MEDICAL TERMINOLOGY

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CHAPTER 1

INTRODUCTION

Medical terminology is a special vocabulary used by health care professionals for precise and effective communication.
It is based on words of Greek and Latin origin, therefore this vocabulary is uniform and consistent in every part of the world.
The basic building blocks of clinical terms are the prefixes, suffixes and word roots. Regardless of the length or complexity of a term, the term can be deciphered knowing the meaning of the sub-units of it.
Students are instructed how to break down complex words into subunits they have been familiar with. Once the word building principles are mastered, any medical term can be easily understood.

- The language of clinical practice is Greek.

Most clinical terms consist of three main parts: - a prefix, a root and a suffix – and these word parts maintain their original, same meanings whenever they appear.

What is the word root? It is the fundamental, basic unit of a word. Choose the Greek word: neur- (nerve in English).

What is the suffix? It is a word part added after the word root to modify its meaning, e.g.:
-itis, (meaning: inflammation of something).

If we put the two word parts together we get a new term: neur + itis = neuritis (inflammation of the nervous system).

What is the prefix? It is a word part added before the root to modify its meaning, e.g.:
leuk/o- (it is an adjective prefix with the meaning „white”).
Choose a noun: cyte (a Greek word: cell) and join them: leukocyte (white blood cell).

We can put two word roots together with the help of the combining vowel: -o.
E.g.: neur – o – cyte = neurocyte (cell in the nervous system, nerve cell).
neur – o –pathy = neuropathy (any disease of the nerve)
nephr –o- pathy= nephropathy (any disease of the kidneys)
cardi – o– logy = cardiology (study of the conditions associated with the heart)
audi – o – logy = audiology (study of hearing)

(If the suffix begins with a vowel, the combining vowel „o” is omitted: neur – **i**tis: neu**ri**tis.)

Prefix	Root	Suffix
erythr/o -	cyte (erythrocyte)	
melan/o -	cyte (melanocyte)	
	vir	-ile (virile)
	febri(s)	-ile (febrile)
	ot/o	-itis (otitis)
	periton(eum)	-itis (peritonitis)
poly-	morph	-ous (polymorphous)

- The language of anatomy is Latin.

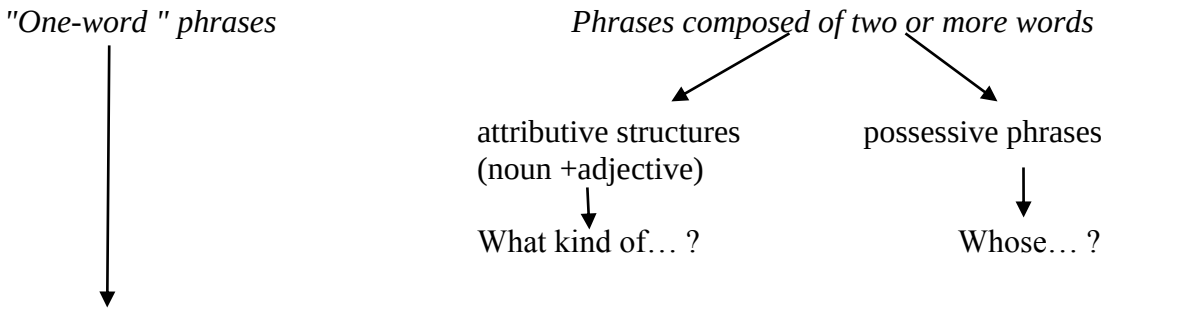
The term "anatomy" comes from the Greek word "anatémnein", meaning " to cut apart" or "dissect".
And yet it is not sufficient to view anatomy merely as the art of dissection. It is rather the science concerned with the construction and composition of the human body.

Hippocrates and other ancient anatomists had to develop a dictionary in order to communicate their observations. Galen, however was among the first to attempt to establish a reasonably comprehensive nomenclature derived from the Greek. It was very extensive and a large percentage of his terms are still in use today.
Because of its long and storied history, the discipline of anatomy makes considerable use of the Latin language.

Efforts to produce a uniform, simple nomenclature began with the *Basle Nomina Anatomica* (1895), which dealt with macroscopic anatomy. Subsequent work by international committees included several revisions, the latest being ***Terminologia Anatomica*** (1998), and compilation of lists of histological and embryological terms.

When taking a glance at the English anatomical nomenclature, one is likely to note that Latin is present, e.g.: *fascia, sulcus, chordae tendineae, foramen magnum*. Furthermore, one will also find nouns in possessive structures, e.g.: *orbicularis oculi/oris, crista galli, levator anguli oris,* graded forms of Latin adjectives, e.g.: *latissimus dorsi, levator palpebrae superioris, longissimus capitis,* and even purely Latin multiple-word terms, e.g.: *flexor digiti minimi brevis, levator labii alaeque nasi.*

Structure of the Anatomical Terms



-fundus (base, bottom)	foramen magnum	rima glottidis (glottic slit)
- frenulum(small bridle)	tunica albuginea	crista galli
-medulla	inferior vena cava	biceps brachii

When Latin forms are borrowed, no system is observed in the English nomenclature.

In the following tables the most common noun and adjective suffixes and prefixes referring to numbers, colours, directions etc. are summarized.

Table 1 Noun Suffixes

1. Suffixes meaning „condition of"

suffix	example
-ia	**anemia**
-ism	**embolism**
-sis	**tuberculosis**
-y	**dysentery**

2. Suffixes for Medical Specialties

suffix	meaning	example
-ian	specialist in a field of study	**physician, pediatrician ***
-iatrics	medical specialty	**pediatrics**
-iatry	medical specialty	**psychiatry**
-ics	medical specialty	**obstetrics**
-ist	specialist in a field of study	**cardiologist**
-logy	study of	**neurology**

*Pediatrician: healer of children; the expression derives from two Greek words: παῖς (*pais* = child) and ἰατρός (*iatros* = doctor or healer).

Table 2 Adjective Suffixes meaning „like, belonging to, pertaining to"

suffix	example
-ac	**cardiac**
-al	**brachial**
-ar	**muscular**
-ary	**dietary**
-form	**fungiform**
-ic	**hepatic**
-ical (ic + al)	**surgical**
-ile	**febrile**
-oid	**ethmoid**
-ory	**circulatory**

Table 3 Prefixes for Numbers

prefix	meaning	example
prim/i-	first	**primitive**
mon/o- ; uni-	one	**monoamniotic, unipennate**
hemi- ; semi-	half, one side	**hemisphere, semiglobe**
bi- ; di-	two, twice	**biceps, diamniotic,**
dipl/o-	double	**diplococci**
tri-	three	**tricuspid**
quadr/i- ; tetra-	four	**quadriceps**
multi-; poly-	many, much	**polycystic**

Exercise 1. Define the following terms.

uniaxial _____
triceps _____
semilunar _____
bipennate _____
trigeminal _____
multiaxial _____

Table 4 Prefixes for Colours

prefix	meaning	example
cyan/o-	blue	**cyanosis**
erythr/o-	red	**erythema**
leuk/o-	white	**leukocyte**
melan/o	black	**melanin**
xanth/o-	yellow	**xanthoma**

Table 5 Negative Prefixes

prefix	meaning	example
a-, an-	not, without, lack	**aseptic**
anti-	against	**antagonist**
contra-	against, opposite	**contraception**
de-	down, without	**desanguination**

Table 6 Prefixes for Direction

prefix	meaning	example
ab-	away from	**abduction**
ad-	toward	**adduction**
dia-	through	**diarrhea**
per-	through	**percutaneous**
trans-	through	**transfusion**

Table 7 Prefixes for Degree

prefix	meaning	example
hyper-	over, abnormally high	**hyperhydrosis**
hypo-	under, abnormally low	**hypoglycemia**
olig/o-	few	**oligodontia**
pan-	all	**pancreas**
super-	above, excess	**suprascapular**

Table 8 Prefixes for Size and Comparison

prefix	meaning	example
eu-	true, good, easy	**euthanasia**
hetero-	other, different	**heterogeneous**
homo, homeo-	same, unchanging	**homothermic**
macro-	large, abnormally large	**macroscopic**
mega-, megalo-	large, abnormally large	**megalocyte**
micro-	small	**microcyte**
neo-	new	**neonate**
ortho-	straight, correct	**orthopedics**
pseudo-	false	**pseudoreaction**
re-	again, back	**reflux**

Table 9 Prefixes for Time and Position

prefix	meaning	example
ante-	before	**antenatal**
pre-	before, in front of	**premature**
pro-	before, in front of	**progenitor**
post-	after, behind	**postnatal**
dextr/o-	right	**dextrocular**

sinistr/o-	left	**sinistromanual**
ec-, ecto-	out, outside	**ectoderm**
ex/o-	away from, outside	**exsanguination**
end/o-	in, within	**endoscope**
mes/o-	middle	**mesencephalon**
syn-, sym-	together	**synergistic**
tel/e-, tel/o-	end	**telencephalon**

Exercise 2. Define the following terms.

oliguria _____
anuria _____
hypotension _____
hypercholesterolemia _____
pandemia _____
endogenous _____

As it was mentioned before medical terminology is mostly based on Greek and Latin terms. It is not a miracle therefore that many of them have special plural forms retaining their original Greek and Latin plural case endings.

Table 10 Plural Endings

word ending	plural ending	singular example	plural example
a	ae	vertebra	**vertebrae**
en	ina	lumen	**lumina**
ex, ix, yx	ices	index	**indices**
is	es	pelvis	**pelves**
ma	mata	adenoma	**adenomata**
nx (anx,inx, ynx)	nges	meninx	**meninges**
on	a	ganglion	**ganglia**
um	a	ovum	**ova**
us	i	fungus	**fungi**

Exercise 3. Give the name of a specialist in the following fields.

ophthalmology _____
audiology _____
gynecology _____
obstetrics _____
otorhinolaryngology _____
garstoenterology _____
nephrology _____
dietetics _____
pediatrics _____

Exercise 4. Write the plural form for the following words.

gingiva _____
diagnosis _____
bacterium _____
foramen _____
ganglion _____
pharynx _____
sarcoma _____

Exercise 5. Write the singular form for of the following words.

testes _____
bacilli _____
phalanges _____
sera _____
foramina _____
cocci _____
prognoses _____

PATIENT HISTORY

Clinical History -11 year-old girl undergoing scoliosis surgery

A 11-year-old girl was operated on for a severe left thoracolumbar scoliosis (Cobb angle 65°). Pedicular screws insertion and rod positioning was technically successful, but five days later, for signs of an early infection, a surgical wound revision was performed by debridement of necrotic tissues and hydrogen peroxide pressure irrigation of the operative field. Unexpectedly, during such procedure, the patient had two episodes of bradycardia followed by ventricular fibrillation, electromechanical dissociation, and pulmonary edema, and she died despite immediate resuscitation efforts.

Autopsy demonstrated the correct positioning of pedicular screws and rods, with external signs of dehiscent wound in the lumbar region. No signs of pulmonary embolism nor associated cardiac defects, such as a patency of foramen ovale, were found. Gross examination of the brain, showed diffuse abnormalities in the cerebral veins.

Final Diagnosis -- A diffuse paradoxical cerebral air embolism of cortical veins

Diagnosis

A diffuse paradoxical cerebral air embolism of cortical veins.

Discussion

The gross evaluation shows diffuse cortical air embolism. Microscopic evaluation also shows air within veins and excluded pulmonary microemboli.

Prolonged prone position, large tissues opening and hydrogen peroxide pressure irrigation represent well known risk factors for pulmonary air embolism in spine surgery. Paradoxical

cerebral air embolism, without pulmonary involvement, is a rare complication during spine surgery and to date it has been always associated to patency of foramen ovale. Nevertheless, in our case, post-mortem examination excluded with certainty any cardiac or vascular defects. Then we can speculate that air bubbles would have reached cerebral veins starting from the venules of muscles and overlying teguments along the infected wound; they would have reached the posterior extra-spinal venous plexus and from there, through the lumbar ascending veins and the azygos-hemiazygos vein system, they would have entered the superior vena cava, bypassing the pulmonary circulation. Finally in a retrograde manner, through the jugular veins, air bubbles would have filled dural venous sinuses and cortical cerebral vein system, causing the patient death.

This is the first and unique case describing a fatal paradoxical air venous cerebral embolism in a pediatric patient undergone spine surgery without cardiac defects.

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Questions:

The suffix in the word embolism means: _____
The suffix in the word bradycardia means: _____
The suffix in the word scoliosis means: _____
The doctor specializing in the field of pediatrics is a _____
The correct singular form of microemboli is _____
The opposite of extra-spinal is _____

Define the following terms, underline the adjective suffixes.

pulmonary, cardiac, cerebral, thoracolumbar, necrotic, microscopic, pediatric

CHAPTER 2

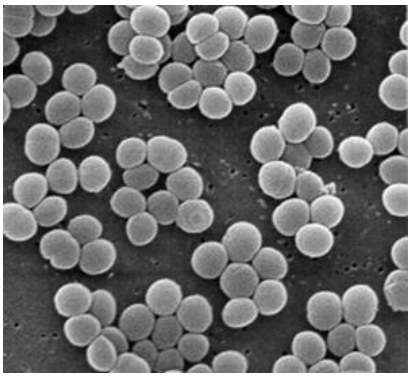
DISEASES

Illness is any disorder of normal body function.

Terms: etiology, acute disease, chronic disease

Figure 2. 1 diplococci.

Figure 2. 2 staphylococci



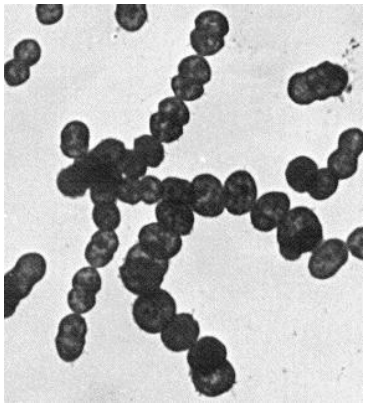


Figure 2.3 streptococci

Responses to Disease

Inflammation
A common response to infection and to other forms of disease is **inflammation.**

Fever

Fever terminology: pyrexia, hyperpyrexia, subfebrility, pyrogen, pyteric, antipyretic

Immunity

Terms: inborn and adaptive immunity

Phagocytosis

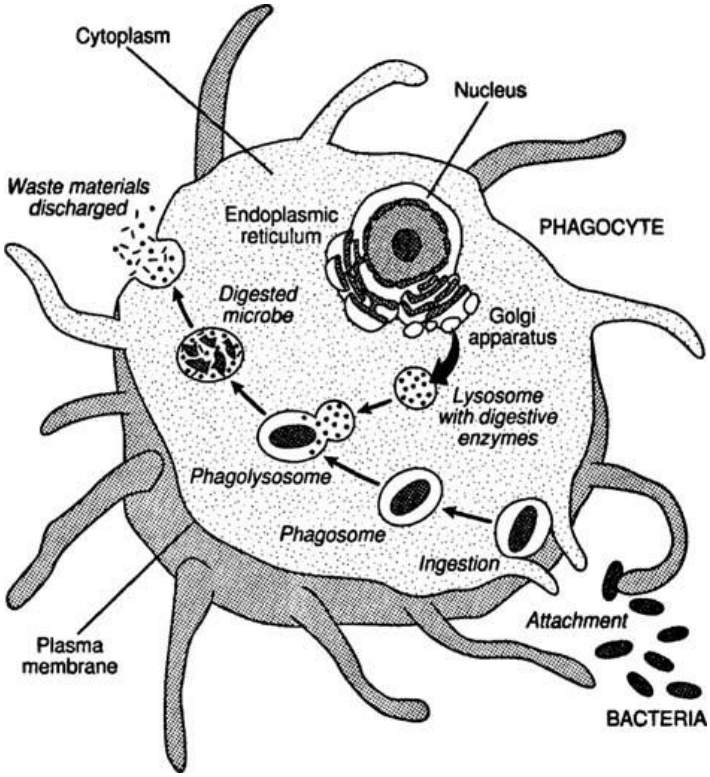


Table 1 Word Roots pertaining to Disease

root	meaning	example
alg/o, algi/o, algesi/o	pain	**algesia**
carcin/o	cancer	**carcinoma**
cyst/o, cyst/i	cyst, bladder, filled sac	**cystic**
lith	stone	**nephrolith**
onc/o	tumour	**oncology**
path/o	disease	**pathogen**
py/o	pus	**pyorrhea**
pyr/o, pyret/o	fever, fire	**antipyretic**
scler/o	hard	**sclerosis**
tox/o, toxic/o	poison	**toxoid**

Exercise 1. Define the terms.

cholelith _____
oncology _____
pathology _____
scleroderma _____
pyoderma _____
analgesia _____
pyrogen _____
antipyretic _____

Table 2 Prefixes for Disease

prefix	meaning	example
brady-	slow	**bradypnea**
dys-	abnormal, difficult	**dyspnea**
mal-	bad, poor	**malnutrition**
pachy-	thick	**pachydactyly**
tachy-	rapid	**tachypnea**
xero-	dry	**xerosis**

Table 3 Suffixes for Disease

suffix	meaning	example
-algia, -algesia	pain	**neuralgia**
-cele	hernia	**mucocele**
-clasis, -clasia	breaking	**osteoclasis**
-itis	inflammation	**otitis**
-megaly	enlargement	**hepatomegaly**
-odynia	pain	**myodynia**
-oma	tumour	**carcinoma**
-pathy	any disease of	**arthropathy**
-rrhage, -rrhagia	profuse flow	**hemorrhage**
-rrhea	flow, discharge	**seborrhea**
-rrhexis	rupture	**hepatorrhexis**
-schisis	fissure, splitting	**cranioschisis**

Table 4 Suffixes for Disease

word	meaning	example
dilation (Latin!) *	widening, expansion	**vasodilation**
ectasis, ectasia (Greek!) *	dilation	**gastrectasia**
edema	swelling	**lymphedema**
lysis	separation, destruction	**carcinolysis**
malacia	softening	**osteomalacia**
necrosis	death of tissue	**myonecrosis**
ptosis	dropping, prolapse	**nephroptosis**
sclerosis	hardening	**phlebosclerosis**
spasm	sudden contraction, cramp	**bronchospasm**
stasis	stoppage	**hemostasis**
stenosis	narrowing, constriction	**angiostenosis**
toxin	poison	**nephrotoxin**

Table 5 Terms for Diseases

epidemic	disease outbreak that affects more individuals than expected
iatrogenic	an infection caused by the effects of treatment (etymologically, the term means "brought forth by a healer" - *ιατρος* means healer)
idiopathic	having no known cause
metastasize	to spread from one part of the body to another
opportunistic	an infection that occurs because of the poor condition of the patient
pathogen	/ microbe / germs / bugs / harmful microorganism – a disease-causing organism
prophylaxis	preventive treatment of disease by hygienic measures, by vaccines or by drug prophylaxis
septicemic	blood poisoning

Exercise 2. Define the following medical terms.

nephropathy _____
hepatomegaly _____
benign _____
malignant _____
chronic _____
acute _____
metastasis _____
myoma _____
myalgia _____
xerosis _____
cardionecrosis _____
bronchostenosis _____
vasodilation _____
staphylococcus _____
streptococcus _____
arthropathy _____
cephaledema _____

CHAPTER 3

DIAGNOSIS

Medical **diagnosis** begins with a patient history.

HPI

PMH

Family and social history

A physical examination follows the history taking.

Inspection: visual examination.
Palpation: touching the surface of the body with the hands or fingers.
Percussion: tapping the body and listening to the sounds produced.
Auscultation: listening to body sounds with a stethoscope.

Vital signs (VS) are also recorded for comparison with normal ranges.
• Temperature (T).
• Pulse rate, measured in beats per minute (bpm).
• Respiration rate (R), measured in breaths per minute.
• Blood pressure (BP)
The device used for measuring pressure is the blood pressure cuff or **sphygmomanometer**

Laboratory test results

Imaging techniques

(CT, MRI ultrasonography..etc)

Terms: radiolucent, radiopaque

Biopsy

Table 1 Word Roots pertaining to Diagnosis and Treatment

root	meaning	example
aer/o	air, gas	**anaerobic**
bar/o	pressure	**barometer**
chrom/o, chromat/o	colour, stain	**achromatous**
chron/o	time	**chronologic**
cry/o	cold	**cryotherapy**
erg/o	work	**synergistic**
phon/o	sound, voice	**phonetics**
phot/o	light	**photography**
radi/o	radiation, X-ray	**radiology**

son/o	sound	**sonogram**
therm/o	heat, temperature	**thermometer**

Table 2 Suffixes for Diagnosis

suffix	meaning	example
-graph	instrument for recording data	**mammograph**
-graphy	act of recording data	**echography**
-gram	a record of data	**electroencephalogram**
-meter	instrument for measuring	**audiometer**
-metry	measurement of	**audiometry**
-scope	instrument for viewing	**laparoscope**
-scopy	examination of	**arthroscopy**

Exercise 1. Define the following terms.

otoscope _____
colonoscopy _____
cardiogram _____
mammography _____
mammogram _____
endoscope _____
cystoscope _____
cystoscopy _____
MRI _____
barometer _____
radiolucent _____
radiopaque _____
chromosome _____
anaerobic _____

Table 3 Suffixes pertaining to Surgery

suffix	meaning	example
-centesis	puncture	**arthrocentesis**
-desis	binding, fusion	**pleurodesis**
-ectomy	excision, surgical removal	**hepatectomy**
-pexy	surgical fixation	**hysteropexy**
-plasty	plastic repair	**arthroplasty**
-rrhaphy	suture, surgical repair	**cystorrhaphy**
-stomy	surgical creation of an opening	**colostomy**
-tome	instrument for incising	**osteotome**
-tomy	incision, cutting	**cystotomy**
-tripsy	crushing	**neurotripsy**

Exercise 2. Define the following terms.

arthrodesis _____
arthrotomy _____
hepatorrhaphy _____
hepatorrhexis _____
hepatectomy _____
hepatotomy _____
hepatopexy _____
amniocentesis _____
gastrotomy _____
dermatome _____

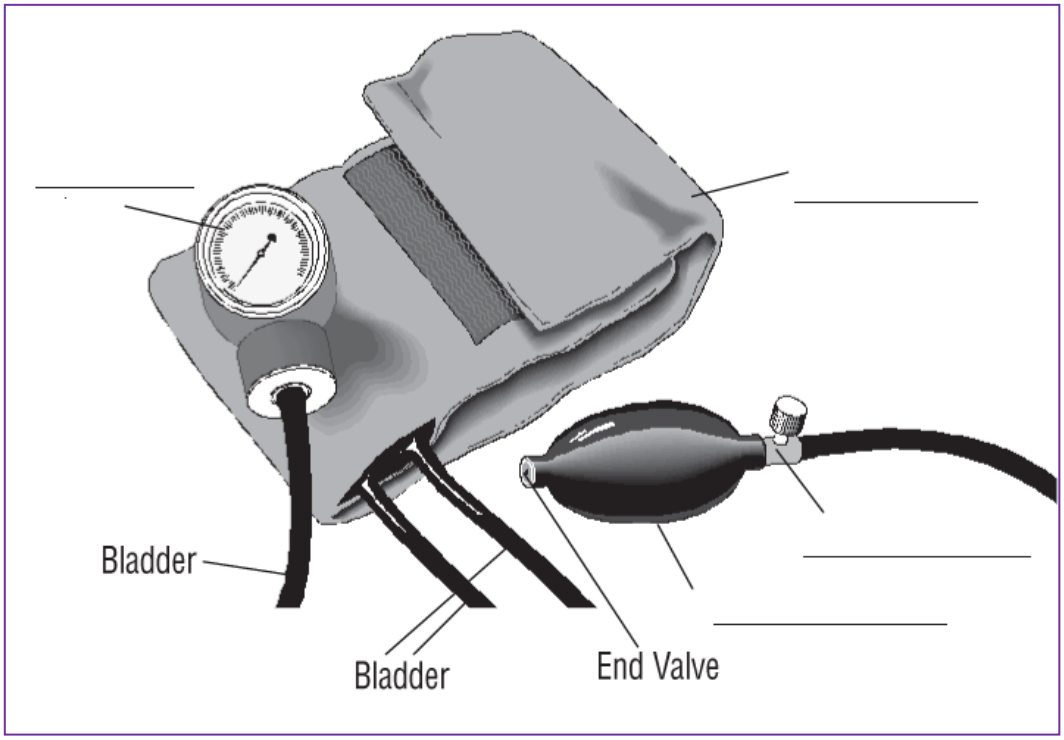
Table 4 Abbreviations to Diagnosis and Treatment

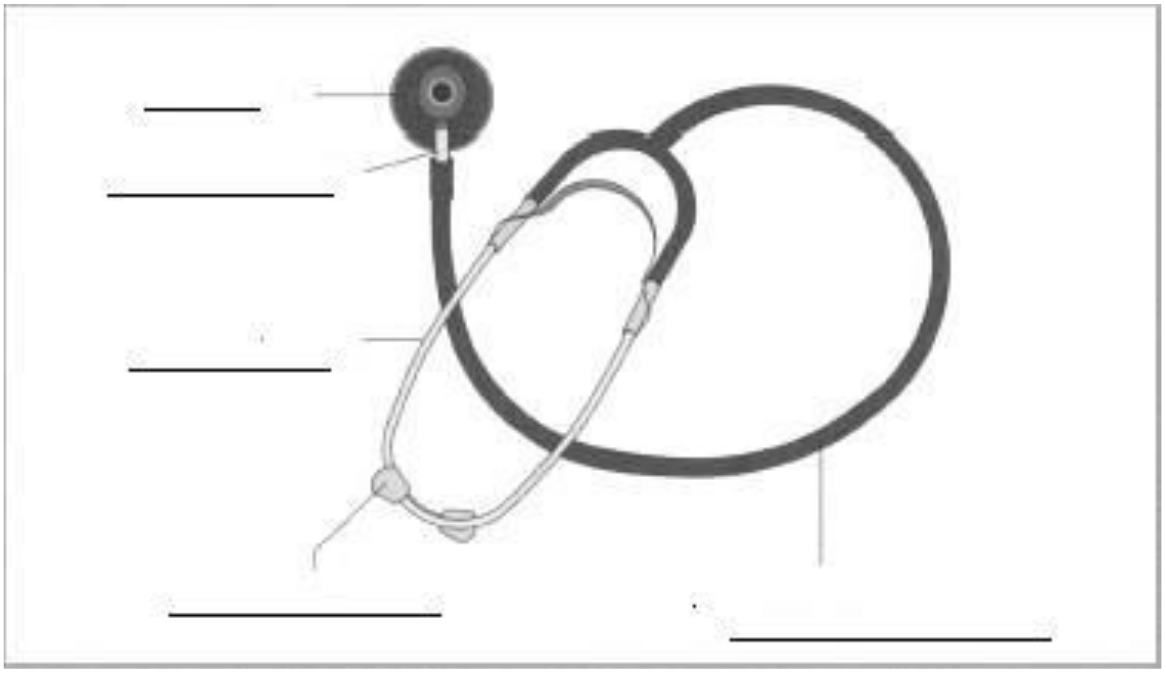
BP blood pressure bpm Beats per minute CC chief complaint CBC complete blood count c/o complains of CT Computed Tomography D/C, dc discontinue, discharge Dx Diagnosis Ht, Hct hematocrit HEENT Head, eyes, ears, nose, and throat h/o history of HPI history of present illness HR heart rate Hx history ICU Intensive Care Unit MRI Magnetic Resonance Imaging	NKDA no known drug allergies NSS normal saline solution P pulse PE physical examination PE(R)RLA pupils equal (regular) react to light and accommodation PMH past medical history pt patient RBC red blood cell; red blood cell count nodes, (distant) metastases VS vital signs WBC white blood cell; white blood (cell) count WNL within normal limits

Exercise 3. Supply technical terms for the following definitions.

suture of a muscle _____
cutting the bone _____
plastic surgery of the abdomen _____
cutting the trachea _____
fixation of the urethra _____
surgical puncture of a joint _____
crushing a nerve _____
making an incision into the abdomen _____

Exercise 4. Label the diagrams.





