### Course

Medical Terminology

### Unit I

Introduction to Medical Terminology

# Essential

**Question** Would learning a foreign language be fun for you?

### TEKS

130.203 (c) (1) (A),(B) (2)(B) (4) (A),(B)

#### Prior Student Learning None needed

### Estimated time

1-1 ½ hours

### Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals.

### Objectives

Upon completion of this lesson, the learner should be able to:

- Explain and synthesize the basic word parts
- Differentiate an acronym and an abbreviation
- Define and decipher various medical abbreviations and acronyms

### Engage

Write a sentence on the board using medical terms, abbreviations, and acronyms. Ask if anyone can read the sentence. Example of a doctor's order:

Dx CHF, ADLs BR c BRP, vs q2h, valium 5mg po hs. Diagnosis: Congestive Heart Failure: activities of daily living; bed rest with bathroom privileges, vital signs every 2 hours and 5 milligrams of valium by mouth at bedtime

### Key Points

- I. Medical Terminology
  - A. Like a foreign language to most people
  - B. Made of terms that describe the human body in detail
  - C. Used to convey the greatest quantity of information, with the least confusion and the most precision, to any medical professional in the world
  - D. A single medical term can describe a disease, condition or procedure that might otherwise take several words
    - 1. Example: *appendectomy* = surgical removal of the appendix
    - 2. Example: coxitis = inflammation of the hip joint
  - E. The foundation of medical terms are Greek and Latin
    - 1. 75% of all medical terms are based on Latin or Greek terms
  - F. The Greeks were the founders of modern medicine
  - G. Latin is the language of choice for medicine and science
  - H. The first medical dictionary appeared in the 1830s
    - 1. Dorland's Illustrated Medical Dictionary was first published in 1890
    - 2. The rapid increase in medical and scientific knowledge necessitates a new medical vocabulary to describe it
    - 3. It is impossible to learn **all** medical terms, but it is possible to figure out their meanings by analyzing the word parts
    - 4. By learning the meaning of the basic word parts, you will frequently be able to interpret the meaning of a word

- I. Etymology
  - 1. The science of the origin and development of words
  - 2. Indicates the origin and historical development of a term
  - 3. Helps you to find its origin and historical development
  - 4. Helps you to decipher words with Latin and Greek origins
- J. Eponyms words named after people
  - 1. Parkinson's disease named after the English physician Dr. James Parkinson
- K. Acronyms modern language terms that stand for longer phrases
- L. Abbreviations
  - 1. Shortened forms of words
  - 2. Used in many health fields
  - 3. Each medical facility has an approved abbreviation list
  - 4. It is the responsibility of healthcare workers to learn the meanings of the abbreviations used in the facility in which they work
  - 5. Refer to the abbreviation/acronym list
- II. Basic Word Parts: Roots
  - A. The glue that holds all medical terms together
  - B. The basic form around which the final word is formed
  - C. The main part of the word
  - D. The foundation of the word
  - E. Gives you a clue as to what you're dealing with
  - F. Specifies the body part
  - G. Combining vowel, usually "o" or "i", joins the root with a prefix or suffix, or another root
- III. Basic Word Parts: Combining Vowels
  - A. Are not used if the word root or suffix begins with a vowel
  - B. Example:
    - 1. Encephal (o) (root meaning brain)
      - a. Encephalitis (means inflammation of the brain)
        - i. "itis" is a suffix meaning "inflammation"
        - ii. "itis" starts with an "i" so a combining vowel is not needed
      - b. Encephalogram
        - i. "gram" is a suffix meaning "tracing" or "record"
        - ii. "gram" does not start with a vowel
        - iii. The combining vowel "o" is used
- IV. Basic Word Parts: Prefixes
  - A. Appear at the beginnings of words
  - B. Tell "how, why, where, when, how much, how many, position, direction, time. or status"
  - C. Give us a clue of what to expect in a word's meaning
  - D. Serve to further define the word root

- E. Refer to the prefix list
- V. Basic Word Parts: Suffixes
  - A. Appear at the ends of words
  - B. Tell us what is happening with a specific body part or system
  - C. Entail what is wrong with you or the procedure used to diagnose or fix it
  - D. Refer to the list of suffixes
- VI. Combining Form
  - A. The combination of a word root with the combining vowel
  - B. Example: Cardi /o/ gram
    - Î

combining form

- C. Refer to the list of combining forms
- VII. Analysis
  - A. Your goal is to learn the tools of word analysis
  - B. This will make the understanding of complex terminology easier
  - C. Learning to divide words into basic elements will help you to interpret them
    - 1. Basic elements: roots, suffixes, prefixes, combining vowels
    - 2. Example:



#### the heart.

VIII. Rules to Remember

- A. Read the meaning of medical terms from the suffix back to the first part of the word
- B. Drop the combining vowel (usually o) before a suffix beginning with a vowel *gastric* not *gastroic*
- C. Retain the combining vowel between two roots in a word
- IX. Spelling is essential
  - A. Many words are pronounced alike but spelled differently and have entirely different meanings
  - B. Examples
    - 1. **Ileum** is a part of the small intestine
    - 2. Ilium is a part of the pelvic, or hip, bone
- X. Pronunciation is also important
  - A. Words spelled correctly but pronounced incorrectly may be misunderstood
  - B. Example
    - 1. **Urethra** (yoo-ree-thruh) is the urinary tract tube leading form the urinary bladder to the external surface
    - 2. **Ureter** (yoo-ree-ter) is one of two tubes leading from the kidney to the urinary bladder
- XI. Learning a new language
  - A. Learning medical words is similar to learning a new language
  - B. The words sound strange and complicated at first
  - C. The medical language is logical in that each term, complex or simple, can be broken down into its basic component parts.

### Activity

- I. Complete the Abbreviations Worksheet.
- II. Make flash cards of medical terminology abbreviations.
- III. Complete the Prefixes Worksheet.
- IV. Make flash cards of medical terminology prefixes.
- V. Complete the Suffixes Worksheet.
- VI. Make flash cards of medical terminology suffixes.
- VII. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

### Assessment

Successful completion of activities

#### Materials

Medical Terminology book List of abbreviations List of Prefixes List of Suffixes Computer Index cards Markers

#### Accommodations for Learning Differences

For reinforcement, the students will use index cards and markers to make flash cards of the medical abbreviations you expect them to learn.

For enrichment, the students will choose 20 medical abbreviations and make a crossword puzzle using the chosen abbreviations.

### **National and State Education Standards**

**National Healthcare Foundation Standards and Accountability Criteria:** Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;

130.203 (c) (2) (B) employ increasingly precise language to communicate

130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:

- (A) distinguish medical abbreviations used throughout the health science industry; and
- (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

### **Texas College and Career Readiness Standards**

English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts. *Cross-Disciplinary Standards*,

I. Key Cognitive Skills D. Academic Behavior: 1. Self monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

## Medical Terminology Abbreviations Worksheet

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A & P	
ab	
abd	
ABG	
a.c.	
ac & cl	
ACLS	
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DOB	
DPT	
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qhs	
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RLQ, RLL	
RML	
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WBC	
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WNL	
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y/o	

## Medical Terminology Abbreviations with Definitions

@	at
A&P	anatomy and physiology
ab	abortion
abd	abdominal
ABG	arterial blood gas
a.c.	before meals
ac & cl	acetest and clinitest
ACLS	advanced cardiac life support
AD	right ear
ADL	activities of daily living
ad lib	as desired
adm	admission
AFB	acid-fast bacillus
AKA	above the knee
alb	albumin
alt dieb	alternate days (every other day)
am	morning
AMA	against medical advice
amal	amalgam
amb	ambulate, walk
AMI	acute myocardial infarction
amt	amount
ANS	automatic nervous system
ant	anterior
AOx3	alert & oriented to person, time, place
Ар	apical
AP	apical pulse
approx	approximately
aq	aqueous
ARDS	acute respiratory distress syndrome
AS	left ear
ASA	aspirin
asap (ASAP)	as soon as possible
as tol	as tolerated
ATD	admission, transfer, discharge
AU	both ears
Ax	axillary
BE	barium enema

bid	twice a day
bil	bilateral
BK	below knee
BKA	below the knee amputation
bl	blood
bl wk	blood work
BLS	basic life support
BM	bowel movement
BOW	bag of waters
B/P	blood pressure
bpm	beats per minute
BR	bedrest
BRP	bathroom privileges
BS	breath sounds
BSI	body substance isolation
BSO	bilateral salpingo-oophorectomy
BUN	blood, urea, nitrogen
BVM	bag-valve-mask
bx	biopsy
_	
С	with
C & S	culture and sensitivity
c-spine	cervical spine
CA	cancer
CAD	coronary artery disease
cal	calorie
CAT	computerized axial tomography
cath	catheter
CBC	complete blood count
СС	cubic centimeters
CC	chief complaint
CCU	coronary care unit
CHD	coronary heart disease
CHF	congestive heart failure
СНО	carbohydrate
chol	cholesterol
circ	circumcision
cl liq	clear liquid
CNS	central nervous system
c/o	complains of
COPD	chronic obstructive pulmonary disease
СРК	creatine phosphokinase

CPR	cardiopulmonary resuscitation
CPT	chest physical therapy
CS	central supply
CSF	cerebrospinal fluid
СТ	computer tomography
CVA	cerebrovascular accident (stroke)
CVU	cardiovascular unit
СХ	cervix or complaint of
CXR	chest x-ray
cysto	cystography
d/c	discontinue
D&C	dilation & curettage
DAT	diet as tolerated
DC	discontinue or discharge
del	delivery
Del. Rm.	delivery room
diff	differential
DNA	deoxyribonucleic acid
DNR	do not resuscitate
DOA	dead on arrival
DOB	date of birth
DPT	diphtheria, pertussis, tetanus
DRG	diagnosis-related grouping
D/S	dextrose in saline
DT's	delirium tremens
DW	distilled water
D5W	5% dextrose in water
Dx	diagnosis
EBL	estimated blood loss
ECG	electrocardiogram
ED	emergency department
EEG	electroencephalogram
EENT	eye, ear, nose, throat
EKG	electrocardiogram
EMG	electromyogram
EOA	esophageal obturator airway
ESR	erythrocyte sedimentation rate
est	estimated
ER	emergency room
ET	endotracheal
ETA	estimated time of arrival
etiol	etiology

ETOH	ethyl alcohol, intoxicated
exam	examination
ехр	exploratory
ext	external, extract, extraction
FBOA	foreign body obstructed airway
FBS	fasting blood sugar
FBW	fasting blood work
FF (F. FI)	force fluids
FH	family history
FHS	fetal heart sounds
FHT	fetal heart tone
FIFO	first in, first out
FSH	follicle-stimulating hormone
ft	foot
FUO	fever undetermined origin
Fx	fracture
GB	gall bladder
GI	gastrointestinal
GU	genitourinary
GTT	glucose tolerance test (pancreas test)
gtt(s)	drop(s)
gyn	gynecology
H&H	hemoglobin and hemocrit
HCG	human chorionic gonadotrophin
hct	hematocrit
HDL	high-density lipoprotein
hgb	hemoglobin
HOB	head of bed
hr (h)	hour
HIV	human immuno virus
HR	heart rate
hs	bedtime, hour of sleep
ht	height
Hx	history
hypo	hypodermic injection
hyst	hysterectomy
1&D	incision and drainage
1&0	intake and output
ICP	intracranial pressure
ICU	intensive care unit
IM	intramuscular
ing	inguinal

inj	injection
IPPB	intermittent positive pressure breathing
irrig	irrigation
IS	intercostal space
isol	isolation
IT	inhalation therapy
IUD	intrauterine device
IV	intravenous
IVF	in vitro fertilization
IVP	intravenous pyelogram
K+	potassium
KCI	potassium chloride
KUB	kidney, ureter, bladder
L	lumbar
L&D	labor and delivery
lac	laceration
lab	laboratory
lap	laparotomy
lat	lateral
LD	lethal dose
LDH	lactic dehydrogenase
LDL	low-density lipoprotein
liq	liquid
LLQ, LLL	left lower quadrant (abdomen), lobe (lung)
LMP	last menstrual period
LOC	level of consciousness
LP	lumbar puncture
lt	left
LUQ, LUL	left upper quadrant (abdomen), lobe (lung)
MA	mental age
MAST	medical antishock trousers
MCI	mass casualty incident
meds	medications
MI	myocardial infarction
MICU	mobile intensive care unit
min	minute
MN	midnight
MOM	milk of magnesia
MRI	magnetic resonance imagery
MS	morphine sulfate, multiple sclerosis
MVA	motor vehicle accident
NVD	nausea, vomiting, diarrhea

NaClsodium chlorideN/Cnasal canula, no complaintsnegnegativeneuroneurologyNGnasogastric tubeNGTnasogastric tubenitronitroglycerineNKAno known allergiesnoc (t)nightNPOnothing by mouthNSnormal salinensgnursingNSRnormal sinus rhythmNVSneurological vital signsOoxygenOBoutspatient departmentODright eye, overdoseointointmentORBout of bedOPDoutpatient departmentORoperating roomordorderlyORTHorthoedisOSleft eyeOToccupational therapyOUboth eyesozouncePplusePpatientPARpercussion & auscultationPARpostanesthesia roomPARpostanesthesia roomPARpostanesthesia roomPARpostanesthesia roomPDRpluse det after roopPARpostanesthesia roomPARpostanesthesia roomPARpostanesthesia roomPARpostanesthesia roomPARpostanesthesia roomPDRpulsePDRpulse det rateropePDRpulse roop disoliciePARpostanesthesia roomPARpostanesthesia room <th>Na+</th> <th>sodium</th>	Na+	sodium
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NG   nasogastric     NGT   nasogastric tube     nitro   nitroglycerine     NKA   no known allergies     noc (t)   night     NPO   nothing by mouth     NS   normal saline     nsg   nursing     NSR   normal sinus rhythm     NVS   neurological vital signs     O   oxygen     OB   obstetrics     OD   right eye, overdose     oint   ointment     OOB   out of bed     OPD   outpatient department     OR   operating room     ortho   correct, right (bones)     os   mouth     OS   left eye     OT   occupational therapy     OU   both eyes     oz   ounce	neuro	neurology
NGT   nasogastric tube     nitro   nitroglycerine     NKA   no known allergies     noc (t)   night     NPO   nothing by mouth     NS   normal saline     nsg   nursing     NSR   normal sinus rhythm     NVS   neurological vital signs     O   oxygen     OB   obstetrics     OD   right eye, overdose     oint   ointment     OOB   out of bed     OPD   outpatient department     OR   operating room     ord   orderly     ORTH   orthopedics     ortho   correct, right (bones)     os   mouth     OS   left eye     OT   occupational therapy     OU   both eyes     oz   ounce	NG	nasogastric
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ODright eye, overdoseointointmentOOBout of bedOPDoutpatient departmentORoperating roomordorderlyORTHorthopedicsorthocorrect, right (bones)osmouthOSleft eyeOToccupational therapyOUboth eyesozounce	OB	obstetrics
ointointmentOOBout of bedOPDoutpatient departmentORoperating roomordorderlyORTHorthopedicsorthocorrect, right (bones)osmouthOSleft eyeOToccupational therapyOUboth eyesozounce	OD	right eye, overdose
OOBout of bedOPDoutpatient departmentORoperating roomordorderlyORTHorthopedicsorthocorrect, right (bones)osmouthOSleft eyeOToccupational therapyOUboth eyesozounce	oint	ointment
OPDoutpatient departmentORoperating roomordorderlyORTHorthopedicsorthocorrect, right (bones)osmouthOSleft eyeOToccupational therapyOUboth eyesozouncePpulseP & Apercussion & auscultationPACpremature atrial contractionpalppalpationPARpostanesthesia roomPATparoxysmal atrial tachycardiapcafter mealspCO2partial pressure of carbon dioxidePDRphysician's desk reference	OOB	out of bed
ORoperating roomordorderlyORTHorthopedicsorthocorrect, right (bones)osmouthOSleft eyeOToccupational therapyOUboth eyesozounce	OPD	outpatient department
ordorderlyORTHorthopedicsorthocorrect, right (bones)osmouthOSleft eyeOToccupational therapyOUboth eyesozounce	OR	operating room
ORTHorthopedicsorthocorrect, right (bones)osmouthOSleft eyeOToccupational therapyOUboth eyesozouncepafterPpulseP & Apercussion & auscultationPACpremature atrial contractionpalppalpationPARpostanesthesia roomPATparoxysmal atrial tachycardiapcafter mealspCO2partial pressure of carbon dioxidePDRphysician's desk reference	ord	orderly
orthocorrect, right (bones)osmouthOSleft eyeOToccupational therapyOUboth eyesozounce	ORTH	orthopedics
osmouthOSleft eyeOToccupational therapyOUboth eyesozounce	ortho	correct, right (bones)
OSleft eyeOToccupational therapyOUboth eyesozounce	OS	mouth
OToccupational therapyOUboth eyesozounce	OS	left eye
OUboth eyesozounce	OT	occupational therapy
ozounce	OU	both eyes
_afterPafterPpulseP & Apercussion & auscultationPACpremature atrial contractionpalppalpationPARpostanesthesia roomPATparoxysmal atrial tachycardiapcafter mealspCO2partial pressure of carbon dioxidePDRphysician's desk reference	OZ	ounce
pafterPpulseP & Apercussion & auscultationPACpremature atrial contractionpalppalpationPARpostanesthesia roomPATparoxysmal atrial tachycardiapcafter mealspCO2partial pressure of carbon dioxidePDRphysician's desk reference	_	
PpulseP & Apercussion & auscultationPACpremature atrial contractionpalppalpationPARpostanesthesia roomPATparoxysmal atrial tachycardiapcafter mealspCO2partial pressure of carbon dioxidePDRphysician's desk reference	р	after
P & Apercussion & auscultationPACpremature atrial contractionpalppalpationPARpostanesthesia roomPATparoxysmal atrial tachycardiapcafter mealspCO2partial pressure of carbon dioxidePDRphysician's desk reference	Р	pulse
PACpremature atrial contractionpalppalpationPARpostanesthesia roomPATparoxysmal atrial tachycardiapcafter mealspCO2partial pressure of carbon dioxidePDRphysician's desk reference	P & A	percussion & auscultation
palppalpationPARpostanesthesia roomPATparoxysmal atrial tachycardiapcafter mealspCO2partial pressure of carbon dioxidePDRphysician's desk reference	PAC	premature atrial contraction
PARpostanesthesia roomPATparoxysmal atrial tachycardiapcafter mealspCO2partial pressure of carbon dioxidePDRphysician's desk reference	palp	palpation
PATparoxysmal atrial tachycardiapcafter mealspCO2partial pressure of carbon dioxidePDRphysician's desk reference	PAR	postanesthesia room
pc after meals   pCO2 partial pressure of carbon dioxide   PDR physician's desk reference	PAT	paroxysmal atrial tachycardia
pCO2 partial pressure of carbon dioxide	рс	after meals
PDR physician's desk reference	pCO2	partial pressure of carbon dioxide
	PDR	physician's desk reference
PE physical exam, pulmonary embolism	PE	physical exam, pulmonary embolism

PEDS	pediatrics
per	by or through
PERL(A)	pupils equal & reactive to light (and accommodation)
PET	positron emission tomography
PH	past history
рН	hydrogen ion concentration
PID	pelvic inflammatory disease
PKU	phenylketonuria
pm	between noon and midnight
PNS	peripheral nervous system
ро	by mouth
post (pos)	posterior
postop,PostOp	postoperative
pp (p.p.)	postprandial (after eating)
pO2	partial pressure of oxygen
PPD	purified protein derivative (TB test)
preop, PreOp	before surgery
prn	as needed, whenever necessary
pro time	prothrombin time
pt	patient, pint
PT	physical therapy
PTT	partial prothrombaplastin time
PVC	premature ventricular contraction
Px	physical exam, prognosis
q	every
qd	every day
qh	every hour
q2h, q3h,	every two hours, every three hours,
qhs	every night at bedtime
qid	four times a day
qm.	every minutes
qns	quantity not sufficient
qod	every other day
qs	quantity sufficient
r (R)	rectal
R (resp)	respirations, rectal
RAIU	radioactive iodine uptake study
RBC	red blood cell/count
RDA	recommended daily allowance
reg	regular
REM	rapid eye movement
Rh	rhesus

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RLringer's lactateRLQ, RLLright lower quadrant (abdomen), lobe (lung)RMLright middle lobe (lung)ROreality orientationR/Orule outROMrange of motionR.R.recovery roomRUQ, RLLright upper quadrant, lobertrightRVresidual volumePxtake (prescription)	RK	radial keratotomy
RLQ, RLLright lower quadrant (abdomen), lobe (lung)RMLright middle lobe (lung)ROreality orientationR/Orule outROMrange of motionR.R.recovery roomRUQ, RLLright upper quadrant, lobertrightRVresidual volumePxtake (prescription)	RL	ringer's lactate
RMLright middle lobe (lung)ROreality orientationR/Orule outROMrange of motionR.R.recovery roomRUQ, RLLright upper quadrant, lobertrightRVresidual volumePxtake (prescription)	RLQ, RLL	right lower quadrant (abdomen), lobe (lung)
ROreality orientationR/Orule outROMrange of motionR.R.recovery roomRUQ, RLLright upper quadrant, lobertrightRVresidual volumePxtake (prescription)	RML	right middle lobe (lung)
R/Orule outROMrange of motionR.R.recovery roomRUQ, RLLright upper quadrant, lobertrightRVresidual volumePxtake (prescription)	RO	reality orientation
ROMrange of motionR.R.recovery roomRUQ, RLLright upper quadrant, lobertrightRVresidual volumePxtake (prescription)	R/O	rule out
R.R. recovery room   RUQ, RLL right upper quadrant, lobe   rt right   RV residual volume   Px take (prescription)	ROM	range of motion
RUQ, RLL right upper quadrant, lobe   rt right   RV residual volume   Px take (prescription)	R.R.	recovery room
rt right   RV residual volume   Px take (prescription)	RUQ, RLL	right upper quadrant, lobe
RV residual volume	rt	right
Py take (proceription)	RV	residual volume
	Rx	take (prescription)
	_	
s without	S	without
S & S signs & symptoms	S & S	signs & symptoms
ss 1/2	SS	1/2
SA sinoatrial	SA	sinoatrial
SB small bowel	SB	small bowel
sc subcutaneous	SC	subcutaneous
SGOT serum glutamic oxaloacetic transaminase	SGOT	serum glutamic oxaloacetic transaminase
SGPT serum glutamic pyruvic transaminase	SGPT	serum glutamic pyruvic transaminase
SIDS sudden infant death syndrome	SIDS	sudden infant death syndrome
Sig: label/write	Sig:	label/write
SL sublingual	SL	sublingual
SMAC sequential multiple analysis computer	SMAC	sequential multiple analysis computer
SOB shortness of breath	SOB	shortness of breath
spec specimen	spec	specimen
sp. gr. specific gravity	sp. gr.	specific gravity
SQ, sub q subcutaneous	SQ, sub q	subcutaneous
SSE soap suds enema	SSE	soap suds enema
stat immediately	stat	immediately
STD sexually transmitted disease	STD	sexually transmitted disease
STH somatotropic hormone	STH	somatotropic hormone
SVD spontaneous vaginal delivery	SVD	spontaneous vaginal delivery
SVN small volume nebulizer	SVN	small volume nebulizer
SVT supraventricular tachycardia	SVT	supraventricular tachycardia
Sx symptoms	Sx	symptoms
T temperature, thoracic	Т	temperature, thoracic
T & A tonsillectomy and adenoidectomy	Τ&Α	tonsillectomy and adenoidectomy
tab tablet	tab	tablet
TAH total abdominal hysterectomy	TAH	total abdominal hysterectomy
TB tuberculosis	TB	tuberculosis

TCDB	turn, cough, deep breath
temp (T)	temperature
TH	thyroid hormone
TIA	transient ischemic attack
tid	three times a day
TLC	tender loving care
TMJ	temporomandibular joint
tol	tolerated
TPN	total parenteral nutrition
TPR	temperature, pulse, respirations
tr	tincture
trach	tracheotomy, tracheostomy
TSH	thyroid-stimulating hormone
TT	tetanus toxiod
TUR	transurethral resection
TV	tidal volume
TVH	total vaginal hysterectomy
TWE	tap water enema
ТХ	traction
UA	urinalysis
umb	umbilicus
unc.	unconscious
ung	ointment
unk	unknown
ur	urine
URC	usual, reasonable, customary
URI	upper respiratory infection
US	ultrasonic
USP	United States Pharmacopeia
UTI	urinary tract infection
V fib	ventricular fibrillation
V tach	ventricular tachycardia
vag	vaginal
VC	vital capacity
VD	venereal disease
vit	vitamin
VO	verbal order
vol	volume
V/S	vital signs
WA	while awake
WBC	white blood cell/count
w/c	wheelchair

WNL	within normal limits
wt	weight
y/o	year(s) old

# Medical Terminology Prefixes Worksheet

PREFIX	MEANING
a-, an-	
ab-	
ad-, af-	
ambi-, ampho-, amphi-	
ana-	
andro-	
ante-	
anti-, ant-	
ар-, аро-	
aut-, auto-	
brachy-	
brady-	
cata-	
circum	
co-, com-, con-	
contra-	
de-	
dextro-	
dia-	
dis-	
dorso-	
dys-	
e-, ec-, ef-, ex-	
ect-, ecto-, exo-	
em-, en-, eso-	
end-, endo-, ent-, ento-	
ep-, epi-	
eu-	
extra-, extro-	
gyn-, gyno-	
hemi-	
hetero-	
hyper-	
hyp-, hypo-	
im-, in-	
infra-	

inter-	
intra-, intro-	
mal-	
mega-, megalo-	
mes-, meso-	
meta-	
micr-, micro-	
mult-, multi-	
neo-	
noso-	
oligo-	
pan-	
para-	
per-	
peri-	
poly-	
post-	
pre-, pro-	
pseud-, pseudo-	
руо-	
pyro-	
re-, retro-	
semi-	
steno-	
sub-	
super-, supra-	
sym-, syn-	
tachy-	
telo-	
therm-	
trans-	
ultra-	
xero-	
COLORS	
albus-	
chloro-	
chromo-	
cirrhos-	
cyano-	
erythro-	
leuko-	

luteus-	
melano-	
polio-	
porphyro-	
rhodo-	
xantho-	
NUMBERS	
nulli-	
haplo-	
mon-, mono-	
bi-, di-, dipl-	
tri-	
quadri-, tetra	
penta-	
hex-, sex-	
octo-, octa-	
nona-	
deci-	

## Medical Terminology Prefixes with Definitions

PREFIX	MEANING
a-, an-	without, lacking, deficient, not
ab-	away from
ad-, af-	toward, to, near
ambi-, ampho-, amphi-	both, double
ana-	up, toward, apart
andro-	man
ante-	before, in front of, forward
anti-, ant-	against, opposing, preventing
ap-, apo-	separation from, derived from
aut-, auto-	self
brachy-	short
brady-	slow
cata-	down, under, lower, against
circum	around
co-, com-, con-	with, together
contra-	against, opposed
de-	down, from
dextro-	to the right
dia-	through, between, apart, across
dis-	apart, free from
dorso-	to the back
dys-	difficult, bad, painful, abnormal
e-, ec-, ef-, ex-	out of, from, away from
ect-, ecto-, exo-	outside of
em-, en-, eso-	in, into, within
end-, endo-, ent-, ento-	within, inside
ep-, epi-	upon, on, over
eu-	normal, good, healthy
extra-, extro-	outside of, beyond, outward
gyn-, gyno-	woman, female
hemi-	half, partial
hetero-	different, other
hyper-	excessive, above, beyond
hyp-, hypo-	under, beneath, deficient
im-, in-	in, into, within, not
infra-	below, beneath
inter-	between

intra-, intro-	within, into
mal-	bad, abnormal
mega-, megalo-	large, big
mes-, meso-	middle
meta-	change
micr-, micro-	small
mult-, multi-	many
neo-	new, recent
noso-	disease
oligo-	little, few
pan-	all, entire
para-	beside, beyond, after
per-	through, excessive
peri-	around, surrounding
poly-	many, much, excessive
post-	after, behind
pre-, pro-	before, in front of
pseud-, pseudo-	false
руо-	pus
pyro-	fire
re-, retro-	backward, behind, again
semi-	half
steno-	narrow
sub-	under, below, beneath
super-, supra-	above, excess, superior
sym-, syn-	together, with
tachy-	fast
telo-	end
therm-	heat
trans-	across, through, beyond
ultra-	beyond, excess
xero-	dry
COLORS	
albus-	white
chloro-	green
chromo-	color
cirrhos-	orange yellow
cyano-	blue
erythro-	red
leuko-	white
luteus-	yellow

melano-	black
polio-	gray
porphyro-	purple
rhodo-	red
xantho-	yellow
NUMBERS	
nulli-	none
haplo-	single
mon-, mono-	one
bi-, di-, dipl-	two, double, twice
tri-	three
quadri-, tetra	four
penta-	five
hex-, sex-	six
octo-, octa-	eight
nona-	nine
deci-	ten

## Medical Terminology Suffixes Worksheet

SUFFIX	MEANING
-ac, -al, -ic, -ary, -ar	
-agra	
-algia	
-apheresis	
-asthenia	
-ase	
-ate	
-atresia	
-capnia	
-cele	
-centesis	
-cidal	
-clasia, clast	
-cle, -cule, -ole	
clysis	
-coccus, -coccis	
-crit	
-crine	
-cyte	
-desis	
-drome	
-dynia	
-ectasis	
-ectomy	
-ectopic	
-emesis	
-emia	
-ent, -er	
-ia	
-esis, -ia, -a	
-ism, -ity, -y	
-osis, -tion, -sis	
-iasis, -sia	
-form, -oid	
-gen, -genic	
-genesis	
-gram	

-graphy -iac -ible, -ile -ician -ictal -ist, -ologist -ites, -itis
-iac -ible, -ile -ician -ictal -ist, -ologist -ites, -itis
-ible, -ile -ician -ictal -ist, -ologist -ites, -itis
-ician -ictal -ist, -ologist -ites, -itis
-ictal -ist, -ologist -ites, -itis
-ist, -ologist -ites, -itis
-ites, -itis
-ize
-logy
-lysis, -lytic
-mamat
-malacia
-mania
-megaly
-metor
-metry
-morph
-oma
-oxia
-paresis
-pathy
-penia
-pepsia
-pexypexis
-phagia, -phagy
-philiaphily
-phobia
-phonia
-phoria
-physis
-plasia -plasm
-plasty
-plegia
-pnea
-poiesis
-porosis
-prandial
-praxia
-ptosis

-rrhage, -rrhagia	
-rrhaphy	
-rrhea	
-rrhexis	
-sarcoma	
-schisis	
-sclerosis	
-scope	
-scopy	
-sepsis	
-spasm	
-stasis	
-stenosis	
-stomy	
-tome	
-tomy	
-tripsy	
-trophy	
-ule	

## Medical Terminology Suffixes with Definitions

SUFFIX	MEANING
-ac, -al, -ic, -ary, -ar	pertaining to, related to, located in
-agra	excessive pain
-algia	pain
-apheresis	removal
-asthenia	weakness
-ase	enzyme
-ate	use, subject to
-atresia	absence of normal body opening
-capnia	carbon dioxide
-cele	protrusion, hernia
-centesis	surgical puncture to remove fluid
-cidal	killing
-clasia, clast	break
-cle, -cule, -ole	small
clysis	irrigation, washing
-coccus, -coccis	berry-shaped
-crit	to separate
-crine	separate, secrete
-cyte	cell
-desis	surgical fixation
-drome	run, running
-dynia	pain
-ectasis	dilation, expansion
-ectomy	surgical removal
-ectopic	displacement
-emesis	vomit
-emia	blood condition
-ent, -er	person or agent
-ia	abnormal state
-esis, -ia, -a	state or condition, disease
-ism, -ity, -y	
-osis, -tion, -sis	
-iasis, -sia	
-form, -oid	resembling, shaped like
-gen, -genic	producing, causing
-genesis	beginning, origin
-gram	record
-graph	instrument that records
-graphy	process of recording
-------------------	----------------------------------
-iac	person afflicted with
-ible, -ile	capable, able
-ician	one who
-ictal	seizure, attack
-ist, -ologist	a specialist in
-ites, -itis	inflammation
-ium	membrane
-ize	use, subject to
-logy	science, study of
-lysis, -lytic	destroy, dissolution, separation
-ma, -mat	disease, condition
-malacia	softening
-mania	madness
-megaly	enlargement
-metor	instrument used to measure
-metry	measurement
-morph	form, shape
-oma	tumor
-opsy	to view
-oxia	oxygen
-paresis	slight paralysis
-pathy	disease
-penia	deficient, lack of
-pepsia	digestion
-pexy, -pexis	fixation, storing
-phagia, -phagy	eating, swallowing
-philia, -phily	love
-phobia	abnormal fear, intolerance
-phonia	pertaining to sound
-phoria	feeling
-physis	growth
-plasia, -plasm	formation, development
-plasty	surgical repair
-plegia	paralysis
-pnea	breathing
-poiesis	formation
-porosis	passage
-prandial	meal
-praxia	in front of, before
-ptosis	drooping, downward displacement
-rrhage, -rrhagia	excessive flow

-rrhaphy	suturing in place
-rrhea	flow or discharge
-rrhexis	rupture
-sarcoma	malignant tumor
-schisis	split, fissure
-sclerosis	hardening
-scope	instrument for examining
-scopy	visual examination
-sepsis	infection
-spasm	sudden involuntary muscle contraction
-stasis	control, stop
-stenosis	narrowing
-stomy	surgical opening
-tome	instrument for
-tomy	cutting, incision
-tripsy	surgical crushing
-trophy	nourishment, development
-ule	little

# **General Body and Directional Terms**

#### Course

Medical Terminology

#### Unit II

The Human Body in Health and Disease

#### Essential Question

What common terminology is used to describe human anatomy?

### TEKS

130.203 (c) (1) (A), (B), (E) (2)(B) (4) (A), (B)

Prior Student Learning None

### Estimated time

1-1 1/2 hours

#### Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals.

### Objectives

Upon completion of this lesson, the learner should be able to:

- Define and decipher common terms associated with the structural organization of the body
- Identify the body cavities and distinguish the organs contained within those cavities
  - Locate and name the anatomical divisions of the back
- List and define the terms related to positions, directions and planes of the body
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course

### Engage

Place several markings on a student volunteer's body. Have three other students write down how they would describe where the marks are located on the student volunteer. Then have each of the three students read aloud what they have written. Explain that by using medical terms to describe the locations of the marks, we can be more exact and this will help whomever is reading the report understand the true location of injuries, anomalies or incisions.

### Key Points

- I. Branches of Science that study the human body
  - a. Anatomy
    - 1. Means "cutting apart" (dissection)
    - 2. Study of the body and the relationships of its parts to each other
    - 3. Dissection is used to study the structure of the human body
  - b. Biology Study of all forms of life and living things
  - c. Embryology
    - 1. Study of the origin and development of an organism
    - 2. Covers from 2<sup>nd</sup> to the 8<sup>th</sup> week after conception, the *embryonic state*
    - 3. After eight weeks, the developing organism is known as a *fetus*.
  - d. Histology
    - 1. Study of the body microscopically
    - 2. Studies the minute structures and their composition, plus the functions of normal cells, tissue and organs.

