

Medical Terminology Study Guide

***NOTE:

- **The curriculum of the course comes from the textbook *Introduction to Medical Terminology, 1st Edition*, written by Linda Stanhope and Kimberly Turnbull, which is specifically developed for high school students. The textbook is published by Goodheart-Willcox Learning, and neither Simple Studies nor the author of this study guide take credit for developing the curriculum of the course.**
- *Medical Terminology is heavily **memorization based**, especially for learning terms. Using this guide’s information, find your own way of studying (writing notes, flashcards, diagrams, Quizlets. etc.) The first unit covers **basic terminology** that is used in a health care setting. The building block terms located at the end of the first unit are essential to understand the remaining units, which cover **terms, conditions and diseases** specific to a body system.*
- *I personally recommend using **Quizlet** for the whole entire course to memorize. It also provides **diagrams** that can help visualize during studying.*
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Unit 1: The Basics

Military Time Conversions:

- Military time, based on 24 hours, is utilized in the medical field.
- It is more clear to use in healthcare documents; AM, PM are **not** used.

<i>Standard</i>	<i>Military</i>	<i>Standard</i>	<i>Military</i>
12:01 AM	0001	12:01 PM	1201
12:05 AM	0005	12:05 PM	1205



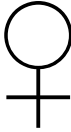
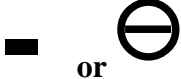

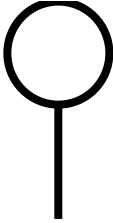




12:30 AM	0030	12:30 PM	1230
1:00 AM	0100	1:00 PM	1300
2:00 AM	0200	2:00 PM	1400
3:00 AM	0300	3:00 PM	1500
4:00 AM	0400	4:00 PM	1600
5:00 AM	0500	5:00 PM	1700
6:00 AM	0600	6:00 PM	1800
7:00 AM	0700	7:00 PM	1900
8:00 AM	0800	8:00 PM	2000
9:00 AM	0900	9:00 PM	2100
10:00 AM	1000	10:00 PM	2200
11:00 AM	1100	11:00 PM	2300
12:00 PM (<u>noon</u>)	1200	12:00 AM (<u>midnight</u>)	2400

Medical Symbols:

- The following symbols are used in prescriptions, doctor memos, etc.
- They save time in writing full terms and are more efficient.

<i>Term</i>	<i>Symbol</i>	<i>Term</i>	<i>Symbol</i>
Right	®	Not/None/Null	∅

Left	Ⓛ	Change	△
Before (think of the letter “a” being derived from <i>ante-</i> , Latin for before)	ā	Primary	1°
After (think of the letter “p” being derived from <i>post-</i> , Latin for after)	p̄	Secondary	2°
With (think of the letter “c” coming from the Spanish word <i>con</i> , which means with)	c̄	Treatment/ Prescription (this is the formal symbol, <u>“Rx”</u> or <u>“rx”</u> are generally used)	Rx
Without (think of the letter “s” coming from the Spanish word <i>sin</i> , which means without)	s̄	Greater than	>
Every	q	Less than	<

Male		Positive	+ or 
Female		Negative	- or 
Increase		Standing	
Decrease		Sitting	
Moving toward		Lying down	

Commonly Used Medical Abbreviations and Acronyms:

- **General:**

<i>Term</i>	<i>Meaning</i>
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Pt or pt	Patient
c/o	“Complains of” or “complaints of”; used when documenting patient symptoms.
y/o	year(s) old
ER/ED	Emergency room/emergency department
OR	Operating room
STAT	immediately
NKDA	“No known drug allergies”
hs	Half strength; bedtime
WNL	Within normal limits
PRN	As needed (in Latin <i>pro re nata</i>)
CPR	Cardiopulmonary resuscitation
Hx or hx	history
Tx or tx	treatment
Dx or dx	diagnosis
Fx or fx	fracture
Dz or dz	disease
PT	Physical therapy; physical therapist
OT	Occupational therapy; occupational therapist
RT	Respiratory therapy; respiratory therapist
ROM	Range of motion (sometimes used for “rupture of membranes”)

H&P	History and physical
HPI	History of present illness
R/O	Rule out (may or may not have)
S/S	Signs and symptoms (sometimes used for “swish and swallow”)
s/p	Status post (previous disease condition)
D/C or d/c	Discharge; discontinue
SOB	Shortness of breath
OD	Overdose (in ophthalmology used to describe “right eye”)
OS	Left eye
OU	Both eyes; each eye
PERRA	Pupils equal, round, reactive to light and accommodation

● **Related to Medications:**

<i>Term</i>	<i>Meaning</i>
Rx	Prescription, treatment
OTC	Over-the-counter (medication)
po	By mouth (which is Latin is “por os”)
pr	Per rectum (through the rectum)
IV	Intravenous (into the vein)
IM	intramuscular
SQ	Subcutaneous (under the skin)

SL	Sublingual (under the tongue)
bid	Twice a day
tid	Three times a day
qid	Four times a day
mL	milliliter
cc	Cubic centimeter (milliliter)
Gtt	drops

- **Related to Lab Studies:**

<i>Term</i>	<i>Meaning</i>
CBC	Complete Blood Count (bloodwork to look for infection or anemia)
H&H	Hematocrit (volume percentage of red blood cells in the blood) and hemoglobin
BMP	Basic metabolic panel (type of blood test)
CMP	Comprehensive metabolic panel (type of blood test)
UA	Urine analysis

- **Related to Vital Signs:**

<i>Terms</i>	<i>Meaning</i>
V/S or VS	Vital signs
BP	Blood pressure
mmHG	Millimeters of mercury (pressure)

HR	Heart rate
bpm	Beats per minute, breathers per minute
RR or Resp	Respiratory rate
temp	temperature
ht	height
wt	weight

- **Related to Diagnostic Tests:**

<i>Term</i>	<i>Meaning</i>
EKG/ECG	Electrocardiogram (of the heart)
CXR	Chest x-ray
MRI	Magnetic resonance imaging
CT	Computerized tomography (scan)

- **Common Medical Conditions:**

<i>Term</i>	<i>Meaning</i>
CAD	Coronary artery disease
MI	Myocardial infarction (heart attack)
COPD	Chronic obstructive pulmonary disease (lung disease common in smokers)
DM	Diabetes mellitus
HA	headache

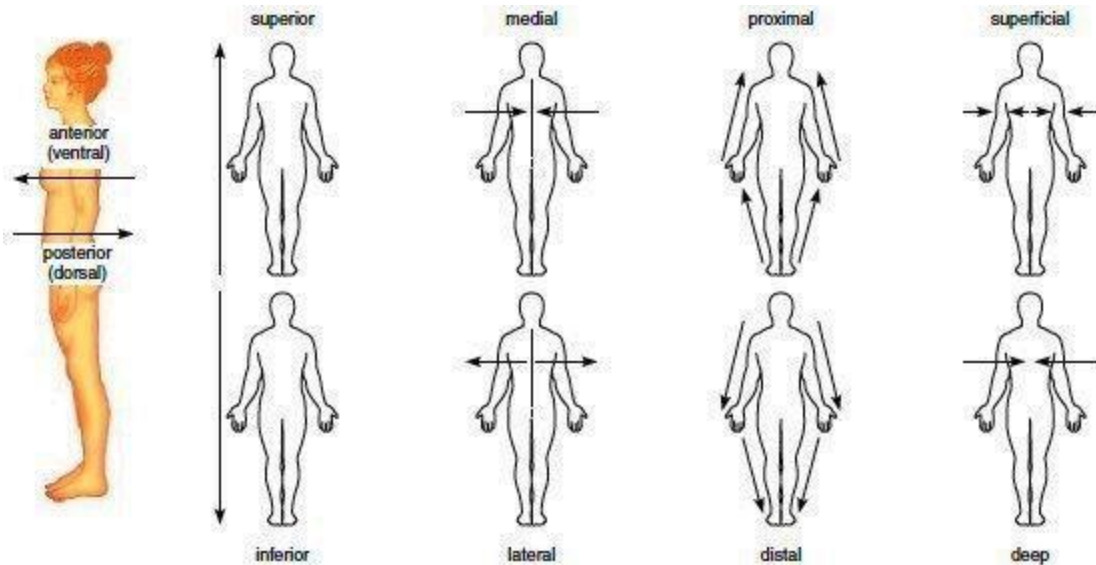
CA	cancer
HTN	Hypertension (high blood pressure)
DJD	Degenerative joint disease
CHF	congestive/chronic heart failure
UTI	Urinary tract infection
GERD	Gastroesophageal reflux disease

- **Related to Medical Professions:**

<i>Term</i>	<i>Meaning</i>
MD	Medical doctor/doctor of medicine
DO	Doctor of osteopathy (treatment through bones, joints, muscle massage)
PA	Physician's assistant
NP	Nurse practitioner
RN	Registered nurse
LVN	Licensed vocational nurse
CMA	Certified medical assistant
CNA	Certified nursing assistant

- **Directional Terms:**

- Image source: <https://training.seer.cancer.gov/anatomy/body/terminology.html>

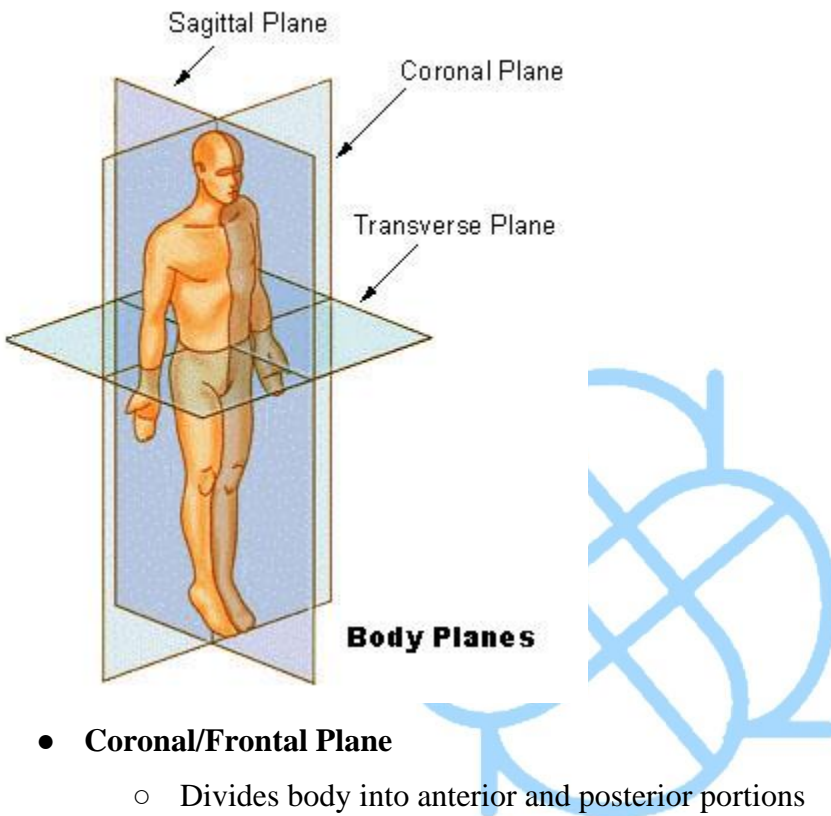


<i>Term</i>	<i>Meaning</i>
standard anatomical position	Agree reference for body position: standing on 2 legs, frontward, arms at sides, palms forward
anterior (ventral)	Front of the body
posterior (dorsal)	Back of the body; towards the back
proximal	Closer to origin of body part; point of attachment of limb to body trunk
superior	Above; toward the head
inferior	Below; away from the head
medial	Toward body midline
lateral	Away from midline; side
distal	Far from the trunk of the body
deep	Away from body surface; more internal