PATIENT HISTORY - **Example of a Complete History and Physical Write-up**

Patient Name:
Unit No:
Location:
Informant: patient, who is reliable, and old CPMC chart.
Chief Complaint: This is the 3rd CPMC admission for this 83 year old woman with a long history of hypertension who presented with the chief complaint of substernal "toothache like" chest pain of 12 hours duration.

History of Present Illness: Ms J. K. is an 83 year old retired nurse with a long history of hypertension that was previously well controlled on diuretic therapy. She was first admitted to CPMC in 1995 when she presented with a complaint of intermittent midsternal chest pain. Her electrocardiogram at that time showed first degree atrioventricular block, and a chest X-ray showed mild pulmonary congestion, with cardiomegaly. Myocardial infarction was ruled out by the lack of electrocardiographic and cardiac enzyme abnormalities. Patient was discharged after a brief stay on a regimen of enalapril, and lasix, and digoxin, for presumed congestive heart failure. Since then she has been followed closely by her cardiologist.
Aside from hypertension and her postmenopausal state, the patient denies other coronary artery disease risk factors, such as diabetes, cigarette smoking, hypercholesterolemia or family history for heart disease. Since her previous admission, she describes a stable two pillow orthopnea, dyspnea on exertion after walking two blocks, and a mild chronic ankle edema which is worse on prolonged standing. She denies syncope, paroxysmal nocturnal dyspnea, or recent chest pains. She was well until 11pm on the night prior to admission when she noted the onset of "aching pain under her breast bone" while sitting, watching television. The pain was described as "heavy" and "toothache" like. It was not noted to radiate, nor increase with exertion. She denied nausea, vomiting, diaphoresis, palpitations, dizziness, or loss of consciousness. She took 2 tablespoon of antacid without relief, but did manage to fall sleep. In the morning she awoke free of pain, however upon walking to the bathroom, the pain returned with increased severity. At this time she called her daughter, who gave her an aspirin and brought her immediately to the emergency room. Her electrocardiogram on presentation showed sinus tachycardia at 110, with marked ST elevation in leads I, AVL, V4-V6 and occasional ventricular paroxysmal contractions. Patient immediately received thrombolytic therapy and cardiac medications, and was transferred to the intensive care unit.

Current Regimen
Digoxin 0.125mg once daily
Enalapril 20mg twice daily
Lasix 40mg once every other day
Kcl 20mg once daily
Tylenol 2 tabs twice daily as needed for arthritis

Past Health
General: Relatively good
Infectious Diseases: Usual childhood illnesses. No history of rheumatic fever.
Immunizations: Flu vaccine yearly. Pneumovax 1996
Allergic to Penicillin-developed a diffuse rash after an injection 20 years ago.
Transfusions: 4 units received in 1980 for GI hemorrhage, transfusion complicated by Hepatitis B infection.
Hospitalizations, Operations, Injuries:

1) Normal childbirth 48 years ago
2) 1980 Gastrointestinal hemorrhage, see below
3) 9/1995 chest pain- see history of present illlness
4) Last mammogram 1994, Flexible Sigmoidoscopy 1997

Systems Review
1.Constitutional: energy level generally good, weight is stable at 160 lbs, height 5'8"
2.HEENT:
No headaches
Eyes: wears reading glasses but thinks vision getting is worse, no diplopia or eye pain
Ears: hearing loss for many years, wears hearing aid now
Nose: no epistaxis or obstruction
No history of tonsillitis or tonsillectomy
Wears full set of dentures for more than 20 years, works well.
3.Respiratory: No history of pleurisy, cough, wheezing, asthma, hemoptysis, pulmonary emboli, pneumonia, TB or TB exposure
4.Cardiac: See HPI
5.Vascular: No history of claudication, gangrene, deep vein thrombosis, aneurysm.
Has chronic venous stasis skin changes for many years
6.G.I.: Admitted to CPMC in 1980 after two days of melena and hematemesis. Upper G.I. series was negative but endoscopy showed evidence of gastritis, presumed to be caused by ibuprofen intake. Her hematocrit was 24% on admission and she received four units of packed cells. Colonoscopy revealed multiple diverticuli. Since then her stool has been brown and consistently hematest negative when checked in clinic. Several months after this admission she was noted to be mildly jaundiced and had elevated liver enzymes, at this time it was realized that she contracted hepatitis B from the transfusions. Since then she has not had any evidence of chronic hepatitis.
7.GU: History of several episodes of cystitis, most recently E Coli 3/1/90, treated with Bactrim. Reports dysuria in the 3 days prior to hospitalization. No fever, no hematuria. No history of sexually transmitted disease. Menarche was at 15, menstrual cycles were regular interval and duration, menopause occurred at 54. Seven pregnancies with 5 normal births and 2 miscarriages.
8. Neuromuscular: Osteoarthritis of the both knees, shoulder, and hips for more than 20 years. Took ibruprofen until 1980, has taken acetaminophen since her GI bleed, with good relief of intermittent arthritis pain. There is no history of seizures, stroke, syncope, memory changes.
9. Emotional: Denies history of depression, anxiety.
10. Hematological: no known blood or clotting disorders.
11. Rheumatic: no history of gout, rheumatic arthritis, or lupus.
12. Endocrine: no know diabetes or thyroid disease.
13. Dermatological: no new rashes or pruitis.

Personal History
1. Mrs. Johnson is widowed and lives with one of her daughters.
2. Occupation: she worked as a nurse to age 67, is now retired.
3. Habits: No cigarettes or alcohol. Does not follow any special diet.

4. Born in South Carolina, came to New York in 1931. she has never been outside of the United States.
5. Present environment: lives in a one bedroom apartment on the third floor of a building with and elevator. She has a home helper who comes 3 hours a day.
6. Financial: Receives social security and Medicare, and is supported by her children.
7. Psychosocial: The patient is generally an alert and active woman despite her arthritic symptoms. She understands that she is having a "heart attack" at the present time and she appears to be extremely anxious.

Family History

The patient was brought up by an aunt; her mother died at the age of 36 from kidney failure; her father died at the age of 41 in a car accident. Her husband died 9 years ago of seizures and pneumonia. She had one sister who died in childbirth. She has 4 daughters (ages 60, 65, 56, 48) who are all healthy, and had a son who died at the age of 2 from pneumonia. She has 12 grandchildren, 6 great grandchildren and 4 great, great grandchildren. There is no known family history of hypertension, diabetes, or cancer.

Physical Exam

1. Vital Signs: temperature 100.2 Pulse 96 regular with occasional extra beat, respiration 24, blood pressure 180/100 lying down.
2. Generally a well developed, slightly obese, elderly black woman sitting up in bed, breathing with slight difficulty. She complains of resolving chest pain.
3. HEENT:

Eyes: extraocular motions full, gross visual fields full to confrontation, conjunctiva clear. sclerae non-icteric, pulpils equal round and reactive to light and accomodation, fundi not well visualized due to possible presence of cataracts.
Ears: Hearing very poor bilaterally. Tympanic membrane landmarks well visualized.
Nose: No discharge, no obstruction, septum not deviated.
Mouth: Complete set of upper and lower dentures. Pharynx not injected, no exudates. Uvula moves up in midline. Normal gag reflex.

4. Neck: jugular venous pressure 8cm, thyroid not palpable. No masses.
5. Nodes: No adenopathy
6. Chest: Breasts: atrophic and symmetric, nontender, no masses or discharges. Lungs: bibasilar rales. No dullness to percussion. Diaphragm moves well with respiration. No rhonchi, wheezes or rubs.
7. Heart: PMI at the 6th ICS, 1 cm lateral to MCL. No heaves or thrills. Regular rhythm with occasional extra beat. Normal S1, S2 narrowly split; positive S4 gallop. A grade II/VI systolic ejection murmur is heard at the left upper sternal border without radiation. Pulses are notable for sharp carotid upstrokes.

Pulses: Carotid brachial radial femoral DP PT
R 2+ 2+ 2+ 2+ 1+ 0
L 2+ 2+ 2+ 2+ 1+ 0

8. Spine: mild kyphosis, mobile, nontender, no costovertebral tenderness.
9. Abdomen: soft, flat, bowel sounds present, no bruits. Nontender to palpation.
Liver edge, spleen, kidney not felt. No masses. Liver span 10cm by percussion.
10. Extremities: skin warm and smooth except for chronic venous stasis changes in both legs. 1+ edema to the knees, non-pitting and very tender to palpation.
No clubbing nor cyanosis.
11.Neurological: Awake, alert and fully oriented. Cranial nerves III-XII intact except for decreased hearing. Motor: Strength not tested, patient moves all extremities. Sensory: Grossly normal to touch and pin prick. Cerebellar: no tremor nor dysmetria. Reflexes symmetrical 1+ through out, no Babinski sign.

12. Pelvic: deferred until patient more stable.
13. Rectal: Prominent external hemorrhoids. No masses felt. Stool brown, negative for blood.

Labs
WBC 12,400 Hgb 12.0 Hct 38.0 MCV 80.0 Plts 218,000 Retic 1.3 Diff Na 143
K4.1 C1 103 CO229 Glu 102 BUN 9 Creat 0.8; T bili 0.5 Dbili 0.1
Alk Phos 155 AST 55 ALT 26 LDH 274 CPK 480, MB fraction positive,
Troponin 25
U/A Sp Gr 1.008 pH 6.5 2+ Alb many WBC many RBC 3+ bact
ABG pH 7.46 pCO234 PO284 O2Sat 98% (room air)
EKG NSR 96, ST elevations I, AVL, V4-V6; rare unifocal VPC's
CXR portable AP, probable cardiomegaly, mild PVC
(*Note: In the Physical Diagnosis Course the labs will not generally be a part of the write-ups, as the chart is not usually available to the students)
Formulation
This 83 year old woman with a history of congestive heart failure, and coronary artery disease risk factors of hypertension and post-menopausal state presents with substernal chest pain. On exam she was found to be in sinus tachycardia, with no JVD, but there are bibasilar rales and pedal edema, suggestive of some degree of congestive heart failure. There were EKG changes indicate an acute anterolateral myocardial infarction, and the labs shows elevation of CPK and troponin.
Impression
1. Acute antelorateral myocardioal infarction, complicated by mild left ventricular dysfunction. Patient has received thrombolysis therapy.
2. Hypertension
3. Dysuria - 3+ bacteria in urine with pyuria
Plan
1.Continue aspirin, heparin, nitrates, beta blockers, nasal oxygen. Follow serial physical exams, EKGs, and labs.
2. Obtain echocardiogram to assess post MI heart function and murmurs heard on cardiac exam. If LV ejection fraction is preserved, to start early beta blocker therapy.
3. Continue ACE inhibitor therapy, and monitor blood pressure.
4. Dysuria and pyuria- probable recurrent cystitis, as she is afebrile and without costovertebral tenderness. Start Bactrim treatment for presumed uncomplicated urinary tract infection and follow up on urine culture result.

(http://www.columbia.edu/itc/hs/medical/physicalDiagnosis/06-07/SampleWriteUp.pdf)

CHAPTER 4

BODY STRUCTURE

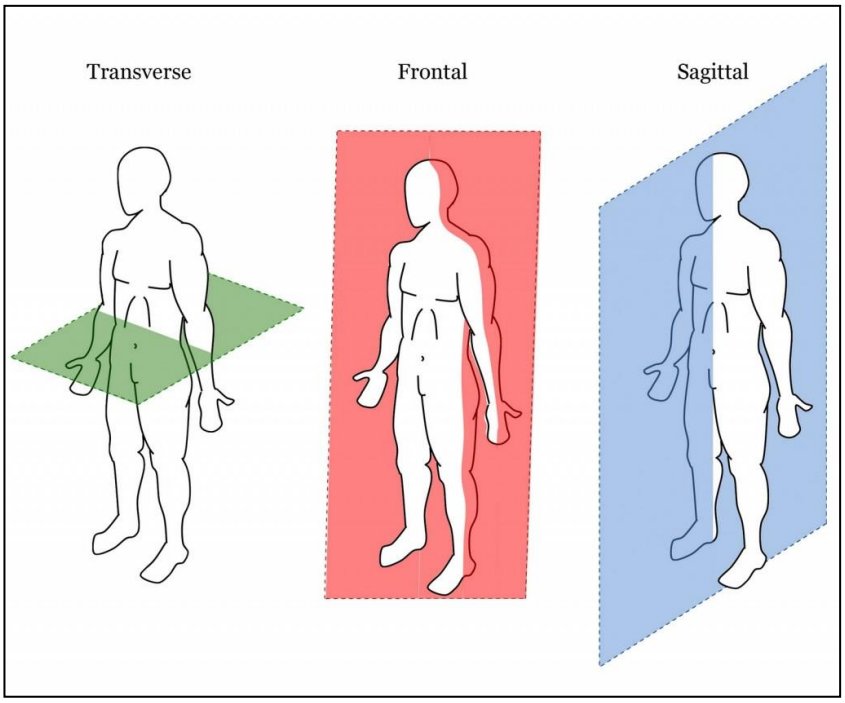
Anatomical Directions

term	definition
anterior	toward the front of the body, the sternum is an anterior structure
posterior	toward the back of the body, the heart is posterior to the sternum
medial	**toward the midline**
lateral	toward the sides, the kidneys are lateral to the vertebral column
median	**on the midline**
intermediate	**between the two most extreme**
proximal	nearer to a given reference point
distal	farthest from the point of origin
superior	above, e.g. the knees are superior to the ankles
inferior	below, the feet are inferior to the ankles
cranial	toward the head
caudal	toward the lower end of the spine
superficial (external)	closer to the surface of the body
deep (internal)	closer to the centre of the body

Body Planes

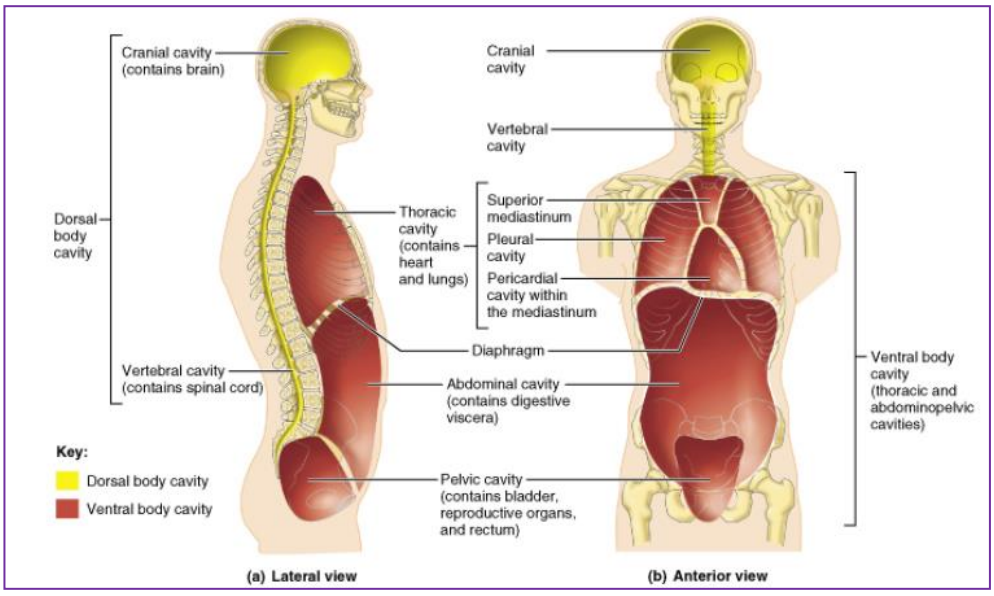
The frontal plane runs lengthwise from side to side, divides the body into anterior and posterior parts.
The sagittal plane divides the body into right and left portions.
The midsagittal plane passes through the midline of the body.
The transverse plane divides the body into superior and inferior parts.

Figure 4.1 illustrates body planes, with subject in anatomical position.



Body Cavities

Internal organs are located within the dorsal and the ventral cavities. Figure 4.2 demonstrates body cavities.



Abdominal Regions

Terms: epigastric, right and left hypochondriac, umbilical, right and left lumbar, suprapubic or vesical region, right and left iliac or inguinal regions

Figure 4.3 illustrates the abdominal regions.

Exercise 1. Label the diagram.

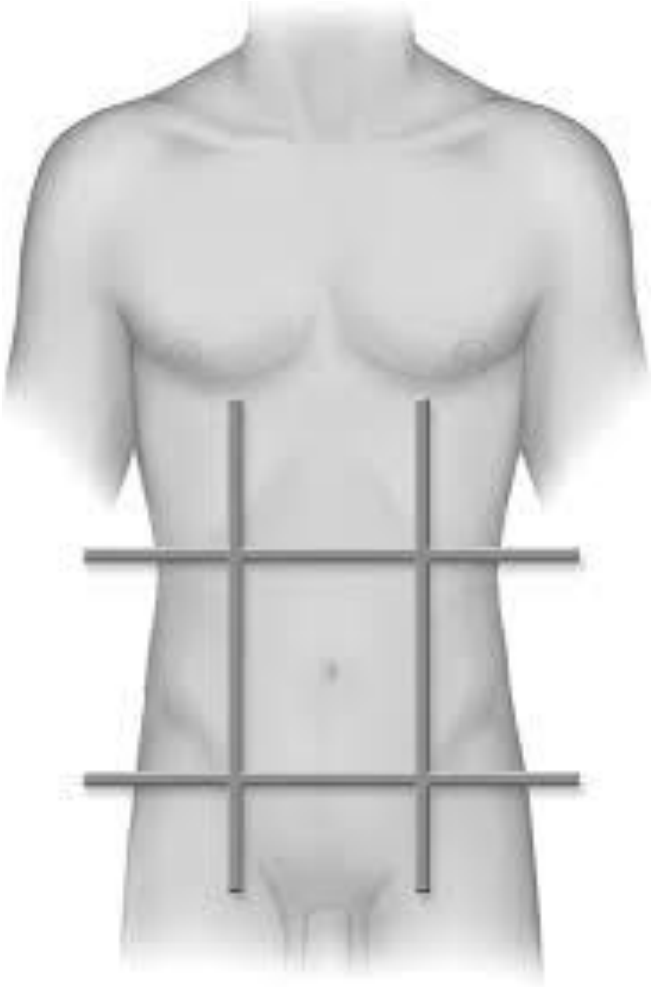


Table 1 Word Parts pertaining to the Body Structure

root	meaning	example
cephal/o	head	**microcephaly**
cervic/o	neck	**cervicofacial**
thorac/o	chest, thorax	**intrathoracic**
abdomin/o	abdomen	**intraabdominal**
celi/o	abdomen	**celiac**
lapar/o	abdominal wall	**laparoscope**
lumb/o	lumbar region, lower back	**thoracolumbar**
periton, peritone/o	peritoneum	**peritoneal**

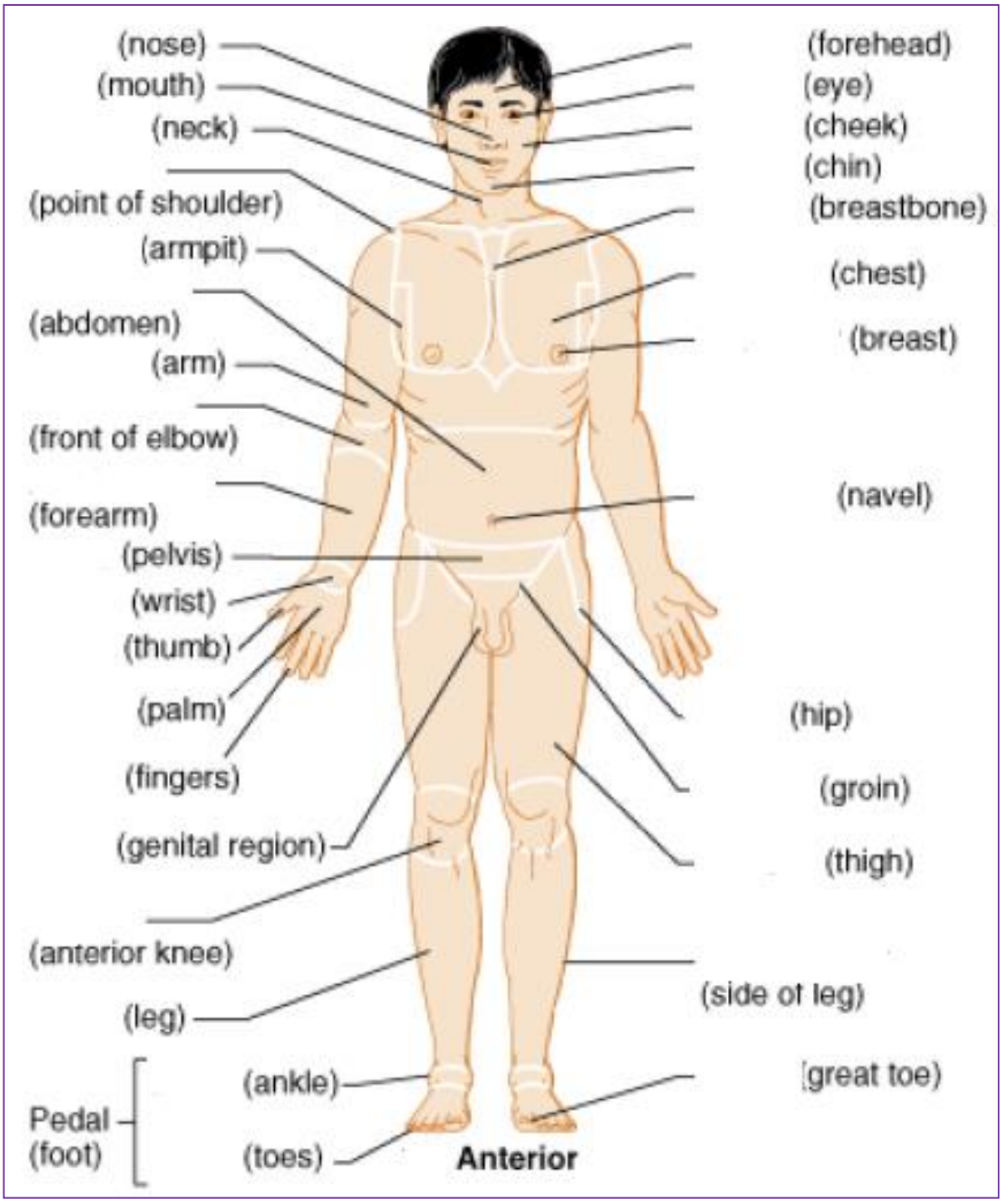
Table 2 Roots for Extremities

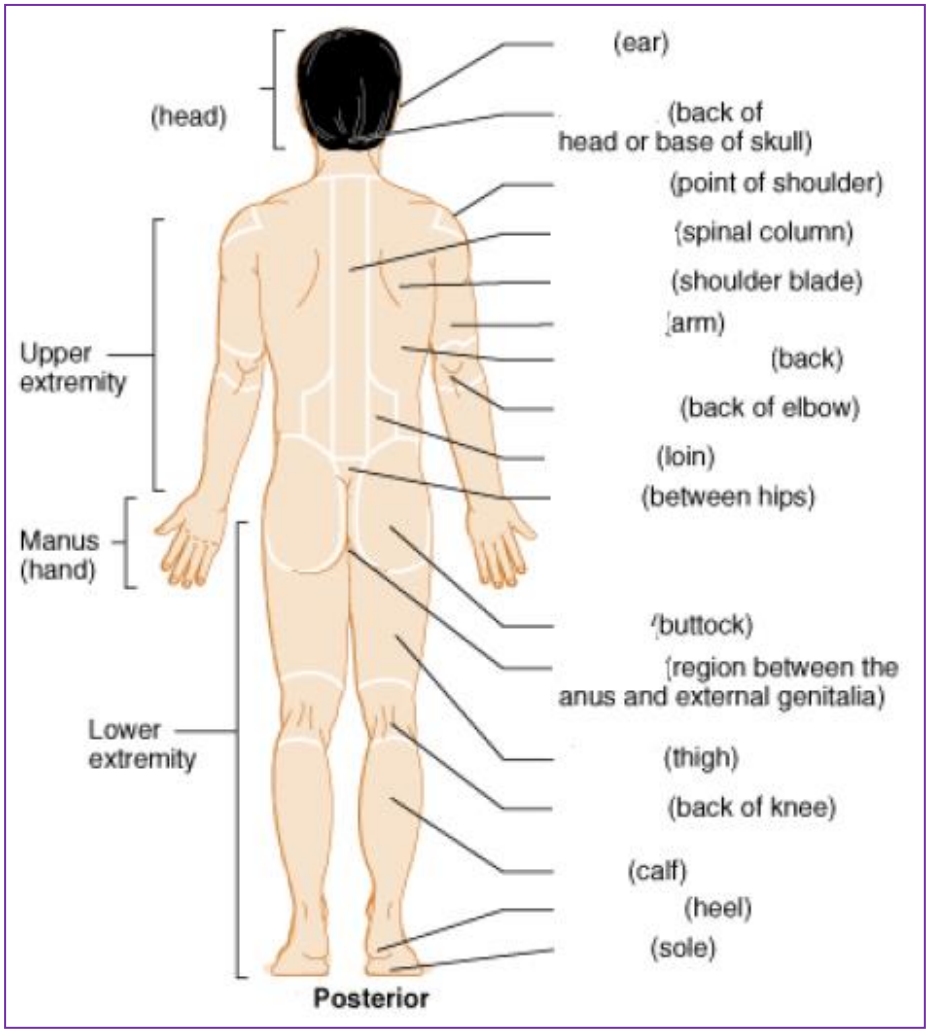
root	meaning
acro	**end, extremity**
brachi/o	**arm**
dactyl/o	**finger, toe**
ped/o	**foot**
pod/o	**foot**

Table 3 Prefixes for Position and Direction

prefix	meaning	example
circum-	around	**circumoral**
peri-	around	**periorbital**
intra-	in, within	**intrathoracic**
epi-	on, over	**epitarsal**
extra-	outside	**extracellular**
infra-	below	**infrascapular**
sub-	below, under	**subcostal**
inter-	between	**intergluteal**
juxta-	near, beside	**juxtaposition**
para-	near, beside	**parasacral**
retro-	behind, backward	**retrouterine**
supra-	above	**suprapatellar**

Exercise 2. Label the diagrams. Name the body regions.