- e. Pathology
  - 1. Study of the changes in the human body which are caused by disease
  - 2. Study changes due to disease that alter the function of the body
- f. Physiology Studies the normal activity and functions of the body
- II. Body in General
  - a. Cells are the basic unit of life
  - b. Cells that perform similar functions join together, or group together, to form tissue.
  - c. Groups of different types of tissue join together to form an organ
  - d. Groups of organs work together to perform a complex function, for a body system
  - e. Trillions of cells that vary in size and shape according to their purpose or function
  - f. Specialized cells are responsible for the functions of growth, secretions, excretions, nutrition, and reproduction
  - g. Mechanical, chemical and nervous stimulation activate the cells
- III. Cells
  - a. Epithelial cells
    - 1. Skin cells
    - 2. May be square and flat
  - b. Fat cells contain large vacant spaces for fat storage
  - c. Muscle cells long and slender
  - d. Nerve cells may be long and have fingerlike extensions, which carry impulses
- IV. Tissues
  - a. Connective tissue
    - 1. Supports and encases body structures.
    - 2. Most widespread kind of tissue throughout the body
    - 3. Holds organs in place and connects body parts to each other
    - 4. Main types of connective tissue:
      - (a) Bone that supports the body
      - (b) Cartilage which is firm but bendable
      - (c) Dense fibrous: makes up the tendons and ligaments
      - (d) Loose that connects adjoining structures
      - (e) Adipose that pads and protects, stores fat, and insulates the body against heat loss
  - b. Epithelial tissue

- 1. Found in the skin and in the lining of blood vessels
- 2. Makes up the outer covering of external and internal body surfaces and the lining of the digestive, respiratory, and urinary tracts
- c. Muscle tissue
  - 1. Provides movement
  - 2. The main function is to contract
- d. Nerve tissue
  - 1. Conducts impulses to and from the brain
  - 2. Is composed of nerve cells called neurons
  - 3. Needs more oxygen and nutrients than any other body tissue
- V. Organs
  - a. When two or more kinds of tissue work together to perform a specific function, you have an organ
  - b. Although organs act as units, they do not function alone
  - c. Several organs join together to form a system and perform a body function
  - d. Each system has a special function
- VI. Systems
  - a. Cardiovascular system
    - 1. Includes the heart and blood vessels
    - 2. Carries the blood throughout the body
  - b. Digestive or gastrointestinal system
    - 1. Includes the mouth, esophagus, stomach, and the small and large intestines
    - 2. Digests and absorbs food and excretes waste
  - c. Endocrine system
    - 1. Made up of a variety of glands
    - 2. Manufactures and distributes hormones
  - d. Integumentary system
    - 1. Includes the hair, skin, nails, sweat glands and oil glands
    - 2. Helps protect the body
  - e. Lymphatic system
    - 1. Works with the cardiovascular system
    - 2. Helps protect the body against disease-causing organisms
  - f. Musculoskeletal system
    - 1. Composed of bones, muscles, tendons and ligaments
    - 2. Provides the framework for the body
    - 3. Supports organs
    - 4. Permits movement in the body
  - g. Reproductive system
    - 1. Includes the uterus, ovaries, testes, and prostate
    - 2. Provides for reproduction
  - h. Respiratory system

- 1. Includes the trachea, lungs, and bronchi
- 2. Provides for the exchange of gases
- 3. Absorbs oxygen
- 4. Expels carbon dioxide
- i. Sensory or special senses system
  - 1. Made up of the eyes, ears, nose, mouth, skin and nerves
  - Acts as the body's external perception/alarm system by letting in light, sound, taste and touch (both pleasure and pain)
- j. Nervous System
  - 1. Brain, spinal cord and nerves
  - 2. Allows the body to act and respond
- k. Urinary system
  - 1. Manufactures and excretes urine
  - 2. Includes the kidneys, ureters, urinary bladder, and urethra
- VII. Cavities of the Body
  - a. Abdominal cavity
    - 1. Contains the stomach, intestines, liver, spleen, gallbladder, pancreas, ureters, and kidneys
    - 2. Ventral body cavity (located on the front of the body)
  - b. Cranial cavity
    - 1. The cavity inside the skull, or the cranium
    - 2. Space within the skull containing the brain
    - 3. Cranial means "pertaining to the skull".
    - 4. Dorsal body cavities (located on the back part of the body)
  - c. Pelvic cavity
    - 1. Contains the urinary bladder, urethra, uterus and vagina in the female, part of the large intestine and the rectum
    - 2. Ventral body cavity (located on the front of the body)
    - 3. Space below the abdomen
  - d. Spinal cavity
    - 1. Consist of the spinal column connecting to the cranial cavity
    - 2. Space within the spinal column (backbone) containing the spinal cord
    - 3. Dorsal body cavities (located on the back part of the body)
  - e. Thoracic or chest cavity
    - 1. Contains the esophagus, trachea, lungs, heart and aorta
    - 2. Can be divided into two smaller areas
      - (a) The pleural cavity surrounds the lungs
      - (b) The mediastinum is the area between the lungs, containing the heart, aorta, trachea, esophagus and thymus gland
    - 3. Ventral body cavity (located on the front of the body)
  - f. Pleural cavity
    - 1. Space around each lung

### VIII. Roots of Structures

Root	What it Means	Example term	What it Means
Cyt/o	Cell	Cytology	Study of cells
Epitheli/o	Epithelium	Epithelioma	Tumor of the skin
Fibr/o	Fibrous	Fibrosis	Condition of the
			fibrous tissue
Hist/o	Tissue	Histologist	Physician who studies
			tissue
Lip/o	Fat	Liposuction	Removal of fat cells by
			suction
Муо	Muscle	Myositis	Enlargement of an
			organ
Neur/o	Nerve	Neuropathy	Condition of the nerve
Organ/o	Organ	Organomegaly	Enlargement of an
			organ
Viscer/o	Internal	Viscera	Internal organs
	organs		

### IX. Structural Suffixes

Suffix	What it Means	Example term	What it Means
-cyte	Cell	Erythrocyte	Red blood cell
-gen	Agent that causes	Carcinogen	Agent causing
			cancer
-genic	Producing	Carcinogenic	Has cancer-
			causing properties
-oma	Tumor or swelling	Myoma	Tumor in the
			muscle
-osis	Abnormal	Cytosis	Abnormal condition
	condition		of cells
-pathy	Disease	Neuropathy	A disease of the
			nerves
-plasm	Growth or	Neoplasm	A new growth
	formation		
-sarcoma	Malignant tumor	Myosarcoma	Malignant muscle
			tumor

### X. Directional Terms

- a. Used to pinpoint or specifically locate an area on the body.
- b. Anatomical position is the body standing, arms at each side, with palms facing forward and the feet side by side
- c. Anatomical plane
  - 1. An imaginary flat plate or field
  - 2. Provide further division of the body, to identify a specific

location or area

- d. Frontal or coronal plane
  - 1. A vertical plane dividing the body into anterior and posterior portions
  - 2. Anterior means front
  - 3. Posterior refers to the back
- e. Mid-sagittal plane
  - 1. A horizontal plane
  - 2. Divides the body into right and left halves at the body's midpoint
- f. Sagittal plane
  - 1. A vertical plane
  - 2. Passes from front to back
  - 3. Divides the body into right and left sides g. Transverse plane
  - 1. A horizontal (cross-section) plane, parallel to the ground and through the waistline
  - 2. Divides the body into upper and lower halves
- h. Ventral
  - 1. Anterior
  - 2. Refers to the front of the body
- i. Dorsal
  - 1. Posterior
  - 2. Refers to the back of the body
- j. Cephalad
  - 1. Above the waistline
  - 2. "head" or "upward"
  - 3. Superior "above"
- k. Caudal
  - 1. Below the waistline
  - 2. Inferior, below
- I. Superior and inferior
  - 1. Also used to describe body parts in relation to one another in general
- m. Lateral sides of the body
- n. Medial refers to the middle
- o. Distal away from the point of origin
  - 1. The foot would be the distal portion of the leg
- p. Proximal refers to 'nearest the point of origin", close proximity
  - 1. The upper thigh would e the proximal portion of the leg
- q. Ipsilateral
  - 1. Pertains to one side
- r. Mediolateral
  - 1. Pertaining to the middle and one side

XI. Root words that pertain to directional terms

Root word	What it means
Anter/o	Front
Caud/o	Tail or downward
Cephal/o	Head or upward
Dist/o	Away from (distant) the point of origin
Dors/o	Back
Infer/o	Below
Later/o	Side
Medi/o	Middle
Poster/o	Back or behind
Proxim/o	Near to (proximity) the point of origin
Super/o	Above
Ventr/o	Front or belly

XII. Regions of the body

- a. Anatomical divisions of the abdomen
- b. Used to describe the regions in which organs and structures are found
- c. Used to diagnose abdominal problems with greater accuracy
  - 1. Hypochondriac region
    - (a) Upper lateral regions beneath the ribs
  - 2. Epigastric region
    - (a) Region of the stomach
  - 3. Lumbar region
    - (a) Two middle lateral regions
  - 4. Umbilical region
    - (a) Region of the navel or umbilicus
  - 5. Inguinal (iliac) region
    - (a) Lower lateral regions
  - 6. Hypogastric region
    - (a)Lower middle region, below the umbilicus

#### XIII. Quadrants

- a. Right upper quadrant
  - 1. RUQ
  - 2. Contains the right lobe of the liver, gallbladder, and parts of the small and large intestines.
- b. Left upper quadrant
  - 1. LUQ
  - 2. Contains the left lobe of the liver, stomach, pancreas, spleen, and parts of the small and large intestines
- c. Right lower quadrant

1. RLQ

- 2. Contains parts of the small and large intestines, appendix, right ureters, right ovary, and fallopian tube.
- d. Left lower quadrant
  - 1. LLQ
  - 2. Contains parts of the small and large intestines, left ureters, left ovary, and fallopian tube

#### XIV. Divisions of the back

Division	Abbreviation	Location
Cervical	С	Neck region. There are 7 cervical
		vertebrae (C1-C7).
Thoracic	T or D	Chest region. There are 12 thoracic
	(D = dorsal)	vertebrae (T1-T12). Each bone is joined
		to a rib
Lumbar	L	Loin or flank region (between the ribs and
		the hip bone). There are 5 lumbar
		vertebrae (L1-L5).
Sacral	D	Five bones (S1-S5) are fused to form one
		bone, the sacrum.
Coccygeal	(none)	The coccyx (tailbone) is a small bone
		composed of 4 fused pieces.

#### XV. Other body regions

Region	Where it is
Auricular region	Around the ears
Axillary	Axillae (armpits)
Buccal	Cheeks of the face
Clavicular	On each side of the sternum
	(breastbone)
Infraorbital	Below the eyes
Infrascapular	On each side of the chest down to
	the last rib
Lumbar	Below the infrascapular area
Mammary	Breast area
Mental	Region of the chin
Orbital	Around the eyes
Pubic	Above the hypogastric region
	(above the pubis)
Sacral	Area over the sacrum
Sternal	Over the sternum
Submental	Below the chin
Supraclavicular	Above the clavicles

XVI. Positions

- a. Erect a standing position
- b. Lateral recumbent lying on left side with right thigh and knee Copyright © Texas Education Agency, 2012. All rights reserved.

drawn up to chest

- c. Prone lying face down
- d. Supine lying flat on your back
- e. Sims' position
  - 1. Semi-prone side position
  - 2. Lying on the left side with the right thigh and knee sharply flexed; left leg straight
  - 3. The lower arm (left) is behind the person
  - 4. Pillow is under the person's head and shoulder
  - 5. Usually not comfortable for older persons
- f. Fowler's position
  - 1. Semi-sitting
  - 2. The head of the bed is raised between 45 and 60 degrees
  - 3. Spine is straight
  - 4. Head is supported with a small pillow

#### Activity

- I. Make flash cards of body and directional terms and practice putting the terms together with prefixes and suffixes to make new terms
- II. Complete Body and Directional Terms Worksheet
- III. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

#### Assessment

Successful completion of the activities

#### Materials

Medical Terminology book List of general body terms Index cards Markers Data projector Computer

#### Accommodations for Learning Differences

For reinforcement, the student will practice terms using flash cards of the female reproductive system

For enrichment, the student will choose 20 general body and directional terms and create a crossword puzzle

#### National and State Education Standards

**National Healthcare Foundation Standards and Accountability Criteria:** Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information Copyright © Texas Education Agency, 2012. All rights reserved.

2.22 Use medical abbreviations to communicate information

### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;
- (E) recall directional terms and anatomical planes related to the body structure
- 130.203 (c) (2) (B) employ increasingly precise language to communicate
- 130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:
  - (A) distinguish medical abbreviations used throughout the health science industry; and
  - (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports

### Texas College and Career Readiness Standards

English and Language Arts

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing

- 1. Identify new words and concepts acquired through study of their relationships to other words and concepts
- 2. Apply knowledge of roots and suffixes to infer the meanings of new words
- 3. Use reference guides to confirm the meanings of new words or concepts

### Cross-Disciplinary Standards

- I. Key Cognitive Skills
  - D. Academic Behavior:
    - 1. Self-monitor learning needs and seek assistance when needed;
    - 3. Strive for accuracy and precision;
    - 4. Persevere to complete and master task
  - E. Work habits:
    - 1. Work independently
    - 2. Work collaboratively
- II. Foundation Skills
  - Α.
- 2. Use a variety of strategies to understand the meaning of new words
- 4. Identify the key information and supporting details

### Medical Terminology Body and Directional Terms

Root	What it Means	Example term	What it Means
Cyt/o		Cytology	
Epitheli/o		Epithelioma	
Fibr/o		Fibrosis	
Hist/o		Histologist	
Lip/o		Liposuction	
Муо		Myositis	
Neur/o		Neuropathy	
Organ/o		Organomegaly	
Viscer/o		Viscera	

Root word	What it means
Anter/o	
Caud/o	
Cephal/o	
Dist/o	
Dors/o	
Infer/o	
Later/o	
Medi/o	
Poster/o	
Proxim/o	
Super/o	
Ventr/o	

Suffix	What it Means	Example term	What it Means
-cyte		Erythrocyte	
-gen		Carcinogen	
-genic		Carcinogenic	
-oma		Myoma	
-osis		Cytosis	
-pathy		Neuropathy	
-plasm		Neoplasm	
-sarcoma		Myosarcoma	

Division	Abbreviation	Location
Cervical	С	
Thoracic	T or D	
	(D = dorsal)	
Lumbar	L	
Sacral	D	

### Medical Terminology Body and Directional Terms

Region	Where it is
Auricular region	
Axillary	
Buccal	
Clavicular	
Infraorbital	
Infrascapular	
Lumbar	
Mammary	
Mental	
Orbital	
Pubic	
Sacral	
Sternal	
Submental	
Supraclavicular	
afferent	
efferent	
anterior	
posterior	
central	
deep	
superficial	
distal	
proximal	
inferior	
superior	
lateral	
medial	
supine	
prone	

Frontal plane	
Sagittal plane	
Transverse plane	

### KEY - Medical Terminology Body and Directional Terms

Root	What it Means	Example term	What it Means
Cyt/o	Cell	Cytology	Study of cells
Epitheli/o	Epithelium	Epithelioma	Tumor of the skin
Fibr/o	Fibrous	Fibrosis	Condition of the fibrous tissue
Hist/o	Tissue	Histologist	Physician who studies tissue
Lip/o	Fat	Liposuction	Removal of fat cells by suction
Муо	Muscle	Myositis	Enlargement of an organ
Neur/o	Nerve	Neuropathy	Condition of the nerve
Organ/o	Organ	Organomegaly	Enlargement of an organ
Viscer/o	Internal organs	Viscera	Internal organs

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Ventr/o	Front or belly

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	causes		
-genic	Producing	Carcinogenic	Has cancer-causing properties
-oma	Tumor or	Myoma	Tumor in the muscle
	swelling		
-osis	Abnormal	Cytosis	Abnormal condition of cells
	condition		
-pathy	Disease	Neuropathy	A disease of the nerves
-plasm	Growth or	Neoplasm	A new growth
-	formation		
-sarcoma	Malignant tumor	Myosarcoma	Malignant muscle tumor

Division	Abbreviation	Location
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Thoracic	T or D	Chest region. There are 12 thoracic vertebrae (T1-T12.
	(D = dorsal)	Each bone is joined to a rib
Lumbar	L	Loin or flank region (between the ribs and the hip bone).
		There are 5 lumbar vertebrae (L1-L5).
Sacral	D	Five bones (S1-S5) are fused to form one bone, the
		sacrum.
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		pieces.

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Infrascapular	On each side of the chest down to the last rib
Lumbar	Below the infrascapular area
Mammary	Breast area
Mental	Region of the chin
Orbital	Around the eyes
Pubic	Above the hypogastric region (above the pubis)
Sacral	Area over the sacrum
Sternal	Over the sternum
Submental	Below the chin
Supraclavicular	Above the clavicles

afferent	Conducting toward a structure.
efferent	Conducting away from a structure.
anterior	Front of the body (ventral).
posterior	Back of the body (dorsal).
central	Pertaining to the center.
deep	Away from the surface.
superficial	Near the surface.
distal	Away from the beginning of a structure; away from the center.
proximal	Pertaining to the beginning of a structure

inferior	Away from the head; below another structure (caudal).
superior	Toward the head; above another structure (cephalic).
lateral	Pertaining to the side.
medial	Pertaining to the middle.
supine	Lying on the back
prone	Lying on the belly

Frontal plane	Vertical plane dividing the body or structure into an anterior and posterior portion.
Sagittal plane	Vertical plane dividing the body or structure into right and left portions.
Transverse plane	Horizontal plane dividing the body or structure into upper and lower portions.

Course

Medical Terminology

**Unit** Skeletal System

#### Essential Question

What medical terms are associated with the skeletal system?

### TEKS

130.203	(C)
1 A-F	
2A-C	
ЗА-С	
4A-B	

#### Prior Student Learning

Basic understanding of roots, prefixes, and suffixes

Estimated time

4-7 hours

### Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the skeletal system to discuss common conditions and diseases.

### Objectives

Upon completion of this lesson, the student will be able to:

- Define and decipher common terms associated with the skeletal system
- Identify the basic anatomy of the skeletal system
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases which involve the skeletal system

### Engage

A 78-year-old, female patient is admitted to the ortho floor with a broken hip; her physician said that her hip broke while she was walking and caused her to fall. The family members are asking you if that is really possible or if they should be looking for another doctor.

### Key Points

- I. Skeletal Terms to Know
  - A. Acro extremities
    - B. Ankyl/o crooked, bent, fused together
  - C. Arthro joint
  - D. Brachi arm
  - E. Burs/o, bursa a leather sac
  - F. Carp wrist
  - G. Cerv/ic neck
  - H. Chir/o hand
  - I. Chrondr/o cartilage
  - J. Cost/o rib
  - K. Crani/o skull, head
  - L. Kyph/o hump kyphosis
  - M. Lord/o bending lordosis
  - N. Lumb/o lumbar region, loin
  - O. Myel/o spinal cord; bone marrow
  - P. Orthr/o straight
  - Q. Osteo/o bone
  - R. Pod, ped, ped/i foot

- S. Rachi/o spine
- T. Sacr/o sacral region
- U. Scoli/o crooked scoliosis
- V. Spondyl/o vertebra
- W. Synovi/o the lubricating fluid of joints
- X. Tars/o ankle
- II. Introduction
  - A. The bony framework of the body (see the Major Skeletal Bones diagram)
  - B. There are 206 bones in an adult
  - C. Functions
    - 1. Support of the body structure and shape
    - 2. Protection of the vital organs
    - 3. Movement and Anchorage of the muscles (levers for muscular action)
      - a. Tendons attach muscle to bone
      - b. Ligaments attach bone to bone
    - 4. Mineral storage calcium and phosphorus
    - 5. Blood cell formation hematopoiesis
- III. Bone Composition
  - A. Collagen a chief organic constituent (protein)
  - B. Inorganic calcium salts (Vitamin D is essential for the absorption of minerals, i.e. calcium)
  - C. Cells
    - 1. Osteoblasts bone-building, bone-repairing cells in the periosteum
    - 2. Osteocytes mature bone cells within the bone matrix
    - 3. Osteoclast causes the reabsorption of bone
  - D. Periosteum
    - 1. A dense, fibrous membrane covering bone
    - 2. Contains blood vessels
    - 3. Essential for bone cell survival and bone formation
- IV. Types of Bones Based on Composition
  - A. Compact bone
    - 1. Very dense, stress bearing
    - 2. Haversian systems
      - a. Lamellae a concentric cylinder-shaped calcified structure
      - b. Lacunae small spaces containing tissue fluid
      - c. Osteocytes facilitate the exchange of calcium between blood and bone
      - d. Canaliculi canals connecting the lacunae to each other and to the haversian canal which

carries nutrients and wastes to and from the osteocytes

- B. Cancellous bone
  - 1. Light and spongy
  - 2. Low stress areas where the weight of bone would be a problem
  - 3. Found at the ends of the long bones, ribs, sternum, hips, vertebrae, and cranium
  - 4. No haversian systems
  - 5. Web-like arrangement
- V. Classification of Bones According to Shape
  - A. Long bones (extremities) levers (see the Long Bone Structure Diagram)
    - 1. Epiphysis at the ends, covered with hyaline cartilage for articulating bones; cancellous bone
    - 2. Diaphysis shaft, covered with periosteum; medullary canal with yellow and red marrow (lined with endosteum); covered with periosteum for bone growth, repair, and nutrition; compact bone
    - 3. Femur, tibia, fibula, humerus, ulna, radius, and clavicle
  - B. Short cube-shaped; allows flexible movement (see the Bone Shape Diagram)
    - 1. Cancellous bone covered by compact bone
    - 2. Carpals, tarsals, metacarpals, metatarsals, and phalanges
  - C. Flat flat plates; protect the vital organs and provide a broad surface area for muscle attachment
    - 1. Cranial bones, facial bones, scapula, and sternum
  - D. Irregular peculiarly shaped to provide support and protection, yet allow flexibility
    - 1. Vertebrae, ribs, ear, hip, and hyoid
  - E. Sesamoid bones
    - 1. Extra bones found in certain tendons, i.e., the patella
- VI. Bone Formation
  - A. Initially collagen fibers secreted by fibroblasts
  - B. Cartilage deposited between the fibers
  - C. The skeleton is fully formed by the second month of fetal development (all cartilage)
  - D. After the eighth week of fetal development, ossification begins (the mineral matter deposited replaces the cartilage)
  - E. Childhood and adolescence ossification exceeds bone loss
  - F. Early adulthood thru middle age ossification equals bone loss
  - G. After age 35 bone loss exceed ossification
  - H. The skull

- 1. Begins as a fibrous membrane
- The ossification center is in the middle of the membrane
  begins in the middle and radiates outward
- Ossification is not complete at birth the fontanels (soft spots) on an infant's head allow molding of the skull during birth and, with the open joints, allows for growth of the brain
- I. Other bones
  - 1. Begin as hyaline cartilage
  - 2. Short bones there is one ossification center in middle that proceeds toward the periphery
  - Long bones there are three ossification centers (one at each end and one in the center of the shaft); ossification goes from the center toward each end and from each end toward the center
- VII. Bone Growth
  - A. Grow in length at the epiphyseal line
  - B. Grow in width by the addition of bone to the surface
  - C. Controlled by the anterior pituitary (growth hormone)
    - 1. Dwarfism hypofunction
    - 2. Giantism hyperfunction
    - 3. Acromegaly hyperfunction after puberty; enlarges bones of the hands, feet, and face

#### VIII. Bone Markings (see the Bone Landmark Diagrams) A. Purpose

- 1. Join one bone to another
- 2. Provide a surface for the attachment of muscles
- 3. Create an opening for the passage of blood vessels and nerves
- 4. Used as landmarks
- B. Examples
  - 1. Process a bony prominence or projection
  - 2. Condyle a rounded, knuckle-like prominence usually at a point of articulation
  - 3. Epicondyle a small projection
  - 4. Head a rounded, articulating process at the end of a bone
  - 5. Spine a sharp, slender projection
  - 6. Tubercle a small, rounded process
  - 7. Tuberosity a large, rounded process
  - 8. Trochanter a large process for muscle attachment
  - 9. Fossa a depression or hollow
  - 10. Foramen a hole
  - 11. Crest a sharp ridge

- 12. Line a ridge of bone that is less prominent than a crest
- 13. Meatus a tube-like passage
- 14. Sinus/antrum a cavity within a bone
- 15. Depression a hollow region or opening
- 16. Fissure a narrow, slit-like opening
- 17. Sulcus a groove
- 18. Facet a small area on a bone
- IX. Bone Marrow
  - A. Yellow marrow
    - 1. Medullary cavity of long bones
    - 2. Fat storage
  - B. Red marrow hematopoietic tissue
    - 1. In children in all cancellous bone
    - 2. In adults in the cancellous bone of the vertebrae, hips, sternum, ribs, cranial bones, proximal ends of femur, and humerus
    - Forms red blood cells (RBCs), platelets, some white blood cells (WBCs), and destroys old RBCs and some foreign materials
- X. Axial Skeleton (see the Lateral Skull Diagram)
  - A. Skull 22 bones
  - B. Cranium houses and protects the brain with eight bones
    - 1. Frontal forms the forehead and the orbits of eyes; supraorbital margins (a ridge that protects the eyes)
    - 2. Ethmoid forms the roof of the nasal cavity; a very light bone with a horizontal plate, a perpendicular plate, and two lateral masses
    - Parietal, Right, and Left form the sides and roof of the skull; the internal surface is rough to accommodate the brain
    - 4. Temporal, Right, and Left forms the temple, cheek, and ear openings
      - a. Squamous portion forms the temple
      - b. Zygomatic process forms the cheek
      - c. Petrous portion forms the auditory canal
      - d. Mastoid portion behind the ear
      - e. Tympanic portion walls of the acoustic meatus
    - 5. Occipital the back of the skull; the inferior portion has a foramen magnum where the spinal cord passes through; the sides of the foramen have two projections (condyles) that articulate with the first cervical vertebra (atlas)
    - 6. Sphenoid fills the space between the orbital plates; contains the sphenoidal sinuses; the upper surface has

		a dep	ression called the sella turcica, where the pituitary
	7	giand	resis
	7.	conne	actions of cranial sutures
	8.	Crania	al Sutures – unite the bones of the cranium: as a
	0.	child o	prows, irregular bands of connective tissue ossify
		and tu	Irn into hard bone
		a.	Coronal suture – between the frontal and parietal
			bones
		b.	Sagittal suture – between the right and left
			parietal bones
		C.	Lambdoidal suture – between the parietal and
		<u>.</u>	occipital bones
		d.	Squamous suture – between the temporal and
		_	parietal bones
		e.	Abnormalities
			I. Microcephalus – premature fusion
			(incroasos intracranial prossure)
	g	Fonta	nels – fusion of the cranial bones is not complete
	0.	at birt	h so a space between the bones remains
		a.	Anterior (Bregmatic) – the "soft spot": closes at
			18 months
		b.	Posterior (Occipital) – triangular; closes at 2-3
			months
		C.	Anteriolateral (Sphenoidal) – at both temples;
			close at 2-3 months
		d.	Posterolateral (Mastoidal) – behind each ear;
~			close at 1 year
C.	Facia	Bones	s – guard and support the eyes, ears, nose, and
	moutr	n; 14 bc	ones
	1.	Nasai	bones (2) – form the bridge of the nose
	2. 3	Maxill	r = 10 ms the central hasal septem any (2) the upper jaw bones: fusion occurs
	5.	hefore	ary (2) – the upper jaw borles, fusion occurs birth (if not a cleft nalate occurs): forms the roof
		of the	mouth walls of the nose and floors of the
		orbita	ls: the body has maxillary sinuses, alveolar
		proce	ss; upper teeth, palatine process; anterior palate;
		the la	rgest bone of the upper face
	4.	Mandible – the lower jawbone; the largest bone of two perpendicular portions called rami (have two	
		proce	sses: condylar process; posterior forms the
		tempo	oral-mandibular joint; coronoid process; anterior for
	_	muscl	e attachment)
	5.	∠ygor	na $(2)$ – the check bones
	ю.	Lacrin	nal ( $2$ ) – the small bones the form the medial Wall

of the eye socket; the tear duct passes through; smallest; fragile

- 7. Palatine (2) forms the back roof of the mouth and floor of the nose; L-shaped
- 8. Inferior turbinate (2) forms the curved ledge inside the side wall of the nose
- D. Ear Bones tiny bones in the middle ear cavity in the temporal bone
  - 1. Malleus (2) the hammer
  - 2. Incus (2) the anvil
  - 3. Stapes (2) the stirrups
- E. Hyoid Bone a U-shaped bone in the neck at the base of the tongue; the only bone that does not touch another bone
- F. Cranial Sinuses cavities within the cranium; function as resonance chambers in the production of the voice; the decrease weight of the skull; lined with mucous membranes
  - 1. Frontal sinuses (2) above the eyebrows; open into the nasal cavity
  - 2. Ethmoid sinuses (2) between the eyes
  - 3. Sphenoidal sinus (1) posterior to the ethmoidal sinuses; opens into the nasopharynx
  - 4. Maxillary sinuses (2) on either side of the nose; opens on the lateral wall of the nasal cavity
- G. Vertebral column
  - 1. Functions
    - a. Supports the trunk and neck
    - b. Protects the spinal cord
    - c. Multiple joint spaces allow for bending and twisting
    - 2. Curves (lateral view) allow for resilience and spring for walking
      - a. Thoracic present at birth
      - b. Sacral bow back
      - c. Cervical begins at 3 months when the infant first begins to lift his or her head
      - d. Lumbar begins when the child first walks
    - 3. Vertebrae 26 bones separated by intervertebral disks to cushion the joints for movement
      - a. Cervical (7) smallest, oblong bodies; wide transverse processes
        - I. Atlas the first cervical vertebra; supports the head by articulating with the condyles of the occipital bone; a bony ring with no body; has a short wing-like transverse process; allows for forward and backward motion

		II.	Axis – the second vertebra; a small body
			with a projection called the odontoid
			process that acts as the axis of rotation for
			the skull
		III.	The 3rd, 4th, 5th, and 6th vertebrae are
			forked to cradle the strong ligaments of
			head
		IV.	The 7th vertebra has a very prominent
			spinous process, called the vertebral
			prominence, that can be felt at the base of
			the neck
	b.	Thora	cic (12) – progressively increase in size
		from t	he neck down; have a long spinous process
		(point	ed downward) and six articular facets for rib
		ättach	iment
	C.	Lumb	ar (5) – the largest and strongest; have
		short	projections for muscle attachment
	d.	Sacra	I – five fused bones; triangular; form the
		dorsa	I part of the pelvis; join the ileum bone at
		the ilio	osacral joint
	e.	Coccy	x - 3-4 fused bones; articulates with the tip
		of the	sacrum; slightly movable (to assist in
		childb	irth)
	4. Injurie	s and	Diseases (see the Abnormal Curvature
	Diagra	am)	Υ.
	a.	Kypho	osis – hunchback; the posterior thoracic is
		exago	lerated
	b.	Lordo	sis – swayback; an exaggerated anterior
		curve	of the lumbar region
	C.	Scolic	sis – a lateral curvature of the spine
	d.	Fractu	ures and dislocations – most often a fracture
		of the	lamina: can cause spinal cord damage and
		paraly	/sis
	e.	Interv	ertebral disk herniation – causes pressure
		on the	spinal nerve and pain
	f.	Tuber	culosis of the spine – by tubercle bacillus:
		destro	by body of vertebrae
H.	Thorax – 25	bones	and cartilage: walls covered by skin and
•••	muscles: the	floor is	s formed by the diaphragm
	1. Functi	ions	
	a.	Protec	ct and support the heart and lungs
	b.	Suppo	ort the bones of the pectoral girdle
	C.	Plays	a leading role in respiration
	d.	The ri	bs and sternum aid in RBC formation
	2. Sterni	um – th	e breast bone: sword and handle shape
	etenik	Manu	brium – the handle: notched for the first 7
	G.		

costal cartilages; articulates with the acromium end of the clavicle and the first rib

- b. Body the blade; notched for first 7 costal cartilages
- c. Xiphoid process the tip; attachment site for the diaphragm
- 3. Costal cartilages hyaline cartilage connecting the ribs to the sternum in 1-7 and to the anterior ribs in 8-10
- 4. Ribs (12 pairs) attached posteriorly to the vertebrae and anteriorly to the costal cartilage
  - a. True ribs the first 7 pairs
  - b. False ribs pairs 8-12 (11 and 12 are the floating ribs)
- XI. Appendicular Skeleton (126 bones)
  - A. Shoulder girdle
    - 1. Clavicles (2) the collarbones
    - 2. Scapulas (2) the shoulder blades
  - B. Upper Extremities
    - 1. Humerus upper arm
    - 2. Radius thumb side of the forearm
    - 3. Ulna little finger side of the forearm
    - 4. Carpals (8) wrist bones
    - 5. Metacarpals (5) hand bones
    - 6. Phalanges (14) finger bones
  - C. Pelvic Girdle
    - 1. Os coxae (2) contains the acetabulum (hip socket)
      - a. Ilium
      - b. Ischium
      - c. Pubis
    - 2. Sacrum
  - D. Lower extremities
    - 1. Femur thigh bone
    - 2. Patella kneecap
    - 3. Tibia shin bone
    - 4. Fibula lateral bone of the lower leg
    - 5. Tarsals (7) ankle bones
      - a. Talus
      - b. Calcaneus
    - 6. Metatarsals (5) foot bones
    - 7. Phalanges (14) toe bones
- XII. Articulations
  - A. Synarthrotic immovable
  - B. Amphiarthrotic limited movement, i.e. the pubic symphysis, vertebral joints, and sacroiliac joint

- C. Diarthrotic freely movable (see the Synovial Joints Diagram)
  - 1. Gliding wrist
  - 2. Pivot between the radius and ulna
  - 3. Ball and socket hip
  - 4. Hinge elbow
- XIII. Diseases/Disorders
  - A. Arthritis an inflammation of the bones at the joints, usually with pain and changes in bone structure
  - B. Bunion an abnormal lateral displacement of the big toe, causing inflammation and thickening of the bursae
  - C. Bursitis an inflammation of the bursa, which is a sac or cavity filled with synovial fluid
  - D. Dislocation the displacement of a bone from a joint, tearing ligaments, tendons, and capsules
  - E. Fracture a break in a bone
    - 1. Simple
    - 2. Compound
    - 3. Spiral
    - 4. Comminuted
    - 5. Greenstick
  - F. Osteitis an inflammation or infection of the bone
  - G. Osteomyelitis a bone infection that involves the bone marrow
  - H. Osteoporosis a condition in which the bones become softer and more brittle, and thus more liable to fracture due to the loss of mineral content; associated with aging
  - I. Rickets a condition in which the bones fail to calcify and growth is hampered, usually due to a deficiency of vitamin D and phosphorus in the diet
  - J. Spina bifida a congenital defect in which the vertebrae fail to unite at the midline
  - K. Sprain the wrenching of a joint with injury to the ligaments

#### Activity

- I. Make flash cards of skeletal terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete the Skeletal System Worksheet.
- III. Complete the Skeletal System Medical Terminology Worksheet.
- IV. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan -

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

V. Research and report on diseases and disorders from the Urinary system

### Assessment

Successful completion of activities

#### Materials

Skeletal System Worksheet Skeletal System Medical Terminology

#### Accommodations for Learning Differences

For reinforcement, the students will practice terms for the skeletal system using flash cards.

For enrichment, the students will choose a disease related to the skeletal system and research the disease using the internet. Students will share their findings with the class.

#### **National and State Education Standards**

National Healthcare Foundation Standards and Accountability Criteria Health care workers will know the various methods of giving and obtaining information. They will communicate effectively, both orally and in writing.

#### TEKS

130.203 (c)(1)(A) identify abbreviations, acronyms, and symbols;

130.203 (c)(1)(B) identify the basic structure of medical words;

130.203 (c)(1)(C) practice word-building skills;

130.203 (c)(1)(D) research the origins of eponyms;

130.203 (c)(1)(E) recall directional terms and anatomical planes related to body structure;

130.203 (c)(1)(F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases, and treatments.

130.203 (c)(2)(A) demonstrate appropriate verbal and written strategies such as correct pronunciation of medical terms and spelling in a variety of health science scenarios;

130.203 (c)(2)(B) employ increasingly precise language to communicate; 130.203 (c)(2)(C) translate technical material related to the health science industry.

130.203 (c)(3)(A) examine medical and dental dictionaries and multimedia resources;

130.203 (c)(3)(B) integrate resources to interpret technical materials;

130.203 (c)(3)(C) investigate electronic media such as the Internet with appropriate supervision.

130.203 (c)(4)(A) distinguish medical abbreviations used throughout the health science industry; and

130.203 (c)(4)(B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and

laboratory reports.

#### **College and Career Readiness Standards**

English/language art

B.1 Identify new words and concepts acquired through study of their relationships to other words and concepts.

B2. Apply knowledge of roots and affixes to infer the meanings of new words.

B3. Use reference guides to confirm the meanings of new words or concepts.

