongue (lingu/o)
inter-	between	intercostal *in-ter-KOS-tal*	between the ribs (cost/o)
juxta-	near, beside	juxtaposition *juks-tah-po-ZIH-shun*	a location near or beside another structure
para-	near, beside	parasagittal *par-ah-SAJ-ih-tal*	near or beside a sagittal plane
retro-	behind, backward	retrouterine *reh-tro-U-ter-in*	behind the uterus
supra-	above	suprapatellar *su-prah-pah-TEL-ar*	above the patella (kneecap)

[a]Also indicates degree.

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Faculty of health sciences

”Medical Terminology“

5th Lecture

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Skin

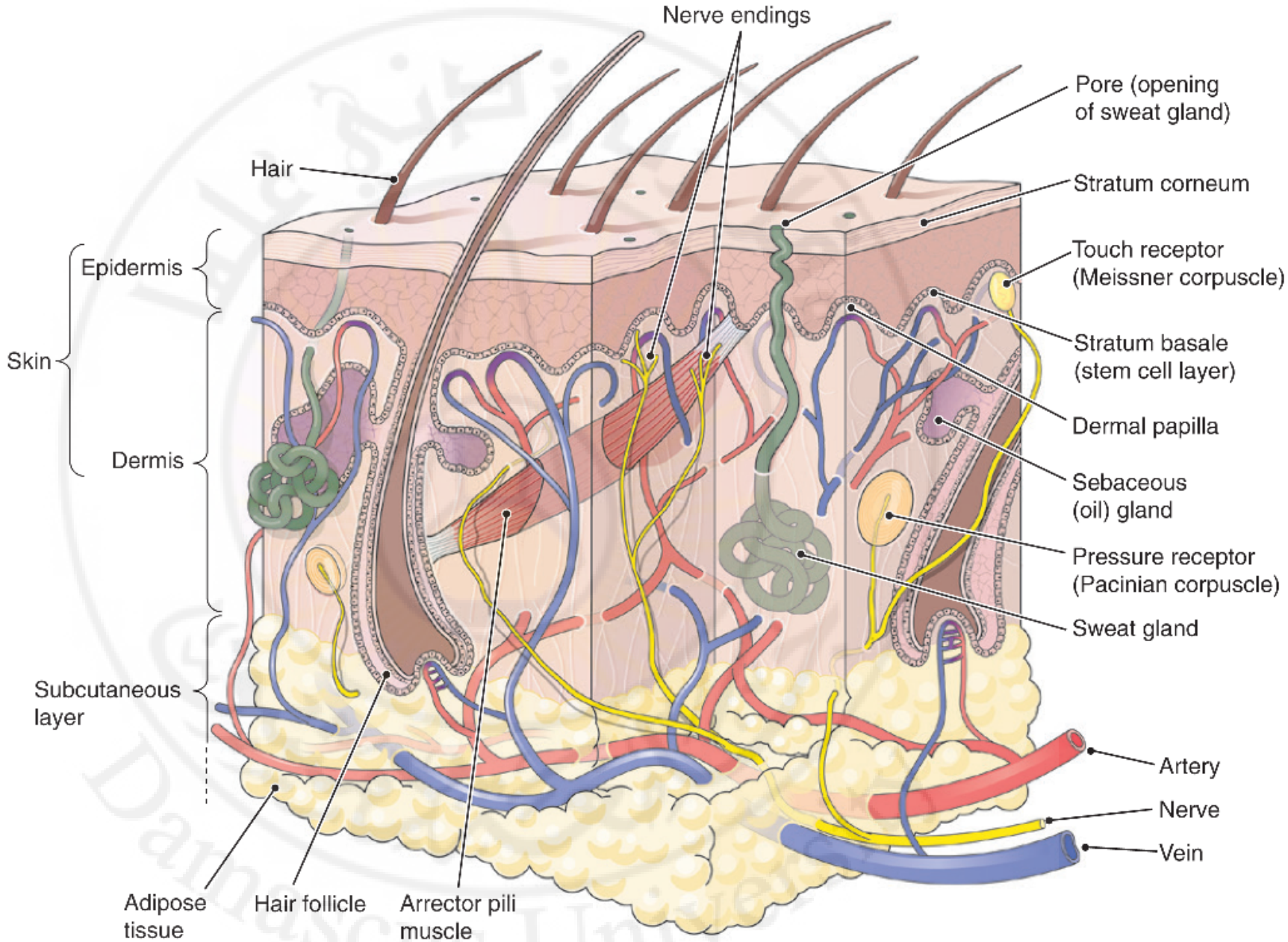


FIGURE 4-1 Cross-section of the skin. The skin layers and associated structures are shown.

Skin

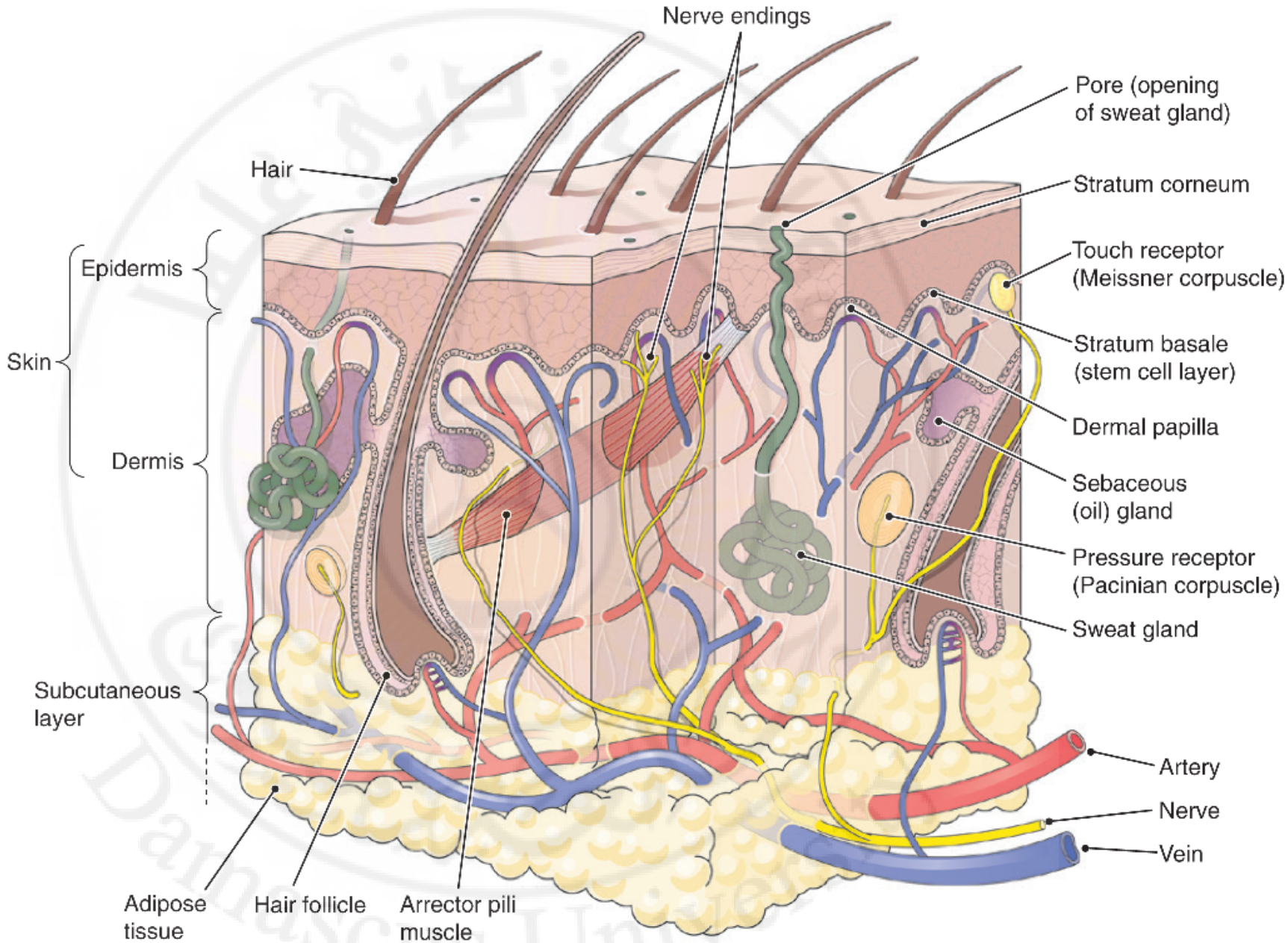


FIGURE 4-1 Cross-section of the skin. The skin layers and associated structures are shown.

Skin

Table 4-1 Roots Pertaining to the Skin and Associated Structures

Root	Meaning	Example	Definition of Example
derm/o, dermat/o	skin	dermabrasion *derm-ah-BRA-zhun*	surgical procedure used to resurface the skin and remove imperfections
kerat/o	keratin, horny layer of the skin	keratinous *keh-RAT-ih-nus*	containing keratin; horny
melan/o	dark, black, melanin	melanosome *MEL-ah-no-some*	a small cellular body that produces melanin
hidr/o	sweat, perspiration	anhidrosis *an-hi-DRO-sis*	absence of sweating
seb/o	sebum, sebaceous gland	seborrhea *seb-or-E-ah*	excess flow of sebum (adjective: seborrheic)
trich/o	hair	trichomycosis *trik-o-mi-KO-sis*	fungal infection of the hair
onych/o	nail	onychia *o-NIK-e-ah*	inflammation of the nail and nail bed (Note: not an *-itis* ending)

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Skin

Wound: Wounds are caused by trauma, as in cases of accidents or .attacks, or by surgery and other therapeutic or diagnostic procedures

Skin

Wound: Wounds are caused by trauma, as in cases of accidents or .attacks, or by surgery and other therapeutic or diagnostic procedures

Skin



FIGURE 4-3 Keloid. Marked overgrowth of scar tissue following earlobe piercing.

Skin

Burns

Most burns are caused by hot objects, explosions, or scalding with hot liquids. They may also be caused by electricity, contact with harmful chemicals, or abrasion. Sunlight can also cause severe burns that may .result in serious illness

Skin

Pressure ulcers are necrotic skin lesions that appear where the body .rests on skin that covers bony projections

The pressure interrupts circulation, leading to thrombosis, ulceration, .and tissue death (necrosis)

Skin

.**Dermatitis** is a general term for inflammation of the skin

:Sx

,**erythema** (redness) and **edema** and sometimes **pruritus** (itching)

Skin

A chronic allergic form of this disorder that appears early in childhood is called **atopic dermatitis** or **eczema**



.Atopic dermatitis (eczema) on an infant's wrist

Skin

Psoriasis is a chronic overgrowth (hyperplasia) of the epidermis,producing large, erythematous (red) .plaques with silvery scales



Skin

Dermatologists treat psoriasis in the following ways depending on :severity

- Topical agents, including corticosteroids, immunosuppressants, vitamins A and D .
- Phototherapy—exposure to ultraviolet B (UVB) light; administration of the drug psoralen (P) to increase skin sensitivity to light followed by exposure to ultraviolet A (UVA) light; laser treatment .
- Systemic suppression of the immune system .

Skin

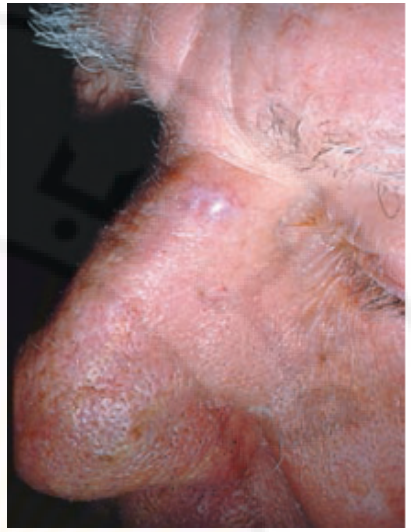
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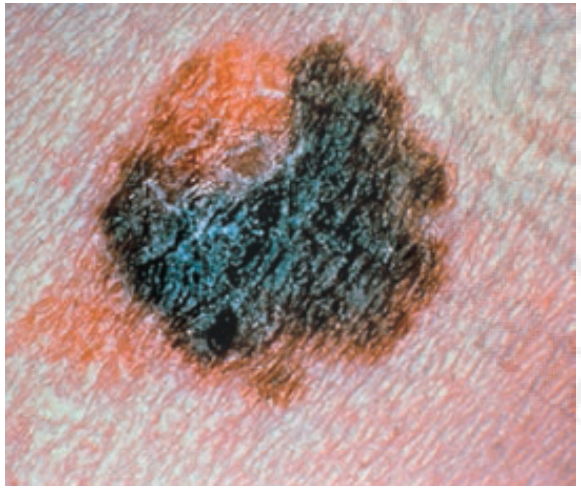
- Topical agents, including corticosteroids, immunosuppressants, vitamins A and D .
- Phototherapy—exposure to ultraviolet B (UVB) light; administration of the drug psoralen (P) to increase skin sensitivity to light followed by exposure to ultraviolet A (UVA) light; laser treatment .
- Systemic suppression of the immune system .

SKIN CANCER

Skin cancer:

- BCC : Basal cell carcinoma
- SCC : Scamous cell carcinoma
- Melanoma









Skin

:RULE OF ABCDE

A : Asymmetry

B : irregular Borders

C : variation in Color

D : Diameter greater than 6 mm

E : Evolution

Skin

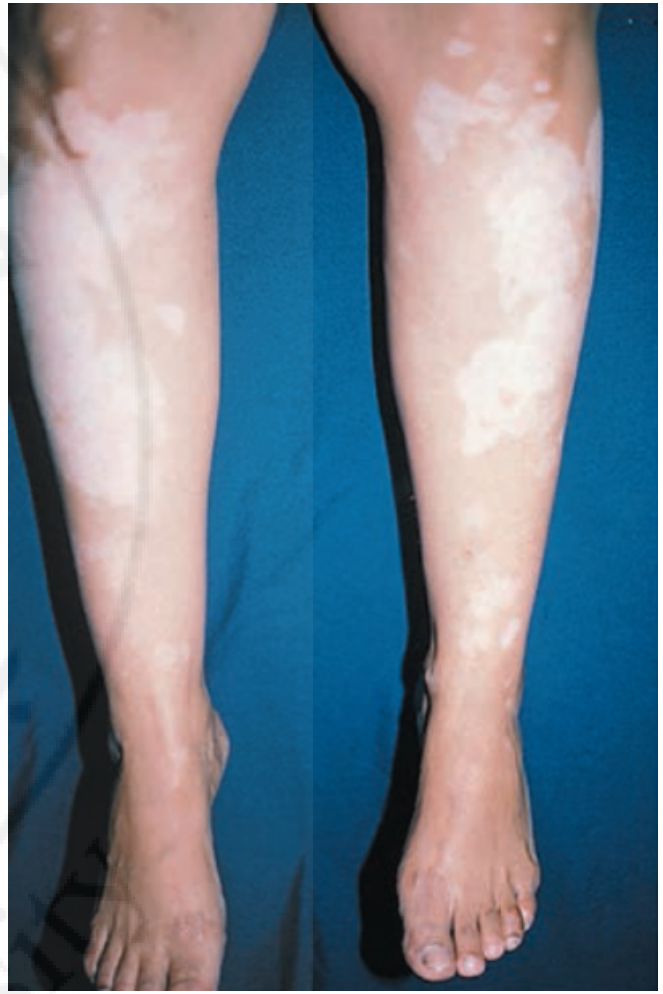
Acne

An inflammatory disease of the sebaceous glands and hair follicles .usually associated with excess sebum secretion

Comedo : blackhead (Plural : comedones)

Skin

Vitiligo Depigmented macules appear on the skin and may merge into large areas that lack melanin. The brown pigment seen in the illustration is the person's normal skin .color; the pale areas are caused by vitiligo



Acquired disease

Skin

albinism

.A hereditary lack of pigment in the skin, hair, and eyes

Congenital disease

Skin

alopecia

.Absence or loss of hair; baldness

Skin

scabies

.A highly contagious skin disease caused by a mite

Skin

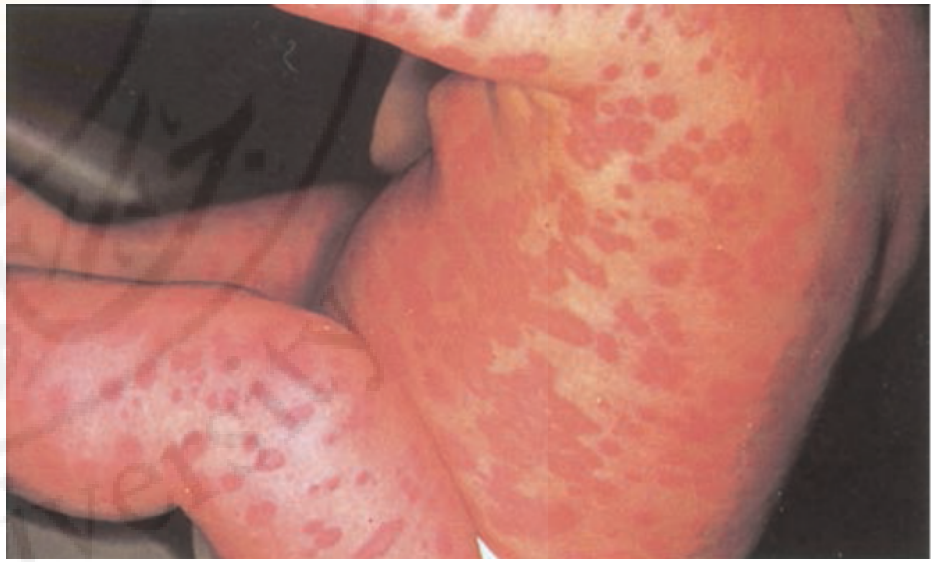
hirsutism

Excessive growth of hair

Skin

urticaria

A skin reaction marked by temporary, smooth, raised areas (wheals) .associated with itching; hives



Special Senses: Ear and Eye

Introduction

The sensory system is our network for detecting stimuli from the internal and external environments. It is needed to maintain homeostasis, provide us with pleasure, and protect us from harm. Pain, for example, is an important warning sign of tissue damage. The signals generated in the various **sensory receptors** must be transmitted to the central nervous system for interpretation.

The general senses

*The receptors for the general senses are found throughout the body.

*And they include:

- Pain
- Touch
- Pressure
- Temperature
- Proprioception : the awareness of body position.

The special senses

The special senses are localized within complex sense organs in the head.

Include:

Gustation (taste) is located in receptors in taste buds on the tongue. These receptors basically detect only sweet, sour, bitter, salty, and umami (*oo-MOM-e*), a savory flavor triggered by certain amino acids and found in proteins and the flavor enhancer MSG.

The special senses

Olfaction (smell) is located in receptors in the nose. Many more chemicals can be discriminated by smell than by taste. Both senses are .important in stimulating appetite and warning of harmful substances

The special senses

- **Hearing** receptors are located in the ear. These receptors respond to movement created by sound waves as they travel through the ear.

The special senses

- **Equilibrium** receptors are also located in the ear. These receptors are activated by changes in the position of cells in the inner ear as we move.

The special senses

- **Vision** receptors are lightsensitive and located deep within the eye, ■ protected by surrounding bone and other support structures. The coordinated actions of external and internal eye muscles help in the formation of a clear image.

Table 8-1 Suffixes Pertaining to the Senses

Suffix	Meaning	Example	Definition of Example
-esthesia	sensation	cryesthesia *kri-es-THE-ze-ah*	sensitivity to cold
-algesia	pain	hypalgesia[a] *hi-pal-JE-ze-ah*	decreased sensitivity to pain
-osmia	sense of smell	pseudosmia *su-DOS-me-ah*	false sense of smell
-geusia	sense of taste	parageusia *par-ah-GU-ze-ah*	abnormal (para-) sense of taste

[a]Prefix hyp/o.

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The Ear

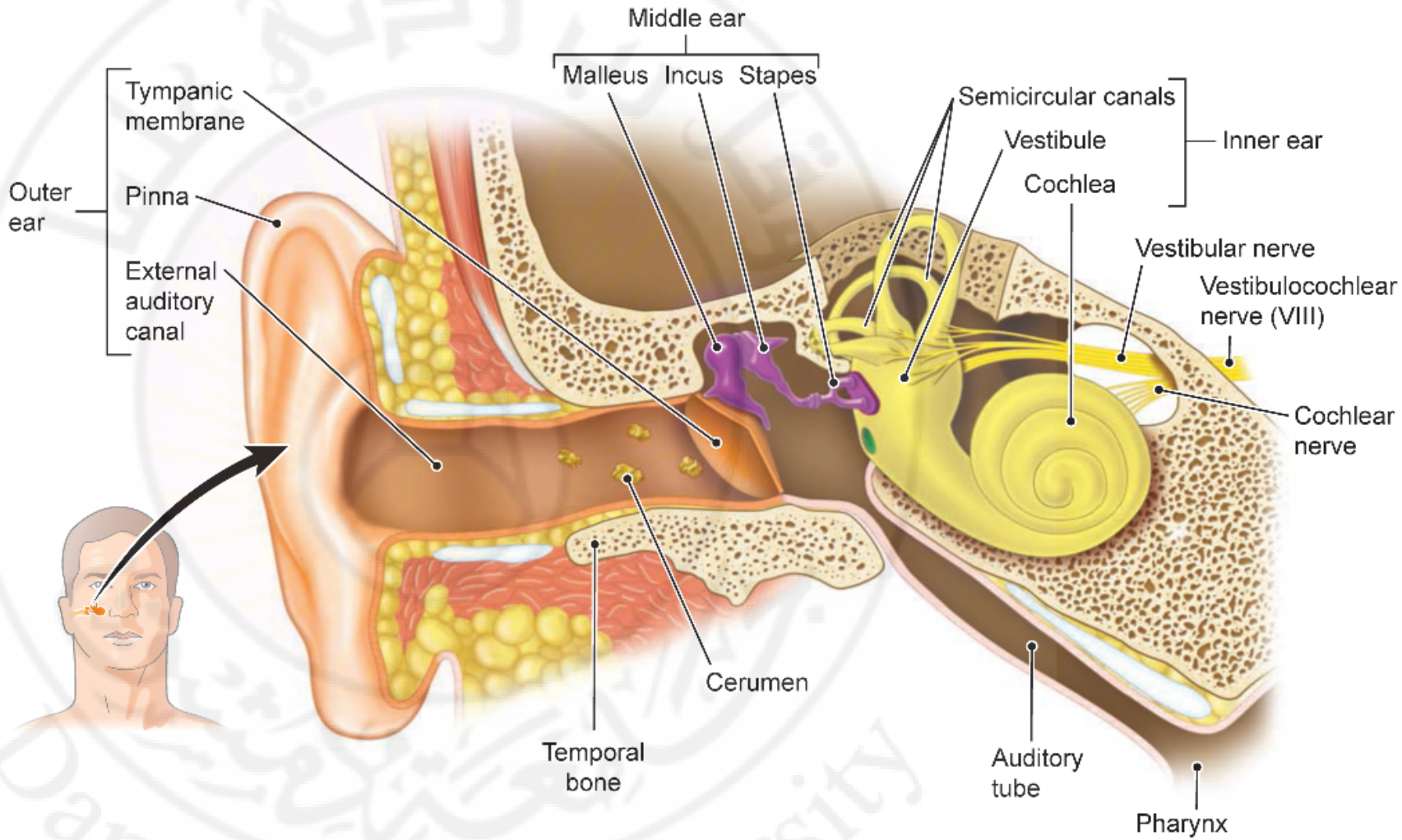


FIGURE 8-2 The ear. Structures in the outer, middle, and inner divisions are shown.

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Clinical Aspects of Hearing

- **HEARING LOSS**
- **OTITIS : otitis externa , otitis media**
- **ACOUSTIC NEUROMA**
- **Audiologists**
- **tinnitus**
- **vertigo**

The Eye and Vision

The eye is protected by its position within a bony socket or **orbit.** It is also protected ;by the eyelids, or **palpebrae**; eyebrows and eyelashes.The **lacrimal** (tear) **glands** constantly batheand cleanse the eyes with a lubricating fluid that drains into the nose. The protective **conjunctiva** is a thin membrane that lines the eyelids and covers the .anterior portion of the eye

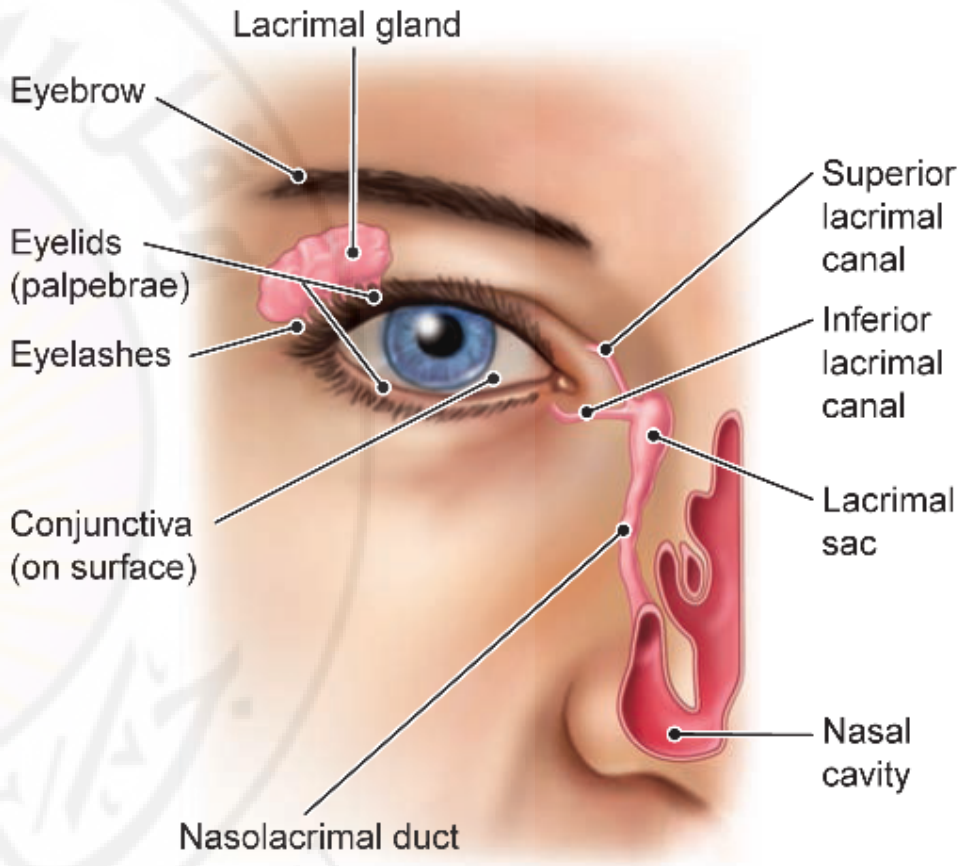


FIGURE 8-6 The eye's protective structures. The lacrimal gland produces tears that flow across the eye and drain into the lacrimal canals.

The Eye and Vision

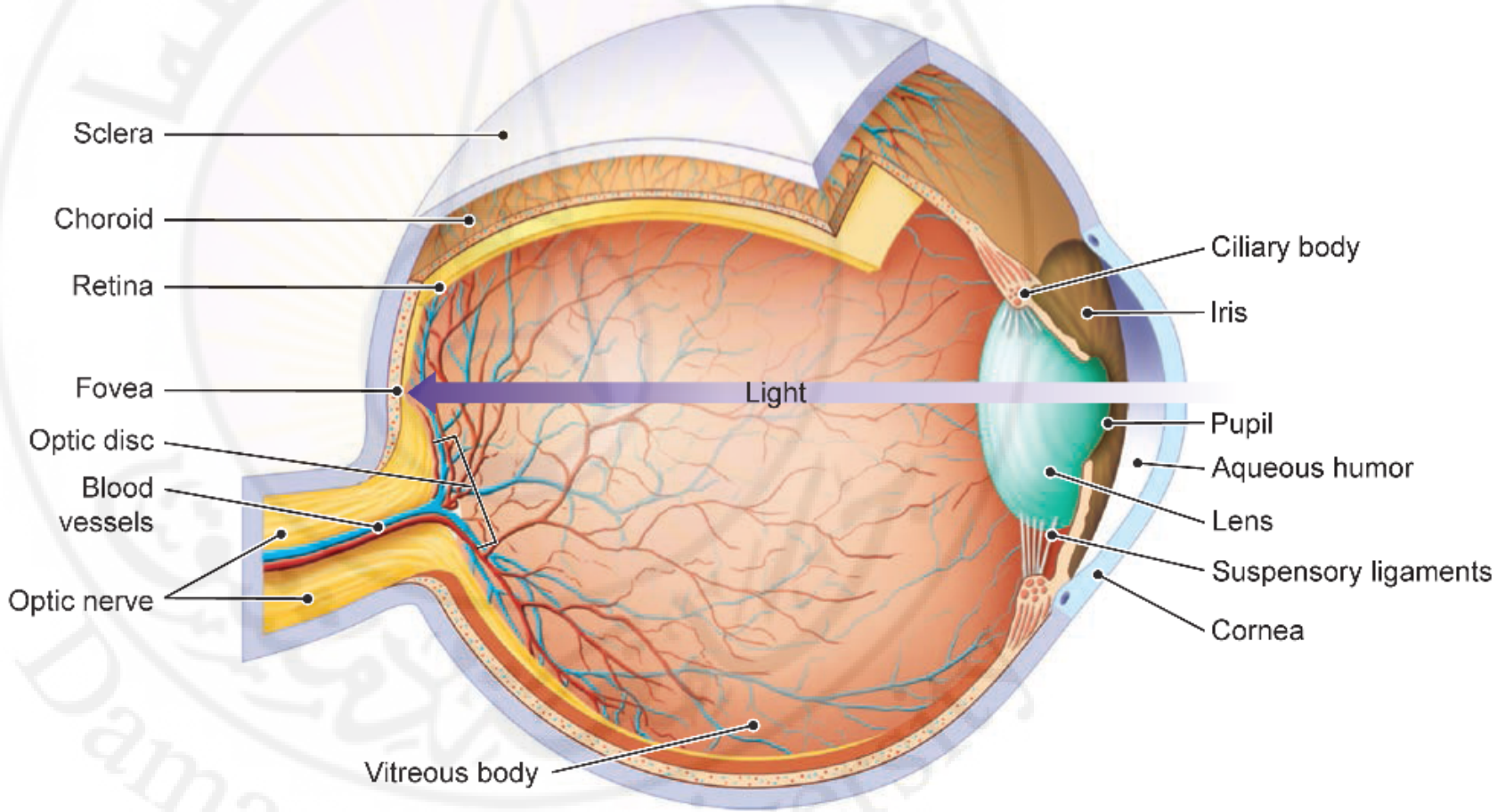


FIGURE 8-7 The eye. The three layers of the eyeball are shown along with other structures involved in vision.

The Eye and Vision

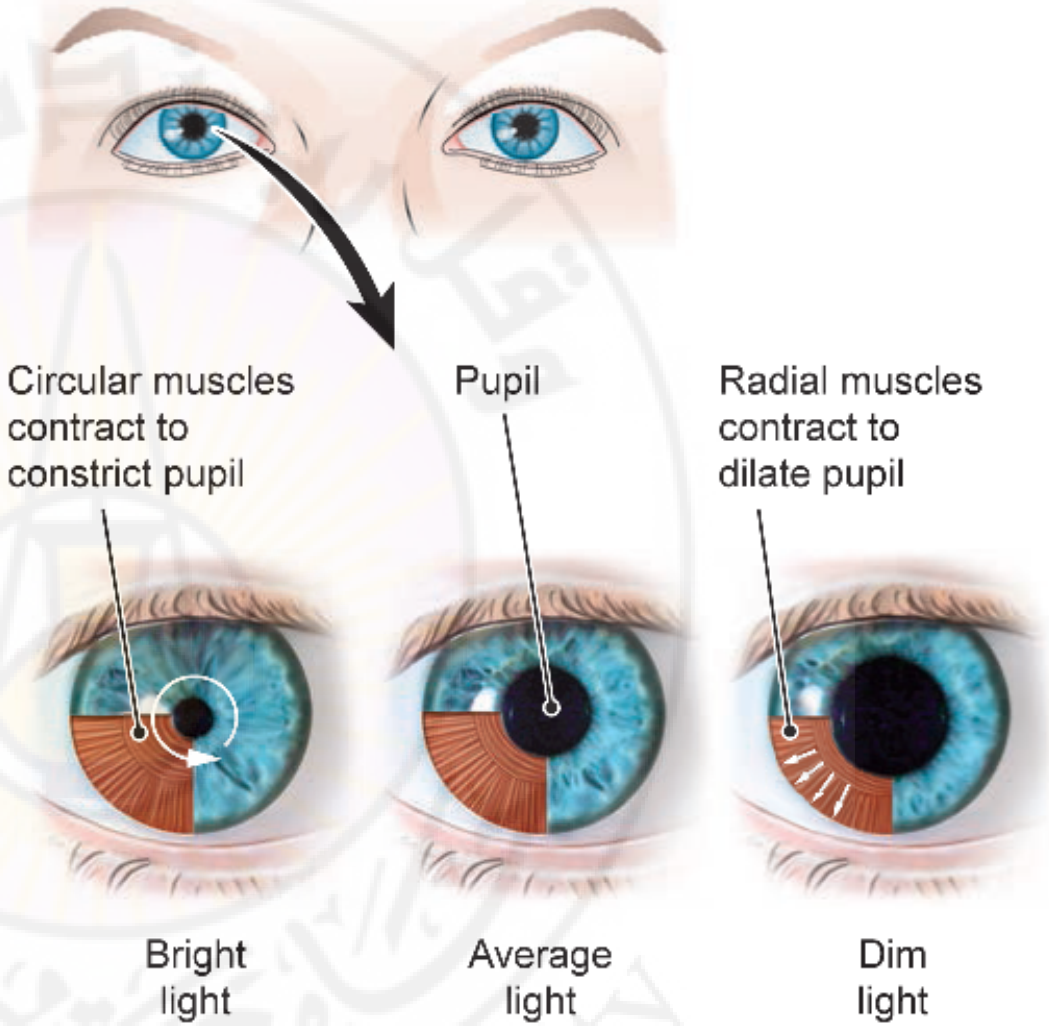


FIGURE 8-9 Function of the iris. In bright light, muscles in the iris constrict the pupil, limiting the light that enters the eye. In dim light, the iris dilates the pupil to allow more light to enter the eye.