Exercise 3. Define the following words.

intra-peritoneal _____
retroperitoneal _____
sublingual _____
intergluteal _____
perineal _____
epitarsal _____
periumbilical _____
paraesophageal _____
subcapular _____

Exercise 4. Opposites. Write a word that has the opposite meaning of each of the following words.

cranial _____
inferior _____
posterior _____
ventral _____
distal _____
internal _____

CHAPTER 5

THE SKELETAL SYSTEM

Table 1 Bones of the Skeleton

cranium	cranial bones (8)
facial portion	facial bones (14)
hyoid	
ossicles	ear bones
vertebral column	vertebrae (26)
thorax	sternum
	ribs (12 pair)
shoulder girdle	clavicle
	scapula
Upper extremity	humerus
	ulna
	radius
	carpals (8)
	metacarpals (5)
	phalanges(14)
pelvic bones	os coxae (2)
lower extremity	femur
	patella
	tibia
	fibula
	tarsal bones (7)
	metatarsals (5)
	phalanges (14)

Table 2 Roots for Bones and Joints

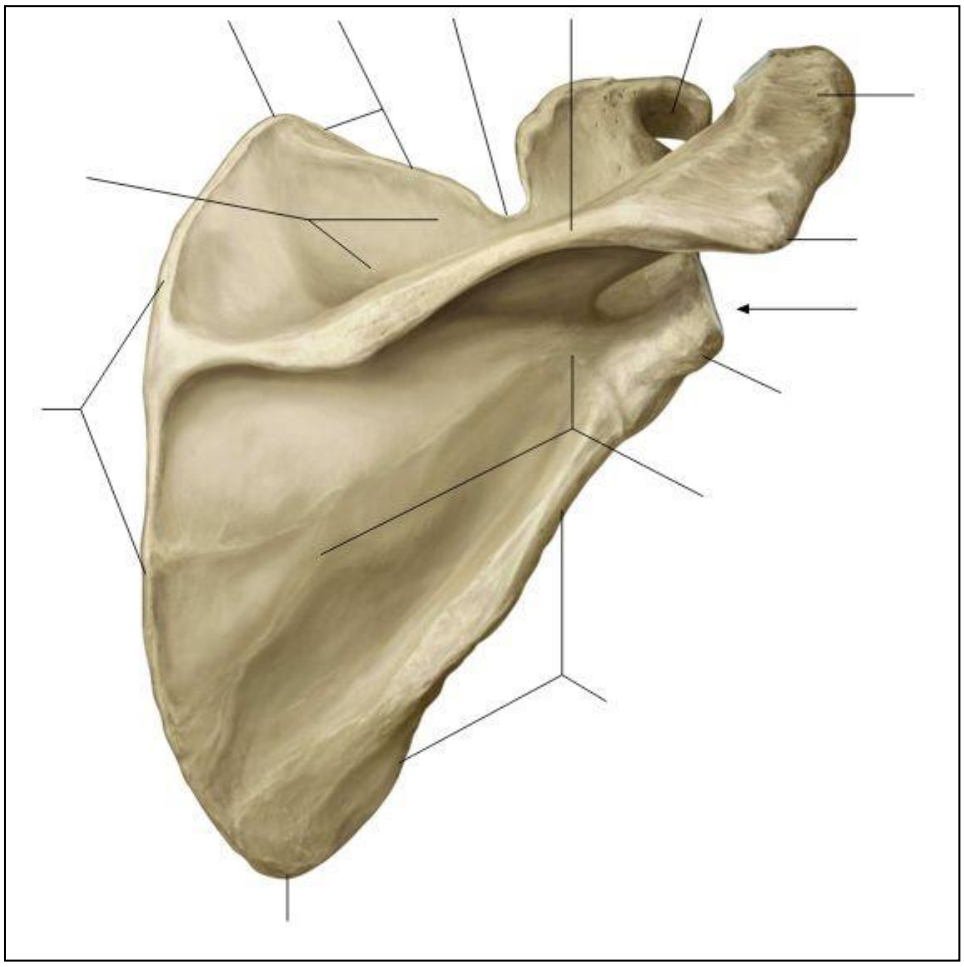
root	meaning	example
oste/o	bone	**ostemalacia**
myel/o	bone marrow, spinal cord	**myelitis**
chondr/o	cartilage	**chondroclast**
arthr/o	joint	**arthrosis**
synov/i	synovial fluid	**asynovia**
burs/o	bursa	**bursitis**

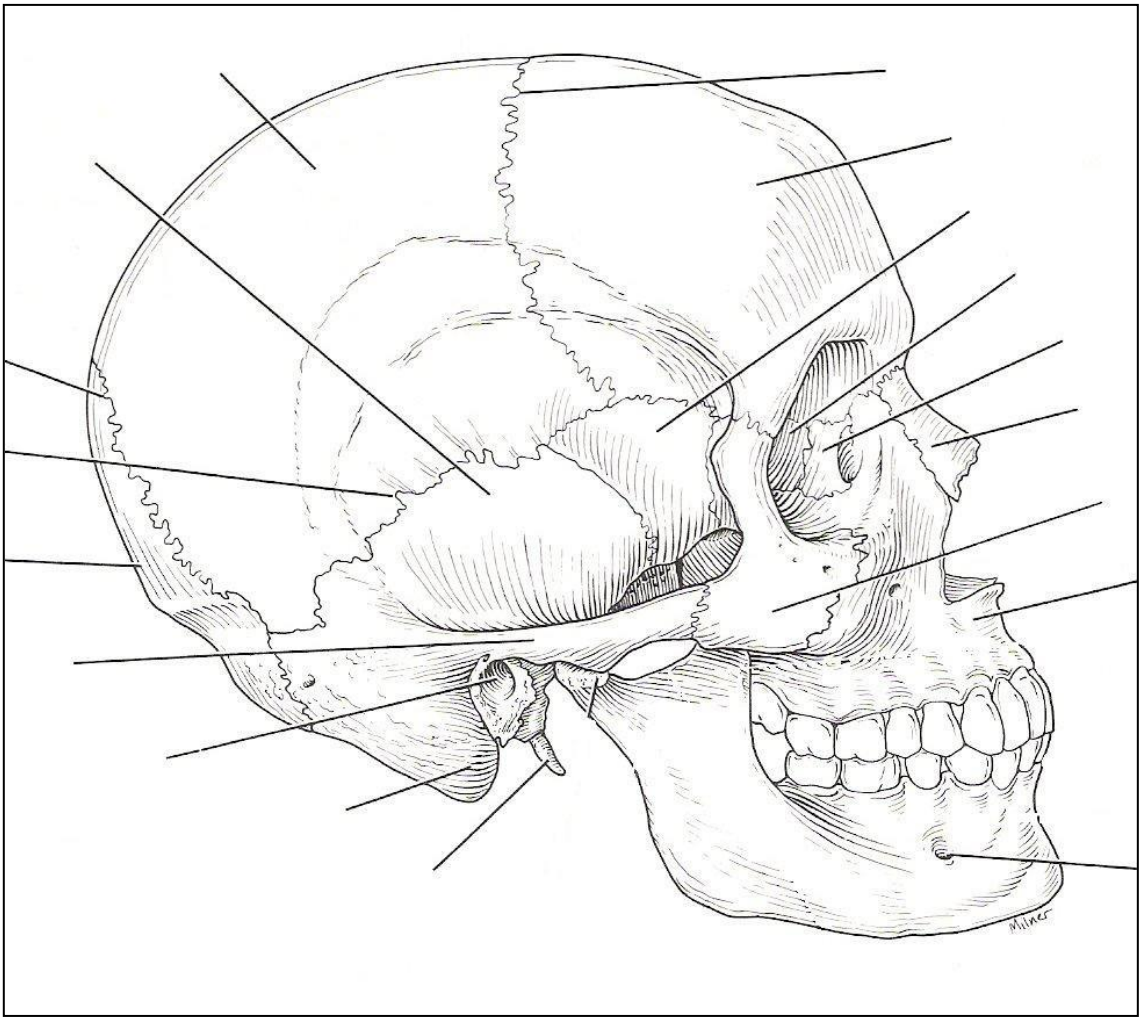
Table 3 Roots for the Skeleton

root	meaning	example
crani/o	skull, cranium	**craniometry**
spondyl/o	vertebra	**spondylolysis**
vertebr/o	vertebra, spinal column	**prevertebral**
rachi/o	spine	**rachischisis**
cost/o	rib	**costochondral**

sacr/o	sacrum	**perisacral**
coccy, coccyg/o	coccyx	**coccygeal**
pelvi/o	pelvis	**pelvimetry**
ili/o	ilium	**iliopelvic**

Exercise 1. Label the diagrams.





Exercise 2. Define the terms.

osteogenesis _____
myeloblast _____
arthrodesis _____
chondrocyte _____
bursolith _____
spondylodynia _____
craniotomy _____
paravertebral _____

Exercise 3. Write medical words for the following definitions.

fissure of the skull _____
inflammation of the vertebrae _____
surgical excision of a rib _____
surgical puncture of the spine _____
below the ribs _____

pertaining to the sacrum and ilium _____
fissure of the spine/spina bifida _____
measurement of the cranium _____
excision of the coccyx _____

Structure of a Long Bone

Terms: diaphysis, epiphysis, epiphyseal plate, epiphyseal line, periosteum

Joints -Articulations

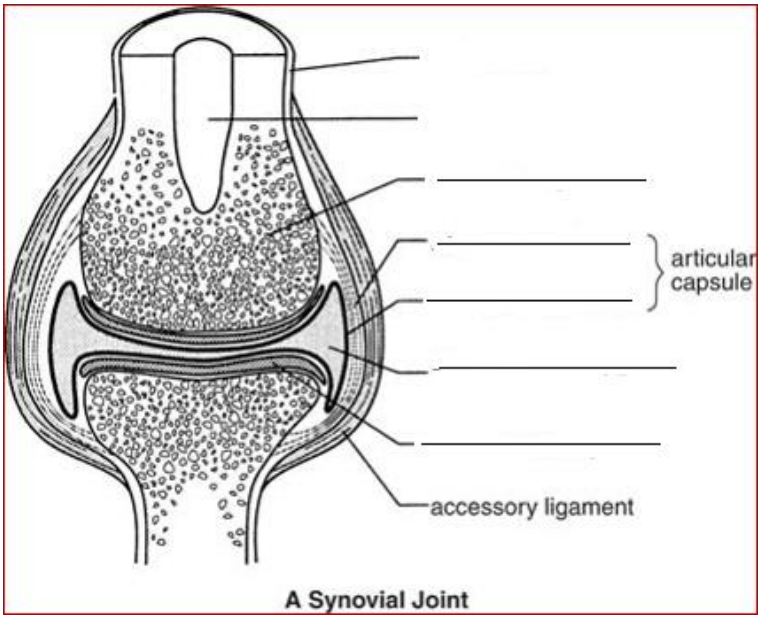
1.Continuous connections (synarthroses)

– fibrous - **syndesmosis:**
e.g.: tibiofibular ligament and sutures of skull: sutura plana, squamosa, serrata

– cartilagineous - **synchondrosis:**
e.g.: during adolescence in the epiphyseal disc; intervertebral disc;

– bony - **synostosis:**
e.g.: btw. the parts of hip bone or btw. epiphysis and diaphysis after growth has ceased;

2. Discontinuous connections (diarthroses) – Exercise 4. Label the diagram.



A Synovial Joint

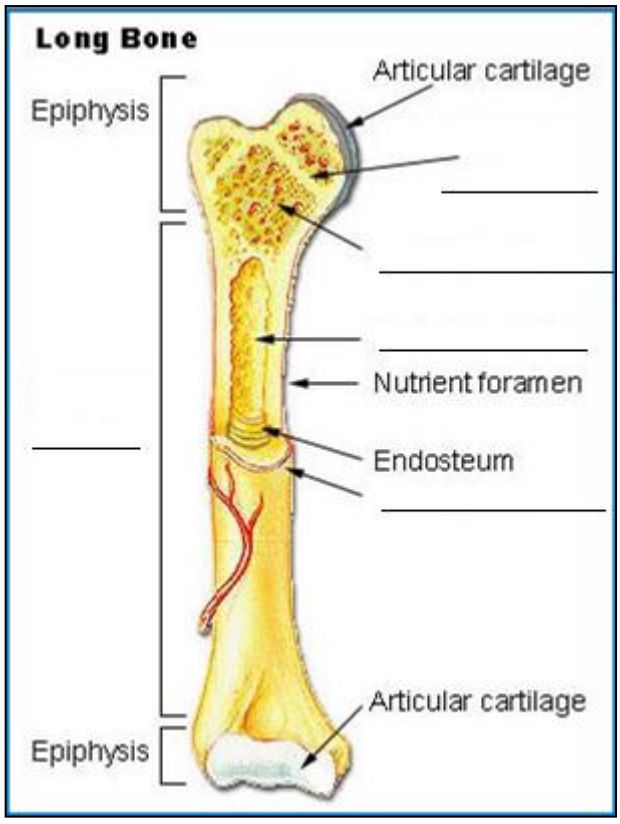
Table 4 Common Skeletal Vocabulary

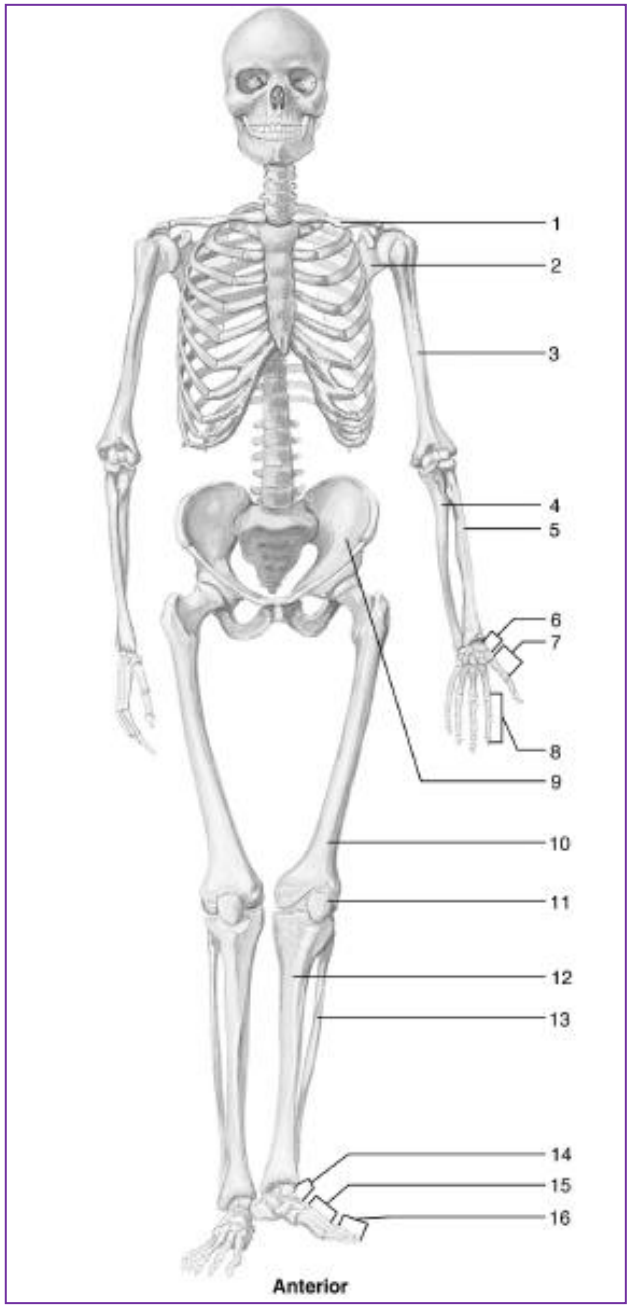
term	meaning
articulation	joint
bursa	sac of fluid in a joint
cancellous bone	spongy bone
compact bone	dense bone tissue
condyle	knuckle-like process at the end of a bone
diaphysis	shaft of a long bone
epiphysis	end of a long bone
fissure	long, cleft-like opening
fontanelle	soft spot of infant's skull
fossa	depression in a bone
hematopoiesis	formationof blood cells
ligament	connective tissue between bones
ossification	bone formation
osteoblast	a bone cell that helps form bone tissue
osteoclast	a bone cell that breaks down bone tissue
trabeculae	supporting bony fibers in cancellous bone

Exercise 5. Define the following terms.

osteolysis _____
myelopoiesis _____
chondroma _____
arthrocentesis _____
bursotomy _____
synovitis _____
osteopenia _____
arthroscope _____
arthropathy _____
osteoclasis _____
osteomalacia _____

Exercise 6. Label the diagrams.





CHAPTER 6

MUSCLES

The *musculoskeletal system* is made up of muscles and joints.

Terms: origin; belly, insertion

Types of Muscles

There are three types of muscles in the body: striated, smooth and cardiac muscles.

Table 1 Types of Movement

abduction	movement of drawing away from the center of the body
adduction	movement of drawing toward the midline of the body
extension	movement in which a limb is placed in a straight position
flexion	movement in which a limb is bent
pronation	movement that turns the palm of the hand downward
rotation	turning around on its own axis
supination	movement that turns the palm of the hand upward

Naming of Muscles

A muscle can be named by its location *(pectoralis major)*, by the direction of its fibers *(rectus abdominis)*, or by its size *(adductor longus)*, shape *(trapezius)* or number of attachment points (heads) *(triceps brachii)*. It may also be named for its action, flexor.

Table 2 Adjectives Describing Muscles

Latin form	English meaning
gracilis	**slender**
latissimus	**wide**
longus	**long**
orbicularis	**circular**
rectus	**straight**
serratus	**sawtoothed**
transversus	**crosswise**
vastus	**great, big**

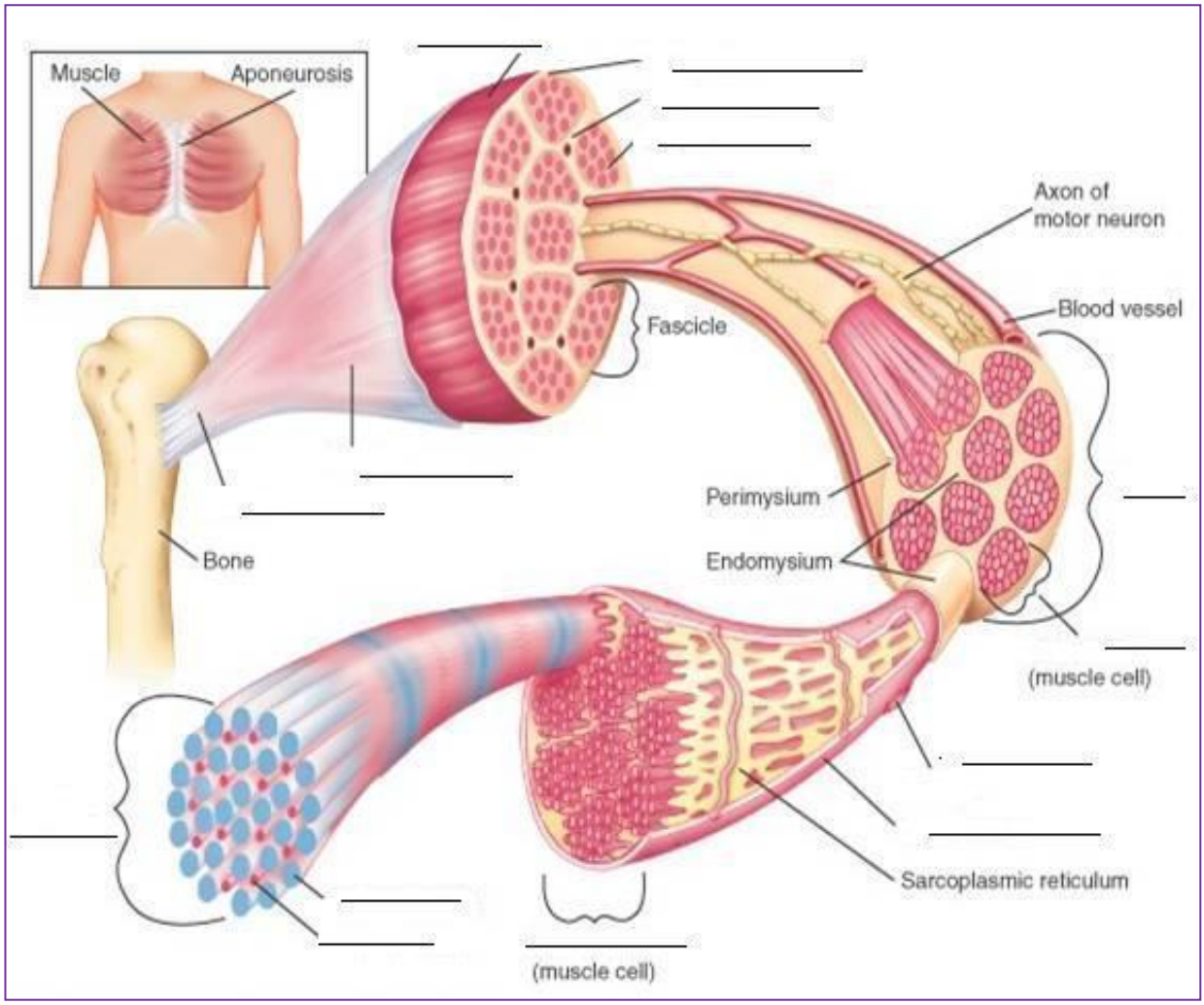
Table 3 Roots pertaining to Muscles

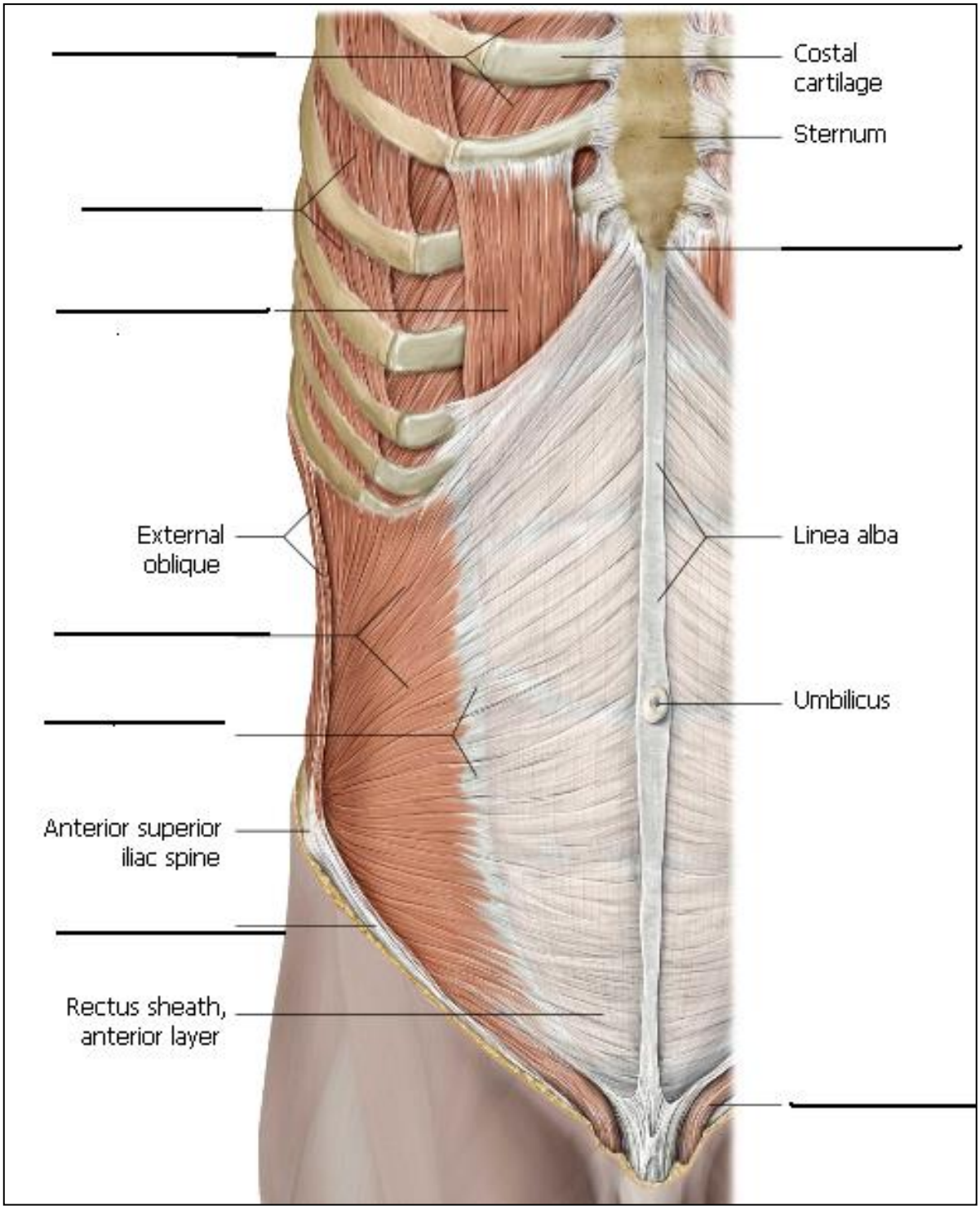
root	meaning	example
my/o	muscle	**myositis**
muscul/o	muscle	**musculotropic**
in/o	fiber	**inosclerosis**