Cross- Disciplinary standards-Foundational Skills

A2. Use a variety of strategies to understand the meanings of new words

# Skeletal System Medical Terminology

### Prefixes, Suffixes, Root Words

-al	
alges/i	
-algia	
ambi	
ankyl/o	
ante	
-ar	
arthr/o	
-blast	
brachi/o	
burs/o	
calcane/o	
carp/o	
-centesis	
cervic/o	
chondr/o	
-clasis	
-clysis	
-clast	
clavic/o	
cost/o	
crani/o	
crista	
-cyte	
-desis	
dextr/o	
disk	
-ectomy	
femor/o	
fibul/o	
-gen	
-graphy	
hemat/o	
humer/o	
hy/o	
-ic	
ili/o	
inter	
ischi/o	

-itis	
kyph/o	
lamin/o	
ligament/o	
lordosis	
-malacia	
mandibul/o	
maxill/o	
menisc/o	
meta	
myel/o	
-oma	
orth/o	
-osis	
osse/o	
oste/o	
patell/o	
ped	
peri	
phalang/o	
-physis	
-poiesis	
-porosis	
pub/o	
scapul/o	
scoli/o	
-scope	
-scopy	
spondyl/o	
stern/o	
supra	
syn	
synovi/o	
tars/o	
tibi/o	
-um	
uln/o	
vertebr/o	

## **Medical Terms**

ambidextrous	
ankylosis	
arthralgia	
arthritis	
arthrocentesis	
arthrodesis	
arthrography	
arthroplasty	
arthroscope	
arthroscopy	
brachial	
bursitis	
calcaneal	
carpals	
cervical	
chondrectomy	
chondromalcia	
collagen	
craniotomy	
cranium	
cribriform	
femoral	
hematopoiesis	
hyoid	
ilium	
infraorbital	
intercostal	
interosseus	
kyphosis	
laminectomy	
ligament	
lordosis	
mental foramen	
metacarpal	
metatarsal	
orthopedic	
osteoarthritis	
osteoblast	
osteoclast	
osteocyte	

osteoma	
osteomalacia	
osteomyelitis	
osteoporosis	
patellar	
periosteum	
polydactylism	
scoliosis	
spondylosis	
sternum	
styloid	
synovial	
vertebral	

#### Medical Abbreviations:

amb	
CXR	
Fx	
Tx	

# Key: Skeletal System Medical Terminology

### Prefixes, Suffixes, Root Words

-al	pertaining to or expressing relationship
alges/i	oversensitivity to pain
-algia	pain
ambi	both
ankyl/o	stiff, crooked, bent
ante	before
-ar	pertaining to
arthr/o	joint
-blast	precursor, developing cell
brachi/o	arm
burs/o	bursa (serous sac)
calcane/o	calcaneous
carp/o	carpals (wrist bone)
-centesis	surgical puncture to remove or aspirate fluid
cervic/o	cervical (neck)
chondr/o	cartilage
-clasis	to break down
-clysis	to wash
-clast	cell to break down
clavic/o	clavicle (collarbone)
cost/o	rib
crani/o	cranium, helmet, skull
crista	ridge
-cyte	cell
-desis	surgical union
dextr/o	right
disk	intervertebral disk
-ectomy	removal of
femor/o	femur
fibul/o	fibula
-gen	producing
-graphy	the process of making a picture
hemat/o	blood
humer/o	humerus
hy/o	u-shaped
-ic	pertaining to
ili/o	ilium (hipbone)
inter	between
ischi/o	ischium

-itis	inflammation of
kyph/o	hump
lamin/o	lamina (layer)
ligament/o	ligament (liga = bind)
lordosis	curvature of the lumbar spine
-malacia	softening
mandibul/o	mandible
maxill/o	maxilla (maxillary)
menisc/o	meniscus
meta	beyond, change
myel/o	bone marrow
-oma	tumor
orth/o	straight
-osis	condition of
osse/o	bone
oste/o	bone
patell/o	patellar (knee cap)
ped	foot
peri	around
phalang/o	phalanges (fingers and toes)
-physis	growth
-poiesis	making or production of
-porosis	porous condtion
pub/o	pubis
scapul/o	scapula (shoulder blade)
scoli/o	crooked, curve
-scope	instrument to view or examine
-scopy	to visualize or view
spondyl/o	vertebra or vertebral column
stern/o	sternum (breast bone)
supra	above
syn	with, together
synovi/o	synovial
tars/o	tarsals (ankle bones)
tibi/o	tibial
-um	pertaining to
uln/o	ulna
vertebr/o	vertebral

## **Medical Terms**

ambidextrous	able to use both hands
ankylosis	condition of being crooked, bent, or stiff
arthralgia	joint pain
arthritis	inflammation of the joints
arthrocentesis	surgical puncture to remove fluid from the joint
arthrodesis	surgical union of the joint
arthrography	the process of recording pictures of the joints
arthroplasty	repair of the joints
arthroscope	instrument to view a joint
arthroscopy	procedure to view a joint
brachial	pertaining to the arms
bursitis	inflammation of the bursa
calcaneal	pertaining to the calcaneous (heel bone)
carpals	wrist bones
cervical	pertaining to the neck
chondrectomy	removal of cartilage
chondromalcia	softening of the cartilage
collagen	glue forming (literal translation; refers to a protein found in the matrix of connective tissue)
craniotomy	incision into the cranium
cranium	pertaining to the skull
cribriform	sieve-like plate
femoral	pertaining to the femur
hematopoiesis	pertaining to the production of blood
hyoid	pertaining to something U-shaped
ilium	pertaining to the ilium (hipbone)
infraorbital	pertaining to below the eye
intercostal	pertaining to between the ribs.
interosseus	between the bones
kyphosis	condition of having a hump (humpback or hunchback)
laminectomy	removal of the lamina or vertebrae layers
ligament	ligament (to bind)
lordosis	condition of being bent forward
mental foramen	chin openings or holes
metacarpal	beyond the wrist
metatarsal	beyond the ankles
orthopedic	straightening the feet
osteoarthritis	inflammation of the bones and the joints
osteoblast	cell that develops the bone
osteoclast	cell that breaks down the bone
osteocyte	bone cell
---------------	---
osteoma	bone tumor
osteomalacia	softening of the bone
osteomyelitis	inflammation of the bone and bone marrow
osteoporosis	pertaining to the porous condition of bones
patellar	pertaining to the patella or kneecap
periosteum	pertaining to around the bone
polydactylism	many fingers or toes
scoliosis	condition of being bent
spondylosis	condition of the vertebral column
sternum	pertaining to the sternum (breastbone)
styloid	resembling a pole or stake
synovial	pertaining to the synovial membrane
vertebral	pertaining to the vertebral column

### Medical Abbreviations:

amb	ambulate	
CXR	chest x-ray	
Fx	fractures	
Tx	treatment or traction	

### Skeletal System Worksheet

- 1. List four functions of the skeletal system.
  - a.
  - b.
  - c.
  - d.
- 2. Define ossification and identify the roles of the osteoblasts, osteocytes, and osteoclasts in the growth of bones.
- 3. Describe the structural and functional features of a typical long bone.
  - a. periosteum
  - b. diaphysis
  - c. epiphysis
  - d. red marrow
  - e. yellow marrow
  - f. articular cartilage
  - g. endosteum
- 4. Describe the following classes of bone and give an example of each:
  - a. long
  - b. short
  - c. flat
  - d. irregular

- 5. Describe the following bone markings:
  - a. foramen
  - b. meatus
  - c. sinus
  - d. fossa
  - e. condyle
  - f. tuberosity
  - g. trochanter
  - h. tubercle
  - i. process
- 6. Describe the terms suture and fontanel.
- 7. Identify the major groups of bones which belong to the axial skeleton and to the appendicular skeleton.
  - a. axial
  - b. appendicular
- 8. Describe the location of the following skull bones:
  - a. mandible:
  - b. hyoid:

- 9. List the number of vertebrae and the nicknames of the cervical vertebrae: a. cervical:
  - b. thoracic:
  - c. lumbar:
  - d. sacrum:
  - e. coccyx:
- 10. Describe the structural classification of the following articulations:
  - a. fibrous:
  - b. synovial:
  - c. cartilaginous:
- 11. Describe a ligament and its role in a synovial joint.
- 12. Describe the diseases and disorders of the skeletal system:
  - a. Arthritis:
  - b. Bursitis:
  - c. Osteoporosis:
  - d. Scoliosis:
  - e. Spina Bifida:

### Skeletal System Worksheet - KEY

- 1. 1. List four functions of the skeletal system.
  - a. Support
  - b. Protection
  - c. Movement Facilitation
  - d. Mineral Storage
- 2. Define ossification and identify the roles of the osteoblasts, osteocytes, and osteoclasts in the growth of bones.
  - a. Ossification the process by which bones form in the body by replacing pre-existing connective tissue with bone. The process occurs during bone growth
  - b. Osteoblasts the cells responsible for bone formation
  - c. Osteocytes mature bone cells
  - d. Osteoclasts cells that break down bone tissue
- 3. Describe the structural and functional features of a typical long bone.
  - a. periosteum a dense, white fibrous covering around the surface of bone. Essential for bone growth, repair, and nutrition. Serves as a point of attachment for the ligaments and tendons
  - b. diaphysis the shaft or long, main portion of a long bone
  - c. epiphysis the expanded ends of the long bone
  - red marrow blood cell forming tissue located within the spaces or the spongy bone of the long bones. Forms all blood cells types including erythrocytes, leukocytes, and thrombocytes
  - e. yellow marrow fat-storing tissues found within the medullary cavities of the long bones
  - f. articular cartilage a thin layer of hyaline cartilage covering the epiphysis in order to reduce friction during the movement of the joint
  - g. endosteum a thin layer of squamous cells lining the medullary cavity
- 4. Describe the following classes of bone and give an example of each.
  - a. long longer than they are wide (humerus, ulna, radius, metacarpals, phalanges, femur, tibia, fibula, metatarsals)
  - b. short cube-shaped, nearly equal in length and width (tarsals and carpals)
  - c. flat generally thin and flat; composed of two layers of compact bone on the outside with a layer of spongy bone on the inside. Provide protection and surface area for muscle attachment (cranial bones, sternum, ribs, and scapulae)
  - d. irregular variously shaped bones (cannot be classified into any other groups or classifications). Vary in the amount of spongy and compact bone (facial bones, vertebrae)

- 5. Describe the following bone markings:
  - a. foramen an opening or hole through a bone serving as a passageway for nerves or blood vessels
  - b. meatus a tube-like passageway within a bone
  - c. sinus a space within a bone, lined with a mucus membrane to reduce the weight of the bone
  - d. fossa a fairly deep pit or depression
  - e. condyle a large, rounded prominence which articulates with another bone
  - f. tuberosity an elevated, rounded, (knob-like) usually roughened area on a bone; generally bigger than a tubercle and is used for muscle attachment
  - g. trochanter a very large, blunt process used for muscle attachment
  - h. tubercle a small, rounded process used for muscle attachment
  - i. process any projection from the surface of a bone used in muscle attachment
- 6. Describe the terms suture and fontanel.
  - a. Suture an immovable joint found only between skull bones
  - b. Fontanel membrane-filled spaces between cranial bones (soft spots of a baby's skull)
- 7. Identify the major groups of bone which belong to the axial skeleton and to the appendicular skeleton.
  - a. axial consists of bones that lie along the axis of the body Skull, Vertebral column, Ribs, Sternum, Hyoid bone
  - b. appendicular contains the bones of the free appendages Clavicle, Scapula, Humerus, Ulna, Radius, Carpals, Metacarpals, Phalanges, Femur, Tibia, Fibula, Patella, Tarsals, Metatarsals, Phalanges
- 8. Describe the location of the following skull bones:
  - a. mandible jawbone
  - b. hyoid located in the neck, between the mandible and the larynx
- 9. List the number of vertebrae and the nicknames of the cervical vertebrae:
  - a. cervical 7 bones
    - C1 atlas
    - C2 axis
  - b. thoracic 12 bones
  - c. lumbar 5 bones
  - d. sacrum 5 fused bones
  - e.  $\operatorname{coccyx} 2-4$  fused bones
- 10. Describe the structural classification of the following articulations:
  - a. fibrous articulating bones are held very closely together by fibrous connective tissue
  - b. synovial joints which contain a synovial cavity between the articulating bones
  - c. cartilaginous articulating bones are held together tightly by cartilage

11. Describe a ligament and its role in a synovial joint.

A band or cord of dense, fibrous connective tissue extending from one bone to another to provide a joint with structural stability

- 12. Describe the diseases and disorders of the skeletal system.
  - a. Arthritis an inflammation of the bones at the joints, usually with pain and changes in bone structure
  - b. Bursitis an inflammation of the bursa, which is a sac or cavity filled with synovial fluid
  - c. Osteoporosis a loss of bone mass and bone density which leads to porous bones, making them more susceptible to fracture
  - d. Scoliosis abnormal lateral curvature of the spine (vertebral column) resulting in an Sshaped appearance
  - e. Spina Bifida occurs when the posterior part of the vertebrae fails to form properly and does not enclose the spinal cord

# Muscular System

**Course** Medical Terminology

### Unit IV

Muscular System

#### Essential Question

What medical terms are associated with the muscular system?

## TEKS

130.203 (c) 1A-F 2A-C 3A-C 4A-B

### Prior Student Learning

Basic understanding of roots, prefixes and suffixes

Estimated time

4-7 hours

Rationale Healthcare professiona

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the muscular system to discuss common conditions and diseases.

# Objectives

Upon completion of this lesson, the student will be able to:

- Define and decipher common terms associated with the muscular system
- Identify the basic anatomy of the muscular system
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases which involve the muscular system

# Engage

Mr. Smith comes into Dr. Jones' office with complaining that his 4-year-old son, Aaron, is having difficultly walking and running without falling. Noticing that Aaron seems behind in his physical growth Dr. Jones orders several tests to see if there is a serious problem.

# **Key Points**

- Muscle terms to know
  - A. My/o muscle
  - B. oblique angled
  - C. Fasci/o fascia
  - D. -lysis breakdown
  - E. Ten/o tendon
  - F. -plegia paralysis
  - G. Kinesi/o movement
  - H. rectus straight
  - I. Ton/o tone
  - J. tansverse crosswise
  - K. Sphincter ring-like
  - L. -cele swelling, hernia, tumor
  - M. -trophy growth or development
  - N. fibr/o fiber, connective tissue
- II. Introduction
  - A. Over 600 muscles make up the muscular system
  - B. 45% of the total body weight of an adult
  - C. Made up of bundles of muscle fibers (long slender cells) held together by connective tissue
  - D. When muscle fibers are stimulated by nerves they contract

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		(bec	ome short and thick,) which causes movement
	Ε.	Con	traction depends on myofilaments: actin and myosin
	F.	Prop	perties
		1.	Excitability – the ability to receive and respond to a stimulus
			(neurotransmitter, hormone, local change in pH); the response
			is the generation and transmission of an electrical current
			(action potential)
			a. Skeletal muscle responds to stimulus quickly with forceful
			b. Viscorel musels reasonds slowly, maintaining contraction
			over a longer period of time
			c. Cardiac muscle is quicker than visceral muscle and
			contraction is stronger but of a longer duration
		2.	Contractility – the ability to shorten forcibly
		3.	Extensibility – the ability to be stretched
		4.	Elasticity – the ability to resume resting length (of the muscle
			fiber) after being stretched
		5.	Automaticity – the ability of a muscle to contract without a
			nerve supply
	G.	Fund	ctions
		1.	Movement – locomotion/manipulation, heartbeat, moving
		~	substances through hollow organs
		2.	Posture maintenance
		ა. ⊿	Joint Stabilization
		- <del>1</del> . 5	Protection of some internal organs
III.	Τνρε	es of	Muscles
	A.	Card	diac (see the Internal Heart Diagram)
		1.	Forms walls of heart
		2.	Contracts to circulate the blood
		3.	Striated (banded) with lots of mitochondria
		4.	Involuntary – functions without conscious thought or control
			(autonomic nervous system control)
		5.	Efferent nerves control the rate of contraction based on the
		~	needs of the body
		6.	Afferent nerves are concerned with the sensations of pain,
		7	Contracts at a steady rate, except for brief, rapid bursts
	В	Visc	eral/smooth
	۵.	1.	Found in the internal organs of the body. such as the digestive
			system, respiratory system, blood vessels, and eyes
		2.	Walls of hollow, visceral organs
		3.	No striations = smooth
		4.	Involuntary – function without conscious thought or control
		_	(autonomic nervous system control)
		5.	Efferent (motor) neurons are less important

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6. Afferent nerves are concerned with the sensations of pain, spasm, and stretch 7. Steadies constant contractions, automaticity C. Skeletal (see the Anterior/ Posterior Muscle diagram) 1. 40% of the body 2. Attaches to and cover the bony skeleton 3. Longest fibers of all the muscle cells 4. Striated 5. Voluntary – a person has control over their actions (central and peripheral nervous system control) 6. Efferent nerve fibers from the brain and spinal cord send impulses for contraction 7. Afferent nerve fibers from the muscle send message to CNS to inform brain of the degree of contraction 8. Contracts rapidly, tires easily; tremendous power, adaptable 9. Causes body movement IV. Methods of Attachment of Skeletal Muscle to Bone A. Tendon 1. Strong, tough connective tissue cord 2. Example - the Achilles tendon which attaches the gastrocnemius muscle on the calf of the leg to the heel bone B. Fascia 1. A tough, sheet-like membrane 2. Covers and protects tissues 3. Example – the lumbodorsal fascia which surrounds the deep muscles of the trunk and back C. Aponeurosis – a broad, flat sheet D. Raphe – a seam of fibrous tissue E. Origin and insertion 1. When muscles attach to bones, one end becomes the origin and one end becomes the insertion 2. Origin – the end that does not move; usually proximal to insertion 3. Insertion – the end that moves when muscle contracts F. Direct (fleshy) – the epimysium is fused to the periosteum or perichondrium G. Indirect – more common due to its durability and size 1. Connective tissue wrappings extend to form tendons; aponeurosis 2. Anchors muscle to the connective tissue of bone or cartilage, the fascia of other muscles, or the raphe V. Gross and Microscopic Anatomy of Skeletal Muscle (see the Basic Muscle Structure Diagram) A. Each muscle is an organ B. There are 100s to 1000s of muscle fibers per muscle C. Connective tissue, blood vessels, and nerve fibers

	D. Con 1.	nective tissue wrappings Endomysium – a fine sheath of areolar connective tissue around each muscle fiber
	2. 3.	Perimysium – a collagenic sheath around several muscle fibers bundled together (fascicles) Epimysium – a dense, fibrous connective tissue surrounding
	4.	the entire muscle Deep fascia – a fibrous connective tissue that binds muscles
		into functional groups and wraps other structures
	E. Nerv	ve and blood supply (see the Neuromusclar Junction Diagram)
	1.	Each muscle fiber has nerve endings to control its activity
	2.	Each muscle has one artery and one or more veins due to its
	0	tremendous energy needs and metabolic waste production
	3.	Enters the central part of the muscle and branches throughout
		the connective tissue, including the endomysium for each
	F Δrra	indement of the fascicles
	1. Ana 1	Determines range of motion and power
	2	Results in muscles with different shapes and functional
	۷.	capabilities
	3.	The more fibers "packed" in the more powerful
	4.	The more parallel the fibers are to the long axis of the muscle,
		the more they can shorten
	5.	Parallel – the fascicles are parallel with the longitudinal axis of the muscle, such as the stylohyoid muscle of the neck
	6.	Pennate (feather-like) – the fascicles are short in relation to
		the entire length of the muscle
	7	Convergent – broad origin: the fascicles converge toward a
		single tendon, i.e. pectoralis major
	8.	Circular – fascicles in concentric rings, i.e. sphincters –
		surround external body openings (orbicularis oris, orbicularis
		oculi)
	9.	T-tubules – where the sarcolemma penetrates the cell to form
		a hollow, elongated tube; conducts nerve impulses to the
		deepest regions of the muscle cell
VI.	The Phys	siology of Skeletal Muscle Contraction
	A. Ene	rgy sources
	1.	The Breakdown of adenosine triphosphate (ATP)
	2.	ATP $<$ $\rightarrow$ ADP + PO <sub>2</sub> + energy
	3.	Energy for resynthesis comes from the breakdown of
		the formation of pyruvic acid
	Л	Results depend upon the amount of ovvicen available
	4.	a During moderate activity with adequate amounts of
		$a$ oxygen – a pyruvic acid is converted to $CO_2 + H_2O$ +

	energy
	b. During strenuous activity with not enough oxygen –
	pyruvic acid is converted to lactic acid = oxygen debt =
	cramps
	c. Oxygen debt – an extra amount of $O_2$ that must be taken
	in by the body for restorative processes; the difference
	between the amount of $O_2$ needed for totally aerobic
	respiration during muscle activity and the amount that is
	actually used
B. Con	tractility
1.	Involves protein filaments – the actin and myosin located in
	the sarcoplasm
2.	Chemical changes
	a. Nerve impulse alters the sarcolemma
	b. Sodium enters the cell and causes the release of calcium
	from the sarcoplasmic reticulum
	c. Calcium combines with troponin on the actin to cause
	contraction
	d. Relaxation of the muscle requires energy to transport
	calcium back into the sarcoplasmic reticulum
3	Electrical changes
0.	a Clinical significance – diagnostics i e EKG EEG EMG
	b All or none law – each muscle cell when stimulated
	gives a total response or does not contract at all
	c Strength depends on the number of muscle cells
	stimulated and the condition of the muscle
	sumulated and the condition of the muscle
0.1010	The number of muscle fibers contracting
۱. د	The rolative size of the muscle (regular eversion increases)
Ζ.	The relative size of the muscle cells to hypertranky)
0	Strength by causing muscle cells to hypertrophy)
3.	Series-elastic elements – the muscle must be attached to
	movable structures and the connective tissues must be pulled
	taut (stretch and recoil); transfer tension to the load
4.	Degree of muscle stretch – a severely stretched muscle
	cannot develop tension
D. Mus	icle tone
1.	Steady partial contraction is present at all times
2.	State of tension when awake
3.	State of readiness to act; enables muscles for immediate
	response
4.	Does not produce an active movement
5.	Keeps muscles firm and healthy
6.	Stabilizes the joints
7.	Maintains posture
8.	Loss of muscle tone
	a. Can occur in severe illnesses such as paralysis and

<ul> <li>palsy</li> <li>b. When muscles are not used for a long period of time – atrophy, waste away (degeneration and loss of mass)</li> <li>c. Complete immobilization of muscle (complete bed rest or loss of neural stimulation or in a cast) – strength decreases 5% per day; paralysis = atrophy to ¼ the initial size; the muscle tissue is replaced by fibrous connective tissue – muscle rehabilitation is impossible; delay with electrical stimulation</li> </ul>
<ul> <li>d. Lack of use can result in contracture (permanent contraction of the muscle due to spasm or paralysis)</li> <li>i. Severe tightening of a flexor muscle</li> <li>ii. Results in bending of a joint</li> <li>iii. When no ATP is available, the state of continuous</li> </ul>
contraction results because crossbridges are unable to detach
v. Fingers, wrists, and knees, as well as other joints, can be affected
<ol> <li>Rigor mortis – the muscle shortens, becoming rigid due to a decrease in ATP</li> </ol>
10. Muscle fatigue
a. The muscle is unable to contract
b. Tension drops to zero
<ul> <li>c. Inability to generate enough ATP to power the contractile process</li> </ul>
d. A relative deficit of ATP, <b>not</b> a total absence
e. An excessive accumulation of lactic acid and ionic imbalances
11.Spasm – a sudden, involuntary contraction of a muscle 12.Clonic – a spasm alternating with relaxation 13.Tonic – sustained
14. Tetanus – a smooth, sustained contraction
15. Letany – the result of low calcium
a. increases the excitability of neurons
b. loss of sensation, muscles twitching, convulsions
<ul> <li>c. if untreated – spasms of the larynx, respiratory paralysis, and death</li> </ul>
E. Sliding Filament Theory
<ol> <li>The individual sarcomeres shorten, the myofibrils shorten, and the whole cell shortens</li> </ol>
<ol><li>The thin filaments slide past the thick filaments so that actin and myosin overlap</li></ol>
3. The muscle fibers are activated by the nervous system
crossbridges attach to the active (myosin binding) sites on actin, pulling the thin filaments toward the center of the

		sarcomere (multiple attachments and detachments); this requires calcium
	4.	Crossbridge attachment, power stroke, crossbridge detachment, "cocking" of the myosin head
	5.	A single power stroke of all crossbridges in the muscle results in the shortening of only 1% (most muscles shorten 30%- 35%); therefore, multiple attach-detach sequences are needed
	6.	Actin – myosin is irreversibly crosslinked due to a calcium influx into the cell
	7.	Rigor mortis – illustrates that crossbridge detachment is ATP- driven; the muscles begin to stiffen 3-4 hours after death; peak rigidity at 12 hours; the stiffness dissipates over the next 48-60 hours
F.	All o	r none response
	1.	Once the muscle fiber has been stimulated to contract, it will contract to its fullest extent
	2.	Each muscle is served by at least one motor nerve, which contains hundreds of neuromuscular junctions within each single muscle fiber
	3.	A motor neuron and all the muscle fibers that it supplies are called a motor unit
	4.	When a motor neuron fires, all the muscle fibers that it innervates respond by contracting
	5.	There are an average 150 muscle fibers per motor unit
	6.	There are four to several hundred muscle fibers per motor unit for fine motor control, i.e. controlling finger and eye movements
G.	Neur	romuscular junction
	1.	The motor neurons stimulate muscle fibers
	2.	The axons divide and end at each of the single muscle fibers, forming the neuromuscular junction
	3.	Synaptic cleft – calcium and acetylcholine (neurotransmitter) fill the cleft, attach to the receptors, and stimulate the muscle fiber to contract (ACh is broken down immediately)
	4.	Curare (used for intubation anesthesia) and organophosphate poisons bind to the receptor sites and block ACh attachment
VII. Inter	actio	ns of Skeletal Muscles
A.	Muse	cles do not act independently
В.	Prim	e Mover/Agonist
	1. 2.	Provides the major force for producing a specific movement Initiates movement
	3.	Example – biceps brachii—elbow flexion
C.	Anta	gonist
	1.	Opposes or reverses a particular movement
_	2.	Example – triceps brachii—elbow extension
D.	Syne	ergist

- 1. Aid the agonists by promotion of the same movement, or by reducing undesirable or unnecessary movements
- 2. Example muscles which help make a fist without bending the wrist
- E. Fixator
  - 1. Synergists which immobilize a bone or a muscle origin
- 2. Example muscles to stabilize the scapula
- VIII. Actions or Movements of Skeletal Muscles
  - A. Goniometry the measurement of joint movement
  - B. Adduction moving a body part toward the midline
  - C. Abduction moving a body part away from the midline
  - D. Flexion decreasing the angle of a joint
  - E. Extension increasing the angle of a joint
  - F. Hyperextension increases the angle beyond the anatomical position
  - G. Circumduction the distal end of an extremity inscribes a circle while the shaft inscribes a cone
  - H. Rotation revolving a body part about the longitudinal axis
    - 1. Internal move toward the midline, or medially
    - 2. External move away from the midline, or laterally
  - I. Supination turn the palm upward; "what's up?"
  - J. Pronation turn the palm downward
  - K. Inversion turn the plantar surface away from the midline
  - L. Plantar flexion (extension) move the sole of the foot downward, as in standing on the toes
  - M. Dorsiflexion move the sole of the foot upward
- IX. Muscle Nomenclature
  - A. Location, i.e. external oblique, pectoralis
  - B. Origin and insertion, i.e. brachioradialis, occipitofrontal
  - C. Number of heads, i.e. biceps, triceps
  - D. Function, i.e. ulnar flexor (flexes the wrist), buccinator (the cheek muscle used to blow a trumpet)
  - E. Size, i.e. vastus medialis
  - F. Shape, i.e. deltoid
  - G. Orientation of the muscle fiber bundles, i.e. rectus abdominus (the straight muscle of the abdomen), orbicularis oris (the circular muscle around the mouth)
  - H. Adjectives to describe muscles
    - 1. bi, tri, quadri 2, 3, 4
    - 2. Externus exterior
    - 3. Gracilis slender
    - 4. Latissimus wide
    - 5. Longissimus long
    - 6. Longus long
    - 7. Medius intermediate
    - 8. Orbicularis around

- 9. Quadratus square
- 10. Rectus straight
- 11. Rhomboideus diamond shaped
- 12. Scalenes irregular triangle
- 13. Teres round
- 14. Transverse crosswise
- 15. Vastus great

### Activity

- I. Make flash cards of muscular terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete Worksheet over the Muscular system
- III. Complete the Medical Terminology Worksheet
- IV. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan -

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

V. Research and report on diseases and disorders from the Muscular system.

### Assessment

Successful completion of the activities

### Materials

Muscular System worksheet Medical term worksheet

#### Accommodations for Learning Differences

For reinforcement, the students will color and label a diagram of the muscles of the body.

For enrichment the students will research and report on a neuromuscular disease.

### National and State Education Standards

National Healthcare Foundation Standards and Accountability Criteria Health care workers will know the various methods of giving and obtaining information. They will communicate effectively, both orally and in writing.

### TEKS

130.203 (c)(1)(A) identify abbreviations, acronyms, and symbols;

130.203 (c)(1)(B) identify the basic structure of medical words;

130.203 (c)(1)(C) practice word-building skills;

130.203 (c)(1)(D) research the origins of eponyms;

130.203 (c)(1)(E) recall directional terms and anatomical planes related to body structure;

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130.203 (c)(1)(F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases, and treatments.

130.203 (c)(2)(A) demonstrate appropriate verbal and written strategies such as correct pronunciation of medical terms and spelling in a variety of health science scenarios;

130.203 (c)(2)(B) employ increasingly precise language to communicate; 130.203 (c)(2)(C) translate technical material related to the health science industry.

130.203 (c)(3)(A) examine medical and dental dictionaries and multimedia resources;

130.203 (c)(3)(B) integrate resources to interpret technical materials;

130.203 (c)(3)(C) investigate electronic media such as the Internet with appropriate supervision.

130.203 (c)(4)(A) distinguish medical abbreviations used throughout the health science industry; and

130.203 (c)(4)(B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

## **College and Career Readiness Standards**

English/language art

B.1 Identify new words and concepts acquired through study of their relationships to other words and concepts.

B2. Apply knowledge of roots and affixes to infer the meanings of new words.

B3. Use reference guides to confirm the meanings of new words or concepts.

Cross- Disciplinary standards-Foundational Skills

A2. Use a variety of strategies to understand the meanings of new words

# Muscular System Worksheet

Na	ne Period	
1.	Muscle tissue has five properties. What are they? Define them.	
	a	
	b	
	C	
	d	
	е	
2.	List the four basic functions of the muscular system.	
	a	
	b	
	С	
	d	
3.	Three types of muscle tissue are found in the human body. What are they? W	here
	s each type found?	
	a	
	b	
	C	
4.	Define Tendon.	
5.	Define Fascia.	
6.	dentify the following:	
	a. Muscle fatigue	

	b. Spasm	
	c. Clonic	
	d. Tonic	
	e. Tentanus	
	f. Tetany	
7.	Choose the type of muscle tissue that fits each descriptive phrase.	
	C = Cardiac Muscle S = Smooth Muscle SK = Skeletal	
	a. Forms the bulk of the wall of the heart	
	b. Has intercalated discs	
	c. Involuntary, nonstriated	
	d. Involuntary, striated	
	e. Located in walls of hollow internal surfaces such as the blood ves	sels
	f. Exhibits autorhythmicity	
	g. Requires a constant supply of oxygen so the mitochondria are lar	ger
	and more numerous	
	h. Is slower to contract than the other two tissue types	
	I. Does not have sarcomeres	
8.	Describe the "sliding filament theory."	
9.	Define these terms:	
	a. Origin	
	b. Insertion	

10. Define the roles of the prime mover (agonist), antagonist, synergist, and fixator in producing body movements.



- 11. What would happen if the flexors of your forearm were functional, but the antagonistic extensors weren't?
- 12. What action would occur if both the flexors and extensors contracted simultaneously?
- 13. What is the location of the pectoralis major, deltoid, and latissimus dorsi muscles? All three of these muscles are (superficial / deep). They are all directly involved with movement of the (shoulder girdle / humerus / radius/ ulna).
- 14. Write the names of the muscles that fit these descriptions.
  - a. Covers most of the posterior of the humerus.
  - b. The largest muscle of the chest region; used to throw a ball in the air (flex the humerus) and to adduct the arm.
  - c. Bows and rotates head from side to side.
  - d. Controls action at the elbow for a movement such as the downstroke in hammering a nail.
  - e. Flexes the forearm.
  - f. Hyperextends the humerus, as in doing the "crawl" swimming stroke.
  - g. Moves the shoulders by raising them and pulling them back; helps hold the head erect
  - h. Abducts the arm \_\_\_\_\_

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### Muscular System Worksheet – Answer Key

- 1. a. Contractility the ability of muscle tissue to shorten and produce force
  - b. Extensibility the ability of muscle tissue to be stretched with very little application of force from the opposing muscle group
  - c. Elasticity the ability of muscle tissue to return to its normal resting length from its extended position without additional energy requirements
  - d. Excitability the ability of muscle tissue to receive and respond to stimuli (electrical)
  - e. Automaticity the ability of muscle to contract without a nerve supply
- 2. Motion, maintenance of posture, heat production, stabilization of joints, protection
- 3. a. Skeletal muscle tissue attached to the bones and moves parts of the skeleton. It is striated and voluntary
  - b. Cardiac muscle tissue forms the bulk of the heart wall. It is striated and involuntary
  - c. Smooth (Visceral) muscle tissue located in the walls of hollow internal structures such as blood vessels, the stomach, and the intestines. It is non-striated and involuntary
- 4. Tendon muscular connective tissue in a cord-like formation
- 5. Fascia a tough, sheet-like membrane that covers and protects
- 6. a. Muscle fatigue a muscle unable to contract, with the inability to produce ATP
  - b. Spasm a sudden, involuntary contraction of a muscle
  - c. Clonic an alternating spasm and relaxation
  - d. Tonic sustained
  - e. Tetanus a smooth sustained contraction
  - f. Tetany the result of low calcium, which increases the excitability of neurons
- 7. a. cardiac f. smooth
  - b. cardiac g. cardiac c. smooth h. smooth
  - d. cardiac i. smooth
  - e. smooth
- 8. The sliding filament theory states that the weakest stimulus from a neuron that can initiate a contraction is the threshold stimulus. Once a threshold stimulus is applied, individual muscle fibers of a motor unit will contract to their fullest extent or will not contract at all. Individual muscle fibers do not partly contract.
- 9. a. The attachment of a muscle tendon or aponeurosis to a stationary bone b. The attachment of a muscle tendon or aponeurosis to a movable bone

- Prime mover a muscle that causes a desired action Antagonist – the muscle which has an opposite effect as that of the prime mover Synergist – a muscle which serves to steady a movement, preventing unwanted movements; helps the prime mover be more efficient
   Fixator – a muscle which stabilizes the origin of the prime mover
- 11. Your arm would flex, but would be unable to relax and extend
- 12. No action would occur there would be no movement at the elbow joint
- 13. superficial, shoulder girdle
- 14. a. Triceps brachii
  - b. Pectoralis major
  - c. Sternocleidomastoid
  - d. Triceps brachii
  - e. Biceps brachii
  - f. Latissimus dorsi
  - g. Trapezius
  - h. Deltoid

# Muscular System Medical Terminology

Write the meaning of each term in the spaces provided below.

•	•
а	
ab	
ad	
-algia	
ambul	
-asthenia	
bi	
blephar/o	
brady	
-cardia	
cardi/o	
-duction	
dys	
electr/o	
end/o	
ері	
fasci/o	
fibr/o	
-gram	
hemi	
hyper	
-ic	
-itis	
-ium	
kinesi/o	
-kinesia	
lei/o	
metr/i	
my/o	
-ology	
-oma	
para	
peri	
-phagia	
-phasia	
-plasty	
-plegia	

## Prefixes, Suffixes, and Root Words

quad	
-rrhexis	
sarc/o	
-spasm	
tachy	
ten/o	
tend/o	
tendin/o	
tetan	
ton/o	
tri	
-trophy	

### **Medical Terms**

abduction	
adduction	
ambulate	
aphasia	
atrophy	
blepharospasm	
bradycardia	
bradykinesia	
dysphagia	
dysphasia	
dystrophy	
electromyogram	
endomysium	
epimysium	
fascia	
fibromyalgia	
hemiplegia	
hypertrophy	
kinesiology	
leiomyoma	
myalgia	
myasthenia	
myocardium	
myoma	
myometrium	
myorrhexis	
paraplegia	

perimysium	
phrenic	
quadriplegia	
sarcolemma	
tachycardia	
tendinitis	
tendinoplasty	
tetanus	

## **Medical Abbreviations**

amb	
CNS	
GI	
HR	
IM	
K	
kg	
lb	
MI	
Na	
Р	
PK	
RICE	

# **KEY - Muscular System Medical Terminology**

## Prefixes, Suffixes, and Root Words

a	without, absence of
ab	from, away from
ad	to, toward
-algia	pain
ambul	walking
-asthenia	weakness, lack of strength
bi	two
blephar/o	eyelids
brady	slow
-cardia	heart
cardi/o	heart
-duction	movement
dys	bad, painful, difficult
electr/o	electricity
end/o	within, inside
ері	on, upon
fasci/o	fascia, fibrous bands
fibr/o	fiber
-gram	recorded picture
hemi	half
hyper	above
-ic	pertaining to
-itis	inflammation of
-ium	pertaining to (not on the words list)
kinesi/o	movement
-kinesia	movement
lei/o	smooth
metr/i	uterine tissue
my/o	muscle
-ology	study of
-oma	tumor
para	beyond (when used with plegia refers to two limbs)
peri	around
-phagia	eating, swallowing
-phasia	speaking
-plasty	surgical repair
-plegia	paralysis
quad	four

-rrhexis	rupture
sarc/o	flesh, muscle
-spasm	sudden, involuntary muscular contraction
tachy	rapid, swift
ten/o	tendon
tend/o	tendon
tendin/o	tendon
tetan	stiff
ton/o	tension, pressure
tri	three
-trophy	development

# **Medical Terms**

abduction	movement away from (the midline)
adduction	movement towards (the midline)
ambulate	to walk
aphasia	without speech
atrophy	without development
blepharospasm	involuntary contraction of the eyelid
bradycardia	slow heart
bradykinesia	slow movement
dysphagia	difficulty swallowing or eating
dysphasia	difficulty speaking or talking
dystrophy	bad development (refers to the disorders when muscle development
ayotrophy	ceases or slows beyond normal)
electromyogram	recording of the electrical activity of the muscles
endomysium	pertaining to within the muscles
epimysium	pertaining to on or upon the muscles
fascia	fascia or fibrous bands
fibromyalgia	pain in the muscle fibers
hemiplegia	half paralyzed (which usually refers to the left side or the right side of the body being paralyzed)
hypertrophy	overdevelopment
kinesiology	study of movement or motion
leiomyoma	tumors of the smooth muscle
myalgia	muscle pain
myasthenia	muscle weakness
myocardium	referring to the heart muscle
myoma	tumor of the muscles
myometrium	muscular uterine tissue
myorrhexis	rupture of the muscles

paraplegia	beyond paralysis (refers to the paralysis of two limbs, usually the legs)
perimysium	pertaining to around the muscles
phrenic	pertaining to the diaphragm
quadriplegia	paralysis of four (referring to the paralysis of all four limbs)
sarcolemma	muscle (flesh) membrane
tachycardia	rapid heart
tendinitis	inflammation of the tendon
tendinoplasty	surgical repair of the tendon
tetanus	condition of stiffness (refers to constant muscle contractions)

# **Medical Abbreviations**

amb	ambulate
CNS	central nervous system
GI	gastrointestinal
HR	heart rate
IM	intramuscular
K	potassium
kg	kilogram
lb	pound
MI	myocardial infarction
Na	sodium
Р	pulse
PK	pain killer
RICE	rest, ice, compression, and elevation

### Course

Medical Terminology

### Unit V

Cardiovascular System

#### Essential Question

What medical terms are associated with the cardiovascular system?

# TEKS

130.203 (c) 1 A-F 2A-C 3A-C 4A-B

### Prior Student Learning

Basic understanding of roots, prefixes and suffixes

## Estimated time

4-7 hours

## Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the cardiovascular system to discuss common conditions and diseases.

## Objectives

Upon completion of this lesson, the student will be able to:

- Define and decipher common terms associated with the cardiovascular system
- · Identify the basic anatomy of the cardiovascular system
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases which involve the cardiovascular system

## Engage

Mr. Smith comes into the ER with complaints of chest pain and SOB. Dr Jones orders EKG, CXR, CBC, Cardiac enzymes, and ABG's STAT because he suspect a myocardial infarction. Mrs. Smith is nervous and is asking you to translate what does all this mean? You take her in the hallway to explain and calm her down.