The Eye and Vision

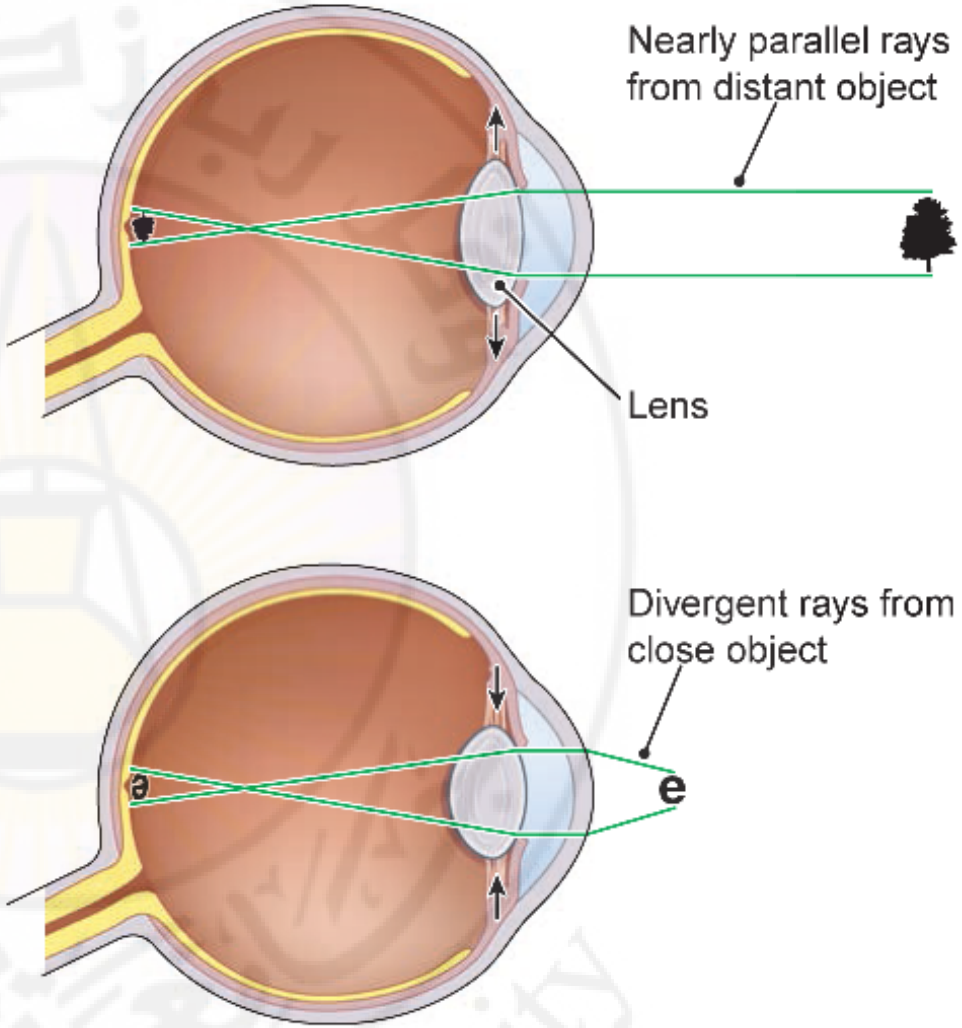


FIGURE 8-8 Accommodation for near vision. When viewing a close object, the lens must become more rounded to focus light rays on the retina.

The Eye and Vision

ERRORS OF REFRACTION

If the eyeball is too long, images will form in front of the retina. To focus clearly, one must bring an object closer to the eye. This condition of *nearsightedness* is technically called **myopia** .The opposite condition is **hyperopia**, or *farsightedness*, in which the eyeball is too short and images form behind the retina.

The Eye and Vision

INFECTION

Several microorganisms can cause **conjunctivitis** (inflammation of the conjunctiva). This is a highly infectious disease commonly called “pink eye.”

The Eye and Vision

A **cataract** is an opacity (cloudiness) of the lens that blurs vision

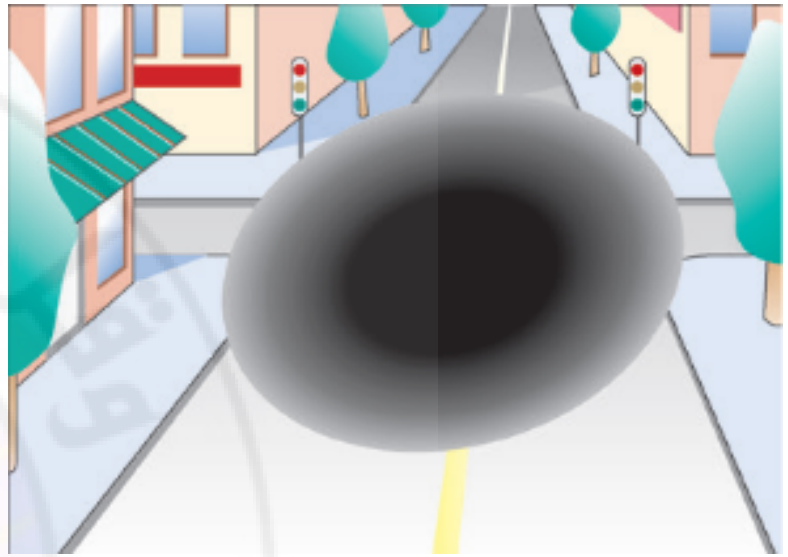
The Eye and Vision

Glaucoma is an abnormal increase in pressure within the eyeball.

The Eye and Vision

Glaucoma is an abnormal increase in pressure within the eyeball.

The Eye and Vision



In cases of **retinal detachment**, the retina

separates from the underlying choroid layer

of the eye as a result of trauma or an accumulation of fluid or tissue between the layers .This disorder may develop slowly or may occur suddenly. If it is left untreated, complete detachment can occur, resulting in blindness. Treatment includes use of an electric current or weak laser beam to create pinpoint scars that reattach the retina.

The Eye and Vision

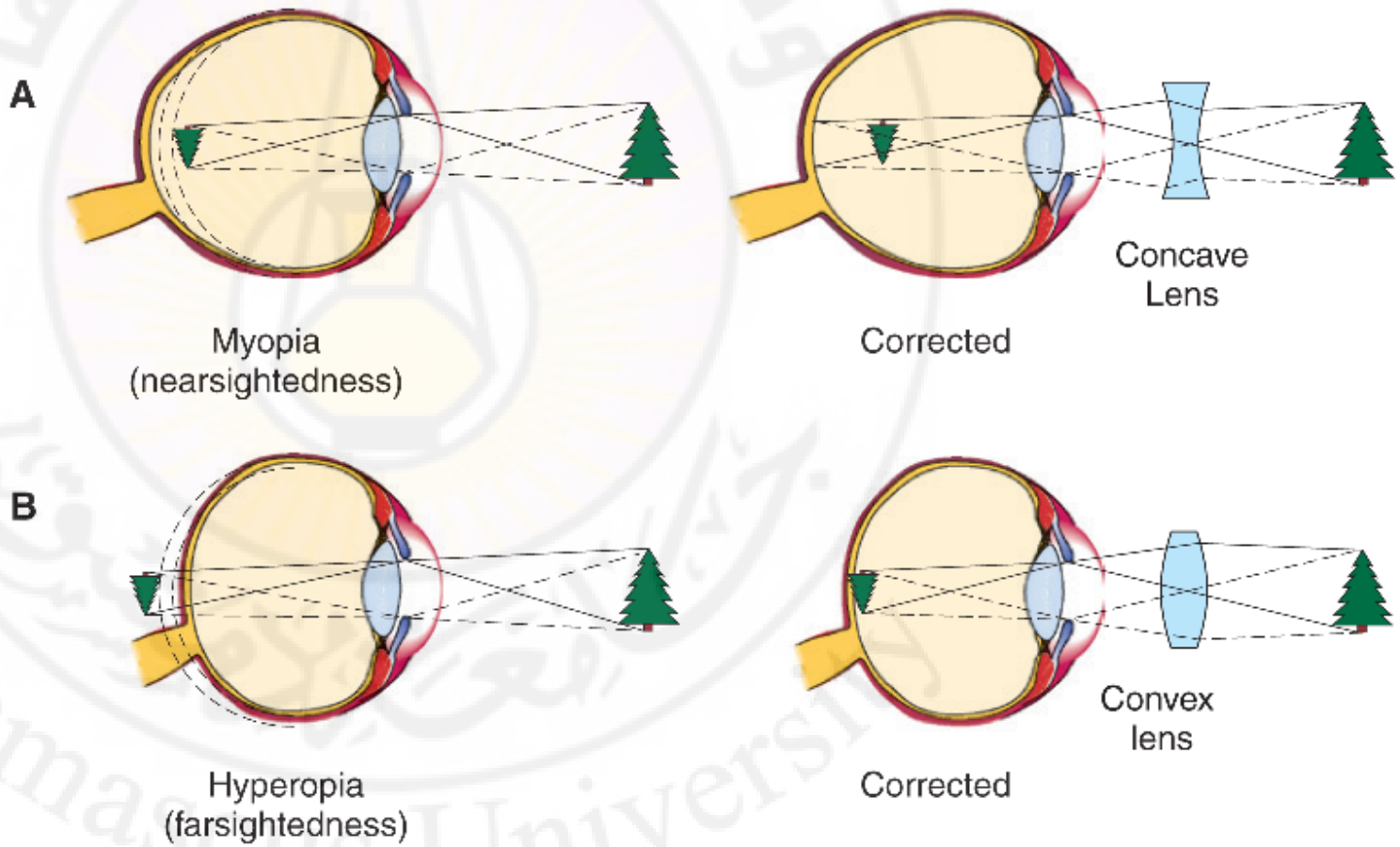


FIGURE 8-11 Errors of refraction. A. Myopia (nearsightedness). **B.** Hyperopia (farsightedness). A concave (inwardly curved) lens corrects for myopia; a convex (outwardly curved) lens corrects for hyperopia.

The Eye and Vision



FIGURE 8-13 **A–D.** Visual disorders.

The Eye and Vision

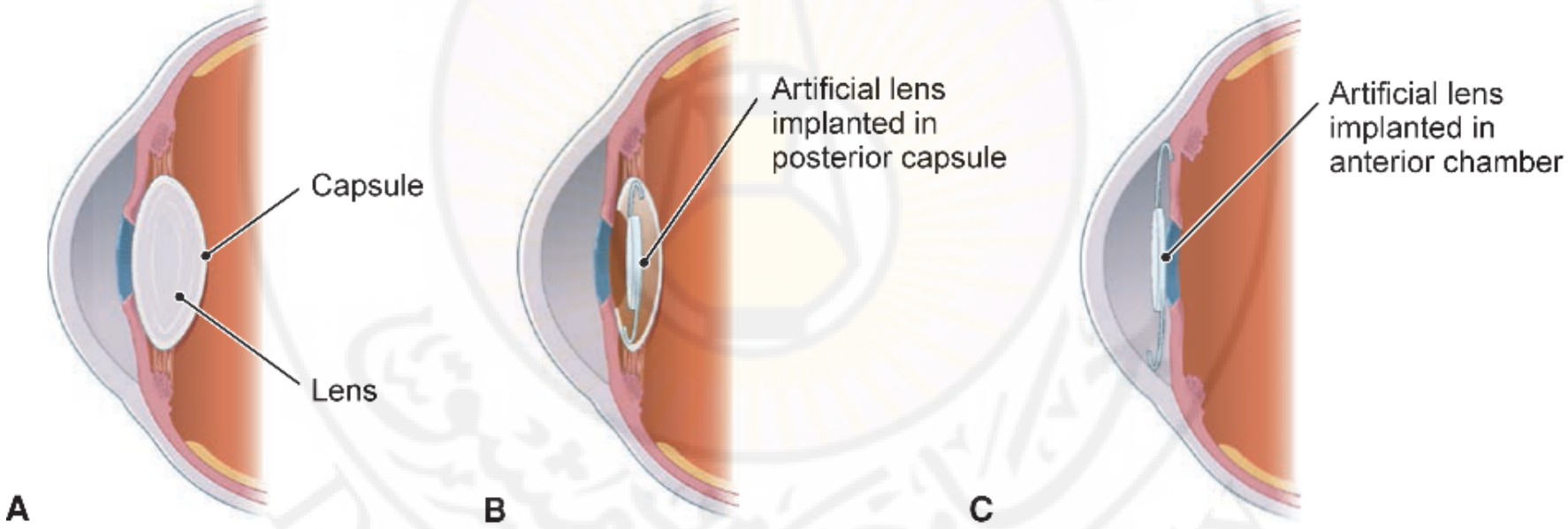


FIGURE 8-14 Cataract extraction surgeries. A. Cross-section of normal eye anatomy. **B.** Extracapsular lens extraction involves removing the lens but leaving the posterior capsule intact to receive a synthetic intraocular lens. **C.** Intracapsular lens extraction involves removing the lens and lens capsule and implanting a synthetic intraocular lens in the anterior chamber.

Faculty of health sciences
"Medical Terminology"
6th Lecture

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Respiratory System

Upper Respiratory Passageways

Cilia—microscopic hair-like projections from the cells that line the nasal passageways— sweep dirt and foreign material toward the throat for elimination

Upper Respiratory Passageways

Material that is eliminated from the respiratory tract by coughing or clearing the throat is called **sputum**.

Upper Respiratory Passageways

Receptors for the sense of smell are located within bony side projections of the nasal cavity called **turbinate bones** or conchae.

Upper Respiratory Passageways

Paranasal sinuses:

In the bones of the skull and face near the nose are air-filled cavities lined with a mucous membrane that drain into the nasal cavity.

Upper Respiratory Passageways

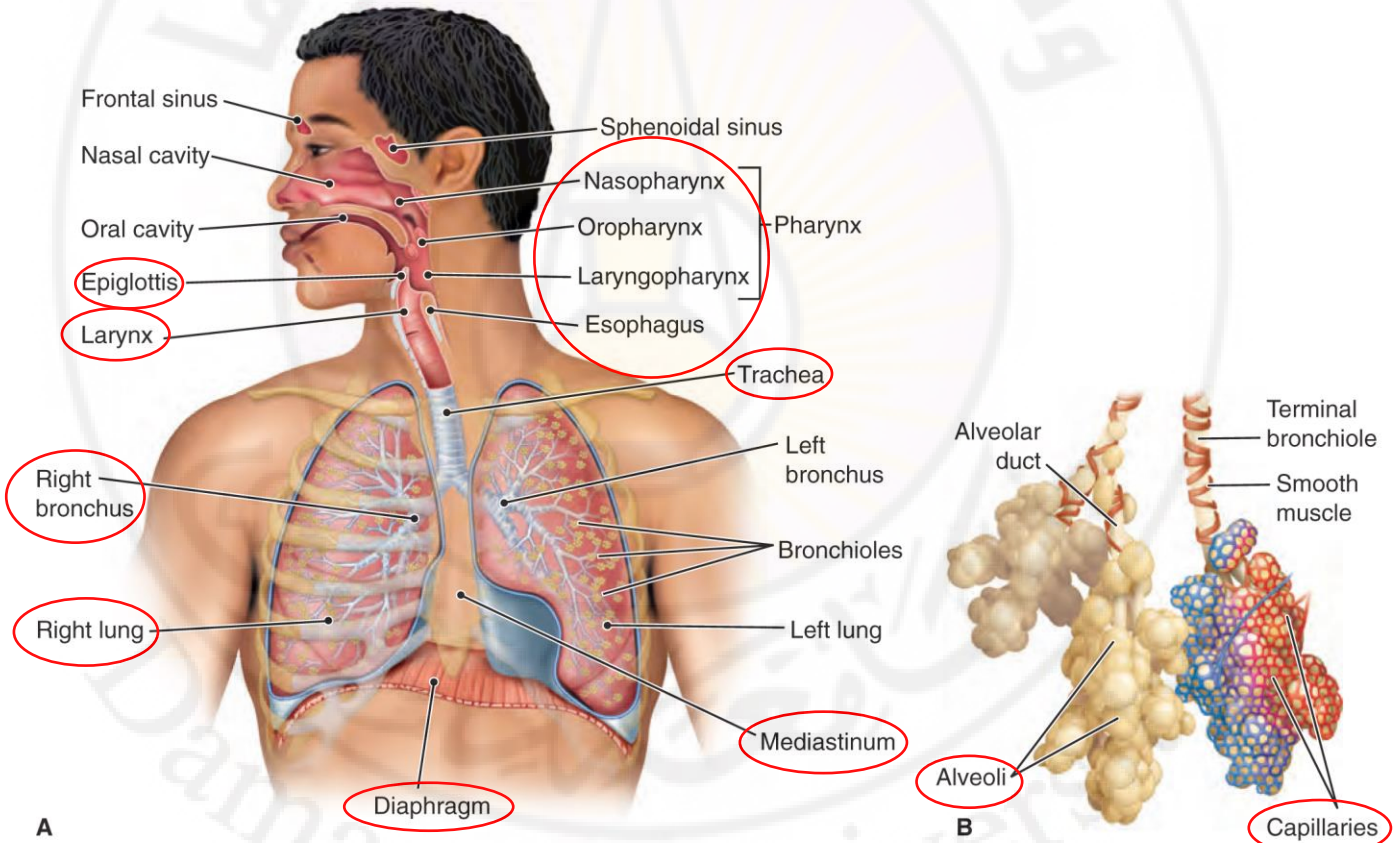


FIGURE 12-2 The respiratory system. A. Overview including some nearby structures. **B.** Enlarged section of lung tissue showing the relationship between the alveoli (air sacs) and the blood capillaries.

Upper Respiratory Passageways



CLINICAL PERSPECTIVES

BOX 12-1

Tonsillectomy: A Procedure Reconsidered

Tonsillitis, a bacterial infection of the tonsils, is a common childhood illness. In past years, surgical removal of the infected tonsils was a standard procedure, as tonsillectomy was thought to prevent severe infections like strep throat. Because tonsils were thought to have little function, surgeons often removed infected tonsils—even healthy tonsils, in order to prevent tonsillitis later. With the discovery that tonsils play an important immune function, the number of tonsillectomies performed in the United States dropped dramatically, reaching an all-time low in the 1980s.

Today, although many cases of tonsillitis are successfully treated with appropriate antibiotics, tonsillectomy is becoming more frequent; in fact, it is the second most common surgical procedure among American children. Surgery is considered if an infection recurs or if enlarged tonsils make swallowing or breathing difficult. Many tonsillectomies are performed in children to treat obstructive sleep apnea, a condition in which the child stops breathing for a few seconds at a time during sleep. Recent studies suggest that tonsillectomy may also be beneficial for children suffering from otitis media (middle ear infection), because bacteria infecting the tonsils may travel to this region of the ear.

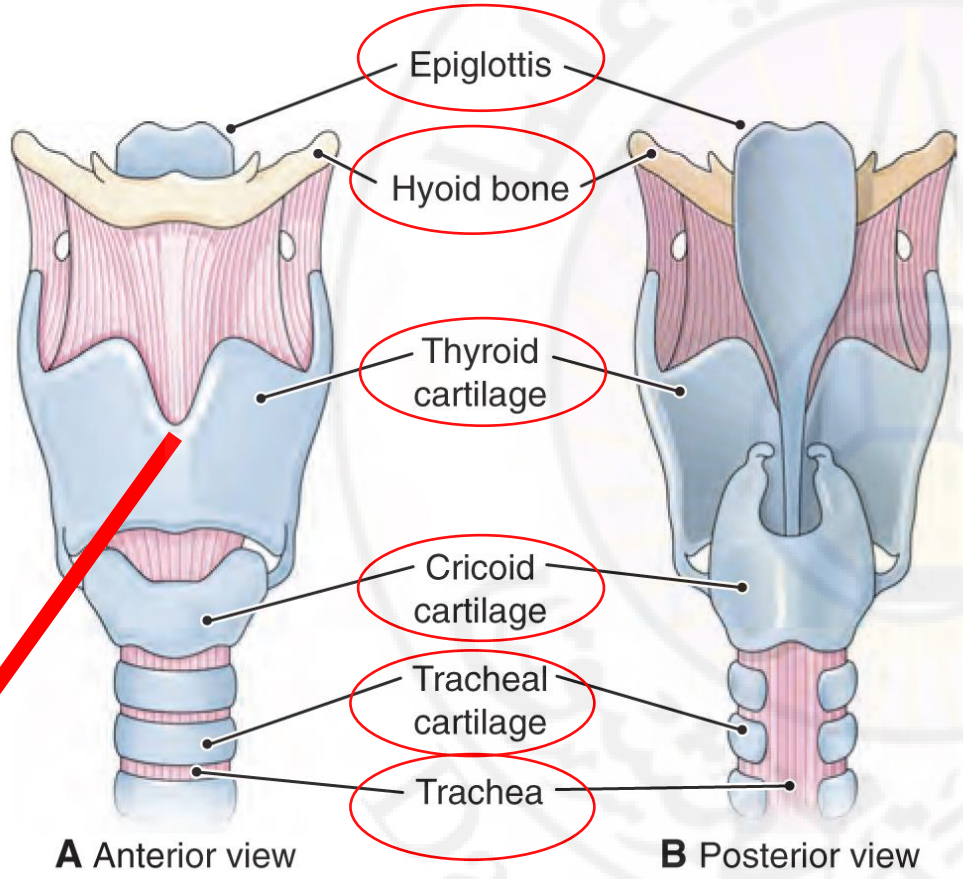
Most tonsillectomies are performed by electrocautery, a technique that uses an electrical current to burn the tonsils away from the throat. Now that this operation is becoming more common, surgeons are developing new techniques. For example, coblation tonsillectomy uses radio waves to break down tonsillar tissue. Studies suggest that this procedure results in a faster recovery, fewer complications, and decreased postoperative pain compared with electrocautery.

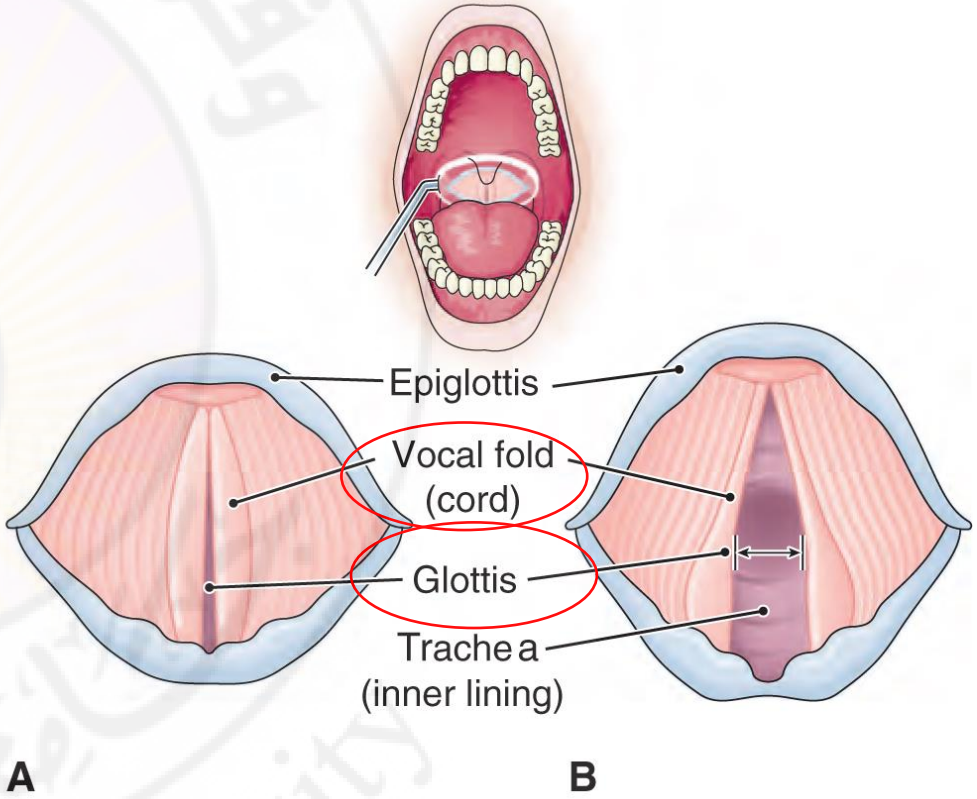
Lower Respiratory Passageways and Lungs

Air moves from the pharynx into the larynx, commonly called the voice box, because it contains the **vocal folds**, or cords. The larynx is at the top of the **trachea**, commonly called the windpipe, which conducts air into the bronchial system toward the lungs.

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Lower Respiratory Passageways and Lungs





the most prominent of which is the anterior thyroid cartilage that forms "Adam's apple"

The mediastinum

The trachea is contained in a region known as the **mediastinum**, which consists of the space between the lungs together with the organs contained in this space. In addition to the trachea, the mediastinum contains the heart, esophagus, large vessels, and other tissues.

The lungs

The cone-shaped lungs occupy the major portion of the thoracic cavity. The right lung is larger and divided into three lobes. The left lung, which is smaller to accommodate the heart, is divided into two lobes. The lobes are further subdivided to correspond to divisions of the bronchial network. A double membrane, the **pleura**, covers the lungs and lines the thoracic cavity. There are two pleural layers:

- The parietal pleura, the outer layer, is attached to the wall of the thoracic cavity.
- The visceral pleura, the inner layer, is attached to the surface of the lungs.

The very narrow, fluid-filled space between the two layers is the **pleural space.** The moist pleural membranes slide easily over each other within the chest cavity, allowing the lungs to expand during breathing.

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Breathing

Air is moved into and out of the lungs by the process of breathing, technically called **pulmonary ventilation.** This consists of a steady cycle of **inspiration** (inhalation) and **expiration** (exhalation), separated by a period of rest. Breathing is normally regulated unconsciously by centers in the brainstem. These centers adjust the rate and rhythm of breathing according to changes in the blood composition, especially the concentration of carbon dioxide.

Table 12-1 Suffixes for Respiration

Suffix	Meaning	Example	Definition of Example
-pnea	breathing	dyspnea *disp-NE-ah*	shortness of breath; painful or difficult breathing
-oxia[a]	level of oxygen	hypoxia *hi-POK-se-ah*	decreased amount of oxygen in the tissues
-capnia[a]	level of carbon dioxide	hypocapnia *hi-po-KAP-ne-ah*	decreased carbon dioxide in the tissues
-phonia	voice	aphonia *ah-FO-ne-ah*	loss of voice

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

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Pneumonia

Pneumonia is caused by many different microorganisms, usually bacteria or viruses.

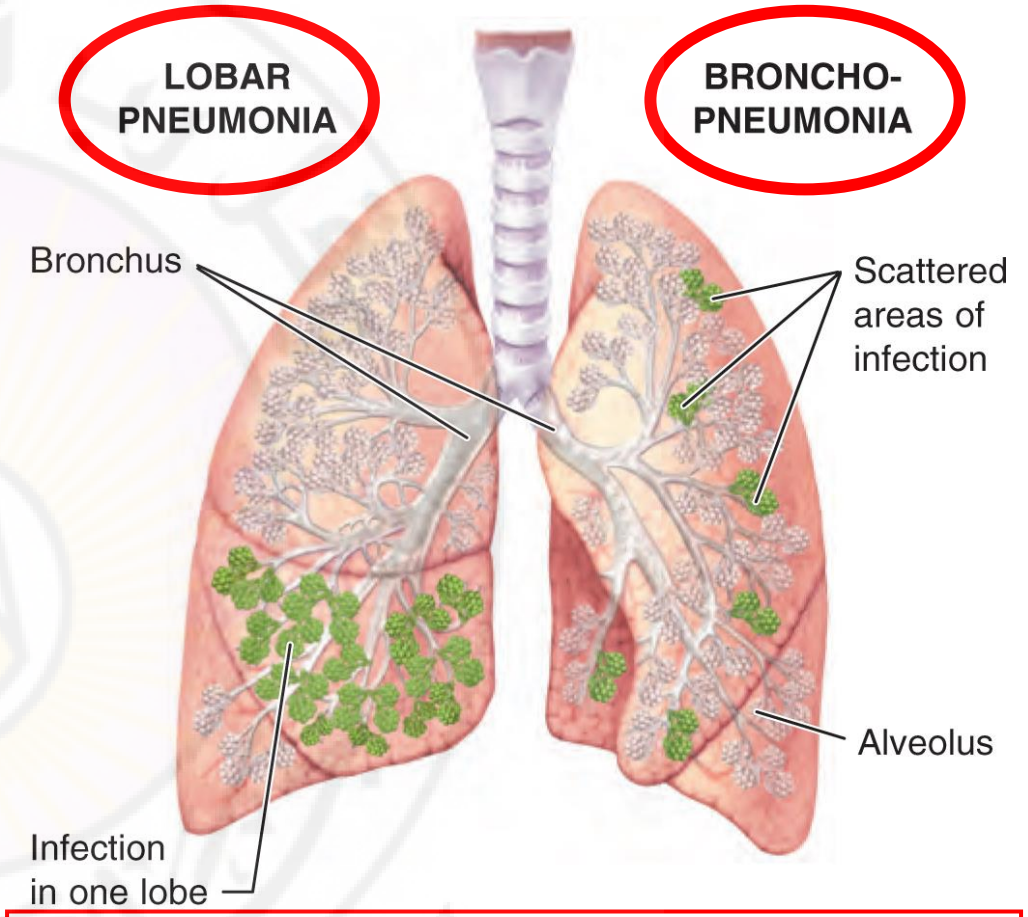
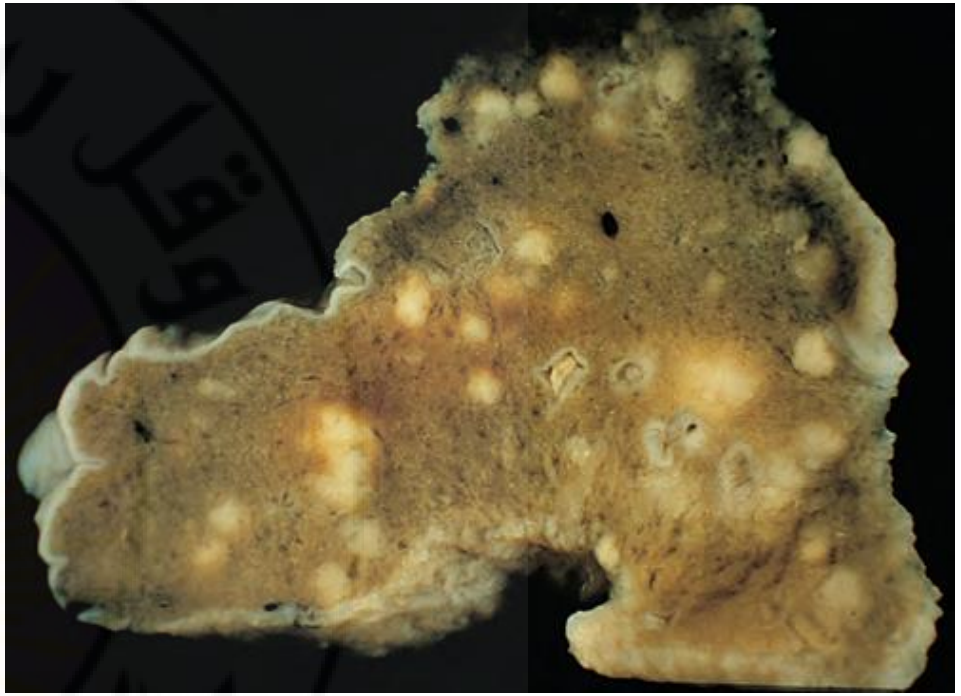


FIGURE 12-8 Pneumonia. In lobar pneumonia (right lung), an entire lobe is consolidated. In bronchopneumonia (left lung), patchy areas of consolidation occur throughout the lung.

Tuberculosis (TB)

The incidence of **tuberculosis** (**TB**) has increased in recent years, along with the increase of AIDS and the appearance of antibiotic resistance in the causative organism, *Mycobacterium tuberculosis* (MTB).



Tuberculosis. The cut surface of the lung reveals numerous white nodules in miliary (generalized) tuberculosis.

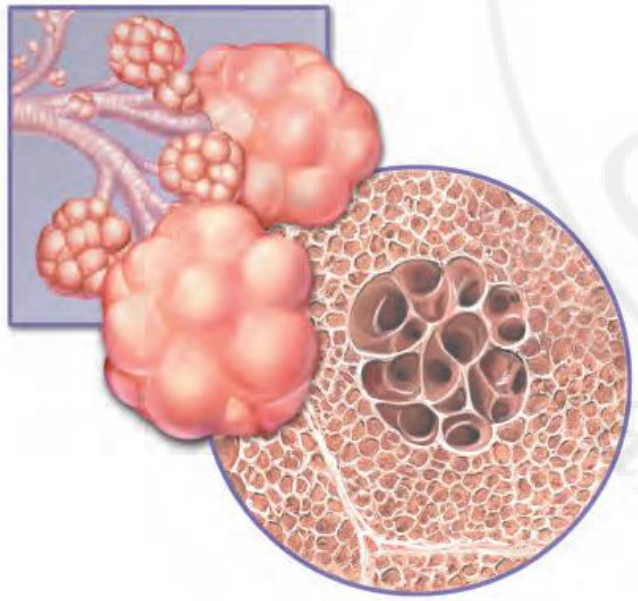
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Common Cold

More than 200 viruses are known to cause the common cold. About one half of these are rhinoviruses, and the others include adenoviruses and coronaviruses.

EMPHYSEMA

Emphysema is a chronic disease associated with overexpansion and destruction of the alveoli, Common causes are exposure to cigarette smoke.



ASTHMA

Asthma attacks result from narrowing of the bronchial tubes.

Asthma is most common in children. Although its causes are uncertain, a main factor is irritation caused by allergy.

Heredity may also play a role.

Sudden infant death syndrome (SIDS), also called “crib death,” is the unexplained death of a seemingly healthy infant under 1 year of age. Death usually occurs during sleep, leaving no signs of its cause. Neither autopsy nor careful investigation of family history and circumstances of death provides any clues.

Some practices that have reduced the incidence of SIDS are:

- Place the baby on his or her back (supine) for sleep (“back to sleep”).
- Keep the baby in a smoke-free environment.
- Use a firm, flat baby mattress.
- Don’t overheat the baby.