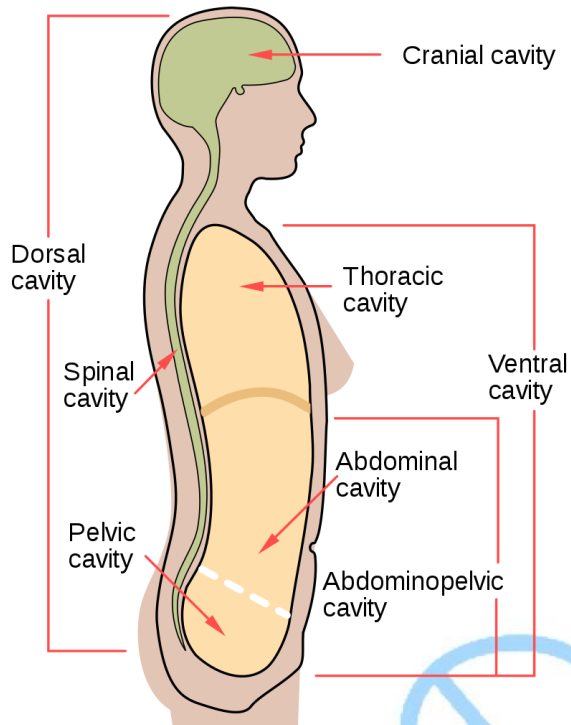
superficial	surface
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Planes of Reference and Cavities:

- Image source :<https://commons.wikimedia.org/wiki/File:BodyPlanes.jpg>



- **Coronal/Frontal Plane**
 - Divides body into anterior and posterior portions
- **Sagittal Plane**
 - Divides body into left and right portions
 - Midsagittal Plane
 - Parasagittal Plane
- **Transverse/Cross-sectional Plane**
 - Divides the body into superior and inferior portions
 - Image source: https://commons.wikimedia.org/wiki/File:Scheme_body_cavities-en.svg



- Know general locations of the different body cavities (e.g. cranial cavity is located in the head/skull).

Medical Terminology Building Blocks:

- IMPORTANT to **memorize** for all of the other units!
- Don't worry! Many of these terms are basic ones (pre-, neur/o, -ologist, etc.).
- Develop a specific study method. I prefer Quizlet, which helped a lot with memorization.

<i>PREFIXES</i>	<i>Meaning</i>
a-/an-	Not, without
pre-	before
post-	after
hypo-	Under, below
hyper-	over

sub-	Under, below
epi-	above
inter-	Between, among
intra-	Within, inside
micro-	small
macro-	large
dys-	Bad, painful, difficult
ROOTS	
neur/o	Nerve, nervous system
ophthalm/o	Eye, vision
ot/o	Ear, hearing
dermat/o	skin
cardi/o	heart
pulmon/o	lung
hepat/o	liver
nepgh/o	kidney
gastr/o	stomach
oste/o	bone
my/o	Muscle, muscle tumor
arthr/o	joint

<i>SUFFIXES</i>	
-ac,-ic,-al,-ous,- tic	Related to or pertaining to
-ectomy	Excision, removal
-itis	Inflammation of
-logist	Specialist in the study of
-logy	Study of
-oma	Tumor mass
-osis	Abnormal condition
-pathy	Disease, disease condition
-scope	Lack, observe
-scopy	Visual examination
-gram	To record
-graphy	Process of recording

Unit 2: Skeletal System

Major Functions of the Skeletal System:

- **Protection** - ribs protect heart; surrounds/protects vital organs
- **Storage** - bones store minerals and some fat
- **Support** - body shape and structure
- **Blood cell formation** - bone marrow makes blood cells

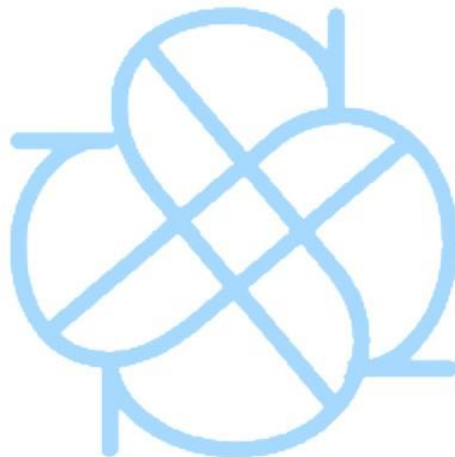
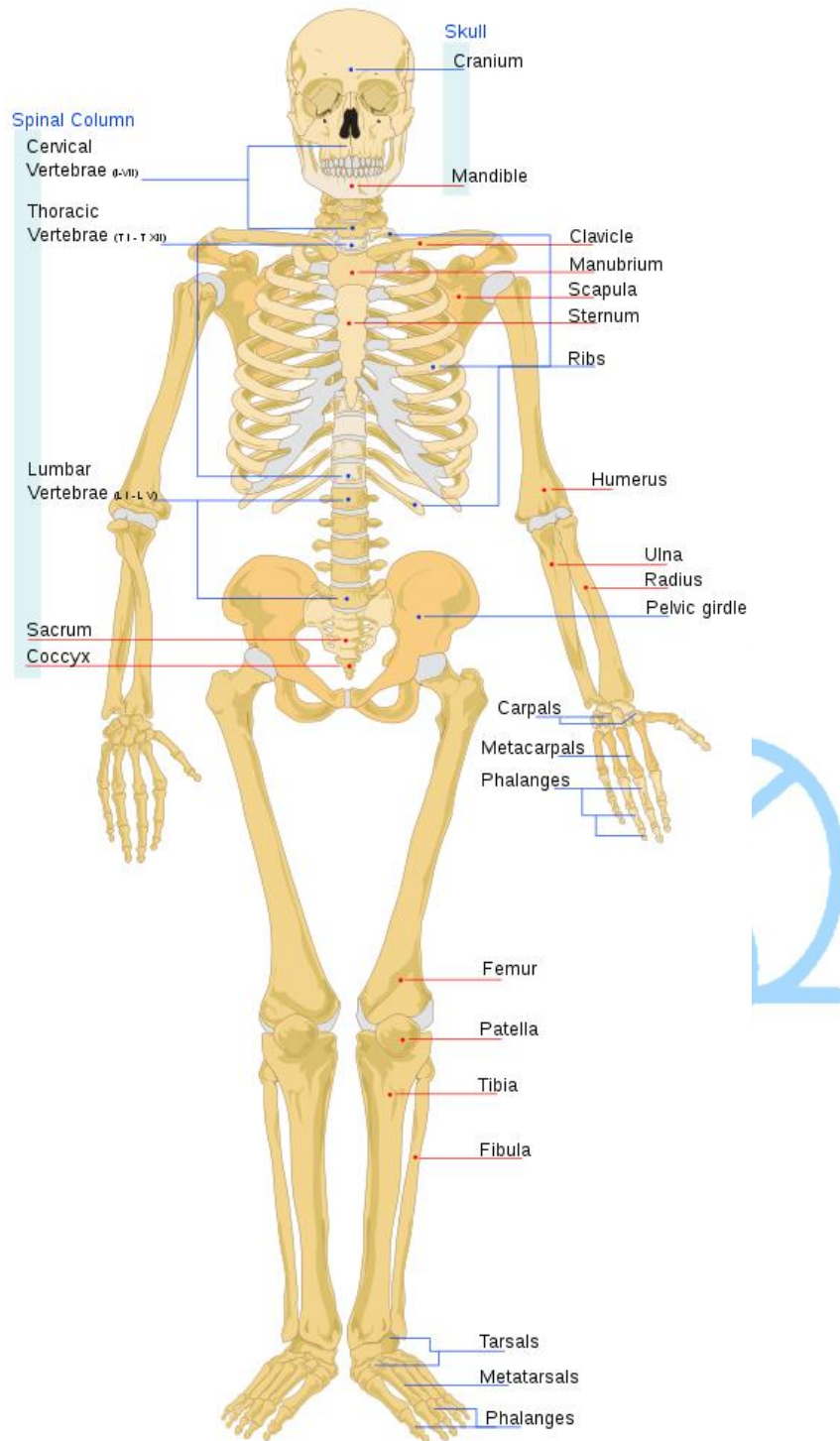


Diagram of the Skeletal System:

- Image source: https://en.wikipedia.org/wiki/File:Human_skeleton_front_en.svg



● **Axial Skeleton:**

- along axis/center of skeleton
- 80 bones
- Skull

- Thoracic cage (ribs, sternum)
- Vertebral column
- **Appendicular Skeleton:**
 - Attaches appendages to axial skeleton
 - 126 bones
 - Shoulder girdle
 - Upper extremities
 - Pelvic girdle
 - Lower extremities

Skeletal System Word Parts:

<i>PREFIXES</i>	<i>Meaning</i>
a-/an-	Without, lack of
anti-	Against, opposite
inter-	between
intra-	Within, inside
meta-	Beyond, change
non-	not
peri-	Surrounding, around
sub-	Under, below
supra-	Above, upper
syn-	With, together
<i>ROOTS</i>	
acr/o	extremities

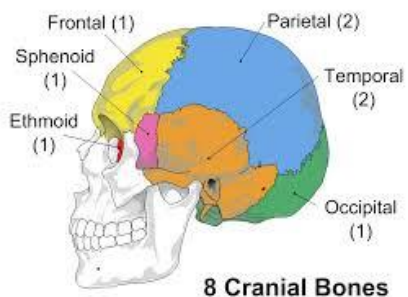
ankyl/o	Crooked, stiff, bent, fused together
arthr/o	joint
brachi/o	arm
burs/o	Bursa (sac of fluid near joint)
carp/o	wrist
cervic/o	Neck, cervix
chir/o	hand
chondro/o	Cartilage (type of connective tissue)
cost/o	ribs
crani/o	Cranium (skull)
kyph/o	Bent, hump
lord/o	Curve, swayback, bent
lumb/o	Lower back
lux/o	dislocation
myel/o	Spinal cord, bone marrow
ortho/o	Straight, correct, upright
ortho/o, oss/e, ost/o, ossi/o	bone
ped/o	Child, foot
pod/o	foot

rheumat/o	Watery flow
sacr/o	Flesh, sacrum
sarc/o	Flesh, connective tissue
scoli/o	Cracked, beat
spondyl/o	Vertebrae, vertebral column, backbone
ster/o	Solid structure, steroid
synovi/o	Synobia, synovial membrane
tors/o	Tarsals (ankle bones)
<i>SUFFIXES</i>	
-al, -ic	Pertaining to
-algia	Pain, painful condition
-ation	Process, condition
-centesis	Surgical puncture
-desis	To bind, tie together
-ectomy	Excision, removal
-itis	Inflammation of
-malacia	(abnormal) softening
-megaly	Enlargement, large
-oid	Like, resembling
-oma	Tumor, mass

-osis	Abnormal condition
-patellar	Knee cap
-penia	Decrease, deficiency
-plasty	Surgical repair
-porosis	Abnormal condition of small holes
-scope	Instrument for viewing
-scopy	Process of visually examining
-tomy	To cut, incision

Cranial Bones:

- Image source: https://commons.wikimedia.org/wiki/File:Cranial_bones_en_v2.svg



- Know the general location of the cranial bones. (Try to identify where their location is by looking at pointing at your own head).