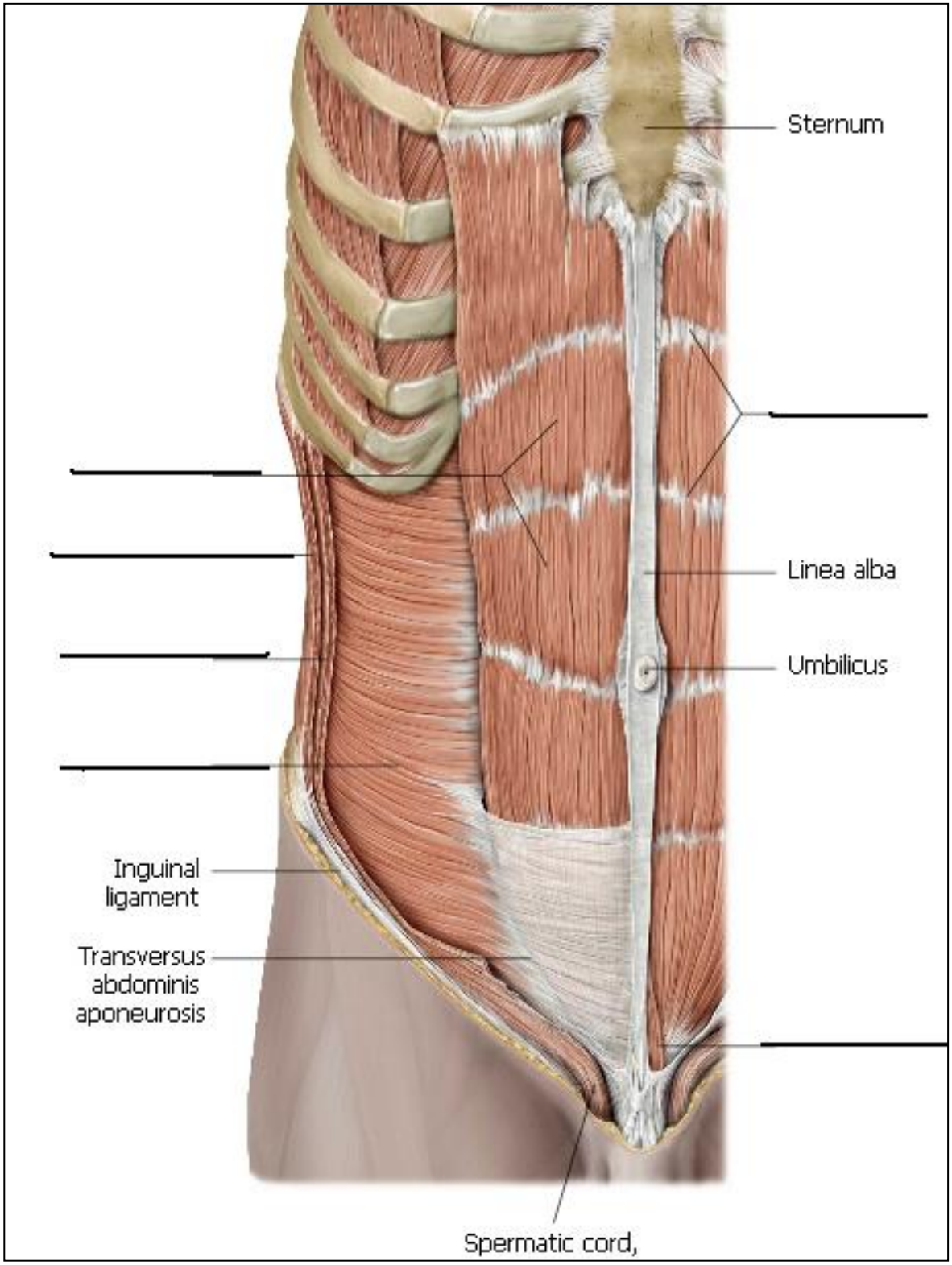
fasci/o	fascia	**fasciodesis**
ten/o, tendin/o	tendon	**tenostosis**
ton/o	tone	**atony**
erg/o	work	**synergistic**
kin/o, kine, kinesi/o	movement	**kinesis**
myocardi/o	heart muscle	**myocarditis**
leiomy/o	smooth visceral muscle	**leiomyoma**
rhabdomy/o	skeletal or striated muscle	**rhabdomyolysis**
sarc/o	soft, fleshy or connective tissue	**sarcoma**

note: in *myositis* an extra **–s** is added

Exercise 1. Label the diagrams.




Costal cartilage
Sternum
External oblique
Linea alba
Umbilicus
Anterior superior iliac spine
Rectus sheath, anterior layer


Sternum
Linea alba
Umbilicus
Inguinal ligament
Transversus abdominis aponeurosis
Spermatic cord,

Exercise 2. Explain the following terms.

endomysium _____

perimysium _____

epimysium _____

actin _____

myosin _____

sarcolemma _____

adduction _____

abduction _____

rotation _____

circumduction _____

myalgia _____

myonecrosis _____

atony _____

dyskinesia _____

tenodesis _____

tenodynia _____

fasciorrhaphy _____

fasciitis _____

polymyositis _____

atrophy _____

Exercise 3. What do the abbreviations refer to?

EMG _____
Ach _____
NMJ _____
CK _____

CHAPTER 7

THE CARDIOVASCULAR SYSTEM

Blood circulates throughout the body in the **cardiovascular system.**

Terms: endocardium, myocardium, epicardium, pericardium, atrium, ventricle, valves, septum, arterial and venous system, capillaries

root	meaning	example
aort/o	aorta	**aortic**
angi/o (Gr.)	vessel	**angiogram**
vas/o (L.)	vessel	**vasoconstriction**
arteri/o	artery	**arteriosclerosis**
arteriol/o	arteriole	**arteriolitis**
atri/o, atri/a	atrium	**atrioventricular**
ather/o	yellow plaque or fatty substance	**atherosclerosis**
cardi/o	heart	**cardiomegaly**
phleb/o (Gr.)	vein	**phlebitis**
ven/o (L.)	vein	**venotomy**
thromb/o	clot	**thrombus**
valv/o, valvul/o	valve	**valvular**
venul/o	venule	**venulitis**
ventricul/o	ventricle	**ventricular**

Exercise 1. Fill in the sentences.

An atriotomy is _____
A valvulotome is _____
Vasospasm means _____
Arteriolitis is _____
Aortoptosis is _____
Phlebectasia is _____
Aortostenosis is _____

Exercise 2. Supply medical terms for the definitions below.

inflammation of the lining of the heart _____
inflammation of the heart muscle _____
inflammation of the fibrous sac around the heart _____
study of the heart _____

between the ventricles _____
enlargement of the heart _____
surgical incision of a valve _____
inflammation of a vein _____
within a vein _____
plastic repair of a vessel _____

Exercise 3. Define the following words.

cardiovascular _____

arteriorrhexis _____

angiectasis _____

angiogram _____

thrombus _____

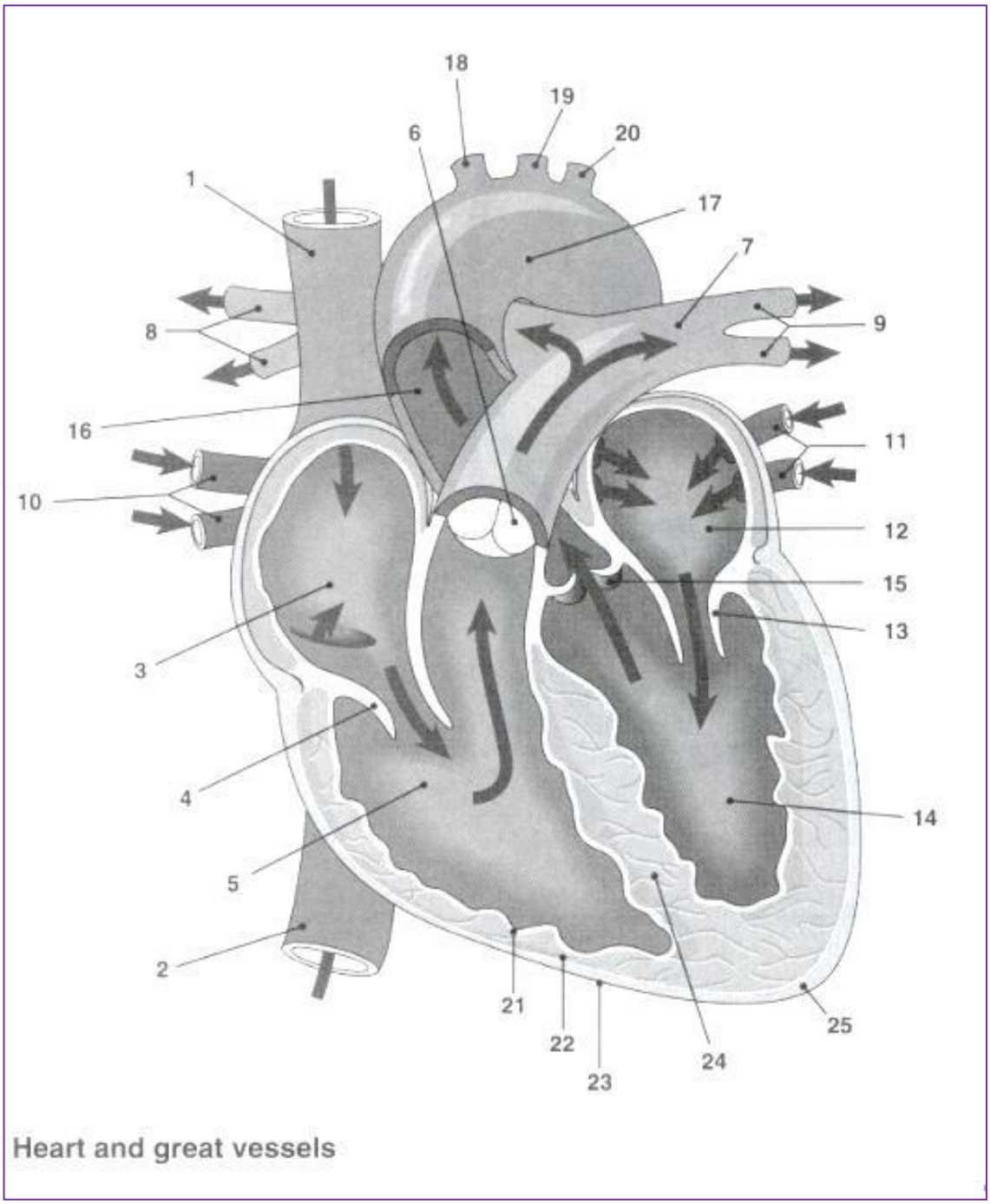
thrombosis _____

embolus _____

embolism _____

arrhythmia _____

Exercise 4. Label the diagram.



Heart and great vessels

Cardiovascular Disorders

Terms: angina pectoris, arteriosclerosis, atherosclerosis, bradycardia, cerebrovascular accident (CVA) clubbing, murmur, cyanosis, deep vein thrombosis (DVT)
embolism, hemorrhoid, hypertension, ischemia, syncope, tachycardia, varicose vein

Terms pertaining to Diagnosis and Treatment

Terms: echocardiography, percutaneous transluminal coronary angioplasty (PTCA)

Exercise 5. Explain the following terms.

varicose veins _____

hemorrhoid _____

phlebitis _____

deep vein thrombosis _____

angina pectoris _____

syncope _____

diaphoresis _____

clubbing _____

CHAPTER 8

THE LYMPHATIC SYSTEM

The **lymphatic system** is a widely distributed system with multiple functions. Its role in circulation is to return excess fluid and proteins from the tissues to the bloodstream. The fluid carried in the lymphatic system is called **lymph.**

Terms: thoracic duct, right lymphatic duct, lymph nodes, tonsils, thymus gland, lymphocytes

Figure 8.1 illustrates the regional lymph nodes.

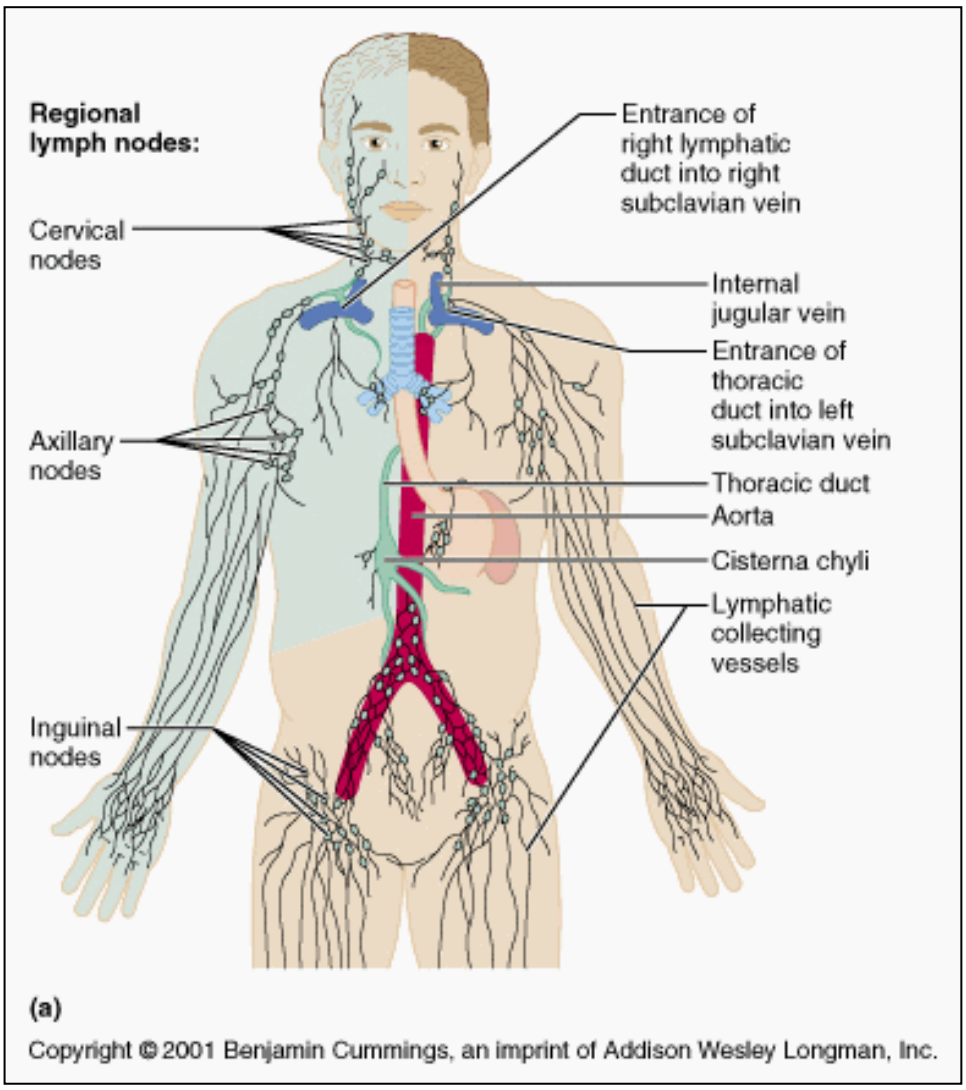


Table 1 Roots pertaining to the Lymphatic System

root	meaning	example
lymph/o	lymph, lymphatic system	**lymphoid**
lymphaden/o	lymph node	**lymphadenectomy**
lymphangi/o	lymphatic vessel	**lymphangiography**
splen/o	spleen	**splenalgia**
thym/o	thymus gland	**athymia**
tonsill/o	tonsil	**tonsillectomy**

Exercise 1. Define the terms.

lymphedema _____
lymphadenitis _____
lymphangiogram _____
splenic _____
thymectomy _____
tonsillopathy _____
lymphangial _____
lymphadenography _____
perisplenitis _____
tonsillitis _____
splenomegaly _____
lymphangioma _____
lymphangiophlebitis _____
hypothymism _____
lymphadenopathy _____

CHAPTER 9

THE RESPIRATORY SYSTEM

PATIENT HISTORY: **Pediatric Asthma Exacerbation History**

REASON FOR ADMISSION: Difficulty breathing.

HISTORY OF PRESENT ILLNESS: The patient is a 9-year-old male with history of asthma. He presented to the emergency department, accompanied by parents, for difficulty breathing. The parents states their son was in his usual state of health and been swimming in their pool for most of the day. Later in the evening he developed a dry cough. His mother started him on albuterol via nebulizer every 2 hours overnight. The mother gave him a dose of Prelone 15 mg per 5 mL, 7.5 mL at midnight. Mother noted no real improvement, and the patient was complaining of continued trouble breathing. Because of the above, he was brought to the emergency department. The parents have noted no fever or recent upper respiratory infection.

In the emergency department his temperature was 99.7, respiratory rate 58, and pulse 136. Oxygen saturation was 85% on room air. The patient was given Xopenex via nebulizer, but due to persistent difficulty breathing and increased respiratory rate with wheezing, the patient was admitted for further treatment and evaluation. While in the emergency department, chest x-ray revealed hyperinflation of the lungs but no acute infiltrate or atelectasis.

This patient does have a history of asthma. He was hospitalized in August and September of last year, and again in July of this year. The most recent hospitalization was preceded by the patient playing in the swimming pool at a hotel, and at that time it was thought water aspiration may have occurred. Chest x-ray at the time of that admission revealed lower lobe collapse. A followup chest x-ray after the July admission was unremarkable.

The patient has been on preventive therapy for his asthma using Flovent 44 mcg 2 puffs once daily. In addition, he uses albuterol as necessary. The parents have not given the patient an albuterol treatment in several weeks. The parents state they do not note difficulty breathing during exercise. An ImmunoCAP specific IgE blood test was negative. There are no pets in the home and no smokers living in the home.

PAST MEDICAL HISTORY: Asthma with 3 prior hospitalizations. No intubations in the past.

CURRENT MEDICATIONS
1. Flovent MDI 44 mcg 2 puffs daily.
2. Albuterol 0.5 mL in 2 mL normal saline used on a p.r.n. basis.

ALLERGIES: No known drug allergies.

SOCIAL HISTORY: The patient lives with his parents and 10 siblings. There is no tobacco exposure.

IMMUNIZATIONS: immunizations are current.

FAMILY HISTORY: One sibling has allergies. Maternal grandfather has a history of asthma.

REVIEW OF SYSTEMS: The patient complains of no fever, chills, or emesis. He has a good appetite. His weight has been stable. He denies sore throat or ear pain. He has no abdominal pain and states he has regular bowel movements. The rest of the review of systems is unremarkable.

PHYSICAL EXAMINATION: This is a tired-looking male. Oxygen saturation is 98% via face mask. Respiratory rate range is 40 to 60, pulse 140. He is in mild respiratory distress. There is use of accessory muscles for respiration. HEENT: Pupils equal and reactive. Extraocular movements are intact. Conjunctivae pink. There is no nystagmus. Tympanic membranes (TMs) clear. No nasal drainage. Mucous membranes are moist. The patient has fair dentition. Neck is supple. There is no prominent adenopathy. The chest moves symmetrically. He is using subcostal muscles. There are expiratory wheezes with bilateral rhonchi and poor air exchange. Heart is tachycardic, regular rhythm, without murmur. The abdomen is soft and nondistended. No tenderness to palpation. Bowel sounds are present. There is no hepatosplenomegaly. Extremities have a brisk capillary refill with no peripheral edema. He is alert and oriented and has frequent coughing spells.

ASSESSMENT: A 9-year-old male with asthma exacerbation.

PLAN: We will begin continuous Xopenex via nebulizer with Atrovent. We will continue monitoring pulse oximetry. If there is worsening shortness of breath and poor air exchange, we will check an arterial blood gas. We will continue the Flovent and increase her dosage to 2 puffs twice daily. We will also continue oral steroids 1 mg/kg twice daily.

Questions

1. Fill in the blanks.

The medical term for difficulty breathing is:_____.
Physical examination revealed tachycardia, which is _____.
Physical examination noted that the patient used accessory muscle for respiration. The primary muscle of respiration is the _____.
Physical examination revealed bilateral ronchi, which suggested the presence of fluid in the bronchi. Ronchus means_____.

2. Define the following abbreviations.

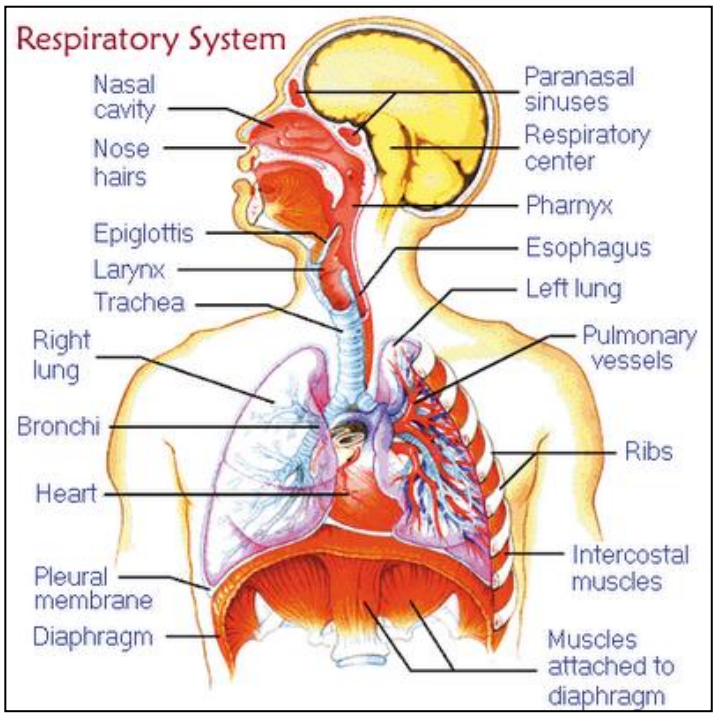
HPI, PMH, NKDA, HEENT

3. Define the following terms.

nebulizer
atelectasis
pulse oximetry

Terms: external – internal gas exchange, cellular respiration,

Figure 9.1 illustrates the main structures of the respiratory system.



Upper Respiratory Passageways

The upper respiratory passageways consist of the nose and the pharynx (throat).

Terms: cilia, paranasal sinuses, conchae

The Pharynx

Terms: nasopharynx, adenoid, oropharynx, laryngeal pharynx

Lower Respiratory Passageways and the Lungs

The Larynx

Terms: thyroid gland, arytenoid gland, glottis. epiglottis. vocal cords

The Trachea

Terms: tracheal bifurcation, expectoration

The Bronchial System

Terms: main bronchi, bronchioles, alveoli

The Lungs

Terms: **pleura. parietal pleura. visceral pleura. the pleural space**

Figure 9.2 illustrates the process of respiration.