# **Key Points**

I. Cardio Terms to Know

- A. Aneurysm widening
  - B. Angina choking pain
  - C. Angio vessel
- D. Arteri/o artery
- E. Arti/o atruim
- F. Ather/o fatty plaque
- G. Cardi/o heart
- H. Cor/o, coron/o heart
- I. Emia blood or blood condition
- J. Hem/a, hem/o, hemat/o blood
- K. Phleb/o vein
- L. Plasm/a, plasm/o plasma (form, mold)
- M. Thromb/o clot
- N. Valv/o value (leaf)
- O. Vas/o vein
- P. Ven/o vein

- II. Introduction to the heart
  - A. Fully formed by the 4th week of embryonic development
  - B. A hollow muscular organ that acts as a double pump
  - C. A continuous pump once pulsations begin, the heart pumps endlessly until death
- III. Heart Anatomy
  - A. General
    - 1. Size approximately the size of a person's fist
    - 2. Location in the mediastinum
  - B. Coverings Pericardium (see the Pericardial Diagram)
    - 1. A double-layered sac
    - 2. Contains 10-20cc. of pericardial fluid to reduce the friction of the beating heart
    - 3. Parietal layer a fibrous membrane; the outer layer
    - 4. Visceral layer serous membrane; also called the epicardium; attached to the myocardium
  - C. The Heart Wall
    - Myocardium heart muscle; thicker on the left side of the heart
    - 2. Endocardium the lining of the heart chambers
  - D. Chambers
    - 1. Atria
      - a. The two upper chambers of the heart
      - b. Have thin walls and a smooth inner surface
      - c. Responsible for receiving blood
      - d. The right atrium receives deoxygenated (oxygen poor) blood from the body through the superior and inferior vena cava
      - e. The left atrium receives oxygenated (oxygen rich) blood from the lungs through the pulmonary veins
    - 2. Ventricles
      - a. The two lower chambers of the heart
      - b. Have thicker walls and an irregular inner surface
      - c. Contain the papillary muscles and chordae tendineae (prevent the heart valves from turning inside out when the ventricles contract)
      - d. The left wall is 3 times as thick as the right wall; forms the apex of the heart
      - e. Responsible for pumping blood away from the heart
      - f. The right ventricle sends deoxygenated blood to the lungs via the pulmonary arteries
      - g. The left ventricle sends oxygenated blood to all parts of the body via the aorta
    - 3. Accessory Structures

- a. Septum the muscular wall dividing the heart into right and left halves
- b. Heart valves prevents the backflow of blood
- c. Papillary muscles
- d. Chordae tendineae
- E. Great Vessels (see the External Heart Diagram)
  - 1. Superior and inferior vena cava the largest veins in the body; receive deoxygenated blood from all parts of the body
  - 2. Coronary sinus
  - 3. Pulmonary arteries carry deoxygenated blood to the lungs from the right ventricle
  - 4. Pulmonary veins carry oxygenated blood to the left atrium from the lungs
  - 5. Aorta the largest artery in the body; carries oxygenated blood to distribute to all parts of the body
- F. The Pathway of Blood Through the Heart and All Body Tissues (see the Internal Heart Diagram)
  - 1. Superior and inferior vena cava
  - 2. Right atrium
  - 3. Tricuspid valve
  - 4. Right ventricle
  - 5. Pulmonary semilunar valve
  - 6. Pulmonary arteries
  - 7. Lungs ( $O_2$  and  $CO_2$  exchange external respiration)
  - 8. Pulmonary veins
  - 9. Left atrium
  - 10. Bicuspid/Mitral valve
  - 11. Left ventricle
  - 12. Aortic semilunar valve
  - 13. Aorta all parts of the body via the arteries
  - 14. Arterioles
  - 15. Capillaries of the individual tissues ( $O_2$  and  $CO_2$  exchange internal respiration)
  - 16. Venules
  - 17. Veins
  - 18. Superior and inferior vena cava
- G. Cardiovascular Circuits
  - Pulmonary circuit the transport of blood from the right side of the heart to the lungs and then back to the left side of the heart
  - Systemic circuit the transport of blood from the left side of the heart to all parts of the body and then back to the right side of the heart
  - 3. Coronary circuit the transport blood from the left side of the heart to the heart tissues and back to the right side of the

heart

- H. Valves
  - 1. Tough fibrous tissues between the heart chambers and major blood vessels of the heart
  - 2. Gate-like structures to keep the blood flowing in one direction and prevent the regurgitation or backflow of blood
  - Atrioventricular valves when ventricles contract, blood is forced upward and the valves close; attached by papillary muscles and chordae tendineae
    - a. Tricuspid valve between the right atrium and the right ventricle
    - b. Bicuspid/mitral valve between the left atrium and the left ventricle
  - 4. Semilunar Valves three half-moon pockets that catch blood and balloon out to close the opening
    - a. Pulmonary semilunar valve between the right ventricle and the pulmonary arteries
    - b. Aortic semilunar valve between the left ventricle and the aortic arch/aorta
- I. Cardiac Circulation (The Blood Supply to the Heart)
  - 1. Aorta -> coronary arteries -> capillaries in the myocardium -> coronary veins -> coronary sinus -> right atrium
  - 2. Blood in the chambers nourishes the endocardium
  - 3. The coronary circuit opens **only** during the relaxation phase of the cardiac cycle
  - 4. Occlusion of the coronary artery a myocardial infarction (heart attack) occurs if collateral circulation is inadequate
- IV. Heart Physiology
  - A. Nerve Supply to the Heart
    - 1. Alters the rate and force of cardiac contraction
    - 2. Vagus nerve (parasympathetic nervous system) slows the heart rate
    - 3. Sympathetic nerves increase the heart rate
    - 4. Epinephrine/norepinephrine increases heart rate
    - 5. Sensory (afferent) nerves detect atria being stretched and lack of oxygen (changes the rate of contractions)
    - 6. Angina chest pain due to a lack of oxygen in coronary circulation
  - B. Intrinsic Conduction System Automaticity (see the Heart Conduction System Diagram)
    - 1. Enables the heart to contract rhythmically and continuously without motor nerve impulses
    - 2. Arrhythmia myocardial cells leak sodium faster than the SA node, causing an irregular heartbeat
    - 3. SA (sinoatrial) node known as the pacemaker, located

where the superior and inferior vena cava enter the right
4. AV (atrioventricular) node – sends impulses to the ventricles
5. Bundle of His/bundle branches – in the septum
6. Purkinje fibers – in the heart wall to distribute nerve impulses
C. Cardiac Cycle – Generated in the Heart Muscle $1 - Ope (1)$ contraction (cycle) – 0.2 cocorde) $1 - Ope (1)$
1. One (1) contraction (systole = 0.5 seconds) + one (1) relevation (diastele = 0.5 seconds) at 75 heats nor minute
2 Initiation of contraction – impulse spreads out over both atria
causing them to contract together and force blood into both
ventricles
3. Impulses from the SA node are sent to the AV node
(between the atria in the septum)
<ol><li>Impulses from the AV node are sent to nerve fibers in the</li></ol>
septum (bundle of His) which transmits the impulse via the
right and left bundle branches to the Purkinje fibers – cause
the ventricles to contract together and force blood out of the
lungs
5. The shift of ions along the conduction system = action
potential
<ol><li>Periods of rest = polarization</li></ol>
<ol><li>Periods of activity = depolarization – when an impulse is</li></ol>
transmitted; and repolarization – when a slow shift back to
polarization occurs
<ol> <li>ENG (see the ENG Diagram)</li> <li>Electrical changes during the cardiac cycle are recorded as</li> </ol>
an FKG
2. To estimate heart rate using an EKG strip, count the number
of QRS complexes in a 6-second strip and multiply by 10
3. P wave
a. Impulse received by the SA node
b. The atria depolarize (contract)
c. Enlarged P wave = enlarged athum of stenosed Av
4 ORS complex
a. Impulse passing through the ventricles (systole)
b. The ventricles depolarize (contract)
c. The atria repolarize (relax)
d. Enlarged Q = myocardial infarction
e. Enlarged R = enlarged ventricles
5. I wave
a. Reputation of the ventricles (diastole) b. Elevated – $K + level too high$
6 PR interval
a. 0.12 – 0.2 seconds

- b. Too long = rheumatic heart disease or hardening of the arteries; conduction problem or delay at the AV node
- 7. ST segment
  - a. Elevated = acute myocardial infarction
  - b. Depressed = insufficient oxygen to the heart
- E. Stroke Volume and Cardiac Output
  - 1. Cardiac out is the volume of blood pumped by the heart per minute, the function of heart rate, and stoke volume
  - 2. Stoke volume is the volume of blood, in milliliters (ml), pumped out of the heart with each beat
  - 3. Weak hearts have low stroke volume they must pump faster to move an adequate amount of blood
  - 4. Well-trained athletes have good stroke volume can pump slower to move an adequate amount of blood
- V. Overview of Blood Vessels
  - A. General Composition and Function
    - 1. Allow for circulation of blood and other bodily fluids to all the body's cells
    - 2. Three layers
      - a. Tunica adventitia outer layer of tough fibrous tissue
      - b. Tunica media smooth muscle which allows vessels to constrict and dilate
      - c. Tunica intima smooth, inner elastic layer (lumen = internal diameter)
  - B. Arteries
    - 1. Carry blood **away** from the heart
    - 2. Thicker, to withstand pressure exerted during systole
    - 3. All but the pulmonary arteries carry oxygenated blood
    - 4. Aorta the largest artery; 1 inch in diameter
    - 5. Arterioles the smallest arteries
    - 6. Coronary arteries the most important; supply blood to the heart muscle
      - a. Left and right main coronary artery
      - b. Left coronary artery -> left anterior descending -> left circumflex branch
      - c. Right coronary artery -> right atrium and right ventricle
  - C. Veins
    - 1. Carry blood toward the heart
    - 2. All **but** the pulmonary veins carry deoxygenated blood
    - 3. Layers are much thinner, and less elastic
    - 4. A series of internal valves that work against the flow of gravity to prevent reflux
    - 5. Superior and inferior vena cava the largest veins
    - 6. Venules the smallest veins
  - D. Capillaries

- 1. Tiny, microscopic vessels
- 2. Walls are one cell layer thick
- 3. Function to transport and diffuse essential materials to and from the body's cells and the blood
- VI. Pulse
  - A. The pressure of the blood pushing against the wall of an artery as the heart beats during systole
  - B. Common pulse sites
    - 1. Temporal at the side of the forehead
    - 2. Carotid at the neck
    - 3. Brachial the inner aspect of the forearm at the antecubital space (the crease of the elbow)
    - 4. Radial at the inner aspect of the wrist on the thumb side
    - 5. Femoral at the inner aspect of the upper thigh or groin
    - 6. Dorsalis pedis at the top of the foot arch
- VII. Blood Pressure
  - A. Systole the maximum pressure formed during a ventricular contraction
  - B. Diastole the minimum pressure during ventricular relaxation (atrial contraction)
  - C. Measured in mm of Hg
  - D. BP = CO x PR (Blood Pressure = Cardiac Output x Peripheral Resistance)
  - E. Normal Ranges
    - 1. Systolic = 100-140
    - 2. Diastolic = 60-90
  - F. Hypotension systolic < 90
  - G. Hypertension systolic > 150 and/or diastolic > 90
  - H. Must be lower in the pulmonary circuit to prevent fluid from filtering out into the alveoli
  - I. Factors Affecting BP
    - 1. Cardiac output
    - 2. Peripheral resistance
    - 3. Blood volume
  - J. Circulatory Shock
    - 1. Hypovolemic shock
    - 2. Vascular shock
    - 3. Cardiogenic shock

VIII. Diagnostic Procedures for the Cardiovascular System

- A. History and Physical
  - 1. Checking for symptoms of disease
  - 2. Chest pain, shortness of breath, awareness of heartbeat

(palpitation), fatigue, dizziness or loss of consciousness, edema, pain in the legs while walking (claudication)

- B. Electrocardiogram a tracing of the electrical activity of the heart
- C. Phonocardiogram an electrocardiogram with heart sounds
- D. Echocardiogram ultrasound measures the size and movement of the heart structures
- E. Doppler Ultrasound measures blood flow
- F. Arteriography radiopaque dye injected into and x-ray series taken of blood flow
- G. Cardiac Catheterization
  - 1. Right side of heart a catheter threaded into a vein, then the vena cava, then the heart, then the pulmonary artery
  - 2. Left side of heart a catheter threaded into an artery, then the left ventricle, then the aorta, then the coronary vessels
  - 3. X-rays taken during the procedure
  - 4. Dye is also injected
- IX. Diseases of the Cardiovascular System
  - A. Arteriosclerosis hardening of the arteries
  - B. Atherosclerosis
    - 1. Fatty deposits on the walls of the arteries
    - 2. Causes
      - a. Increased blood lipids
      - b. High blood pressure
      - c. Smoking
      - d. Obesity
      - e. Physical inactivity
      - f. Tension
  - C. Hypertension
    - 1. 90% = essential hypertension no specific cause
    - 2. 10% = a symptom of another disease, i.e. an adrenal tumor or kidney disease
    - 3. Increases the workload of the heart
    - 4. Leads to hypertrophy of the left ventricle, then heart failure
    - 5. Accelerates the development of atherosclerosis
  - D. Ischemic Heart Disease
    - 1. The oxygen supply to the heart is inadequate
    - 2. Atherosclerosis is a major cause
    - 3. Can lead to
      - a. Angina pectoris a condition in which the coronary arteries are temporarily blocked reduced blood supply to the heart chest pain
      - b. Heart attack cessation of normal cardiac contraction (cardiac arrest)
      - c. Myocardial infarction necrosis (death) of the heart muscle due to severe, prolonged ischemia
- d. Sudden death the heart stops and ventricular
- fibrillation occurs
- E. Cardiac Arrhythmias
  - 1. An abnormality in the rate, rhythm, or conduction of the heart beat
- F. Bacterial Endocarditis
  - 1. An inflammation of the internal lining of the heart
  - 2. Also involves the heart valves
- G. Valvular Heart Disease
  - 1. Involves abnormalities of the heart valves
  - 2. Especially the mitral and aortic valves
  - 3. The leading cause rheumatic fever with a hypersensitivity reaction to streptococcus antigens
  - 4. Heart valves are scarred
  - 5. Treatment valve replacement
- H. Congenital Heart Disease
  - 1. Defects in the heart that occurred during embryologic and fetal development
  - 2. Involves defective communication between the chambers, malformation of the valves, and malformation of the septa
  - Cyanotic the inability of the individual to get adequate blood oxygenation due to extensive cardiac abnormalities that cause blood to be shunted away from lungs
  - For example "Blue Babies" a failure of the foramen ovale to close or transposition of the great arteries or patent ductus arteriosus
- I. Congestive Heart Failure (CHF)
  - 1. Pumping action of the heart is diminished
  - 2. Fluid accumulates and is retained in the tissues
  - 3. Compensations
    - a. Increased heart rate, greater force of contraction
    - b. Retention of fluid by the kidneys
    - c. Enlargement of the heart
- J. Cor Pulmonale
  - 1. Hypertrophy of the right ventricle due to hypertension in pulmonary circulation
  - Increased BP in the lungs –a reduction in blood flow and increased resistance in the lungs – pulmonary hypertension – increased pressure in the pulmonary arteries – blood backs up into the right ventricle – hypertrophy
- K. Peripheral Arterial Disease
  - 1. Decreased blood flow to the peripheral vessels
- L. Varicose Veins
  - 1. Enlarged veins which can be inflamed
- M. Hemorrhoids
  - 1. Varicose veins of the rectal and anal area

- N. Aneurysm
  - 1. A weak section in the wall of an artery that balloons out and ruptures
- O. Phlebitis
  - 1. Inflammation of a vein
- P. Thrombus
  - 1. A blood clot that stays where it is formed
- Q. Stroke (CVA)
  - 1. Brain infarct caused by decreased oxygen supply to the brain due to a blood clot or hemorrhage
- R. Raynaud's Disease
  - 1. A circulation disorder
- S. Esophageal Varices
  - 1. Varicose veins of the esophagus
- T. Tetralogy of Fallot
  - 1. Four different heart defects that occur at birth which are life threatening to the fetus

### Activity

- 1. Students should make flash cards of Cardio terms and practice putting terms together with Prefixes and Suffixes to make new terms.
- 2. Complete the Cardiovascular System Worksheet.
- 3. Complete the Terminology Worksheet.
- 4. Complete the Cardiovascular System Medical Terminology Worksheet
- Review media terms with the students using review games such as the "fly swatter game" or the "flash card drill" (See the Medical Terminology Activities Lesson Plan -<u>http://texashste.com/documents/curriculum/principles/medical\_terminol</u> ogy\_activities.pdf ).
- 6. Research and report on diseases and disorders of the Cardiovascular System.

## Assessment

Successful completion of Activities

### Materials

Cardiovascular System Worksheet Medical Terms Worksheet Cardiovascular System Medical Terminology Worksheet KEY - Cardiovascular System Worksheet KEY - Medical Terms Worksheet KEY - Cardiovascular System Medical Terminology Worksheet

## Accommodations for Learning Differences

For reinforcement, the students will practice terms of the cardiovascular system using flash cards.

For enrichment, the students will choose a disease related to the cardiovascular system and research the disease using the internet. The students will share their findings with the class.

## **National and State Education Standards**

National Healthcare Foundation Standards and Accountability Criteria Health care workers will know the various methods of giving and obtaining information. They will communicate effectively, both orally and in writing.

# TEKS

130.203 (c)(1)(A) identify abbreviations, acronyms, and symbols;

130.203 (c)(1)(B) identify the basic structure of medical words;

130.203 (c)(1)(C) practice word-building skills;

130.203 (c)(1)(D) research the origins of eponyms;

130.203 (c)(1)(E) recall directional terms and anatomical planes related to body structure;

130.203 (c)(1)(F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases, and treatments.

130.203 (c)(2)(A) demonstrate appropriate verbal and written strategies such as correct pronunciation of medical terms and spelling in a variety of health science scenarios;

130.203 (c)(2)(B) employ increasingly precise language to communicate; 130.203 (c)(2)(C) translate technical material related to the health science industry.

130.203 (c)(3)(A) examine medical and dental dictionaries and multimedia resources;

130.203 (c)(3)(B) integrate resources to interpret technical materials; 130.203 (c)(3)(C) investigate electronic media such as the Internet with appropriate supervision.

130.203 (c)(4)(A) distinguish medical abbreviations used throughout the health science industry; and

130.203 (c)(4)(B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

# **College and Career Readiness Standards**

English/language art

B.1 Identify new words and concepts acquired through study of their relationships to other words and concepts.

B2. Apply knowledge of roots and affixes to infer the meanings of new words.

B3. Use reference guides to confirm the meanings of new words or

concepts.

Cross- Disciplinary standards-Foundational Skills A2. Use a variety of strategies to understand the meanings of new words

The	Card	liovasc	ular	System
-----	------	---------	------	--------

Na	The Cardiovascular System ame Period	
1.	What is the protective membrane covering of the heart called?	
2.	Which chambers of the heart receive blood from the veins?	
3.	What chambers of the heart are known as pumping chambers?	
4.	What is the name of the blood vessel that brings venous blood from the head, neck, and arms to the right atrium?	
5.	What is the name of the blood vessel that brings venous blood from the abdomen and legs into the right atrium?	
6.	What is the name of the blood vessels that take deoxygenated blood from the right ventricle to the lungs?	
7.	What is the name of the blood vessels that take oxygenated blood from the lungs to the left atrium?	
8.	The largest artery in the body is the	
9.	The valves are formed from the most inner heart layer, or the	
10. The valve between the right atrium and the right ventricle is known as the The valve between the left atrium and the left ventricle is known		
	as the	
11	. The valves between the ventricles and blood vessels are known as the	
12	. Complete flow of blood through the heart. Blood entering the atrium flows through the tricuspid valve and into the	

From there, the deoxygenated blood flows past the pulmonary .

semilunar valve and into the \_\_, and then into the lungs.

(	Oxygenated blood lea	ves the lungs through the	and enters the
13.	What is the semilunar	valve?	
14.'	What is the pacemake	r of the heart?	
15.1	List and describe the l a b c d	neart's cardiac conduction system.	
16.	a. What is systole? b. What is diastole?		
17.	If the patient has an e	evated blood pressure we say they have_	
18.	What is the stroke vol	ume?	
19.	What is cardiac outpu	?	
20.	a. What vessel carr b. What vessel carr c. What vessel is re cells?	ies blood away from the heart? ies blood to the heart? sponsible for gas and nutrient exchange v	vithin each of the body's
21.	Describe each of the f a. arteries	ollowing vessels:	
	b. veins		
	c. capillaries		
22.	What is a pulse?		

- 23. Identify the location of the following pulse points:
  - a. What pulse is felt on the upper surface of the foot?\_\_\_\_\_
  - b. What pulse is felt in the antecubital space?\_\_\_\_\_
  - c. What pulse is felt in the groin?\_\_\_\_\_
  - d. What pulse is found in the neck?\_\_\_\_\_
  - e. What pulse is found on the wrist side of the arm?\_\_\_\_\_
- 24. Answer the following questions about blood pressure.
  - a. What is the first measurement of blood pressure?\_\_\_\_\_
  - b. What does it measure?\_\_\_\_\_
  - c. What is the second measurement of blood pressure?\_\_\_\_\_
  - d. What does it measure?\_\_\_\_\_
- 25. a. What circulation route takes deoxygenated blood to the lungs where it can pick up oxygen?\_\_\_\_\_
  - b. What circulation route takes oxygenated blood through the body?\_\_\_\_\_

# WORKSHEET - Cardiovascular Review - KEY

- 1. What is the protective membrane covering of the heart called? Pericardium
- 2. What chambers of the heart receive blood from veins? Atria
- 3. What chambers of the heart are known as pumping chambers? Ventricles
- 4. What is the name of the blood vessel that brings venous blood from the head, neck, and arms to the right atrium? <u>Superior Vena Cava</u>
- 5. What is the name of the blood vessel that brings venous blood from the abdomen and legs to the right atrium? <u>Inferior Vena Cava</u>
- 6. What is the name of the blood vessels that take deoxygenated blood from the right ventricle to the lungs? <u>Pulmonary arteries (which branch from the pulmonary trunk)</u>
- 7. What is the name of the blood vessels that take oxygenated blood from the lungs to the left atrium? <u>Pulmonary veins</u>
- 8. The largest artery in the body is the <u>Aorta</u>
- 9. The valves are formed from the most inner heart layer or the <u>Endocardium</u>.
- 10. The valve between the right atrium and the right ventricle is known as the <u>Tricuspid Valve</u>. The valve between the left atrium and the left ventricle is known as the <u>Bicuspid Valve (also called the Mitral Valve)</u>.
- 11. The valves between the ventricles and blood vessels are known as the <u>Pulmonary and Aortic</u> <u>Semilunar Valves</u>.
- 12. Complete flow of blood through the heart. Blood entering the <u>Right</u> atrium flows through the tricuspid valve and into the <u>Right</u> ventricle. From there, the deoxygenated blood flows past the pulmonary semilunar valve and into the <u>Pulmonary Arteries</u>, and then into the lungs. Oxygenated blood leaves the lungs through the <u>Pulmonary Veins</u> and enters the <u>Left</u> atrium of the heart. Blood continues to flow through the <u>Mitral/Bicuspid</u> valve and into the <u>Left</u> ventricle. From there, blood will flow past the aortic semilunar valve and into the <u>Aorta</u>.
- 13. What is a semilunar valve? <u>Semilunar Valves: 3 half-moon pockets that catch blood and</u> <u>balloon out to close the opening</u>
- 14. What is the pacemaker of the heart? <u>SA node</u>

- 15. List and describe the heart's cardiac conduction system.
  - a. <u>SA (sinoatrial) node: known as the pacemaker, located where the superior and inferior</u> vena cava enter the right atrium
  - b. AV (atrioventricular) node: sends impulses to the ventricles
  - c. Bundle of His/bundle branches: in the septum
  - d. Purkinje fibers: in the heart wall to distribute nerve impulses
- 16. a. What is systole? <u>Maximum pressure formed during a ventricular contraction</u>b. What is diastole? <u>Minimum pressure during ventricular relaxation (atrial contraction)</u>
- 17. If the patient has an elevated blood pressure we say they have <u>Hypertension</u>.
- 18. What is the stroke volume? <u>Stroke volume is the volume of blood, in milliliters (ml), pumped</u> out of the heart with each beat
- 19. What is cardiac output? Cardiac output is the volume of blood pumped by the heart per minute the function of heart rate and stroke volume
- 20. a. What vessel carries blood away from the heart? Arteries
  - b. What vessel carries blood to the heart? Veins
  - c. What vessel is responsible for gas and nutrient exchange within each of the body's cells? <u>Capillaries</u>
- 21. Describe each of the following vessels:
  - a. arteries carry blood away from the heart. Thicker to withstand the pressure exerted during systole. All but the pulmonary arteries carry oxygenated blood
  - b. veins <u>carry blood toward the heart. All but the pulmonary veins carry</u> <u>deoxygenated blood. Layers are much thinner, less elastic. A series of</u> <u>internal valves that work against the flow of gravity to prevent reflux</u>.
  - c. capillaries <u>tiny, microscopic vessels. Walls one cell layer thick. Function to transport</u> <u>and diffuse essential materials to and from the body's cells and the blood</u>
- 22. What is a pulse? The pressure of the blood pushing against the wall of an artery as the heart beats during systole.
- 23. Identify the location of the following pulse points:
  - a. What pulse is felt on the upper surface of the foot? Dorsalis pedis
  - b. What pulse is felt in the antecubital space? Brachial

- c. What pulse is felt in the groin? Femoral
- d. What pulse is found in the neck? Carotid
- e. What pulse is found on the wrist side of the arm? Radial
- 24. Answer the following questions about blood pressure.
  - a. What is the first measurement of blood pressure? Systole
  - b. What does it measure? Pressure as the ventricles contract
  - c. What is the second measurement of blood pressure? Diastole
  - d. What does it measure? Pressure remaining in the artery as the ventricles rest
- 26. a. What circulation route takes deoxygenated blood to the lungs where it can pick up oxygen? <u>Pulmonary</u>
  - b. What circulation route takes oxygenated blood through the body? Systemic

# Medical Terminology Worksheet

Please write the meaning of the terms in the right column.

an	
anti	
-apheresis	
-blast	
-crit	
cyt/o	
-cyte	
-emia	
erythr/o	
ferr	
fibr/o	
-gen	
hem/o	
hemat/o	
-ic	
-in	
-is	
kary/o	
leuk/o	
lys/o	
-lysis	
macr/o	
mega	
mon/o	
myel/o	
-ologist	
-ology	
-oma	
-osis	
-penia	
-phage	
-philia	
plasm/o	
-plasty	
-poiesis	
poly	
pro	

Prefixes, Suffixes, and Root Words

reticul/o	
-rrhage	
sepsis	
septic	
-stasis	
thromb/o	
Medical Terms	
anemia	
aplastic	
erythrocyte	
erythropoiesis	
ferrous	
fibrinogen	
fibrinolysis	
hematocrit	
hematocytoblast	
hematologist	
hematology	
hematoma	
hematopoiesis	
hemolytic	
hemophilia	
hemorrhage	
hemostasis	
leukemia	
leukocyte	
leukocytosis	
leukopenia	
macrophage	
megakaryocyte	
monocyte	
myelofibrosis	
plasmapheresis	
polycythemia	
proerythroblast	
reticulocyte	
sepsis	
septicemia	
thrombocyte	

thrombocytopenia	
thrombolysis	
thromboplastin	
thrombosis	
Medical	
Abbreviations	
AIDS	
BP	
CBC	
CO <sub>2</sub>	
CVA	
DVT	
FBS	
GTT	
HBV	
Hct	
Hg	
hgb	
HIB	
HIV	
ml	
mm	
O <sub>2</sub>	
RBC	
S&S	
SOB	
stat	
WBC	
WNL	

# **KEY** - Medical Terminology Worksheet

	with a st
an	
anu	
-blast	developing cell
-Crit	to separate
cyt/o	
-cyte	
-emia	blood condition
erythr/o	red
ferr	iron
fibr/o	fiber
-gen	producing
hem/o	blood
hemat/o	blood
-ic	pertaining to
-in	pertaining to
-is	pertaining to
kary/o	body, nucleus
leuk/o	white
lys/o	destruction of
-lysis	destruction of
macr/o	large
mega	large
mon/o	one
myel/o	bone marrow (also spinal cord)
-ologist	one who studies, specialist
-ology	study of
-oma	tumor, mass
-osis	condition of
-penia	deficiency of
-phage	eating
-philia	love, affection, affinity
plasm/o	plasma
-plastv	(surgical) repair
-poiesis	making of/production of
poly	many
pro	before
reticul/o	netlike
101001/0	

Prefixes, Suffixes, and Root Words

-rrhage	burst forth
sepsis	infection
septic	pathogenic
-stasis	standing still
thromb/o	clot
Medical Terms	
anemia	without blood (generally used to describe a lack of red blood cells)
aplastic	failing to develop into new tissue (Aplastic anemia is a term used to describe when red blood cells are not produced by the bone marrow)
erythrocyte	red (blood) cell
erythropoiesis	production of red (referring to the production of red blood cells)
ferrous	pertaning to iron
fibrinogen	producing fibers (which will be used in the blood clotting process)
fibrinolysis	destruction of fibers
hematocrit	to separate blood
hematocytoblast	blood-developing cell (this is the "stem" cell that is responsible for forming the three types of blood cells)
hematologist	one who specializes in the study of blood
hematology	the study of blood
hematoma	blood tumor or mass (bruise also called ecchymosis)
hematopoiesis	the production of blood
hemolytic	the destruction of blood
hemophilia	pertaining to an affinity or love of blood (has evolved to refer to a number of blood coagulation disorders)
hemorrhage	blood bursting forth
hemostasis	blood standing still (Refers to the stopping of the bleeding)
leukemia	"white blood" (cancer of the blood with many immature white blood cells)
leukocyte	white (blood) cell
leukocytosis	condition of white cells (used to refer to a high number of white blood cells: higher than 10,000 WBC per mm <sup>3</sup> )
leukopenia	deficiency of white cells (used to refer to a low number of white cells; lower than 5,000 WBC per mm <sup>3</sup> )
macrophage	large eater (refers to the white blood cell, the monocyte, that is found in the tissues and is an integral part in the immune response).
megakaryocyte	large, nucleated cell (will break apart to form the platelets or thrombocytes)
monocyte	one cell (refers to a specific type of WBC)

myelofibrosis	a condition of the fibers in the bone marrow (a condition caused when fibrous tissue replaces the bone marrow)
plasmapheresis	removing plasma
polycythemia	blood condition of many cells (refers to an overproduction of all blood cell types)
proerythroblast	developing red cell that comes before
reticulocyte	net cell (refers to one of the stages of red blood cell development)
sepsis	condition of infection
septicemia	condition of infected blood
thrombocyte	clotting cell (platelets)
thrombocytopenia	deficiency of clotting cells
thrombolysis	destruction of a clot
thromboplastin	pertaining to forming a clot
thrombosis	condition of a clot (or clots)
Medical	
Abbreviations	
AIDS	Acquired Immunodeficiency Syndrome
BP	blood pressure
CBC	complete blood count
CO <sub>2</sub>	carbon dioxide
CVA	cerebrovascular accident (a stroke)
DVT	deep vein thrombosis
FBS	fasting blood sugar
GTT	glucose tolerance test
HBV	hepatitis B virus
Hct	hematocrit
Hg	mercury
hgb	hemoglobin
HIB	haemophilus influenzae type B
HIV	human immunodeficiency virus
ml	milliliter
mm	millimeter
O <sub>2</sub>	oxygen
RBC	red blood cell(s)
S&S	signs and symptoms
SOB	shortness of breath
stat	immediately
WBC	white blood cell(s)
WNL	within normal limits

# Cardiovascular System Medical Terminology Worksheet

Please write the meaning of the terms in the right column.

## Prefixes, Suffixes, Root Words

а	
-ac	
-al	
angi/o	
aort/o	
-ar	
arteri/o	
-ary	
ather/o	
atri/o	
bi	
brady	
calc/i	
cardi/o	
clavicul/o	
coronary	
dys	
ech/o	
-ectomy	
electr/o	
-emia	
end/o	
ері	
femor/o	
furc	
-gram	
-graph	
-grapher	
-graphy	
hem/o	
hemat/o	
hepat/o	
homeo	
hyper	
һуро	

inter	
intra	
isch/o	
-itis	
kal/i	
lip/o	
-logy	
medi	
-megaly	
-meter	
my/o	
natri	
-odynia	
-ologist	
-ology	
-oma	
-osis	
-pathy	
-penia	
peri	
phleb/o	
-plasty	
poly	
-rrhexis	
-sclerosis	
-scope	
semi	
sphygm/o	
-stasis	
-stenosis	
stern/o	
steth/o	
-stomy	
sub	
-tachy	
-tension	
thromb/o	
tibi/o	
-tomy	
valve	
vas/o	

ven/o	
ventricle	
Medical Terms	
angiocardiography	
angioma	
angioplasty	
aortogram	
arteriorrhexis	
arteriosclerosis	
atherectomy	
atherosclerosis	
atrioventricular	
bifurcation	
bradycardia	
cardiac	
cardiodynia	
cardiologist	
cardiology	
cardiomegaly	
cardiomyopathy	
coronary	
coronary ischemia	
coronary thrombosis	
echocardiogram	
electrocardiogram	
electrocardiograph	
electrocardiography	
endarterectomy	
endocarditis	
endocardium	
epicardium	
femoral	
homeostasis	
hypercalcemia	
hyperkalemia	
hyperlipidemia high blood levels of fat	
hypernatremia	
hypertension	

hypocalcemia	
hypokalemia	
hyponatremia	
hypotension	
interventricular	
intravenous	
ischemia	
myocarditis	
myocardium	
pericardium	
pericarditis	
pericardiostomy	
phlebitis	
phlebotomy	
stethoscope	
subclavian	
sphygmocardiograph	
sphygmomanometer	
tachycardia	
thrombophlebitis	
thrombosis	
tibial	
valvulitis	
venogram	
Medical Abbreviations	
av	
BP	
CBC	
CPR	
CVA	
DNR	
DVT	
ECG	
EKG	
ER	
ETA	
Hg	

HR	
IV	
К+	
MI	
Na+	
NCR	
Р	
PE	
RBC	
SA	
stat	
TPR	
VS	
VSS	
WBC	

# **KEY** - Cardiovascular System Medical Terminology Worksheet

а	without the absence of
-ac	pertaining to
-al	pertaining to
angi/o	vessel
aort/o	aorta; largest artery
-ar	pertaining to
arteri/o	artery
-ary	pertaining to
ather/o	fatty plaque
atri/o	atrium
bi	two
brady	slow
calc/i	calcium
cardi/o	heart
clavicul/o	clavicle (collarbone)
coronary	circling the heart
dys	bad, painful, difficult
ech/o	reflected sound
-ectomy	removal or excision
electr/o	electricity
-emia	blood condition
end/o	within
ері	on, upon
femor/o	femur
furc	branch; forked
-gram	record a picture
-graph	instrument that records
-grapher	one who records
-graphy	the process of recording a picture
hem/o	blood
hemat/o	blood
hepat/o	liver
homeo	same
hyper	above
һуро	below
inter	between
intra	within
isch/o	deficiency, blockage

# Prefixes, Suffixes, Root Words

-itis	inflammation of
kal/i	potassium
lip/o	fat
-logy	study of
medi	middle
-megaly	enlargement
-meter	instrument that measures
my/o	muscle
natri	sodium
-odynia	pain
-ologist	one who studies, specialist
-ology	study of
-oma	mass, tumor
-osis	condition of
-pathy	disease
-penia	deficiency
peri	around
phleb/o	vein
-plasty	surgical repair
poly	many
-rrhexis	rupture
-sclerosis	hardening
-scope	instrument to view or examine
semi	half
sphygm/o	pulse
-stasis	standing still
-stenosis	narrowing, constriction
stern/o	chest, sternum
steth/o	chest
-stomy	create a new opening
sub	below, under
-tachy	fast, rapid
-tension	pressure
thromb/o	clot
tibi/o	tibia; lower leg bone
-tomy	to cut into, incision
valve	structure to permit one-way flow
vas/o	vessel
ven/o	vein
ventricle	a small cavity

Medical Terms	
angiocardiography	the process of recording pictures (x-rays) of the heart and vessels
angioma	tumor of the vessels
angioplasty	repair of the vessels
aortogram	picture (x-ray) of the aorta
arteriorrhexis	rupture of an artery
arteriosclerosis	hardening of an artery
atherectomy	removal of the fatty plaque
atherosclerosis	condition of hardening (of a blood vessel) due to fatty plaque
atrioventricular	pertaining to the atria and the ventricles
bifurcation	two branches (a blood vessel splits into two blood vessels)
bradycardia	slow heart beat (less than 60 beats per minute)
cardiac	pertaining to the heart
cardiodynia	pain in the heart
cardiologist	a specialist of the heart
cardiology	study of the heart
cardiomegaly	enlargement of the heart
cardiomyopathy	disease of the heart muscle
coronary	circling the heart (also used when referring to a heart attack or MI)
coronary ischemia	lack of blood flow in the heart due to a blockage
coronary thrombosis	condition of a blood clot within the heart's own blood vessels
echocardiogram	using sound waves to visualize the heart
electrocardiogram	recording of the heart's electricity (electrical pattern)
electrocardiograph	machine that records the heart's electricity (electrical pattern)
electrocardiography	the process of recording the heart's electricity (electrical pattern)
endarterectomy	removal from within an artery (used to describe the process of removing fatty plaque from an artery, such as the carotid artery)
endocarditis	inflammation within the heart (the inner lining of the heart).
endocardium	pertaining to the inner layer of the heart
epicardium	pertaining to upon the heart (the outer layer of the heart; also known as the visceral pericardium)
femoral	pertaining to the femur
homeostasis	"standing the same" (the body's ability to keep its internal environment constant)

hypercalcemia	high blood levels of calcium
hyperkalemia	high blood levels of potassium
hyperlipidemia high blood levels of fat	
hypernatremia	high blood levels of sodium
hypertension	high blood pressure
hypocalcemia	low blood levels of calcium
hypokalemia	low blood levels of potassium
hyponatremia	low blood levels of sodium
hypotension	low blood pressure
interventricular	pertaining to between the ventricles
intravenous	pertaining to within the veins
ischemia	deficiency of blood (to a muscle or an organ)
myocarditis	inflammation of the heart muscle
myocardium	pertaining to the heart muscle (the middle layer of the heart, composed of cardiac muscle)
pericardium	around the heart
pericarditis	inflammation around the heart (an inflammation of the membranes surrounding the heart)
pericardiostomy	formation of an opening in the pericardium (for drainage of extra fluid or blood)
phlebitis	inflammation of a vein
phlebotomy	to cut (make an incision) into a vein
stethoscope	instrument used to listen to sounds produced in the body
subclavian	pertaining to below the clavicle (collarbone)
sphygmocardiograph	machine used to record the pulse (usually the radial) with the heartbeat
sphygmomanometer	instrument used to measure the pulse (as in blood pressure)
tachycardia	rapid heartbeat (usually above 100 beats per minute)
thrombophlebitis	inflammation of a vein associated with a clot
thrombosis	condition of clotting
tibial	pertaining to the tibia
valvulitis	inflammation of the valves
venogram	picture (x-ray) of a vein or veins
Medical Abbreviations	
av	atrioventricular
BP	blood pressure
CBC	complete blood count

CPR	cardiopulmonary resuscitation
CVA	cerebrovascular accident
DNR	do not resuscitate
DVT	deep vein thrombosis
ECG	electrocardiogram
EKG	electrocardiogram
ER	emergency room
ETA	estimated time of arrival
Hg	mercury
HR	heart rate
IV	intravenous
К+	potassium
MI	myocardial infarction
Na+	sodium
NCR	no cardiac resuscitation
Р	pulse
PE	pulmonary embolus
RBC	red blood cell
SA	sino-atrial
stat	immediately
TPR	temperature, pulse, respiration
VS	vital signs
VSS	vital signs stable
WBC	white blood count

# Lymphatic and Immune System Terminology

## Course

Medical Terminology

### Unit VI

Lymphatic and Immune System

#### Essential Question

What medical terms are associated with the lymphatic and immune systems

TEKS

130.203 (c) 1(A),(B),(C), (F) 2(B) 4 (A),(B) 5(B),(C),(D),(E)

# Prior Student

Learning Basic medical terminology: roots, prefixes and suffixes

# Estimated time 4 hours

**Rationale** Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other healthcare professionals. They should be able to use terminology related to the lymphatic and immune systems when discussing medications.