Diseases of the Skeletal System:

- **STOP!** Have you learned the word parts for this unit? Knowing them will help you know the meaning of the following words.
- Most of the words can be understood using word parts, but others need to be memorized.

1. **Ankylosis** - fusion of the bones; abnormal stiffness and immobility of a joint
2. **Chondromalacia** - runner's knee; cartilage under the patella/kneecap deteriorates

3. **Dislocation** - injury when joints/body part's normal position is disturbed
4. **Gout** - excess of uric acid in the blood, causing pain, inflammation, swelling
5. **Kyphosis** - "hunchback"; instability in back and neck
6. **Lordosis** - excessive inward curvature of spine
7. **Myeloma** - malignant tumor/cancer in the bone marrow
8. **Ostealgia** - pain in a bone
9. **Osteitis** - inflammation of the substance of a bone
10. **Osteoarthritis** - damage to the cartilage of the flexible part of the bone
11. **Osteoma** - new piece of bone/tumor growing on another piece of bone
12. **Osteomyelitis** - inflammation of bone or bone marrow due to infection
13. **Osteopenia** - loss of bone density; precursor to osteoporosis
14. **Osteoporosis** - bones become brittle and fragile
15. **Osteosarcoma** - cancer producing immature bone; begins in cells that form bone
16. **Paget's disease** - bones become fragile and crooked
17. **Periostitis** - inflammation of the periosteum, a layer of connective tissue surrounding bone
18. **Rheumatoid arthritis** - chronic inflammatory disorder affecting joints like in hands, feet
19. **Scoliosis** - sideways curvature of spine; can occur in growth spurt before puberty
20. **Spina bifida** - split/open spine, can be caused by lack of Vitamin B in mother's diet
21. **Spondylosis** - aging phenomenon, bones and ligament in the spine wear
22. **Sprain** - damage to ligament (the bands of tissue between joints)
23. **Subluxation** - partial displacement of spinal cord or another joint
24. **Talipes** - clubfoot, foot twisted/upside down, no discomfort or pain

Skeletal System: Fractures

- For practical purposes and to avoid copyright, images of the fractures won't be included. However you can search them up (or use the images provided on Quizlet) to visualize when studying.

<i>FRACTURE TYPE</i>	<i>DESCRIPTION</i>
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displaced	Bone is broken into two or more pieces and the ends do not line up together; <u>pulled out of normal alignment</u> ,
non-displaced	Bone breaks away partially or all the way through but the bones do not move; <u>they remain aligned</u> .
closed/simple	AKA “simple fix”; fracture with intact overlying skin.
Open compound	AKA “compound fix”; bone (usually its end) penetrates skin. Usually a <u>bad situation</u> with this fracture.
transverse	break at <u>right angle</u> to bone plane; caused by direct blow or prolonged stress (e.g. running).
comminuted	break/splinter of bone into two fragments; occurs after high-impact trauma. <u>Lots of miniscule pieces</u> .
greenstick	Incomplete fracture; occurs when bone is bent and partially broken. Most are found in children under the age of 10 because their bones are “soft”.
spiral	Fracture where bone is twisted apart, seen in long arm/leg bones. Common result of sports injury or falling distances.
compression	Function of vertebrae, occurs as spines bones compress. Osteoporosis is the most common cause.
stress	Small bones crack, caused by overuse/repetitive activity. Weight bearing bones of feet and legs are most vulnerable.

Unit 3: Muscular System

Directional Movement:

- For practical purposes and to avoid copyright, images of the directional movements won't be included. They can be understood without images, but you can search them up (or use the images provided on Quizlet) to visualize when studying if needed.

<i>MOVEMENT</i>	<i>DESCRIPTION</i>
abduction	Motion of a structure away from the midline.
adduction	Motion towards the center of the body.
extension	Movement that increases the angle between two body parts.
flexion	Movement that decreases the angle between two body parts.
rotation	Turning around the axis.
circumduction	Circular movement of a limb.
supination (under-pronation)	Outward roll of foot during normal motion
pronation	Natural side-to-side movement of the foot as you walk or run; normal inward of foot step
elevation	Movement in a superior direction
depression	Movement in inferior direction
dorsiflexion	Act of raising the foot upwards, towards the shin
plantarflexion	Movement in which the top of your foot points away from your leg
inversion	Movement of sole towards the median plane (midline of the body)
eversion	Movement of the sole of the foot away from the median plane (midline of the body)
protraction	Moving the shoulder blades (scapula) forward, towards the chest

retraction	Moving the shoulder blades (scapula) towards the spine
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Word Parts:

<i>PREFIXES</i>	<i>MEANING</i>
a-, an-	Not, without
ab-	From, away from
ad-	toward
bi-	Two, twice, double
brady-	Abnormally slow
circum-	Around (circumference)
dorsi-	back
dys-	Bad, painful, difficult
e-, ex-	Out, away from
hemo	Half, partial
hyper-	over
hypo-	Under, below
in-	In, within
par, para-	Beside; near; equal, bring forth
quadri-	Four, square
tachy-	Fast, rapid

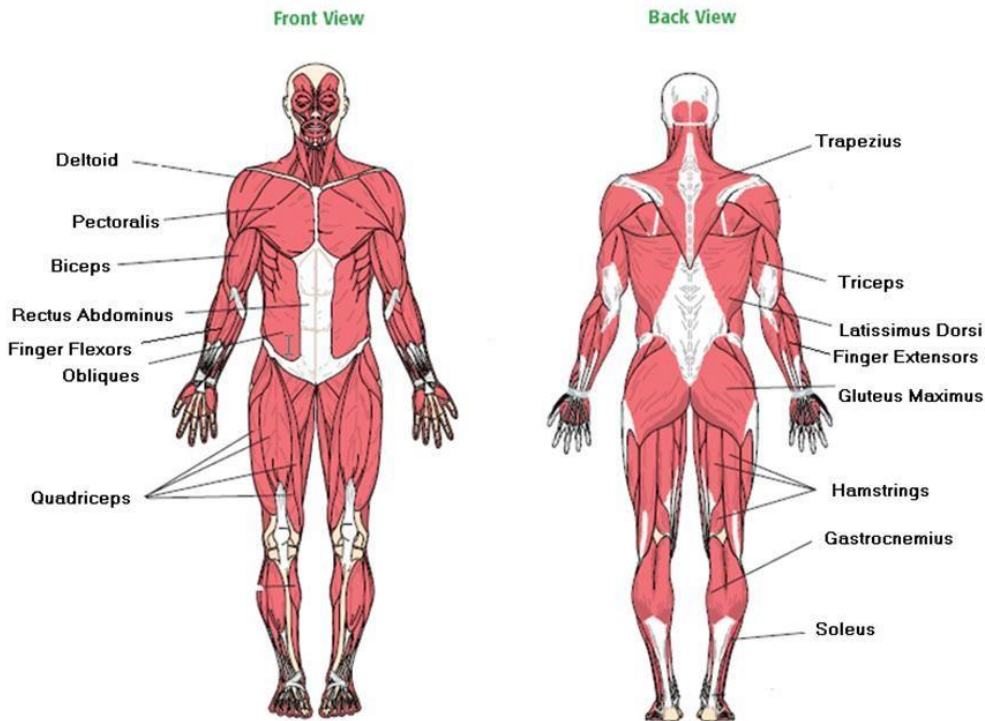
tri-	Three, triple
ROOTS	
articul/o	Joint, articulation
card/o, cardio/o	heart
duct/o	To lead, carry
electr/o	electricity
fasci/o	Fascia (fibrous connective tissue)
fibr/o	Fiber, fibrous tissue
flex/o	To bend, bending
kines/o, kinesi/o	Movement, motion
lei/o	Smooth muscle
muscul/o	muscular
my/o, myos/o	muscle
myocardi/o	Myocardium (heart muscle)
neur/o	Nerve, nervous system
orth/o	Straight, upright
ped/o	foot
plant/o	Sole of foot
radi/o	X-rays, radius, radiation
sarc/o	Flesh, connective tissue

son/o	Sound, sound waves
tax/o	Coordination, order
tend/o, tendin/o, tendon/o	Tendon; extend, strain
tens/o	Pressure, tension
ton/o	Tone, tension, pressure
vers/p	To travel, to turn
<i>SUFFIXES</i>	
-ac, -al, -ar, -ic	Pertaining to
-asthenia	Lack of strength, weakness
-algia	Pain, painful condition
-cele	Hernia, swelling
-ceps	Head, point of origin
-dynia	Condition of pain
-ectomy	Surgical removal, excision
-esthesia	Sensation, feeling
-gram	To record
-graphy	Process of recording
-ia	Condition of
-ion	Process; a charged atom
-itis	Inflammation of

-logy	Study of
-lysis	Loosening, destruction
-malacia	Abnormal, softening
-oma	Tumor, mass, swelling
-paresis	Weakness; slight/partial paralysis
-penia	Decrease, deficiency
-plasty	Surgical repair, construction
-plegia	Paralysis, stroke
-plegic	Pertaining to paralysis
-rrhexis	Rupture of, bursting
-scope	Instrument for visual examination
-scopy	Process of visually examining
-tomy	Process of cutting, incision
-tonia	Tone, degree of muscle tension
-trophy	Nourishment, development

Major Muscles of the Human Body:

- Image source: <https://www.britannica.com/science/human-muscle-system>



- Know the general locations of the muscles in the human body

Common Abbreviations Associated with the Muscular System:

- **MD** - muscular dystrophy
- **PT** - physical therapy
- **CAT** - computerized axial tomography
- **ROM** - range of motion
- **PCP** - primary care physician
- **NSAIDs** - nonsteroidal anti-inflammatory drugs
- **CT** - computed/computerized tomography
- **CTS** - carpal tunnel syndrome
- **DMD** - Duchenne muscular dystrophy
- **IM** - intramuscular

Diseases and Conditions of the Skeletal System:

- **STOP!** Have you learned the word parts for this unit? Knowing them will help you know the meaning of the following words.

- Most of the words can be understood using word parts, but others need to be memorized.