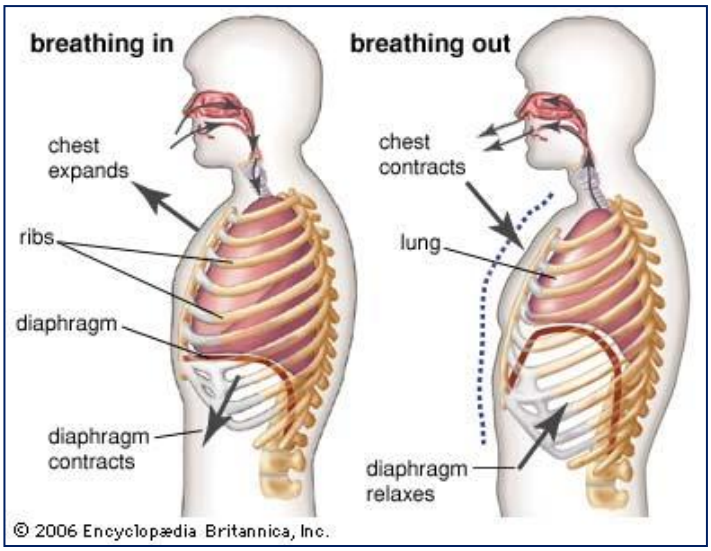


Table 1 Word Roots pertaining to the Respiratory System

root	meaning	example
nas/o	nose	**paranasal**
rhin/o	nose	**rhinoplasty**
pharyng/o	pharynx	**pharyngospasm**
laryng/o	larynx	**laryngeal**
trache/o	trachea	**tracheotome**
bronch/o, bronch/i	bronchus	**bronchogenic**
bronchiol	bronchiole	**bronchiolar**
phren/o	diaphragm	**phrenic**
phrenic/o	phrenic nerve	**phrenicotripsy**
pleur/o	pleura	**pleuralgia**
pulm/o, pulmon/o	lungs	**intrapulmonary**
pneumon/o	lung	**pneumonectomy**
pneum/o, pneumat/o	air, gas, lung, respiration	**pneumothorax**
spir/o	breathing	**spirometer**

Table 2 Suffixes for Respiration

suffix	meaning	example
-pnea	breathing	**orthopnea**
-oxia	level of oxygen	**hypoxia**
-capnia	level of carbon dioxid	**hypercapnia**
-phonia	voice	**dysphonia**

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

Exercise 1. Give the medical term for the following.

lack of oxygen in the tissues _____
decreased carbon dioxide in the tissues _____
normal levels of carbon dioxide in the tissues _____
lack of voice _____
painful or difficult breathing _____
easy, normal breathing _____
lack of breathing _____
rapid rate of breathing _____
inflammation of the pharynx _____
pertaining to the pharynx _____
endoscopic examination of a bronchus _____

inflammation of the bronchioles _____
narrowing of a bronchus _____
plastic repair of the larynx _____
surgical incision of the trachea _____
surgical puncture of the pleural space _____
creation of an opening into the trachea _____
sudden contraction of a bronchus _____
hernia of the pleura _____
incision of the phrenic nerve _____

Exercise 2. Define the following words.

bronchiectasis _____
peribronchial _____
endotracheal _____
nasopharyngeal _____
pneumonitis _____
pleuropulmonary _____
pneumoplasty _____
pulmonology _____
pyothorax _____
adenoidectomy _____
bradypnea _____
pneumonopathy _____
rhinoplasty _____
pharyngoxerosis _____

CHAPTER 10

THE DIGESTIVE SYSTEM

From the Mouth to the Stomach

Terms:
oral cavity (cavitas oris), hard palate (palatum durum), soft palate (velum palatinum), uvula, esophagus, lower esophageal sphincter (LES), pylorus

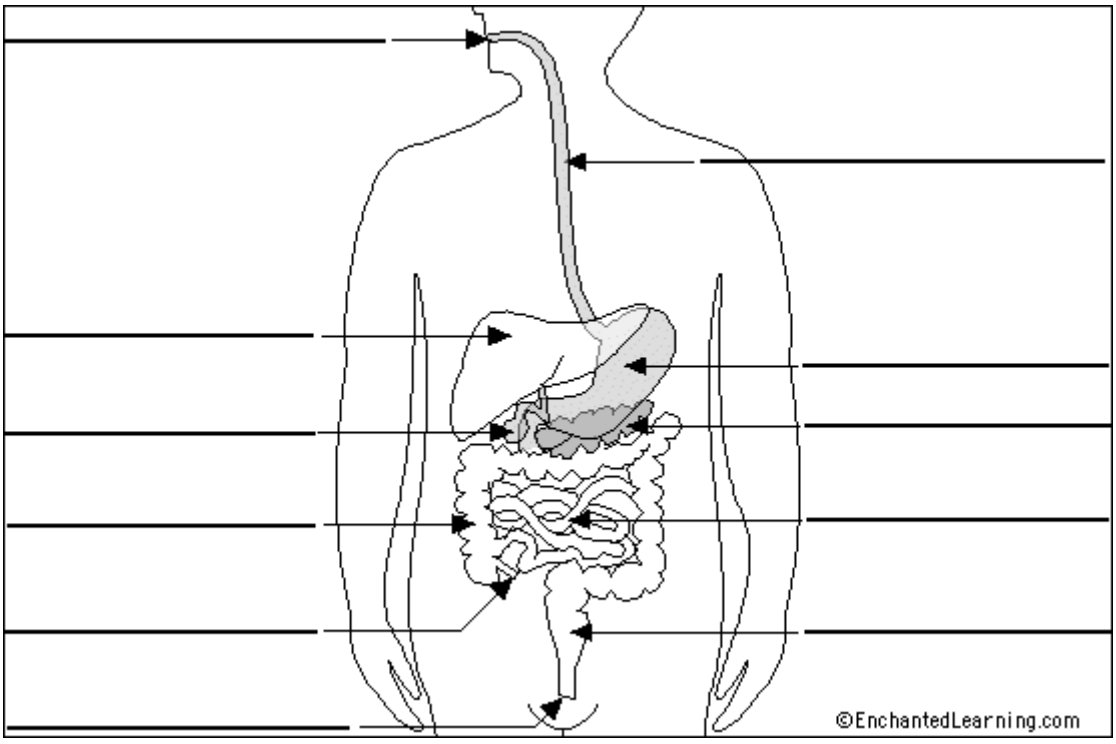
The Small Intestine

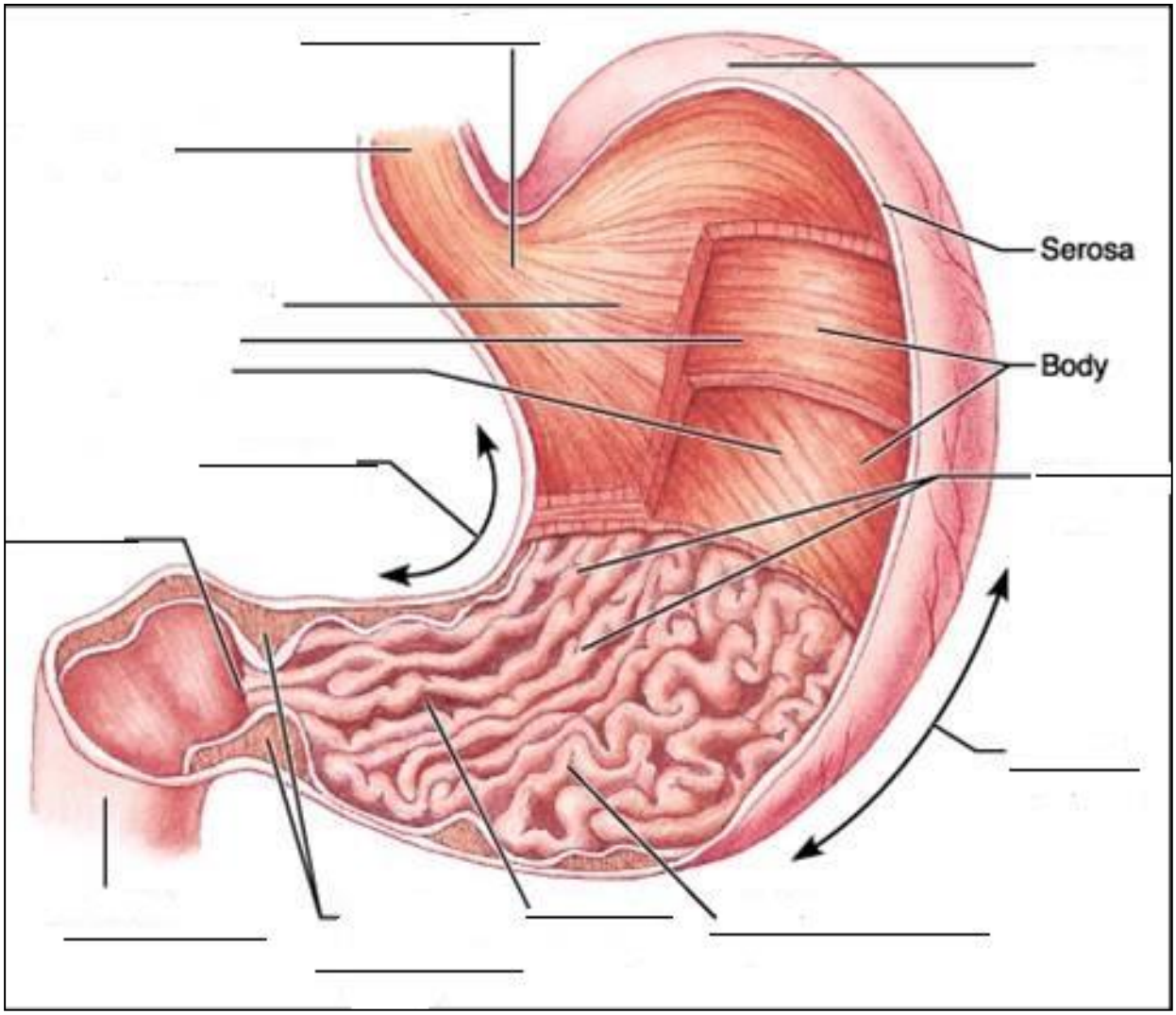
Terms: duodenum, jejunum and ileum, lacteals

The Large Intestine

Terms; cecum, appendix, ascending colon, transverse colon, descending colon, sigmoid colon, rectum, anus

Exercise 1. Label the diagrams.

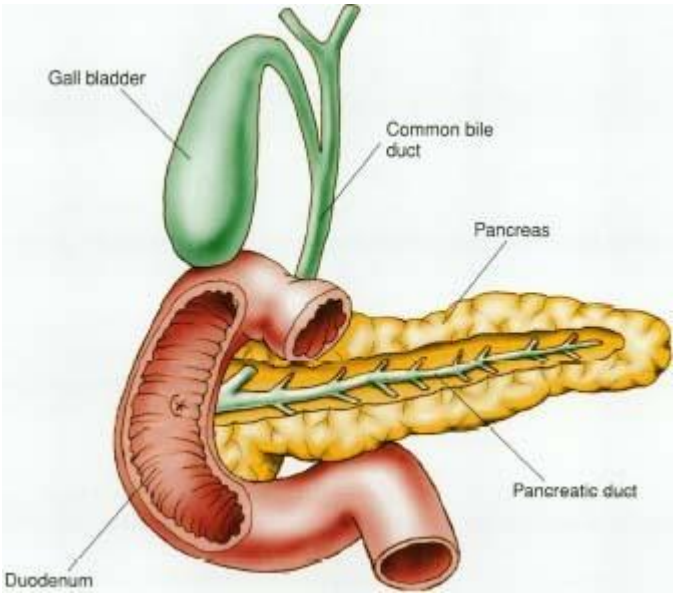




The Accessory Organs

Terms: salivary glands, salivary amylase, liver, hepatic portal system. bile, gallbladder , right and left hepatic duct, common hepatic duct, cystic duct, common bile duct, pancreas, pancreatic duct

Figure 10.1 illustrates the accessory organs.



Roots pertaining to Digestion

Table 1 Roots for the Mouth

root	meaning	example
bucc/o	cheek	**buccal**
dent/o, dent/i, dent/u	tooth,teeth	**edentulous**
gingiv/o	gingiva	**gingivectomy**
gloss/o	tongue	**glossoplegia**
lingu/o	tongue	**orolingual**
gnath/o	jaw	**prognathous**
labi/o	lip	**labium**
cheil/o	lip	**cheiloschisis**
or/o	mouth	**circumoral**
stoma,stomat/o	mouth	**xerostomia**
palat/o	palate	**palatine**
sial/o	saliva, salivary gland,	**sialogram**
uvul/o	uvula	**uvulotome**

Exercise 2. Fill in the sentences.

A stomatologist specializes in _____
Micrognathia is _____
A sialolith is _____
An orthodontist specializes _____

Hemiglossal means pertaining to _____
Cheiloschisis is a fetal malformation involving _____

Exercise 3. Define the following medical terms.

sublingual _____
hypoglossal _____
palatorrhaphy _____
gingivitis _____
labiodental _____
uvuloptosis _____

Table 2 Roots for the Digestive Tract

root	meaning	example
esophag/o	esophagus	**esophageal**
gastr/o	stomach	**gastroparesis**
pylor/o	pylorus	**pyloroplasty**
enter/o	intestine	**dysentery**
duoden/o	duodenum	**duodenostomy**
jejun/o	jejunum	**jejunectomy**
ile/o	ileum	**ileitis**
cec/o	cecum	**cecoptosis**
col/o, colon/o	colon	**coloclysis**
sigmoid/o	sigmoid colon	**sigmoidoscope**
rect/o	rectum	**rectocele**
proct/o	rectum	**proctopexy**
an/o	anus	**perianal**
pepsia	digestion	**eupepsia**

Exercise 4. Supply medical terms for the following definitions.

study of the stomach and the intestines _____
inflammation of the esophagus _____
surgical fixation of the stomach _____
downward displacement of the pylorus _____
endoscopic examination of the duodenum _____
surgical creation of an opening into the jejunum _____
excision of the ileum _____
inflammation of the stomach and the intestines _____
surgical puncture of the abdomen _____
normal digestion _____
poor, difficult digestion _____

Exercise 5. Give medical terms for the following.

surgical creation of an opening into the colon _____
surgical fixation of the colon _____
inflammation of the colon _____
surgical puncture of the colon _____
any disease of the colon _____

Table 3 Roots pertaining to the Accessory Organs

root	meaning	example
hepat/o	liver	**hepatorrhexis**
bili	bile	**biliary**
chol/e, chol/o	bile, gall	**cholestasis**
cholangi/o	bile duct	**cholangioma**
cholecyst/o	gallbladder	**cholecystitis**
choledoch/o	common bile duct	**choledochal**
pancreat/o	pancreas	**pancreatotropic**

Exercise 6. Supply medical terms for the following definitions.

radiographic study of the pancreas _____
condition of having a stone in the pancreas _____
condition of having a stone in the common bile duct _____
enlargement of the liver _____
inflammation of the liver _____
suture of the bile duct _____
a gallstone _____
removal of the gallbladder _____
an incision into the common bile duct _____
formation of bile _____

Common Gastrointestinal Conditions

Because the GI system is made of many parts, it can be prone to all sorts of ailments and maladies. Some symptoms, diseases are listed below.

aphagia: inability to swallow
dysphagia: difficulty swallowing
esophagitis: inflammation of the esophagus
halitosis: bad breath
heartburn: burning sensation caused by reflux or flowing back of acid from the stomach into esophagus
cholecystitis: inflammation of the gallbladder
Crohn's disease: inflammation and ulceration of the intestinal tract of terminal or end portion of ileum
diverculitis: inflammation of the diverticula

enteritis: inflammation of the intestine
gastroenteritis: inflammation of the stomach and the intestines
Hepatitis A: acute inflammation of the liver, spread by fecal-oral contact
Hepatitis B: inflammation of the liver due to a virus transmitted by blood and body fluids
Hepatitis C: virus affecting the liver, spread through blood and body fluids. Like other forms of hepatitis, this can produce jaundice.
pancreatitis: inflammation of the pancreas
ulcerative colitis: chronic inflammation of colon with ulcers
celiac disease: also known as malabsorption syndrome, gluten enteropathy or nontropical sprue. This disease is thought to be precipitated by gluten-containing foods. The hair-like projections (villi) degenerate, or actually flatten losing their absorption function. Those with the disease must follow a gluten-free diet to control abdominal pain and diarrhea.
cirrhosis: is a scarring of the liver parenchyma, or tissue, due to damage from alcohol, drugs, and viruses, like hepatitis.
GERD: gastroesophageal reflux disease, it refers to the backward flow of gastrointestinal contents into the esophagus.
IBS: irritable bowel syndrome is a group of symptoms including diarrhea, abdominal bloating, cramping and constipation associated with stress and tension.

Exercise 7. Explain the following terms.

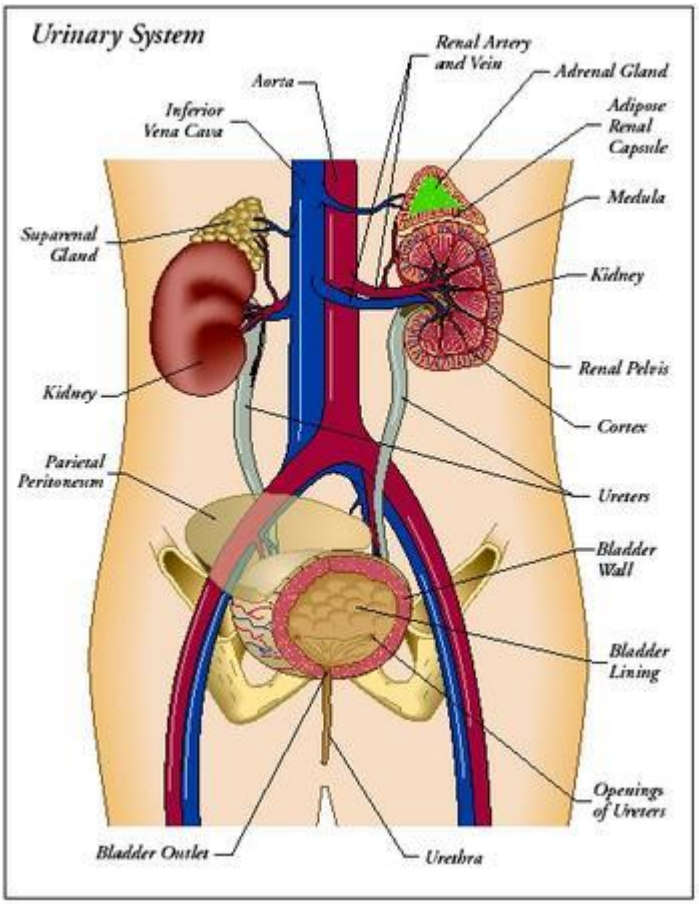
laparotomy _____
gastrectomy _____
ileostomy _____
pyloroplasty _____
herniorrhaphy _____
colectomy _____
colostomy _____
choledocholithotomy _____

CHAPTER 11

THE URINARY SYSTEM

The urinary system excretes metabolic waste. In the process of forming and eliminating urine, it also regulates the composition, volume and acid-base balance of body fluids. The system is thus of critical importance in maintaining homeostasis, the state of internal balance.

Figure 11.1 illustrates the front view of urinary system.



Terms: kidneys, renal cortex, renal medulla, renal pyramids, renal pelvis (pyelon), ureter, urinary bladder, urethra, external and internal urinary sphincter

The Nephrons

Terms: nephrons glomerular (Bowman) capsule, proximal convoluted tubule, loop of Henle, distal convoluted tubule, collecting duct.

Table 1 Roots for the Kidney

root	meaning	example
ren/o	kidney	**renal**
nephr/o	kidney	**nephrosis**
glomerul/o	glomerulus	**juxtaglomerular**
pyel/o	renal pelvis	**pyelectasis**
cali/o, calic/o	calyx	**calicectomy**

Table 2 Roots for the Urinary Tract

root	meaning	example
ur/o	urine, urinary tract	**urosepsis**
urin/o	urine	**nocturia**
ureter/o	ureter	**ureterostenosis**
cyst/o	urinary bladder	**cystocele**
vesic/o	urinary bladder	**supravesical**
urethr/o	urethra	**urethrotome**

Excercise 1. . Use the appropriate word root to write a term for the following.

surgical removal of the kidney _____
study of the kidney _____
softening of the kidney _____
poisonous or toxic to the kidney _____
any disease of the kidney _____

Exercise 2. Supply medical terms for the following.

inflammation of the glomerulus _____
dilatation of a renal calyx _____
radiograph of the renal pelvis _____
plastic repair of the renal pelvis _____
hardening of a glomerulus _____
inflammation of the renal pelvis and kidney _____
a urinary calculus _____
presence of urinary waste products in the blood _____
around the kidney _____
behind the kidney _____

Exercise 3. The root *ur/o* is used in the suffix *–uria*, which means ‘condition of urine or of urination’. Give the appropriate technical terms for the following.

lack of urine _____
painful or difficult urination _____

formation of excess urine _____
presence of cells in the urine _____
presence of blood in the urine _____

Exercise 4. Supply medical terms for the following.

increased excretion of urine _____
lack of urination _____
excretion of sodium in the urine _____
excretion of potassium in the urine _____
inflammation of the urinary bladder _____
surgical fixation of the urinary bladder _____
an instrument for examining the inside of the bladder _____
incision into the bladder _____
endoscopic examination of the urethra _____
surgical fixation of the urethra _____
pain felt in the urinary bladder _____
formation of urine _____

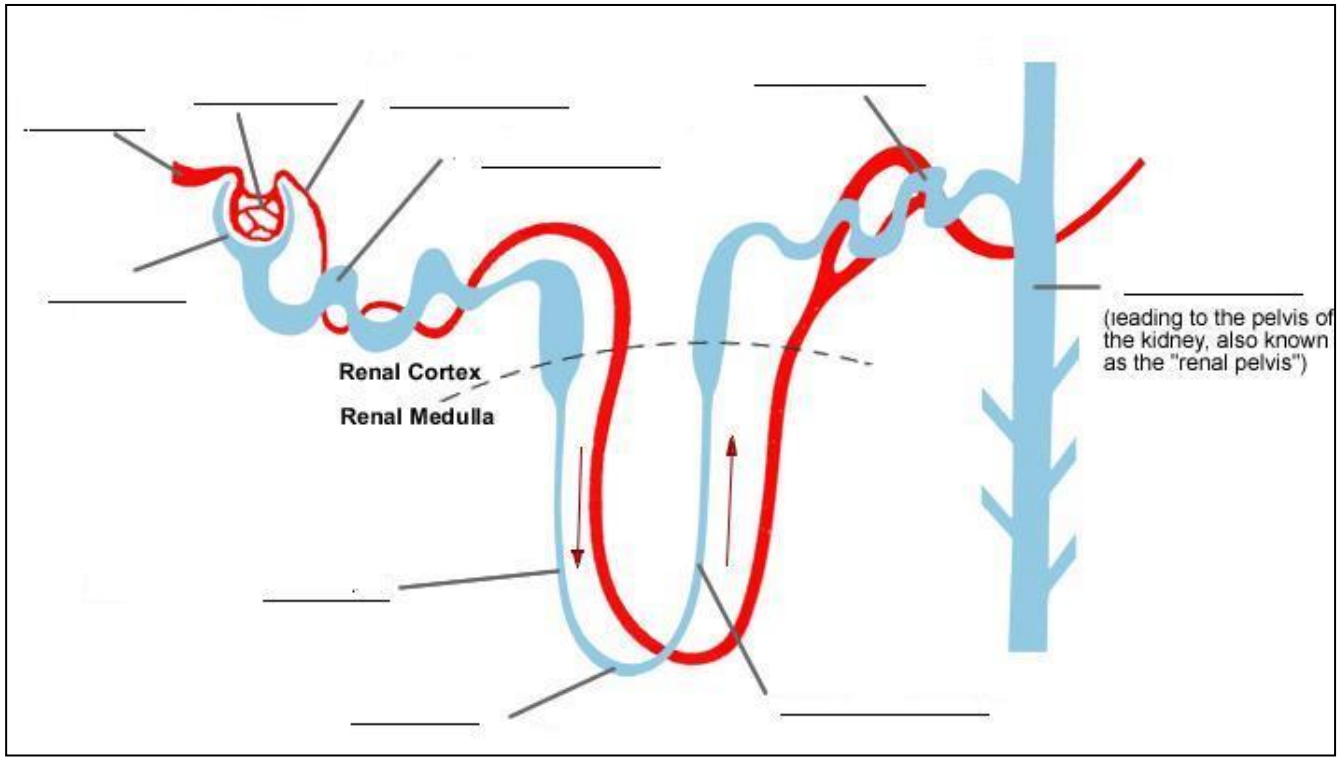
Table 3 Urinary Surgeries and Procedures

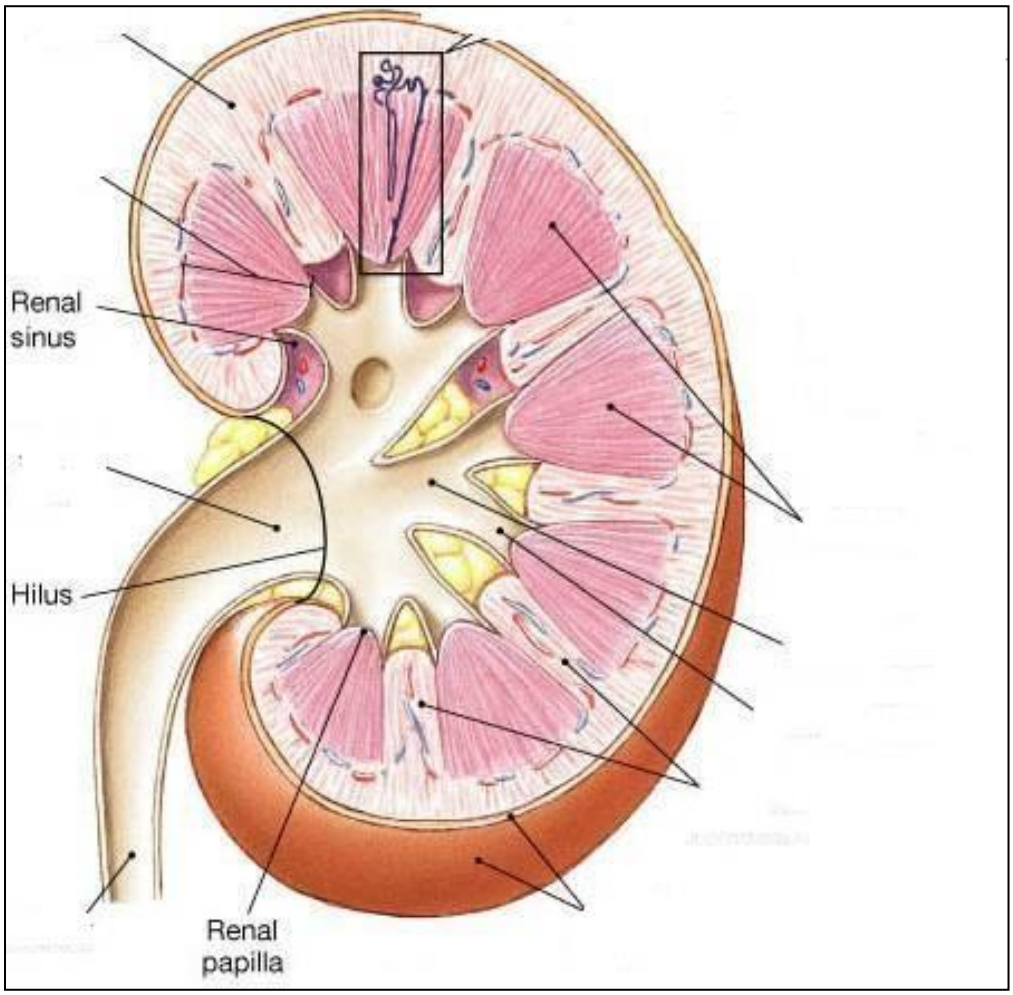
cystectomy	surgical excision of the bladder
dialysis	the procedure to remove waste material such as urea from the blood stream
ESWL	extracorporeal shock wave lithotripsy
hemodialysis	artificial kidney machine filtering waste from blood stream
lithotripsy	surgical or shock wave disintegration or crushing of kidney stones
peritoneal dialysis	waste is removed from the blood via fluid exchange through the peritoneal cavity
pyelolithotomy	incision into the renal pelvis to remove stones

Exercise 5 Define the following terms.

pyuria _____
oliguria _____
chromaturia _____
nocturia _____
urinary stasis _____
enuresis _____
incontinence _____
polydipsia _____

Exercise 6. Label the diagrams.





CHAPTER 12

THE MALE REPRODUCTIVE SYSTEM

PATIENT HISTORY

OPERATIVE REPORT

PREOPERATIVE DIAGNOSIS: Left varicocele.

POSTOPERATIVE DIAGNOSIS: Left varicocele.

PROCEDURE: Left varicocelectomy.

INDICATION: This is a previously healthy 35-year-old man who has complaints of chronic left testalgia. No previous history of trauma was noted, and he had no prior history of any surgery in that area. Clinically, the patient has a grade 2 out of 3 varicocele and after discussing options with him, he elected to proceed with the surgery mentioned above. Risks, benefits and alternatives were discussed. He understood and elected to proceed.

TECHNIQUE: The patient was placed in the supine position. The perineum was prepped and draped in sterile fashion. Antibiotics were given prior to start of surgery. Using a #15 blade, I made a small left inguinal incision just below the external inguinal ring. Using both sharp and blunt dissection, I was able to identify the left inguinal spermatic cord which was then isolated, skeletonized and mobilized using a Penrose drain that was brought out and suspended up above the wound. Using sharp and blunt dissection, I was able to isolate the left vas deferens which was mobilized away from the area of the dissection. The rest of the cord was then dissected through using both sharp and blunt dissection and the varicoceles identified were suture ligated using both 2-0 and 3-0 silks. After they were completely ligated, the rest of the cord was inspected and vas deferens remained intact. There was no evidence of injury. I placed a cord vacuum into the wound itself where, once adequate hemostasis was assured, the area was irrigated until clear. I reapproximated the subcutaneous tissues in an interrupted 3-0 Vicryl followed by 3-0 Vicryl suture followed by 4-0 Monocryl closing the skin in subcuticular fashion. Estimated blood loss minimal. No complications noted during the procedure. The patient was transported to the recovery room in good condition.