# Objectives

Upon completion of this lesson, the student will be able to

- Define and decipher common terms associated with the lymphatic and immune systems
- Identify the basic anatomy of the lymphatic and immune systems
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases which involve the lymphatic and immune systems

# Engage

There are numerous video clips on the Internet that relate to the lymphatic and immune systems. Show one of the video clips on Stem-cell transplants and discuss the advances in the medical treatment that have happened in the past few years.

# Key Points

Ι.

Lymph

- A. A clear, watery fluid
- B. Surrounds the body's cells
- C. Flows in a system of thin-walled lymph vessels that extends throughout the body (lymphatic system)
- D. Has a close relationship to the blood system, but differs from blood
- E. Rich in two types of white blood cells
  - 1. Lymphocytes
  - 2. Monocytes
- F. The liquid part of lymph contains water, salts, sugar, and metabolic waste (urea, creatinine)
- G. Originated from the blood
- H. Has the same fluid that filters out of tiny blood capillaries into the spaces between cells
  - Interstitial fluid passes continuously into specialized, thinwalled vessels called lymph capillaries, which are found coursing through tissue spaces
  - 2. When the fluid is in the lymph capillaries it is called lymph instead of interstitial fluid

- I. Passes through larger lymph vessels and clusters of lymph tissues (lymph nodes)
- J. Finally reaches large lymph vessels in the upper chest
- K. Large lymph vessels empty into the bloodstream
- II. Functions of the Lymphatic System
  - A. The drainage system to transport needed proteins and fluids that have leaked out of the blood capillaries back into the bloodstream via the veins
  - B. Absorbs lipids (fats) from the small intestine and transports them to the bloodstream
  - C. Defends the body against foreign organisms such as bacteria and viruses
  - D. Lymphocytes and monocytes (originating in the bone marrow, lymph nodes, spleen, and thymus gland) protect the body by producing antibodies and mounting a cellular attack on foreign cells and organisms
- III. Lymphatic System
  - A. Lymph capillaries
    - 1. Begin in the spaces around cells throughout the body
    - 2. Thin-walled tubes that carry lymph from the tissue spaces to larger lymph vessels
  - B. Lymph vessels thicker walled and containing valves to help keep lymph flowing in the right direction
  - C. Lymph Nodes
    - 1. Masses of lymph cells and vessels, surrounded by connective tissue
    - 2. Located along the path of the lymph vessels
  - D. Lymph nodes produce lymphocytes. They also filter lymph and trap substances from infections, and inflammatory and cancerous lesions
  - E. Macrophages are located in lymph nodes as well as the spleen, liver, and lungs
    - 1. Swallow (Phagocytose) foreign substances
    - 2. When bacteria are present in lymph nodes that drain a particular area of the body, the nodes become swollen
  - F. B lymphocytes (B cells)
    - 1. Present in the nodes
    - 2. Produce antibodies
  - G. T lymphocytes (T cells)
    - 1. Attack bacteria and foreign cells
    - 2. Recognize a cell surface protein as foreign, attaching to the foreign or cancerous cells
    - 3. Poke "hoses" in them, injecting them with toxic chemicals

- IV. Major sites of lymph node concentration
  - A. Cervical
  - B. Axillary (armpit)
  - C. Mediastinal
  - D. Inguinal (groin)
  - E. Tonsils masses of lymph tissue in the throat near the back of the mouth
  - F. Adenoids enlarged lymph tissue in the part of the throat near the nasopharynx
- V. Lymph Flow
  - A. All lymph vessels lead toward the thoracic cavity
  - B. Empty into two large ducts in the upper chest
    - 1. The right lymphatic duct drains the right side of the head and the chest
    - 2. Thoracic duct drains the lower body and the left side of the head
    - 3. Both ducts carry the lymph into large veins in the neck, where the lymph then enters the bloodstream
- VI. Spleen
  - A. Located in the LUQ of the abdomen, next to the stomach
  - B. Functions
    - 1. Destruction of old erythrocytes by macrophages
    - 2. Filtration of microorganisms
    - 3. Activation of lymphocytes by antigens filtered from the blood
    - 4. Storage of blood, especially erythrocytes and platelets
  - C. Susceptible to injury a sharp blow to the upper abdomen can cause the spleen to rupture
  - D. A ruptured spleen can lead to a massive hemorrhage
    - 1. Immediate surgical removal may be necessary
    - 2. After the spleenectomy, the liver, bone marrow, and lymph nodes take over the functions of the spleen
- VII. The Thymus Gland
  - A. Located in the upper mediastinum, between the lungs
  - B. Composed of nests of lymphoid cells
  - C. Important in the development of an effective immune system in childhood
  - D. In early development, the thymus lymphocytes learn to recognize and accept the body's own antigens
- VIII. Immune System
  - A. Specialized to defend the body against antigens (toxins, bacterial proteins or foreign blood cells)
  - B. Leukocytes (neutrophils, monocytes, macrophages) are in

tissues throughout the body

- C. Lymphoid organs (lymph nodes, spleen, and thymus) produce lymphocytes and antibodies
- IX. Immunity
  - A. The body's ability to resist foreign organisms and poisons that damage tissues and organs
  - B. Natural immunity
    - 1. Protection inherited and present at birth
    - 2. Not dependent on previous contact with infectious agents
- X. Acquired immunity
  - A. The body's ability to form antibiotics
  - B. Example the common cold; the body produces antibodies after exposure to the cold virus
  - C. These antibodies remain in the body to protect against further infection at a later time
  - D. Vaccinations are an acquired immunity
  - E. Sometimes an immediate immunity is needed as in the case of poisons entering the body antitoxins
  - F. Infections of antibodies, such as immunoglobulins, provide protection against disease
  - G. Babies receive maternal antibodies through the placenta or breast milk after birth
- XI. Immunotherapy
  - A. The use of antibodies, B cells, and T cells to treat diseases such as cancer
    - 1. Monoclonal antibodies (MoAb) are antibodies created in a laboratory by special reproductive (cloning) techniques
    - 2. Vaccines are preparations that contain antigens from tumor cells that stimulate T cells to recognize and kill cancer cells
    - 3. Transfer of immune cells in bone marrow transplantation
- XII. Pathology Immunodeficiency
  - A. Severe Combined Immunodeficiency Disease (SCID)
    - 1. Present at birth
    - 2. Infants are born with a deficiency of B cells and T cells, resulting in a lack of immunity
    - 3. The thymus is small and the children have little or no protection against infection
  - B. Acquired Immunodeficiency Syndrome (AIDS)
    - A group of clinical signs and symptoms associated with suppression of the immune system and marked by opportunistic infections, secondary neoplasms, and neurologic problems

- C. Kaposi Sarcoma
  - 1. Malignancy associated with AIDS
  - 2. Dark purplish skin nodules
- XIII. Pathology Hypersensitivity
  - A. Allergy an abnormal hypersensitivity acquired by exposure to an antigen
    - 1. Allergic rhinitis
    - 2. Systemic anaphylaxis
    - 3. Asthma
    - 4. Hives
    - 5. Atopical dermatitis
    - 6. Atopy a hypersensitivity or allergic state (inherited predisposition)
- XIV. Pathology Malignancies
  - A. Lymphoma
    - 1. A malignant tumor of lymph nodes and lymph tissue
    - 2. Many types of lymphoma
  - B. Hodgkin disease a malignant tumor of lymphoid tissue in the spleen and lymph nodes
  - C. Non-Hodgkin lymphoma follicular lymphoma and large cell lymphoma
    - 1. Mostly B cell lymphomas
    - 2. Rarely T cell malignancies
  - D. Multiple Myeloma a malignant tumor of bone marrow cells
     1. A tumor composed of plasma cells
  - E. Waldenström macroglobulinemia a tumor of malignant B cells
    - 1. Causes blood to become thick and impairs blood passage through capillaries in the brain and eyes
  - F. Thymoma -a malignant tumor of the thymus gland
    - 1. Associated with disorders of the immune system that cause muscular weakness or anemia
- XV. Laboratory Tests
  - A. **CD4<sup>+</sup> cell count** measures the number of CD4<sup>+</sup> T cells (helper T cells) in the bloodstream of patients with AIDS
  - B. **ELISA** a screening test to detect anti-HIC antibodies in the blood stream
    - 1. Antibodies to HIV appear within 2 weeks of infection
  - C. Western blot test used to confirm the presence of HIV antibodies
  - D. Immunoelectrophoresis a test that separates immunoglobulins (IgM, IgG, IgE, IgA, IgD)
    - 1. Detects the presence of abnormal levels of antibodies in patients with conditions such as multiple myeloma

E. Viral load test – a measurement of the amount of AIDS virus in the bloodstream

## XVI. Clinical Procedures

A. CT – computed tomography scan

- 1. X-ray imaging produces cross-sectional and other views of anatomic structures
- 2. Shows abnormalities of lymphoid organs

## XVII. Vocabulary

1		
Term	Meaning	
Acquired	Production of antibodies and lymphocytes after	
Immunity	exposure to an antigen	
Adenoids	A mass of lymphatic tissue in the nasopharynx	
Antibody	A protein produced by B cell lymphocytes to destroy	
	antigens	
Antigen	A substance that the body recognizes as foreign;	
	evokes an immune response. Most antigens are	
	proteins or protein fragments found on the surface of	
	bacteria, viruses, or organ transplant tissue cells	
Axillary nodes	Lymph nodes in the armpit (underarm)	
B cell	A lymphocyte that originates in the bone marrow and	
(B lymphocyte)	transforms into a plasma cell to secrete antibodies.	
	The B refers to the bursa of Fabricuius, an organ in	
	birds in which B cell differentiation occurs	
Cervical nodes	Lymph nodes in the neck	
Complement	Proteins in the blood that help antibodies and T cells	
system	kill their target	
Cytokines	Proteins that aid and regulate the immune response.	
	Examples are interferons and interleukins	
Cytotoxic T cell	A T lymphocyte that directly kills foreign cells (CD8+	
	cell or T8 cell)	
Dendritic cell	A specialized macrophage that digests foreign cells	
	and helps B and T cells to mark antigens for	
	destruction	
Helper I cell	A lymphocyte that aids B cells and cytotoxic I cells	
	In recognizing antigens and stimulating antibody	
	production; also called a CD4+ cell or 14 cell	
immunity	I he body's ability to resist foreign organisms and	
	toxins. This includes natural immunity and acquired	
	Immunity	
Immunogiopulins	Antibodies (gamma globulins) such as IgA, IgE, IgG,	
	Igivi, and igu that are secreted by plasma cells in	
have a the second	response to the presence of an antigen	
Immunotherapy	Use of immune cells, antibodies, or vaccines to treat	

	or prevent disease	
Inguinal Nodes	Lymph nodes in the groin region	
Interferons	Proteins (cytokines) secreted by T cells to aid and	
	regulate the immune response	
Interleukins	Proteins (cytokines) that stimulate the growth of B	
	and T lymphocytes	
Interstitial fluid	Fluid in the spaces between cells. This fluid	
	becomes lymph when it enters lymph capillaries	
Lymph	A thin, watery fluid found within lymphatic vessels	
	and collected from tissues throughout the body. Latin	
	lympha means clear spring water	
Lymph capillaries	The tiniest lymphatic vessels	
Lymphoid organs	Lymph nodes, spleen, and thymus gland	
Lymph node	A collection of stationary, solid lymphatic tissue	
	along the lymph vessels	
Lymph vessel	Carrier of lymph throughout the body; lymphatic	
	vessels empty lymph into veins in the upper part of	
	the chest	
Macrophage	A large phagocyte found in lymph nodes and other	
	tissues of the body	
Mediastinal	Lymph nodes in the area between the lungs in the	
nodes	thoracic (chest) cavity	
wonocional	An antibody produced in a laboratory to attack	
antibody	antigens and destroy cells. It is useful in	
	Immunolnerapy	
	Protection that an individual innerits to fight infection	
Plasma cell	A lymphocyte that produces and secretes antibodies.	
Dight Lymphotic	A large lymphotic vegeel in the chect that receives	
	A large lymphalic vessel in the chest that receives	
Spleen	An organ poor the stomach that produces, stores	
Spieen	and eliminates blood cells	
T coll	A lymphocyte that originates in the hone marrow but	
(T lymnhocyte)	matures in the thymus dand: it acts directly on	
(Trymphocyte)	antigens to destroy them or produce chemicals	
	(cytokines) such as interferons and interleukins that	
	are toxic to antigens	
Suppressor T cell	A lymphocyte that inhibits the activity of B and T	
	lymphocytes. Also called a Tred (redulatory T cell)	
Tolerance	The ability of T lymphocytes to recognize and accent	
	the body's own antigens as "self" or friendly. Once	
	tolerance is established, the immune system will not	
	react against the body	
Thoracic duct	The large lymphatic vessel in the chest that receives	
T cell (T lymphocyte) Suppressor T cell Tolerance Thoracic duct	A lymphocyte that originates in the bone marrow but matures in the thymus gland; it acts directly on antigens to destroy them or produce chemicals (cytokines) such as interferons and interleukins that are toxic to antigens A lymphocyte that inhibits the activity of B and T lymphocytes. Also called a Treg (regulatory T cell) The ability of T lymphocytes to recognize and accept the body's own antigens as "self" or friendly. Once tolerance is established, the immune system will not react against the body The large lymphatic vessel in the chest that receives	

	lymph from below the diaphragm and the left side of the body above the diaphragm; it empties the lymph into veins in the upper chest
Thymus gland	Organ in the mediastinum that conditions T lymphocytes to react to foreign cells and aids in the immune response
Tonsils	A mass of lymphatic tissue in the back of the oropharynx
Toxin	Poison; a protein produced by certain bacteria, animals, or plants
Vaccination	Exposure of an individual to a foreign protein (antigen) that provokes an immune response. The response will destroy any cell that possesses the antigen on its surface and will protect against infection. The term comes from the Latin <i>vacca</i> , cow – the first inoculations were given with organisms that caused the disease cowpox to produce immunity to smallpox
Vaccine	Weakened or killed microorganisms, toxins, or other proteins given to induce immunity to infection or disease

# XVIII. Combining Forms

• •			
	Combining Form	Meaning	
	immun/o	Protection	
	lymph/o	Lymph	
	lymphaden/o	Lymph node (gland)	
	splen/o	Spleen	
	thym/o	Thymus gland	
	tox/o	Poison	

# XIX. Prefixes

Prefix	Meaning
ana-	Again, anew
inter-	Between

# XX. Abbreviations

<b>`</b>	Abbreviations	
	Abbreviatio	Meaning
	n	
	AIDS	Acquired Immunodeficiency Syndrome
	CD4 <sup>+</sup> cell	Helper T cell
	CD8 <sup>+</sup> cell	Cytotoxic T cell
	CMV	Cytomegalovirus – causes opportunistic AIDS-related
		infection

Crypto	Cryptococcus – causes opportunist AIDS-related infections
ELISA	Enzyme-linked immunosorbent assay (a test to detect anti-HIV antibodies)
G-CSF	Granulocyte-macrophage Colony-Stimulating Factor – a cytokine secreted by macrophages to promote growth of myeloid progenitor cells and their differentiation to granulocytes
GM-CSF	Granulocyte-Macrophage Colony-Stimulating Factor – a cytokine secreted by macrophages to promote growth of myeloid progenitor cells and their differentiation to granulocytes
HAART	Highly active antiretroviral therapy (used to treat AIDS)
HD	Hodgkin Disease
Histo	Histoplasmosis – a fungal infection seen in AIDS patients
HIV	Human Immunodeficiency Virus (causes AIDS)
HSV	Herpes Simplex Virus
IgA, IgD, IgE, IgG, IgM	Immunoglobulines
IL1 to IL15	Interleukins
KS	Kaposi Sarcoma
MAI	<i>Mycobacterium Avium-Intracellulare</i> complex – a group of pathogens that cause lung and systemic disease in immunocompromised patients
MoAb	Monoclonal Antibody
NHL	Non-Hodgkin Lymphoma
PCP	Pneumocystis pneumonia
PI	Protease Inhibitor
RTI	Reverse Transcriptase Inhibitor
SCID	Severe Combined Immunodeficiency Disease
T4 cell	Helper T cell (lymphocyte)
T8 cell	Cytotoxic T cell (lymphocyte)
Treg	Regulatory I cell (suppressor T cell)
Тохо	Toxoplasmosis – a parasitic infection associated with AIDS

# Activity

I. Make flash cards of lymphatic/immune system terms and practice putting the terms together with prefixes and suffixes to make new terms.

- II. Complete the Lymphatic/Immune System Vocabulary Worksheet.
- III. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan -<u>http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf</u>)
- IV. Research and report on diseases and disorders from the lymphatic/immune system.

### Assessment

Students will complete a written test.

### Materials

Access to the internet to find video on Stem-cell transplant Computer and data projector Disease report rubric Index cards Lymphatic/Immune System vocabulary worksheet and Key Markers

## **Accommodations for Learning Differences**

For reinforcement, the student will practice terms using flash cards of the lymphatic/immune system.

For enrichment, the student will collect information on stem-cell research and then present the pros and cons of the research.

## National and State Education Standards

### **National Healthcare Foundation Standards and Accountability Criteria:** Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

# TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;
- (E) recall directional terms and anatomical planes related to the body structure
- (F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases, and treatments.
130.203 (c) (2) (B) employ increasingly precise language to communicate

- 130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:
  - (A) distinguish medical abbreviations used throughout the health science industry; and
  - (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

130.203(c)(5)(B) translate medical terms to conversational language to facilitate communication;

(C) distinguish medical terminology associated with medical specialists such as geneticist, pathologists, and oncologist

- (D) summarize observations using medical terminology; and
- (E) correctly interpret contents of medical scenarios.

### Texas College and Career Readiness Standards

English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts. *Cross-Disciplinary Standards*,

I. Key Cognitive Skills D. Academic Behavior: 1. Self monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

# Lymphatic/Immune System Vocabulary Worksheet

Term	Meaning
Acquired	
Immunity	
Adenoids	
Antibody	
Antigen	
Axillary nodes	
B cell	
(B lymphocyte)	
Cervical nodes	
Complement	
system	
Cytokines	
Cytotoxic T cell	
Dendritic cell	
Helper T cell	
Immunity	
Immunoglobulins	
Immunotherapy	
Inguinal Nodes	
Interferons	
Interleukins	
Interstitial fluid	
Lymph	

Lymph capillaries	
Lymphoid organs	
Lymph node	
Lymph vessel	
Macrophage	
Mediastinal	
nodes	
Monoclonal	
antibody	
Natural immunity	
Plasma cell	
Right Lymphatic Duct	
Spleen	
T cell (T lymphocyte)	
Suppressor T cell	
Tolerance	
Thoracic duct	
Thymus gland	
Tonsils	
Toxin	
Vaccination	
Vaccine	

# Lymphatic/Immune System Vocabulary – Key

Term	Meaning
Acquired	Production of antibodies and lymphocytes after exposure to an
Immunity	antigen
Adenoids	A mass of lymphatic tissue in the nasopharynx
Antibody	A protein produced by B cell lymphocytes to destroy antigens
Antigen	A substance that the body recognizes as foreign; evokes an immune
	response. Most antigens are proteins or protein fragments found on
	the surface of bacteria, viruses, or organ transplant tissue cells
Axillary nodes	Lymph nodes in the armpit (underarm)
B cell	A lymphocyte that originates in the bone marrow and transforms into
(B lymphocyte)	a plasma cell to secrete antibodies. The B refers to the bursa of
	Fabricuius, an organ in birds in which B cell differentiation occurs
Cervical nodes	Lymph nodes in the neck
Complement	Proteins in the blood that help antibodies and T cells kill their target
system	
Cytokines	Proteins that aid and regulate the immune response. Examples are
	interferons and interleukins
Cytotoxic T cell	A T lymphocyte that directly kills foreign cells (CD8+ cell or T8 cell)
Dendritic cell	A specialized macrophage that digests foreign cells and helps B and
	T cells to mark antigens for destruction
Helper T cell	A lymphocyte that aids B cells and cytotoxic T cells in recognizing
	antigens and stimulating antibody production; also called a CD4+ cell
Immunity	The body's ability to resist foreign organisms and toxins. This
In the second	Includes natural immunity and acquired immunity
Immunoglobulins	Antibodies (gamma globulins) such as IgA, IgE, IgG, IgM, and IgD
	that are secreted by plasma cells in response to the presence of an
Immunothoropy	Antigen
minunomerapy	
Inquinal Nodos	Lymph nodos in the grain ragion
Interferons	Proteins (cytokines) secreted by T cells to aid and regulate the
	immune response
Interleukins	Proteins (cytokines) that stimulate the growth of B and T
Interiouking	lymphocytes
Interstitial fluid	Fluid in the spaces between cells. This fluid becomes lymph when it
	enters lymph capillaries
Lymph	A thin, watery fluid found within lymphatic vessels and collected from
	tissues throughout the body. Latin <i>lympha</i> means clear spring water
Lymph capillaries	The tiniest lymphatic vessels
Lymphoid organs	Lymph nodes, spleen, and thymus gland
Lymph node	A collection of stationary, solid lymphatic tissue along the lymph
	vessels

Lymph vessel	Carrier of lymph throughout the body; lymphatic vessels empty
	lymph into veins in the upper part of the chest
Macrophage	A large phagocyte found in lymph nodes and other tissues of the
	body
Mediastinal	Lymph nodes in the area between the lungs in the thoracic (chest)
nodes	cavity
Monoclonal	An antibody produced in a laboratory to attack antigens and destroy
antibody	cells. It is useful in immunotherapy
Natural immunity	Protection that an individual inherits to fight infection
Plasma cell	A lymphocyte that produces and secretes antibodies. It originates
	from B lymphocytes
Right Lymphatic	A large lymphatic vessel in the chest that receives lymph from the
Duct	upper right part of the body
Spleen	An organ near the stomach that produces, stores, and eliminates
	blood cells
T cell	A lymphocyte that originates in the bone marrow but matures in the
(T lymphocyte)	thymus gland; it acts directly on antigens to destroy them or produce
	chemicals (cytokines) such as interferons and interleukins that are
	toxic to antigens
Suppressor T cell	A lymphocyte that inhibits the activity of B and T lymphocytes. Also
	called a Treg (regulatory T cell)
Tolerance	The ability of T lymphocytes to recognize and accept the body's own
	antigens as "self" or friendly. Once tolerance is established, the
	immune system will not react against the body
Thoracic duct	The large lymphatic vessel in the chest that receives lymph from
	below the diaphragm and the left side of the body above the
	diaphragm; it empties the lymph into veins in the upper chest
I hymus gland	Organ in the mediastinum that conditions 1 lymphocytes to react to
<b>T</b>	foreign cells and aids in the immune response
Tonsiis	A mass of lymphatic tissue in the back of the oropharynx
Toxin	Poison; a protein produced by certain bacteria, animais, or plants
Vaccination	Exposure of an individual to a foreign protein (antigen) that provokes
	an immune response. The response will destroy any cell that
	possesses the antigen on its surface and will protect against
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	inoculations were given with organisms that caused the disease
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	to induce immunity to intection or disease

## Lymphatic/Immune System Combining Forms Worksheet

Combining Form	Meaning
immun/o	
lymph/o	
lymphaden/o	
splen/o	
thym/o	
tox/o	

## Lymphatic/Immune System Prefixes

Prefix	Meaning
ana-	
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# Lymphatic/Immune System Abbreviations

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Crypto	
ELISA	
G-CSF	
GM-CSF	
HAART	
HD	

Histo	
HIV	
HSV	
IgA, IgD, IgE, IgG, IgM	
IL1 to IL15	
KS	
MAI	
MoAb	
NHL	
PCP	
PI	
RTI	
SCID	
T4 cell	
T8 cell	
Treg	
Тохо	

Combining Form	Meaning
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# Lymphatic/Immune System Combining Forms – Key

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Disease Report Template	
Disease	
Alternate Names	
Definition	
Etiology	
Signs & Symptoms	
Diagnostic Tests	
Treatment	
Complications	
Prognosis	
Bibliography	

### Course

Medical Terminology

#### Unit VII

The Respiratory System

### Objectives

Rationale

Upon completion of this lesson, the learner should be able to:

• Define and decipher common terms associated with the respiratory system

Healthcare professionals must have a comprehensive medical vocabulary in

order to communicate effectively with other health professionals. They

should be able to use terminology of the Respiratory System to discuss

- Identify the basic anatomy of the respiratory system
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases which involve the respiratory system

### Engage

Have the students pinch their nostrils closed and seal their lips around a small straw. Ask them to breathe only through the straw for 2-3 minutes. Then ask them to breathe deeply without the obstruction of the straw or occlusion of the nose. Have several students describe the feeling of having no free air flow into and out of their lungs.

### **Key Points**

I. Lungs and Air Passages

common conditions and diseases.

- A. Nose, pharynx, larynx, trachea, bronchi, alveoli and lungs
- B. Responsible for
  - 1. Taking in  $O_2$  (needed by all body cells)
  - 2. Removing CO<sub>2</sub> (metabolic waste product)
- C. Body has 4-6 minute supply of O<sub>2</sub>
- D. Must work continuously or death will occur
- II. Nose
  - A. Has 2 nostrils or nares
    - 1. Openings through which air enters
  - B. Nasal septum
    - 1. Partition or wall of cartilage
    - 2. Divides the nose into 2 hollow spaces called nasal cavities
- **III. Nasal Cavities** 
  - A. Lined with mucous membrane
  - B. Rich blood supply
  - C. As air enters it is warmed, filtered and moistened

# Essential Question

What are the medical terms associated with the Respiratory System?

## TEKS

130.203 (c) (1) (A), (B), (E), 2(B), 4 (A), (B)

#### Prior Student Learning None

### Estimated time

3-5 hours

- D. Mucous also helps trap pathogens and dirt
- E. Cilia: tiny hair-like structures which also trap dirt and pathogens, pushing them toward the esophagus to be swallowed
- F. Olfactory receptors for the sense of smell
- G. Nasolacrimal ducts drain tears from the eye into the nose to provide additional moisture for the air
- IV. Paranasal Sinuses
  - A. Hollow air-containing spaces within the skull
  - B. Cavities in the skull around the nasal area
  - C. Connected to the nasal cavity by short ducts
  - D. Lined with mucous membrane that warms and moistens air
  - E. Provide resonance for the voice
- V. Pharynx
  - A. The throat
  - B. Lies directly behind the nasal cavities
  - C. As air leaves the nose it enters the pharynx
  - D. Has three sections
    - 1. Nasopharynx
      - a. Upper portion behind the nasal cavities
      - b. Contain the pharyngeal tonsils or adenoids (lymphatic tissue) and the auditory (eustachian) tube openings
    - 2. Oropharynx
      - a. Middle section located behind the oral cavity
      - b. Contains the palatine tonsils (two rounded masses of lymphatic tissue)
      - c. Received both air from the nasopharynx and food and air from the mouth
    - 3. Laryngopharynx
      - a. Bottom section of the pharynx
      - b. Branches into the trachea, which carries air to and from the lungs, and the esophagus – the tube that carries food to the stomach
- VI. Epiglottis
  - A. A flap of cartilage attached to the root of the tongue
  - B. Prevents choking or aspiration of food
  - C. Acts as a lid over the opening of the larynx
  - D. During swallowing when food and liquid move through the throat, the epiglottis closes over the larynx
- VII. Larynx
  - A. Voice box
  - B. Lies between the pharynx and trachea
  - C. Has a framework of cartilage commonly called the "Adam's apple"
  - D. Contains two folds called vocal cords

- 1. Opening between the vocal cords is the glottis
- 2. As air leaves the lungs, the vocal cords vibrate and produce sound
- 3. Tongue and lips act on the sound to produce speech
- VIII. Trachea
  - A. Windpipe
  - B. Tube extending from the larynx to the center of the chest (about 4.5" long)
  - C. Carries air between the pharynx and bronchi
  - D. Series of c-shaped cartilages, which are open on the dorsal or back surface, and help keep the trachea open
- IX. Bronchi
  - A. Two divisions of the trachea near the center of the chest
    - 1. Right and left bronchus (singular)
    - 2. Right bronchus is shorter, wider and extends more vertically than the left bronchus
  - B. Each bronchus enters a lung and carries air from the trachea to the lungs
  - C. In the lungs, the bronchi continue to divide into smaller and smaller bronchi
  - **D.** Smaller branches are called **bronchioles**
  - E. Smallest bronchioles, called terminal bronchioles; end in the air sacs called **alveoli**
- X. Alveoli
  - A. Air sacs that resemble a bunch of grapes
  - B. Adult lung contains approximately 300 million alveoli
  - C. Made of one layer of squamous epithelium tissue
  - D. Contains a rich network of blood capillaries
  - E. Capillaries allow  $O^2$  and  $CO_2$  to be exchanged between the blood and the lungs
  - F. Inner surface of alveoli are covered with surfactant
    - 1. Lipid or fatty substance
    - 2. Helps prevent alveoli from collapsing
- XI. Erythrocytes
  - A. Carry oxygen to all parts of the body
  - B. Carries carbon dioxide to the lungs for exhalation
- XII. Lungs
  - A. Organs that contain divisions of the bronchi and alveoli
  - B. Right lung has 3 sections or **lobes**: superior, middle and inferior
  - C. Left lung has only two lobes, superior and inferior
  - D. Left lung is smaller because the heart lies more to the left side of the chest
  - E. Both the lungs are located in the thoracic cavity
  - F. Apex: uppermost part of the lung
  - G. Base: lower part of the lung

- H. Hilum: the midline region in which blood vessels, nerves, lymphatic tissue, and bronchial tubes enter and exit the lung
- I. The lungs extend form the collarbone to the **diaphragm**
- XIII. Diaphragm
  - A. A muscular partition
  - B. Separates the thoracic from the abdominal cavity
  - C. Aids in the process of breathing
    - 1. Contracts
      - a. Moves downward, enlarging the area in the thoracic cavity
      - b. Decreasing internal air pressure, so that air flows into the lungs to equalize the pressure
    - 2. Relaxes
      - a. When the lungs are full, the diaphragm relaxes and elevates
      - b. Makes the area in the thoracic cavity smaller, thus increasing air pressure in the chest
      - c. Air is expelled out of the lungs to equalize pressure
- XIV. Pleura
  - A. Consists of two layers
    - 1. Visceral pleura attached to surface of lung; inner layer closer to the lungs
    - 2. Parietal pleura attached to the chest wall; outer layer, closer to the ribs
  - B. Pleural space
    - 1. Located between the two layers
    - 2. Filled with a thin layer of pleural fluid that lubricates the membranes and prevents friction as the lungs expand during breathing
- XV. Pathway of Air
  - A. Nose
  - B. Nasal cavities and paranasal sinuses
  - C. Pharynx (adenoids and tonsils)
  - D. Larynx (epiglottis)
  - E. Trachea
  - F. Bronchi
  - G. Bronchioles
  - H. Alveoli
  - I. Lung capillaries
- XVI. Ventilation
  - A. Process of breathing
  - B. Respiration
  - C. Two phases
    - 1. Inspiration or inhalation
      - a. Process of breathing in air

- b. Diaphragm contracts and enlarges the thoracic cavity
- 2. Expiration or exhalation
  - a. Process where air leaves the lungs
  - b. Diaphragm and intercostal muscles relax and air is forced out of the lungs
- D. Inspiration + Expiration = Respiration
  - 1. The mechanical process of breathing
  - 2. The exchange of air between the lungs and the external environment
  - 3. Process is controlled by the respiratory center in the medulla oblongata of the brain
- E. Respiration is a Vital Sign
  - 1. Normal adult respiration rate is 12-20 breaths/minute
  - 2. How do we know if a person is breathing? We can see the chest rise and fall
- XVII. Abnormal Breathing
  - A. Dyspnea: difficult or labored breathing
  - B. Apnea: absence of respiration
  - C. Tachypnea: breathing rate above 25/breaths/minute
  - D. Bradypnea: slow respirations, below 10 breaths/minute
  - E. Orthopnea: dyspnea in any position other than sitting erect or standing
  - F. Cyanosis: bluish discoloration of the skin, lips or nail beds as a result of decreased  $O_2$
- XVIII. External Respiration
  - A. Occurs between the outside environment and the capillary blood of the lungs
  - B. Exchange of O<sub>2</sub> and CO<sub>2</sub> between the lungs and bloodstream
  - C. O2 breathed in through the respiratory system, enters the alveoli
    - 1. Concentration of O<sub>2</sub> in the alveoli higher than the concentration in the blood capillaries
    - 2. O<sub>2</sub> leaves the alveoli and enters the capillaries or bloodstream
  - D. CO<sub>2</sub> a metabolic waste product is carried in the bloodstream
    - 1. Concentrations of CO<sub>2</sub> is higher in the capillaries
      - 2. It leaves the capillaries and enters the alveoli
      - 3. Alveoli expel the CO<sub>2</sub> from the body during exhalation
- XIX. Internal respiration
  - A. Exchange of CO<sub>2</sub> and O<sub>2</sub> between the tissue cells and the bloodstream
  - B. O<sub>2</sub> is carried to the tissue cells by the blood
    - 1. Concentrations of O<sub>2</sub> is higher in the blood than in the tissue cells
    - 2. O<sub>2</sub> leaves the blood capillaries and enters tissue cells

- C. Tissue cells use the O<sub>2</sub> and nutrients to produce energy, water and CO<sub>2</sub>, a process called **cellular respiration** 
  - 1. Level of CO<sub>2</sub> is higher in cells
  - 2. CO<sub>2</sub> leaves the cells and enters the blood stream to be transported back to the lungs where external respiration takes place
- XX. Respiration Vocabulary
  - A. Adenoids: lymphatic tissue in the nasopharynx; pharyngeal tonsils
  - B. Alveolus: (singular) air sac in the lung
  - C. Apex of the lung: tip or uppermost portion of the lung
  - D. Apical: pertaining to the apex
  - E. Base: lower portion of the lung
  - F. Basilar: pertaining to the base
  - G. Bronchus (singular) branch of the trachea that is a passageway into the lung
  - H. CO<sub>2</sub>: carbon dioxide, produced by body cells when oxygen and food combine; exhaled through the lungs
  - I. Cilia: thin hairs attached to the mucous membrane epithelium lining of the respiratory tract; clear bacteria and foreign substances from the lung
  - J. Diaphragm: muscle separating the chest and abdomen
  - K. Epiglottis: lid-like piece of cartilage that covers the larynx when we swallow
  - L. Expiration: breathing out (exhalation)
  - M. Hilum: midline region where the bronchi, blood vessels, and nerves enter and exit the lungs
  - N. Inspiration: breathing in (inhalation)
  - O. Larynx: voice box; containing the vocal cords
  - P. Lobe: division of a lung
  - Q. Mediastinum: region between the lungs in the chest cavity
  - R. Nares: openings through the nose carrying air into the nasal cavities
  - S. O<sub>2</sub>: oxygen
  - T. Palatine tonsil: one of a pair of almond-shaped masses of lymphatic tissue in the oropharynx (palatine means pertaining to the roof of the mouth)
  - U. Paranasal sinus: one of the air cavities in the bones near the nose
  - V. Parietal pleura: outer fold of pleura lying closer to the ribs and chest wall
  - W. Pharynx: throat, including the nasopharynx, oropharynx and laryngopharynx
  - X. Pleura: double-folded membrane surrounding each lung
  - Y. Pleural cavity: space between the fold of the pleura
  - Z. Pulmonary parenchyma: essential part of the lung, responsible

for respirations; bronchioles and alveoli

- AA. Respirations: process of moving air into and out of the lungs (breathing)
- BB. Trachea: windpipe
- CC. Visceral pleura: inner fold of pleura lying closer to the lung tissue
- XXI. Abbreviations