1. **Ataxia** - loss of full control of bodily movements
2. **Contracture** - shortening and hardening of muscles, tendons, leading to rigidity, deformity
3. **Hypertrophy** - enlargement of organ or tissue from increase in the cells' size
4. **Myasthenia gravis** - lack of communication between the muscles and nerves
5. **Atrophy** - the waste away/shrinking of an organ or tissue from decrease in cellular size
6. **Tremor** - unintentional/uncontrollable movement of a limb or a part of it
7. **Plantar fasciitis** - strain or stress of the heel of the feet or surrounding ligaments
8. **Myocele** - swelling/hernia of the muscle, especially before the pelvis
9. **Dystaxia** - impaired balance/coordination, can be due to brain/nerve/muscle damage
10. **Rigor** - stiffness of death
11. **Impingement syndrome** - inflammation from repetitive shoulder activities
12. **Myoparesis** - slight muscle paralysis
13. **Myorrhaxis** - rupture/tearing of muscle caused by trauma
14. **Flaccidity** - lacking firmness
15. **Muscular dystrophy** - a hereditary condition marked by progressive weakening and wasting of muscles
16. **Tetany** - condition of cramping and twitching of hand, feet muscles; caused by low calcium
17. **Hypotonia** - abnormally low level of muscle tone
18. **Leiomyoma** - estrogen and progesterone during childhood years
19. **Rhabdomyolysis** - muscles starts to break down releasing all of its contents into blood
20. **Spasm** - sudden, involuntary contraction of one or more muscles
21. **Tendinitis/Tendonitis** - inflammation or irritation of a tendon
22. **Sarcopenia** - loss of skeletal mass and function
23. **Leiomyosarcoma** - cancer that rises from smooth muscle cells
24. **Strain** - stretching or tearing of muscles in tendon

Unit 4: Integumentary System

Functions of the Integumentary System:

1. A **protective barrier** from excessive sunlight, infection, abrasions.
2. Receive **stimuli** from the outside to the brain (nervous system sensors).
3. **Excretion** of waste.
4. **Blood storage**; can allow extra blood if needed to organs.
5. Regulate body **temperature**.
6. Makes **Vitamin D** for the body.

Components of the Integumentary System:

1. Skin
2. Hair
3. Nails
4. Sweat glands
5. Oil glands



Word Parts:

<i>PREFIXES</i>	<i>MEANING</i>
auto-	self
e-, ex-	Out, away from
epi-	above
in-	in
intra-	Within, inside
para-	Beside, near
per-	By, through, throughout

ROOTS	
aden/o	Gland, glandular
adip/o	Fatty tissue, fat
albin/o	white
aut/o	Self, same
blephar/o	Eyelid, eyelash
carcin/o	Cancerous, cancer
caus/o	Burn, burning
cauter/o	Heat, burn
cis/o	To cut, incision (process of cutting into)
cry/o	Cold, freezing, frozen
cutane/o	skin
cyan/o	Dark blue, blue
cyt/o	Cell (combining form)
derm/a, dermat/o, derm/o	skin
diaphor/o	Profuse sweating, sweat
ecchym/o	Blood in the tissues
erythem/o, erythemat/o	Flushed, redness
erythr/o	Red, red blood cell

hidr/o	Sweat, perspiration, sweat glands
hist/o	Combining form of tissue, tissue
ichthy/o	Dry, scaly
immun/o	Immune, protection, safe
integument/o	Skin, covering, integumentary
jaund/o	Jaundice (yellow)
kerat/o	Horny tissue, hard; cornea
lip/o	Lipid (fat)
melan/o	Black, dark
myc/o	Mold, fungus
necr/o	Death (of cells or whole body)
onych/o	Fingernail, toenail
papill/o	Optic disc; nipple-like
pil/o	Hair, hair follicle
prurit/o, psor/o	Itch, itching
py/o	Combining form for pus
rhytid/o	(skin) wrinkle
scler/o	Hardening; sclera (white of eye)
seb/o	Sebum (oil)
squam/o	Scale-like (cell)

steat/o	Fat, lipid, sebum
trich/o	Hair or hair-like structure
ungu/o	Fingernail, toenail
xer/o	Dry, dryness
<i>SUFFIXES</i>	
-al, -ary, -ic, -ous, -tic	Pertaining to
-cyte	(mature) cell
-derma	skin
-dermis	inner/middle layer of skin
-ectomy	Excision, removal
-ema	State, condition, swelling
-esis	Condition of
-iasis	Abnormal condition
-ism	Condition, state of
-logy	Study of
-oma	Tumor, mass, swelling, collection of fluid
-opsy	Process of viewing
-ose	Pertaining to, full of, sugar
-osis	Abnormal condition
-plasty	Surgical correction or repair

-rrhea	Discharge, flow
-therapy	treatment

Types of Cancerous Skin Lesions:

1. **Basal cell carcinoma** - begins in basal cells (type of skin cell that produces new skin as old ones die). Often appears as slightly transparent bumpy, brown scaly patches. Least dangerous of skin cancer. Normal appearance, often left alone at first.
2. **Squamous cell carcinoma** - type of skin cancer more serious than basal cell carcinoma; often characterized by scaly red papules or nodules
3. **Malignant carcinoma** - low chance of removal; occurs in melanocytes
4. **Kaposi's sarcoma (KS)** - malignant tumor of blood vessels associated with AIDS

ABCDE of Melanoma:

- The following are the **main five characteristics of melanoma** (skin cancer) lesions observed.
- For practical purposes and to avoid copyright, image examples won't be included. They can be understood without images, but you can search them up (or use the images provided on Quizlet) to visualize when studying if needed.

<i>LETTER</i>	<i>MEANING</i>
A - asymmetry	One half of the melanoma does not match the other
B - border	Uneven borders of the melanoma
C - color	Variety of colors like brown, tan or black in the melanoma
D - diameter	The melanoma grows larger than the size of a pencil eraser ($\frac{1}{4}$ inch)

E - evolution	The melanoma changes in size, shape, color, elevation, or gets another trait or new symptom
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Types of Burns:

- For practical purposes and to avoid copyright, image examples won't be included. They can be understood without images, but you can search them up (or use the images provided on Quizlet) to visualize when studying if needed.

<i>TYPE</i>	<i>CHARACTERISTICS</i>
first-degree	<ul style="list-style-type: none"> • Superficial • Affects only epidermis • Burn site is erythematous (skin redness), dry, painful • Hyperesthesia (over-sensation) • No blisters
second-degree	<ul style="list-style-type: none"> • Partial thickness • Involves epidermis, part of dermis • Erythematous, edematous (swollen), painful • Hyperesthesia • Blisters
third-degree	<ul style="list-style-type: none"> • Full thickness • Epidermis, dermis destroyed; may involve subcutaneous tissues • Hyperesthesia or anesthesia (no sensation) depending on nerve damage • May be white or blackened/charred
fourth-degree	<ul style="list-style-type: none"> • Full thickness • Epidermis, dermis, subcutaneous tissues destroyed • Extends into deeper structures (muscles, bones)

	<ul style="list-style-type: none">● Anesthesia since nerves destroyed● Often fatal
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Diseases and Conditions:

- **STOP!** Have you learned the word parts for this unit? Knowing them will help you know the meaning of the following words.
 - Some of the words can be understood using word parts, but others need to be memorized.
1. **Acne** - inflammatory disease of the skin involving the sebaceous glands and hair follicles
 2. **Albinism** - absence of pigment in skin, hair and eyes
 3. **Alopecia** - baldness, hair loss
 4. **Cyanosis** - bluish discoloration of the skin and mucous membranes
 5. **Ecchymosis** - large bruise
 6. **Eczema** - noninfectious, inflammatory skin disease characterized by redness, blisters, scabs and itching
 7. **Gangrene** - death of tissue caused by loss of blood supply followed by bacterial invasion
 8. **Keloid** - thick scar resulting from excessive growth of fibrous tissue
 9. **Impetigo** - bacterial skin infections characterized by isolated pustules that become crusted and rupture
 10. **Petechiae** - small bruise; minute, pinpoint hemorrhage under the skin
 11. **Psoriasis** - chronic skin condition producing red lesions covered with silvery scales
 12. **Scabies** - skin disease produced by mites
 13. **Tinea** - ringworm; infection of the skin caused by a fungus
 14. **Urticaria** - allergic reaction of the skin characterized by the eruption of pale red, elevated patches called wheals or hives
 15. **Vitiligo** - localized loss of skin pigmentation characterized by milky-white patches
 16. **Wart** - flesh-colored, raised area caused by a viral infection

Unit 5: Lymphatic System

Functions of the Lymphatic System:

1. Returns fluid from tissues back to the heart
2. Helps large molecules enter the blood (lipids, hormones)
3. Immune surveillance

Lymphatic Collecting System (smallest to largest):

1. Capillaries
2. Vessels
3. Trunks
4. Ducts

Lymphoid Organs:

1. **Tonsils** - around throat (lingual, tubal, adenoid, palatine)
2. **Diffuse lymphoid tissue** - in gastrointestinal and respiratory tract
3. **Spleen** - below diaphragm, above stomach
4. **Thymus** - chest, below neck
5. **Lymph nodes** - neck, armpit, groin (everywhere)

Disease Classification Vocabulary:

1. **Acute** - characterized by rapid onset, severe symptoms, short duration
2. **Chronic** - characterized by long duration and slow progression
3. **Terminal** - a term for diseases that have possible treatment but no cures
4. **Congenital** - condition present at birth, may be a result of genetic or environmental factors
5. **Genetic** - inherited, passed on from one's parents
6. **Idiopathic** - diseases and conditions that have unknown etymologies
7. **Iatrogenic** - diseases or conditions that arises as a medical or surgical complication
8. **Nosocomial** - infection acquired in hospital setting not present upon admission
9. **Infectious** - capable of causing an infection
10. **Opportunistic** - diseases or conditions that do not take hold unless the immune system is in a weakened state
11. **Inflammatory** - marked or caused by inflammation (redness, fever, swelling)

- 12. **Neoplastic** - describes a new, abnormal growth that may or may not be cancerous
- 13. **Autoimmune** - condition in which the body reacts to its own health tissue as it does to foreign antigens
- 14. **Immunological** - pertaining to a reaction between an antigen and an antibody

Word Parts:

<i>PREFIXES</i>	<i>MEANING</i>
a-, an-	Not, without
anti-	Against, opposite
auto-	Self, own, same
con-	with
en-	in
epi-	above
macro-	Large, long
mega-	large
meta-	Beyond, change
micro-	small
mono-	one
neo-	New, recent
poly-	many
pro-	Before, forward
trans-	Across, through