1.Define the underlined terms.

Terms: gonads, gametes, spermatozoa (singular: spermatozoon), testes epididymis,vas deferens, ejaculatory ducts, seminal vesicles, prostate, and bulbourethral glands (or Cowper's glands). penis, scrotum, spermatic cords, perineum.

The Testes

Terms:seminiferous tubules, Sertoli cells, Leydig cells, testosterone.

Exercise 1. Label the diagram.

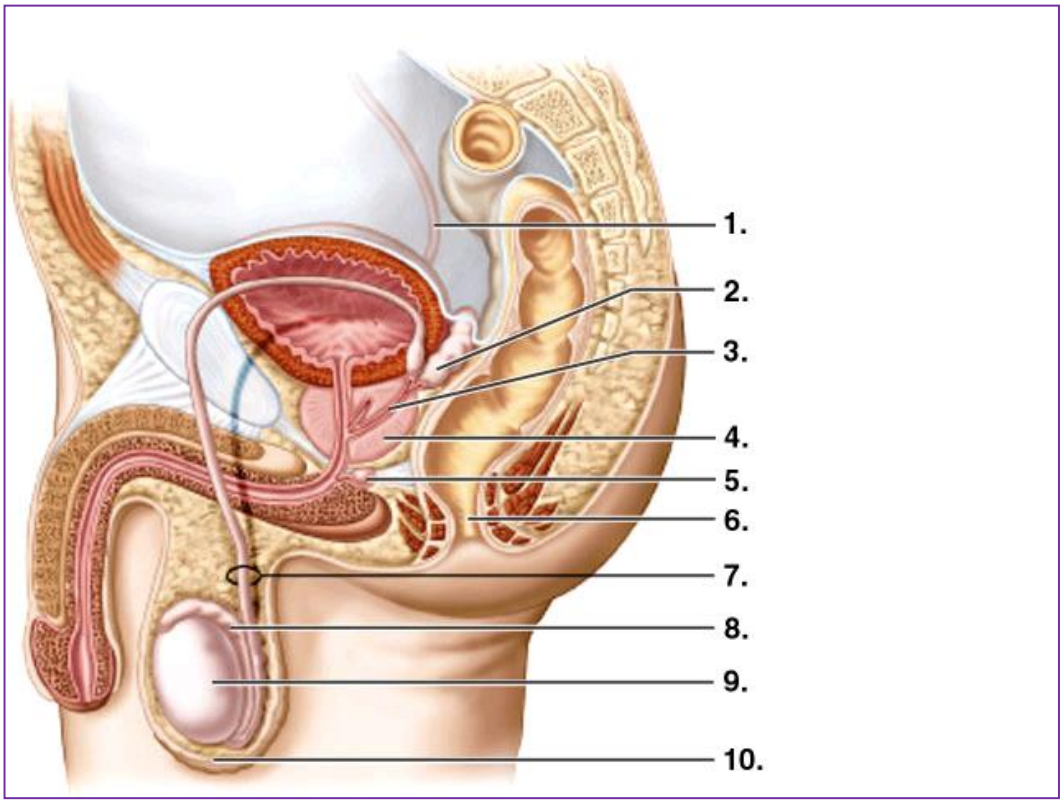


Table 1 Roots pertaining to Male Reproductive System

root	meaning	example
andro/o	male	**andropathy**
balan/o	glans penis	**balanitis**
epididym/o	epididymis	**epididymotomy**
orchi/o, orchid/o	testis	**anorchism**
test/o	testis, testicle	**testosterone**
osche/o	scrotum	**oscheal**
prostat/o	prostate	**prostatometer**
semin	semen	**inseminate**
sperm/i, spermat/o	semen, spermatozoa	**polyspermia**
vas/o	vas deferens, ductus deferens	**vasostomy**
vesicul/o	seminal vesicle	**vesiculogram**

Exercise 2. Define the following terms.

seminal _____
orchiepididymitis _____
orchialgia _____
epididymectomy _____
prostatic _____
cryptorchidism _____
vesiculotomy _____
anorchism _____
aspermia _____
balanocele _____
balanorrhea _____
oligospermia _____
prostatolith _____
prostatorrhea _____

Exercise 3. Word building.

stone in the scrotum _____
surgical incision of the prostate _____
surgical fixation of the testis _____
inflammation of a seminal vesicle _____
excision of the vas deferens _____
plastic repair of the scrotum _____
excision of the prostate gland _____
surgical creation of an opening in the vas deferens _____
incision of the epididymis _____
presence of pus in the semen _____
condition of having sperm in the urine _____

CHAPTER 13

THE FEMALE REPRODUCTIVE SYSTEM

PATIENT HISTORY: **Laparoscopic-Assisted Hysterectomy**

Title of Operation: Laparoscopic-assisted hysterectomy and bilateral salpingo-oophorectomy.

Procedure in Detail: After informed consent was obtained, the patient was taken to the operating room where she underwent general endotracheal anesthesia. The patient was then prepped and draped in normal sterile fashion in the dorsal lithotomy position in Allen stirrups. A Foley catheter was placed, and a Rubin cannula was placed in the cervix. The infraumbilical area was injected with Xylocaine. A 1-cm incision was then made. The Veress needle was then placed. Two towel clips were then placed on the skin to elevate the abdomen. The Veress needle was placed through this incision with proper placement verified by saline drop test and an opening pressure of 3 mmHg. The abdomen was then insufflated. The pelvis was examined and noted to be grossly normal. Two additional 10-mm trocars were placed in the left and right lower quadrants under direct visualization. Each area was injected with lidocaine first. The pelvis was fully examined.

The uterus was grossly normal and retroverted. There were normal bilateral tubes and ovaries. There was a small amount of endometriosis along the posterior uterosacral ligaments which was ablated. Next, the left infundibulopelvic ligament was clamped and cut using the Endostapler. Prior to this being transected, care was taken to verify that the ureter was not in the clamp. The remainder of the broad ligament was then serially transected using the stapling device. Once again, prior to transection and stapling, each pedicle was checked to ensure that there was no ureter noted in the clamp. In a similar fashion, the right infundibulopelvic ligament was clamped and transected using the stapler. Once again, the ureter was identified prior to any transection. The remainder of the broad ligament was transected in a similar fashion. The bladder was elevated, and the peritoneum above the bladder was incised with the Endoshears. The space was developed using the Endoshears. All areas appeared to be dry.

Attention was then turned to the vagina. The patient was converted to high stirrups using the Allen stirrups. A weighted speculum was placed in the most posterior vagina with a Deaver retractor in the anterior vagina. The cervix was grasped with two thyroid Lahey clamps. The mucosa of the cervix was circumscribed with Bovie cautery.

The bladder was bluntly dissected off of the lower uterine segment, and the peritoneum was then entered. The posterior cul-de-sac was grasped with a Kocher clamp and elevated. Curved Mayo scissors were used to enter the posterior cul-de-sac. A speculum was then placed. A Heaney clamp was then used on the right side to clamp across the uterosacral complex. This was then transected and suture-ligated with 0 Vicryl. In a similar fashion, the left uterosacral was transected, cut, and suture-ligated with 0 Vicryl. The small amount of remaining broad ligament was then clamped with Heaney clamps on each side, transected, and suture-ligated with 0 Vicryl. The uterus was then easily delivered through the vagina.

The vaginal cuff and perineum were closed together using a 2-0 Vicryl from 12 o'clock to 6 o'clock, being tied in the midline. The uterosacral ligament pedicles had been tagged, and

these were tied in the midline and reattached to the vaginal cuff. The vaginal cuff, once it was sewn, was noted to be hemostatic. The Foley catheter drained clear urine.

The patient was taken out of stirrups, awakened, extubated, and transferred to the recovery room in stable condition. The patient tolerated the procedure well. All counts were correct times three. The patient received Ancef for antibiotic prophylaxis.

Questions:

1. What does *informed consent* mean?
2. Define the following medical terms:

endotracheal, laparoscopic-assisted hysterectomy, prophylaxis, dorsal lithotomy position

3. *Surgical removal of the ovaries and ociducts* is termed_____
4. A *trocar* is an instrument used to_____

5. An instrument that enlarges the opening of a passage, allowing for examination is called a _____

6. There was a small amount of endometrial tissue found in the pelvic cavity along the posterior uterosacral ligaments. The name of this disorder is _____

The Ovaries

Terms: ovaries, graafian follicle**,** ovulation

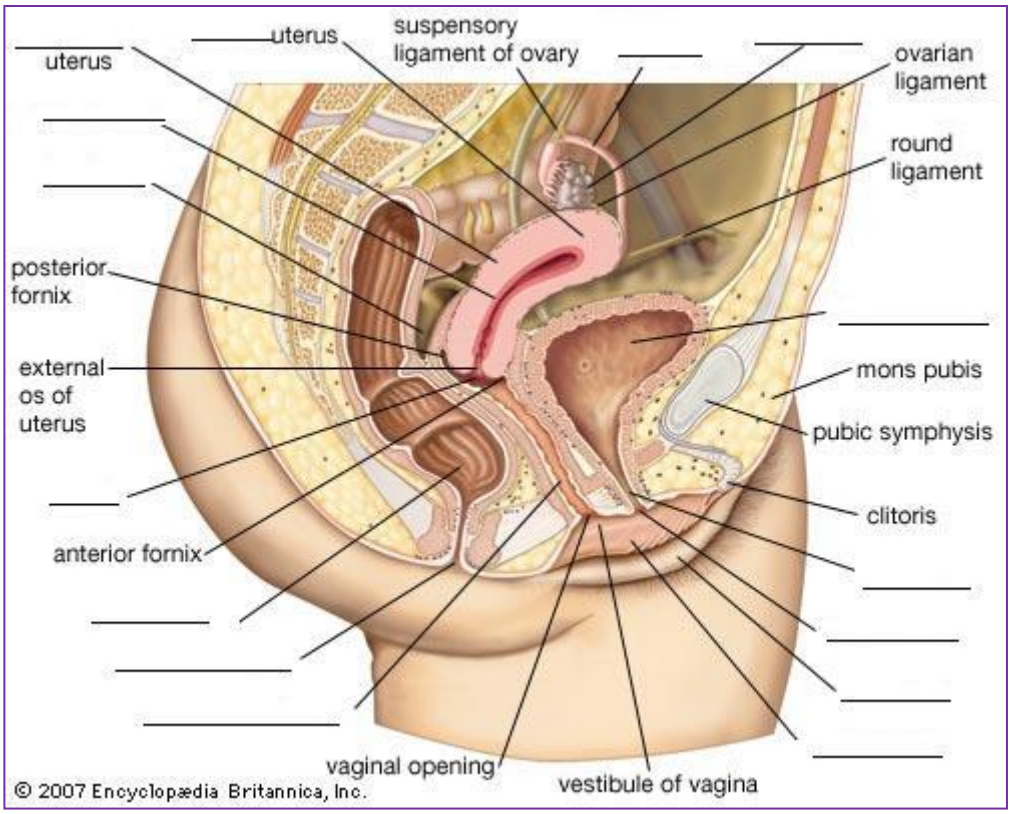
The Oviducts, Uterus, and Vagina

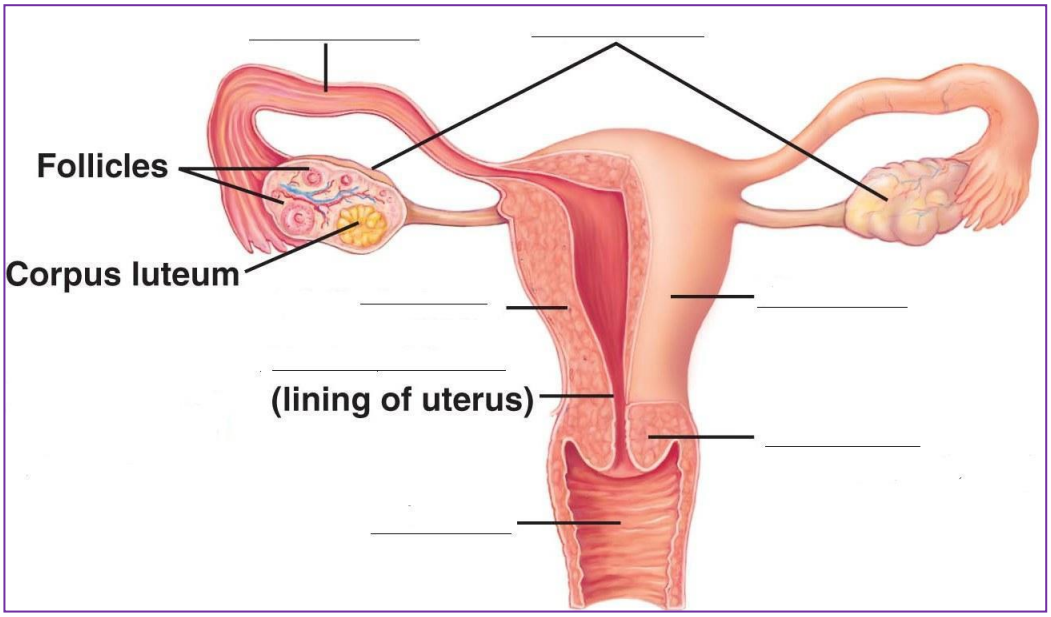
Terms: oviduct (uterine tube or fallopian tube), uterus (fundus, a triangular cavity, cervix), endometrium, myometrium, perimetrium, vagina.

The External Genital Organs

Terms: vulva, labia majora, labia minora, clitoris, perineum, episiotomy

Exercise 1. Label the diagrams.

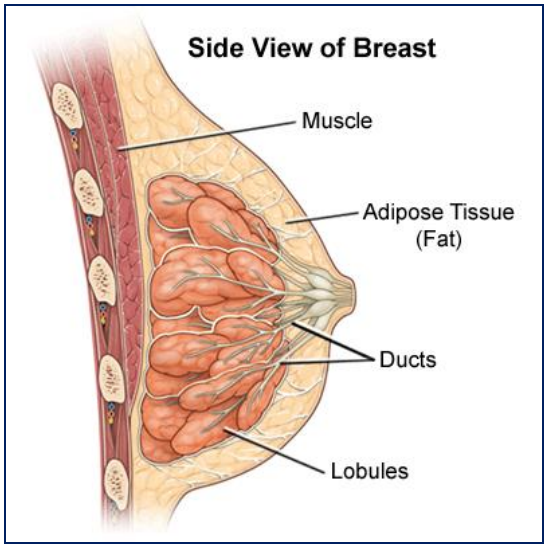




The Mammary Glands

Terms: breasts, mammary, or milk-producing glands, mammary papilla, areola

Figure 13.1 demonstates the side view of the breast.



The Menstrual Cycle

Terms; menarche, Follicle stimulating hormone (FSH) estrogen, luteinizing hormone (LH), ovulation, corpus luteum, progesterone and estrogen, menstruation, menopause

Table 1 Word Roots Pertaining to the Female Reproductive System

root	meaning	example
gyn/o, gynec/o	woman	**gynecology**
men/o, mens	month, menstruation	**premenstrual**
oo	ovum, egg cell	**oocyte**
ov/o, ovul/o,	ovum, egg cell	**ovulatory**
ovari/o	ovary	**ovariopexy**
oophor/o	ovary	**oophorectomy**
perine/o	perineum	**perineal**
salping/o	oviduct, tube	**salpingoplasty**
uter/o	uterus	**intrauterine**
metr/o, metr/i	uterus	**metrorrhea**
hyster/o	uterus	**hysterotomy**
cervic/o	cervix, neck	**endocervical**
colp/o	vagina	**colposcope**
vagin/o	vagina	**vaginometer**
vulv/o	vulva	**vulvar**
episi/o	vulva	**episiotomy**
clitor/o, clitorid/o	clitoris	**clitorectomy**
mamm/o	breast, mammary gland	**mammoplasty**
mast/o	breast, mammary gland	**amastia**

Exercise 2. Define the following terms.

gynecopathy _____
intermenstrual _____
oogenesis _____
oophoritis _____
anovulatory _____
ovarian _____
salpingectomy _____
hysteroscopy _____
metromalacia _____
uterovesical _____
vaginoplasty _____
colpodynia _____

Exercise 3. Supply medical terms for the following.

a physician specializing in the study of diseases of women _____
after ovulation _____
profuse bleeding at the time of menstruation _____
absence of menstruation _____
painful or difficult menstruation _____
scanty menstrual flow _____
hernia of the ovary _____
surgical fixation of the ovary _____
surgical puncture of an ovary _____
excision of an ovary _____
malignant tumor of the ovary _____
within the uterus _____
radiograph of the uterus and oviducts _____
surgical fixation of the uterus _____
prolapse of the uterus (metr/o) _____
softening of the uterus (metr/o) _____
inflammation of the cervix _____
within the cervix _____
inflammation of the vagina _____
narrowing of the vagina (colp/o) _____
any disease of the vulva _____
suture of the vulva (episi/o) _____
inflammation of the clitoris _____
radiograph of the breast _____
excision of the breast _____
inflammation of the breast (mast/o) _____

CHAPTER 14

PREGNANCY AND CHILDBIRTH

PATIENT HISTORY: **Delivery of a normal baby after repeat myomectomy, lysis of adhesions, and tubal repair**

J.F., a 36 -year-old woman, was referred because of infertility and uterine fibroids. Seven years earlier she had an abdominal myomectomy to treat severe menorrhagia. For the past 18 months JF was again experiencing very heavy periods with clots, lasting seven days, followed by lighter bleeding lasting two more weeks. She was having urinary frequency and urgency as well as pelvic pain and painful intercourse. On examination, her uterus was enlarged to the size of a 16-week pregnancy. On pelvic ultrasound there were many fibroids, the largest being eight cm in diameter. Abdominal surgery was recommended.

At surgery, extensive pelvic adhesions were found, probably related to the previous myomectomy. The pelvic bowel, bladder, uterus, ovaries, and fallopian tubes, were enmeshed in thick adhesions. Using microsurgical technique and magnification, the adhesions were meticulously removed (lysis), freeing up the adherent organs and repairing their surfaces. The fallopian tubes, including the finger-like terminal projections, were significantly damaged; these were also repaired using microsurgical technique. After this extensive lysis and repair, the uterus was exposed. Numerous fibroids, including the largest that was bulging into the uterine cavity (submucous) and causing the bleeding, were removed. This myomectomy was accomplished without entering the endometrial cavity in order to avoid distortion of the cavity and adhesion formation. The uterus was then carefully reconstructed resulting in a uterus close to normal size and shape. Because of microsurgical technique and the application of a uterine tourniquet during surgery there was minimal blood loss during surgery.

As recommended for uterine healing, JF avoided conception for the first six months. Shortly thereafter she conceived and delivered a healthy baby through Cesarean section.

(http://althysterectomy.org/case_studies.htm)

Questions:

1. Define the following medical terms:

myomectomy, menorrhagia, endometrial

2. What is the medical term for painful intercourse? _____

3. Give the medical term for the following:

plastic repair of the uterine tube _____

fingerlike terminal projections of the fallopian tubes_____

a condition in which bodily tissues that are normally separate grow together _____

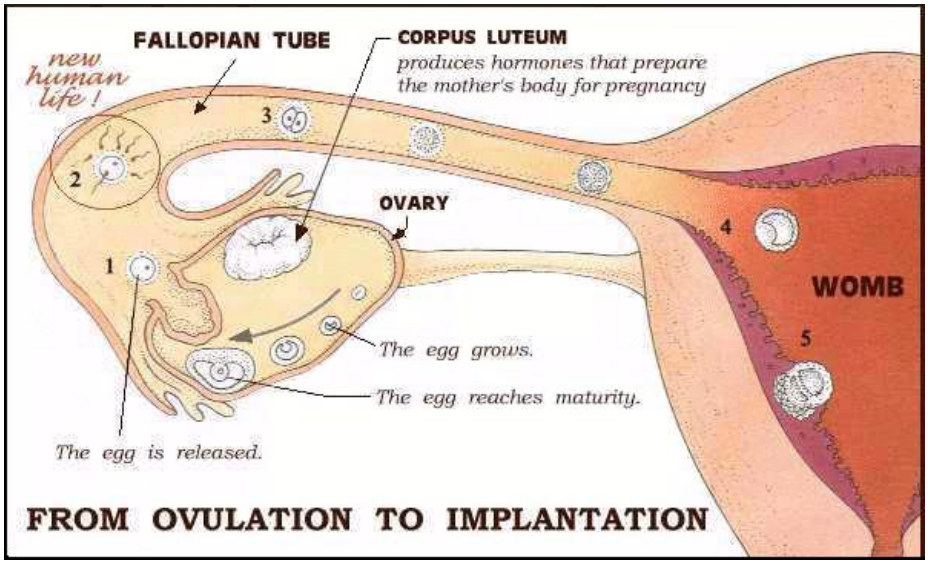
excessive passage of urine _____

Numerous fibroids were found in the uterine cavity, including the largest that was *below the mucous membrane*. The medical term for this location is _____

Fertilization and Early Development

Terms: fertilization, zygote, embryo, human chorionic gonadotropin (HCG), fetus.

Figure 14.1 demonstrates the stages from ovulation to implantation.



The Placenta

Terms: placenta, chorion, amnion, umbilical cord, gestation, amniotic sac (amnion)

Childbirth

Terms; gravida, para, post partum period, puerpera

Table 1 Word Parts pertaining to Pregnancy and Childbirth

root	meaning	example
amni/o	amnion, amniotic sac	**diamniotic**
chori/o	relationship to a membrane	**chorioangioma**
cyes/o, cyes/i	pregnancy	**pseudocyesis**
embry/o	embryo	**embryonic**
fet/o	fetus	**fetometry**
galact/o	milk	**agalactia**
gravida	pregnant woman	**nulligravida**
lact/o	milk	**lactose**
nat/i	birth	**neonate**
para	woman who has given birth	**multipara**
puerper/o	childbirth	**puerperum**
terat/o	malformed fetus	**teratogenic**
toc/o	labor	**dystocia**

Exercise 1. Define the following terms.

embryology _____
postnatal _____
monoamniotic _____
hyperlactation _____
anovulatory _____
inframammary _____
congenital _____
prenatal _____
extraembryonic _____
multigravida _____
tripara _____
galactorrhea _____
dystocia _____
amniotomy _____

Exercise 2. Word building.

measurement of the fetus _____
first menstrual period _____
presence of pus in the oviduct _____
endoscopic examination of the fetus _____
any disease of an embryo _____
study of the newborn _____
dry labor _____
slow labor _____
cystic enlargement (-cele) of a milk duct _____
period after childbirth _____

CHAPTER 15

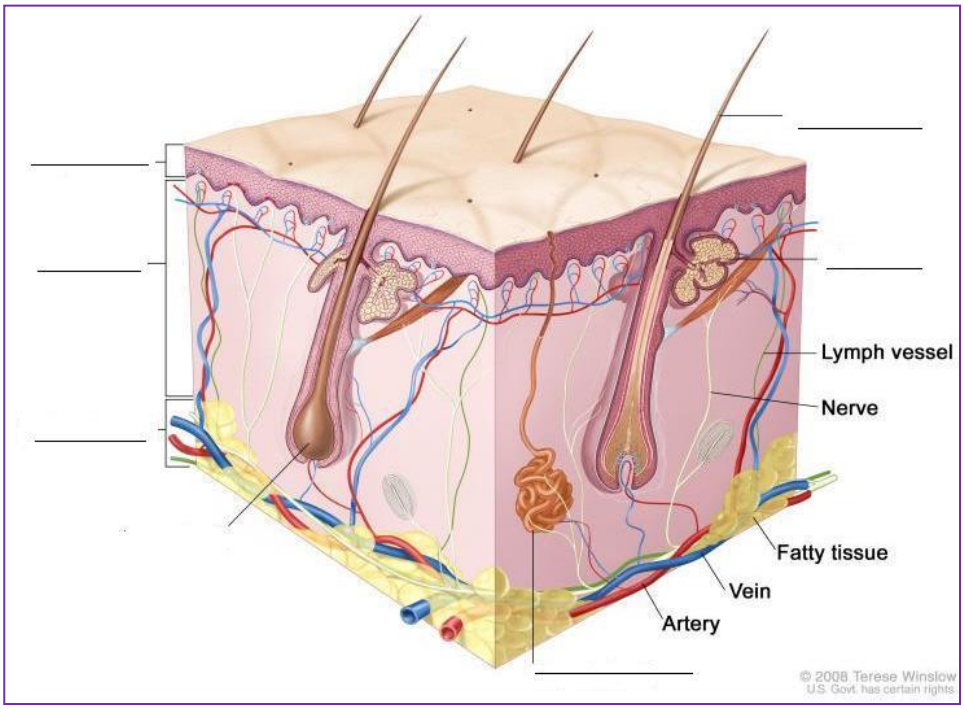
THE SKIN

The skin and its associated structures make up the **integumentary system.**

Layers of Skin

Terms: epidermis, dermis, subcutaneous tissue, sebaceous (oil) glands, dudoriferous (sweat) glands, sebum

Exercise 1. Label the diagrams.