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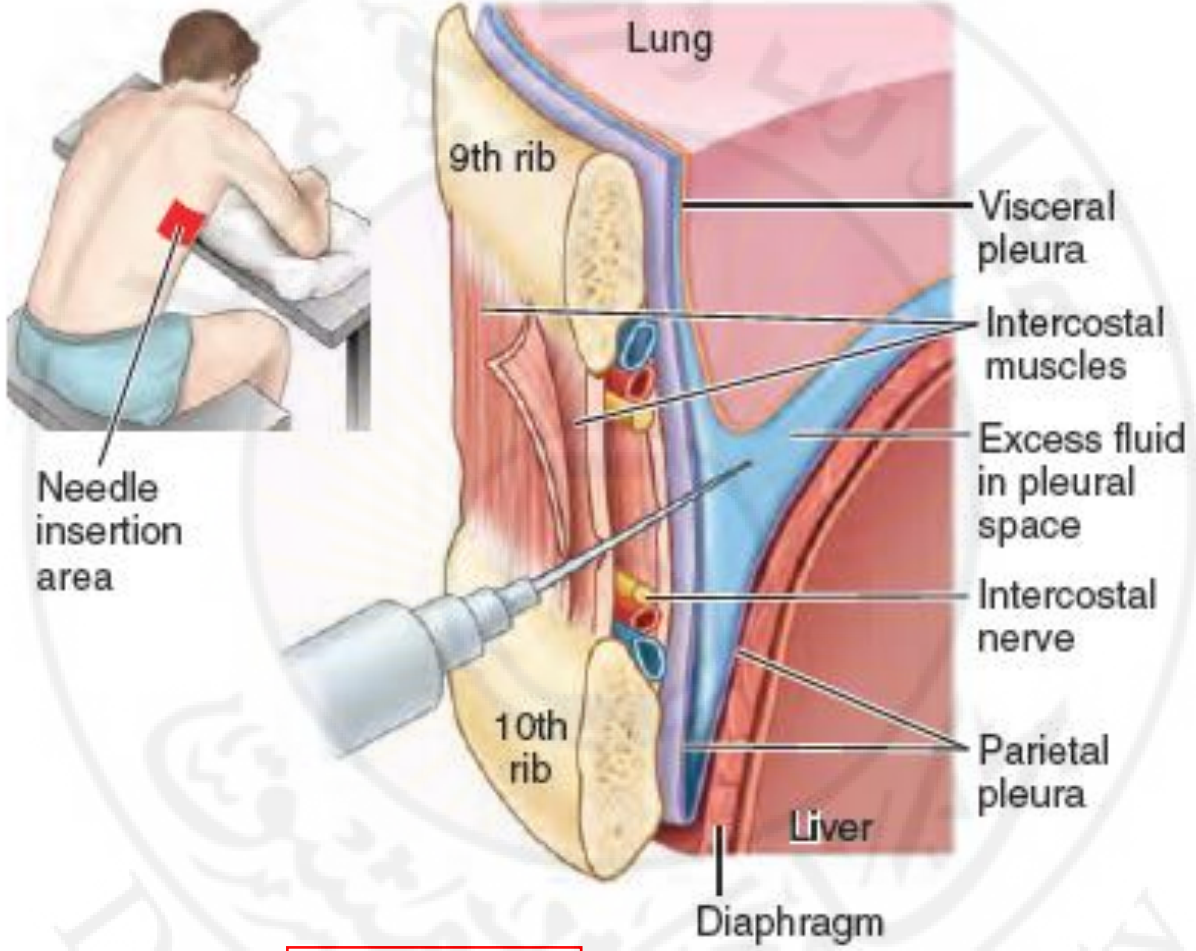


FIGURE 12-13 **Thoracentesis.** A needle is inserted into the pleural space to withdraw fluid.



FIGURE 12-14 **Pulse oximetry.** The oximeter measures the oxygen saturation of arterial blood.

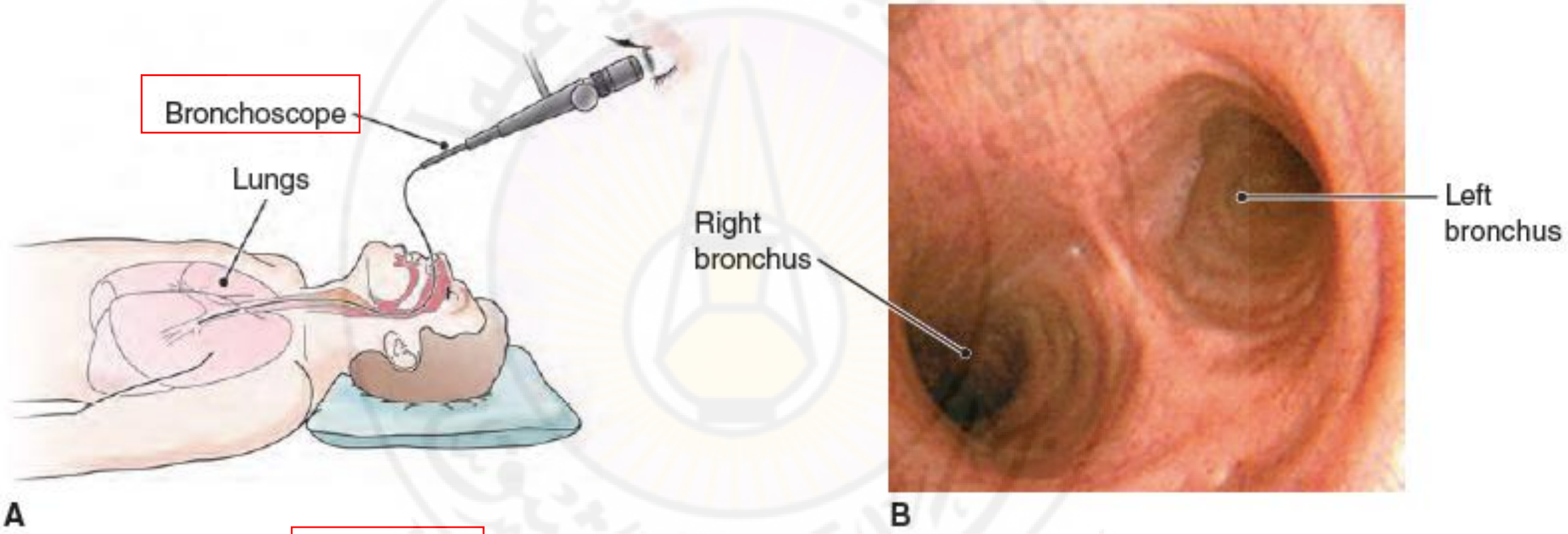
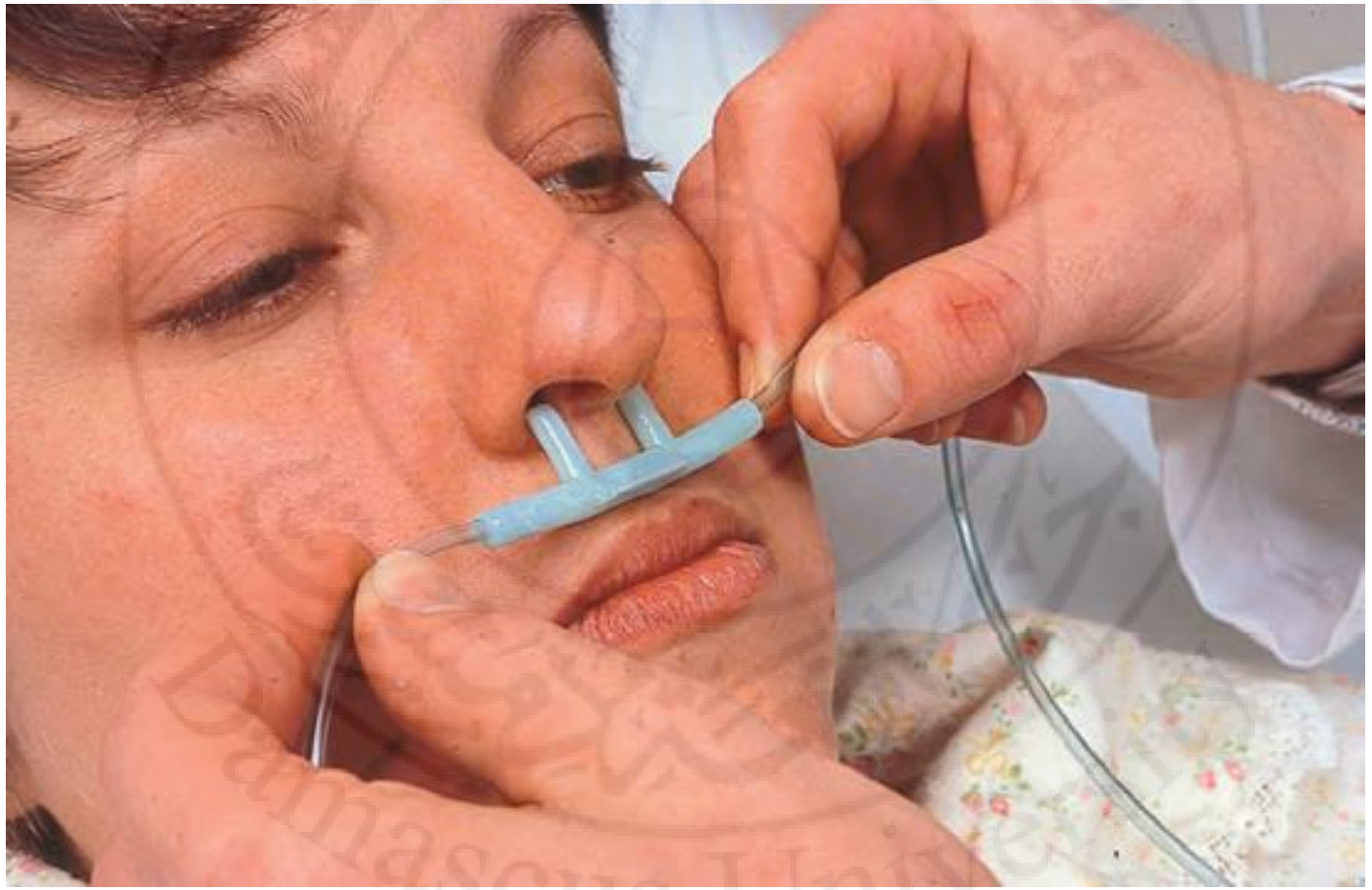


FIGURE 12-16 **Use of a bronchoscope. A.** A bronchoscope is a lighted tube used to inspect the bronchi, remove specimens, and remove foreign objects. **B.** View of the bronchial openings through a bronchoscope. Note the larger right bronchus.

Nasal cannula



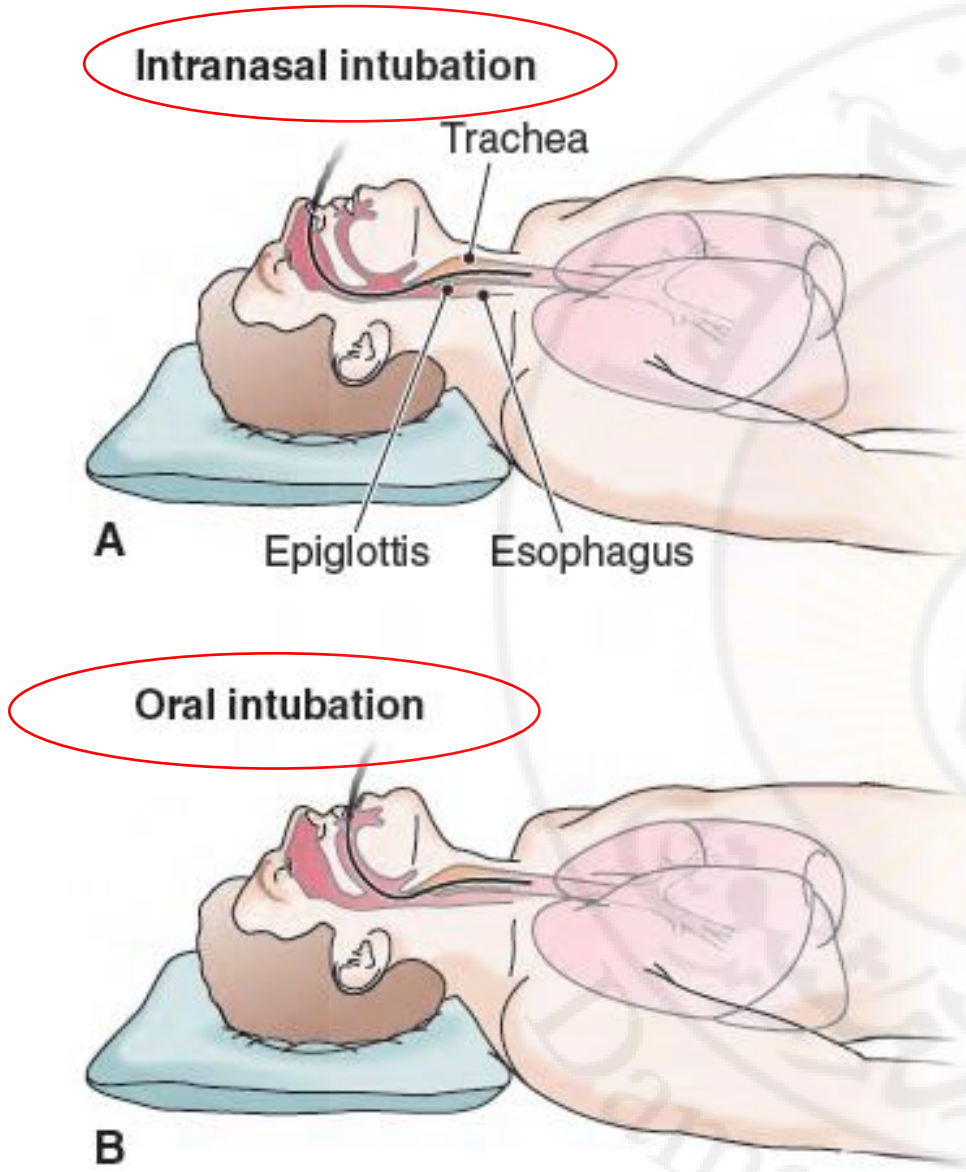


FIGURE 12-18 **Endotracheal intubation. A.** Nasal endotracheal catheter in proper position. **B.** Oral endotracheal intubation.

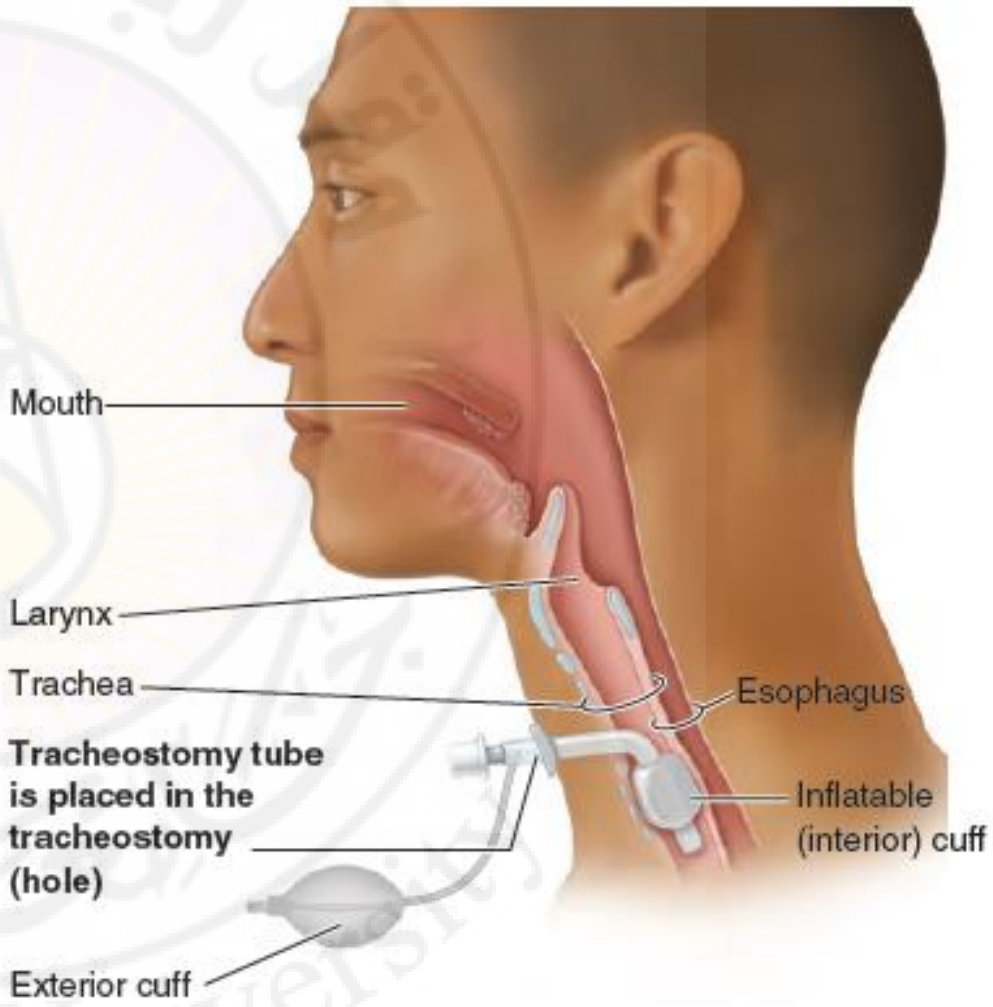


FIGURE 12-19 **A tracheostomy tube in place.**

Faculty of health sciences

"Medical Terminology"

7th Lecture

Dr. Hamza Omar Shasho

ENT-HNS MD

Digestion

Digestion takes place in the digestive tract proper, which extends from the **mouth** to the **anus**.

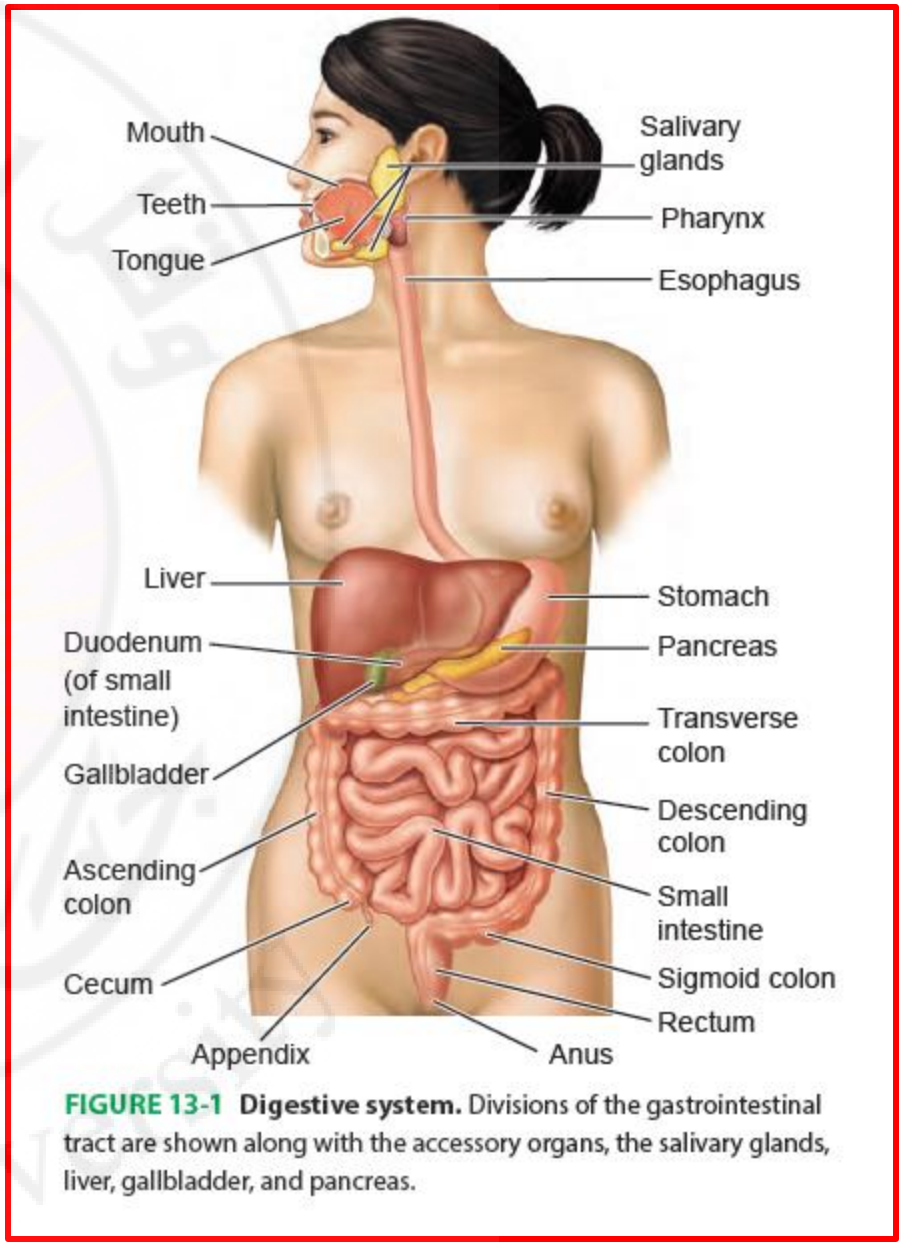


FIGURE 13-1 Digestive system. Divisions of the gastrointestinal tract are shown along with the accessory organs, the salivary glands, liver, gallbladder, and pancreas.

Peristalsis, wave-like contractions of the organ walls, moves food through the digestive tract and also moves undigested waste material out of the body.

A large serous membrane, the **peritoneum** (*per-ih-to-NE-um*), covers the organs in the abdominal cavity, supporting and separating them.

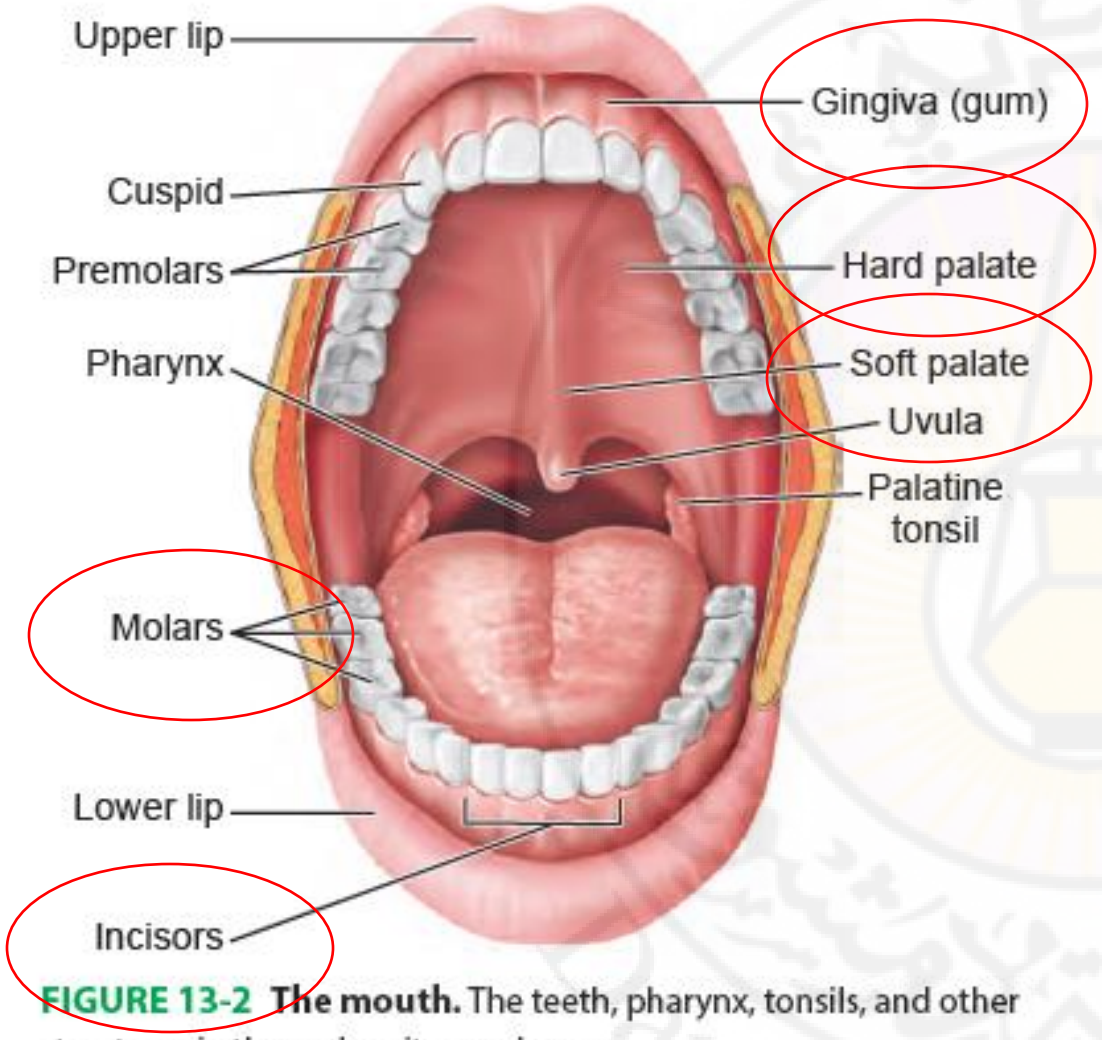


FIGURE 13-2 The mouth. The teeth, pharynx, tonsils, and other structures in the oral cavity are shown.

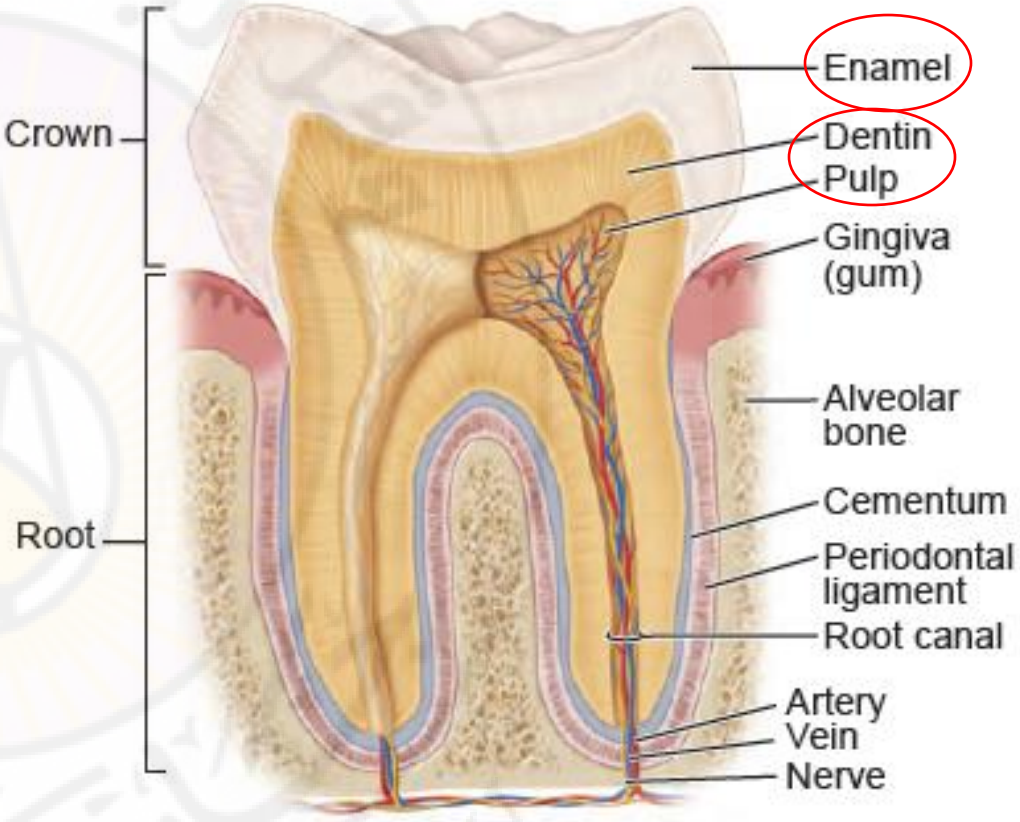


FIGURE 13-3 A molar tooth. The bony socket, gingiva, blood vessels, and nerve supply are shown as well as portions of the tooth.

In the process of chewing, or **mastication**, the tongue, lips, cheeks, and palate also help to break up food and mix it with **saliva**, a secretion that moistens the food and begins starch digestion.

The partially digested food passes through the stomach's lower portion, the **pylorus**, into the **intestine**.

THE SMALL INTESTINE

Food leaving the stomach enters the **duodenum**, the first portion of the **small intestine.** As the food continues through the **jejunum** and **ileum**, the small intestine's remaining sections, digestion is completed. (Ileum sounds like ilium, a large bone of the pelvis. For information on these and other homonyms).

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FOCUS ON WORDS

Homonyms

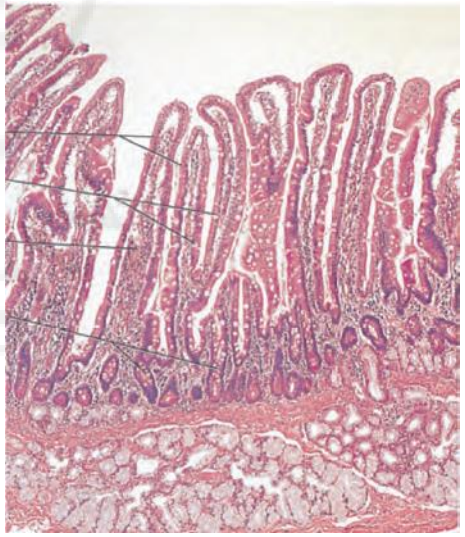
BOX 13-3

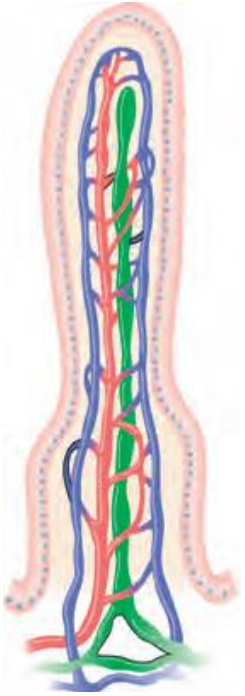
Homonyms are words that sound alike but have different meanings. One must know the context in which they are used in order to understand the intended meaning. For example, the ilium is the upper portion of the pelvis, but the ileum is the last portion of the small intestine. Different adjectives are preferred for each—iliac for the first and ileal for the second. The word *meiosis* refers to the type of cell division that halves the chromosomes to form the gametes, but *miosis* means abnormal contraction of the pupil. Both words come from the Greek word that means a decrease.

Similar-sounding names lead to some funny misspellings. The large bone of the upper arm is the humerus, but this bone is often written as "humorous." The vagus nerve (cranial nerve X) is named with a root that means "wander," as in the words vague and vagabond, because this nerve branches to many of the internal organs. Students often write the name as if it had some relation to the famous gambling city in Nevada.

Homonyms may have a more serious side as well. Drug names may sound or look so similar that clinicians could confuse them, leading to dangerous, potentially fatal, complications. For example, a 50 y/o woman was hospitalized after she took Flomax, which is used to treat symptoms for an enlarged prostate instead of Volmax, which is used to relieve bronchospasm. Another example involved two drugs used to treat schizophrenia, clozapine and olanzapine; a young man was given the wrong drug and suffered severe complications. The FDA and the United States Adopted Names Council regulate sound-alike or look-alike drug names. The World Health Organization (WHO) has rejected many proposed names, and has even changed drug names after they have been marketed, when they have led to medication errors.

The digested nutrients, including water, minerals, and vitamins, are absorbed into the circulation, aided by small projections in the intestinal lining called **villi** (Pleural). Each villus (singular) has blood capillaries to absorb nutrients into the bloodstream





villus

THE LARGE INTESTINE (Colon)

This part of the digestive tract begins in the lower right region of the abdomen with a small pouch, the **cecum**, to which the **appendix** is attached. (The appendix does not aid in digestion, but contains lymphatic tissue and may function in immunity.) The colon consists of the ascending colon, the transverse colon, and the descending colon.

As food is pushed through the colon, water is reabsorbed, and stool or **feces** is formed. This waste material passes into the S-shaped **sigmoid colon** and is stored in the **rectum** until eliminated through the anus.

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The Accessory Organs

The salivary glands, which secrete into the mouth, are the first accessory organs to act on food

The Accessory Organs

The salivary glands, which secrete into the mouth, are the first accessory organs to act on food (FIG. 13-5). They

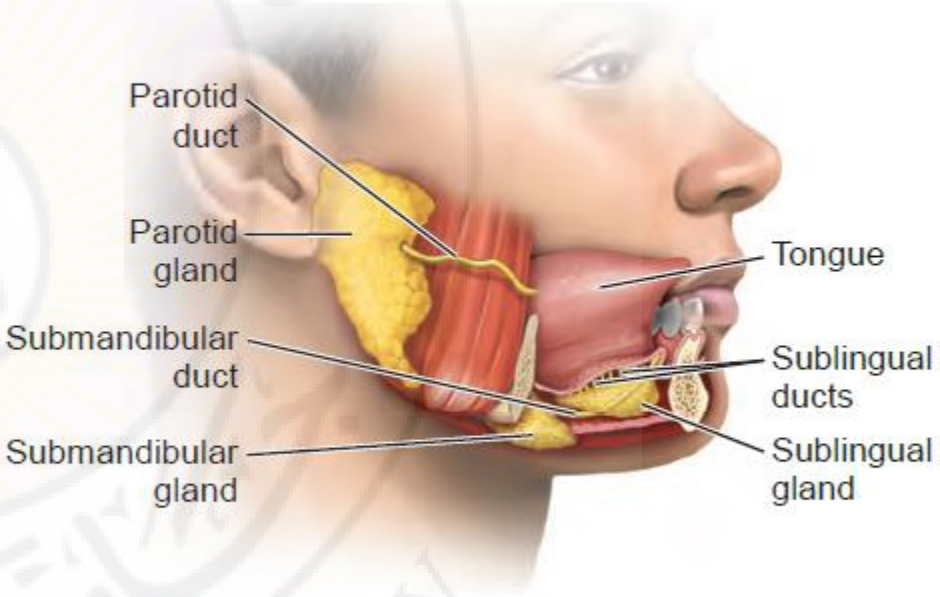


FIGURE 13-5 Salivary glands. These accessory organs of digestion secrete into the mouth.