ROOTS	
adenoid/o	Structure resembling glands, adenoids
agglutino/o	Clumping; sticking together
angi/o	Blood or lymph vessel
arteri/o	arteries
chron/o	Time, timing
cyt/o	cell
erythr/o	Red, red blood cell
hem/a, hem/o, hemat/o	Blood, relating to blood
iatr/o	Treatment, physician, medicine
idi/o	Unknown, peculiar; individual
immun/o	Immune, protection, safe
leuk/o	White, colorless
ly/o	Break down, dissolve, loosen, destroy
lymph/o, lymphat/o	lymph
lymphaden/o	Lymph gland (node)
lymphangi/o	Lymphatic vessel, ducts
morph/o	Shape, form
myel/o	Spinal cord, bone marrow

nucle/o	Nucleus, nuclear
path/o	Disease, suffering, feeling, emotion
phag/o	Eat, swallow
phleb/o	Vein, veins
ser/o	Serum, serous membrane
splen/o	spleen
thromb/o	Clot, clotting, blood clot
thym/o	Thymus gland
tonsill/o	Tonsils, throat
tox/o	Poison, poisonous
ven/i, ven/o	Blood vessel, vein
vir/o	Poison, virus
<i>SUFFIXES</i>	
-al, -ar, -ic, -ical, -tic	Pertaining to
-ation	Process, condition
-blast	Bud; immature lytic cell
-crit	Separate, choose
-cyte	cell
-ectomy	excision
-emia	Blood condition

-fusion	Come together
-gen	Origin, production
-globulin	Plasma protein
-ia	Status, condition
-itis	Inflammation of
-lysis	Separate, destruction
-lytic	Pertaining to
-megaly	Enlargement, large
-oma	Tumor, mass, swelling
-osis	Abnormal condition
-penia	Decrease, deficiency
-phage	Eat, swallow
-pheresis	Removal, withdraw
-phil, -philia	Love, attraction to
-phoresis	transmission
-plasm	Formation (of cells)
-plastic	Pertaining to formation
-plasty	To repair
-poiesis	Formation, production
-rrhage	Bleeding, abnormal discharge

-sis	State, condition
-stasis	State of balancy, stability, equilibrium
-suppression	Hold, or shrink
-therapy	treatment
-tomy	Process of cutting, making incision into

Lymphatic System Structures:

- **Axillary lymph nodes** - concentrated in armpit, retrieve upper limb, female breast lymph
- **Cervical lymph nodes** - deep/superficial in neck; monitor head, neck, lymphs
- **Inguinal lymph nodes** - in groin; receive lymph from entire lower limb
- **Spleen** - below diaphragm/above stomach; produces/stores/eliminates blood cells
- **Thymus** - behind sternum/underneath neck, near to heart in chest; larger in teens/kids
- **Tonsils** - pharynx, back of throat; lymphatic tissue masses filtering interstitial fluid

Diseases and Conditions of the Blood and Lymphatic System:

- **STOP!** Have you learned the word parts for this unit? Knowing them will help you know the meaning of some of the following words.
 - Some of the words can be understood using word parts, but others need to be memorized.
1. **Aplastic anemia** - lacking formation of the red blood cells
 2. **Hemolytic anemia** - inherited condition; blood cells destroyed faster than production
 3. **Iron-deficiency anemia** - low blood hemoglobin; less iron
 4. **Pernicious anemia** - immature cells circulate in the bloodstream and are not acting as red blood cells
 5. **Sickle-cell anemia** - a mutation in hemoglobin alters red blood cells into sickle shape
 6. **Thalassemia** - body makes an abnormal form/inadequate amount of hemoglobin
 7. **Hemophilia** - blood doesn't clot normally; usually inherited from parent-to-child
 8. **Von Willebrand disease** - platelets don't clot blood as well

9. **Multiple myeloma** - cancer cells accumulate in bone marrow; contaminate healthy cells
10. **Polycythemia** - slow-growing blood cancer; too many red blood cells, less water, fluid in blood
11. **Deep vein thrombosis** - vein lying deep under a skin
12. **Leukemia** - bone-marrow and other blood-producing organs produce many eukaryotic/white blood cells
13. **AIDs** - HIV entering the body (attacks the immune system, weakens it)
14. **Agammaglobulinemia** - inherited diseases resulting in antibody, lymphocyte blood deficiency
15. **Allergy** - hypersensitive body reaction to an allergen
16. **Anaphylaxis** - severe allergic reaction
17. **Hodgkin's lymphoma** - lymphoma developed in lymphocytes
18. **Non-Hodgkin's lymphoma** - can occur in anywhere; in lymphocytes
19. **Mononucleosis** - overproduction of white blood cells
20. **Splenomegaly** - condition of spleen enlargement
21. **Lymphedema** - lymph swelling caused by lymph damage/removal
22. **Lymphadenitis** - enlargement of lymph nodes when inflamed by virus/bacteria/fungi
23. **Lymphangitis** - inflammation of the lymphatic by bacteria/fungi (via cuts, wounds)
24. **Systemic lupus erythematosus** - lupus-caused rash on face making the face look like a wolf

Blood Types:

- Two main kinds of **antigens** - Antigens A&B
- **Four blood types** - A, B, AB, O
- A&B alleles are **dominant**; O is **recessive**
- The correct blood type is needed for blood transfusions
- Blood type **AB** is considered the *universal recipient* because it has antigens for A and B so it won't make antibodies
- Blood type **O** is considered the *universal donor* because it does not have antigens
- The **rh(tor-)/Rhesus-factor** is another antigen system that must be looked at with blood typing to avoid a transfusion reaction

Unit 6: Cardiovascular System

Functions of the Cardiovascular System:

- Contains the **heart**, which transports nutrients, oxygen, waste, heat, hormones and immune cells throughout the body
- The heart essentially acts a **pump** to maintain body pressure
- **Arteries** carry blood away from the heart; **veins** carry blood back to the heart
 - The **aorta** is the body's largest artery
- The high blood pressure caused by ventricular contraction is **systolic blood pressure**; when the ventricles relax, the corresponding blood pressure is **diastolic blood pressure**

Characteristics/Body Parts of the Cardiovascular system:

- Heart is situated in **mediastinal cavity** between the lungs
- Heart is nestled in a double-walled sac called the **pericardium**
- Heart has three layers: **epicardium** (outer layer), **myocardium** (middle muscular layer), **endocardium** (innermost layer)
- Heart is divided by the **septum**, a thin inner partition
- The upper chambers of the heart are called **superior atria** (for low pressure); lower chambers are called **inferior ventricles**
 - Ventricles are heart pumps and have muscular walls

Word Parts:

<i>PREFIXES</i>	<i>MEANING</i>
a-, an-	Not, without
anti-	against
brady-	slow
dia-	Through; complete
echo-	Reflected sound

em-	in
endo-	In, within
epi-	On, over, upon
hyper-	Above, above normal, excessive
hypo-	Below, below normal, deficient
per-	through
peri-	Around, surrounding
trans-	across
ROOTS	
angi/o	Vessel (blood)
aort/o	aorta
arteri/o	artery
arteri/o	Arteriole (small artery)
ather/o	Plaque; fatty buildup
bol/o	Cast, throw
cardi/o	heart
coagul/o	Coagulation (clotting)
constrict/o	narrowing
coron/o	heart
cyan/o	blue

dilat/o	To enlarge/expand
electr/o	electricity
my/o	muscle
phleb/o	vein
pulmon/o	lung
rhythm/o	Rhythm; heartbeat
septo/o	Wall; partition
son/o	sound
sphygm/o	pulse
systol/o	contraction
thromb/o	clot
vas/o	Vessel; duct
vascul/o	Blood vessel
ven/i, ven/o	vein
ventricul/o	ventricle
venul/o	Venule (small vein)
<i>SUFFIXES</i>	
-ac, -al, -ary, -ic, -ous	Pertaining to
-ation	Process; condition

-ant	Substance that produces
-e	Noun suffix with no meaning
-emic	Pertaining to blood condition
-ia	condition
-in, -ine	chemical, chemical compound; substance
-ism	Process; condition
-ive	Substance that promotes
-lytic	Pertaining to break down
-or	One who (or something that) takes action or does something
-osis	Abnormal condition
-pathy	disease
-trophy	Condition of growth or development
-sclerosis	Hardening; thickening
-stenosis	Narrowing; tightening
-um, -us	Structure; tissue; thing
-version	To turn

- **STOP!** Have you learned the word parts for this unit? Knowing them will help you know the meaning of some of the following words.
- Most of the words can be understood using word parts, but others need to be memorized.

Heart Diseases and Conditions:

1. **Angina** - chest pain
2. **Cardiac tamponade** - heart pressure caused by pericardial fluid
3. **Cardiomyopathy** - heart muscle disease
4. **Congestive heart failure (CHF)** - heart unable to pump required blood amount
5. **Endocarditis** - inflammation of inner heart lining (endocardium)
6. **Mitral valve prolapse (MVP)** - inner mitral valve closure
7. **Murmur** - abnormal heart sound
8. **Myocarditis** - heart muscle inflammation
9. **Myocardial infarction** - heart attack
10. **Pericarditis** - inflammation of enclosing heart membrane (pericardium)

Vascular Diseases and Conditions:

1. **Aneurysm** - weakened arterial wall ballooning
2. **Arteriosclerosis** - abnormal narrowing of the arteries
3. **Atherosclerosis** - abnormal hardening of the arteries
4. **Coronary artery diseases (CAD)** - surrounding heart artery disease
5. **Embolus** - clot that breaks loose, travels through bloodstream
6. **Peripheral artery disease (PAD)** - partial/total artery blockage, usually in arteries leading to the leg/arm
7. **Varicose veins** - swollen/twisted vein with defective valves

Terminology Related to Vital Veins:

1. **Bradycardia** - slow heart rate
2. **Tachycardia** - fast heart rate
3. **Hypertension (HTN)** - high blood pressure
4. **Hypotension** - low blood pressure

Heart Rhythm Disturbances:

1. **Arrhythmia** - irregular heartbeat
2. **Fibrillation** - irregular heart contraction
3. **Flutter** - rapid/irregular contractions

4. **Premature ventricular contractions (PVCs)** - ventricular contraction preceding normal pulse initiated by stroke

Cardiovascular Diagnostic Tests/Procedures:

1. **Angiogram** - blood vessel radiographic visualization
2. **Auscultation** - listening to body sounds
3. **Cardiac catheterization** - thin/flexible tube guided into vein/artery
4. **Echocardiogram** - record of heart using sounds
5. **Electrocardiogram (EKG/ECG)** - record of heart-electrical activity
6. **Holter Monitor (Portable Electrocardiograph)** - worn by ambulatory patients; monitor heart rates/rhythm for 24 hours

Cardiovascular Surgical & Therapeutic Procedures:

1. **Coronary artery bypass graft (CABG)** - surgical technique bringing new blood supply to heart muscle, detouring blocked arteries
2. **Defibrillation** - use of electric shock to restore heart's normal rhythm
3. **Endarterectomy** - surgical plaque removal from artery inner layer
4. **Percutaneous transluminal coronary angioplasty (PTCA)** - opens up blocked coronary arteries to allow blood circulate normally once again

Unit 7: Respiratory System

Word Parts:

<i>PREFIXES:</i>	<i>MEANING</i>
a-	Not; without
anti-	against
brady-	slow
dys-	Painful; difficult

em-	in
endo-	In; within
eu-	Good; normal
hyper-	Above (normal); excessive
hypo-	Below (normal); deficient
poly-	Many; much
ROOTS:	
alveol/o	Alveolus (air sac)
angi/o	Vessel (blood)
arteri/o	artery
aspir/o	removal
atel/o	Incomplete; imperfect
bol/o	Cast; throw
bronch/o	Bronchus, bronchial tube
bronchi/o	Bronchioles (smaller subdivisions of the bronchus)
carcin/o	cancer
cardi/o	heart
cyan/o	blue
diaphragmat/o	diaphragm
dilat/o	To enlarge; expand

epiglott/o	epiglottis
hist/o	tissue
laryng/o	Larynx; voice box
lob/o	lobe
nas/o	nose
pharyng/o	Pharynx; throat
pleur/o	Pleura; serous membrane that enfolds the lungs
pneum/o, pneumat/o	Lung; air
pulmon/o	lung
py/o	pus
resuscit/o	To revive
rhin/o	nose
sinus/o	Sinus; cavity
spir/o	breathing
thorac/o	chest
tonsill/o	tonsils
trache/o	Trachea; windpipe
tub/o	tube
SUFFIX:	

-al, -ary, -ial, -ic, -tic	Pertaining to
-ant	Substance that promotes
-ation	Process; condition
-capnia	Carbon dioxide
-centesis	Surgical puncture to remove fluid
-ectasis	Dilation; expansion
-ema	condition
-emia	Blood condition
-ia	condition
-ion	Process; state; condition
-ism	Process; condition
-metry	Process of measures
-meter	measure
-or	One who (or something that)
-phonia	voice
-pnea	breathing
-rrhea	Flow; excessive discharge
-spasm	Muscle contraction
-stenosis	Narrowing tightening

-stomy	Surgical opening
-thorax	Chest; pleural activity

Anatomy and Physiology:

1. **Breathing** - process of moving air in and out of the lungs (naturally & artificially)
2. **Respiration** - process of oxygen and carbon dioxide exchange in the lungs
3. **12-16 breaths per minute** - normal respiratory rate for an adolescent
4. **Nasal septum** - structure that divides the nose into two sides
5. **Nasal cavity** - air-filled cavities that warm inhaled air
6. **Larynx** - medical term for the voice box
7. **Trachea** - medical term for the windpipe
8. **Cellular respiration** - oxygen is delivered and carbon dioxide is removed at the cellular and tissue levels
9. **Alveoli** - tiny air sacs in which gases are exchanged
10. **Diaphragm** - dome-shaped structure between thoracic and abdominal cavities

Identifying Abbreviations:

1. **COPD** - chronic obstructive pulmonary disease
2. **Pt or pt** - patient
3. **ABG** - arterial blood gases
4. **VQ** - ventilation/perfusion
5. **BPM/bpm** - beats per minute; breaths per minute
6. **CXR** - chest x-ray
7. **CPAP** - continuous positive airway pressure
8. **PE** - pulmonary embolism
9. **TB** - tuberculin; tuberculosis
10. **ET** - endotracheal
11. **CF** - cystic fibrosis
12. **ER** - emergency room
13. **CPR** - cardiopulmonary resuscitation

14. **BP** - blood pressure

Diseases and Conditions:

- **STOP!** Have you learned the word parts for this unit? Knowing them will help you know the meaning of some of the following words.
 - Some of the words can be understood using word parts, but others need to be memorized.
1. **Allergic rhinitis** - breathing in allergens, which causes itchy eyes and running noses; also known as “hay fever”
 2. **Aspiration** - action of drawing a breath and taking in something not supposed to be taken; pneumonia may develop
 3. **Asthma** - chronic inflammatory disease of the airways; characterized by breathing difficulty, coughing and wheezing
 4. **Atelectasis** - lung collapse caused by blocked airway/pressure outside of the lungs; incomplete expansion of the alveoli
 5. **Bronchitis** - inflammation of the bronchial tubes; causes coughs that brings no mucus; caused by cigarettes and exposure to pollution
 6. **Bronchogenic carcinoma** - malignant neoplasm of the lung arising from the bronchioles/bronchitis; often genetic but may be caused by breathing in hazardous chemicals
 7. **Bronchospasm** - spasms of the bronchial smooth muscle; caused by COPD or stress hormones
 8. **Chronic obstructive pulmonary disease** - group of lung diseases that block airflow and make it difficult to breathe; namely caused by smoking
 9. **Common cold** - can be caused by a virus; affects the throat; can be known as “rhinovirus”
 10. **Croup** - can be caused by a virus, namely parainfluenza; upper airway infections blocking the mouth, has barking sound. Usually in children, infants
 11. **Cyanosis** - bluing of skin; loss of blood, or fingers or toes getting too cold
 12. **Cystic fibrosis** - genetic disorder present at birth that affects both respiratory and digestive systems extensive mucus secretion, infections vulnerability. Fatal if untreated; occurs with two recessive alleles in parents

13. **Emphysema** - conditions in which the air sacs of the lungs are damaged and enlarged, causing breathlessness/ Hyperinflation of air sacs
14. **Empyema** - accumulation of pus in the pleural (or a body) cavity
15. **Epiglottitis** - epiglottis becomes inflamed/enlarged, may causes upper airway obstruction; most common in children between ages of 2 and 12
16. **Hemothorax** - results in the collection of blood in space between chest and lungs
17. **Influenza** - contagious virus that infects the nose, throat and lungs; spreads when people cough/sneeze
18. **Laryngitis** - inflammation (overuse, irritation or infection) of the voice box/larynx
19. **Nasal polyp** - painless benign growth on lining of nose/sinus; causes may be asthma; recurring infection
20. **Pharyngitis** - inflammation/swelling in back of throat
21. **Pleural effusion** - buildup of excess fluid between layers of pleura and the lunges
22. **Pneumonia** - caused by bacterial/fungal infection; air sacs filled with fluid
23. **Pneumothorax** - blocked/collapsed lung caused by chest injury or lung diseases
24. **Pulmonary embolism** - “lung attack”; blockages of lungs, death may occur; can cause clotting/pain
25. **Sinusitis** - inflammation of the sinuses characterized by fever and pain, nasal discharge
26. **Sleep apnea** - sleep disorder (snoring, fatigue); most common cause is being overweight/obese
27. **Sputum** - mixture of saliva and mucus coughed up
28. **Streptococcal pharyngitis** - commonly known as “strep throat”; highly contagious, spread through airborne particles; infection of the back of the throat
29. **Tonsillitis** - inflammation of the tissue (tonsils) at the back of the throat; may be acute or chronic
30. **Tuberculosis** - bacteria that spread from person to person through microscopic droplet into the air; coughing up of blood is hallmark symptom

Unit 8: Digestive System

Digestive System Tract Order:

1. **Oral cavity** - the cavity of the mouth where food enters
2. **Pharynx** - muscular wall in the process of swallowing; serves as pathway for food movement from mouth to esophagus
3. **Epiglottis** - small flap of elastic cartilage that directs food from esophagus and directs air into the lungs
4. **Esophagus** - muscular tube allowing food to pass from pharynx to stomach. Through peristalsis, it allows the pushing of food from pharynx to stomach, no matter the body position
5. **Esophageal sphincter** - keep food and secretions from going down the windpipe; lower esophageal sphincter (LES) prevents acid/stomach content from going backwards
6. **Stomach** - helps churn up and digest food; smooth muscles here break down food via peristalsis
7. **Pyloric sphincter** - acts as valve to control flow of partially digested food from the stomach to small intestine
8. **Duodenum** - first section of small intestine; connects stomach to jejunum; where most of the chemical digestion takes place
9. **Jejunum** - middle section of small intestine; most nutrients of food are absorbed by this organ before further absorption in ileum
10. **Ileum** - last region of the small intestine; digestive material passes through here to get to the cecum
11. **Cecum** - beginning of large intestine pouch connected to ileum and the ascending colon
12. **Ascending colon** - takes digestive material up; region of large intestine
13. **Transverse colon** - longest, most movable part of the colon; in between the ascending and descending colon
14. **Descending colon** - moves digestive material downwards; region of large intestine
15. **Sigmoid colon** - loop of large intestine; closest to rectum, anus
16. **Rectum** - last portion of large intestine
17. **Anus** - opening of digestive tract which helps stool pass through

Word Parts:

<i>PREFIX</i>	<i>MEANING</i>
a-, an-	Not, without
de-	Lack of; down; less; removal of
dia-	Through, complete
dys-	Pain; difficult
endo-	In; within
epi-	On; over; upon
peri-	Around, surrounding
post-	After; behind
pre-	Before; in front of
sub-	Below; under
ultra-	Beyond; excess
<i>ROOTS</i>	
abdomin/o	abdomen
append/o, appendic/o	appendix
an/o	anus
bil/i	Bile; gall
cec/o	cecum
chol/o	Gall; bile
cholecyst/o	gallbladder

cirrh/o	orange-yellow
coll/o, colon/o	colon
cyst/o	Cyst; fluid sac; bladder
dent/i	tooth
duoden/o	duodenum
enter/o	intestine
esophag/o	esophagus
gastr/o	stomach
gingiv/o	gums
gloss/o	tongue
gluc/o, glyc/o	Sugar, glucose
hemat/o	blood
hepat/o	liver
ile/o	ileum
inguin/o	groin
jaund/o	yellow
jejun/o	jejunum
lampor/o	Abdominal wall; abdomen
ling/o	tongue
lith/o	stone

odont/o	tooth
or/o	mouth
pancreat/o	pancreas
peritone/o	perineum
phag/o	Eat; swallow; engulf
pharyng/o	Pharynx; throat
proct/o	Rectum; anus
rect/o	Rectum
sigmoid/o	Sigmoid (colon)
splen/o	spleen

Characteristics of the Digestive System:

- The **four major functions** of the digestive system are ingestion, digestion, absorption, and elimination (definitions are in the table below)
- As food makes its journey through the digestive tract, it is called different things:
 - food going from the mouth to the stomach is called a **bolus**
 - a bolus is converted to **chyme** in the stomach
 - chyme is converted to **feces** in the large intestine

Key Terms:

<i>TERMS</i>	<i>MEANING</i>
absorption	the process by which nutrients leave the digestive tract and enter the bloodstream

appendix	small, pouch-like sac of tissue located just off the cecum; its function is unclear
bolus	ball-like mixture of food and saliva that forms in the mouth during the process of chewing
borborygmi	rumbling sounds caused by gas moving through the intestines
bowel	the portion of the digestive tract beyond the stomach; the intestines
bowel obstruction	when digested material is prevented from moving normally through the bowel
chyme	a pulpy substance that results when acidic gastric juices mix with partially digested food in the stomach
defecation	the discharge of feces from the body through the anus
digestion	the process by which food is broken down into smaller components
elimination	the excretion of solid waste from the body
emesis	action or process of vomiting
eructation	the release of gas from the stomach through the mouth; commonly known as belching
feces (stool)	the solid or semisolid remains of food that could not be digested in the small intestine
ingestion	the intake of food and liquids into the body
peristalsis	the involuntary, rhythmic contractions of the muscles of the

	digestive tract
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Diseases and Conditions:

<i>TERMS</i>	<i>MEANING</i>
appendicitis	disease in which the appendix becomes inflamed and often times filled with pus
celiac disease	autoimmune disease in which the ingestion of gluten results in damage to the small intestine
cholecystitis	inflammation of the gallbladder
cholelithiasis	the formation of hardened deposits (gallstones) within the fluid of the gallbladder
cirrhosis	chronic liver disease from various causes characterized by scarring and liver failure
colon cancer	malignant tumor of the large intestine
Crohn's disease	chronic inflammatory bowel disease that affects the lining of the digestive tract
gastroenteritis	inflammation of the stomach and intestines
gastroesophageal reflux disease (GERD)	disease in which stomach acid backflows into the esophagus causing irritation
ileus	temporary stoppage of intestinal peristalsis
intussusception	the folding of one section of the intestines into an adjacent section (much like a telescope), resulting in obstruction
irritable bowel syndrome (IBS)	a group of symptoms including diarrhea, bloating,

	cramping, and constipation that is associated with stress
peptic ulcer	an open sore in the stomach or duodenum caused by the bacterium <i>Helicobacter pylori</i>
peritonitis	inflammation of the peritoneum, which lines the abdominal wall and covers the abdominal organs
volvulus	abnormal twisting of the intestines resulting in obstruction

Accessory Organs:

1. **Liver** - makes bile that breaks apart fats
2. **Gallbladder** - stores bile
3. **Pancreas** - makes juices with different functions
 - a. **Amylase** - breaks down carbohydrates
 - b. **Bicarbonate** - acts as buffer
 - c. **Lipase** - breaks down fats
 - d. **Trypsin** - breaks down proteins

Abdominal Quadrants:

- The four different types of quadrants and the organs they contain
- Think of the nine squares of the abdomen facing towards you

<p>Right Upper Quadrants (RUQ):</p> <ul style="list-style-type: none"> ● Liver ● Stomach ● Gallbladder ● Duodenum ● Right kidney ● Pancreas ● Transverse colon ● Right adrenal gland 	<p>Left Upper Quadrants (LUG):</p> <ul style="list-style-type: none"> ● Liver ● Left adrenal gland ● Stomach ● Left kidney ● Pancreas ● Spleen ● Transverse colon ● Small intestine
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<p>Right Lower Quadrant (RLQ):</p> <ul style="list-style-type: none"> ● Small intestine ● Large intestine ● Cecum ● Appendix ● Right ureter ● Right reproductive organs: <ul style="list-style-type: none"> ○ Ovary (female) ○ Fallopian tube (female) ○ Spermatic cord (male) 	<p>Left Lower Quadrants (LLQ):</p> <ul style="list-style-type: none"> ● Small intestine ● Large intestine ● Left ureter ● Left reproductive organs: <ul style="list-style-type: none"> ○ Fallopian tube (female) ○ Ovary (female) ○ Spermatic cord (male) ● Sigmoid colon
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Abdominal Regions:

- The nine different abdominal regions
- Think of the nine squares of an abdomen facing towards you

Right hypochondriac region	Epigastric region	Left hypochondriac region
Right lumbar region	Umbilical region	Left lumbar region
Right iliac region	Hypogastric region	Left iliac region

Unit 9: Nervous System

Word Parts:

<i>PREFIX</i>	<i>MEANING</i>
bi-	two; both
con-	together; with
dys-	painful; difficult
en-	in; within
epi-	on; over; upon

hemi-	half
intra-	within; into
mono-	one; single
par-, para-	near; beside; alongside; beyond; abnormal
poly-	many; much
post-	after; behind
quadri-	four
sub-	below; under
ROOTS	
anxi/o	anxious; uneasy
cephal/o	head
cerebell/o	cerebellum
cerebr/o	cerebrum
contus/o	to bruise
crani/o	skull
dur/o	dura mater
encephal/o	brain
esthes/o, esthesi/o	nervous sensation
gli/o	glue; glial cells (gluey supportive nervous system cells)
hem/a, hem/o, hemat/o	blood
hydr/o	water
hypn/o	sleep
isch/o	back; to hold back
lamin/o	lamina (thin plate or layer); arch
lex/o	word

medull/o	medulla oblongata
mening/o, meningi/o	meninges
my/o	muscle
neur/o	nerve
phas/o	speech
phob/o	fear
phren/o	mind
pol/o	extreme
poli/o	gray matter
pont/o	pons
psych/o	mind
radicul/o	nerve root
schiz/o	split
somat/o	body
synaps/o, synapt/o	synapse; point of contact; to join
syncop/o	to faint; to cut off; to cut short
tax/o	coordination; order
tempor/o	the temples
thalam/o	thalamus
thec/o	sheath (meninges)
traumat/o	trauma; injury; wound
troph/o	development; nourishment
ventricul/o	ventricle
SUFFIX	
-al, -ar, -eal, -ial, -ic, -tic	pertaining to

-algesia	pain; sensitivity
-algia	pain
-asthenia	weakness
-cele	hernia; swelling; protrusion
-emic	pertaining to blood condition
-esthesia	feeling; sensation
-ia	condition
-ion	process; state; condition
-itis	inflammation
-lepsy	seizure
-leptic	to seize; to take hold of
-lysis	breakdown; separation; loosening
-lytic	pertaining to breakdown or destruction
-oma	tumor; mass
-orexia	appetite
-osis	abnormal condition
-paresis	weakness
-pathy	disease
-phasia	speech
-plegia	paralysis
-rrhage	rupture; bursting forth
-rrhaphy	suture
-sclerosis	hardening; thickening
-taxia	muscle coordination
-tomy	process of cutting; incision

-tropic	turning
-um, -us	structure; tissue; thing

Diseases and Conditions:

1. **Epilepsy** - a neurological disorder of the central nervous system in which the activity of the nerve cells in the brain becomes disrupted, causing intermittent seizures
2. **Migraine** - a severe headache that causes intense throbbing and pain, and has accompanying symptoms such as nausea, vomiting, photophobia (sensitivity to light), and phonophobia (sensitivity to sound)
3. **Concussion** - a traumatic brain injury (TBI) resulting from a blow to the head or violent shaking of the head and upper body; causes partial or complete loss of brain function characterized by memory loss, impaired coordination, balance deficit, and dizziness
4. **Syncope** - temporary loss of consciousness due to inadequate blood flow to the brain; commonly known as fainting
5. **Guillain-Barré syndrome (GBS)** - a disorder in which one's own immune system attacks the body's nerves resulting in a progressive, symmetrical paralysis and loss of reflexes; starts in the legs and progresses upward; usually triggered by an infection and resolves within two weeks
6. **Transient ischemic attack (TIA)** - a brief stoppage of blood flow (ischemia) to a part of the brain characterized by neurological symptoms that resolve within minutes; warning sign of a stroke
7. **Alzheimer's disease** - a form of dementia (progressive mental deterioration) resulting from atrophy of the frontal and occipital lobes of the brain; characterized by irreversible memory loss, deterioration of intellect, movement disturbances, apathy, and disorientation
8. **Delerium** - an acute state of mental confusion and agitation characterized by disorientation of time and place; often accompanied by hallucinations; usually reversible
9. **Cerebral aneurysm** - abnormal, localized dilation of a blood vessel in the cerebrum; may rupture and cause severe complications, including death

10. **Bell's palsy** - unilateral (one-sided) paralysis of the nerves that control the facial muscles causing one side of the face to droop; temporary condition; usually caused by a virus
11. **Hemorrhagic stroke** - death of brain tissue that occurs when a weakened or overstressed blood vessel ruptures and bleeds into the surrounding tissue in the brain
12. **Cerebral palsy** - permanent disorder that affects movement and muscle tone; caused by abnormal brain development or trauma to the brain before birth; characterized by floppy or rigid limbs and involuntary motions
13. **Seizure** - a disruption of electrical activity in the brain that produces physical and mental changes, such as convulsions, sensory disturbances, and loss of consciousness
14. **Amyotrophic lateral sclerosis (ALS)** - a disease characterized by the degeneration of motor neurons in the spinal cord and in the brain's medulla and cortex, resulting in progressive muscular weakness and atrophy with involuntary contractions and excessive reflexes (also known as Lou Gehrig's disease)
15. **Spina bifida** - congenital defect in which part of the membrane covering the spinal cord protrudes through a gap in the spine
16. **Parkinson's Disease** - progressive disease of the nervous system characterized by tremor, bradykinesia (slow movement), muscular rigidity, and an irregular gait
17. **Multiple Sclerosis (MS)** - a chronic, slow-progressing, autoimmune disease in which the myelin sheaths of nerve cells are damaged, resulting in weakness and/or numbness in the limbs, unsteady gait, uncoordinated movement, and fatigue
18. **Coma** - a state of extended unconsciousness caused by a medical crisis, such as traumatic brain injury (TBI), stroke, infection, or illness; also can be intentionally drug-induced
19. **Ischemic Stroke** - death of brain tissue that occurs when a blood vessel that supplies blood to the brain becomes occluded (blocked)
20. **Aura** - a sensation that can occur before a migraine or seizure that may involve visual changes, numbness, tingling, and/or sensing a peculiar odor

Cranial Nerves:

- **Cranial Nerve I: Olfactory**
 - Sense of smell

- “Old factory that makes perfume”
- **Cranial Nerve II: Optic**
 - Sense of vision
 - Superman can see through walls
- **Cranial Nerve III: Oculomotor**
 - Eye movement for going up/downwards, medial (towards the middle)
 - Motors move/make movement
- **Cranial Nerve IV: Trochlear**
 - Eye movement for going down and inwards
- **Cranial Nerve V: Trigeminal**
 - Face sensation, clenching teeth (biting, chewing)
 - Touching forehead, cheek, and clenching teeth makes a triangle shape
- **Cranial Nerve VI: Abducens**
 - Looking side to side
 - As you look side to side, you are abducting towards an extreme
 - Abs are a six pack - six for Cranial Nerve VI
- **Cranial Nerve VII: Facial**
 - Taste for the Anterior
 - Anterior $\frac{2}{3}$ of the tongue
 - Smile with tongue out
 - There are 7 parts of your face - facial - so Cranial Nerve VII
- **Cranial Nerve VIII: Vestibulocochlear**
 - Hearing
 - Equilibrium
 - 80-year-old has hard time hearing
- **Cranial Nerve IX: Glossopharyngeal**
 - Posterior $\frac{1}{3}$ of the tongue
 - Speech & Taste
 - Take 9 minutes to say the nerve
- **Cranial Nerve X: Vagus**
 - Digestion/Defecation

- Slow heart rate
- “Vagus” rhymes with “anus,” an organ used for defecation
- **Cranial Nerve XI: Spinal Accessory**
 - Shoulder Shrugging
 - You don’t know what the nerve is, so you shrug your shoulders
- **Cranial Nerve XII: Hypoglossal**
 - Tongue Movement
 - It is very hot, so you are eating 12 ice creams. But, you need to eat them all before they melt, so you use your tongue very fast