Abbreviation	Definition
ABGs	Arterial blood gases
AFB	Acid-fast bacillus (organism that causes
	tuberculosis
ARDS	Acute respiratory distress syndrome – a group
	of signs and symptoms associated with acute
	respiratory failure
BAL	Bronchioalveolar lavage
Bronch	Bronchoscopy
CF	Cystic fibrosis
CO <sub>2</sub>	Carbon dioxide
COPD	Chronic obstructive pulmonary disease
CPAP	Continuous positive airway pressure
CPR	Cardiopulmonary resuscitation
C&S	Culture and sensitivity testing
СТРА	Computed tomography pulmonary angiography
CXR	Chest x-ray
DL <sub>co</sub>	Diffusion capacity of the lung for carbon
	monoxide
DOE	Dyspnea on exertion
DPT	Diphtheria, Pertussis, Tetanus (vaccine)
FEV <sub>1</sub>	Forced expiratory volume in 1 second
FVC	Forced vital capacity – amount of gas that can
	be forcibly and rapidly exhaled after a full
	inspiration
HCO <sub>3</sub>	Bicarbonate- measured in blood to determine
	acidity or alkalinity
ICU	Intensive care unit
	Left lower lobe (of lung)
LUL	Left upper lobe (of lung)
MDI	Metered-dose inhaler
NSCLC	Non-small cell lung cancer
O <sub>2</sub>	Oxygen
OSA	Obstructive sleep apnea
PaCO <sub>2</sub>	Carbon dioxide partial pressure – measure of
	the amount of carbon dioxide in arterial blood
PaO <sub>2</sub>	Oxygen partial pressure – a measure of the
	amount of oxygen in arterial blood

PCP	Pneumocystic pneumonia
PE	Pulmonary embolism
PEP	Positive expiratory pressure – ventilator
	strategy in which patient takes a deep breath,
	and then exhales through a device that resists
	air flow
PEEP	Positive end expiratory pressure (ventilator
	setting in which airway pressure is maintained
	at about atmospheric pressure)
PFTs	Pulmonary function tests
PND	Paroxysmal nocturnal dyspnea
PPD	Purified protein derivative – substance used in
	a tuberculosis test
RDS	Respiratory distress syndrome
RLL	Right lower lobe (of the lung)
RSV	Respiratory syncytial virus
RUL	Right upper lobe (of the lung)
RV	Residual volume – amount of air remaining in
	lungs at the end of maximal expiration
SCLC	Small cell lung cancer
SOB	Shortness of breath
ТВ	Tuberculosis
TLC	Total lung capacity
URI	Upper respiratory infection
V <sub>T</sub>	Tidal volume – amount of air inhaled and
	exhaled during a normal ventilation
VATS	Video-assisted thoracic surgery (thoracoscopy)
VC	Vital capacity – equals inspiratory reserve
	volume plus expiratory reserve volume plus
	tidal volume
V/Q scan	Ventilation-perfusion scan – radioactive test of
	lung ventilation and blood perfusion throughout
	the lung capillaries (ling scan)

### • Suffixes

Suffix	Meaning
-ema	Condition
-osmia	Smell
-pnea	Breathing
-ptysis	Spitting
-sphyxia	Pulse
-thorax	Chest, pleural cavity

## XXII. Combining Forms

Combining form	Meaning

Adenoid/o	Adenoids
Alveoli/o	Alveolus, air sac
Bronchi/o	Bronchus
Bronchiol/o	Bronchiole, small bronchus
Capn/o	Carbon dioxide
Coni/o	Dust
Cyan/o	Blue
Epiglott/o	Epiglottis
Laryng/o	Larynx, voice box
Lob/o	Lobe of the lung
Mediastin/o	Mediastinum
Nas/o	Nose
Orth/o	Straight, upright
Ox/o	Oxygen
Pector/o	Chest
Pharyng/o	Pharynx, throat
Phon/o	Voice
Phren/o	Diaphragm
Pleur/o	Pleura
Pneumon/o	Air, lung
Plumon/o	Lung
Rhin/o	Nose
Sinus/o	Sinus, cavity
Spir/o	Breathing
Tel/o	Complete
Thorac/o	Chest
Tonsil/o	Tonsils
Trache/o	Trachea, windpipe

## XXIII. Diagnostic Terms

Word	Meaning
Auscultation	Listening to sounds within the body (using a
	stethoscope)
Percussion	Tapping on a surface to determine the difference
	in the density of the underlying structure
Pleural rub	Scratchy sound produced by pleural surfaces
	rubbing against each other
Rales (crackles)	Fine crackling sounds heard on auscultation
	(during inhalation) when there is fluid in the alveoli
Rhonchi (singular:	Loud rumbling sounds heard on auscultation of
rhonchus)	bronchi obstructed by sputum.
Sputum	Material expelled from the bronchi, lungs, or upper
	respiratory tract by spitting
Stridor	Strained, high-pitched sound heard on inspiration
	caused by obstruction in the pharynx or larynx

Wheezes	Continuous high-pitched whistling sounds
	produced during breathing

## XXIV. Upper Respiratory Disorders

Croup	Acute viral infection of infants and children with obstruction of the larynx, barking cough, and stridor
Diphtheria	Acute infection of the throat and upper respiratory tract caused by the diphtheria bacterium
Epistaxis	Nosebleed
Pertussis	Whooping cough: highly contagious bacterial infection of the pharynx, larynx, and trachea caused by Bordetella Pertussis

### XXV. Bronchial Disorders

T	
Asthma	Chronic bronchial inflammatory disorder with
	airway obstruction due to bronchial edema and
	constriction with increased mucus production.
Bronchiectasis	Chronic dilation of bronchus secondary to
	infection
Chronic bronchitis	Inflammation of bronchi persisting over a long
	time; type of chronic obstructive pulmonary
	disease
Cystic fibrosis (CF)	Inherited disorder of exocrine glands resulting in
	thick mucus secretions in the respiratory tract that
	do not drain normally

### XXVI. Lung Disorders

Atelectasis	Collapsed lung; incomplete expansion of alveoli
Emphysema	Hyperinflation of air sacs with destruction of
	alveolar walls
Lung cancer	Malignant tumor arising from the lungs and
	bronchi
Pneumoconiosis	Abnormal condition caused by dust in the lungs,
	with chronic inflammation, infection, and bronchitis
Pneumonia	Acute inflammation and infection of alveoli, which
	fill with pus or products of the inflammatory
	reaction
Pulmonary	Large collection of pus (bacterial infection) in the
abscess	lungs
Pulmonary edema	Fluid in the air sacs and bronchioles
Pulmonary	Clot or other material lodges in vessels of the lung
embolism (PE)	
Pulmonary fibrosis	Formation of scar tissue in the connective tissue
	of the lungs
Sarcoidosis	Chronic inflammatory disease in which small

	nodules (granulomas) develop in lungs, lymph nodes, and other organs
Tuberculosis (TB)	Infectious disease caused by Mycobacterium tuberculosis; lungs usually are involved, but any organ in the body may be affected

### XXVII. Pleural Disorders

Mesothelioma	Rare malignant tumor arising in the pleura	
Pleural effusion	Abnormal accumulation of fluid in the pleural	
	space (cavity)	
Pleurisy (pleuritis)	Inflammation of the pleura	
Pneumothorax	Collection of air in the pleural space	

### XXVIII. Asthma

- A. Chronic bronchial inflammatory disorder with airway obstruction due to bronchial edema and constriction with increased mucus production
- B. Usually caused by a sensitively to an allergen such as dust, pollen, animals or foods
- C. Stress, overexertion and infections can also cause an asthma attack
- D. Symptoms
  - 1. Occur when bronchospasms narrow openings of bronchioles, mucus production increases, and edema develops in the mucosal lining
  - 2. Dyspnea and wheezing
  - 3. Coughing with expectoration of sputum
  - 4. Tightness in chest
- E. Triggers
  - 1. Exercise
  - 2. Strong odors
  - 3. Cold air
  - 4. Stress
  - 5. Allergens (dust, pollen, animals, foods)
  - 6. Medications (aspirin, beta-blockers)
- F. Treatment
  - 1. Anti-inflammatory agents inhaled (long-term control with glucocorticoids)
  - 2. Bronchodilators to enlarge the bronchioles
  - 3. Identification and elimination of or desensitization to allergens causing the problem
- XXIX. Chronic Bronchitis
  - A. Inflammation of the bronchi and bronchial tubes persisting over a long time
  - B. Etiological factors: smoking, infection
  - C. Type of COPD

- D. Occurs after frequent attacks of acute bronchitis and long-term exposure to pollutants or smoking
- E. Characterized by chronic inflammation, damaged cilia, and enlarged mucous glands
- F. Symptoms
  - 1. Excessive mucus resulting in productive cough
  - 2. Wheezing and dyspnea
  - 3. Chest pain
  - 4. Prolonged expiration of air
- G. Treatment with antibiotics and bronchodilators and respiratory therapy
- H. There is no cure
- XXX. Chronic Obstructive Pulmonary Disease
  - A. COPD
  - B. Any chronic lung disease that results in obstruction of the airways
  - C. Disorders such as chronic asthma, chronic bronchitis, emphysema and tuberculosis lead to COPD
  - D. Smoking is the primary cause, but allergies and chronic respiratory infections are also factors
- XXXI. Emphysema
  - A. Noninfectious chronic respiratory condition
  - B. Hyperinflation of air sacs with destruction of alveolar walls
  - C. Occurs when the walls of the alveoli deteriorate and lose their elasticity
    - 1. CO<sub>2</sub> remains trapped in the alveoli
    - 2. Poor exchange of gases
  - D. Most common causes are heavy smoking and prolonged exposure to air pollutants
  - E. Form of COPD
- XXXII. Epistaxis
  - A. Nosebleed
  - B. Occurs when capillaries in the nose become congested and bleed
  - C. Causes
    - 1. Irritation of nasal mucous membranes
    - 2. Trauma
    - 3. Vitamin K deficiency
    - 4. Clotting abnormalities
    - 5. Hypertension

### XXXIII. Laryngitis

- A. Inflammation of the larynx and vocal cords
- B. Frequently occurs with other respiratory infections
- C. Symptoms
  - 1. Hoarseness or loss of voice
  - 2. Sore throat

3. Dysphasia or difficulty in swallowing

XXXIV. Pleurisy

- A. Inflammation of pleura or membranes of the lungs
- B. Usually occurs with pneumonia or other infections
- C. Symptoms
  - 1. Sharp stabbing pain while breathing
  - 2. Capitation or grating sounds in the lungs
  - 3. Dyspnea and fever
- XXXV. Pneumonia
  - A. Inflammation and infection of the alveoli with a buildup of fluid or exudates
  - B. Usually caused by a bacteria, virus or chemicals
  - C. Symptoms
    - 1. Chills
      - 2. Fever
      - 3. Chest pain
      - 4. Productive cough
      - 5. Dyspnea
      - 6. Fatigue
- XXXVI. Tuberculosis
  - A. Infectious disease of the lung caused by the bacterium Mycobacterium tuberculosis
  - B. TB
  - C. At times, white blood cells surround invading TB organisms, wall them off, creating a nodule called a tubercle
    - 1. Organisms remain dormant in the tubercle
    - 2. Can cause an active case of TB later if the body's resistance is lowered
  - D. Signs and Symptoms
    - 1. Fatigue, chest pain, fever, night sweats, weight loss
    - 2. Hemoptysis (coughing up blood-tinged sputum)

### XXXVII. Clinical Procedures

Word	Meaning
Chest x-ray (CXR)	Radiographic image of the thoracic cavity (chest film)
Computed	Computer-generated series of x-ray images show
tomography scan of	thoracic structures in cross section and other
the chest (CT)	planes
Magnetic resonance	Magnetic waves create detailed images of the
imaging of the chest (MRI)	chest in frontal, lateral, and cross-sectional planes
Positron emission	Radioactive glucose is injected and images reveal
tomography can of	metabolic activity in the lungs
the lung (PET)	
Ventilation-perfusion	Detection device records radioactivity in the lung

scan (V/Q)	after injection of a radioisotope or inhalation of
	small amount of radioactive gas (xenon)
Bronchoscopy	Fiberoptic endoscope examination of the
	bronchial tubes
Laryngoscopy	Visual examination of the voice box.
Endotracheal	Placement of a tube through the mouth into the
intubation	pharynx, and trachea to establish an airway
Lung biopsy	Removal of lung tissue followed by microscopic
	examination
Mediastinoscopy	Endoscopic visual examination of the
	mediastinum
Pulmonary function	Tests that measure the ventilation mechanics of
test (PFTs)	lung function, lung volume, and capacity of the
	lungs to exchange oxygen and carbon dioxide
	efficiently
Thoracentesis	Surgical puncture to remove fluid from the pleural
	space
Thoracotomy	Large surgical incision of the chest
Thoracoscopy	Visual examination of the chest via small incisions
(thorascopy)	and use of an endoscope
Tracheostomy	Surgical creation of an opening into the trachea
	through the neck
Tuberculin test	Determines past or present tuberculosis infection
	based on a positive skin reaction
Tube thoracotomy	Chest tube is passed through an opening in the
	chest to continuously drain a pleural effusion

### Activity

- I. Make flash cards of respiratory system terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete Respiratory System Terms Worksheet
- III. Complete the Respiratory System Vocabulary Worksheet
- IV. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan -

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf) Research and report on diseases and disorders from the Respiratory system

### Assessment

Successful completion of the activities

### Materials

List of Respiratory Terms Worksheet and Key Index cards

Markers Respiratory Terminology Worksheet Respiratory Terminology Key Straws

### **Accommodations for Learning Differences**

For reinforcement, the student will practice terms using flash cards of the female reproductive system.

For enrichment, the student will research and report on a respiratory disease using multimedia technology.

### **National and State Education Standards**

**National Healthcare Foundation Standards and Accountability Criteria:** Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;
- (E) recall directional terms and anatomical planes related to the body structure

130.203 (c) (2) (B) employ increasingly precise language to communicate

- 130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:
  - (A) distinguish medical abbreviations used throughout the health science industry; and
  - (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports

### **Texas College and Career Readiness Standards**

English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing

**1**. Identify new words and concepts acquired through study of their relationships to other words and concepts

2. Apply knowledge of roots and affixes to infer the meanings of new words

3. Use reference guides to confirm the meanings of new words or concepts. *Cross-Disciplinary Standards* 

I. Key Cognitive Skills D. Academic Behavior: 1. Self-monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work

independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details

# **Respiratory Combining Forms**

Combining form	Meaning
Adenoid/o	Adenoids
Alveoli/o	Alveolus, air sac
Bronchi/o	Bronchus
Bronchiol/o	Bronchiole, small bronchus
Capn/o	Carbon dioxide
Coni/o	Dust
Cyan/o	Blue
Epiglott/o	Epiglottis
Laryng/o	Larynx, voice box
Lob/o	Lobe of the lung
Mediastin/o	Mediastinum
Nas/o	Nose
Orth/o	Straight, upright
Ox/o	Oxygen
Pector/o	Chest
Pharyng/o	Pharynx, throat
Phon/o	Voice
Phren/o	Diaphragm
Pleur/o	Pleura
Pneumon/o	Air, lung
Plumon/o	Lung
Rhin/o	Nose
Sinus/o	Sinus, cavity
Spir/o	Breathing
Tel/o	Complete
Thorac/o	Chest
Tonsil/o	Tonsils
Trache/o	Trachea, windpipe

## Suffixes

Suffix	Meaning
-ema	Condition
-osmia	Smell
-pnea	Breathing
-ptysis	Spitting
-sphyxia	Pulse
-thorax	Chest, pleural cavity

## Abbreviations

Abbreviation	Meaning
ABGs	Arterial blood gases
AFB	Acid-fast bacillus (organism that causes tuberculosis
ARDS	Acute respiratory distress syndrome – a group of signs and
	symptoms associated with acute respiratory failure
BAL	Bronchioalveolar lavage
Bronch	bronchoscopy
CF	Cystic fibrosis
CO <sub>2</sub>	Carbon dioxide
COPD	Chronic obstructive pulmonary disease
CPAP	Continuous positive airway pressure
CPR	Cardiopulmonary resuscitation
C&S	Culture and sensitivity testing
СТРА	Computed tomography pulmonary angiography
CXR	Chest x-ray
DL <sub>co</sub>	Diffusion capacity of the lung for carbon monoxide
DOE	Dyspnea on exertion
DPT	Diphtheria, Pertussis, tetanus (vaccine)
FEV <sub>1</sub>	Forced expiratory volume in 1 second
FVC	Forced vital capacity – amount of gas that can be forcibly and
	rapidly exhaled after a full inspiration
HCO <sub>3</sub>	Bicarbonate- measured in blood to determine acidity or alkalinity
ICU	Intensive care unit
LLL	Left lower lobe (of lung)
LUL	Left upper lobe (of lung)
MDI	Metered-dose inhaler
NSCLC	Non-small cell lung cancer
O <sub>2</sub>	Oxygen
OSA	Obstructive sleep apnea
PaCO <sub>2</sub>	Carbon dioxide partial pressure – measure of the amount of carbon
	dioxide in arterial blood
PaO <sub>2</sub>	Oxygen partial pressure – a measure of the amount of oxygen in
	arterial blood
PCP	Pneumocystic pneumonia
PE	Pulmonary embolism
PEP	Positive expiratory pressure – ventilator strategy in which pt takes a
	deep breath and then exhales through a device that resists air flow
PEEP	Positive end-expiratory pressure (ventilator setting in which airway
	pressure is maintained about atmospheric pressure
PFTs	Pulmonary function tests
PND	Paroxysmal nocturnal Dyspnea
PPD	Purified protein derivative – substance used in a tuberculosis test
RDS	Respiratory distress syndrome
RLL	Right lower lobe (of the lung)

RSV	Respiratory syncytial virus
RUL	Right upper lobe (of the lung)
RV	Residual volume – amount of air remaining in lungs at the end of
	maximal expiration
SCLC	Small cell lung cancer
SOB	Shortness of breath
ТВ	Tuberculosis
TLC	Total lung capacity
URI	Upper respiratory infection
V <sub>T</sub>	Tidal volume – amount of air inhaled and exhaled during a normal
	ventilation
VATS	Video-assisted thoracic surgery (thoracoscopy)
VC	Vital capacity – equals inspiratory reserve volume plus expiratory
	reserve volume plus tidal volume
V/Q scan	Ventilation-perfusion scan – radioactive test of lung ventilation and
	blood perfusion throughout the lung capillaries (lung scan)

## RESPIRATORY SYSTEM TERMINOLOGY Worksheet

Write the meaning of each term in the spaces provided below

Term	Meaning
ox/o ox/i -	oxia oxygen
· · ·	
hypoxemia	
hypoxia, anoxia	
oximeter	
oximetry	
oxyhemoglobin	
-capnia	carbon dioxide
acapnia	
hypercapnia	
hypocapnia	
-pnea	breathing
apnea	
bradypnea	
dyspnea	
eupnea	
hyperpnea	
hypopnea	
orthopnea	
tachypnea	
nas/o	Nose
nasitis	
nasology	
nasopharyngitis	
nasoscope	
rhin/o	nose
rhinitis	
rhinocheiloplasty	
rhinomycosis	
rhinoplasty	
rhinorrhagia	
rhinorrhea	
rhinostenosis	
rhinovirus	

muc/o	mucus
mucopurulent	
mucous	
mucus	
sinus/o	sinus
paranasal sinuses	
sinusitis	
sinusotomy	
pharyng/o	pharynx
laryngopharynx	
nasopharynx	
oropharynx	
pharyngalgia	
pharyngectomy	
pharyngitis	
pharyngomycosis	
pharyngopathy	
pharyngoplasty	
pharyngorrhea	
pharyngoscope	
pharyngotomy	
pharyngoxerosis	
tonsill/o	tonsil
tonsillectomy	
tonsillitis	
tonsillotome	
adenoid/o	adenoids (adeno=gland, oids=like/resembling)
adenoid hypertrophy	
adenoidectomy	
adenoiditis	
adenotome	
laryng/	larynx (voice box)
laryngalgia	
laryngectomee	
laryngectomy	
laryngitis	
laryngocentesis	
laryngomalacia	
laryngopathy	

laryngopiasty	
laryngoplegia	
laryngoscope	
laryngoscopy	
laryngospasm	
laryngostenosis	
laryngoxerosis	
-phonia or voice	pertaining to sound
aphonia	
dysphonia	
epiglott/o	epiglottis
epiglottid/o	
epiglottitis	
epiglottidectomy	
trache/o	trachea
endotracheal	
intubation	
tracheitis	
tracheoplasty	
tracheostenosis	
tracheostoma	
tracheostomy	
tracheotomy	
bronch/i bronch/o	bronchi/bronchiole
bronchiol/o	
bronchiectasis	
bronchiectasis bronchiostenosis	
bronchiectasis bronchiostenosis bronchitis	
bronchiectasis bronchiostenosis bronchitis bronchodilator	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchoedema	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchoedema bronchogenic	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchoedema bronchogenic carcinoma	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchoedema bronchogenic carcinoma bronchomycosis	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchoedema bronchogenic carcinoma bronchomycosis bronchopathy	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchogenic carcinoma bronchomycosis bronchopathy bronchoplasty	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchogenic carcinoma bronchomycosis bronchopathy bronchoplasty bronchopneumonia	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchoedema bronchogenic carcinoma bronchomycosis bronchopathy bronchoplasty bronchopneumonia bronchorrhagia	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchogenic carcinoma bronchomycosis bronchopathy bronchoplasty bronchopneumonia bronchorrhagia bronchorrhea	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchogenic carcinoma bronchogenic carcinoma bronchomycosis bronchopathy bronchoplasty bronchopneumonia bronchorrhagia bronchorrhea bronchoscope	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchoedema bronchogenic carcinoma bronchomycosis bronchopathy bronchoplasty bronchopneumonia bronchorrhagia bronchorrhea bronchoscope bronchoscopy	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchogenic carcinoma bronchogenic carcinoma bronchomycosis bronchopathy bronchoplasty bronchoplasty bronchopneumonia bronchorrhagia bronchorrhea bronchoscope bronchoscopy bronchospasm	
bronchiectasis bronchiostenosis bronchitis bronchodilator bronchoedema bronchogenic carcinoma bronchogenic carcinoma bronchomycosis bronchopathy bronchoplasty bronchoplasty bronchopneumonia bronchorrhagia bronchorrhea bronchorrhea bronchoscope bronchospasm bronchotomy	

alveol/o	alveoli (air sacs in the lungs)
alveolitis	
pulmon/o	lung
pulmonectomy	
pneum/o pneumat/o pneumon/o	lung, air
pneumatic	
pneumohemothorax	
pneumomalacia	
pneumonectomy	
pneumonia	
pneumometer	
thorac/o	thorax (chest)
thoracalgia	
thoracocentesis /	
thoracentesis	
thoracodynia	
thoracotomy	
-thorax	chest
hemothorax	
hydrothorax	
pneumothorax	
pyothorax	
pleur/o	pleura
pleurocentesis	
pleuropexy	
pleuralgia	
pleurisy	
lob/o	lobe
lobectomy	
lobitis	
atel/-	imperfect
atelectasis	

diaphragmat/o	diaphragm (partition)
diaphragmatic	
alaphiaginatio	
phren/	diaphragm
phrenic nerve	
phrenoplegia	
Phrenospasm	
spir/o	breathe
spirometer	
spirometry	
spirograph	
spirogram	
Rela	ated Respiratory Terminology and Diseases
ABG's	
adenoids	
apex	
ARDS	
asbestosis	
asphyxia	
aspirate	
asthma	
atelectasis	
bronchiectasis	
bronchioles	
carina	
Cheyne-Stokes	
chronic bronchitis	
cleft palate	
COPD	
cough	
cricoid cartilage	
croup	
cyanosis	
cystic fibrosis	
diaphragm	
diphtheria	
emphysema	
epiglottis	
epistaxis	
expiration	
FEV1	

FVC
alottis
Heimlich maneuver
hiccup
hilum
hilus
hvaline membrane
disease
influenza
inspiration
IRV
Kussmaul's
palatine tonsils
palliative
parietal pleura
patient rales
PCP
pertussis
pleurisy
pneumonia
pneumothorax
postural drainage
purulent
respiration
rhonchi
RV
snoring
stridor
surfactant
thyroid cartilage
tuberculosis
TIC
Vagus nerve
Valsalva maneuver
VC
Visceral pleura
VT
vawn

## RESPIRATORY SYSTEM TERMINOLOGY Key

Term	Meaning	
ox/o ox/i -	oxia oxygen	
hypoxemia	Insufficient oxygenation of the blood	
hypoxia, anoxia	Oxygen deficiency	
oximeter	An electronic device for determining the oxygen concentration in arterial blood	
oximetry	Use of oximeter to check oxygen saturation of blood	
oxyhemoglobin	Combined form of hemoglobin and oxygen (found in arterial blood)	
-capnia	carbon dioxide	
acapnia	Absence of carbon dioxide	
hypercapnia	Increased amount of carbon dioxide in the blood	
hypocapnia	Decreased amount of carbon dioxide in the blood	
-pnea	breathing	
apnea	Without breath	
bradypnea	Slow breathing	
dyspnea	Difficulty breathing	
eupnea	Normal breathing	
hyperpnea	Increased respiratory rate of breathing	
hypopnea	Decreased respiratory rate of breathing	
orthopnea	Labored breathing while lying flat	
tachypnea	Rapid breathing	
nas/o	nose	
nasitis	Inflammation of the nose	
nasology	Study of the nose	
nasopharyngitis	Inflammation of the nasopharynx	
nasoscope	Instrument for examination of the nasal cavity	
rhin/o	nose	
rhinitis	Inflammation of the nasal mucosa	
rhinocheiloplasty	Plastic surgery of nose and upper lip	
rhinomycosis	Fungi in the mucus membrane of the nose	
rhinoplasty	Repair of the nose	
rhinorrhagia	Epistaxis (bleeding of the nose)	
rhinorrhea	Thin watery discharge from the nose	
rhinostenosis	Obstruction of the nasal passages	
rhinovirus	Virus that caused the common cold	
---------------------	---	--
muc/o	mucus	
mucopurulent	Mucus and pus	
mucous	Having the nature of or resembling mucous; secreting mucus	
mucus	Viscid fluid secreted	
sinus/o	sinus	
paranasal sinuses	Assessor nasal sinuses	
sinusitis	Inflammation of a sinus	
sinusotomy	The incising of a sinus	
pharyng/o	pharynx	
laryngopharynx	The lower part of the pharynx	
nasopharynx	The part of the pharynx situated above the soft palate	
oropharynx	The central portion of the pharynx lying in the middle of the soft palate	
pharvngalgia	Pain in the pharvnx	
pharyngectomy	Partial excision of the pharynx to remove growths	
pharyngitis	Inflammation of the mucous membranes and lymphoid tissues of pharynx	
pharyngomycosis	Disease of the pharynx caused by fungi	
pharyngopathy	Any disorder of the pharvnx	
pharyngoplasty	Reparative surgery of the pharynx	
pharyngorrhea	Discharge of mucous from the pharvnx	
pharyngoscope	An instrument for visual examination of the pharvnx	
pharyngotomy	Incision of the pharvnx	
pharyngoxerosis	Dryness of the pharynx	
tonsill/o	tonsil	
tonsillectomy	Incision of the tonsils	
tonsillitis	Inflammation of a tonsil or tonsils	
tonsillotome	A surgical instrument used in tonsillectomy	
adenoid/o	adenoids (adeno=gland, oids=like/resembling)	
adenoid hypertrophy	Enlargement of the pharyngeal tonsil	
adenoidectomy	Excision of the adenoids	
adenoiditis	Inflammation of adenoid tissue	
adenotome	Device for excising a gland	
laryng/	larynx (voice box)	
laryngalgia	Laryngeal pain	
laryngectomee	An individual whose larynx has been removed	
laryngectomy	Removal of part of the larynx	
laryngitis	Inflammation of larynx	
laryngocentesis	Incision/puncture of larynx	

laryngomalacia	Softening of the tissue of the larynx
laryngopathy	Any disease of the larynx
laryngoplasty	Plastic reparative surgery of larynx
laryngoplegia	Paralysis of laryngeal muscles
laryngoscope	Instrument consisting a blade and light to examine larynx
laryngoscopy	Visual examination of interior larynx
laryngospasm	Spasm of larynx muscles
laryngostenosis	Structure of the larynx
laryngoxerosis	Abnormal dryness of larynx
-phonia or voice	pertaining to sound
aphonia	Loss of speech
aysphonia	Difficulty speaking: hoarse
epiglott/o	epiglottis
epiglottid/o	
epiglottitis	Inflammation of the epiglottis
epiglottidectomy	Excision of the epiglottis
trache/o	trachea
andatraahaal	Discoment of a tube through the mouth into the phonymy longry
intubation	and the treehee to establish on sinuou
	Inflommation of traches
tracheoplacty	Surgical repair of the traches
tracheoptoposio	Constriction or perrowing of the lumon of the traches
tracheostema	Opening into the traches via the pack
tracheostomy	The surgical experies of the traches to provide and secure and
liacheosioniy	
tracheotomy	The surgical opening of the trachea to provide and secure an
lacheolomy	open airway
bronch/i bronch/o	bronchi/bronchiole
bronchiol/o	
bronchiectasis	Chronic dilation of bronchus or bronchi
bronchiostenosis	Narrowing of bronchial tubes
bronchitis	Inflammation of the mucous membranes of the bronchial airways
bronchodilator	A drug that expands the bronchi by releasing bronchial muscles
bronchoedema	Edematous swelling of the mucous of the bronchial tubes
bronchogenic	Cancer in bronchus
carcinoma	
bronchomycosis	Any fungal infection of the bronchi or bronchial tubes
bronchopathy	Any pathetical condition involving the bronchi or bronchioles
bronchoplasty	Surgical repair of bronchial defect
bronchopneumonia	A type of pneumonia marked by scattered consolidation
bronchorrhagia	A bronchial hemorrhage
bronchorrhea	An abnormal secretion from the bronchial mucous membranes
bronchoscope	An endoscope designed to pass through the trachea for visual

	inspection	
bronchoscopy	Examination of the bronchi through a bronchoscope	
bronchospasm	An abnormal narrowing with partial obstruction of lumen of the	
	bronchi	
bronchotomy	Surgical incision of a bronchus, larynx, or trachea	
alveol/o	alveoli (air sacs in the lungs)	
alveolitis	Inflammation of the alveoli	
pulmon/o	lung	
pulmonectomy	Removal of all or part of the lung's tissue	
pneum/o pneumat/o	lung, air	
pneumon/o		
pneumatic	Concertning gas or air	
pneumohemothorax	Gas or air and blood collected in the pleural cavity	
pneumomalacia	Abnormal softening of lungs	
pneumonectomy	Excision of the lung	
pneumonia	Inflammation of the lungs	
pneumometer	Instrument for measuring the volume of air moved in and out of	
	the lungs during respiration	
thorac/o	thorax (chest)	
thoracalgia	Thoracic pain	
thoracocentesis/	Surgical puncture of chest wall to remove fluids	
thoracentesis		
thoracodynia	Pain in the thorax	
thoracotomy	Surgical incision of the chest wall	
-thorax	chest	
hemothorax	Blood or bloody fluid in the pleural cavity	
hydrothorax	Noninflammatory collection of fluid in the pleural cavity	
Pneumothorax	Air or gas in pleural cavity	
Pyothorax	Pus in the pleural cavity	
pleur/o	pleura	
pleurocentesis	thoracentesis	
pleuropexy	fixation of the pleura	
pleuralgia	Pain in pleura or on the side	
pleurisy		
proundy	Inflammation of the pleura	
lob/o	Inflammation of the pleura lobe	
lobectomy	Inflammation of the pleura lobe Surgical removal of a lobe of any organ or gland	
lobectomy	Inflammation of the pleura Iobe Surgical removal of a lobe of any organ or gland Inflammation of the lobe	

atel/-	imperfect
atelectasis	Collapsed or airless condition of the lungs
diaphragmat/o diaphragm/o	diaphragm (partition)
diaphragmatic	Pertaining to the diaphragm
phren/	diaphragm
phrenic nerve	Nerve passing through the diaphragm
phrenoplegia	Pain in the diaphragm
phrenospasm	Spasm of the diaphragm
spir/o	breathe
spirometer	An apparatus used to measure lung volumes and airflow
spirometry	Measurement of air flow and lung volumes
spirograph	Graphic record of respiratory movements
spirogram	Record made by spirograph

## Related Respiratory Terminology and Diseases:

Arterial blood gas
Pharyngeal tonsils
Tip of uppermost portion if the lung
Acute respiratory distress syndrome
Asbestos particles accumulated in the lungs
Condition caused by insufficient intake of oxygen
To draw in or out by suction
Disease caused by increase responsiveness of the trachea
bronchia to various stimuli
Collapsed lung
Chronic dilation of a bronchus secondary to infection
The smallest divisions of the bronchial tubes
A structure a projecting central ridge
Breathing pattern marled by a period of apnea lasting 10 to 60
sec.
Inflammation of bronchi persisting over a long time
Divided roof of the mouth
Chronis Obstructive Pulmonary disease
Forceful and sometimes violent expiratory effort
C-shaped rings of cartilage separated by fibrous connected tissue
Active viral infection of infants and children with barking cough
and stridor

cyanosis	Blue, gray, slate or dark purple discoloration of the skin
cystic fibrosis	C F; inherited disorder of exocrine glands resulting in thick mucus
	secretions in the respiratory tract that do not drain normally
diaphragm	Muscle separating the chest and abdomen
diphtheria	An acute infection of the upper respiratory tract
emphysema	Chronic pulmonary disease; loss of the normal elastic properties
	of the lung; pathological distention of interstitial tissue by gas or air
epiglottis	Lid-like piece of cartilage that covers the larynx during swallowing
epistaxis	Hemorrhage from the nose
expiration	Expulsion of air from the lungs in breathing
FEV <sub>1</sub>	Forced expiratory volume in the first second of respiration
FVC	Forced tidal capacity: amount of gas that can be forcibly and
	rapidly exhaled after a full inspiration
glottis	Slit-like opening to the larynx
Heimlich maneuver	Artificial cough
hiccup	Spasmodic periodic closure of the glottis
hilum	Midline region of the lung where the bronchi, blood vessels, &
	nerves enter/exit lungs
hilus	Hilum
hvaline membrane	Respiratory distress syndrome of the new born
disease	
influenza	An acute contagious respiratory infection
inspiration	Drawing air into lungs
IRV	Inspiratory reserve volume
Kussmaul's	Very deep gasping type respiration associated with diabetic
	acidosis and coma
Legionnaires' Disease	A severe/ fatal disease characterized by pneumonia
Palatine tonsils	In the oropharynx, two hundred masses of lymphatic tissue
palliative	Relieving symptoms, but no curing of the disease
parietal pleura	Outer fold of pleura lying closer to the lung tissue
patent rales	Cracking sound heard on auscultation
PCP	Pneumocystic carinii pneumonia: a type of pneumonia seen in
	AIDS patients
pertussis	Whooping cough, highly contagious
pleurisy	Inflammation of the pleura
pneumonia	Acute inflammation and infection of alveoli
pneumothorax	Collection of air in the pleural space
postural drainage	Passive airway clearance technique
purulent	Containing pus
respiration	The interchange of gases between an organism & medium in
	which lives
rhonchi	Wheezing, snoring, or squeaking sound heard during
	auscultation

RV	Residual volume; amount of air remaining in lungs at the end
	of maximal expiration
snoring	Noise produced while breathing through the mouth during sleep
stridor	High pitched harsh sound occurring during inspiration
surfactant	A lipoprotein secreted by alveolar cells, helps keep alveoli from
	collapsing; surface active agent that lowers surface tension
thyroid cartilage	Principal cartilage of the larynx
tuberculosis	Infectious disease caused by mycobacterium tuberculosis
TLC	Total lung capacity
uvula	Free edge of the soft palate that hangs at the back of the throat
Vagus nerve	10 <sup>th</sup> cranial nerve, has branches to many organs
Valsalva maneuver	An attempt to forcibly exhale the glottis, nose, and mouth closed
VC	Vital capacity; equals inspiratory reserve volume plus expiratory
	reserve volume plus tidal volume
visceral pleura	Inner fold of pleura lying closer to the lung tissue
VT	Tidal volume; amount of air inhaled and exhaled during a normal
	ventilation
yawn	Opening the mouth widely and involuntarily to take a deep
	breath

## Respiratory Diagnostic Terms Worksheet

Write the meaning of each term in the spaces provided below

Word	Meaning
Auscultation	
Percussion	
Pleural rub	
Rales (crackles)	
Rhonchi (singular:	
rhonchus)	
Sputum	
Stridor	
Wheezes	

## **Upper Respiratory Disorders**

Word	Meaning	
Croup		
Diphtheria		
Epistaxis		
Pertussis		

### **Bronchial Disorders**

Word	Meaning
Asthma	
Bronchiectasis	
Chronic bronchitis	
Cystic fibrosis (CF)	

## Lung Disorders

Word	Meaning
Atelectasis	
Emphysema	
Lung cancer	
Pneumoconiosis	
Pneumonia	
Pulmonary abscess	
Pulmonary edema	
Pulmonary embolism	
(PE)	
Pulmonary fibrosis	
Sarcoidosis	
Tuberculosis (TB)	

## **Pleural Disorders**

Word	Meaning
Mesothelioma	
Pleural effusion	
Pleurisy (pleuritis)	
Pneumothorax	

## **Clinical Procedures**

Word	Meaning
Chest x-ray (CXR)	
Computed	
tomography scan of	
the chest (CT)	
Magnetic resonance	
imaging of the chest	
(MRI)	
Positron emission	
tomography can of	
the lung (PET)	
Ventilation-perfusion	
scan (V/Q)	
Bronchoscopy	
Laryngoscopy	
Endotracheal	
intubation	
Lung biopsy	
Mediastinoscopy	
Pulmonary function	
test (PFTs)	
Thoracentesis	
Thoracotomy	
Thoracoscopy	
(thorascopy)	
Tracheostomy	
Tuberculin test	
Tube thoracostomy	

# **Respiratory Diagnostic Terms - Key**

Word	Meaning
Auscultation	Listening to sounds within the body (using a stethoscope)
Percussion	Tapping on a surface to determine the difference in the density of
	the underlying structures
Pleural rub	Scratchy sound produced by pleural surfaces rubbing against each
	other
Rales (crackles)	Fine crackling sounds heard on auscultation (during inhalation)
	when there is fluid in the alveoli
Rhonchi (singular:	Loud rumbling sounds heard on auscultation of bronchi obstructed
rhonchus)	by sputum
Sputum	Material expelled from the bronchi, lungs, or upper respiratory tract
	by spitting
Stridor	Strained, high-pitched sound heard on inspiration caused by
	obstruction in the pharynx or larynx
Wheezes	Continuous high-pitched whistling sounds produced during
	breathing

## **Upper Respiratory Disorders**

Word	Meaning
Croup	Acute viral infection of infants and children with obstruction of the
	larynx, barking cough, and stridor
Diphtheria	Acute infection of the throat and upper respiratory tract caused by
	the diphtheria bacterium
Epistaxis	Nosebleed
Pertussis	Whooping cough; highly contagious bacterial infection of the
	pharynx, larynx, and trachea caused by Bordetella pertussis

## **Bronchial Disorders**

Word	Meaning
Asthma	Chronic bronchial inflammatory disorder with airway obstruction
	due to bronchial edema and constriction, and increased mucus
	production
Bronchiectasis	Chronic dilation of a bronchus secondary to infection
Chronic bronchitis	Inflammation of bronchi persisting over a long time; type of chronic
	obstructive pulmonary disease
Cystic fibrosis (CF)	Inherited disorder of exocrine glands resulting in thick mucous
	secretions in the respiratory tract that do not drain normally

## Lung Disorders

Word	Meaning
Atelectasis	Collapsed lung; incomplete expansion of alveoli
Emphysema	Hyperinflation of air sacs with destruction of alveolar walls
Lung cancer	Malignant tumor arising from the lungs and bronchi

Pneumoconiosis	Abnormal condition caused by dust in the lungs, with chronic
	inflammation, infection, and bronchitis
Pneumonia	Acute inflammation and infection of alveoli, which fill with pus or
	products of the inflammatory reaction
Pulmonary abscess	Large collection of pus (bacterial infection) in the lungs
Pulmonary edema	Fluid in the air sacs and bronchioles
Pulmonary embolism	Clot or other material lodges in vessels of the lung
(PE)	
Pulmonary fibrosis	Formation of scar tissue in the connective tissue of the lungs
Sarcoidosis	Chronic inflammatory disease in which small nodules (granulomas)
	develop in lungs, lymph nodes, and other organs
Tuberculosis (TB)	Infectious disease caused by Mycobacterium tuberculosis; lungs
	usually are involved, but any organ in the body may be affected

## **Pleural Disorders**

Word	Meaning
Mesothelioma	Rare malignant tumor arising in the pleura
Pleural effusion	Abnormal accumulation of fluid in the pleural space (cavity)
Pleurisy (pleuritis)	Inflammation of the pleura
Pneumothorax	Collection of air in the pleural space

# **Clinical Procedures**

Word	Meaning
Chest x-ray (CXR)	Radiographic image of the thoracic cavity (chest film)
Computed	Computer-generated series of x-ray images show thoracic
tomography scan of	structures in cross section and other planes
the chest (CT)	
Magnetic resonance	Magnetic waves create detailed images of the chest in frontal,
imaging of the chest	lateral, and cross-sectional planes
(MRI)	
Positron emission	Radioactive glucose is injected and images reveal metabolic
tomography scan of	activity in the lungs
the lung (PET)	
Ventilation-perfusion	Detection device records radioactivity in the lung after injection of a
scan (V/Q)	radioisotope or inhalation of small amount of radioactive gas
	(xenon)
Bronchoscopy	Fiberoptic endoscope examination of the bronchial tubes
Laryngoscopy	Visual examination of the voice box.
Endotracheal	Placement of a tube through the mouth into the pharynx, and
intubation	trachea to establish an airway
Lung biopsy	Removal of lung tissue followed by microscopic examination
Mediastinoscopy	Endoscopic visual examination of the mediastinum
Pulmonary function	Tests that measure the ventilation mechanics of the lungs function,
test (PFTs)	lung volume, and capacity of the lungs to exchange oxygen and
	carbon dioxide efficiently

Thoracentesis	Surgical puncture to remove fluid from the pleural space
Thoracotomy	Large surgical incision of the chest
Thoracoscopy	Visual examination of the chest via small incisions and use of an
(thorascopy)	endoscope
Tracheostomy	Surgical creation of an opening into the trachea through the neck
Tuberculin test	Determines past or present tuberculosis infection based on a
	positive skin reaction
Tube thoracostomy	Chest tube is passed through an opening in the chest to
	continuously drain a pleural effusion

# Let's Eat! – The Gastrointestinal System

#### Course

Medical Terminology

#### Unit VIII

The Digestive System

#### Essential Question

What medical terms are associated with the gastrointestinal system?