The Accessory Organs

The **liver** is a large gland with many functions. A major activity is to process blood, removing toxins and converting nutrients into new compounds (chemical brain). A special circulatory pathway, the **hepatic portal system**, carries blood to the liver from the other abdominal organs. The liver functions in digestion by secreting **bile**, which emulsifies fats, that is, breaks them down into smaller units. The **gallbladder** stores bile until it is needed in digestion.

The Accessory Organs

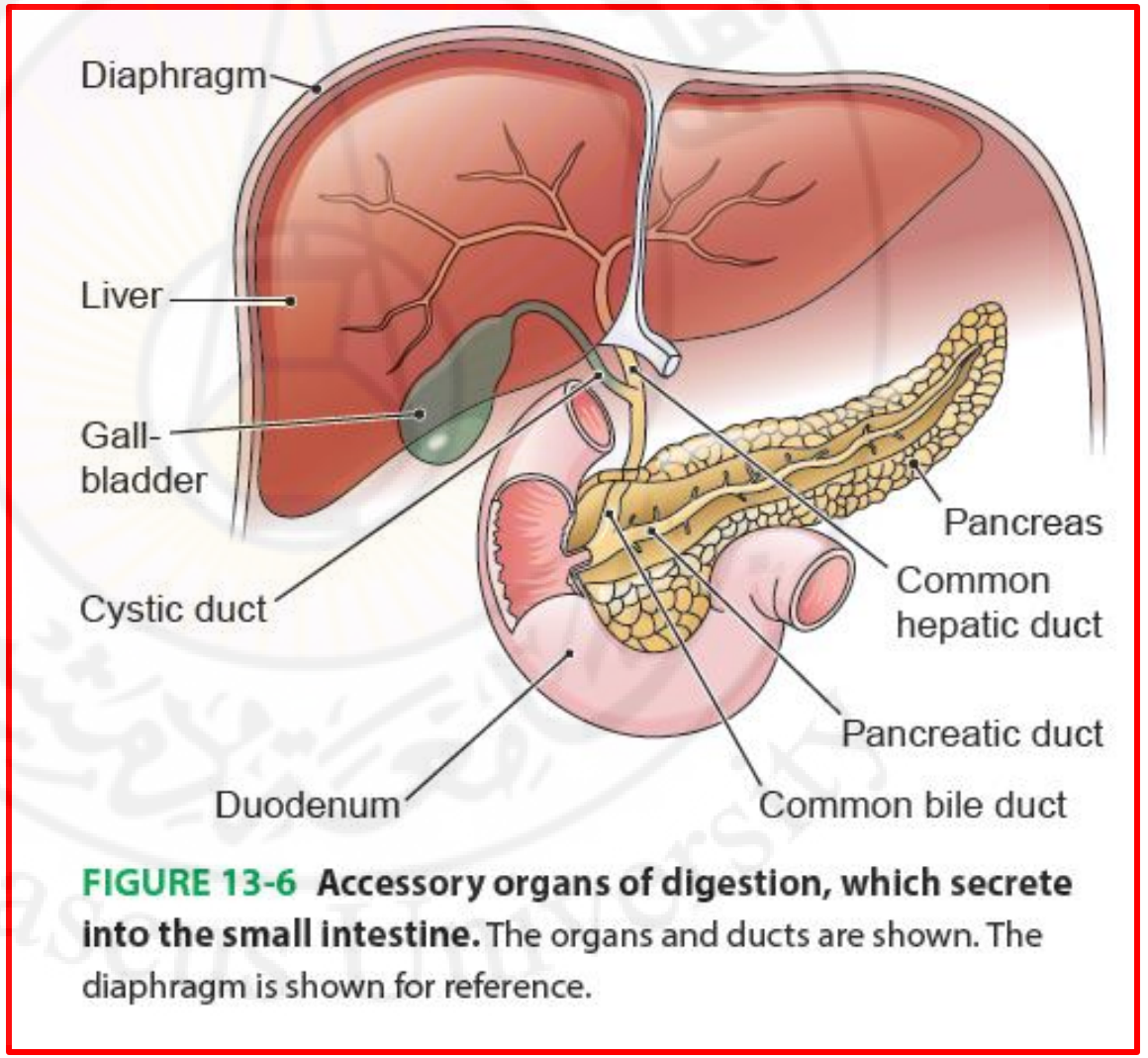


FIGURE 13-6 Accessory organs of digestion, which secrete into the small intestine. The organs and ducts are shown. The diaphragm is shown for reference.

Table 13-1 Roots for the Mouth

Root	Meaning	Example	Definition of Example
bucc/o	cheek	buccoversion *buk-ko-VER-zhun*	turning toward the cheek
dent/o, dent/i	tooth, teeth	edentulous *e-DEN-tu-lus*	without teeth
odont/o	tooth, teeth	periodontics *per-e-o-DON-tiks*	dental specialty that deals with the study and treatment of the tissues around the teeth
gingiv/o	gum (gingiva)	gingivectomy *jin-jih-VEK-to-me*	excision of gum tissue
gloss/o	tongue	glossoplegia *glos-o-PLE-je-ah*	paralysis (-plegia) of the tongue
lingu/o	tongue	orolingual *or-o-LING-gwal*	pertaining to the mouth and tongue
gnath/o	jaw	prognathous *PROG-nah-thus*	having a projecting jaw
labi/o	lip	labium *LA-be-um*	lip or lip-like structure
or/o	mouth	circumoral *sir-kum-OR-al*	around the mouth
stoma, stomat/o	mouth	xerostomia *ze-ro-STO-me-ah*	dryness (xero-) of the mouth
palat/o	palate	palatine *PAL-ah-tine*	pertaining to the palate (also palatal)
sial/o	saliva, salivary gland, salivary duct	sialogram *si-AL-o-gram*	radiograph of the salivary glands and ducts
uvul/o	uvula	uvulotome *U-vu-lo-tome*	instrument (-tome) for incising the uvula

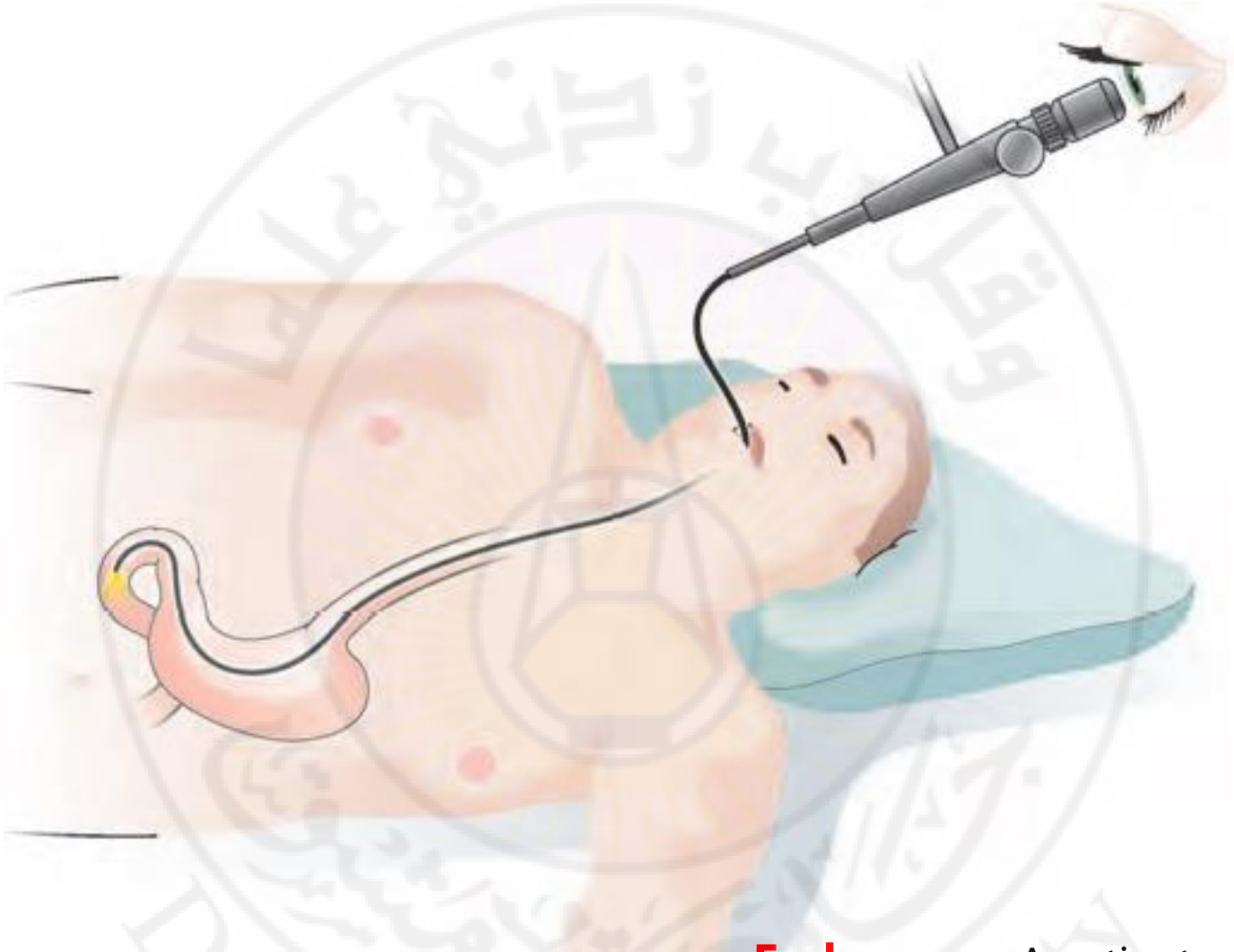
Clinical Aspects of the Digestive System

Appendicitis results from infection of the appendix, often secondary to its obstruction. Surgery is necessary to avoid rupture and **peritonitis**, infection of the peritoneal cavity.

Clinical Aspects of the Digestive System

Peptic Ulcers

A peptic ulcer is a lesion of the gastric mucous membrane marked by inflammation and tissue damage.

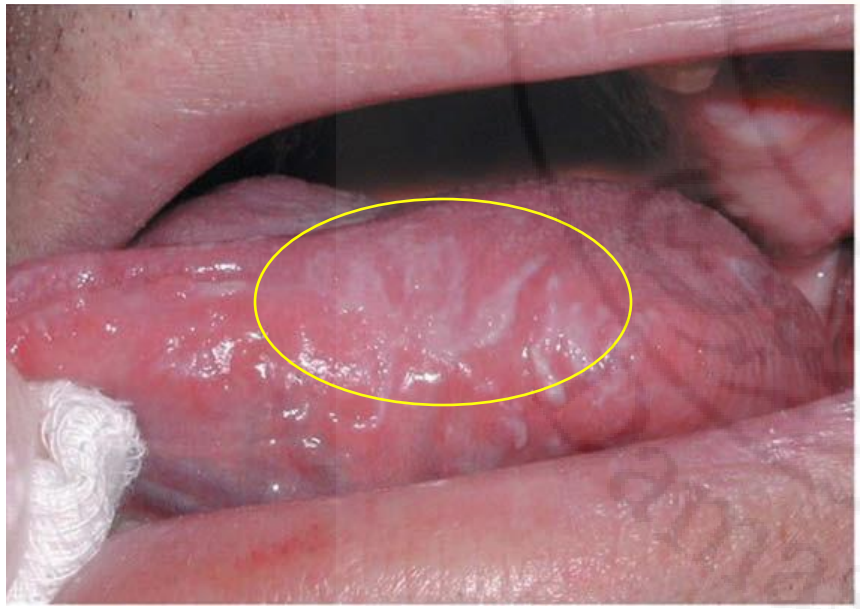


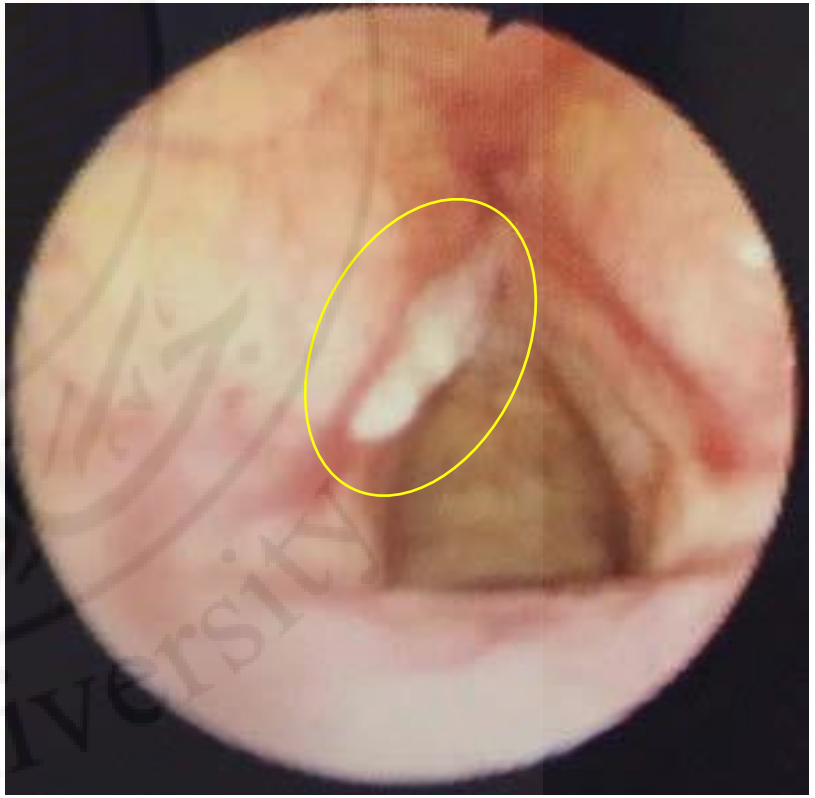
Endoscopy. A patient undergoing gastroscopy is sho

Ulcers can be diagnosed by **endoscopy**

Clinical Aspects of the Digestive System

Leukoplakia, white patches on mucous membranes, often results from smoking.





Clinical Aspects of the Digestive System

The most common sites for GI tract cancer are the colon and rectum.

A diet low in fiber and calcium and high in fat is a major risk factor in colorectal cancer.

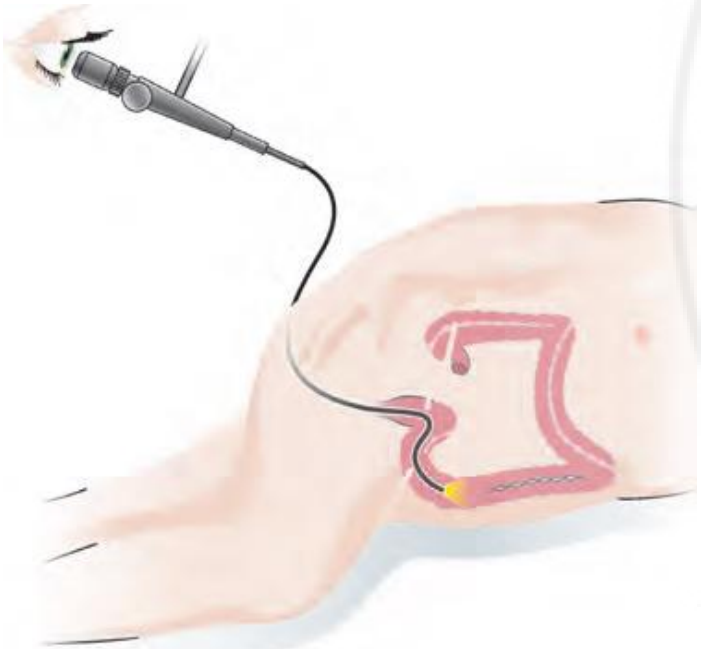
Clinical Aspects of the Digestive System

One sign of colorectal cancer is bleeding into the intestine, which can be detected by testing the stool for blood. Because this blood may be present in very small amounts, it is described as **fecal occult** ("hidden") **blood (FOC)**.

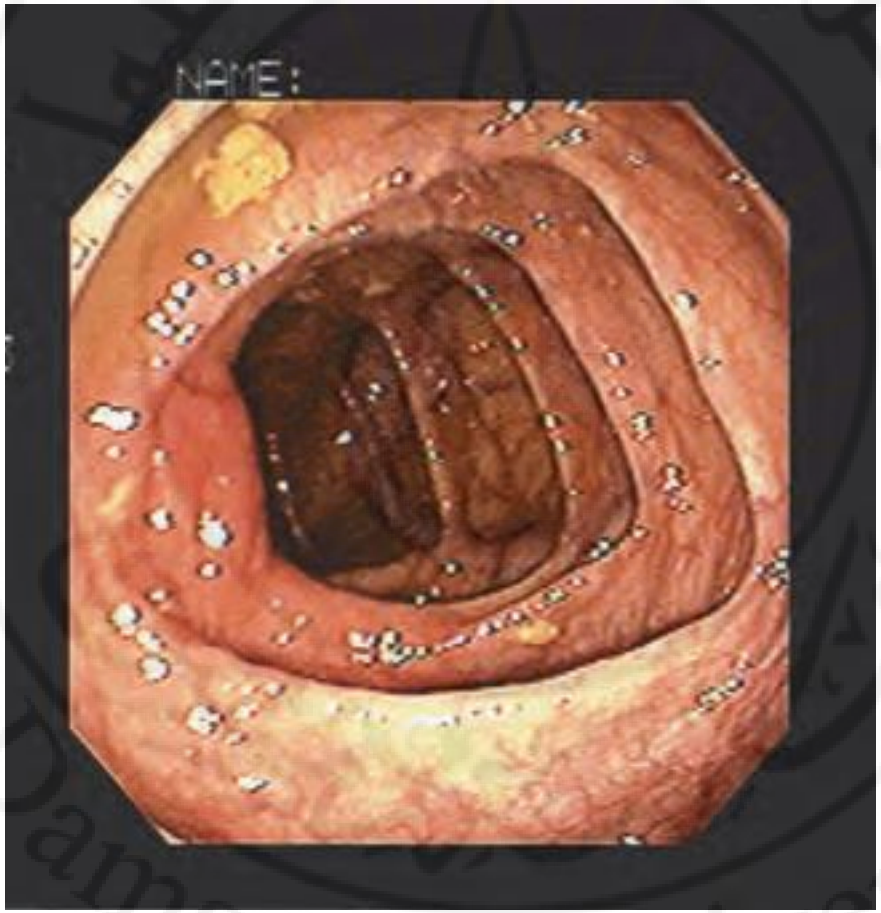
Clinical Aspects of the Digestive System

Polyps (growths) in the intestine often become cancerous and should be removed. Polyps can be identified and even removed by endoscopy.

A



B



C



Colonoscopy. A. Sigmoidoscopy. The flexible fiberoptic endoscope is advanced past the proximal sigmoid colon and then into the descending colon. **B.** Endoscopic image of the cecum, the first portion of the large intestine. **C.** Endoscopic image of a colonic polyp.

Gastroesophageal reflux disease (GERD)

refers to reflux of gastric juices into the esophagus due to weakness at the gastroesophageal junction, specifically the LES. These acidic secretions irritate the lining of the esophagus and even the throat and mouth if propelled upward by **regurgitation.** A GERD symptom commonly known as **heartburn**, an upward-radiating burning sensation behind the sternum, does not involve the heart, but is experienced in the area near the heart

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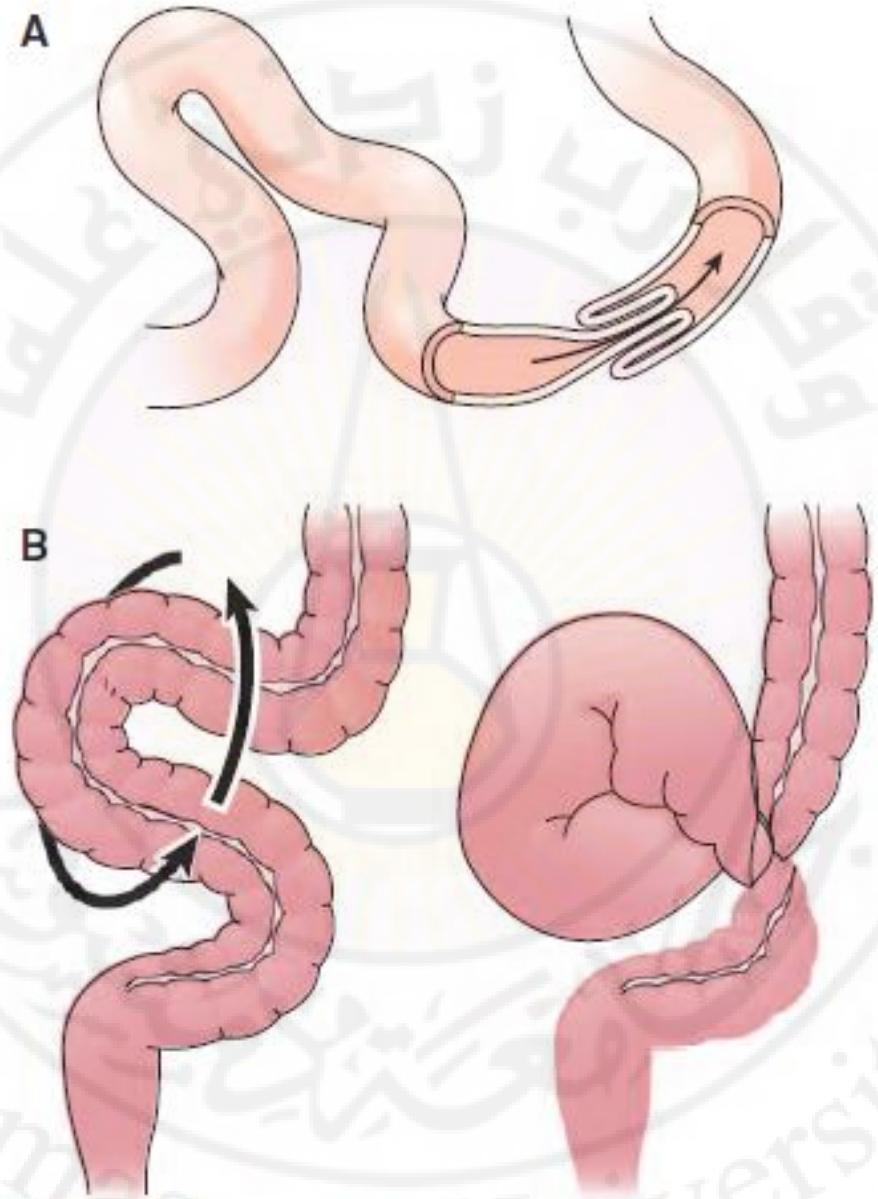


FIGURE 13-10 Intestinal obstruction. A. Intussusception. **B.** Volvulus, showing counterclockwise twist.

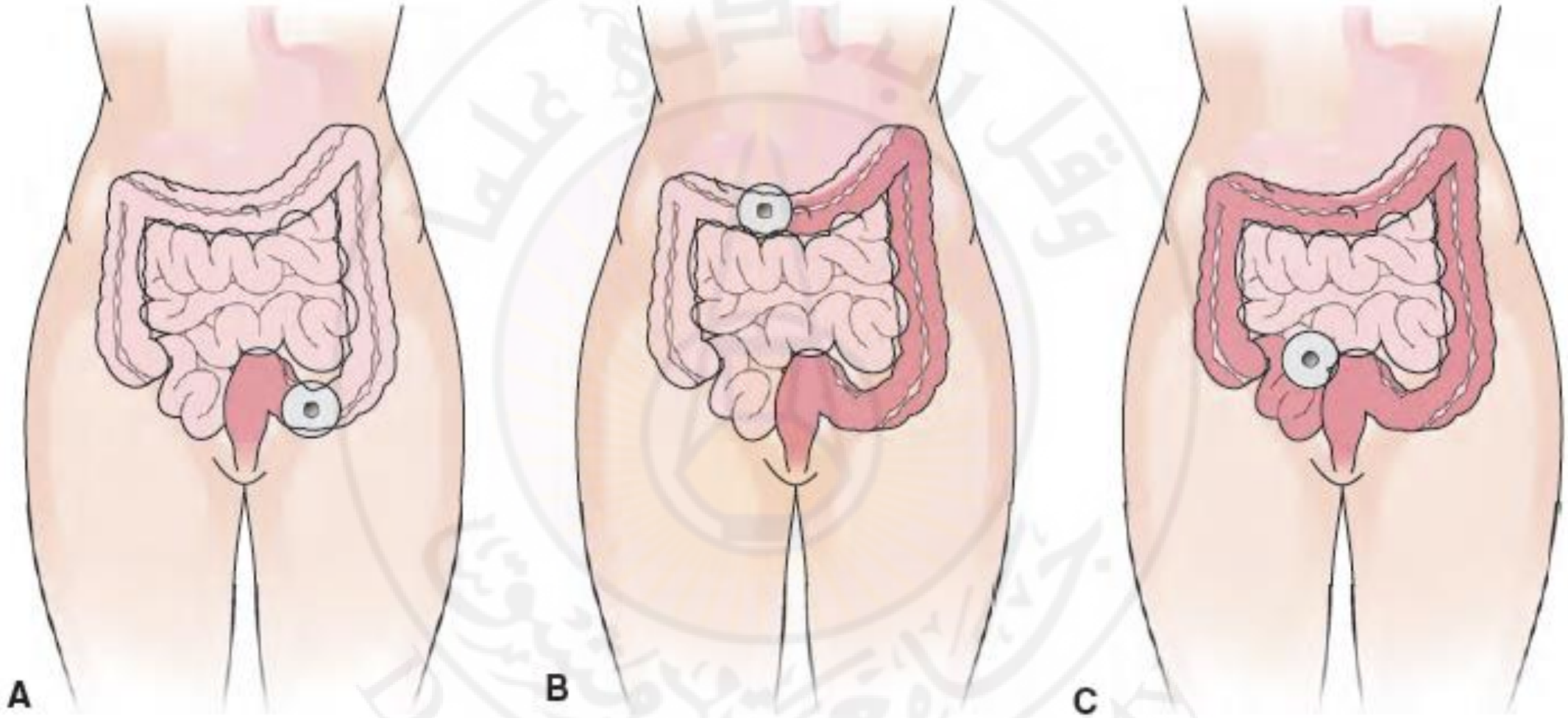


FIGURE 13-9 **Ostomy surgery.** Various locations are shown. The shaded portions represent the bowel sections that have been removed or are inactive. **A.** Sigmoid colostomy. **B.** Transverse colostomy. **C.** Ileostomy.

Hepatitis

Hepatitis A virus (HAV) is the most common hepatitis virus. It is spread by fecal–oral contamination, often by food handlers, and in crowded, unsanitary conditions. It may also be acquired by eating contaminated food.

Hepatitis

Hepatitis B virus (HBV) is spread by blood and other body fluids. It may be transmitted sexually, by sharing injection needles, Effective vaccines are available.

Hepatitis

Hepatitis C is spread through blood and blood products or by close contact with an infected person. Drug treatment is available to cure hepatitis C.

Transmission rate in needle stick

HBV → 30% (VACCINE)

HCV → 3% (NO VACCINE YET , PREVENTIVE MEASURES , BUT THERE IS EFFECTIVE TREATMENT)

HIV → 0.3% (NO VACCINE YET , PREVENTIVE MEASURES , BUT THERE IS EFFECTIVE TREATMENT)

Gallstones

Cholelithiasis refers to the presence of stones in the gallbladder or bile ducts, which is usually associated with **cholecystitis**, inflammation of the gallbladder.

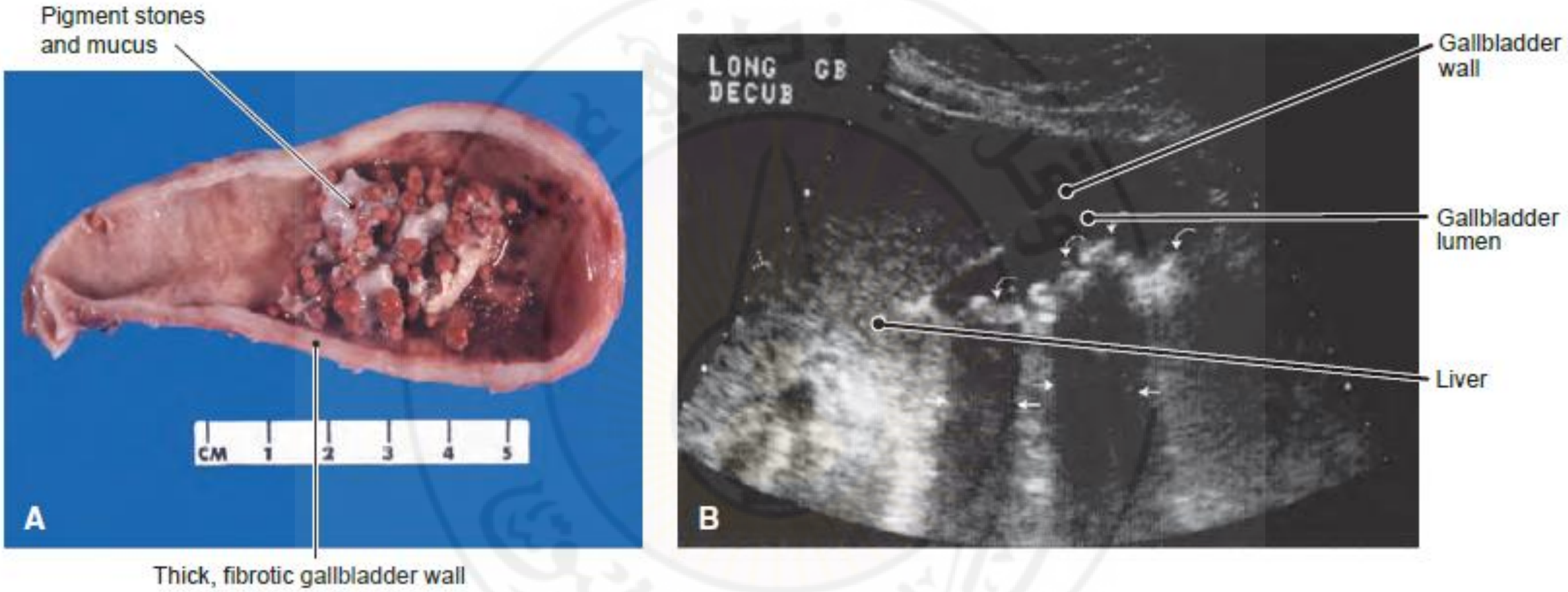


FIGURE 13-15 **Cholelithiasis (gallstones). A.** Formation of gallstones (cholelithiasis) causes gallbladder inflammation (cholecystitis) and bile obstruction. Numerous gallstones and a thickened gallbladder wall caused by chronic inflammation are evident in this figure. **B.** Sonogram shows dense gallstones (*curved arrows*). Shadows appear (between the *straight arrows*) because the sound waves cannot penetrate the stones (calculi).

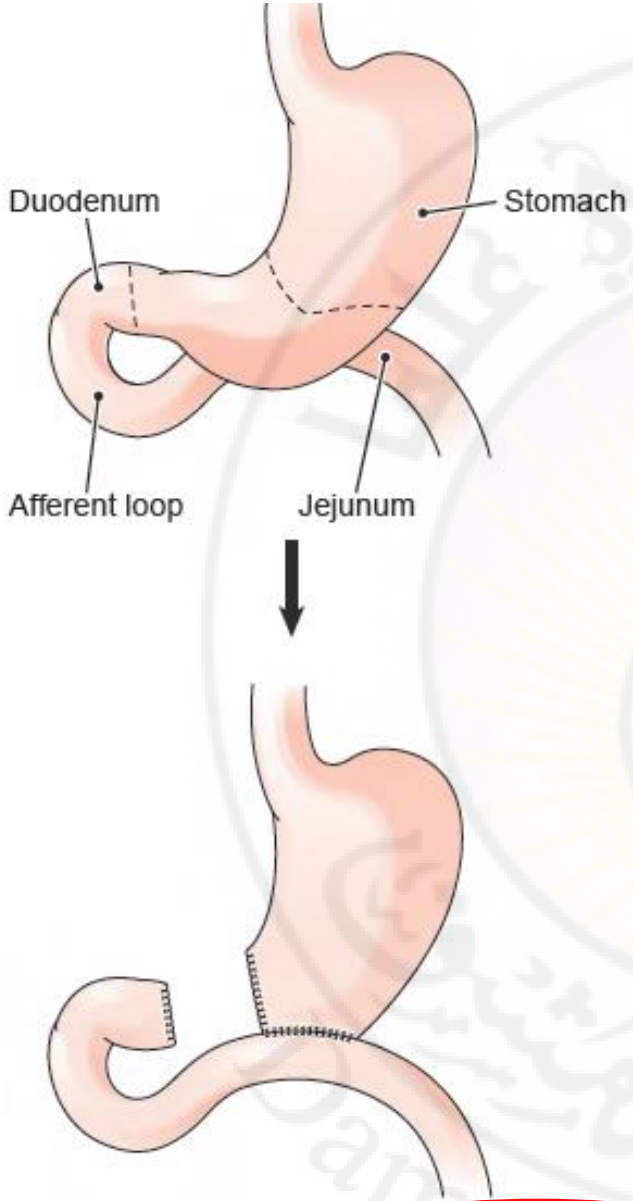


FIGURE 13-17 Gastric bypass. For treatment of morbid obesity, a small pouch is created in the stomach to limit food intake. The pouch is attached to the jejunum in a gastrojejunostomy to bypass the stomach and reduce nutrient absorption.