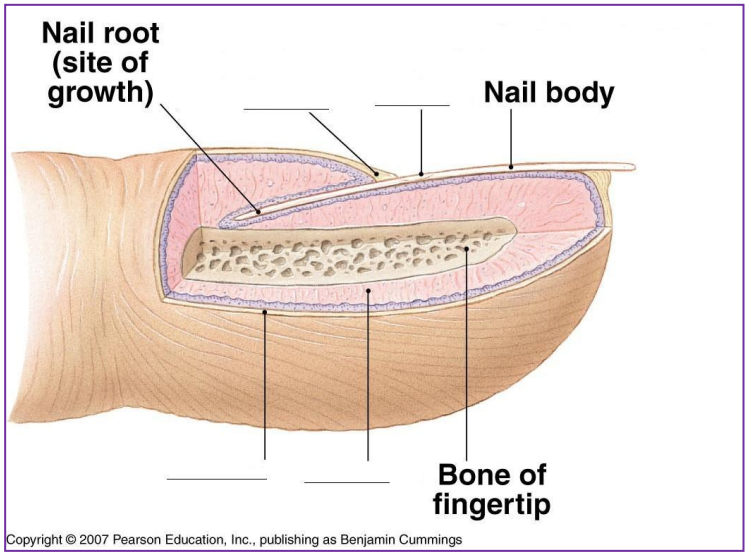


Table 1 Roots pertaining to the Skin

root	meaning	example
derm/o, dermat/o	skin	**dermatology**
cutane/o	skin	**subcutaneous**
kerat/o	keratin, horny layer of the skin	**keratolysis**
melan/o	dark, black, melanin	**melanocyte**
hidr/o	sweat, perspiration	**anhidrosis**
diaphor/o	profuse sweating	**diaphoresis**
seb/o	sebum, sebaceous gland	**seborrhea**
trich/o	hair	**trichomycosis**
onych/o	nail	**onychia**

Exercise 2. Define the following terms.

hypodermic _____
hyperhidrosis _____
hyperkeratosis _____
dermatoplasty _____
percutaneous _____
keratogenic _____
xeroderma _____
pachyderma _____
hypertrichosis _____
onychomycosis _____
onychocryptosis _____
achromotrichia _____

Exercise 3. Word building.

any disease of the skin _____
insufficient production of melanin _____
hardening of the skin _____
tumour containing melanin _____
discharge of sebum _____
instrument for cutting the skin _____
loosening or separation of a nail _____
study of hair _____

Exercise 4. Give the medical term for the descriptions.

excess production of melanin _____
absence of sweating _____
excessive growth of horny tissue of the skin _____
inflammation of sweat glands _____
inflammation of the tissue surrounding a nail _____
softening of a nail _____
alternative name for a scar _____
diffuse redness of the skin _____
fluid that drains from a wound _____
baldness _____
hives _____

Exercise 5. Define the medical terms pertaining to skin disorders.

onychia _____
dermatopathy _____
dermatitis _____
pyoderma _____
melanocyte _____

CHAPTER 16

THE SENSES

PATIENT HISTORY: **Conjunctival infection**

A 22-year-old man was involved in a motorcycle accident and suffered a severe closed head injury which produced diffuse cerebral injury and a fracture of the left temporal bone. He was admitted to a neurosurgical intensive care unit and required artificial ventilation for 17 days. A tracheostomy was performed to assist with ventilation. He gradually became independent of the ventilator, and regained consciousness and was eventually transferred to the neurosurgical ward. He was noted to have a left facial nerve palsy (caused by the fracture) and to be restless and confused but no other focal neurological defect was identified. The facial nerve palsy impaired his ability to blink on the left. While unconscious both his eyes had been taped shut to prevent injury and infection. Attempts were made to tape the left eye shut on the ward, but he persistently removed the dressing. Three days after his transfer to the ward the left eye was noted to be red with crusted swollen lids. The cornea was hazy and he was photophobic. A clinical diagnosis was made of *conjunctivitis and keratitis secondary to exposure*. Swabs taken from the eye grew Pseudomonas aeruginosa. He was treated vigorously with topical antibiotics and the eyelids were temporarily sutured together. Despite this he suffered considerable corneal scarring with loss of visual acuity in the left eye.
(http://www.immunologyclinic.com/case.asp?chap=12&case=1)

Define the underlined terms.

The **sensory system** is our network for detecting stimuli from the internal and external environments. It is needed to maintain homeostasis and protect us from harm.

Terms: general senses: pain; touch, the tactile sense; pressure; temperature; proprioception, special senses: gustation, olfaction hearing and equilibrium, vision

Table 1 Suffixes pertaining to the Senses

suffix	meaning	example
-esthesia	sensation	**dysesthesia**
-algesia	pain	**hypalgesia**
-osmia	sense of smell	**parosmia (para- abnormal)**
-geusia	sense of taste	**pseudogeusia (pseudo-false)**

Exercise 1. Supply medical terms for the following definitions.

lack of sensation _____
sensitivity to temperature _____
excess sensitivity to pain _____
abnormal sense of taste _____
muscular sensation _____

The Eye

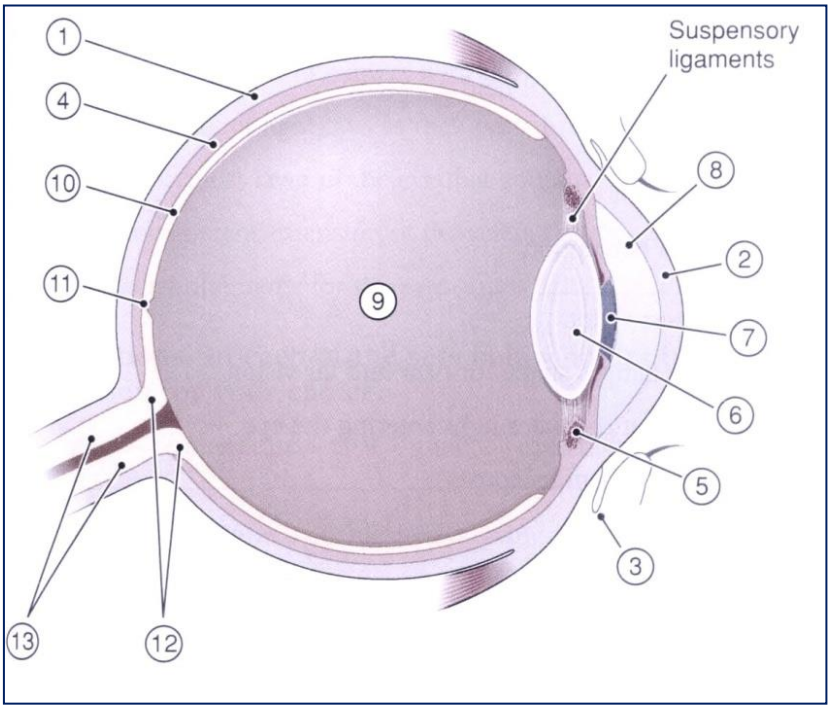
Inner eye

Terms: cornea, sclera. uvea**,** choroid, ciliary body, iris, lens, accommodation of the eye, retina, cones, rods, refraction (bending) optic disk, fovea, macula, aqueous humor, vitreous humor

Outer eye

Terms: orbital cavity, ocular muscles, eyelids, conjunctival membrane, lacrimal apparatus.

Exercise 2. Label the diagram.



Accommodation of the Eye

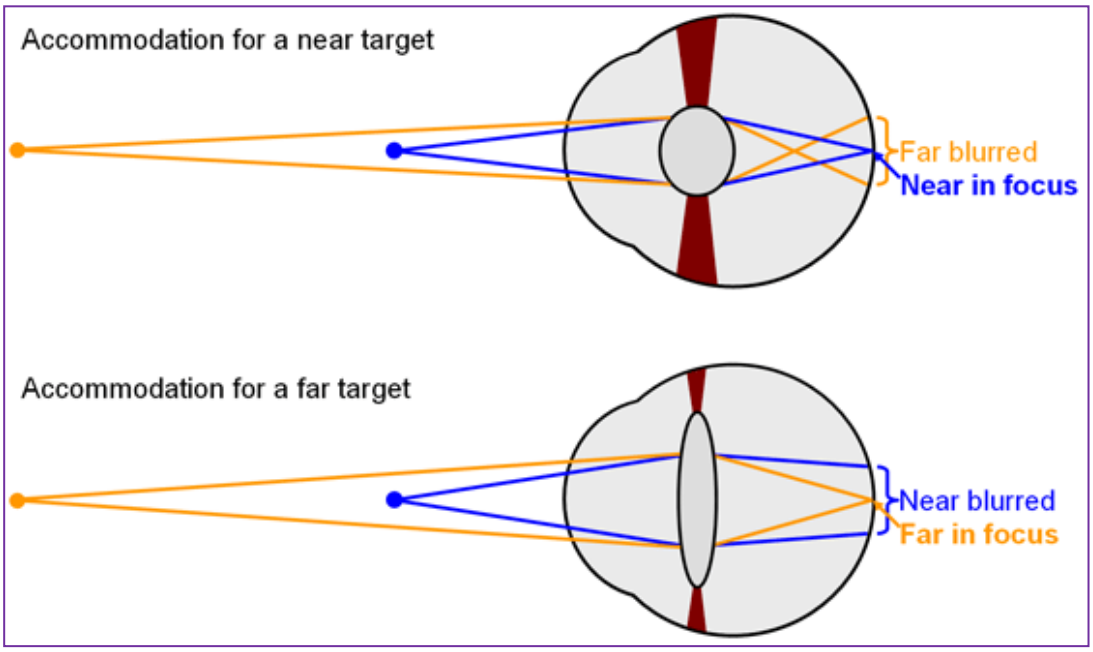


Figure 16.1 demonstrates the accommodation of the eye.

Table 2 Word Parts pertaining to the Eye and Vision

root	meaning	example
blephar/o	eyelid	**blepharoplegia**
palpebr/o	eyelid	**palpebral**
dacry/o	tear, lacrimal apparatus	**dacryolith**
dacryocyst/o	lacrimal sac	**dacryocystocele**
lacrim/o	tear, lacrimal apparatus	**lacrimation**
opt/o	eye, vision	**optometer**
ocul/o	eye	**sinistrocular**
ophthalm/o	eye	**exophthalmos**
scler/o	sclera	**episcleritis**
corne/o	cornea	**circumcorneal**
kerat/o	cornea	**keratometer**
lent/i	lens	**lentiform**
phak/o, phac/o	lens	**aphakia**
uve/o	uvea	**uveal**
chori/o, choroid/o	choroid	**subchoroidal**
cycl/o	ciliary body, ciliary muscle	**cycloplegic**
ir, irit/o, irid/o	iris	**iridoschisis**
pupill/o	pupil	**iridopupillary**
retin/o	retina	**retinoscopy**
mydri/o	wide	**mydriatic**

Exercise 3. Define each of the following words.

interpalpebral _____
dacryocystectomy _____
optical _____
intraocular _____
sclerotome _____
keratitis _____
cyclotomy _____
chorioretinal _____
iridocyclitis _____
anisometropia _____
hemianopia _____

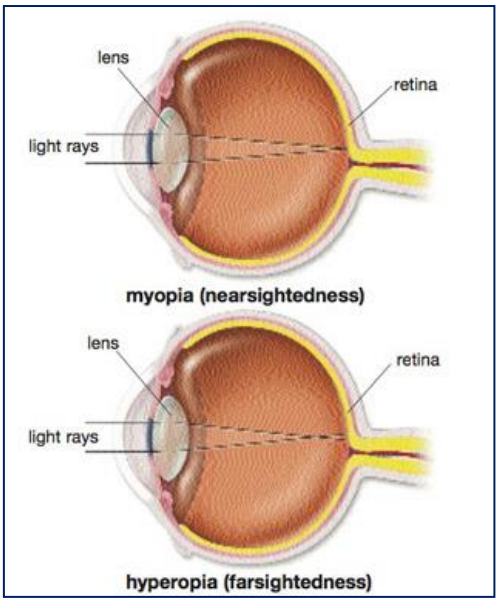
Exercise 4. Supply technical terms for the following.

spasm of the eyelid _____
discharge from the lacrimal apparatus _____
inflammation of a lacrimal sac _____
inflammation of the uvea and sclera _____
softening of the lens _____
pertaining to the pupil _____
inflammation of the ciliary body _____
any disease of the retina _____
an instrument used to examine the eye _____
the medical specialty that deals with the eye and diseases of the eye _____
surgical removal of (part of) the iris _____

Table 3 Suffixes for the Eye and Vision

suffix	meaning	example
-opsia	vision	**macropsia**
-opia	eye, vision	**myopia**

Figure 16.2 shows a farsighted and a nearsighted eye.



The Ear

Terms; outer, middle, inner ear, external auditory meautus, tympanic membrane, auditory ossicles (malleus, incus, stapes), oval window, round window, cochlea, organs of Corti, vestibular apparatus

Exercise 5. Label the diagram.

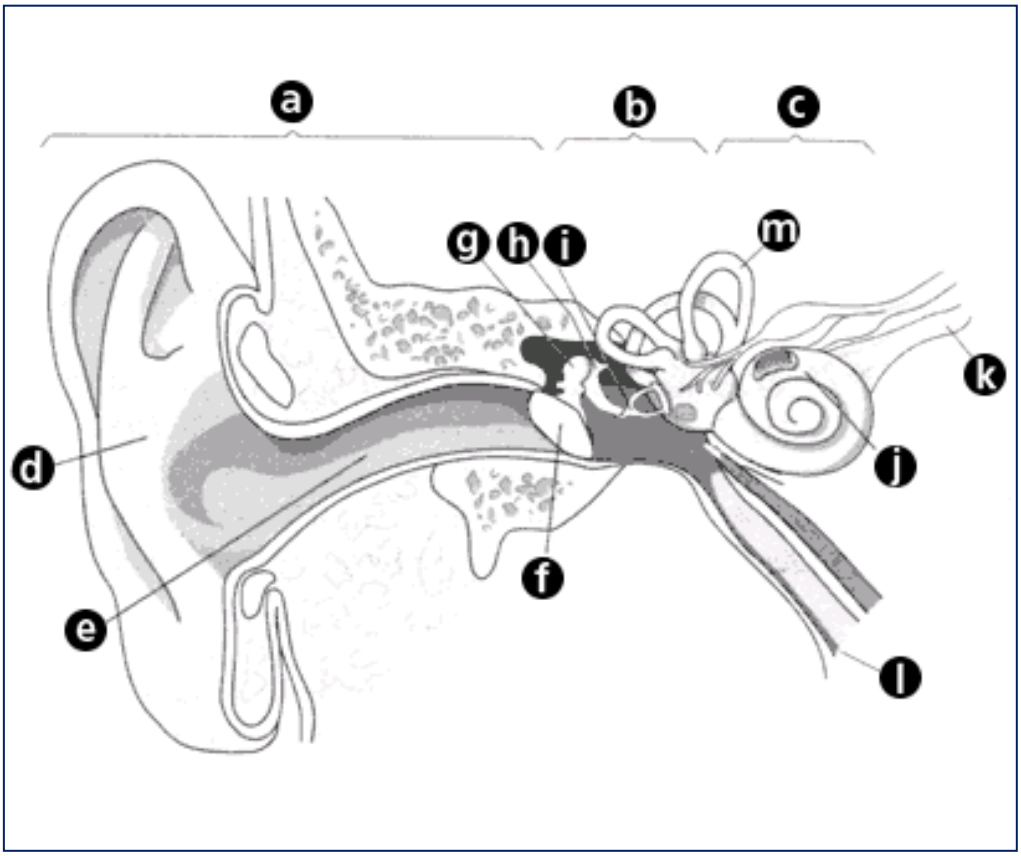


Table 4 Roots pertaining to the Ear and Hearing

root	meaning	example
audi/o	hearing	**audition**
acous, acus, cus	sound, hearing	**acoustic**
ot/o	ear	**otic**
myring/o	tympanic membrane	**myringotome**
tympan/o	tympanic cavity (middle ear)	**tympanometry**
salping/o	tube, eustachian tube	**salpingoscope**
staped/o, stapedi/o	stapes	**stapedoplasty**
labyrinth/o	labyrinth, inner ear	**labyrinthitis**
vestibul/o	vestibule, vestibular apparatus	**vestibulotomy**
cochle/o	cochlea of inner ear	**retrocochlear**

Exercise 6. Form adjectives.

cochlea _____
vestibule _____
labyrinth _____
stapes _____

Exercise 7. Write a word for each of the following definitions.

an instrument for measuring hearing _____
pain in the ear _____
plastic repair of the middle ear _____
incision of the tympanic membrane _____
plastic repair of the stapes _____
pertaining to the vestibular apparatus and cochlea _____
inflammation of the labyrinth _____
within the cochlea _____
excision of the stapes _____

Exercise 8. Define each of the following words.

audiologist _____
otitis _____
myringoscope _____
vestibulopathy _____

PATIENT HISTORY: **CT Scan of the Temporal Bones**

TECHNIQUE: Both axial and coronal thin slices through the middle ear structures were performed.

FINDINGS: On the left side, the ossicles are well defined in the middle ear. No evidence of any fluid or soft tissue filling noted in the middle ear to suggest cholesteatoma. Scutum is intact. Attic area of the middle ear is clear. No pneumatization of the mastoid is seen. This could be a congenital variation. Tympanic membrane is intact. Cochlea and semicircular canals are well defined; however, the surrounding temporal bones are showing some sclerotic changes. Internal auditory canal is not showing any erosion or widening.

On the right side, there is poor pneumatization of the right mastoid air cells. Ossicles are intact. No fluid or soft tissue filling noted in the middle ear. The scutum is intact. Cochlea and semicircular canals are well defined; however, there is shown some sclerosis of the surrounding temporal bones. These findings may be within normal limits (WNL). Tympanic membrane is intact. Internal auditory canal shows no erosion or widening.

IMPRESSION: Both mastoids show poor pneumatization, probably congenital. Middle ear ossicles, cochlea and semicircular canals are well defined. No evidence of cholesteatoma or fluid-filled middle ear noted. Internal auditory canals are normal.

Questions:

1. CT revealed that the cochlea and the semicircular canals appeared healthy. The cochlea contains the_____ receptors, the semicircular canals contain the _____ ones.

2. *Cholesteatoma* is a possible complication of _____ .

3. Define the word *pneumatization*.

4. Coronal images of the patient's middle ear were produced using CT. The coronal plane divides the brain into _____ portions. The transverse plane divides the brain into _____ portions.

CHAPTER 17

THE NERVOUS SYSTEM

The **nervous system** and the endocrine system coordinate and control the body.

Terms: central nervous system (CNS), peripheral nervous system (PNS), neurons, neuroglia

The Neuron

Terms: dendrite, axon, myelin, sensory, or affarent neuron, motor, or efferent neuron, interneurons, synapse

Figure 17.1 demonstrates the types of neuron.

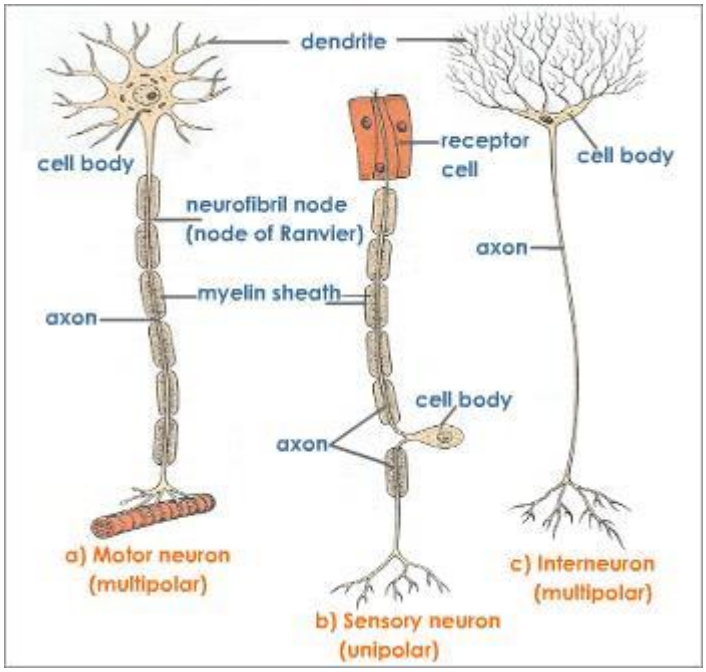


Table 1 Roots pertaining to the Nervous System

root	meaning	example
neur/o, neur/i	nervous system, nervous tissue, nerve	**neurotrophin**
gli/o	neuroglia	**glioma**
gangli/o	ganglion	**ganglionectomy**
mening/o, meninge/o	meninges	**meningococci**
myel/o	spinal cord, bone marrow	**myelodysplasia**
radicul/o	spinal nerve root	**radiculitis**

The brain (*encephalon*)

Terms: brain stem – (*truncus cerebri):* medulla oblongata, pons and midbrain
diencephalon - (*diencephalon*-"interbrain") : thalamus, hypothalamus and hypophysis
cerebrum – (*cerebrum +cortex cerebri)*
cerebellum – (*cerebellum*)

The Meninges

Terms: dura mater, arachnoid, pia mater, cerebrospinal fluid (*liquor cerebrospinalis*)

Figure 17.2 shows the major parts of the human brain.

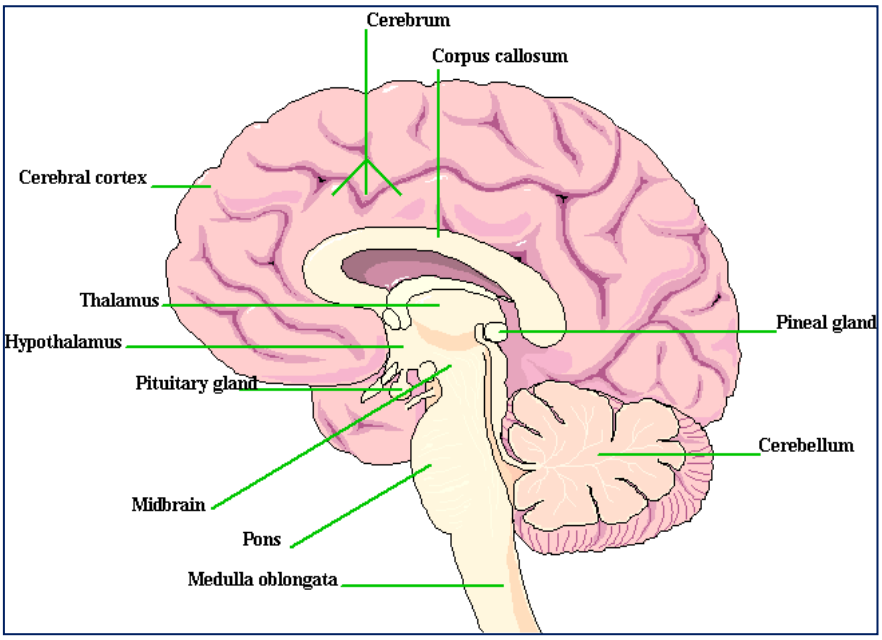


Table 2 Roots for the Brain

encephal/o	brain	**anencephaly**
cerebr/o	cerebrum	**cerebrovascular**
cortic/o	cerebral cortex	**corticospinal**
cerebell/o	cerebellum	**supracerebellar**
thalam/o	thalamus	**thalamotomy**
ventricul/o	cavity, ventricle	**intraventricular**
medull/o	medulla oblongata (also spinal cord)	**medullary**
psych/o	mind	**psychoactive**
narc/o	stupor, unconsciousness	**narcosis**
somn/o, somn/i	sleep	**somnolence**

Exercise 1. Label the diagrams.

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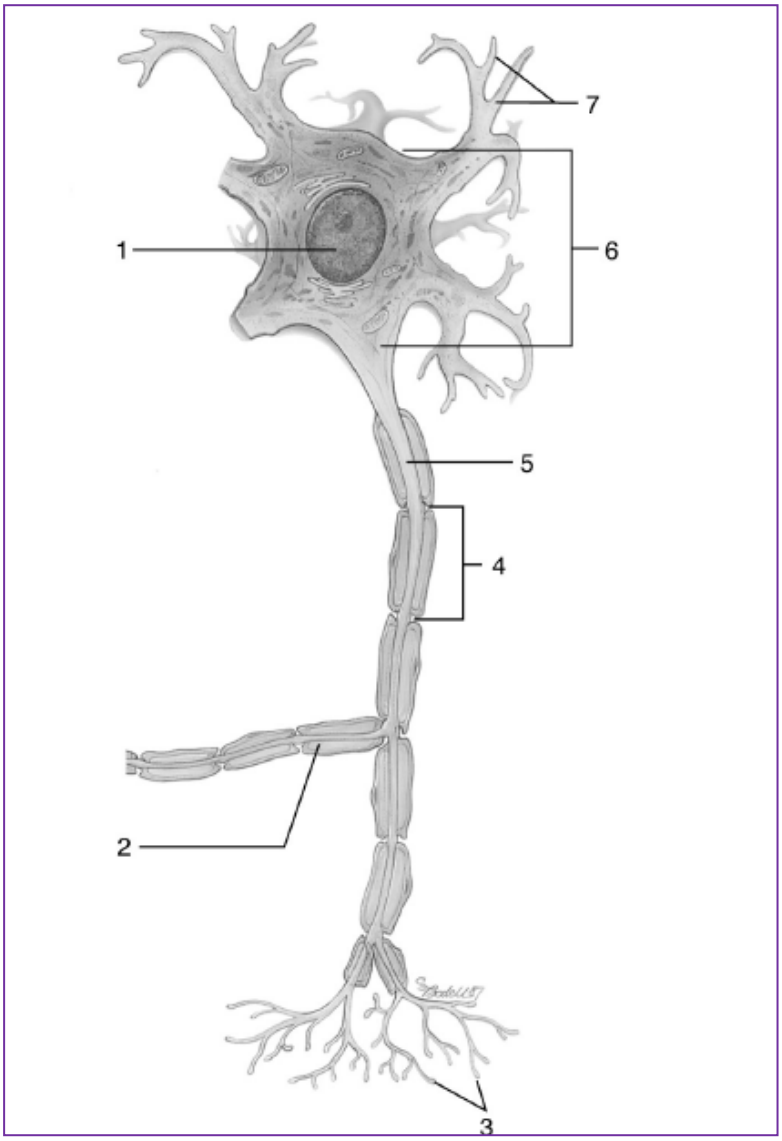
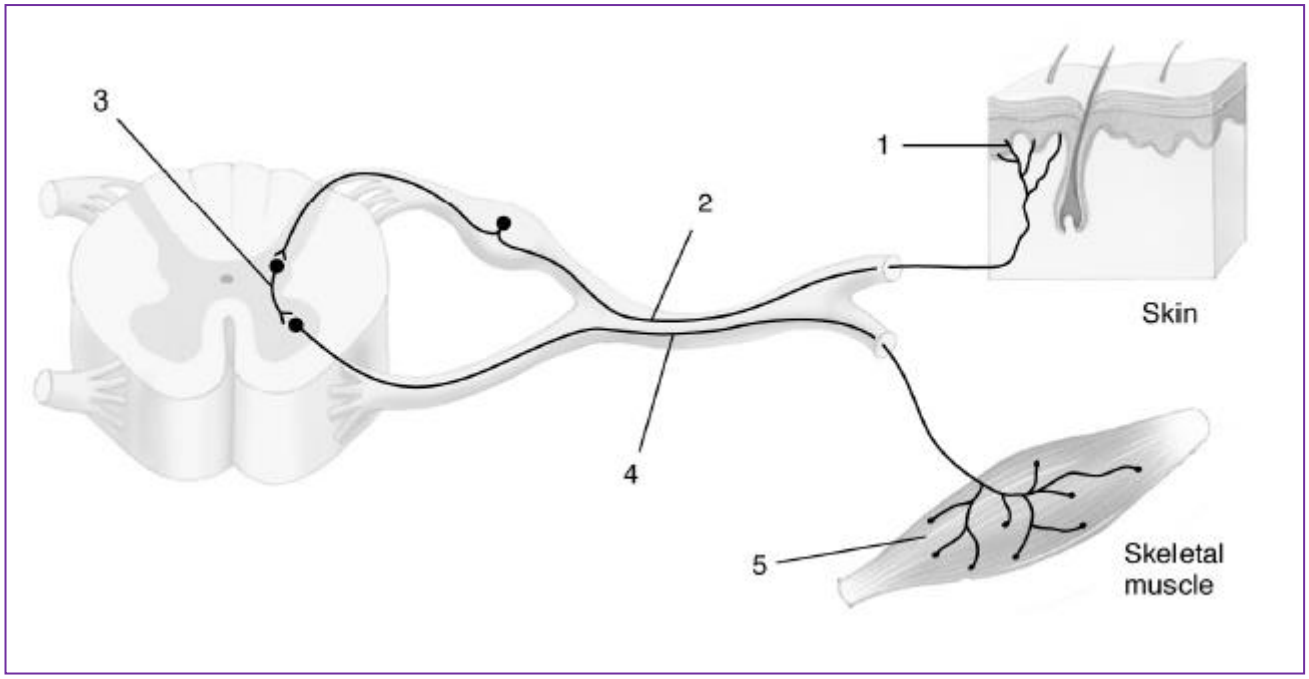




Exercise 2. Supply medical terms for the following definitions.

tumour of a ganglion _____
inflammation of the spinal cord _____
pain in a nerve _____
x-ray image of the spinal cord _____
any disease of the nervous system _____
inflammation of the brain _____
incision of a ventricle _____
study of the mind _____
inability to sleep _____

Table 3 Suffixes pertaining to the Nervous System

suffix/termination	meaning	example
-phasia	speech	**heterophasia**
-lalia	speech, babble	**coprolalia**
-lexia	reading	**dyslexia**
-plegia	paralysis	**tetraplegia**
-paresis	partial paralysis	**hemiparesis**
-lepsy	seizure	**narcolepsy**
-phobia	persistent, irrational fear	**agoraphobia**
-mania	excited state, obsession	**megalomania**

Exercise 3. Explain the following terms.

aphasia _____
bradylexia _____
pyromania _____
EEG _____
photophobia _____
sonophobia _____
alexia _____
myoparesis _____
pachymeninx _____
cardioplegia _____

Exercise 4. Fill in the blanks.