## TEKS

130.203 (c) (1) (A), (C), (F) (2)(A),(B) (3) (A), (B), (C) (4) (A), (B)

#### Prior Student Learning

A basic understanding of medical roots, prefixes, and suffixes

#### Estimated time

2 hours

### Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use the terminology of the gastrointestinal system to discuss common conditions and diseases.

## Objectives

Upon completion of this lesson, the learner should be able to:

- Define and decipher common terms associated with the digestive system
- Identify the basic anatomy of the digestive system
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases which involve the digestive system

## Engage

Have students measure 23 feet on your classroom floor or in the hallway this is the approximate length of the intestinal tract. Ask if they can name any of the organs or body parts that make up the 23 feet.

## Key Points

- I. Gastrointestinal System
  - A. "GI" system
  - B. Alimentary or digestive tract
  - C. Begins at the mouth and ends at the anus
- II. Functions
  - A. Carrying food for digestion
  - B. Preparing food for absorption
  - C. Transporting waste products for elimination

## III. The Journey

- A. Digestion begins in the mouth
  - 1. Food is put in the mouth
  - 2. It is broken down mechanically and chemically
    - a. Chewing (*mastication*)
    - b. Digestive enzymes help speed up the chemical reaction
    - Proteins break down into amino acids, complex sugars are reduced to simple sugars, and large fat molecules are broken down into *fatty acids* and *triglycerides*
  - 3. Absorption

- a. Takes place when digested food is absorbed into the blood stream
- b. It goes through the walls of the small intestine
- c. Fatty acids and triglycerides are absorbed through the wall of the small intestine
- 4. Elimination
  - a. Solid waste materials that cannot be absorbed into the bloodstream are passed out of the body
  - b. Feces collects in the large bowel and exits through the anus
- IV. Mouth
  - A. Oral cavity
  - B. Lips provide the opening
  - C. Cheeks form the walls
  - D. *Hard palate* roof of the mouth
  - E. Muscular soft palate
    - 1. Lies posterior to the hard palate
    - 2. Separates the mouth from the throat
  - F. *Pharynx* the throat
  - G. Rugae
    - 1. Irregular ridges in the mucous membranes
    - 2. Cover the anterior portion of the hard palate
  - H. Uvula
    - 1. Hangs from the soft palate
    - 2. Means "little grape"
    - 3. Aid the production of sounds and speech
  - I. Tongue
    - 1. Extends across the floor of the oral cavity
    - 2. Attached by muscles to the lower jaw
    - 3. Moves food around during chewing (*mastication*) and swallowing (*deglutition*)
  - J. Tonsils
    - 1. Masses of lymphatic tissue
    - 2. Located in depressions of the mucous membranes in the walls of the pharynx
    - Act as filters to protect the body from the invasion of germs
    - 4. Produce *lymphocytes* (white blood cells which fight disease)
  - K. Gums
    - 1. Made of fleshy tissue
    - 2. Surround the sockets in which the teeth are found
  - L. Teeth
    - 1. 32 permanent teeth in the entire oral cavity incisors, canines, premolars/molars, cuspids/bicuspids
    - 2. Structure of a tooth:

- a. Crown above the gum
- b. Root fits into the socket of the alveolar process of either the upper or lower jaw
- c. Enamel
  - i. Outermost protective layer of the crown
  - ii. Dense, hard, white substance
  - iii. The hardest substance in the body
- d. Dentin
  - i. Layer underneath the enamel
  - ii. Extends throughout the crown
  - iii. Is the main bulk of the tooth
  - iv. Yellowish in color
  - v. Composed of body tissue which is softer than enamel
- e. Cementum
  - i. Protective and supportive layer
  - ii. Covers the dentin in the root
- f. Periodontal membrane
  - i. Surrounds the cementum
  - ii. Holds the tooth in place in the tooth socket
- g. Pulp
  - i. Delicate layer in the center of the tooth
  - ii. Underneath the dentin
  - iii. Also called the *root canal*
  - iv. Contains blood vessels, nerve endings, connective tissue, and lymph vessels
- M. Three pairs of salivary glands
  - 1. Produce a fluid called saliva which contains digestive enzymes
  - 2. Parotid gland, submandibular, and sublingual glands all produce saliva
- V. Pharynx
  - A. Throat
  - B. Food passes from the mouth to the pharynx
  - C. Muscular tube lined with a mucous membrane
  - D. Common passageway for air and food
  - E. Epiglottis covers the opening to the larynx and prevents food from entering the windpipe (trachea) during swallowing
- VI. Esophagus
  - A. 9-10 inch muscular tube
  - B. Extends from the pharynx to the stomach
  - C. Aids in swallowing
  - D. Peristalsis involuntary, progressive, wavelike contraction which moves food along the alimentary tract

- VII. Stomach
  - A. Composed of
    - 1. Fundus top portion
    - 2. Body middle portion
    - 3. Antrum lower portion
  - B. Openings into and from the stomach are controlled by sphincters
    - 1. Cardiac sphincter
      - a. Relaxes and contracts to move food from the esophagus into the stomach
      - b. Found at the top of the stomach, where the esophagus meets the stomach
    - 2. Pyloric sphincter
      - a. Allows food to leave the stomach when it has been sufficiently digested
      - b. Found at the end of the stomach
  - C. Rugae
    - 1. Line the stomach
    - 2. Irregular ridges in the mucous membranes
- VIII. Small intestine
  - A. Extends from the pyloric sphincter to the first part of the large intestine
  - B. 20 feet long
  - C. Lined with villi
    - 1. Tiny microscopic projections
    - 2. Completely digested nutrients pass through the tiny capillaries of the villi and enter the blood stream
  - D. Three parts
    - 1. Duodenum
      - a. 1 foot long
      - b. Duodenum is from the Latin word *duodeni* meaning "twelve inch"
      - c. Receives food from the stomach
      - d. Receives bile from the liver and gallbladder
      - e. Receives pancreatic juice from the pancreas
      - f. Enzymes and bile help digest food
      - 2. Jejunum
        - a. 8 feet long
        - b. Connects with the 3<sup>rd</sup> section of the small intestine
        - c. Jejunum is from the Latin jejunas meaning "empty"
      - 3. Ileum
        - a. 11 feet long
        - b. Attached to the first part of the large intestine
        - c. Ileum is from the Greek cilein meaning "to roll"
- IX. Large intestine

- A. Extends from the ileum to the anus
- B. Four parts
  - 1. Cecum
    - a. A pouch on the right side which is connected to the ileum by the *ileocecal sphincter*
    - b. Vermiform appendix hangs from the cecum
      - i. Appendix
        - ii. Only causes a problem when infected
  - 2. Colon
    - a. 5 feet long
    - b. 3 divisions
      - i. Ascending colon extends from the cecum to the undersurface of the liver
      - Transverse colon –passes horizontally to the left toward the spleen, and then turns downward
      - iii. Descending colon the downward portion of the colon
  - 3. Sigmoid colon
    - a. S-shaped
    - b. Distal end of the descending colon
    - c. Leads into the rectum
  - 4. Rectum
    - a. Terminates in the lower opening of the gastrointestinal tract
    - b. Anus opening to the outside world (the "exit")
- X. Liver
  - A. Food does not pass through the liver
  - B. Located in the right upper quadrant (RUQ) of the abdomen
  - C. Manufactures bile
  - D. Bile
    - 1. Has a detergent-like effect on fats in the duodenum
    - 2. It breaks apart large fat globules so that enzymes from the pancreas can digest the fats this is called *emulsification*
    - 3. Contains
      - a. cholesterol
      - b. Bile acids
      - c. Bilirubin a waste
    - 4. Product of hemoglobin destruction
    - 5. Continuously release from the liver
    - 6. Travels down the hepatic duct to the cystic duct, which leads to the gallbladder
  - E. Combines bilirubin with bile and both are secreted into the duodenum, eventually to leave the body as feces
  - F. Functions

- 1. Keeps the amount of glucose in the blood at a normal level
- Removes excess glucose from the bloodstream and stores it as glycogen (starch) – this is called glycogenesis
- 3. When the blood sugar level is low, it converts the glycogen into glucose
- 4. Converts proteins and fats into glucose this is called *gluconeogenesis*
- 5. Manufactures some blood proteins
- 6. Destruction of old erythrocytes and release of bilirubin
- 7. Removal of poisons from the blood

#### XI. Gallbladder

- A. Pear-shaped sac under the liver
- B. Stores and concentrates the bile for later use

#### XII. Pancreas

- A. An exocrine gland
- B. Produces pancreatic juices filled with enzymes (amylase and lipase) to digest food
- C. An endocrine gland secreting into the bloodstream
- D. Secretes insulin
  - 1. Insulin is needed to help release sugar from the blood to be used by the cells of the body

#### XIII. Gastrointestinal root words

Root Word	What it means
(Combining forms)	
abdomin/o-	abdomen
amyl/o	starch
an/o	anus
antr/o-	relationship to an antrum
appendic/o	appendix
-ase	enzyme
bilirubin/o	bilirubin
bucc/o	cheek (facial)
cec/o	cecum
celi/o	belly, abdomen
cheiol/o	saliva
chol/e, bil/i	gall, bile
cholecyst/o	gallbladder
choledoch/o	common bile duct
col/o, colon/o	colon
dent/o, odont/o	teeth
donto-	tooth

duoden/o	duodenum
enter/o	small intestine
esophag/o	esophagus
gastr/o	stomach
gingiv/o	gums
gloss/o-	tongue
gluc/o, glyc/o	sugar
glycogen/o	glycogen, animal starch
hepat/o	liver
ile/o	ileum
-iasis	abnormal condition
jejun/o	jejunum
labi/o, cheil/o	lip
lingu/o, gloss/o	tongue
lip/o, steat/o	fat, lipids
or/o	mouth, oral
palat/o	palate
pancreat/o	pancreas
peritone/o	peritoneum
pharyng/o	pharynx, throat
polyp-	a tumor with a pedicle
	(many footed)
-prandial	meal
proct/o	anus, rectum
pylor/o	pylorus
rect/o	rectum
sial/o	saliva
sialladen/o	salivary gland
sigmoid/o	sigmoid colon
spleen/o	spleen
stomat/o	mouth
submaxill/o	lower jaw
tonsill/o	tonsil
uvul/o	uvula

## XIV. Common Gastrointestinal prefixes and suffixes

<u>Prefix</u>	What it means
dys-	bad, difficult, painful
re-	back
retro-	backward, back
sub-	undar halow
3ub-	
Sub-	What it means
-ase	What it means enzyme
Suffix -ase -clysis	What it means enzyme irrigation, washing
Suffix -ase -clysis -ectomy	What it means enzyme irrigation, washing surgical removal

-flux	flow
-gram	record
-iasis	abdominal condition
-ist	a specialist
-it is	inflammation
-lithiasis	calculus or stone
-logy	science or study of
-lytic	destruction or breakdown
-megaly	enlargement
-orrhaphy	surgical fixation or suturing
-ostomy	creation of an artificial opening
-plasty	repair
-plegia	eating, swallowing
-prandal	meal
-rrhaphy	suturing in place
-scope	instrument for examining
-spasm	sudden involuntary muscle
	contraction
-tomy	cutting, incision
-tresia	opening
-tripsy	crushing

### XV. Common Gastrointestinal Conditions

Conditions	What it means
Anorexia	Lack of appetite
Anorexia nervosa	Psychiatric disorder; an abnormal fear of
	becoming obese
Aphagia	Inability to swallow
Aphthous stomatitis	Canker sores in the mouth
Ascites	Abnormal accumulation of fluid in the
	peritoneal cavity caused by cirrhosis, tumors,
	and infection
Borborygmus	Rumbling, gurgling sound made by moving of
	gas in the intestine
Bruxism	Grinding the teeth involuntarily, often while
	sleeping
Calculus	Stones
Cashexia	Generalized poor nutrition
Cathartic	Strong laxative
Cholelithiasis	Condition of having gallstones
Cleft palate	Congenital split in the roof of the mouth or
	upper lip
Colonic polyposis	Polyps, small growths protruding from the
	mucous membrane of the colon
Constipation	Difficult or delayed defecation caused by low

	peristalsis movement, by over-absorption of
	water as its contents sit too long in the
	intestine, or by dehydration
Dental caries	Cavities in the teeth (caries means "decay")
Diarrhea	Frequent discharge of liquid stool (feces)
Diverticula	Abnormal side pockets in hollow structures
	such as the intestines, sigmoid colon, and
	duodenum
Duodenal ulcer	Ulcer in the duodenum
Dyspepsia	Difficult digestion
Dysphagia	Difficulty swallowing
Dysphasia	Difficulty speaking
Edentulous	Without teeth
Eructation	Act of belching or raising gas from the stomach
Esophageal varices	Swollen, twisted veins around the distal end of
	the esophagus
Esophagitis	Inflammation of the esophagus
Flatus	Gas expelled through the anus
Gallstones	Hard collections of bile that form in the
	gallbladder and bile ducts
Gastric ulcer	Lesion on the wall of the stomach (peptic
	ulcer)
Gastritis	Inflammation of the stomach
Gastrodynia	Pain in the stomach
Gingivitis	Inflammation of the gums
Halitosis	Bad breath
Heartburn	Burning sensation caused by reflux or flowing
	back of acid from the stomach into the
	esophagus
Hematemesis	Vomiting blood
Hemorrhoids	Swollen or twisted veins either outside or just
	inside the anus
Hepatoma	Tumor of the liver
Hepatomegaly	Enlargement of the liver
Hernia	A protrusion of an organ or part of an organ
	through the wall of the cavity that contains it
Herpes simplex	Cold sore or fever blister on the lip or nose due
	to the herpes virus
Hiatal hernia	Protrusion of part of the stomach through the
	esophageal opening into the diaphragm
Hyperemesis	Excessive vomiting
lleus	Intestinal obstruction that can be caused by
	failure of peristalsis following surgery, hernia,
	tumor, adhesions, and often by peritonitis
Inguinal hernia	A small loop of bowel protruding through a

	weak place in the inguinal ring, an opening in the lower abdominal wall, which allows blood
Intussusception	children
Laxative	Medication encouraging the movement of
	feces
Leukoplakia	White plaques or patches of mouth mucosa
Melena	Black stool – feces containing blood
Nasogastric	Pertaining to the nose and stomach
Nausea	Urge to vomit
Polyposis	Condition of polyps in the intestinal wall
Pruritus ani	Intense itching of the anal area
Regurgitation	Return of solids and fluids to the mouth from
	the stomach
Steatorrhea	Excessive fat in the feces
Sublingual	Under the tongue
Ulcer	Sore or lesion of the mucous membrane or
	skin
Volvulus	Twisting of the intestine upon itself
Vomit	Also known as emesis -stomach contents
	expelled through mouth

### XVI. Gastrointestinal Disease and Pathology

Disease/Pathology	What it means
Anal fistula	An abnormal tube-like passageway near the anus communicating with
	the rectum
Anorexia	Psychiatric condition involving self-
	deprivation of food, lack of appetite, and pathological weight loss
Anorexia nervosa	Psychiatric disorder – an abnormal fear of becoming obese
Bulimia	Gorging with food and then purging, most commonly by inducing
	or laxatives (diuretics)
Celiac disease	Malabsorption syndrome – thought to be precipitated by gluten- containing foods. The hair-like projections (villi) degenerate so that they lose their absorption function. Hereditary – common in people of Irish origin
Cholecystitis	Inflammation of the gallbladder
Cirrhosis	Scarring of the liver parenchyma, or

Ulcerative colitis	Chronic inflammation of the colon with ulcers
Periodontal disease	Inflammation and degeneration of gums, teeth, and the surrounding bone
Pancreatitis	Inflammation of the pancreas
IBS (spastic colon)	of symptoms including diarrhea, abdominal bloating, cramping, and constipation associated with stress and tension
Hepatitis C	Virus affecting the liver, spread through blood and body fluids
Hepatitis B	Inflammation of the liver due to a virus transmitted by blood and body fluids
Hepatitis A	Acute inflammation of the liver, spread by fecal-oral contact
Hepatitis	Inflammation of the liver caused by a virus or damage to the liver
GERD	Gastroesophageal reflux disease – backward flow of gastrointestinal contents into the esophagus
Gastroenteritis	Inflammation of the stomach and intestine
Enteritis	Inflammation of the intestine
Crohn's disease	an ongoing disorder that causes
	tissue, due to damage from alcohol, drugs, and viruses like hepatitis

### XVII. Radiology and Diagnostic Testing

<u> </u>	0
Abdominal ultrasound	Most common method to determine the presence of stones in the gallbladder, liver cysts, abscesses, gallstones, and enlarged pancreas
Alkaline phosphatase	Elevated results indicate liver disease
Amylase	Pancreatic enzyme levels elevated in disease of the pancreas
Barium enema	a special x-ray of the large intestine, which includes the colon and rectum
Bilirubin levels	Present in liver and gallbladder disease
CBC	Complete blood count – measures the types and levels of white blood cells, red blood cells, and platelets

Cholangiogram	X-ray film of a bile duct - contrast
	medium is injected to outline the ducts
Cholecystogram	X-ray of the gallbladder
Colonoscopy	Visual examination of the colon
СРМ	Complete metabolic profile – damaged
	organs release certain enzymes from
	their damaged tissue, and these
	elevated enzyme levels show up in the
	blood. The CMP looks at electrolytes,
	liver function, and kidney function
EGD	Esophagogastroduodenoscopy –
	visual examination of the esophagus,
	stomach and duodenum
Gastroscopy	Visual examination of the stomach
Helicobacter pylori antibody	Blood test to determine the presence
test	of H. pylori organisms – a bacteria that
	can be found in the stomach lining,
	causing duodenal ulcer
Laparoscopy	Visual examination of any internal
	organ or cavity
Occult blood test	lest to detect hidden blood in the
	feces – sometimes called Hema-
Proctoscopy	Visual examination of the rectum
Protein	Blood test to check for protein, which
Oinne aide a a sur	IS Elevated in liver disease
Sigmoidoscopy	Visual examination of the sigmoid
Upper GI series	Series of x-rays taken of the stomach
	and duodenum atter barium is
	swallowed or a meal has been taken

XVIII. Common Surgeries and Procedures

- A. Surgical excisions or removals
  - 1. Abdominoperineal resection surgical excision of the colon and rectum, by both the abdominal and perineal approach
  - 2. Appendectomy surgical excision of the appendix
  - 3. Cholecystectomy excision of the gallbladder
  - 4. Colectomy excision of the colon or part of the colon
  - 5. Gastrectomy surgical excision of the stomach
  - 6. Polypectomy excision of a polyp
  - 7. Uvulectomy excision of the uvula
- B. Surgical repairs
  - 1. Anoplasty repair of the anus
  - 2. Anastomosis surgical connection between two normally

	distir 3. Chol to re 4. Lapa 5. Pylo 6. Unul pala	nct structures edocholithotomy – incision into the common bile duct move a stone protomy – incision into the abdomen roplasty – repair of the pylorus oplatopharyngoplasty (UPPP) – repair of the uvula, re, and pharynx to correct obstructive sleep apnea
	<ol> <li>Vagotomy – cutting of certain branches of the vagus nerve performed during gastric surgery to reduce the amount of gastric acid</li> </ol>	
C. Creations of artificial openings		
	<ol> <li>Colostomy – artificial opening into the colon through the abdominal wall</li> </ol>	
	<ol> <li>Gastrojejunostomy – artificial opening between the stomach and jejunum</li> </ol>	
	3. Gastrostomy – artificial opening into the stomach through	
	the abdominal wall; this is a feeding method used when	
	swallowing is not possible	
	4. Herniorrhaphy – surgical repair of a hernia by means of a	
suturing operation		
5. Ileostomy – creation of an artificial opening into the ileum		tomy – creation of an artificial opening into the ileum
through the abdominal wall for the passage of feces		igh the abdominal wall for the passage of feces
	6. Jeju	nostomy – creation of an artificial opening in the
jejunum		
XIX Gastrointestinal Pharmacology		
	Medication type	How it is used
	Antacids	Common OTC products used to relieve
		heartburn
	Simethicone	Relieves excess flatulence
	Laxatives	Relieve constipation
	Antidiarrheals	Stop diarrhea
	Stool softeners	Allow fat and water in the stool to mix in order
		to soften hard stool
Activated		Used for its absorption powers; often used via

nasogastric tube to absorb ingested poisons

Used to treat spasms of the GI system such as IBD and diverticulitis; effectively slow down

Bowel cleansers taken before a barium

peristalsis with a calming effect

Control nausea and vomiting

enema or bowel surgery

Used to induce vomiting

Used to treat gastric ulcers

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charcoal

Anticholinergics

preparations and

Antiemetics

Bowel

enemas

Emetics H2 blockers

Word	
absorption	Passage of materials into the bloodstream
alimentary tract	The digestive system – aliment means food
amino acide	Small substances which make up proteins and
	are produced when proteins are digested
amulase	Enzyme from the pancreas to digest starch
antrum	Linzyme from the pancieds to digest starch
	Lower opening of the digestive tract
anus	Cossistion of digostion
bioucpid tooth	Two promotor tooth distal to the capinos
bicuspiù leelli	(curpide) on each side of a dental arch
hilo	Digostive juice mode in the liver and stored in
Dile	the gallbladder
bilirubin	Pigment released by the liver in the bile –
	produced from the destruction of hemoglobin
bowel	Intestine
bradyphagia	Abnormal slowness in eating
canine	Cuspid – canine means doglike
cecum	First part of the large intestine
cementum	Bonelike supportive tissue that surrounds the
	dentin in the root of a tooth
colon	Large intestine – ascending, transverse, and
	descending parts
common bile	Carries bile from the liver and gallbladder to the
duct	duodenum
cuspid	Canine tooth – the cuspids of the upper jaw are
	called eyeteeth
deglutition	Swallowing
dentin	Major tissue composing teeth – covered by
	enamel in the crown and by cementum in the
	root
digestion	Breakdown of complex foods into simpler forms
duodenum	First part of the small intestine
dyspepsia	Painful digestion
dysentery	Painful, inflamed intestines
emesis	Vomiting
emulsification	Breaking up of large fat molecules
enamel	Hard, outermost layer of a tooth
enzyme	A chemical that speeds up a reaction between
	substances
esophagus	Tube connecting the mouth and the stomach
eructation	Producing gas from the stomach – belching
etiology	Study of the cause of disease
fatty acids	Substances produced when fats are digested

#### XX. Common Gastrointestinal Vocabulary

feces	Solid wastes – stool
fundus	Upper, rounded part of the stomach
gallbladder	Small sac under the liver – stores bile
gavage	Feeding with a stomach tube
ducose	Simple sugar
alvcogen	Animal starch – dlucose is stored as dlycoden
henatic nortal	Capillary networks of the intestines and liver
system	which are connected via the portal vein
herpes simplex	Cold sores or fever blisters – caused by a virus
hydrochloric	Substance produced by the stomach –
acid	necessary for digestion of food
ileum	Third part of the small intestine
incisor	One of four front teeth in the dental arch
insulin	Hormone produced by the pancreas
ieiunum	Second part of the small intestine
lipase	Pancreatic enzyme necessary to digest fats
mastication	Chewing
palate	Roof of the mouth
pancreas	Organ under the stomach – produces insulin
papillae	Small elevations on the tongue
parotid gland	Salivary gland near the ear
peristalsis	Wavelike contractions of the tubes of the
F	alimentary tract
pharynx	Throat
polyphagia	Eating abnormally large amounts of food at a
	meal
pulp	Soft tissue within a tooth
pylorus	Area of the pyloric sphincter – distal region of
	the stomach
rectum	End of the colon
rugae	Ridges on the hard palate and wall of the
	stomach
saliva	Digestive juice produced by the salivary glands
salivary glands	Parotid, sublingual, and submaxillary glands
sigmoid colon	Lower part of the colon – shaped like an "S"
sphincter	Ring of muscles
triglycerides	Products of fat digestion
uvula	Soft tissue hanging from the soft palate
vermiform	Blind-ended pouch hanging from the cecum
appendix	
villus, villi	Tiny microscopic projections in the walls of the
	small intestine to absorb nutrients into the blood
	stream

#### Activity

- I. Make flash cards of gastrointestinal terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete the Gastrointestinal Medical Terminology Worksheet
- III. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan -

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

IV. Research and report on diseases and disorders from the gastrointestinal system

#### Assessment

Successful completion of the activities

#### Materials

Medical Terminology book List of gastrointestinal terms Pathway of food through the body Index cards Markers Data projector Computer Internet access

#### Accommodations for Learning Differences

For reinforcement, the student will practice terms using flash cards related to the gastrointestinal system.

For enrichment, the students will research a disease or disorder related to the gastrointestinal system. Share findings with the class using a multimedia presentation.

#### National and State Education Standards National Healthcare Foundation Standards and Accountability Criteria:

Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

#### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (C) practice word building skills;
- (F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and

diagnostic procedures, diseases and treatments

130.203 (c) (2)

(A) demonstrate appropriate verbal and written strategies such as correct pronunciation of medical terms and spelling in a variety of health science scenarios

(B) employ increasingly precise language to communicate

(C) translate technical material related to the health science industry

130.203 (c) (3)

(A) examine medical and dental dictionaries and multimedia resources;

(B) integrate resources to interpret technical materials;

(C) investigate electronic media such as the internet with appropriate supervision

- 130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:
  - (A) distinguish medical abbreviations used throughout the health science industry; and
  - (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

#### Texas College and Career Readiness Standards

English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

**1**. Identify new words and concepts acquired through study of their relationships to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts.

Cross-Disciplinary Standards,

I. Key Cognitive Skills D. Academic Behavior: 1. Self monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

# Gastrointestinal System Terminology

labia-	lip
labiogingival	
labiodental	
labiotenaculum	
labiochorea	
labioglossopharyngeal	
labiomycosis	
stoma-, stomato-	mouth
stomatodynia	
stomatogastric	
stomatognathic	
stomatalgia	
stomatitis	
stomatology	
stomatorrhagia	
stomatosis	
stomatomalacia	
stomatoplasty	
stomatomycosis	
stomatonecrosis	
stomatologist	
aphthous stomatitis	
gingiv/o-	gums
gingivalgia	
gingivectomy	
gingivitis	
gingivoplasty	
gingivostomatitis	
gingivolabial	
gingivosis	
dento-	teeth
dentitis	
dentist	
dentimeter	
dentition	
donto-	tooth
oligodontia	
orthodontist	
anodontia	

gastro-, gaster, -gastero-	stomach
megalogastria	
microgastria	
gastroptosis	
gastromalacia	
gastrodynia	
gastralgia	
gastrectasis	
gastrectomy	
gastritis	
gastroenteritis	
gastroileitis	
gastric lavage	
nasogastric tube	
gastric ulcer	
gastrostomy	
gastroscope	
gastroscopy	
gastroduodenitis	
entero-	small intestine
enteralgia	
enterectasis	
enterectomy	
enterorrhaphy	
enterotomy	
hepat-	liver
hepatalgia	
hepatodynia	
hepatectomy	
hepaticoduodenostomy	
hepatitis	
hepaticolithotripsy	
hepatology	
hepatologist	
hepatomalacia	
hepatomegaly	
hepatosplenomegaly	
hepatonephritis	
hepatoscopy	
perihepatitis	
hepatotoxemia	

hernia-	Protrusion of an organ or part of an organ through the wall of the cavity that normally contains it
herniorrhaphy	
hernioplasty	
cholecyst-	gallbladder
cholecystectomy	
cholecystenterorrhaphy	
cholecystitis	
cholecystolithiasis	
cholecystorrhaphy	
cholecystogram	
cholangi/o-	bile duct
cholangiectasis	
cholangioenterostomy	
cholangiography	
cholangiotomy	
cholangioitis	
cholangioma	
cholangiogram	
chol/e-	gall, bile
cholelithotripsy	
cholelithotomy	
cholepathia	
cholepoiesis	
cholelithiasis	
acholia	
choledocho-	common bile duct
choledochectomy	
choledocholithiasis	
choledocholithotomy	
choledochoplasty	
choledochorrhaphy	
choledocholithotripsy	
an/o-	Anus
anoplasty	
anosigmoidoscopy	
anorectal	
anoscope	
antr/o-	relationship to an antrum

antrectomy	
antroduodenectomy	
antrotomy	
antrotome	
antritis	
col/o-	colon
colonoscopy	
colectomy	
colostomy	
colorrhaphy	
colonorrhagia	
colonopathy	
colonalgia	
colotomy	
colocentesis	
coloenteritis	
coloptosis	
colorectitis	
coloproctitis	
colotomy	
cec/o-	cecum
cecorrhaphy	
cecectomy	
cecitis	
cecoileostomy	
cecoptosis	
esophag/o-	esophagus
esophagalgia	
esophagectomy	
esophagocele	
esophagodynia	
esophagoenterostomy	
esophagogastroanastomosis	
esophagogastroplasty	
esophagoscope	
esophagoscopy	
esophagitis	
esophagotomy	
esophagomalacia	
esophagomycosis	
esophagoptosis	
esophagostenosis	

duoden/o-	duodenum
duodenal ulcer	
duodenitis	
duodenorrhaphy	
duodenotomy	
duodenoscopy	
duodenectasis	
duodenectomy	
jejun/o-	jejunum
jejunitis	
jejunoileitis	
jejunotomy	
jejunorrhaphy	
jejunectomy	
jejunojejunostomy	
ile/o-	lleum
ileostomy	
ileocecal	
ileitis	
ileocolitis	
ileorrhaphy	
ileotomy	
ileocystoplasty	
paralytic ileus	
proct/o-	Anus, rectum
proctoptosis	
proctoscopy	
proctologist	
proctology	
proctitis	
proctalgia	
proctoclysis	
proctodynia	
proctostenosis	
proctocele	
proctorrhaphy	
proctotomy	
proctosigmoidoscopy	
proctectasia	
proctoplegia	
proctoplasty	

proctorrhagia	
proctoscope	
•	
rect/o-	rectum
rectocele	
rectitis	
rectocolitis	
rectopexy	
rectostenosis	
rectotomy	
sigmoid/o-	sigmoid colon
sigmoidoscope	
sigmoidoscopy	
sigmoidotomy	
sigmoidectomy	
sigmoidostomy	
sigmoiditis	
sigmoidopexy	
cheil/o-	lip
cheilorrhaphy	
cheilitis	
macrocheilia	
cheilotomy	
cheilgnathopalatoschisis	
cheilophagia	
cheiloplasty	
cheilosis	
cheilostomatoplasty	
appendic/o-	appendix
appendicitis	
appendectomy	
appendalgia	
appendicectasis	
gloss/o-	tongue
glossorrhaphy	
glossitis	
glossolalia	
aglossia	
macroglossia	
ankyloglossia	
glossopyrosis	

glossoplegia	
glossoptosis	
glossology	
lingu/o-	tongue
sublingual	
linguopapillitis	
lapar/o-	abdomen
laparotomy	
laparorrhaphy	
laparocholecystotomy	
laparoenterostomy	
laparogastrotomy	
laparomyitis	
laparoscope	
laparoscopy	
abdomin/o-	abdomen
abdominoplasty	
abdominocentesis	
celi/o-	belly, abdomen
celioenterotomy	
celiogastrotomy	
celiotomy	
pylor/o-	pylorus
pyloroplasty	
pyloric stenosis	
pyloralgia	
pyloritis	
pyloromyotomy	
pylorospasm	
uvul/o-	uvula
uvulitis	
uvulectomy	
uvuloptosis	
palat/o-	palate
palatitis	
palatoplasty	
palatoplegia	

peritone/o-	peritoneum
peritoneal	
peritonitis	
peritonealgia	
polyp-	a tumor with a pedicle (many footed)
polyposis	
polypotome	
polypectomy	
sialo-	saliva
sialolith	
sialadenitis	
sialoadenotomy	
sialolithotomy	
sialaporia	
sialitis	
sialorrhea	
sialostenosis	
pancreat-	pancreas
pancreatitis	
pancreatomy	
Related terms	
achalasia	
achylia	
adhesions	
aerophagia	
anastomosis	
anorexia	
apepsia	
aphagia	
ascites	
atresia	
bradyphagia	
bulimia	
cachexia	
cirrhosis	
crohn's disease	
diarrhea	
dysentery	
dyspepsia	
dysphagia	
emesis	
eructation	
-----------------------	--
feces	
gavage	
glucose	
hepatic portal system	
herpes simplex	
intussusception	
laxative	
leukoplakia	
melena	
nasogastric	
nausea	
peptic ulcer	
polyphagia	
volvulus	