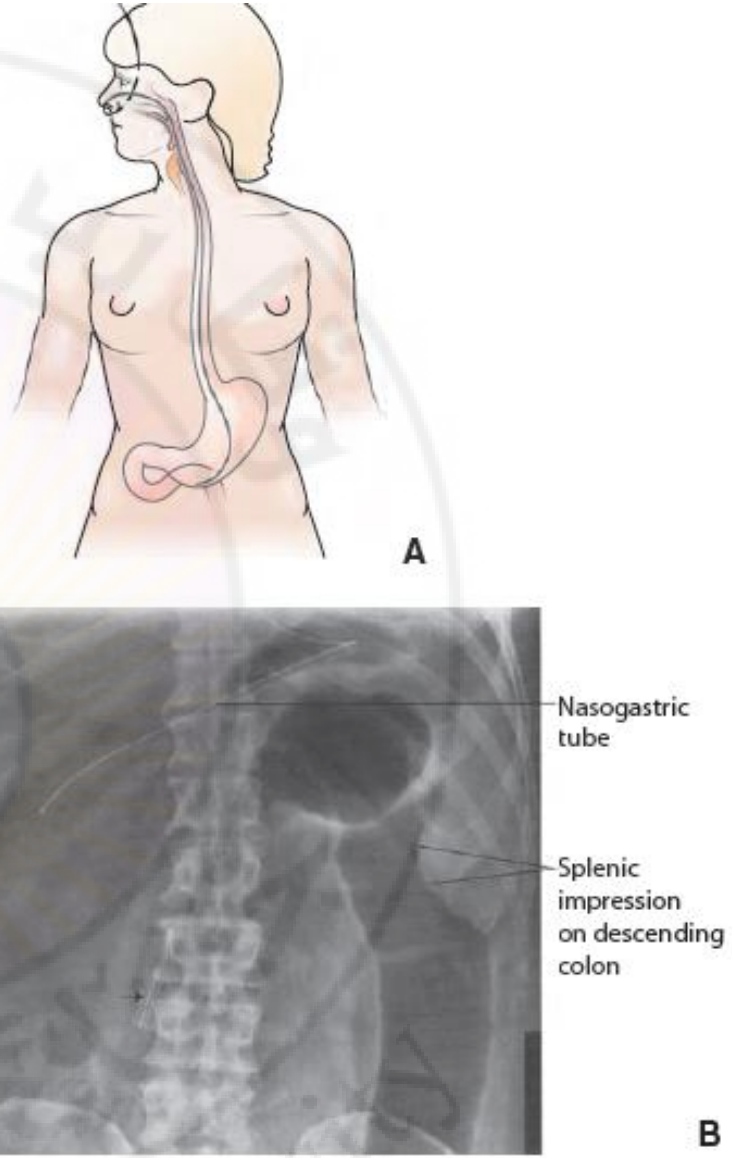


FIGURE 13-19 A nasogastric (NG) tube. A. Diagram showing an NG tube in place. **B.** Abdominal radiograph showing an NG tube. The filter (*arrow*) shown in the inferior vena cava is meant to trap emboli that might originate in the lower extremities and pelvis.

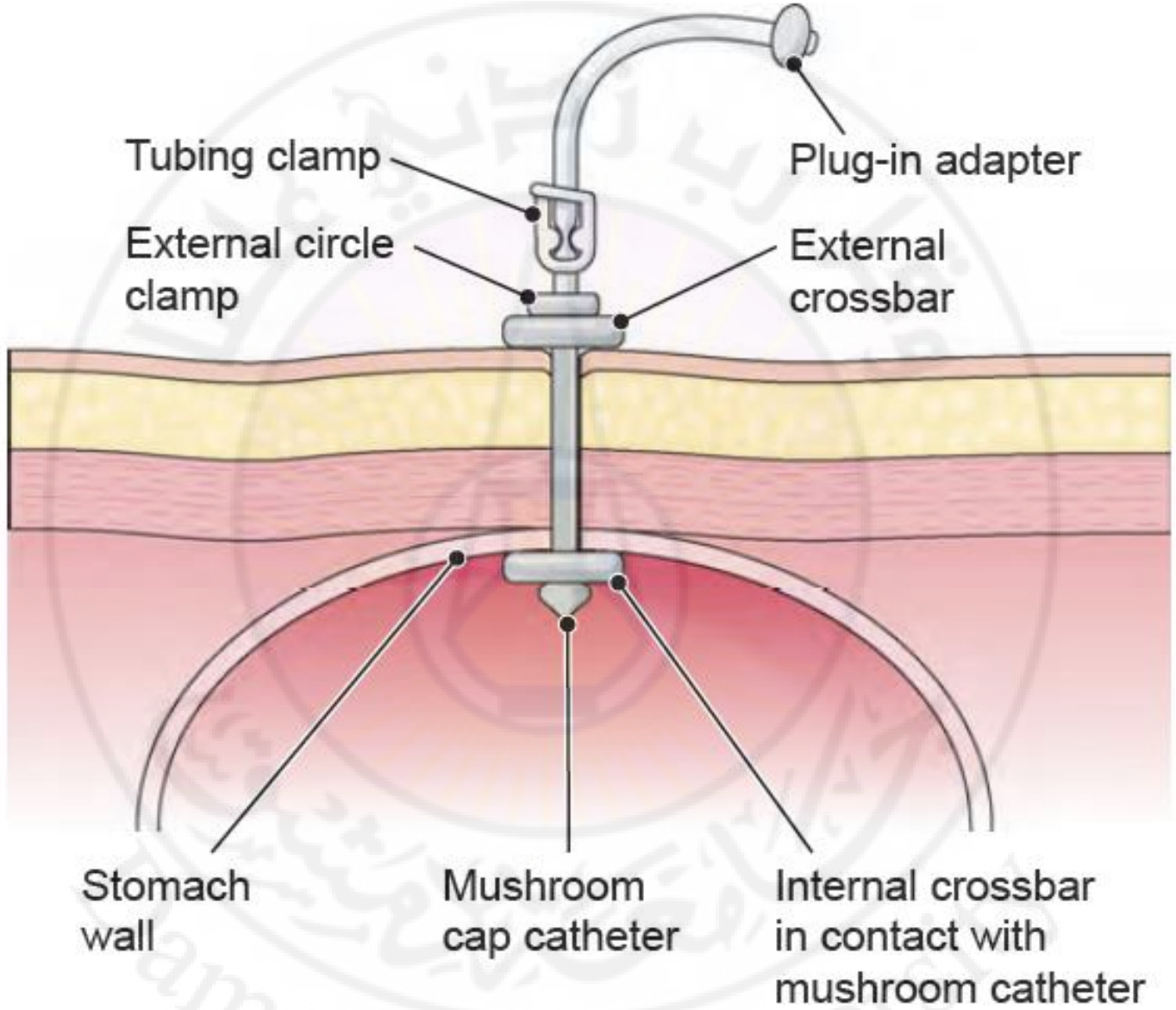


FIGURE 13-20 Percutaneous endoscopic gastrostomy (PEG) tube. The tube is shown in place in the stomach.

Faculty of health sciences

"Medical Terminology"

8th Lecture

Dr. Hamza Omar Shasho

ENT-HNS MD

The Urinary System

The urinary system excretes metabolic waste. While forming and eliminating urine, it also regulates the composition, volume, and acid–base balance (pH) of body fluids. In several ways, kidney activity affects the circulation and blood pressure.

The Urinary System

the urinary system consists of:

Two kidneys, the organs that form urine

- Two ureters, which transport urine from the kidneys to the bladder
- The urinary bladder, which stores and eliminates urine
- The urethra, which carries urine out of the body

Damascus University

The Urinary System

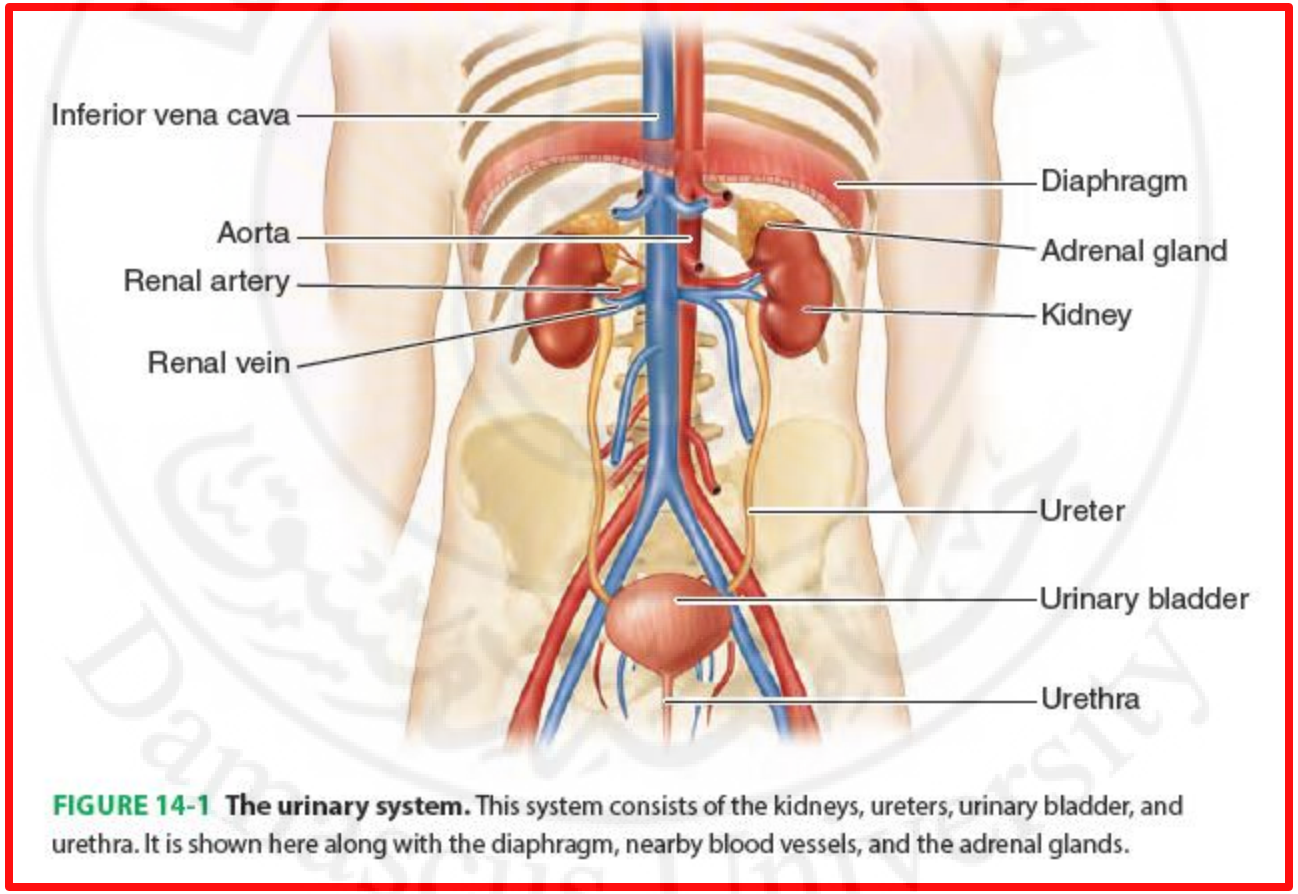


FIGURE 14-1 The urinary system. This system consists of the kidneys, ureters, urinary bladder, and urethra. It is shown here along with the diaphragm, nearby blood vessels, and the adrenal glands.

The Urinary System

If you look inside the kidney ,you will see that it has an outer region, the **renal cortex**, and an inner region, the **renal medulla**. The medulla is divided into triangular sections, the **renal pyramids**. These pyramids have a lined appearance because they are made up of the loops and collecting tubules of the **nephrons**, the kidney's functional units. Each collecting tubule empties into a urine-collecting area called a **calyx** (from the Latin word meaning "cup"). Several of the smaller minor calices merge to form a major calyx. The major calices then unite to form the **renal pelvis**, the upper funnel-shaped portion of the **ureter**.

The Urinary System

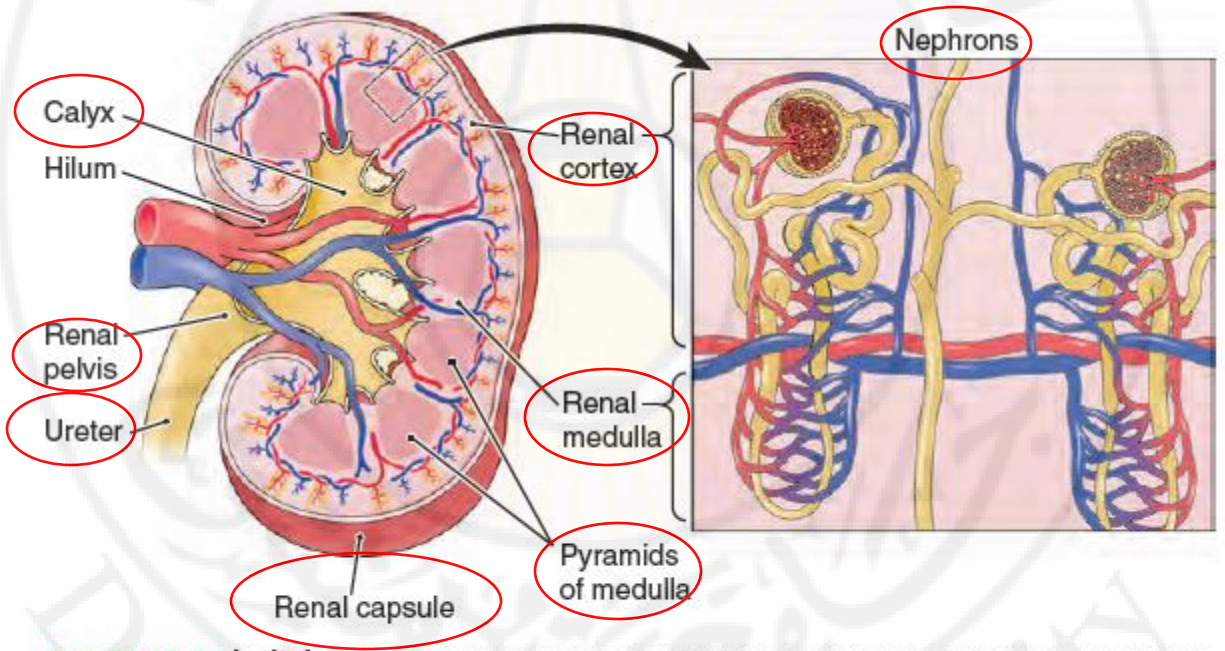


FIGURE 14-2 The kidney. A longitudinal section (*left*) through the kidney shows its internal structure. The hilum is the point where blood vessels and ducts connect with the kidney. An enlarged diagram of nephrons. Each kidney contains more than 1 million nephrons (*right*).

TRANSPORT AND REMOVAL OF URINE

Urine is drained from the renal pelvis and carried by the left and right ureters to the **urinary bladder**, where it is stored. The bladder is located posterior to the pubic bone and below the peritoneum. As the bladder fills, it expands upward from a stable triangle at its base. This triangle, the **trigone**, is marked by the ureteral openings and the urethral opening below. The trigone's stability prevents urine from refluxing into the ureters.

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TRANSPORT AND REMOVAL OF URINE

The voiding (release) of urine, called **urination** or more technically, **micturition**, is regulated by two sphincters

An inability to retain urine is termed *urinary incontinence*.

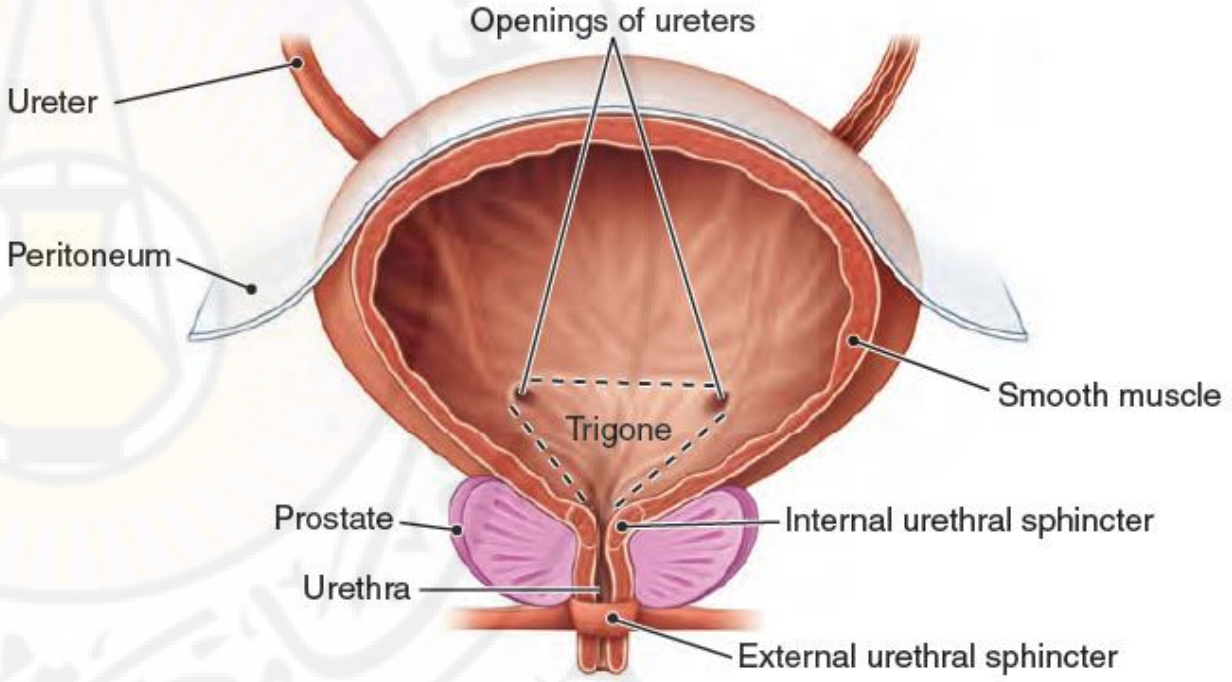


FIGURE 14-4 The urinary bladder. The interior of the male bladder is shown. The trigone is a triangular region in the bladder floor marked by the openings of the ureters and the urethra. The urethra travels through the prostate gland in the male.

TRANSPORT AND REMOVAL OF URINE

Table 14-1 Roots for the Kidney

Root	Meaning	Example	Definition of Example
ren/o	kidney	suprarenal *su-prah-RE-nal*	above the kidney
nephr/o	kidney	nephrosis *nef-RO-sis*	any noninflammatory disease condition of the kidney
glomerul/o	glomerulus	juxtaglomerular *juks-tah-glo-MER-u-lar*	near the glomerulus

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Clinical Aspects of the Urinary System

INFECTIONS :

Organisms that infect the urinary tract generally enter through the urethra and ascend toward the bladder, producing **cystitis**.

dysuria, painful or difficult urination.

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Clinical Aspects of the Urinary System

INFECTIONS :

Untreated, the infection can ascend even further into the urinary tract. The infecting organisms are usually colon bacteria carried in feces, particularly *Escherichia coli*. Although urinary tract infections (UTIs) do occur in men, they appear more commonly in women because the female urethra is shorter than the male urethra and its opening is closer to the anus. Poor toilet habits and **urinary stasis** are contributing factors.

Clinical Aspects of the Urinary System

INFECTIONS :

An infection that involves the kidney and renal pelvis is termed **pyelonephritis**.

Clinical Aspects of the Urinary System

In hospitals, UTIs may result from procedures involving the urinary system, especially **catheterization**

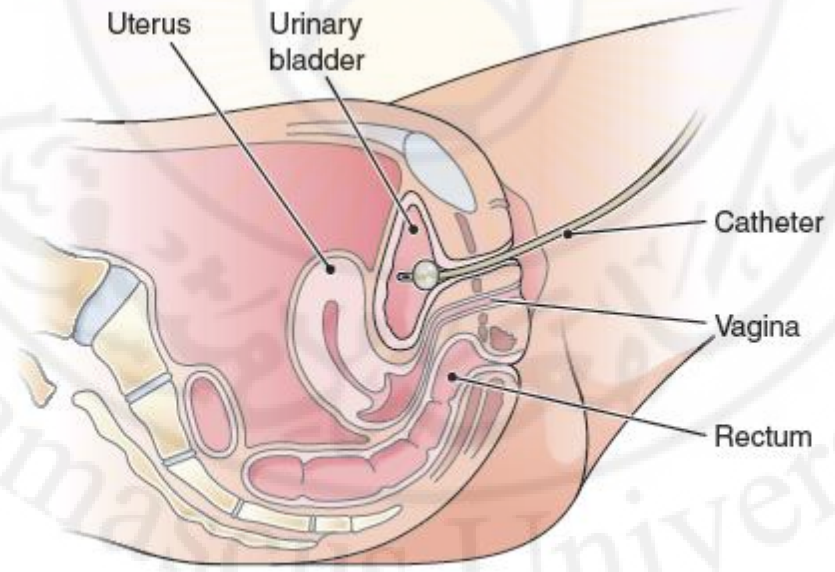


FIGURE 14-5 An indwelling (Foley) catheter. The catheter is shown in place in the female bladder.

Clinical Aspects of the Urinary System

INFECTIONS :

An infection that involves the kidney and renal pelvis is termed **pyelonephritis**.

Clinical Aspects of the Urinary System

GLOMERULONEPHRITIS

Although the name simply means inflammation of the glomeruli and kidney, **glomerulonephritis** is a specific disorder that follows an immunologic reaction.

It is usually a response to infection in another system, commonly a streptococcal infection of the respiratory tract or a skin infection.

Clinical Aspects of the Urinary System

Because of damage to kidney tissue, blood and proteins escape into the nephrons, causing **hematuria**, blood in the urine, and **proteinuria**,

Clinical Aspects of the Urinary System

NEPHROTIC SYNDROME

Glomerulonephritis is one cause of **nephrotic syndrome**, a disease in which the glomeruli become overly permeable and allow the loss of proteins.

Clinical Aspects of the Urinary System

Nephrotic syndrome is marked by proteinuria and **hypoproteinemia**.

Clinical Aspects of the Urinary System

RENAL FAILURE

Chronic renal failure results from a gradual loss of nephrons.

Injury, shock, exposure to toxins, infections, and other renal disorders may cause sudden damage to the nephrons, resulting in a rapid loss of kidney function, or **acute renal failure (ARF)**.

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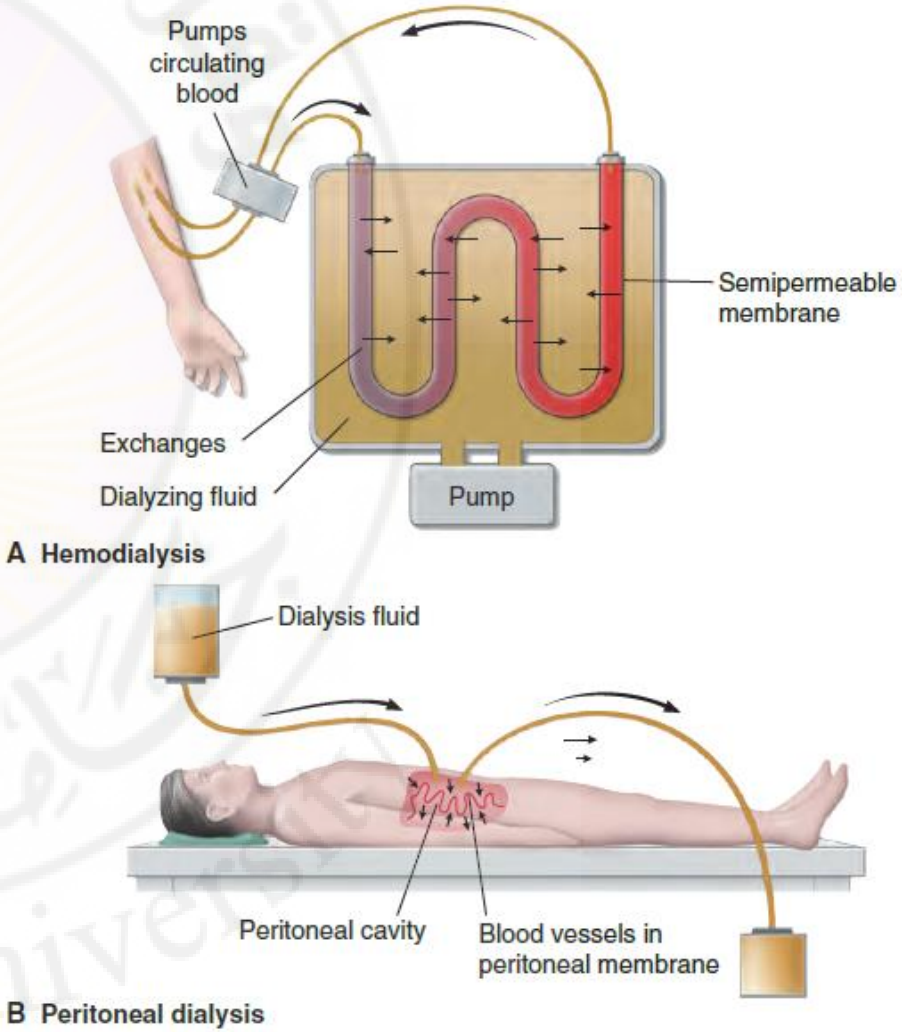
Clinical Aspects of the Urinary System

Renal failure may lead to a need for kidney **dialysis** or, ultimately, **renal transplantation**.

Clinical Aspects of the Urinary System

Type of dialysis:

- **hemodialysis**
- **peritoneal dialysis**



Clinical Aspects of the Urinary System



CLINICAL PERSPECTIVES

BOX 14-2

Sodium and Potassium: Causes and Consequences of Imbalance

Sodium and potassium concentrations in body fluids are important measures of water and electrolyte balance. An excess of sodium in body fluids is termed **hypernatremia**, taken from the Latin name for sodium, *natrium*. This condition accompanies dehydration and severe vomiting and may cause hypertension, edema, convulsions, and coma. **Hyponatremia**, a sodium deficiency in body fluids, can come from water intoxication (overhydration), heart failure, kidney failure, cirrhosis of the liver, pH imbalance, or endocrine disorders. It can cause muscle weakness, hypotension, confusion, shock, convulsions, and coma.

The term **hyperkalemia** is taken from the Latin name for potassium, *kalium*. It refers to excess potassium in body fluids, which may result from kidney failure, dehydration, and other causes. Its signs and symptoms include nausea, vomiting, muscular weakness, and severe cardiac arrhythmias. **Hypokalemia**, or low potassium in body fluids, may result from taking diuretics that cause potassium to be lost along with water. It may also result from pH imbalance or secretion of too much aldosterone from the adrenal cortex, resulting in potassium excretion. Hypokalemia causes muscle fatigue, paralysis, confusion, hypoventilation, and cardiac arrhythmias.

Clinical Aspects of the Urinary System

URINARY STONES

Urinary lithiasis (presence of stones) may be related to infection, irritation, diet, or hormone imbalances that lead to increased calcium in the blood. Most urinary calculi (stones) are made up of calcium salts, but they may be composed of other materials as well. Causes of stone formation include dehydration, infection, abnormal pH of urine, urinary stasis, and metabolic imbalances. The stones generally form in the kidney and may move to the bladder). This results in great pain, termed **renal colic**, and obstruction that can promote infection and cause **hydronephrosis**, collection of urine in the renal pelvis.

Because they are radiopaque, stones can usually be seen on simple radiographs of the abdomen. Stones may dissolve and pass out of the body on their own. If not, they may be removed surgically, in a **lithotomy**, or by endoscopy.

External shock waves are used to crush stones in the urinary tract in a procedure called extracorporeal (outside the body) shock-wave **lithotripsy** (crushing of stones) **(FIG. 14-7)**.

Clinical Aspects of the Urinary System

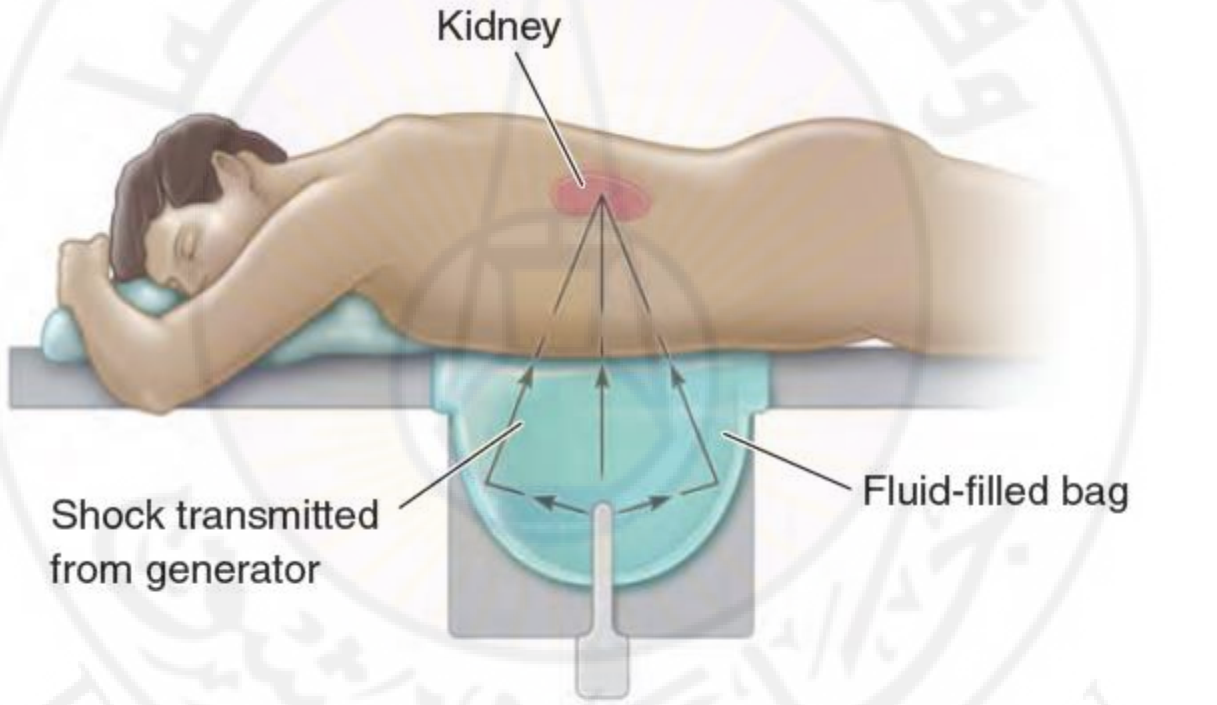


FIGURE 14-7 Lithotripsy. Shock waves are used to break kidney stones and allow for their passage. The procedure is called extracorporeal shock-wave lithotripsy (ESWL).

Investigations of urinary system

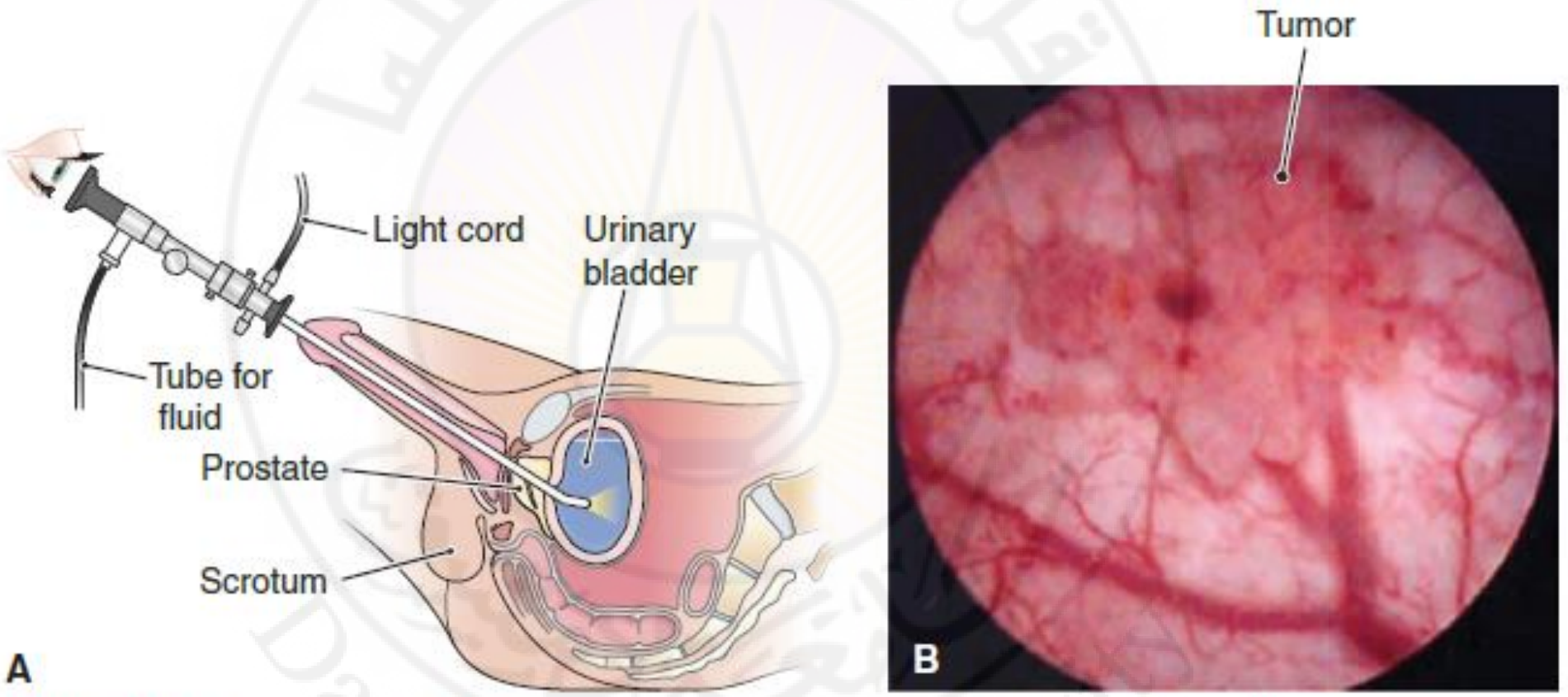


FIGURE 14-8 Cystoscopy. A. A lighted cystoscope is introduced through the urethra into the bladder of a male subject. Sterile fluid is used to inflate the bladder. Cystoscopes are used to examine the bladder, take biopsy specimens, and remove tumors. **B.** A cancer of the bladder, as viewed through a cystoscope.