The junction between two nerve (or a muscle or a gland cell) cells is a _____
A simple, rapid, automatic response to a stimulus is a(n) _____
The membranes that cover the brain and spinal cord are the _____
The sympathetic and parasympathetic systems make up the _____
A chemical that acts at a synapse is a(n) _____
The posterior portion of the brain that coordinates muscle movement is the _____

Exercise 5. Define the following terms.

anencephaly _____
corticothalmic _____
polyneuritis _____
encephalomalacia _____
leptomeninges _____
panplegia _____
radicular _____
dyssomnia _____
hydrocephalus _____
craniorachischisis _____
dyslexia _____
hydrophobia _____
intramedullary _____
gyrus _____
sulcus _____

Exercise 6. Write the adjective form of the following words.

ganglion _____
cortex _____
dura _____
meninges _____
psychosis _____

Exercise 7. Write the plural form of the following words.

ganglion _____
meninx _____
gyrus _____
sulcus _____

CHAPTER 18

DRUGS - PRESCRIPTIONS

PATIENT HISTORY: INTRACRANIAL HEMATOMA INPATIENT REHABILITATION HISTORY AND PHYSICAL

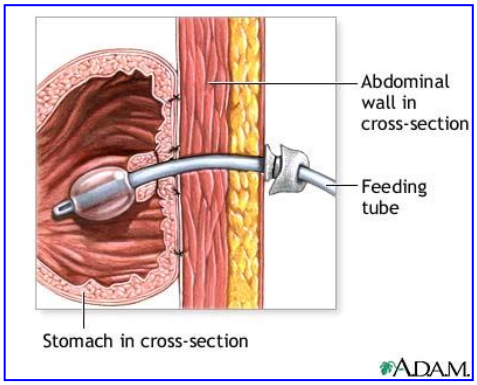
CHIEF COMPLAINT: Intracranial hematoma.

HISTORY OF PRESENT ILLNESS: This is a female who was in relatively good health and active. She developed a right frontal headache, dysarthria and left arm weakness while shoveling snow. She initially presented to her local emergency room, where a head CT showed a large right intraparenchymal hematoma in the mid posterior frontal lobe. She was subsequently transferred to another hospital where followup head CT showed increasing hematoma and edema with a 2-mm midline shift. A neurosurgeon was consulted. She underwent a surgical decompression with right frontal craniotomy with evacuation of an intraparenchymal hematoma.

Her hospital course was relatively unremarkable. She was noted to be confused and considered to possibly have sundowning. Her blood glucose levels were generally in the 150s to 160s. She was noted to have decreased p.o. intake and was dysphagic. A PEG tube was placed and she was placed on Dilantin for seizure prophylaxis with therapeutic levels. She was mildly anemic. She was seen by physical therapy and noted to be transferring with maximum assist and able to stand for 15 to 30 seconds. She was admitted to acute inpatient rehabilitation for deficits in bed mobility, transfers, ambulation and activities of daily living.

PAST MEDICAL HISTORY
1. Mild chronic obstructive pulmonary disease.
2. Borderline diabetes mellitus.
3. Gastroesophageal reflux disease.

PAST SURGICAL HISTORY: Remote history of cesarean section.



PEG tube (http://health.allrefer.com)

CURRENT MEDICATIONS

1. Humalog insulin sliding scale.
2. Colace 100 mg b.i.d.
3. Senokot daily.
4. Dilantin 125 mg t.i.d.
5. Ranitidine 150 mg b.i.d.
6. Tylenol 1000 mg q.4 h. p.r.n.
7. Benadryl 25 mg at bedtime p.r.n.
8. Nifedipine 10 mg q.3 h. p.r.n.
9. Oxycodone 5/325 mg q.4 h. p.r.n.
10. Phenergan 12.5 to 25 mg p.o. q.6 h. p.r.n.

11. Diflucan 200 mg daily.
12. Multiple vitamin 1 tablet every day.

ALLERGIES: No known drug allergies.

HABITS: No tobacco or alcohol use.

SOCIAL HISTORY: The patient is a widow. She resides alone in a home with a basement and 3 steps to enter the main floor. Per her family, she will be discharged to a family member's home or to an adult assisted living facility after acute rehabilitation.

FAMILY HISTORY: Noncontributory.

REVIEW OF SYSTEMS:
DERMATOLOGIC: Right frontal head incision.
HEENT: No headache. She wears no glasses. She has no hearing difficulty. No sore throat.
NECK: Negative.
RESPIRATORY: She denies cough.
CARDIOVASCULAR: No history of hypertension, chest pain or lightheadedness.
GASTROINTESTINAL: She complains of constipation. No nausea.
MUSCULOSKELETAL: Negative.
GENITOURINARY: A Foley catheter is in place.
NEUROLOGIC: Dysphagia and dysarthria. She denies lower or upper extremity paresthesias.
ENDOCRINE: Borderline diabetes. No history of hypothyroidism.
PSYCHIATRIC: Reportedly confused with possible sundowning at night while hospitalized at the outside facility.

PHYSICAL EXAMINATION
GENERAL: A female who appears her stated age. She is well nourished and well developed, resting comfortably in the bed.
VITAL SIGNS: Temperature is 96.8, heart rate 82, respirations 20, blood pressure 122/60, and 98% oxygen saturation on room air.
SKIN: Head incision is intact with sutures. No erythema.
HEENT: Head is normocephalic, atraumatic. Eyes show extraocular movements intact. Full range of motion. No nystagmus. PERRLA. Sclerae white. Mild right gaze preference. Ears, nose, mouth and throat show moist mucus membranes.
NECK: Supple.
LUNGS: Clear to auscultation bilaterally.
HEART: Regular rate and rhythm. No murmurs.
ABDOMEN: PEG tube intact. No erythema. Bowel sounds positive. Abdomen is nontender.
EXTREMITIES: No lower extremity edema. Calves are soft.
NEUROLOGIC: Oriented to place and year. She knows her home address and the situation surrounding her admission to the hospital. She has dysarthric speech and decreased alertness. We did not test gait. Right finger to nose noted to be intact. Cranial nerves reveal a left facial droop. No resting tremor. Sensation to light touch is intact. Reflexes in the upper extremities are symmetric and 2/4. Lower extremity reflexes, right patella reflexes are 2/4, left 1+/4. The right toe is downgoing, left toe mute. Manual muscle testing reveals left upper extremity strength 0/5, left hip flexion 1/5, left knee extension 2/5, dorsiflexion and great toe extensor 0/5.

IMPRESSION AND PLAN
1. Intracranial hemorrhage status post frontal craniotomy with evacuation of hematoma with residual dense left hemiparesis, dysphagia, dysarthria and left-sided neglect. We will begin multidisciplinary physical therapy for deficits with bed mobility, transfers and ambulation. Occupational therapy will be utilized to optimize the patient's activities of daily living. Speech therapy will be consulted for swallowing evaluation and dysarthria. We will continue seizure prophylaxis with Dilantin.
2. Vertebrobasilar spasm prophylaxis. We will continue the patient on nifedipine for 3 weeks.
3. Deep venous thrombosis prophylaxis. We will begin sequential compression devices.
4. Drowsiness. We will begin amantadine 100 mg b.i.d.
5. The patient's pain is currently well controlled with Tylenol, and we will use oxycodone for breakthrough pain.
6. Gastroesophageal reflux disease. We will continue ranitidine b.i.d.
7. Thrush. We will continue Diflucan for another day.
8. Hyperglycemia. This is a patient with a history of borderline diabetes mellitus. We will check blood glucoses before meals and at bedtime. We will continue Humalog sliding scale. We will send a hemoglobin A1C.

Define the underlined terms.

A **drug** is a substance that alters body function. Traditionally, drugs have been derived from natural plant, animal, and mineral sources. Today, most are manufactured synthetically by pharmaceutical companies.

Nomenclature

Drug: a substance used in the diagnosis, treatment, or prevention of a disease or as a component of a medication;
(is thought to originate from Old French "drogue", or from Middle Dutch "droge-vate" meaning "dry barrels", referring to medicinal plants preserved in them)
Remedy: something, such as medicine or therapy, that relieves pain, cures disease, or corrects a disorder; (Latin remedium : re+ medēri , to heal)
Medication: medicine, medicament; an agent that promotes recovery from injury or ailment; (Latin: medicamentum, from medicare, to cure)

Pharmacon (Gr) - magic charm, poison, drug
- pharmacy: (Gr: pharmakeia) - administration of drugs the art of preparing and dispensing drugs;
- a place where drugs are sold; a drugstore;
- pharmacology - the science of drugs, including their composition, uses, and effects
- pharmacologist - a health professional trained in the art of preparing and dispensing drugs
- apothecary (Gr.: apothéké = storehouse): a pharmacy or a pharmacist
(an archaic word for pharmacy: αποτίθηναι= to put away)

Dispensing of medication is often regulated by governments into three categories:

- over the counter (OTC) medications, which are available in pharmacies and supermarkets without special restrictions;
- behind-the-counter (BTC), which are dispensed by a pharmacist without needing a doctor's prescription;
- and prescription only medicines (POM), which must be prescribed by a licensed medical professional, usually a physician;

Adverse Drug Effects

Most drugs have potential adverse effects or **side effects** that must be evaluated before being prescribed. In addition, there may be **contraindications,** or reasons not to use a particular drug for a specific individual based on that person's medical conditions, current medications, sensitivity, or family history.
Anaphylaxis is an immediate and severe allergic reaction that may be caused by a drug. It can lead to life-threatening respiratory distress and circulatory collapse**.**

Why Do Medicines Have More Than One Name?

1. Drugs often have several names. When a drug is first discovered, it is given a chemical name, which describes the atomic or molecular structure of the drug. The chemical name is thus usually too complex for general use.

2. The generic name is usually a simple version of the chemical name for the drug (the active ingredient of the medicine) and is not capitalized.

3. The brand name (trade name) is chosen by the manufacturer, usually on the basis that it can be recognised, pronounced and remembered by health professionals and members of the public (is written with an initial capital letter).

Table 1 Word parts pertaining to drugs

word part	meaning	example
-lytic	dissolving, loosening	**thrombolytic**
-mimetic	simulating, mimicking	**sympathomimetic**
- tropic	acting on	**psychotropic**
anti	against	**antiemetic**
contra	against, oppose	**contraceptive**
chem/o	chemical	**chemotherapy**
hypn/o	sleep	**hypnotic**
narc/o	stupor	**narcosis**
pyr/o, pyret/o	fever	**antipyretic**
tox/o, toxic/o	poison, toxin	**toxigenic**

Exercise 1. Write the opposite of each of the following words:

pyretic _____
indicated _____
inflammatory _____
act _____
septic _____
toxin _____

Exercise 2. Define each of the following words:

vasoconstriction _____
pharmacology _____
gonadotropic _____
mucolytic _____

Exercise 3. Define each of the following words:

anxiolytic _____
psychotropic _____
bronchodilation _____
sublingual _____

Exercise 5. Write a word for each of the following definitions:

Counteracting fever _____
Dissolving blood clots _____
One who prepares, sells, or dispenses drugs _____
One who studies poisons _____

DRUG PREPARATIONS

Drugs come in many different forms: tablets, drops, ointments, injections, transdermal patches…and a single drug is often available in different formations.
Various factors determine which form of a drug is used:

- the age of the patient
- the patient's medical history
- the area of the body it will act upon
- the speed at which it is needed…
- chemical properties of the medication

1.Liquid drugs- for some people, these medications are easier to swallow than pills

Aerosol (aerosolum)- a suspension of drug particles in air or gas,dispersed as a mist to be inhaled; used for various respiratory conditions;
Emulsion (emulsio) – a mixture in which one liquid is dispersed but not dissolved in another liquid;
Suspension (suspensio)- fine particles are dispersed in a liquid; must be shaken before use;
Drops (gutta) – are commonly used for eye and ear infections;

Syrup (sirupus) – a thick, sweet liquid, a concentrated solution of sugar used for flavouring medicines (sirupus aurantii, fragariae, rubi idaei);

2.Semisolid drugs:

Ointment (unguentum) – is applied directly to the skin and are used to treat local skin infections (insect bites, haemorrhoids..);
Oculentum – ointment used to treat eye-disorders;

3.Solid drugs:

Tea-mixture (species) - can be made with fresh or dried flowers, leaves, seeds or roots, generally by pouring boiling water over the plant parts and letting them steep for a few minutes;
Pill (pilula), *tablet* (tabuleta), capsules are taken by swallowing;
(A pill is a round mass of medication; tablets are flatter). Sometimes they are covered with a thin layer to protect your stomach or to protect drug from the strong stomach acid.

Capsules are small gelatinous containers enclosing a dose of medication;

Suppository (suppositorium) – substance mixed and molded with a base that is inserted rectally or vaginally. It melts at body temperature and then enters the bloodstream; used when a person cannot take a drug orally (if you are vomiting, unable to swallow, unconscious…; rectal administration can also be useful for young children);

PRESCRIPTION WRITING

A prescription is an instruction from a prescriber to a dispenser.
Every country has its own standards for the minimum information required for a prescription, and its own laws and regulations to define which drugs require a prescription and who is entitled to write it. Many countries have separate regulations for opiate prescriptions.

Information on a prescription

There is no global standard for prescriptions and every country has its own regulations.

The most important requirement is that the prescription be clear. It should be legible and indicate precisely what should be given. Few prescriptions are still written in Latin; the local language is preferred.

Name and address of the prescriber, with telephone number (if possible)

This is usually pre-printed on the form. If the pharmacist has any questions about the prescription (s)he can easily contact the prescriber.

Date of the prescription

In many countries the validity of a prescription has no time limit, but in some countries pharmacists do not give out drugs on prescriptions older than three to six months.

Name and strength of the drug

R/(not Rx) is derived from *Recipe* (Latin for 'take'). After R/you should write the name of the drug and the strength. It is strongly recommended to use the **generic** (nonproprietary) name. This facilitates education and information. It means that you do not express an opinion about a particular brand of the drug, which may be unnecessarily expensive for the patient. It also enables the pharmacist to maintain a more limited stock of drugs, or dispense the cheapest drug. However, if there is a particular reason to prescribe a special brand, the trade name can be added. Some countries allow generic substitution by the pharmacist and require the addition '*Do not substitute*' or '*Dispense as written*' if that brand, and no other, is to be dispensed.

The strength of the drug indicates how many milligrams each tablet, suppository, or milliliter of fluid should contain. Internationally accepted abbreviations should be used: g for gram, ml for milliliter. Try to avoid decimals and, where necessary, write words in full to avoid misunderstanding. For example, write levothyroxin 50 micrograms, not 0.050 milligrams or 50 ug. Badly handwritten prescriptions can lead to mistakes, and it is the legal duty of the doctor to write legibly. In prescriptions for controlled drugs or those with a potential for abuse it is safer to write the strength and total amount in words, to prevent tampering. Instructions for use must be clear and the maximum daily dose mentioned.

Dosage form and total amount

Only use standard abbreviations that will be known to the pharmacist.

Information for the package label

S stands for *Signa* (Latin for 'write'). All information following the S or the word 'Label' should be copied by the pharmacist onto the label of the package. This includes how much of the drug is to be taken, how often, and any specific instructions and warnings. These should be given in lay language. Do not use abbreviations or statements like 'as before' or 'as directed'. When stating 'as required', the maximum dose and minimum dose interval should be indicated. Certain instructions for the pharmacist, such as 'Add 5 ml measuring spoon' are written here, but of course are not copied onto the label.

Prescriber's initials or signature

Name and address of the patient; age (for children and elderly)

The data listed above are the core of every prescription. Additional information may be added, such as the type of health insurance the patient has. The layout of the prescription form and the period of validity may vary between countries. The number of drugs per prescription may be restricted. Some countries require prescriptions for opiates on a separate sheet. Hospitals often have their own standard prescription forms.

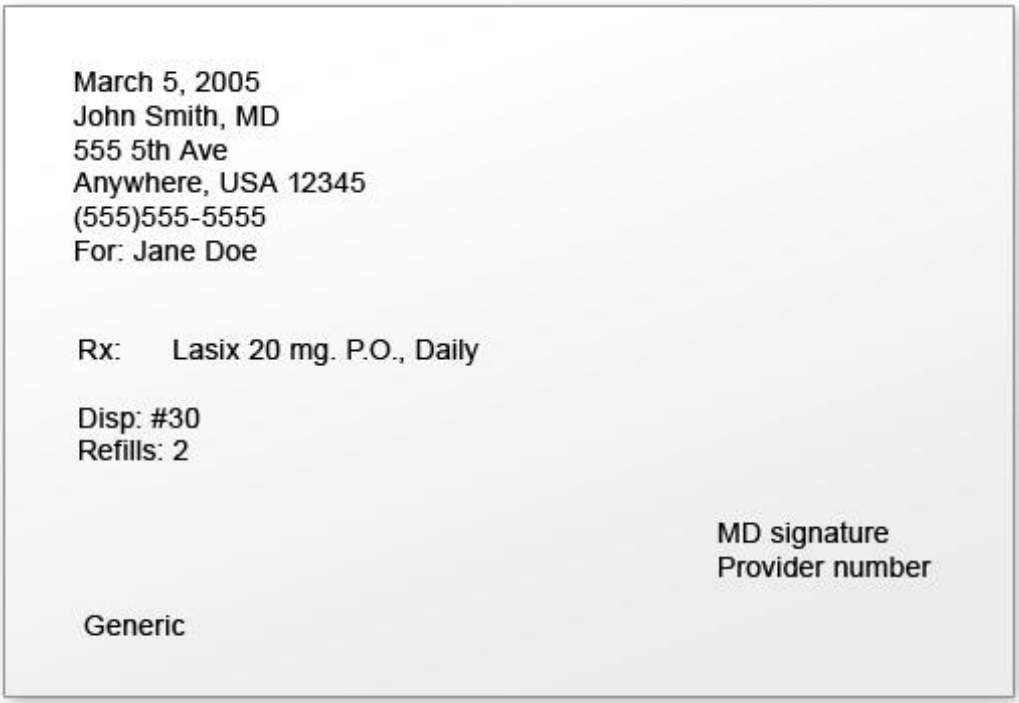
Summary

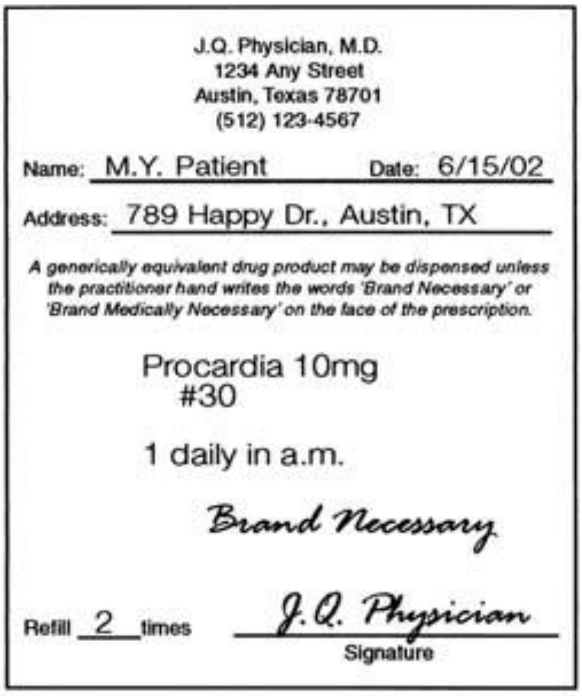
A prescription should include:

Name, address, telephone of prescriber
Date
Generic name of the drug, strength
Dosage form, total amount
Label: instructions, warnings
Name, address, age of patient
Signature or initials of prescriber

Samples

This prescription tells you that Lasix is to be given by mouth daily. Disp. #30 means that 30 pills are to be dispensed from the pharmacy. There are only 2 refills.





J.Q. Physician, M.D.
1234 Any Street
Austin, Texas 78701
(512) 123-4567

Name: M.Y. Patient Date: 6/15/02

Address: 789 Happy Dr., Austin, TX

A generically equivalent drug product may be dispensed unless the practitioner hand writes the words 'Brand Necessary' or 'Brand Medically Necessary' on the face of the prescription.

Procardia 10mg
#30

1 daily in a.m.

Brand Necessary

Refill 2 times

J.Q. Physician
Signature

A – name of patient
B – Date
C – Name of drug (generic or brand name can be used); Write legibly, capital letters are preferred.
D – Strength of drug (usually in milligrams). Decimal points should be avoided, if a decimal point must be used place a zero before – e.g.0.5ml

E – type of vehicle (capsule or tablet, liquid suspension, inhaler.. - pharmacist will assume pill form unless specified)

F – instructions for administration (amount and frequency)

G - # dispense indicates amount of drug (number of pills, cc of liquids, grams of ointment, number of inhalers)
H – number of refills

I – signature of the doctor (faculty, signature - must be signed by a licensed MD)

Latin Terms on a Prescription

There are several components to writing prescriptions, one of which is the writing of specific keywords in Latin.

Most Common Latin Abbreviations Used in Prescription Writing:

- a.c. = before meals (from "ante cibum," before meals)
- ad lib: use as much as one desires (from "ad libitum")
- b.i.d. = twice a day
- caps = capsules
- da or daw = dispense as written
- g (or gm or GM) = gram
- gtt. = drops (from "guttae," drops)
- h. = hour
- mg = milligram
- ml = milliliter
- p.c. = after meals (from "post cibum," after meals)
- p.o. = by mouth, orally (from "per os," by mouth)
- p.r.n. = when necessary (from "pro re nata," for an occasion that has arisen, as circumstances require, as needed)
- q.d. = once a day (from "quaque die," once a day)

- q.i.d. = four times a day (from "quater in die," 4 times a day)
- q._h.: If a medicine is to be taken every so-many hours (from "quaque," every and the "h" indicating the number of hours)
- q.h. = every hour
- q.2h. = every 2 hours
- q.3h. = every 3 hours
- q.4h. = every 4 hours
- t.i.d. = three times a day (from "ter in die," 3 times a day)
- ut dict. = as directed (from "ut dictum," as directed)

The Most Common Classifications of Medications

Analgeticum - Analgesics - Drugs that help relieve pain.

Anasetheticum - Anesthetics – reduce or eliminate sensation (esthesi/o)

Anticoagulants – prevent coagulation and formation of blood clots

Antiemeticum - Antiemetics – relieve symptoms of nausea and prevent vomiting

Antiphlogisticum - antiinflammatory drugs

Antipyreticum – antipyretics- counteract fever

Antihypertensives – lower blood pressure by reducing cardiac output, dilating vessels or promoting excretion of water by the kidneys

Antiinfective agents (antibacterials, antibiotics) – kill or prevent the growth of infectious organisms

Antimycoticum - Antifungals – effective against fungi

Antivirals – effective against viruses

Antineoplastics – destroy cancer cells; they are toxic for all cells but have greater effect on cells that are actively growing and dividing

Cardiacum - Cardiac drugs (antiarrhytmics, beta-blockers…etc) – act on heart

Cholagogum – cholagogue – a drug which promotes the discharge of bile from the body

Diureticum - Diuretics – promote excretion of water, sodium… by the kidneys; used to reduce edema and blood pressure

Emeticum – promote vomiting
Laxans, Purgans - Gastrointestinal drugs (antidiarrheals, laxatives…) – act on the GI tract; treat or prevent diarrhea, promote eliminations from the large intestine

Hypnoticum - Hypnotics – induce sleep or dull senses

Sedativum - Sedatives/hypnotics (tranquillizers) – induce rexation and sleep; reduce mental tension and anxiety

Spasmolyticum - Muscle relaxants – depress nervous system stimulation of skeletal muscles; used to control muscle spasm and pain

Antidepressans - Psychotropics (antianxiety agents, antidepressants…) – affect the mind, alterning mental activity, state or behaviour

Respiratory drugs–act on the respiratory system:

Antitussicum - antitussives- suppress coughing;
bronchodilators - prevent or eliminate spasm of the bronchi, widen the bronchi
Expectorans - expectorants - induce productive coughing
Mucolyticum - mycolytics – dissolve mucus to eliminate respiratory secretions

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