Unit 10: Endocrine System

Word Parts:

<i>PREFIXES:</i>	<i>MEANING</i>
anti-	against
endo-	in; within
exo-	outward
hyper-	above; above normal; excessive
hypo-	below; below normal; deficient
pan-	everything; all
para-	near; beside; alongside; beyond; abnormal
poly-	many; much
post-	after; behind
ultra-	beyond; excess
<i>ROOTS;</i>	

acid/o	acid
acr/o	extremities
aden/o	gland
adren/o, adrenal/o	adrenal gland(s)
anter/o	front
calc/o	calcium
crin/o	secrete
gigant/i	abnormally large
gluc/o, glyc/o	sugar; glucose
gonad/o	sex glands
gynec/o	female; woman
insulin/o	insulin
kal/i	potassium
mast/o	breast
myx/o	mucus
natr/o	sodium
ophthalm/o	eye
pancreat/o	pancreas
parathyroid/o	parathyroid gland
pituitar/o	pituitary gland

radi/o	x-rays
thym/o	thymus
thyr/o, thyroid/o	thyroid gland
<i>SUFFIXES:</i>	
-al, -ary, -ic	pertaining to
-assay	to analyze
-carcinoma	cancerous tumor
-dipsia	thirst
-ectomy	surgical removal; excision
-edema	swelling; fluid retention
-emia	blood condition
-ia	condition
-ism	process; condition
-itis	inflammation
-megaly	enlargement
-oid	like; resembling
-oma	tumor; mass
-osis	abnormal condition
-pathy	disease
-phagia	eating; swallowing

-stasis	stoppage of flow
-trophin	hormone
-uria	urination; condition of urine
-y	process; state

Diseases and Conditions:

1. **Exophthalmos** - excessive protrusion by the eyeball, usually due to excessive secretion of thyroid hormone by the thyroid gland
2. **Pheochromocytoma** - rare tumor of the adrenal glands that secretes excessive epinephrine and norepinephrine, resulting in pounding headaches, hypertension, palpitations, paleness, and shortness of breath
3. **Hirsutism** - condition characterized by excessive growth of hair or presence of body hair in unusual places, especially in women; caused by hormonal imbalance resulting in overproduction of androgens (male sex hormones)
4. **Cushing's syndrome** - disease resulting from excessive secretion of cortisol; caused by malfunctioning adrenal glands or excessive use of steroids; characterized by weakness, easily bruised skin, hypertension, and weight gain with a distinctive rounded face
5. **Diabetes insipidus** - rare type of diabetes in which the pituitary gland secretes an inadequate amount of antidiuretic hormone (ADH), resulting in excessive urine production and excessive thirst
6. **Tetany** - nervous system excitability and muscle spasms caused by parathyroid hormone deficiency that results in low blood calcium levels
7. **Graves' disease** - autoimmune disease that causes excessive secretion of thyroid hormone by the thyroid gland; signs and symptoms include anxiety, tremors, heat sensitivity, and weight loss
8. **Cretinism** - congenital (present at birth) hypothyroidism; thyroid gland does not secrete sufficient thyroid hormone, resulting in delayed or abnormal physical and mental development

9. **Diabetes mellitus (Type 1)** - a chronic disease in which the pancreas produces little or no insulin, a hormone needed for glucose (sugar) to enter cells; requires lifelong blood glucose monitoring and insulin supplementation
10. **Gynecomastia** - enlargement or swelling of breast tissue in males due to decreased male hormones (testosterone) or increased female hormones (estrogen)
11. **SIADH** - a condition in which too much antidiuretic hormone (ADH) is secreted by the pituitary gland, resulting in fluid retention and increased blood volume
12. **Acromegaly** - enlargement of the face, feet, and hands due to excessive secretion of growth hormone; caused by malfunction of the hypothalamus or the anterior pituitary gland
13. **Myxedema** - severe form of hypothyroidism (deficiency of thyroid hormone) that results in characteristic features such as dry skin and hair, facial swelling, hoarse voice, thickened skin, and mental/physical slowness
14. **Gigantism** - rare condition characterized by excessive secretion of growth hormone by the pituitary gland in children; results in an abnormally tall stature, prominent jaw and forehead, thick fingers and toes, and other features
15. **Panhypopituitarism** - condition of inadequate secretion, or total lack of secretion, of anterior pituitary hormones
16. **Addison's disease** - disease resulting from insufficient secretion of hormones (cortisol and sometimes aldosterone) from the adrenal glands; signs and symptoms include anemia, hypotension, hypoglycemia, fatigue, and joint pain

Endocrine System Glands:

1. **Adrenal glands** - also known as the adrenals; produces hormones that regulates your metabolism, immune system, blood pressure, response to stress and other essential functions; composed of the cortex and the medulla which are each responsible for producing different hormones
2. **Hypothalamus** - produces releasing and inhibiting hormones, which stop and starts the production of hormones throughout the body
3. **Pancreas** - secretes the hormones insulin and glucagon to control blood sugar levels throughout the day

4. **Parathyroid glands** - also known as the parathyroids; there are four; produces a hormone called parathyroid hormone (PTH) that raises the blood calcium level by breaking down the bone (where most of the body's calcium is stored) and causing calcium release
5. **Pineal gland** - also known as the pineal body; produces melatonin, which helps maintain circadian rhythm (natural sleep-wake cycle about every 24 hours) and regulate reproductive hormones
6. **Pituitary gland** - also known as the pituitary; main function is to secrete hormones into bloodstream; can affect other organs, especially the thyroid
7. **Ovaries** - (there are two; females only) Secrete hormones, primarily estrogen and progesterone, that are vital to normal reproductive development and fertility; oval-shaped and the size of a large grape
8. **Testes** - (there are two; males only) Secrete testosterone, a hormone that is vital to the normal development of male physical characteristics
9. **Thymus gland** - also known as thymus; makes white blood cells called T lymphocytes that fight infection and are crucial as a child's immune system develops; starts to shrink after puberty
10. **Thyroid gland** - also known as the thyroid; produces hormones that regulates the body's metabolic rate as well as the heart, digestive function, muscle control, brain development, mood and brain maintenance; its correct function depends on having a good supply of iodine from the diet

Unit 11: Urinary System

Functions of the Urinary System:

- To regulate water volume, ion salt concentrations, pH levels
- Influences blood pressure, red blood cell production
- Regulates balance of water and salt in the blood

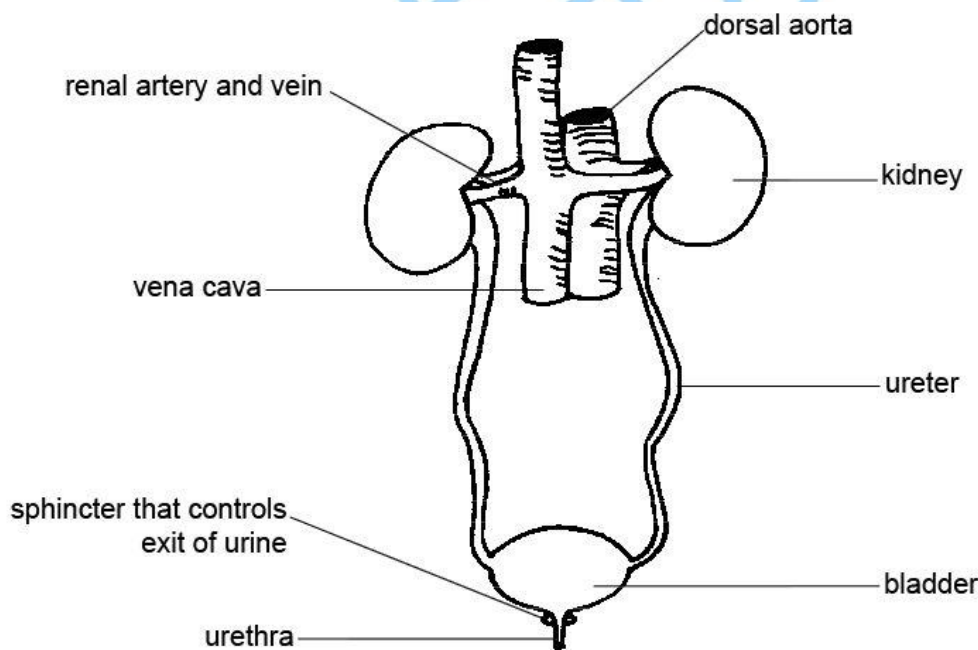
Characteristics of the Urinary System:

- Amino acids have nitrogen molecules that may get converted to **ammonia**, which is toxic. The liver converts it to the less toxic **urea** compound which gets filtered by the kidney's **nephrons**
- Smooth muscle uses **peristalsis** to move urine out of the kidney, into the ureter, and then into the bladder
- The process of making urine involves:
 - **glomerular filtration**
 - **tubular reabsorption**
 - **tubular secretion**
- The filtrate of the kidney travels through the tubules and empties out through the collecting duct, emptying out what we know as **urine**
- An adult bladder can hold about **16 ounces** (2 cups) of urine

Diagram of the Urinary System:

- Image source:

https://commons.wikimedia.org/wiki/File:Anatomy_and_physiology_of_animals_Urinary_system.jpg



Word Parts:

<i>PREFIXES:</i>	<i>MEANING:</i>
a-, an-	not; without
dia-	complete; through
dys-	painful; difficult
hyper-	above; above normal; excessive
hypo-	below; below normal; deficient
inter-	between
intra-	within; into
poly-	many; much
<i>ROOTS:</i>	
albumin/o	albumin (a protein)
azot/o	nitrogen
bacteri/o	bacteria
calcul/o	stone
carcin/o	cancer
cyst/o	cyst; fluid sac; bladder
glomerul/o	glomerulus (cluster of capillaries in the kidney where waste products are filtered out of the blood)
glyc/o, glycos/o	sugar; glucose
hem/a, hem/o, hemat/o	blood
isch/o	to hold back
lith/o	stone; calculus
meat/o	meatus (passageway into the body)
nephr/o	kidney; nephron (functional unit of the kidney)

noct/o	night
olig/o	scant (very small amount)
peritone/o	peritoneum
py/o	pus
pyel/o	renal pelvis (the part of the kidney where urine collects/drains)
ren/o	kidney
ur/o	urine; urinary tract
ureter/o	ureter
urethr/o	urethra
urin/o	urine
vesic/o	urinary bladder
SUFFIXES:	
-al, -ary, -eal, -ic, -ous	pertaining to
-cele	hernia; swelling; protrusion
-emia	blood condition
-gram	record; image
-iasis	abnormal condition
-ion	process; state; condition
-itis	inflammation
-lysis	breakdown; separation; loosening
-lytic	pertaining to breakdown or destruction
-oma	tumor; mass
-osis	abnormal condition
-pathy	disease
-pexy	surgical fixation

-sclerosis	hardening; thickening
-stenosis	narrowing
-stitial	pertaining to standing or positioned
-tripsy	crushing
-uria	urination; condition of urine
-us	structure; tissue; thing