Investigations of urinary system

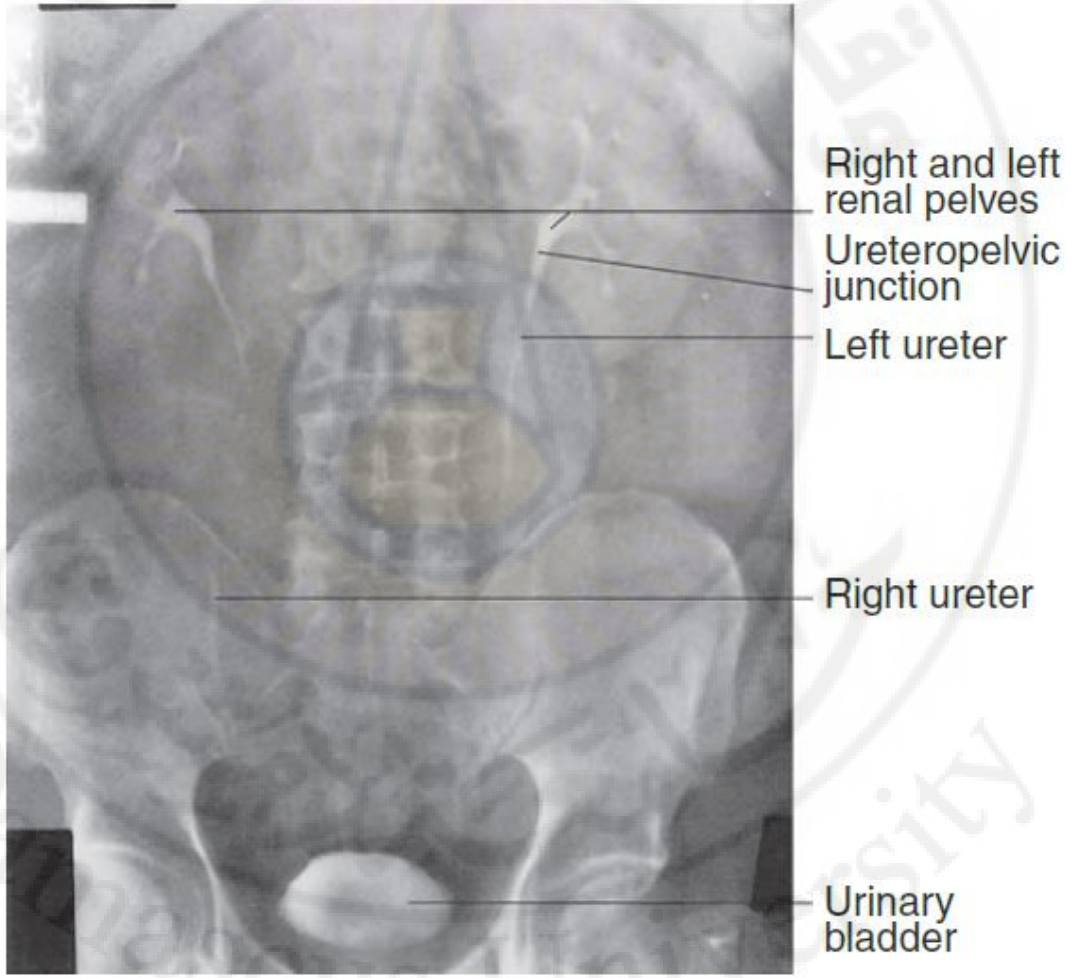


FIGURE 14-10 Intravenous urogram. The image shows the renal pelvis, ureters, and urinary bladder.

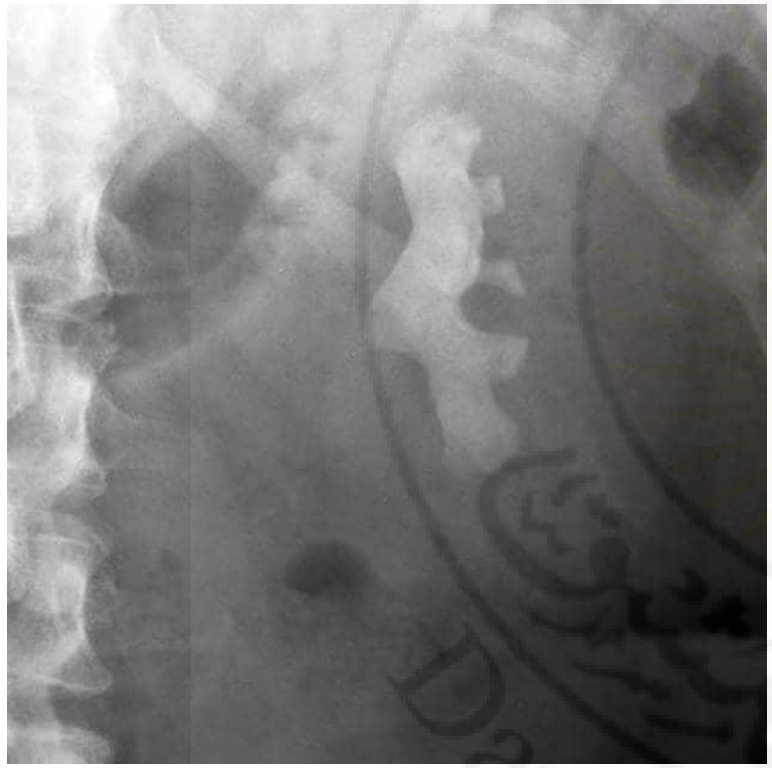




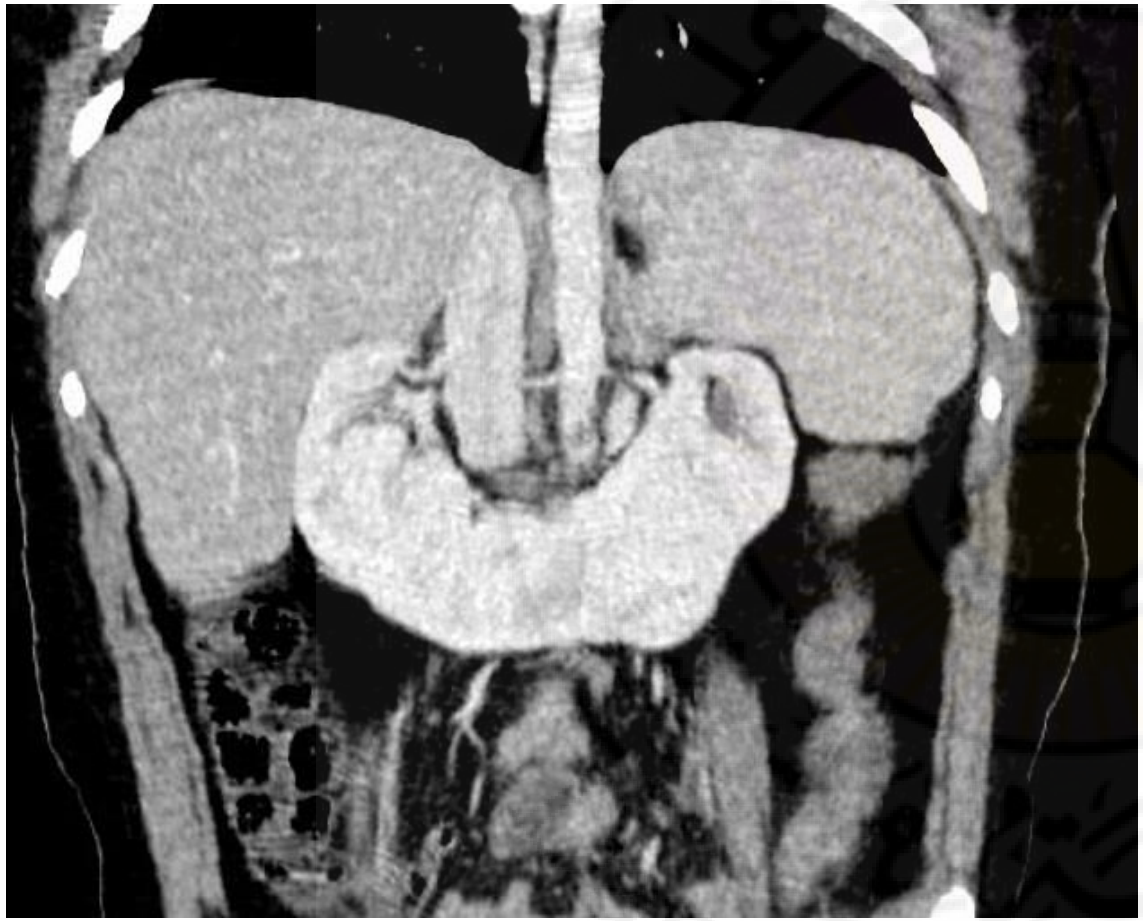
FIGURE 14-14 Staghorn calculus. The kidney shows hydronephrosis and stones that are casts of the dilated calices.

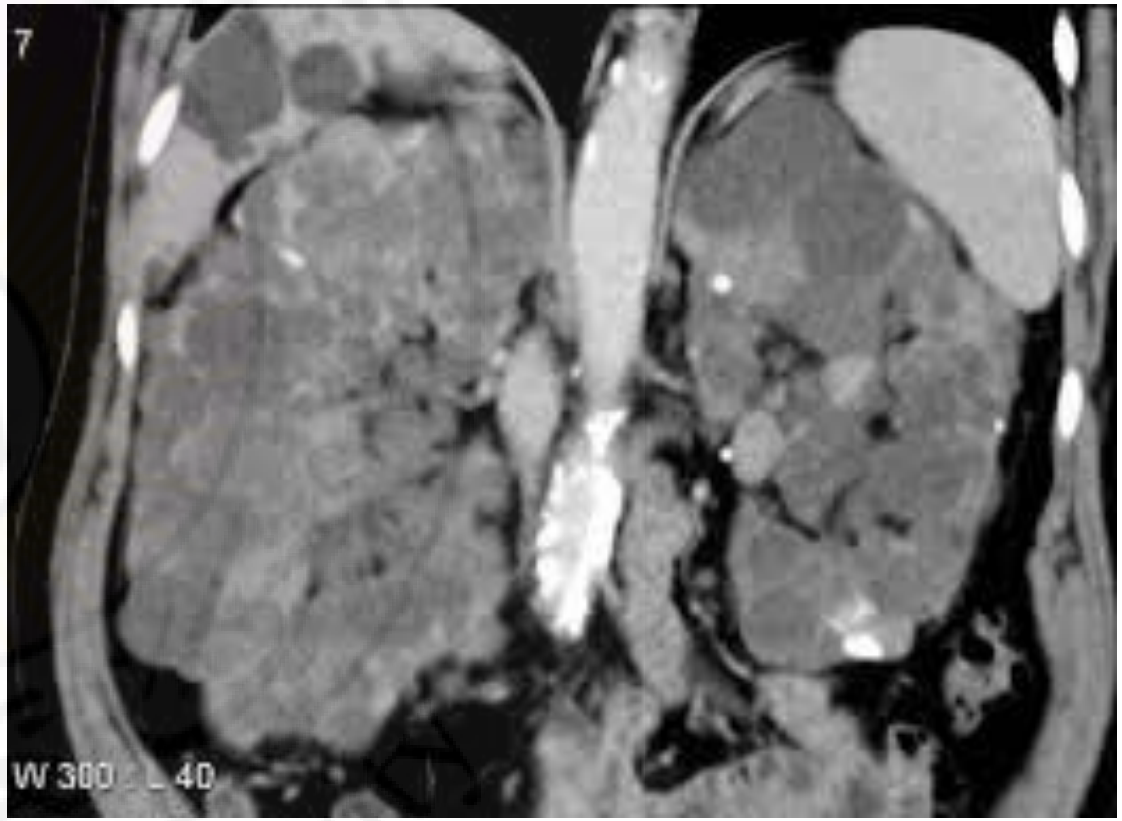


FIGURE 14-11 Horseshoe kidney. The photograph shows the kidneys fused at the poles.



FIGURE 14-13 Adult polycystic disease. The kidney is enlarged, and the active tissue is almost entirely replaced by cysts of varying size. (*Left*) Surface view. (*Right*) Longitudinal section.




7
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"Medical Terminology"
9+10th Lecture

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The nervous system

THE NEURON

The neuron is the nervous system's basic functional unit . Each neuron has two types of fibers extending from the cell body:

- A **dendrite** carries impulses toward the cell body.
- An **axon** carries impulses away from the cell body.

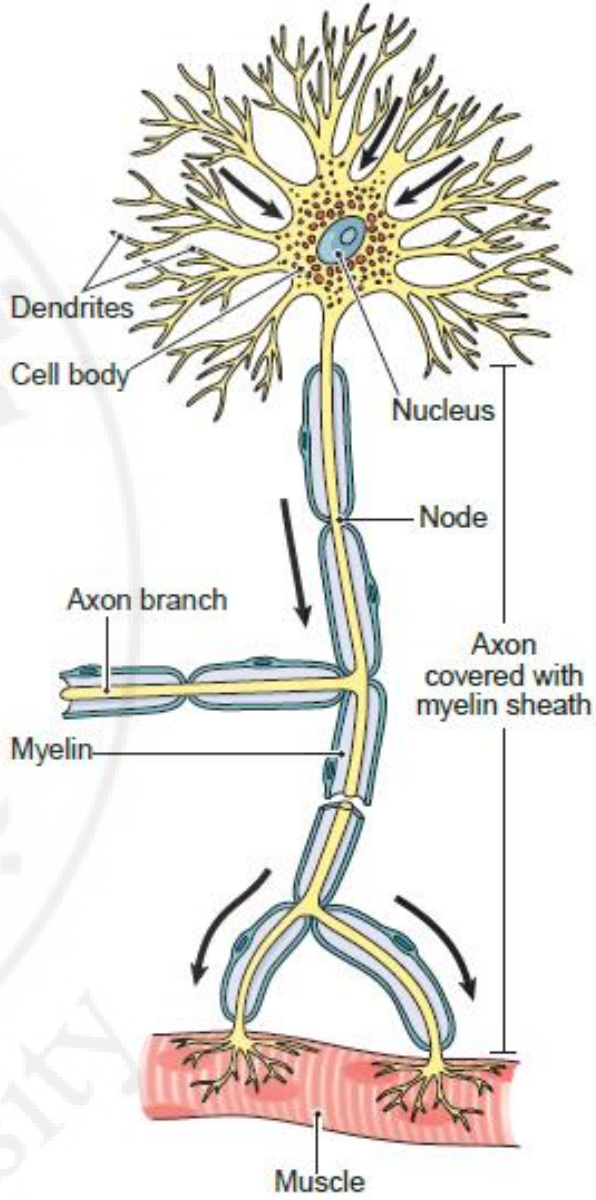


FIGURE 7-2 A motor neuron. The break in the axon denotes length. The *arrows* show the direction of the nerve impulse.

The nervous system

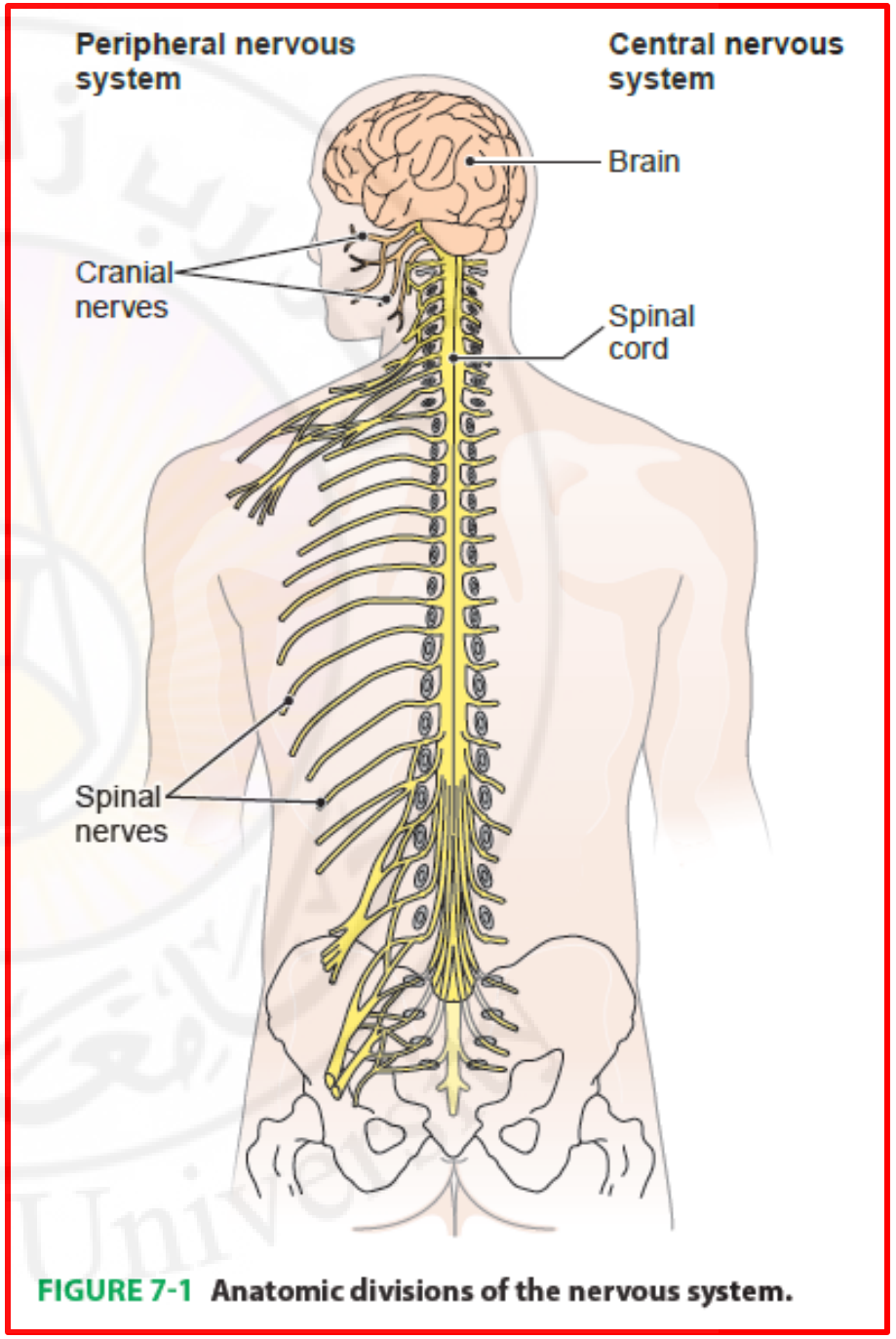


FIGURE 7-1 Anatomic divisions of the nervous system.

The nervous system

The Brain

The brain is nervous tissue contained within the cranium. It consists of the **cerebrum**, **diencephalon**, **brainstem**, and **cerebellum**. The cerebrum is the largest part of the brain ; it is composed largely of white matter with a thin outer layer of gray matter, the **cerebral cortex**. The cerebrum's distinct surface is formed by grooves, or **sulci** (singular: sulcus), and raised areas, or **gyri** (singular: gyrus).

The nervous system

The cerebrum is divided into two hemispheres by a deep groove, the longitudinal fissure. Each hemisphere is further divided into lobes with specialized.

The remaining parts of the brain are as follows:

■ The diencephalon contains the **thalamus**, the **hypothalamus**, and the pituitary gland. The thalamus receives sensory information and directs it to the proper portion of the cortex. The hypothalamus controls the pituitary and forms a link between the endocrine and nervous systems.

■ The brainstem consists of the: **Midbrain**, which contains reflex centers for improved vision and hearing.

Pons, which forms a bulge on the anterior surface of the brainstem

Medulla oblongata, which connects the brain with the spinal cord. All impulses passing to and from the brain travel through this region. The medulla also has vital centers for control of heart rate, respiration, and blood pressure.

■ The cerebellum is under the cerebrum and dorsal to the pons and medulla. Like the cerebrum, it is divided into two hemispheres. The cerebellum helps to control voluntary muscle movements and to maintain posture, coordination, and balance.

The nervous system

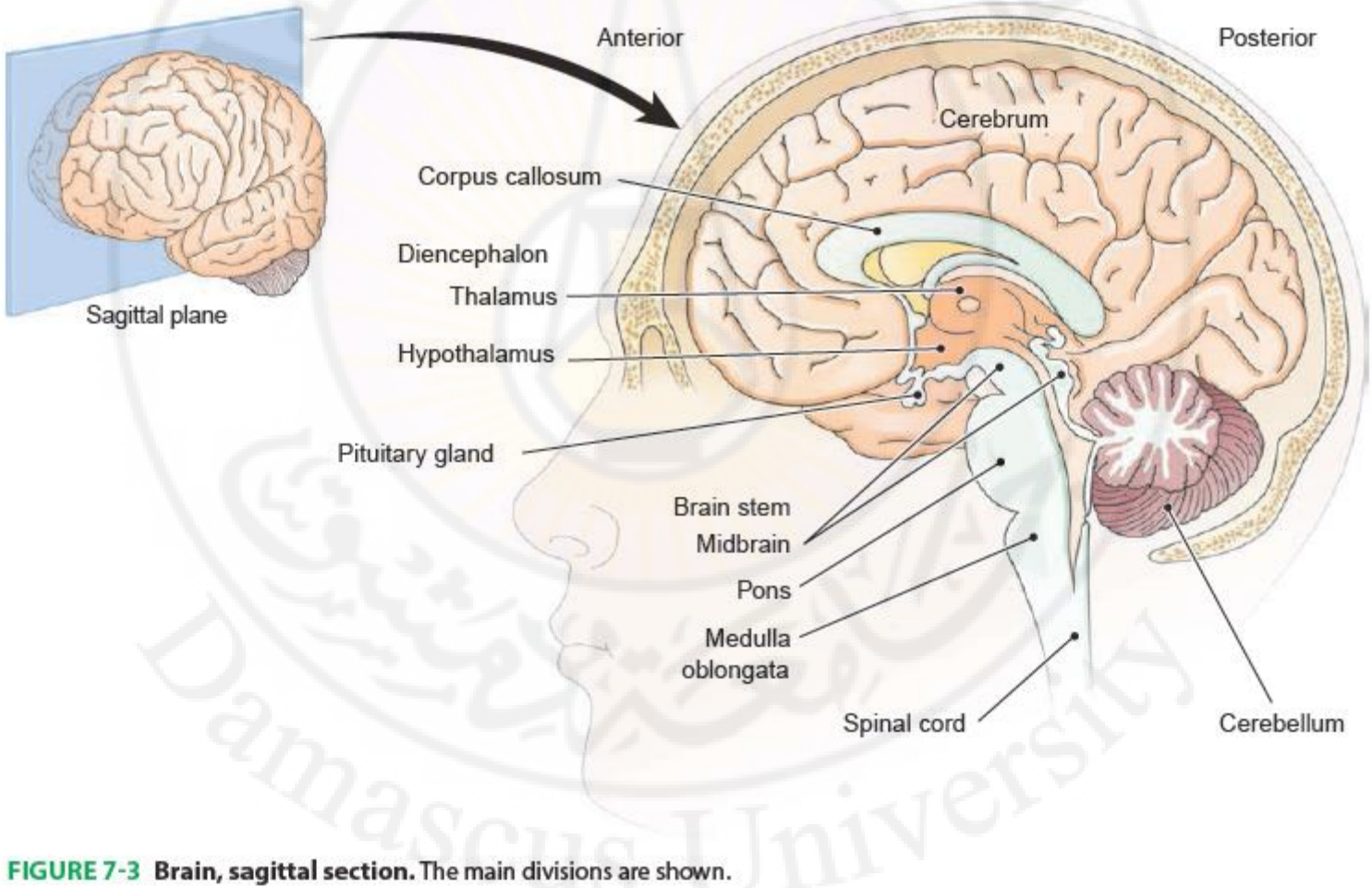


FIGURE 7-3 **Brain, sagittal section.** The main divisions are shown.

The nervous system

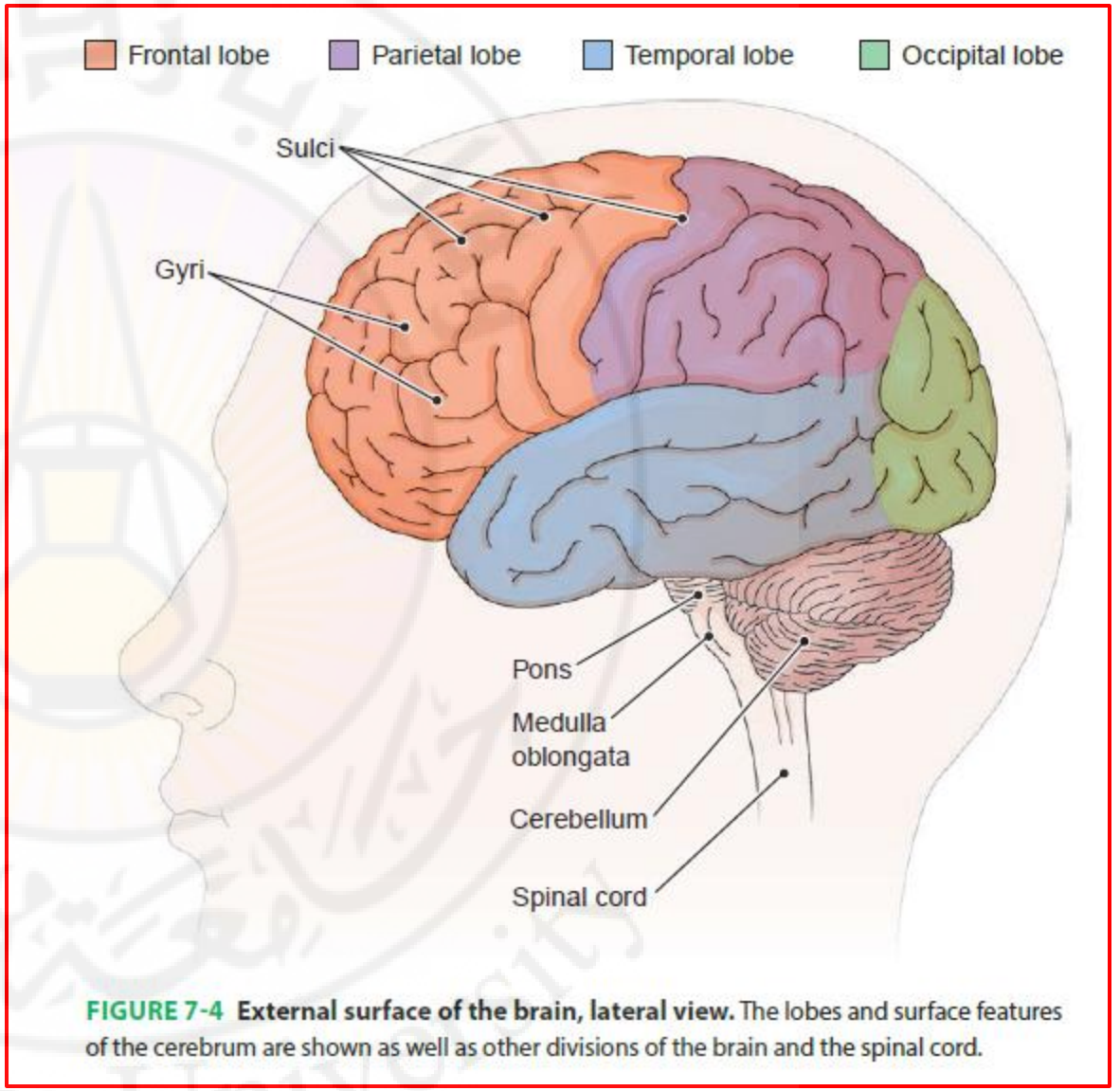


FIGURE 7-4 External surface of the brain, lateral view. The lobes and surface features of the cerebrum are shown as well as other divisions of the brain and the spinal cord.

The nervous system

Within the brain are four **ventricles** (cavities) in which **cerebrospinal fluid (CSF)** is formed. This fluid circulates around the brain and spinal cord, acting as a protective cushion for these tissues.

Covering the brain and the spinal cord are three protective layers, together called the **meninges** . All are named with the Latin word *mater*, meaning "mother," to indicate their protective function. They are the:

- **Dura mater**, the outermost and toughest of the three. *Dura* means "hard."
- **Arachnoid mater**, the thin, web-like middle layer. It is named for the Latin word for spider, because it resembles a spider web.
- **Pia mater**, the thin, vascular inner layer, attached directly to the tissue of the brain and spinal cord. *Pia* means "tender."

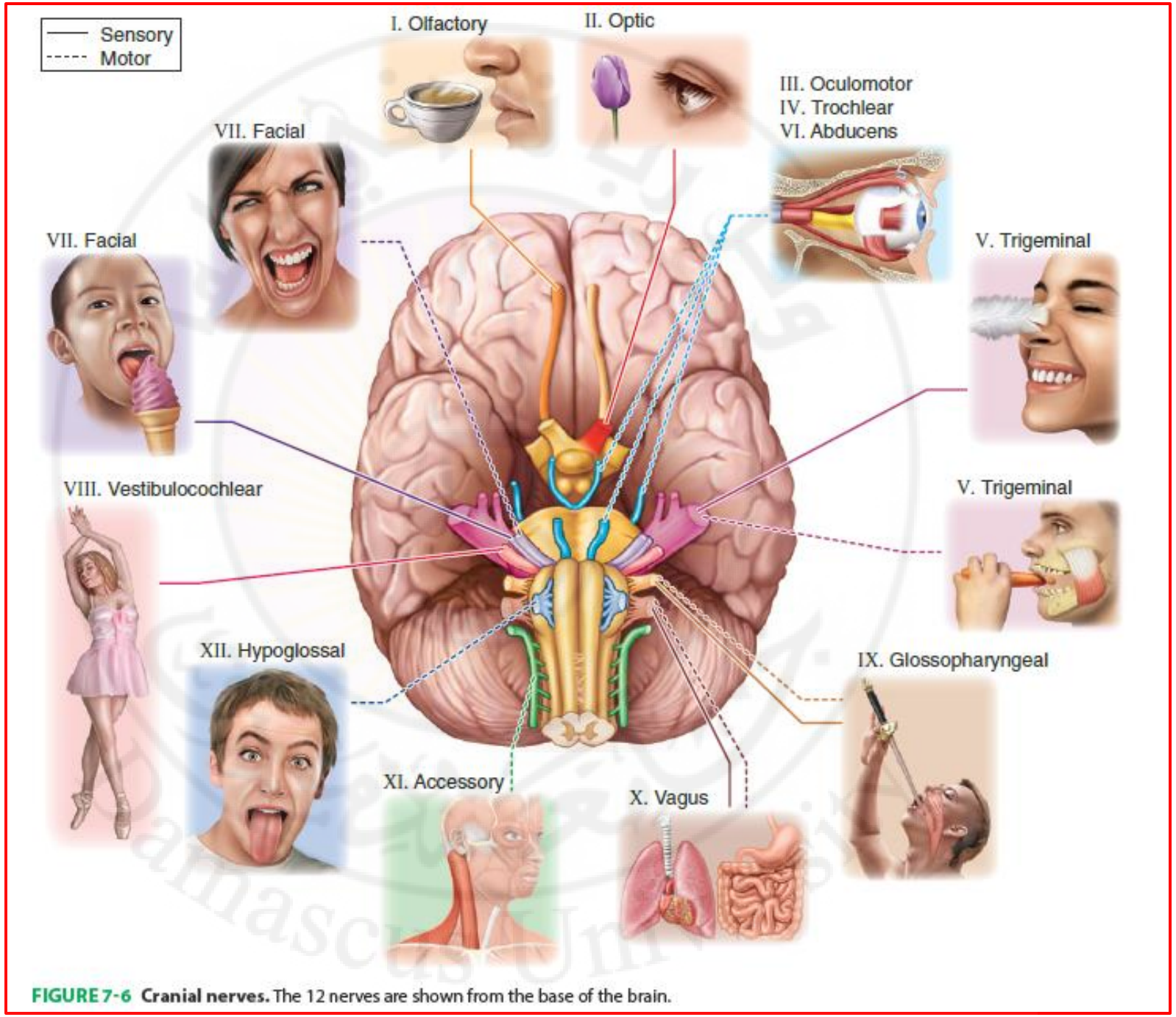


FIGURE 7-6 Cranial nerves. The 12 nerves are shown from the base of the brain.

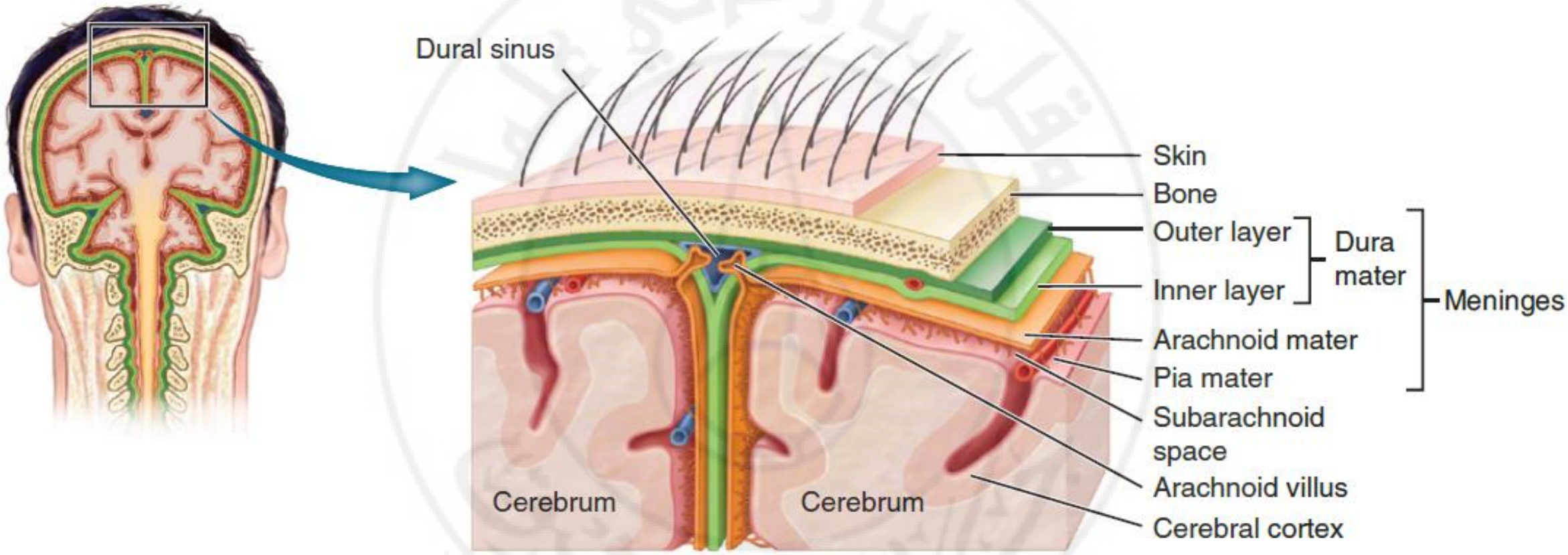
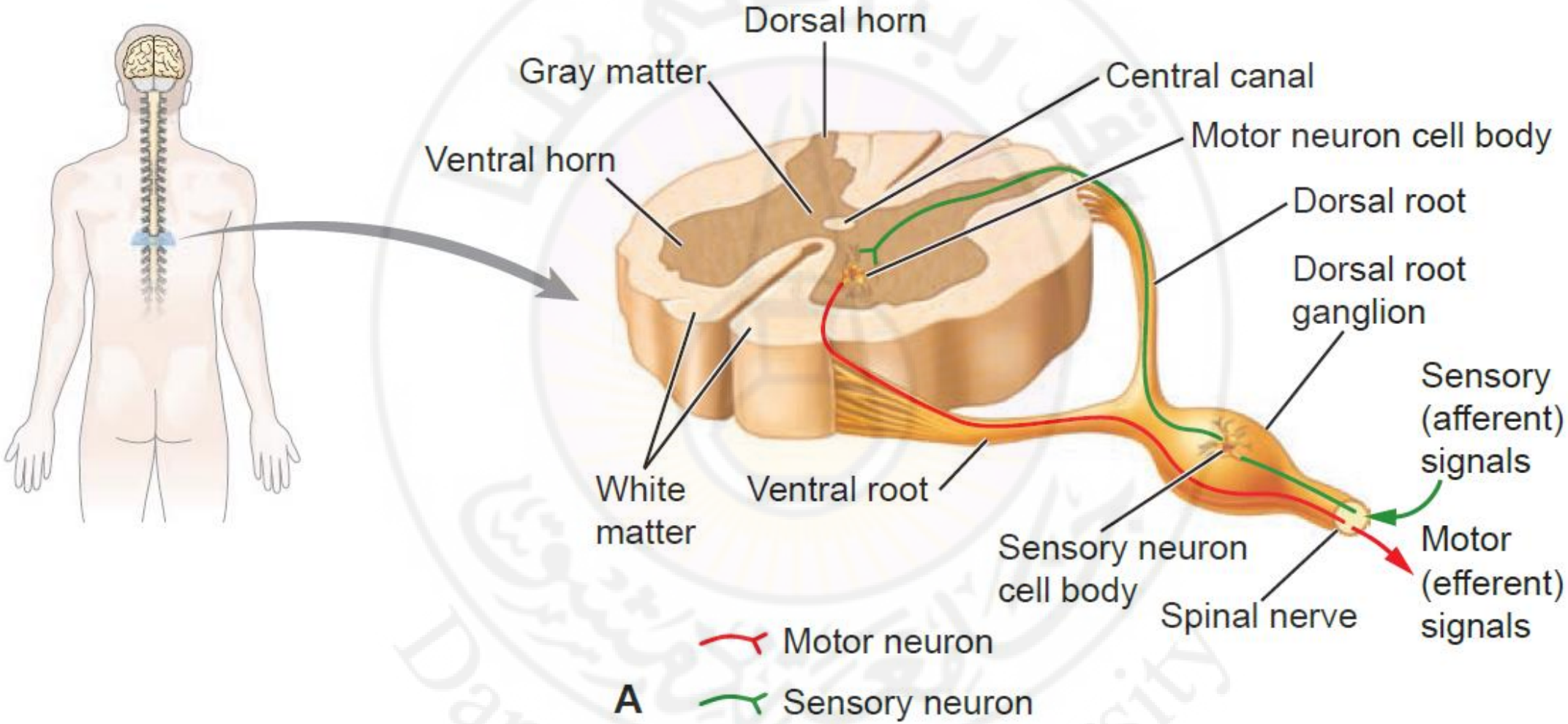


FIGURE 7-5 The meninges. The three protective layers and adjacent tissue are shown in a frontal section of the head.


Dorsal horn
Gray matter
Central canal
Motor neuron cell body
Ventral horn
Dorsal root
Dorsal root ganglion
Sensory (afferent) signals
White matter
Ventral root
Sensory neuron cell body
Motor (efferent) signals
Spinal nerve
Motor neuron
A
Sensory neuron

The term **cerebrovascular accident (CVA),** or **stroke**, applies to any occurrence that deprives brain tissue of oxygen. These events include blockage (ischemic stroke) in a vessel that supplies the brain, a ruptured blood vessel (hemorrhagic stroke).

An **aneurysm** is a localized dilation of a vessel that may rupture and cause hemorrhage. An aneurysm may be congenital or may arise from other causes, especially atherosclerosis, which weakens the vessel wall. Hypertension then contributes to its rupture.

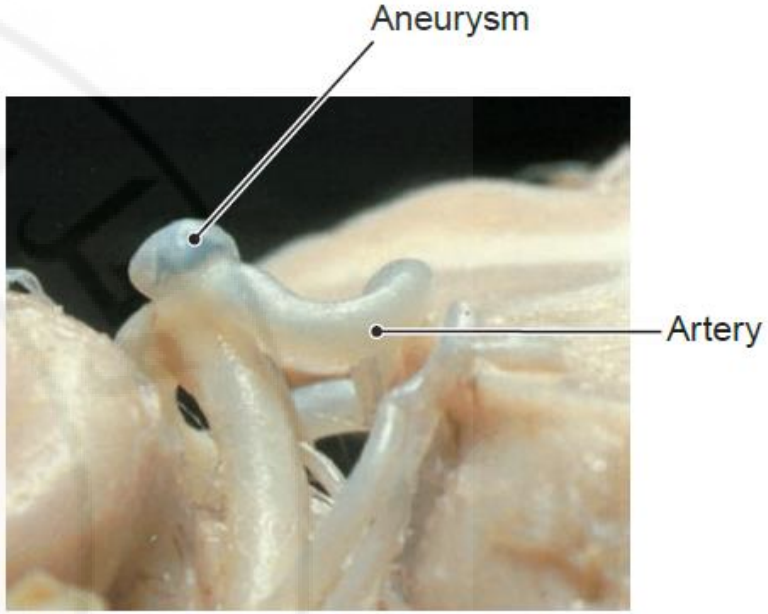


FIGURE 7-11 Aneurysm. A thin-walled aneurysm protrudes from an artery.

A **cerebral contusion** is a bruise to the brain's surface, usually caused by a blow to the head. Blood escapes from local vessels, but the injury is not deep. Cerebral **concussion**, also known as a **mild traumatic brain injury (MTBI)**, refers to a transient alteration in brain function resulting from head trauma. The effects include amnesia, headache, dizziness, vomiting, disorientation, and sometimes loss of consciousness.

epidural hematoma

bleeding between the dura mater and the skull.

subdural hematoma

A tear in the wall of a dural sinus causes bleeding between dura matter and arachnoid matter.

Intracranial hemorrhage

Hematoma inside brain tissue.

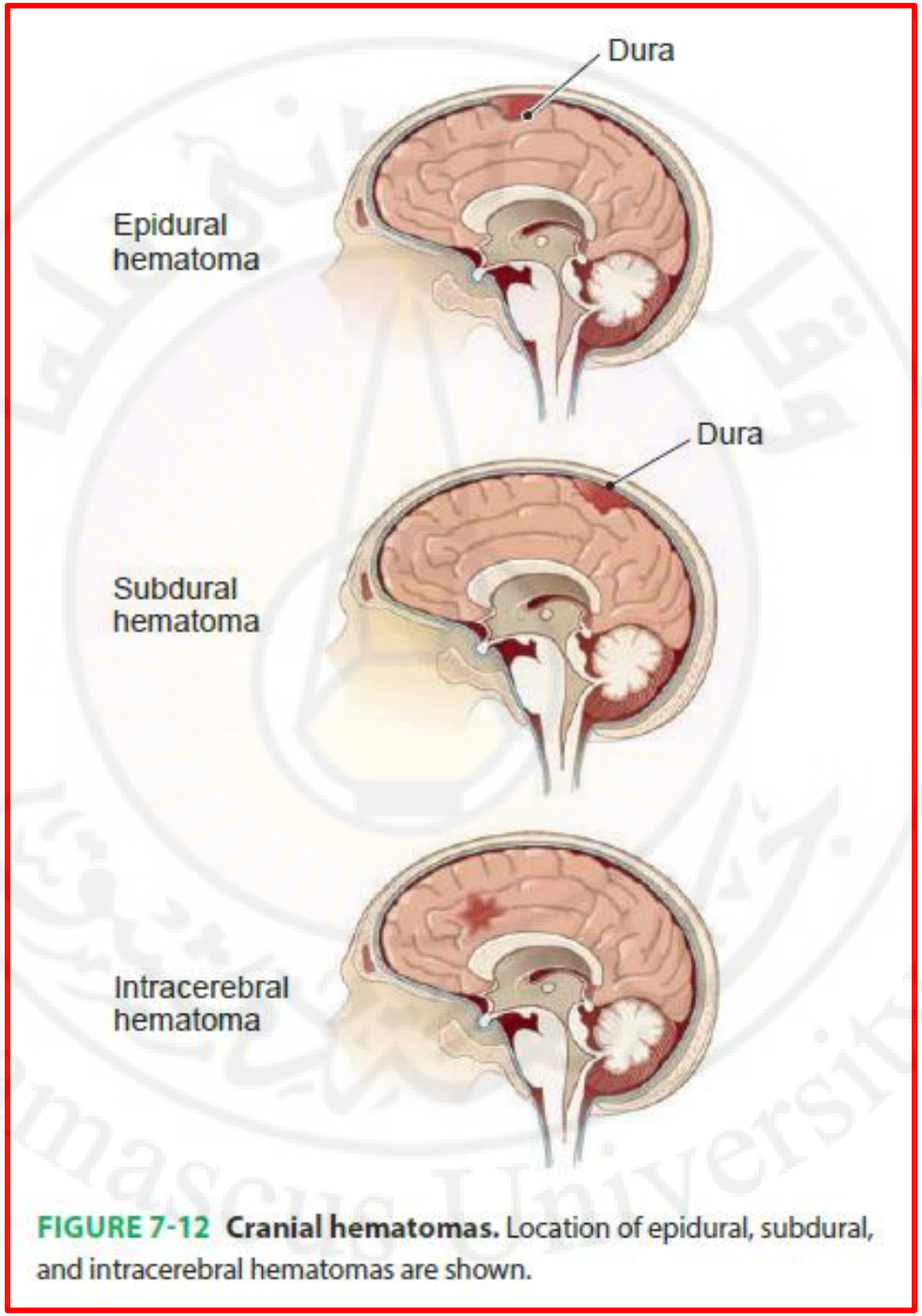


FIGURE 7-12 Cranial hematomas. Location of epidural, subdural, and intracerebral hematomas are shown.

Confusion is a state of reduced comprehension, coherence, and reasoning ability resulting in inappropriate responses to environmental stimuli.

Coma is a state of unconsciousness from which one cannot be aroused.

Inflammation of the meninges, or **meningitis**, is usually caused by bacteria that enter through the ear, nose, or throat or are carried by the blood.

Physicians can withdraw fluid for diagnosis by a **lumbar puncture**, using a needle to remove CSF from the meninges in the lumbar region of the spine. A laboratory can examine this fluid for white blood cells and bacteria in the case of meningitis.

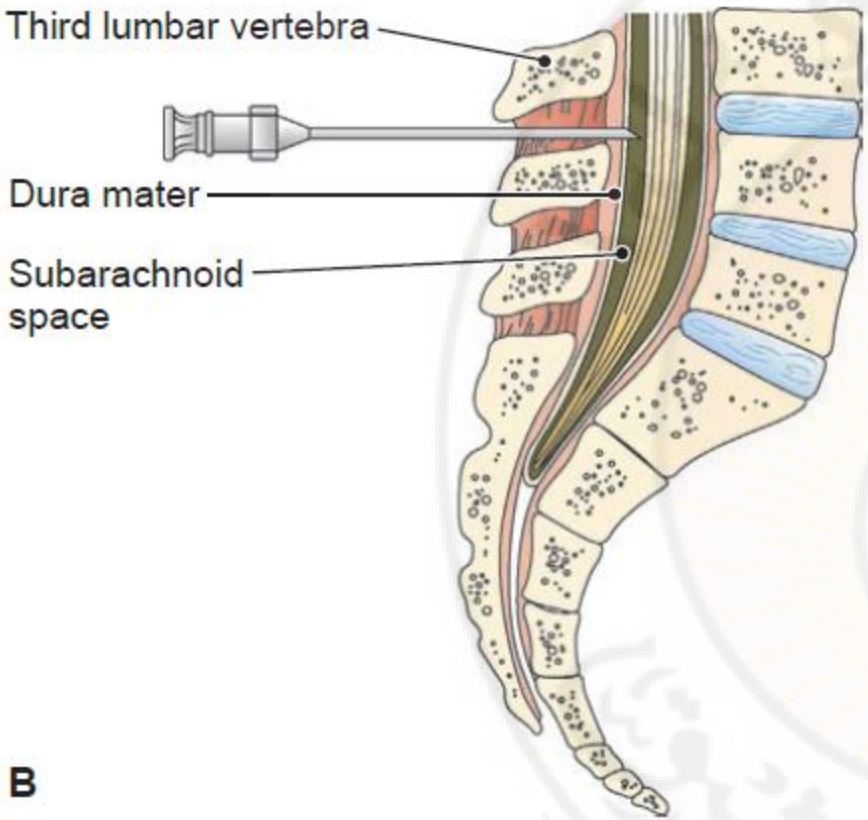


FIGURE 7-13 Lumbar puncture. A. Position of the patient for a lumbar puncture. **B.** CSF is withdrawn from the subarachnoid space between the third and fourth or fourth and fifth lumbar vertebrae.



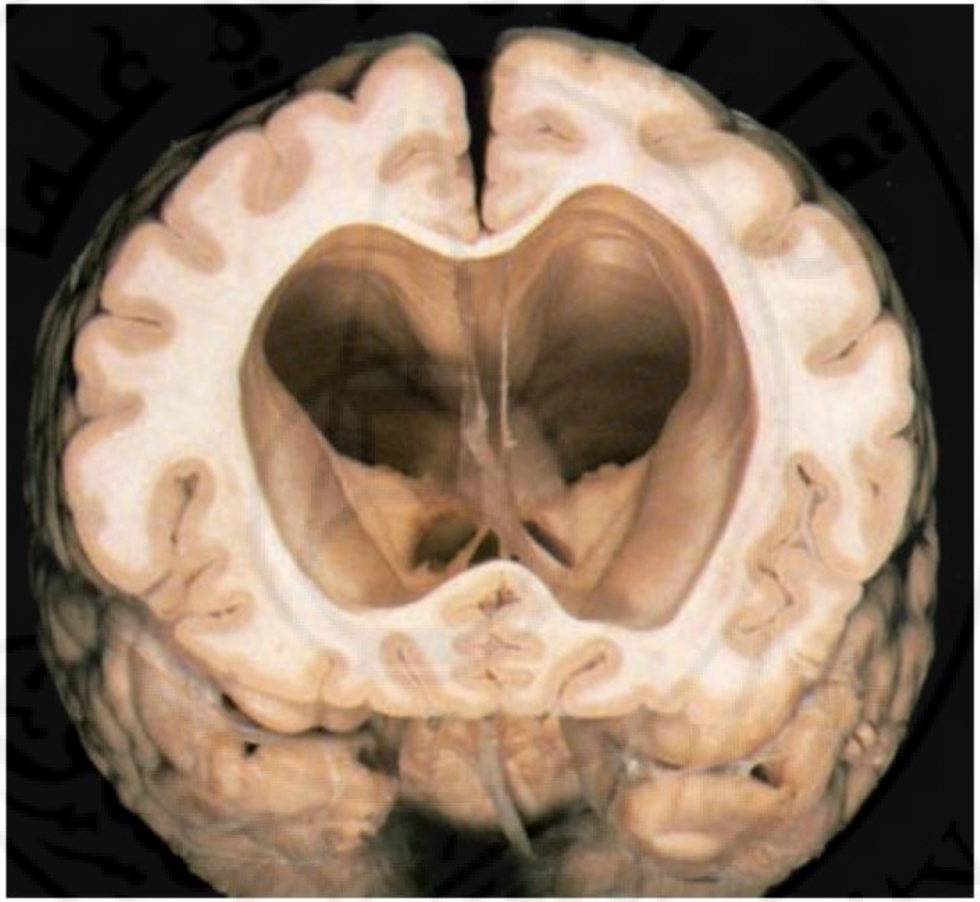


FIGURE 7-15 Hydrocephalus. Coronal section of the brain showing marked enlargement of the ventricles caused by a tumor that obstructed the flow of CSF.

DEGENERATIVE DISEASES

Multiple sclerosis (MS) is an autoimmune disease resulting in the demyelination (loss of the myelin sheath) of CNS axons and eventually neuronal death.

Parkinsonism occurs when, for unknown reasons, certain neurons in the midbrain fail to secrete the neurotransmitter dopamine.

This leads to tremors, muscle rigidity, flexion at the joints, akinesia (loss of movement), and emotional problems.

DEGENERATIVE DISEASES

Alzheimer disease (AD) results from unexplained degeneration of neurons and atrophy of the cerebral cortex .

DEGENERATIVE DISEASES



FIGURE 7-16 Effects of Alzheimer disease. A. Normal brain. **B.** Brain of a patient with Alzheimer disease, showing atrophy of the cortex with narrow gyri and enlarged sulci.

DEGENERATIVE DISEASES

EPILEPSY

A prime characteristic of epilepsy is recurrent seizures brought on by abnormal electric activity of the brain.

DEGENERATIVE DISEASES

How is epilepsy patient managed during an acute attake ?

Psychiatric 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.

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.

Obsessive–compulsive disorder (OCD) is a condition marked by disturbing thoughts or images that are persistent and intrusive, the person with OCD engages in repetitive behavior that interferes with normal daily activities, although he or she knows that such behavior is unreasonable. These patterns include repeated washing; performing rituals; arranging, touching, or counting objects; and repeating words or phrases.

OCD is associated with perfectionism and rigidity in behavior. Some specialists believe that OCD is related to low levels of the neurotransmitter serotonin in the brain. Treatment is with behavioral therapy and antidepressant drugs that increase the brain's serotonin levels.

When a highly stressful, catastrophic event results in persistent emotional difficulties, the condition is described as **posttraumatic stress disorder (PTSD)**. People who are abused, have their lives threatened, witness a crime, experience a natural disaster, and combat veterans are subject to PTSD.

Patients need early treatment with emotional support, protection, psychotherapy, and drugs to treat depression and anxiety.

Depression is a mental state characterized by profound feelings of sadness, emptiness, hopelessness, inability to concentrate, and lack of interest or pleasure in activities. Depression is often accompanied by insomnia, loss of appetite, and suicidal tendencies.

In **bipolar disorder** , normal moods alternate with episodes of depression and **mania**, a state of elation that may include agitation, hyperexcitability, or hyperactivity. Treatment for bipolar disorder may differ from therapy for depression alone and includes mood-stabilizing drugs and professional mental health therapy.

Most of the drugs used to treat mood disorders affect the level of neurotransmitters in the brain, such as the SSRIs, which prolong the action of serotonin.

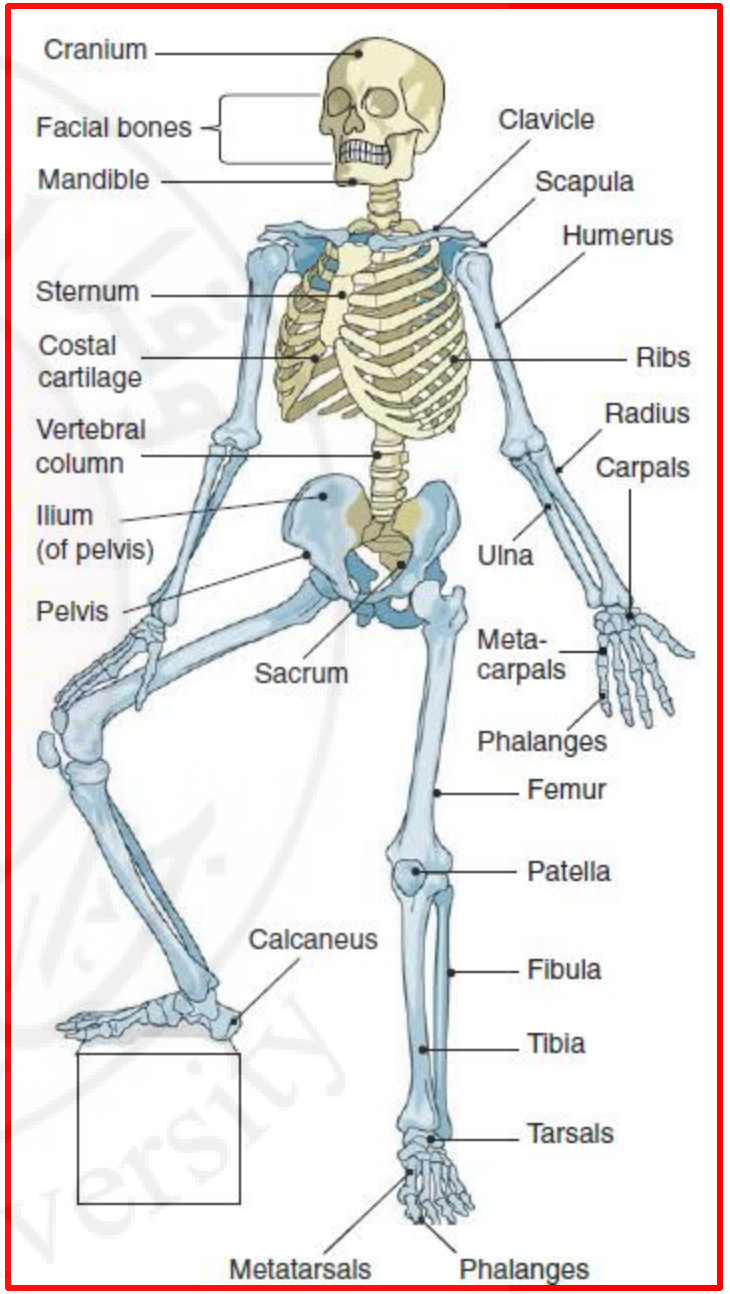
Psychosis is a mental state in which there is gross misperception of reality. This loss of touch with reality may be evidenced by **delusions** (false beliefs), including **paranoia**, delusions of persecution or threat, or **hallucinations**, imagined sensory experiences. Although the patient's condition makes it impossible for him or her to cope with the ordinary demands of life, there is lack of awareness that this behavior is inappropriate.

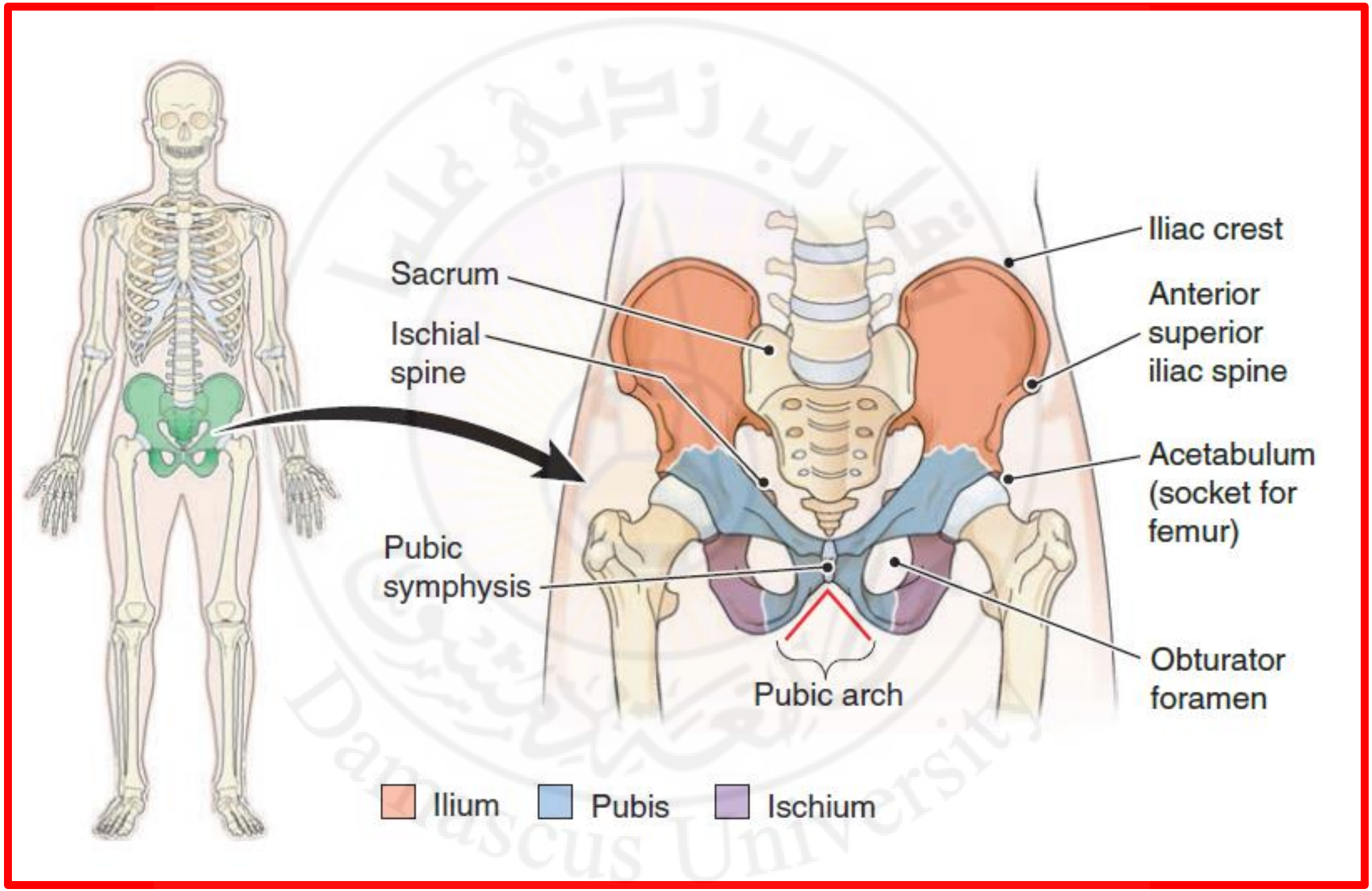
ANXIETY DISORDERS

AUTISM SPECTRUM DISORDER

The term autism spectrum disorder (ASD) applies to a range of impairments that appear early in life and affect social interactions and communication skills. Despite their limitations, a person with ASD may be of normal or above average intelligence, and even brilliant.

The skeletal system




Sacrum
Ischial spine
Pubic symphysis
Iliac crest
Anterior superior iliac spine
Acetabulum (socket for femur)
Obturator foramen
Pubic arch
Ilium
Pubis
Ischium

Although bone appears to be inert, it is actually living tissue that is constantly being replaced and remodeled throughout life. Three types of cells are involved in these changes:

- **Osteoblasts**, the cells that produce bone
- **Osteocytes**, mature bone cells that help to maintain bone tissue
- **Osteoclasts**, involved in the breakdown of bone tissue to release

DISORDERS

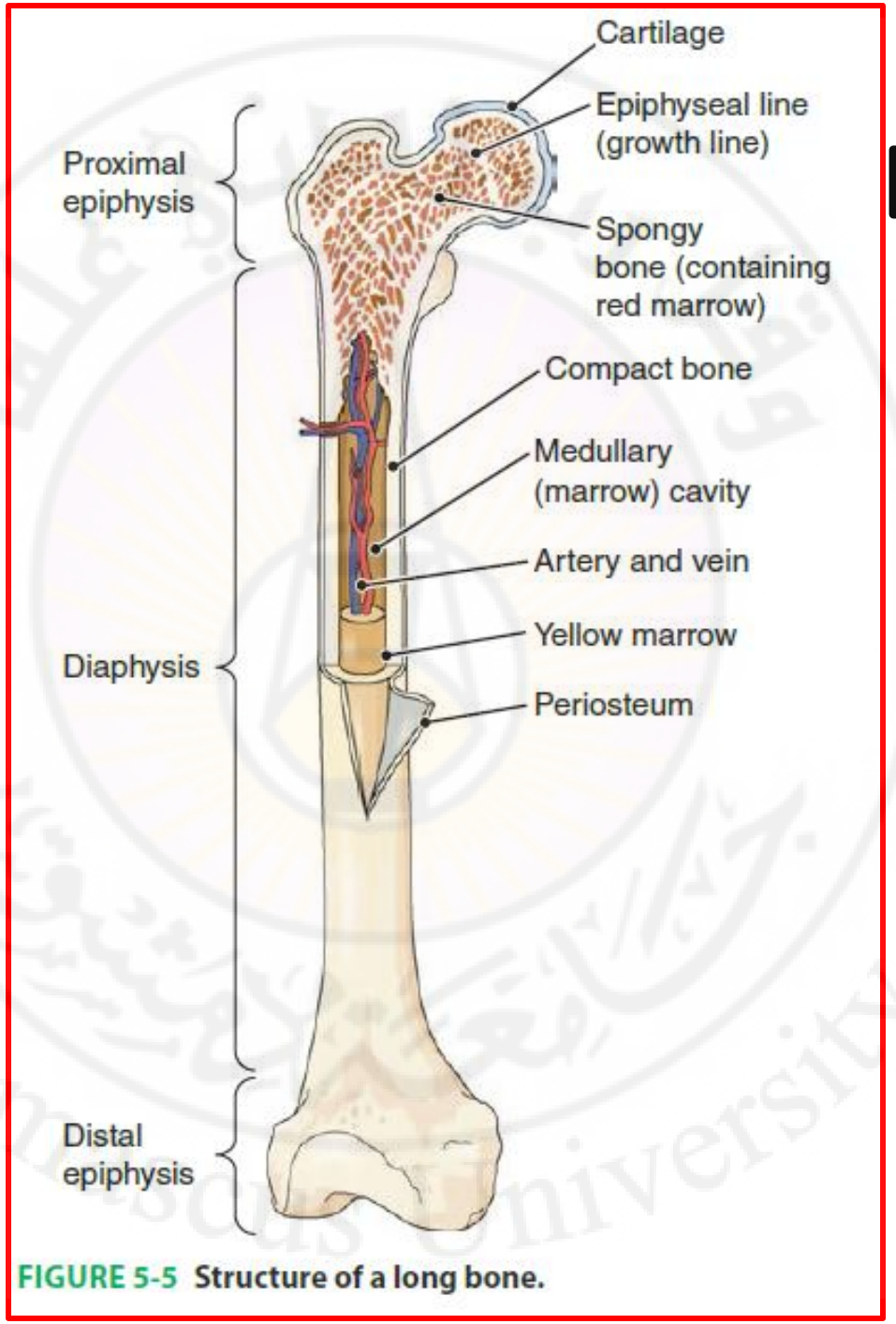


FIGURE 5-5 Structure of a long bone.

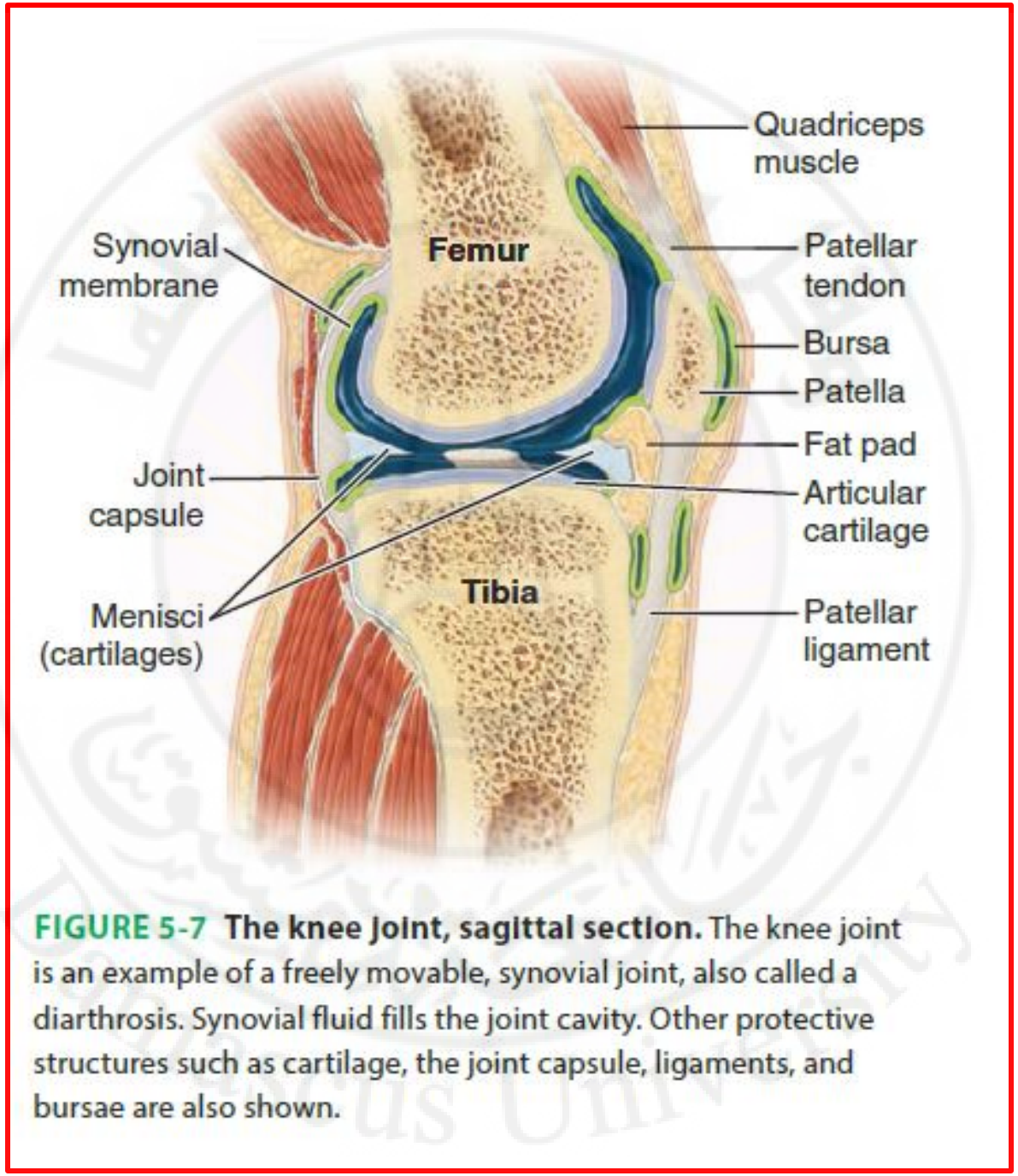


FIGURE 5-7 The knee joint, sagittal section. The knee joint is an example of a freely movable, synovial joint, also called a diarthrosis. Synovial fluid fills the joint cavity. Other protective structures such as cartilage, the joint capsule, ligaments, and bursae are also shown.

Clinical aspects

- **Osteomyelitis** is an inflammation of bone caused by pus forming bacteria that enter through a wound or are carried by the blood.

- A **fracture** is a break in a bone, usually caused by trauma. The effects of a fracture depend on the break's location and severity.

Reduction of a fracture refers to realignment of the broken bone. If no surgery is required, the reduction is described as closed; an open reduction is one that requires surgery to place the bone in proper position. Rods, plates, or screws might be needed to ensure proper healing.

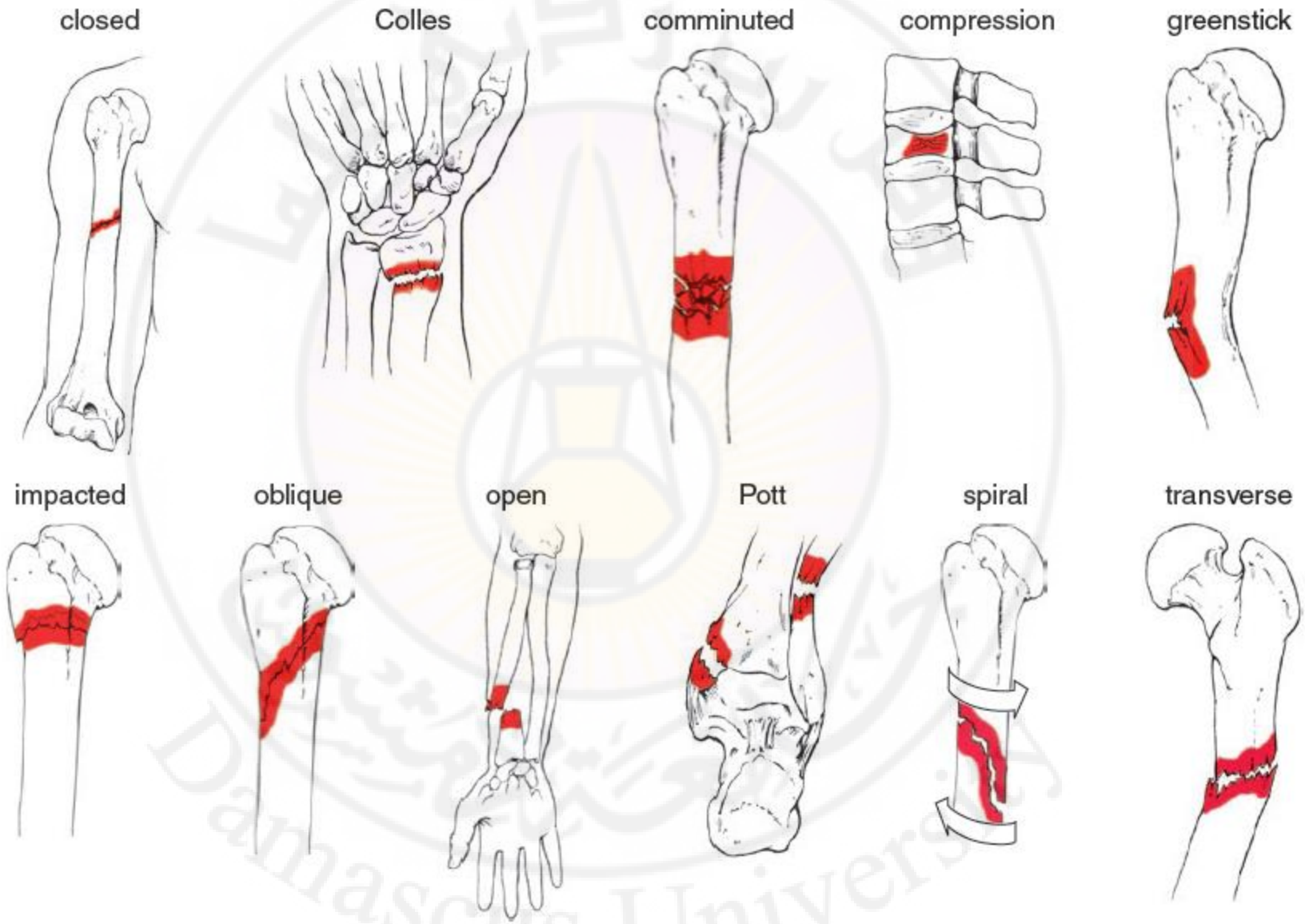


FIGURE 5-9 **Types of fractures.**

- **Osteoporosis** is a loss of bone mass that results in bone weakening .
- A decrease in estrogens after menopause makes women over age 50 most susceptible to the effects of this disorder. Efforts to prevent osteoporosis include a healthful diet, adequate intake of calcium and vitamin D,and engaging in regular weight bearing exercises, such as walking, running, aerobics, and weight training. These exercises stimulate bone growth and also contribute to the balance and muscle strength needed to prevent falls.

Osteoporosis is diagnosed and monitored using a DEXA (dual energy xray absorptiometry) scan, an imaging technique that measures bone mineral density (BMD).

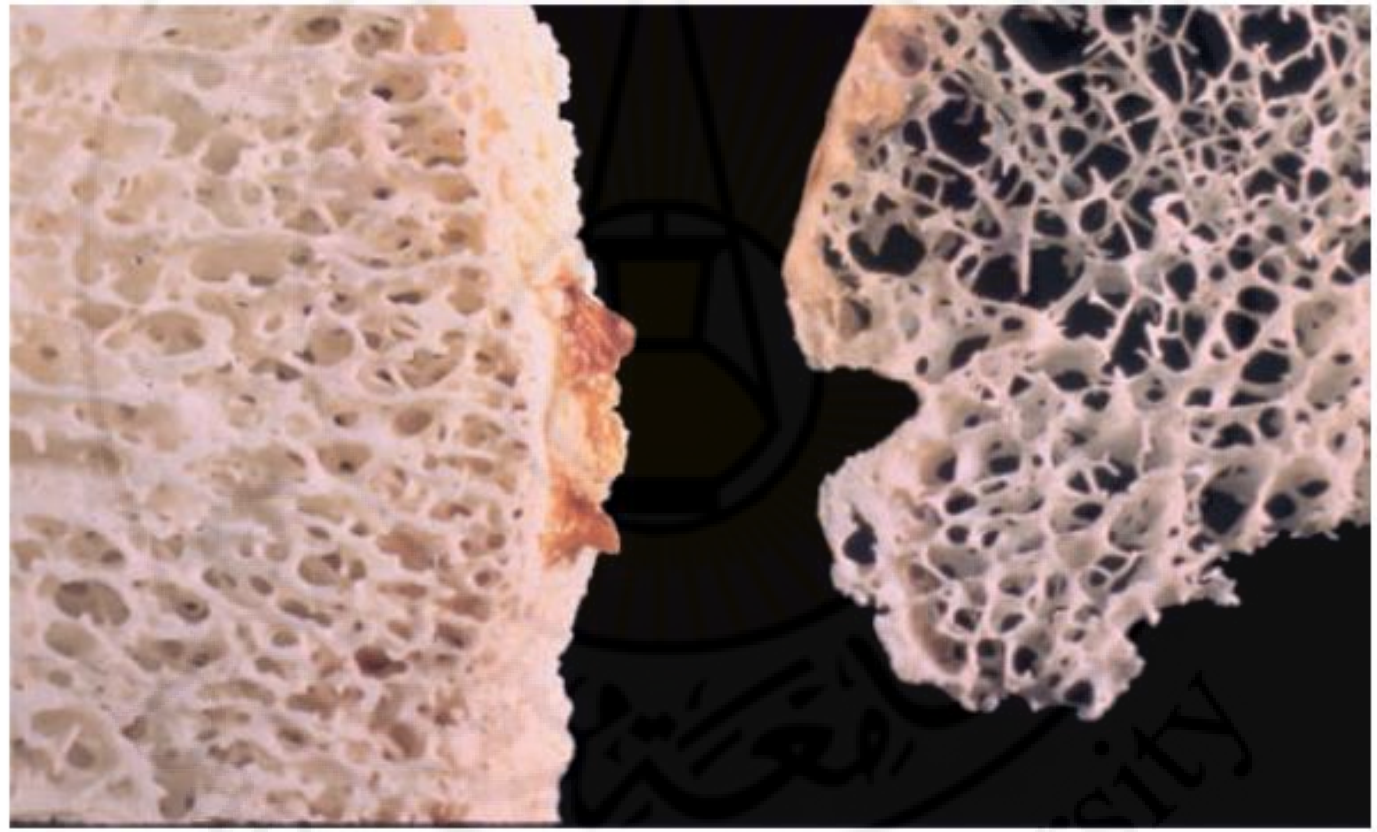
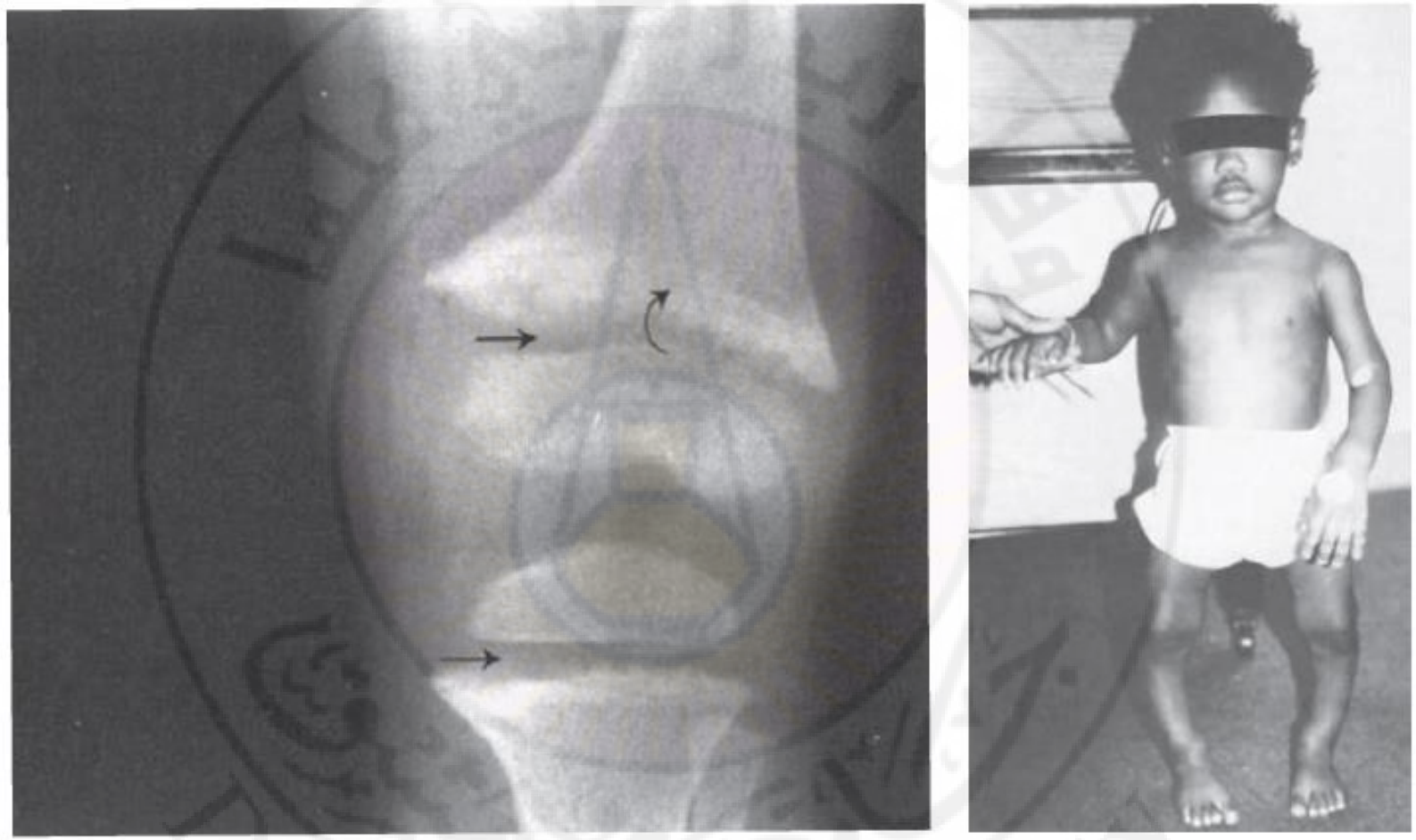


FIGURE 5-10 Osteoporosis. Femoral head showing osteoporosis (*right*) compared with a normal control (*left*).

- In **osteomalacia** there is a softening of bone tissue because of diminished calcium salt formation.
- When osteomalacia occurs in children, the disease is called **rickets**
- Rickets is usually caused by a vitamin D deficiency. disorders. When



A B

FIGURE 5-11 Rickets. A. Radiograph of the left knee joint showing widening of the growth regions of the bones (*arrows*). **B.** Young child showing rickets.

Arthritis

The most common form of arthritis is **osteoarthritis (OA)** or **degenerative joint disease (DJD)** **(FIG. 5-13)**. This involves a gradual degeneration of articular (joint) cartilage as a result of wear and tear.

Radiographs show a narrowing of the joint cavity and bone thickening. Cartilage may crack and break loose, causing inflammation in the joint and exposing the underlying bone.

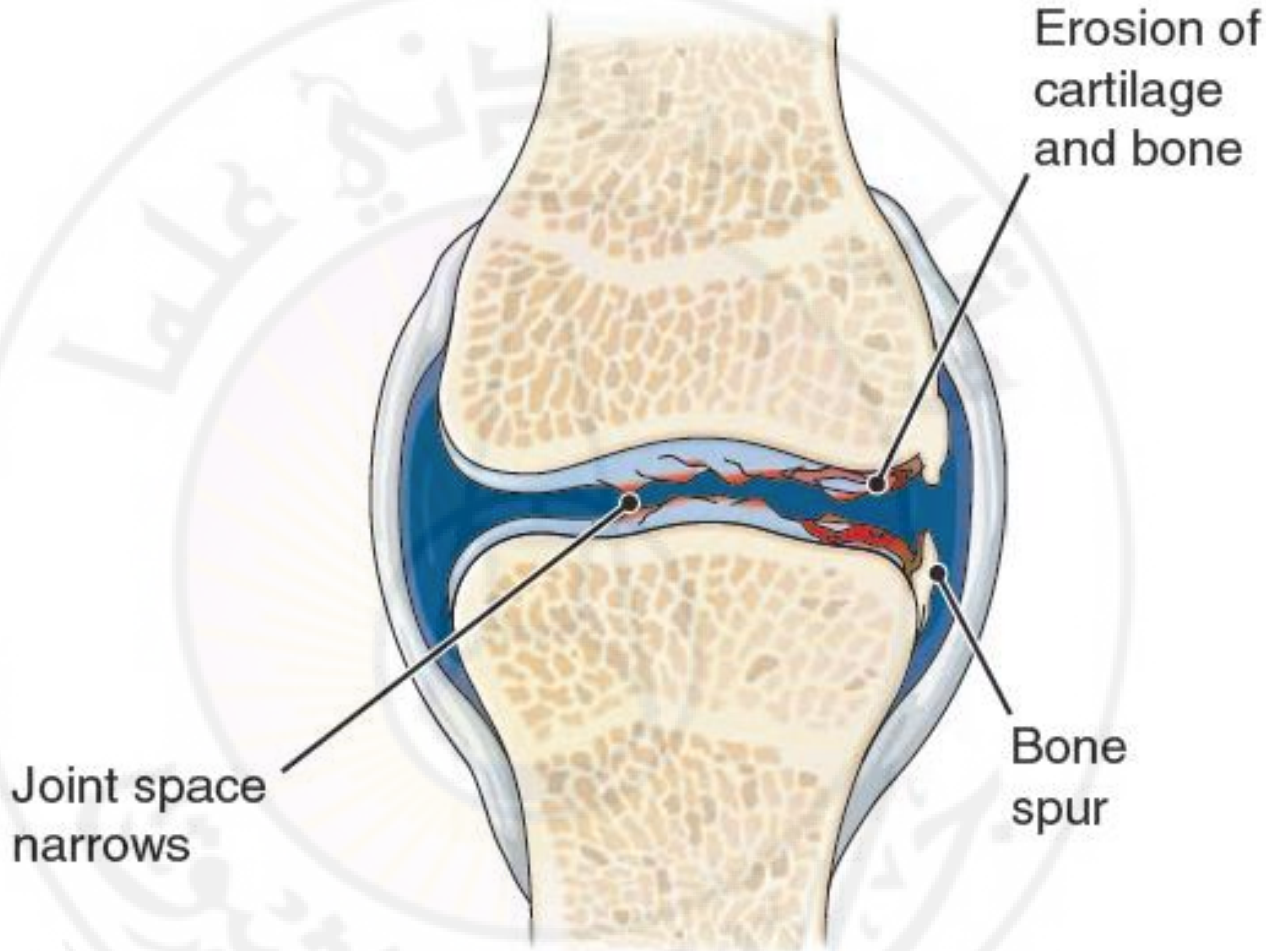


FIGURE 5-13 Joint changes in osteoarthritis (OA). The left side of the joint shows early changes with breakdown of cartilage and narrowing of the joint space. The right side shows progression of the disease with loss of cartilage and a bone overgrowth (spur).

OA is treated with analgesics to relieve pain; **anti-inflammatory agents**, such as corticosteroids; **nonsteroidal anti-inflammatory drugs (NSAIDs)**; and physical therapy. Steroids can be injected directly into an arthritic joint, but because they may ultimately cause cartilage damage, only a few injections can be given within a year at intervals of several months. Treatment may include drainage of excess fluid from the joint in an **arthrocentesis.** Application of ice, elevation, and acupuncture may also help to relieve pain in cases of joint inflammation.

Gout is caused by an increased level of uric acid in the blood, salts of which are deposited in the joints. It mostly occurs in middle-aged men and almost always involves pain at the base of the great toe.

Rheumatoid arthritis (RA) is a systemic inflammatory joint disease that commonly appears in young adult women. Its exact causes are unknown, but it may involve immunologic reactions. A group of antibodies called **rheumatoid factor** often appears in the blood,



In **arthroscopy**, orthopedic surgeons use a type of endoscope called an arthroscope to examine a joint's interior and perform surgical repairs if needed.

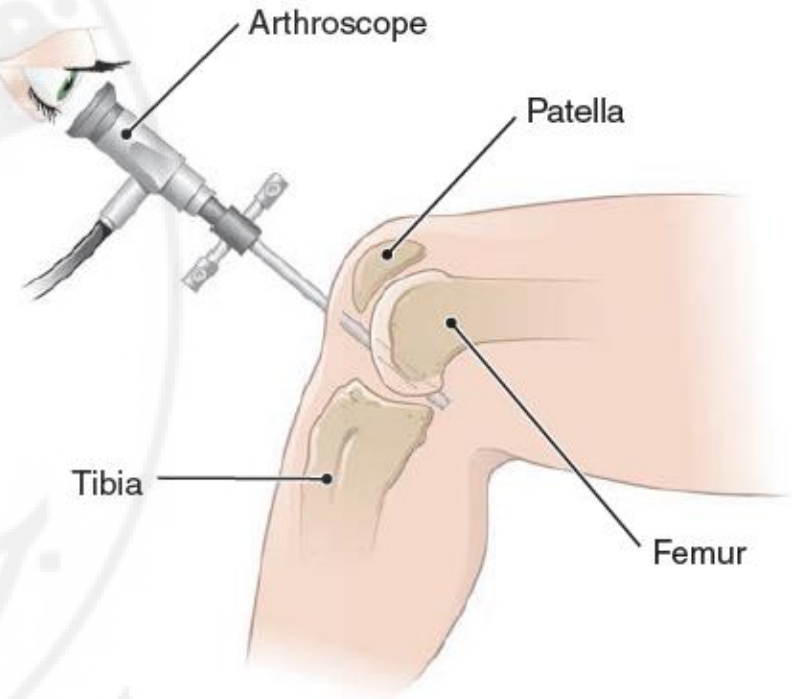


FIGURE 5-15 Arthroscopic examination of the knee. An arthroscope (a type of endoscope) is inserted between projections at the end of the femur to view the posterior of the knee.

Disorders of the spine

Spondylolisthesis is a forward sliding of a vertebra over the vertebra below (listhesis means “a slipping”) (FIG. 5-17). The condition follows spondylolysis, degeneration of the joint structures that normally stabilize the vertebrae.

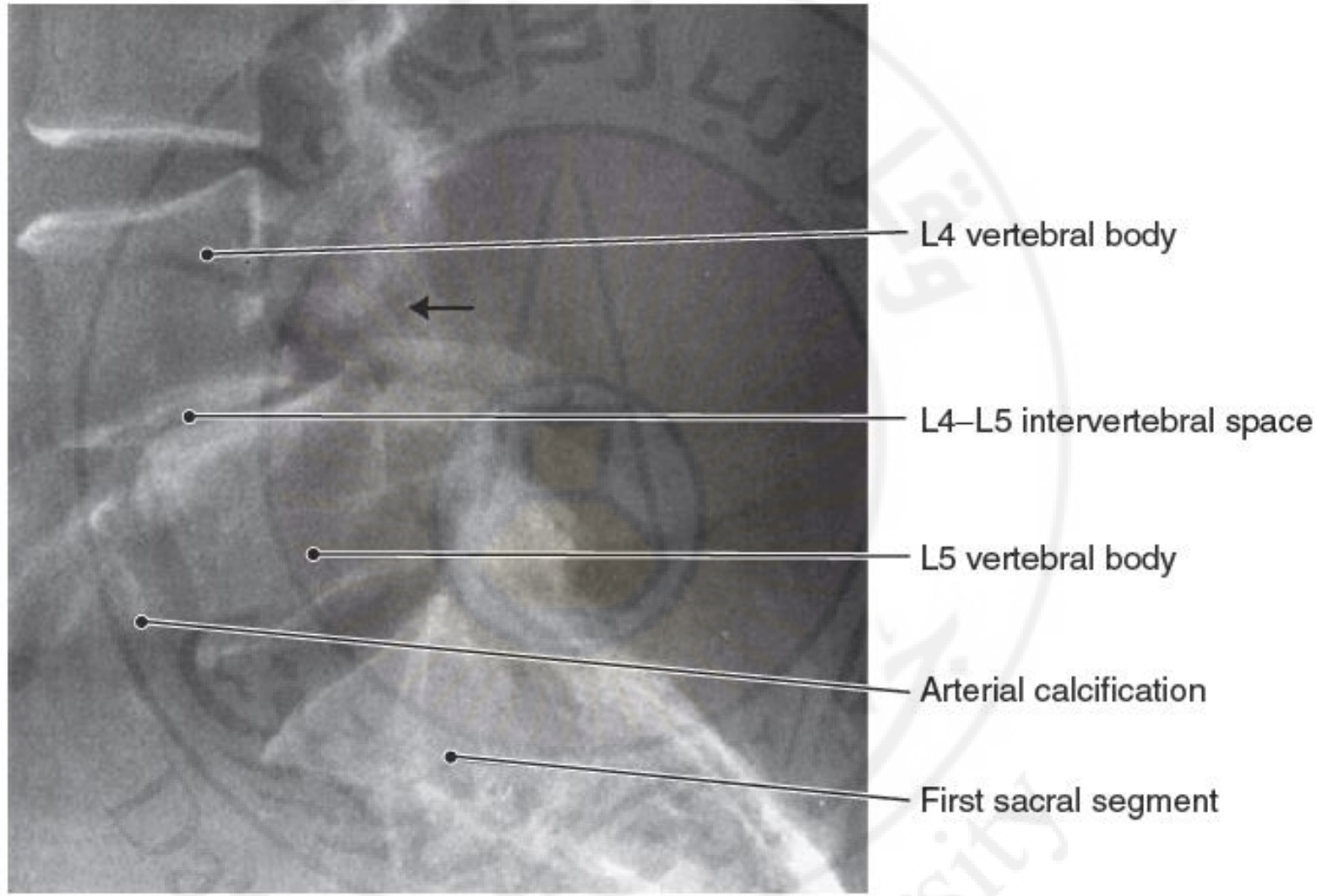


FIGURE 5-17 Spondylolisthesis. The L4 vertebral body has slid forward over L5, and there is marked narrowing of the L4–L5 intervertebral disk space.

Herniated Disk

In cases of a herniated disk ,the central mass (nucleus pulposus) of an intervertebral disk protrudes through the disk's weakened outer ring (annulus fibrosus) into the spinal canal.

The herniated or "slipped" disk puts pressure on the spinal cord or spinal nerves, often causing sciatica, which is pain along the sciatic nerve in the thigh. There may be spasms of the back muscles, leading to disability.

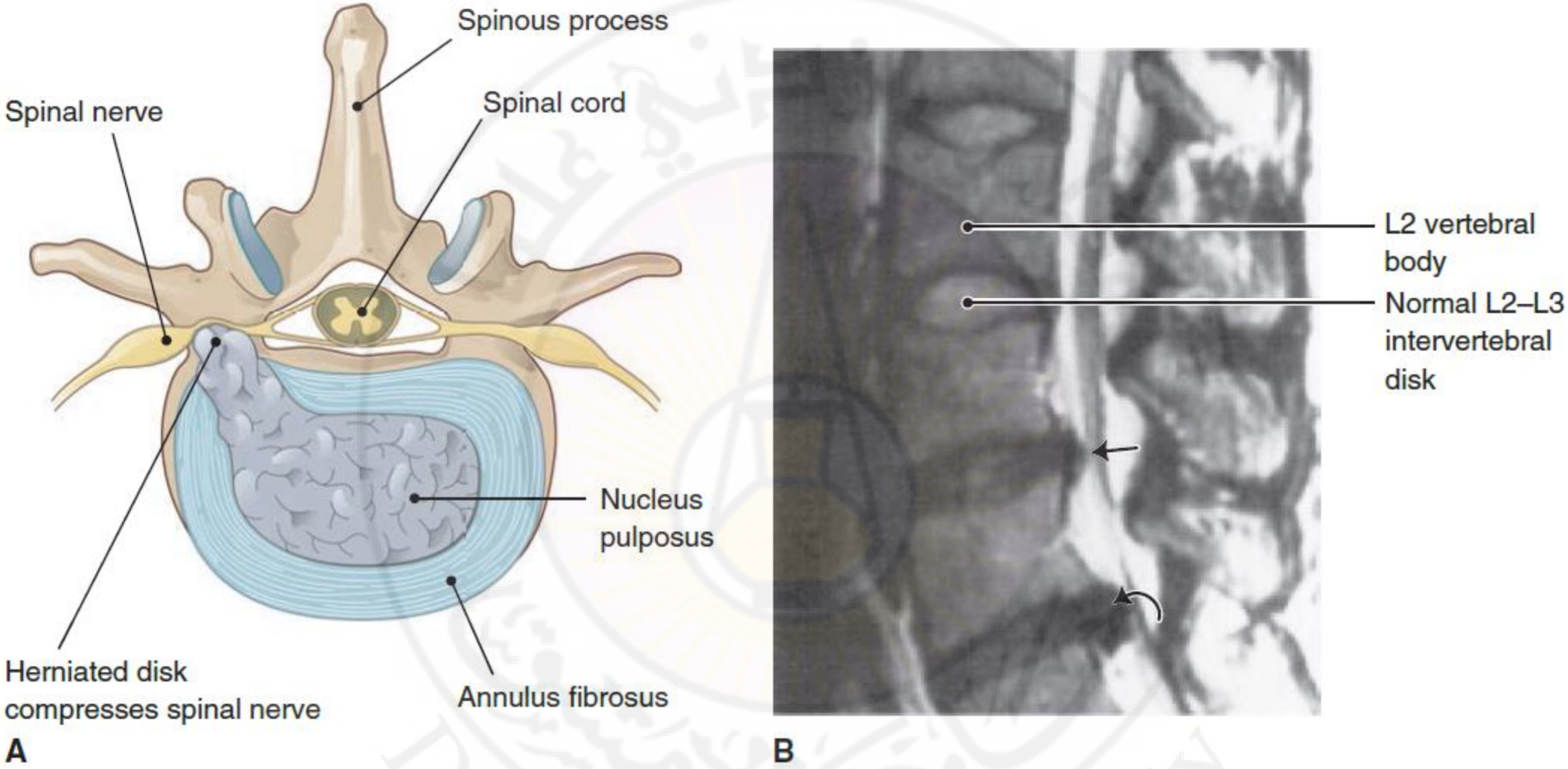


FIGURE 5-18 Herniated disk. A. The central mass of the disk protrudes into the spinal canal, putting pressure on the spinal nerve. **B.** Magnetic resonance image (MRI) of the lumbar spine, sagittal section, showing herniated disks at multiple levels. There is a bulging L3–L4 disk (*straight arrow*) and an extruded L4–L5 lumbar disk (*curved arrow*).

Curvatures of the Spine

The spine has four normal curves—two directed toward the anterior in the cervical and lumbar regions and two directed toward the posterior in the thoracic and sacral regions .

Any exaggeration or deviation of these curves is described as **curvature of the spine.** Three common types of spinal curvatures are described as follows:

- **Kyphosis** is an exaggerated curve in the thoracic region, popularly known as “hunchback.”
- **Lordosis** is an exaggerated curve in the lumber region, popularly known as “swayback.”
- **Scoliosis** is a sideways curvature of the spine in any region.

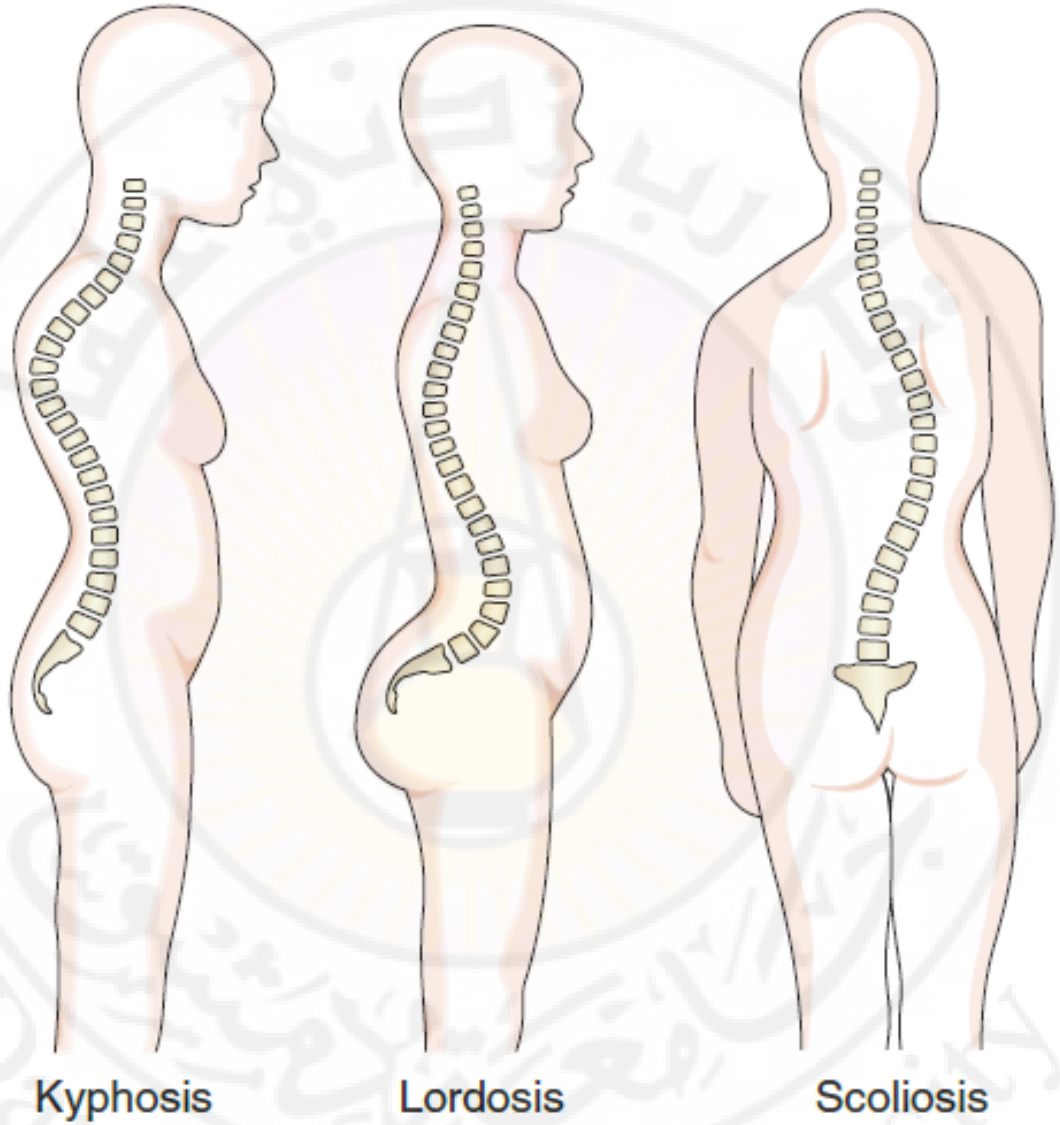


FIGURE 5-19 Curvatures of the spine. Kyphosis is an exaggerated thoracic curve; lordosis is an exaggerated lumbar curve; scoliosis is a sideways curve in any region.

تم بحمده تعالى