# Gastrointestinal System Terminology - Key

labia-	lip
labiogingival	concerning the lips and gums
labiodental	concerning the lips and teeth
labiotenaculum	instrument for holding lips during operation
labiochorea	spasm of the lips, causing stuttering
labioglossopharyngeal	concerning lips, tongue, and pharynx
labiomycosis	fungal disease of the lips
stoma-, stomato-	mouth
stomatodynia	pain in the mouth
stomatogastric	concerning the stomach and mouth
stomatognathic	mouth and jaws together
stomatalgia	pain in the mouth
stomatitis	inflammation of the mouth
stomatology	science of the mouth and teeth
stomatorrhagia	hemorrhage of the mouth or gums
stomatosis	any disease of the mouth
stomatomalacia	pathological softening of any mouth structure
stomatoplasty	surgical repair of the mouth
stomatomycosis	fungal disease of the mouth
stomatonecrosis	gangrenous ulcerative inflammation of the mouth
stomatologist	specialist in mouth and teeth, and their diseases
aphthous stomatitis	formation of tiny ulcers on the mucosa of the mouth
ainaiv/o-	aums
gingivalgia	pain in the gums
ainaivectomy	excision of diseased gum tissue
ainaivitis	inflammation of the gums
gingivoplastv	surgical correction of the gingival margin
gingivostomatitis	inflammation of the gingival tissue and the mucosa
gingiyolabial	concerning the gums and lips
gingivosis	chronic gingivitis
dento-	teeth
dentitis	inflammation of dentin
dentist	authorized practitioner of dentistry
dentimeter	device for measuring teeth
dentition	the development and cutting of teeth
donto-	tooth
	a hereditary developmental anomaly characterized by
	fewer teeth than normal
orthodontist	a dentist who is an expert in orthodontia
51410401404	

anodontia	absence of teeth
gastro-, gaster, -gastero-	stomach
megalogastria	excessive size of the stomach
microgastria	unusual smallness of the stomach
gastroptosis	downward displacement of the stomach
gastromalacia	softening of the stomach walls
gastrodynia	pain in the stomach
gastralgia	pain in the stomach
gastrectasis	dilatation of the stomach
gastrectomy	removal of all or part of the stomach
gastritis	inflammation of the stomach
gastroenteritis	inflammation of the stomach and intestinal tract
gastroileitis	inflammation of the stomach and ileum
gastric lavage	washing out of the stomach
nasogastric tube	a tube inserted into the nose that runs into the
	stomach
gastric ulcer	an ulcer of the stomach
gastrostomy	surgical creation of a gastric fistula through the
	abdomen
gastroscope	endoscope for examining the interior of the stomach
gastroscopy	examination of the stomach and abdominal cavity
gastroduodenitis	inflammation of the stomach and duodenum
entero-	small intestine
enteralgia	neuralgia or pain in the intestines
enterectasis	dilation of the small intestines
enterectomy	excision of a portion of the intestine
enterorrhaphy	stitching of an intestinal wound
enterotomy	incision or dissection of the intestine
hepat-	liver
hepatalgia	pain in the liver
hepatodynia	pain in the liver
hepatectomy	removal of all or part of the liver
hepaticoduodenostomy	making a duct between the hepatic duct and
	duodenum
hepatitis	inflammation of the liver
hepaticolithotripsy	crushing of a biliary calculus in the hepatic duct
hepatology	study of the liver
hepatologist	a specialist in the liver
hepatomalacia	softening of the liver
hepatomegaly	enlargement of the liver
hepatosplenomegaly	x-ray examination of the liver and spleen
hepatonephritis	inflammation of both the liver and kidneys

hepatoscopy	examination of the liver
perihepatitis	inflammation of the peritoneal covering of the liver
hepatotoxemia	autointoxication due to malfunction of the liver
hernia-	protrusion of an organ or part of an organ through the
	wall of the cavity that normally contains it
herniorrhaphy	surgical procedure for repair of a hernia
hernioplasty	surgical operation for a hernia
cholecyst-	gallbladder
cholecystectomy	excision of the gall bladder
cholecystenterorrhaphy	suture of the gall bladder to the intestinal wall
cholecystitis	inflammation of the gall bladder
cholecystolithiasis	gallstones in the gall bladder
cholecystorrhaphy	suturing of the gall bladder
cholecystogram	a radiographic image of the gall bladder
cholangi/o-	bile duct
cholangiectasis	dilation of the bile ducts
cholangioenterostomy	surgically produced connection of a bile duct and the
	intestine
cholangiography	radiographic examination of the bile ducts
cholangiotomy	incision of a bile duct for the removal of stones
cholangioitis	inflammation of the bile ducts
cholangioma	a tumor of the bile ducts
cholangiogram	examination of the bile ducts
chol/e-	gall, bile
cholelithotripsy	crushing of a biliary calculus
cholelithotomy	removal of gallstones through surgical incision
cholepathia	spasmodic contraction of the bile ducts
cholepoiesis	formation of bile
cholelithiasis	formation of calculi or bilestones in the gall bladder or
	common duct
acholia	absence of or decrease in bile
choledocho-	common bile duct
choledochectomy	excision of a portion of the common bile duct
choledocholithiasis	calculi in the common bile duct
choledocholithotomy	removal of a bile stone through incision in the
	common bile duct
choledochoplasty	operation for repair of the common bile duct
choledochorrhaphy	suturing of the severed ends of the common bile duct
choledocholithotripsy	crushing of a gallstone in the common bile duct
· · ·	

an/o-	anus
anoplasty	plastic surgery of the anus
anosigmoidoscopy	direct visual examination of the anus, rectum, and
	colon
anorectal	pertaining to both the anus and rectum
anoscope	speculum for examining the anus and lower rectum
antr/o-	relationship to an antrum (any nearly closed cavity or
	chamber, especially in a bone)
antrectomy	excision of the walls of an antrum
antroduodenectomy	surgical removal of the pyloric antrum and upper
	portion of the duodenum
antrotomy	cutting through an antral wall
antrotome	instrument used to perform an antrotomy
antritis	inflammation of an antrum
col/o-	colon
colonoscopy	examination of the upper part of the rectum
colectomy	excision of all or part of the colon
colostomy	opening of any part of the colon through the
,	abdominal wall to the outside
colorrhaphy	suture of the colon
colonorrhagia	hemorrhage from the colon
colonopathy	any disease of the colon
colonalgia	pain in the colon
colocentesis	surgical puncture of the colon to relieve distension
coloenteritis	inflammation of the mucous membrane of the colon
	or small intestine
coloptosis	a downward displacement of the colon
colorectitis	inflammation of the colon and rectum
coloproctitis	colonic and rectal inflammation
colotomy	incision of the colon
cec/o-	cecum
cecorrhaphy	suturing the cecum
cecectomy	incision into the cecum
cecitis	inflammation of the cecum
cecoileostomy	surgical formation of an anastomosis between the
	cecum and the ilium
cecoptosis	falling displacement of the cecum
esophag/o-	esophagus
esophagalgia	pain in the esophagus
esophagectomy	excision of a part of the esophagus
esophagocele	hernia of the esophagus
esophagocele	hernia of the esophagus

esophagodynia	pain in the esophagus
esophagoenterostomy	formation of a portal between the esophagus and the
	intestine after removal of the stomach
esophagogastroanastomosis	joining the esophagus to the stomach
esophagogastroplasty	plastic repair of the esophagus and stomach
esophagoscope	an endoscope for examination of the esophagus
esophagoscopy	examination of the esophagus
esophagitis	inflammation of the esophagus
esophagotomy	surgical incision into the esophagus
esophagomalacia	softening of the esophageal walls
esophagomycosis	bacterial or fungal disease of the esophagus
esophagoptosis	relaxation and prolapse of the esophagus
esophagostenosis	stricture or narrowing of the esophagus
duoden/o-	duodenum
duodenal ulcer	damaged mucous membrane
duodenitis	inflammation of the duodenum
duodenorrhaphy	suturing the duodenum
duodenotomy	an incision into the duodenum
duodenoscopy	inspection of the duodenum with an endoscope
duodenectasis	chronic inflammation of the duodenum
duodenectomy	excision of part or all of the duodenum
jejun/o-	jejunum (second portion of the small intestine)
jejunitis	inflammation of the jejunum
jejunoileitis	inflamed condition of the jejunum and ileum
jejunotomy	surgical incision into the jejunum
jejunorrhaphy	surgical repair of the jejunum
jejunectomy	excision of some or all of the jejunum
jejunojejunostomy	formation of a passage between two parts of the
	jejunum
ile/o-	ileum (lower 60% of the small intestine)
ileostomy	creation of a surgical passage through the abdominal
	wall into the ileum
ileocecal	relating to the ileum and cecum
ileitis	inflammation of the ileum
ileocolitis	inflammation of the mucous membrane of the ileum
	and colon
ileorrhaphy	surgical repair of the ileum
ileotomy	incision into the ileum
ileocystoplasty	use of a portion of the ileum to increase size of the
	bladder
paralytic ileus	ileus

proct/o-	anus, rectum
proctoptosis	prolapse of the anus and rectum
proctoscopy	instrumental inspection of the rectum
proctologist	one who specializes in the colon, rectum, and anus
proctology	dealing with the treatment of diseases of the colon,
	rectum, and anus
proctitis	inflammation of the rectum and anus
proctalgia	pain in the anus or rectum
proctoclysis	an infusion, drop by drop, into the rectum and colon
proctodynia	pain in the anus or rectum
proctostenosis	stricture of the anus or rectum
proctocele	protrusion of the rectal mucosa into the vagina
proctorrhaphy	suturing of the rectum or anus
proctotomy	incision of the rectum or anus
proctosigmoidoscopy	visual examination of the rectum and sigmoid colon
proctectasia	dilation of the anus or rectum
proctoplegia	paralysis of the anal sphincter
proctoplasty	plastic surgery of the anus or rectum
proctorrhagia	bleeding from the anus or rectum
proctoscope	instrument for inspection of the rectum
rect/o-	rectum
rectocele	protrusion or herniation of the posterior vaginal wall
rectitis	inflamed condition of the rectum
rectocolitis	inflamed condition of the rectum and colon
rectopexy	fixation of the rectum by suturing to another part
rectostenosis	stricture of the rectum
rectotomy	incision for a stricture of the rectum
sigmoid/o-	sigmoid colon
sigmoidoscope	tubular speculum for examination of the sigmoid
	colon
sigmoidoscopy	use of a sigmoidoscope to examine the sigmoid colon
sigmoidotomy	incision of the sigmoid
sigmoidectomy	removal of all or part of the sigmoid flexure
sigmoidostomy	creation of artificial anus in the sigmoid flexure
sigmoiditis	inflammation of the sigmoid colon
sigmoidopexy	fixation of the sigmoid to an abdominal incision
cheil/o-	lips
cheilorrhaphy	surgical repair of a cleft palate
cheilitis	inflammation of the lip
macrocheilia	abnormal size of the lips characterized by swelling of
	the glands
cheilotomy	excision of part of a lip

cheilgnathopalatoschisis	cleft in the hard and soft palate
cheilophagia	habit of biting one's own lip
cheiloplasty	plastic operation on the lips
cheilosis	morbid condition of the lips with a reddened
	appearance
cheilostomatoplasty	plastic surgery and restoration of the mouth
appendic/o-	appendix
appendicitis	inflammation of the appendix
appendectomy	removal of all or part of the appendix
appendalgia	pain in the lower right quadrant, in area of the
	appendix
appendicectasis	dilation of the vermiform appendix
gloss/o-	tongue
glossorrhaphy	suture of a wound of the tongue
glossitis	inflammation of the tongue
glossolalia	repetition of senseless remarks not related to the
	subject or situation
aglossia	congenital absence of the tongue
macroglossia	hypertrophied condition of the tongue
ankyloglossia	abnormal shortness of the frenum of the tongue
glossopyrosis	burning sensation of the tongue
glossoplegia	paralysis of the tongue
glossoptosis	dropping of the tongue out of normal position
glossology	study of the tongue and its diseases
lingu/o-	tongue or tongue-like structure
sublingual	under the tongue
linguopapillitis	small ulcers of the papillae of the edge of the tongue
lapar/o-	abdomen
laparotomy	surgical opening of the abdomen
laparorrhaphy	suture of wounds into the abdominal wall
laparocholecystotomy	incision into the gall bladder through abdominal wall
laparoenterostomy	formation of opening into the intestine through the
	abdominal wall
laparogastrotomy	abdominal incision into the stomach
laparomyitis	inflammation of the muscular portion of the abdominal wall
laparoscope	endoscope designed for the visual examination of the peritoneal cavity
laparoscopy	examination of the peritoneal cavity using a laparoscope

abdomin/o-	abdomen
abdominoplasty	cosmetic surgery of the abdomen
abdominocentesis	puncture of the abdomen for the withdrawal of fluids
celi/o-	belly, abdomen
celioenterotomy	incision to gain access to the intestines
celiogastrotomy	incision, through the abdomen, into the stomach
celiotomy	surgical incision into the abdominal cavity
	/
pylor/o-	pylorus (lower orifice of the stomach, opening to the
	duodenum)
pyloroplasty	operation to repair the pylorus
pyloric stenosis	narrowing of the pyloric orifice
pyloralgia	pain around the pylorus
pyloritis	inflammation of the pylorus
pyloromyotomy	incision and suture of the pyloric sphincter
pylorospasm	spasmodic contractions of the pyloric sphincter
uvul/o-	uvula
uvulitis	inflammation of the uvulus
uvulectomy	removal of part or all of the uvula
uvuloptosis	relaxed and pendulous condition of the palate
palat/o-	palate
palatitis	inflammation of the palate
palatoplasty	surgical repair of the palate
palatoplegia	paralysis of the muscles of the soft palate
peritone/o-	peritoneum
peritoneal	relating to the peritoneum, the serous membrane
	lining the abdominal cavity
peritonitis	inflammation of the peritoneum
peritonealgia	pain of the peritoneum
polyp-	a tumor with a pedicle (many footed)
polyposis	the presence of numerous polyps
polypotome	instrument for the excision of polyps
polypectomy	surgical removal of a polyp
sialo-	saliva
sialolith	a salivary concretion or calculus
sialadenitis	inflamed condition of a salivary gland
sialoadenotomy	incision of a salivary gland
sialolithotomy	removal of a calculus from a salivary gland or duct
sialaporia	deficient secretion of saliva

sialitis	inflammation of a salivary gland
sialorrhea	excessive flow of saliva
sialostenosis	closure of a salivary duct
pancreat-	pancreas
pancreatitis	inflammation of the pancreas
pancreatomy	surgical incision into the pancreas
related terms	
achalasia	failure to relax a muscle
achylia	absence of chyle or other digestive juice
adhesions	a holding together or binding of two parts
aerophagia	swallowing of air
anastomosis	surgical or pathological connection of two tubular structures
anorexia	psychiatric condition involving self-deprivation of food, lack of appetite, and pathological weight loss
apepsia	cessation of digestion
aphagia	inability to swallow
ascites	accumulation of fluid in the peritoneal cavity
atresia	congenital absence or closure of a normal opening
bradyphagia	abnormal slowness in eating
bulimia	a neurotic disorder characterized by binge eating,
	followed by vomiting or induced diarrhea
cachexia	a state of ill health, wasting, or malnutrition
cirrhosis	chronic disease of the liver
crohn's disease	an ongoing disorder that causes inflammation of the digestive tract
diarrhea	medication encouraging the movement of feces
dysentery	painful, inflamed intestines
dyspepsia	painful digestion
dysphagia	difficulty speaking
emesis	vomiting
eructation	producing gas from the stomach – belching
feces	solid wastes – stool
gavage	feeding with a stomach tube
glucose	simple sugar
hepatic portal system	capillary networks of the intestines and liver which are
	connected via the portal vein
herpes simplex	cold sores, fever blisters – caused by a virus
intussusception	telescoping of the intestine – common in children
laxative	medication encouraging the movement of feces
lleukoplakia	white plaques or patches of mouth mucosa
melena	black stool – feces containing blood
nasogastric	pertaining to the nose and stomach

nausea	urge to vomit
peptic ulcer	lesion on the wall of the stomach (peptic ulcer)
polyphagia	eating abnormally large amounts of food at a meal
volvulus	twisting of the intestine upon itself

# Pathway of food through the digestive tract



### Course

Medical Terminology

### Unit IX

The Urinary System

#### Essential Question

What medical terminology is associated with the Urinary System?

# TEKS

130.203 (c) (1)(A),(B),(E) 2(B) 4 (A),(B)

#### Prior Student Learning None

Estimated time

2-3 hours

### Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the Urinary system to discuss common conditions and diseases.

# Objectives

Upon completion of this lesson, the learner should be able to:

- Define and decipher common terms associated with the urinary system
- Identify the basic anatomy of the urinary system
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases which involve the urinary system
- Describe how urinalysis is used and interpreted as a diagnostic test
- Explain clinical procedures and laboratory tests as they pertain to the urinary system

# Engage

Search the web for a video of a kidney transplant or another urinary surgery.

Show the video to the class and explain that they will be learning vocabulary pertaining to the urinary system.

# Key Points

- I. Major Parts of the Urinary system
  - A. Kidney
    - 1. Two bean-shaped organs behind the abdominal cavity -- (retroperitoneal)
    - 2. On either side of the spine in the lumbar region
    - 3. Surrounded by a cushion of adipose tissue and fibrous connective tissue (protection for the kidneys)
    - 4. Each kidney is about the size of a fist and weighs from 4-6 pounds
    - 5. Cortex region
      - Cortex means "bark" as in the bark of a tree
    - 6. Medulla region
      - Medulla means marrow
    - 7. Hilum

A depression on the medial border of the kidney

### B. Ureter

1. Two hollow muscular tubes

- 2. 16-18 inches long
- 3. Carries urine from the kidneys to the urinary bladder
- C. Urinary bladder
  - 1. A hollow, muscular sac
  - 2. Temporary reservoir for urine
  - 3. Trigone
    - a. A triangular region at the base of the bladder
    - b. The place where the ureters enter and the urethra exits

### D. Urethra

- 1. A tube that carries urine from the urinary bladder to the outside of the body
- 2. Urination
  - a. Process of expelling urine through the urethra
  - b. Also referred to as voiding
- 3. Urinary meatus
  - The external opening of the urethra
- 4. Female urethra is about  $1\frac{1}{2}$  inches long
- 5. Male urethra is about 8 inches long
  - a. Extends downward through the prostate gland to the meatus at the tip of the penis
- II. How the kidneys produce urine
  - A. Renal arteries
    - Blood enters each kidney from the aorta by way of the R & L renal arteries
    - 2. After the renal arteries enter the kidney, they branch into smaller and smaller arteries
  - B. Arterioles
    - 1. The smallest arteries
    - 2. Blood passes through the arterioles slowly and constantly
  - C. Renin
    - 1. If blood pressure falls in the vessels of the kidney, the kidney produces renin
    - 2. Renin is discharged into the blood and promotes formation of a substance that stimulates the contraction of arterioles
    - 3. This increases blood pressure and normal blood flow in the kidneys
  - D. Glomeruli
    - 1. Each arteriole in the cortex of the kidney leads into a mass of very tiny, coiled and intertwined smaller blood vessels called glomeruli (pleural)
    - 2. Glomerulus (singular) is a collection of tiny capillaries formed I the shape of a small ball.
    - 3. There are about 1 million glomeruli in the cortex region of each kidney

- E. Filtration
  - 1. Urine is produced by filtration
  - 2. As blood passes through the glomeruli, water, salts and urea and other waste products leave the bloodstream
- F. Creatinine and uric acid
  - Waste products from the bloodstream
- G. Glomerular (Bowman) capsule
  - 1. A cup-like structure that surrounds each Glomerulus
  - 2. Waste products collect in the Bowman capsule
  - 3. The walls of the glomeruli prevent large substances (proteins and blood cells) from filtering into the capsule
    - a. Protein and bloods cells normally do not appear in urine
- H. Renal tubule
  - 1. A twisted tube attached to each Glomerular capsule
  - 2. As water, sugar, salts, urea and other wastes pass through the renal tubule, most of the water, all the sugar, and some salts return to the bloodstream
  - 3. All collecting tubules lead to the renal pelvis (a basin-like area in the central part of the kidney)
- I. Reabsorption
  - 1. The active process of Reabsorption ensures that the body retains essential substances such as sugar, water and salts.
- J. Secretion
  - 1. The final process in the formation of urine
  - 2. The waste products of metabolism become toxic if allowed to accumulate in the body
  - 3. The waste products (acids, drugs, potassium) leave the body in urine
- III. Three steps in the formation of urine
  - A. Glomerular filtration (water, sugar, wastes {urea and Creatinine}, and salts)
  - B. Tubular Reabsorption (of water, sugar and some salts)
  - C. Tubular secretion (of acids, potassium and drugs)
- IV. Nephron
  - A. Combination of a glomerulus and a renal tubule forms a unit
  - B. Each kidney contains about 1 million nephrons
- V. Leaving the Body
  - A. The renal pelvis narrows into the ureter
  - B. The ureter carries the urine to the urinary bladder
  - C. The bladder (a muscular sac) temporarily stores urine
  - D. As bladder fills, pressure increases at the base of the bladder
  - E. Individual notices a need to urinate and voluntarily relaxes the sphincter muscles so urine can be passed out of the body

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### VI. Urinary System root words

Root Word	What it means
(Combining forms)	
Albumin/o	Albumin (a protein in the blood)
Azot/o	Nitrogen
Bacteri/o	Bacteria
Cali/o, calic/o	calyx
Cyst/o	Urinary bladder
Dips/o	Thirst
Glomerul/o	Glomerulus
Kal/o	Potassium
Ket/o, Kenton/o	Ketone bodies
Lith/o	Stone
Meat/o	Meatus
Natr/o	Sodium
Nephr/o	Kidney
Noct/o	night
Olig/o	Scanty
Py/o	pus
Pyel/o	Renal pelvis
Ren/o	Kidney
Trigon/o	Trigone (region of the bladder)
Ur/o	Urine (urea)
Ureter/o	Ureter
urethra/o	urethra
Urin/o	Urine
Vesic/o	Urinary bladder

### VII. Common Urinary Suffixes

Suffix	What it means
-poietin	Substance that forms
-tripsy	crushing
-uria	Urination: urine condition

### VIII. Urinary Abbreviations and Acronyms

Abbreviation	What it means
or acronym	
ADH	Antidiuretic hormone – vasopressin
ARF	Acute renal failure
BILI	Bilirubin
BUN	Blood urea nitrogen
CAPD	Continuous ambulatory peritoneal dialysis
Cath	Catheter, catheterization
CCPD	Continuous cycling peritoneal dialysis
CKD	Chronic kidney disease
CI	Chloride – an electrolyte excreted by the kidney
CPCL	Creatinine clearance; also seen as CrCl or CLcr
CRF	Chronic renal failure – progressive loss of kidney function
C&C	Culture and sensitivity testing
Cysto	Cystoscopic examination
ESRD	End-stage renal disease
ESWL	Extracorporeal shock wave lithotripsy
GFR	Glomerular filtration rate
HCO <sub>3</sub>	Bicarbonate – an electrolyte conserved by the
НО	Hemodialysis
	Interstitial cystitis – chronic inflammation of the
	bladder wall
K <sup>+</sup>	Potassium
KUB	Kidney, ureter, and bladder
Na⁺	sodium
PD	Peritoneal dialysis
рН	Potential hydrogen; scale to indicate degree of
	acidity or alkalinity
PKD	Polysystic kidney disease
PKU	Phenylketonuria
PUL	Percutaneous ultrasonic lithotripsy
RP	Retrograde pyelogram
sp gr	Specific gravity
UA	Urinalysis
UTI	Urinary tract infection
VCUG	Voiding cystourethrogram

# IX. Common Urinary Vocabulary

Term	What it means
Arteriole	Small artery
Calyx or calyx	Cup-like collecting region of the renal pelvis
Catheter	Tube for injecting or removing fluids
Cortex	Outer region of an organ: the renal cortex is the
	outer region of the kidney (cortical means
	pertaining to the cortex).
Creatinine	Nitrogenous waste excreted in urine. Creatinine
	clearance is a measure of the efficiency of the
	kidneys in removing Creatinine from the blood.
Electrolyte	Chemical element that carries an electrical
<b>,</b>	charge when dissolved in water. Electrolytes are
	necessary for functioning of muscles and nerves.
Ervthropoietin	Hormone secreted by the kidney to stimulate the
(EPO)	production of red blood cells by bone marrow.
	Poietin means a substance that forms.
Filtration	Process whereby some substances, but not all.
	pass through a filter
Glomerular	Enclosing structure surrounding each glomerulus.
capsule	Also known as Bowman capsule.
Glomerulus	Plural of glomeruli. Tiny ball of capillaries in the
	kidney
Hilum	Depression in an organ where blood vessels and
	nerves enter and leave
Kidney	One of two bean-shaped organs on either side of
	the backbone in the lumbar region. The kidney
	filters nitrogenous wastes from the bloodstream.
Meatus	Opening or canal
Medulla	Inner region of an organ. The renal medulla is
	the inner region of the kidney.
Nephron	Combination of glomerulus and renal tubule
	where filtration, reabsorption, and secretion take
	place in the kidney
Nitrogenous	Substance containing nitrogen and excreted in
waste	urine
Potassium	An electrolyte regulated by the kidney so that a
(K <sup>+</sup> )	proper concentration is maintained within the
	blood
Reabsorption	Process whereby renal tubules return materials
	necessary to the body back into the bloodstream
Renal artery	Blood vessel that carries blood to the kidney
Renal pelvis	Central collecting region in the kidney
Renal tubule	Microscopic tubes in the kidney where urine is
	formed after filtration

Renal vein	Blood vessel that caries blood away from the kidney and toward the heart
Rennin	Hormone secreted by the kidney; it raises blood pressure by influencing vasoconstriction.
Sodium (N⁺)	An electrolyte regulated in the blood and urine by the kidneys. It is needed for proper transmission of nerve impulses, heart activity and other metabolic functions.
Trigone	Triangular area in the urinary bladder
Urea	Major nitrogenous waste excreted in urine
Ureter	One of the two tubes leading from the kidneys to the urinary bladder
Urethra	Tube leading from the urinary bladder to the outside of the body
Uric acid	Nitrogenous waste excreted in the urine
Urinary bladder	Hollow, muscular sac that holds and stores urine
Urination	Voiding; process of expelling urine; also called micturition

# X. Urinary System Diseases and Pathology

Disease/Pathology	What it means
Glomerulonephritis	Inflammation of the glomeruli within the kidney
Interstitial nephritis	Inflammation of the connective tissue that lies between the renal tubules
Nephrolithiasis	Kidney stones; renal calculi
Nephritic syndrome	Nephrosis; group of clinical signs and symptoms caused by excessive protein loss in urine
Polycystic kidney disease	PKD: multiple fluid-filled sacs (cysts) within and on the kidney
Pyelonephritis	Inflammation of the lining of the renal pelvis and renal parenchyma
Renal cell carcinoma	Hypernephroma: cancerous tumor of the kidney in adulthood
Renal failure	Kidney decreases excretion of wastes as a result of impaired filtration function
Renal hypertension	High blood pressure resulting from kidney disease
Wilms tumor	Malignant tumor of the kidney occurring in childhood
Diabetes insipidus	Antidiuretic hormone is not secreted adequately, or the kidney is resistant

	to its effect
Diabetes mellitus	Insulin is not secreted adequately or not used properly in the body. Mellitus means sweet.
Diabetes	"To pass through" when the word diabetes is used alone, it refers to Diabetes Mellitus.

### XI. Laboratory Tests

A. BUN

- 1. Blood urea nitrogen
- 2. Measurement of urea levels in blood
- B. Creatinine clearance
  - 1. Measurement of the rate at which Creatinine is cleared from the blood by the kidney
  - 2. This is an important test to assess the functioning of the kidney
  - 3. This test is an indicator of the glomerular filtration rate (GFR), which normally is 90-120ml/minute
- XII. Clinical Procedures

A. CT Scan

- 1. X-ray images show multiple cross-sectional and other views of organs and tissues
- 2. Useful in diagnosis of tumors, cysts, abscesses and hydronephrosis
- B. KUB
  - 1. Kidneys, ureters, and bladder
  - 2. X-ray examination of the kidneys, ureters and bladder
  - 3. Shows the size and location of the kidneys in relation to other organs in the abdominopelvic region
- C. Renal angiography
  - 1. X-ray examination of the blood vessels of the kidney
  - 2. Helps diagnose areas of bleeding within a kidney and renal artery stenosis in hypertensive patients
- D. RP
  - 1. Retrograde pyelogram
  - 2. X-ray imaging of the renal pelvis and ureters after injection of contrast through a urinary catheter into the ureters from the bladder
- E. VCUG
  - 1. Voiding cystourethrogram
  - 2. X-ray record of the urinary bladder and urethra obtained while the patient is voiding
- F. Ultrasonography
  - 1. Imaging of urinary tract structures using high-frequency sound waves

- 2. The size of the kidney, tumors, polycystic kidney disease and ureteral and bladder obstruction can be diagnosed using ultrasound
- G. Radioisotope scan
  - 1. Image of the kidney after injecting a radioactive substance into the blood stream
  - 2. The imaging shows the size and shape of the kidney and its functioning
- H. MRI
  - 1. Magnetic resonance imaging
  - 2. Changing magnetic field produces images of the kidney and surrounding structures in three planes of the body
- I. Cystoscopy
  - 1. Direct visualization of the urethra and urinary bladder with an endoscope
  - 2. A hollow metal tube is inserted into the urinary meatus and passed through the urethra into the bladder
- J. Dialysis
  - 1. HD
    - a. Hemodialysis
    - b. Uses an artificial kidney machine that receives waste-filled blood from the patient bloodstream, filters it, and returns the dialyzed blood to the patient's body.
    - 2. PD
      - a. Peritoneal dialysis
      - b. A peritoneal catheter is used to introduce fluid into the abdominal cavity; chemical properties of the fluid cause wastes in the capillaries to pass out of the bloodstream and into the fluid; and, then the fluid is drained out.
- K. Lithotripsy
  - 1. Urinary tract stones are crushed
  - 2. Uses shock waves directed toward the stone from the outside of the body
- L. Renal angioplasty
  - 1. Dilation of narrowed areas in renal arteries
  - 2. A balloon attached to a catheter is inserted into the artery and then inflated to enlarge the vessel diameter
  - 3. Afterward, stents may be inserted to keep the vessel open
  - 4. A stent is a metal meshed tube
- M. Renal biopsy
  - 1. Removal of kidney tissue for microscopic exam
  - 2. May be performed through the skin or during surgery
- N. Renal transplantation

- 1. Surgical transfer of a kidney from a donor to a recipient
- 2. Renal failure patients may receive a kidney from a living donor or from a cadaver
- 3. Best results occur when the donor is closely related to the recipient
- O. Renal catheterization
  - 1. Passage of a flexible, tubular instrument through the urethra into the urinary bladder
  - 2. Usually used for short-term drainage of urine
  - 3. Foley catheter: an indwelling catheter held in place by a balloon inflated with liquid

### Activity

- I. Make flash cards of urinary system terms and practice putting the terms together with prefixes and suffixes to make new terms
- II. Complete Urinary System Terms Worksheet
- III. Complete the Urologic Case Studies
- IV. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan -

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

V. Research and report on diseases and disorders from the Urinary system

### Assessment

Successful completion of the activities

### Materials

Medical Terminology book List of Urinary terms Index cards Markers Urologic case studies Urologic case studies - Key Urinary terminology worksheet Urinary terminology-Key

### Accommodations for Learning Differences

For reinforcement, the student will practice terms using flash cards of the urinary system.

For enrichment, the student will research and report on a disease or disorder of the urinary system.

### National and State Education Standards

National Healthcare Foundation Standards and Accountability Criteria Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information Copyright © Texas Education Agency, 2012. All rights reserved.

2.22 Use medical abbreviations to communicate information

### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols
- (B) identify the basic structure of medical words
- (E) recall directional terms and anatomical planes related to the body structure
- 130.203 (c) (2) (B) employ increasingly precise language to communicate
- 130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:
  - (A) distinguish medical abbreviations used throughout the health science industry; and
  - (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

### **Texas College and Career Readiness Standards**

English and Language Arts

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts. *Cross-Disciplinary Standards*,

I. Key Cognitive Skills D. Academic Behavior: 1. Self-monitor learning needs and seek assistance when needed; 3. Strive for accuracy and precision; 4. Persevere to complete and master task. E. Work habits: 1. Work independently; 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

# **URINARY SYSTEM TERMINOLOGY-Worksheet**

Please write the meaning of the terms in the right column.

Term	Meaning
pyel/o	Renal Pelvis
pyelocystitis	
pyelostomy	
pyelotomy	
pyelonephritis	
pyelolithotomy	
pyelectasis	
pyelography	
pyeloplasty	
pyelitis	
pyelocystostomosis	
pyelonephrosis	
pyelopathy	
pyeloplication	
pyeloscopy	
retrograde pyelogram	
IVP	
ren/o	
renography	
renal failure = ARF / CRF	
Rennin	
renogastric	
renogram	
renopathy	
renal calculi	
renal biopsy	
renal failure	
renal scan	
glomerul/o	
glomerular	
glomerulitis	
glomerulonephritis	
glomerulopathy	
glomerulosclerosis	
nephr/o	Kidney
hydrohematonephrosis	
hydronephrosis/nephrohydrosis	
nephralgia	
nephrectomize	
nephrectomy	
nephric	

P	· · · · · · · · · · · · · · · · · · ·
nephridium	
nephritis	
nephroabdominal	
nephrocalcinosis	
nephrocardiac	
nephrocele	
nephrocolic	
nephrocolopexy	
nephrocoloptosis	
nephrocystanastomosis	
nephrocystitis	
nephrocystosis	
nephrogenetic	
nephrography	
nephrology	
nephroma	
nephromalacia	
nephromegaly	
nephron	
nephropathy	
nephropexy	
nephroptosis	
nephropyeloplasty	
nephropyosis	
nephrorrhagia	
nephrorrhaphy	
nephrosclerosis	
nephrosis	
nephrostomy	
nephrotomography	
nephrotoxin	
nephrotropic	
meat/o	Meatus (passage)
meatal	
meatorrhaphy	
meatoscope	
meatoscopy	
meatotome	
meatotomy	
cyst- cyst/o	Bladder, Sac
cystalgia/cystodynia	
cystectomy	
cystitis	
cvstoadenoma	
cystocele	

cystoenterocele	
cystography	
cystojejunostomy	
cystolith	
cystolithectomy	
cystolithiasis	
cystoma	
cystometrography	
cystopexy	
cystoplasty	
cystoplegia	
cystoptosis	
cystorrhagia	
cystorrhaphy	
cystorrhea	
cystoscope	
cystoscopy	
cystotomy	
cystoureteritis	
cystoureterogram	
cystourethrograhy	
cystourethrography	
· · · · ·	
vesic/o	Bladder
vesicotomy	Bladder
vesicotomy vesicocele	Bladder
vesicotomy vesicocele vesicoclysis	Bladder
vesicotomy vesicocele vesicoclysis vesicofixation	Bladder
vesicotomy vesicocele vesicoclysis vesicofixation urethr/o	Bladder
vesicotomy vesicocele vesicoclysis vesicofixation urethr/o urethrorrhaphy	Bladder Urethra
vesicotomy vesicocele vesicoclysis vesicofixation urethr/o urethrorrhaphy urethrostomy	Bladder
vesic/ovesicotomyvesicocelevesicoclysisvesicofixationurethr/ourethrorrhaphyurethrostomyurethrotrigonitis	Bladder Urethra
vesic/ovesicotomyvesicocelevesicoclysisvesicofixationurethr/ourethrorrhaphyurethrostomyurethrotrigonitisurethrodynia/urethralgia	Bladder
vesic/o         vesicotomy         vesicocele         vesicoclysis         vesicofixation         urethr/o         urethrorrhaphy         urethrostomy         urethrotrigonitis         urethrodynia/urethralgia         urethratresia	Bladder Urethra
vesicotomy vesicocele vesicoclysis vesicofixation urethrorrhaphy urethrostomy urethrotrigonitis urethrodynia/urethralgia urethratresia urethrectomy	Bladder Urethra
vesic/ovesicotomyvesicocelevesicoclysisvesicofixationurethr/ourethrorrhaphyurethrostomyurethrostomyurethrodynia/urethralgiaurethratresiaurethrectomyurethrography/urethrograph	Bladder Urethra
vesicotomy vesicocele vesicoclysis vesicofixation <u>urethr/o</u> urethrorrhaphy urethrostomy urethrotrigonitis urethrodynia/urethralgia urethratresia urethratresia urethrography/urethrograph urethrometer	Bladder Urethra
vesicotomy vesicocele vesicoclysis vesicofixation urethr/o urethrorrhaphy urethrostomy urethrostomy urethrotrigonitis urethrodynia/urethralgia urethrodynia/urethralgia urethretresia urethretresia urethrography/urethrograph urethrometer urethrometer	Bladder Urethra
vesic/ovesicotomyvesicocelevesicoclysisvesicofixationurethr/ourethrorrhaphyurethrostomyurethrostomyurethrodynia/urethralgiaurethratresiaurethrectomyurethrography/urethrographurethrorrheaurethrorrhea	Bladder         Urethra         Image: state stat
vesic/ovesicotomyvesicocelevesicoclysisvesicofixationurethr/ourethrorrhaphyurethrostomyurethrostomyurethrodynia/urethralgiaurethrectomyurethrectomyurethrectomyurethrography/urethrographurethrorrheaurethroscopy/urethroscopeurethrospasm	Bladder Urethra Urethra
vesicotomy vesicocele vesicoclysis vesicofixation urethr/o urethrorrhaphy urethrostomy urethrostomy urethrotrigonitis urethrodynia/urethralgia urethrodynia/urethralgia urethrectomy urethrography/urethrograph urethrometer urethrometer urethrorrhea urethroscopy/urethroscope urethrospasm urethropexy	Bladder           Urethra
vesicotomy vesicocele vesicoclysis vesicofixation <u>urethr/o</u> urethrorrhaphy urethrostomy urethrostomy urethrotrigonitis urethrodynia/urethralgia urethratresia urethratresia urethrectomy urethrography/urethrograph urethrometer urethrometer urethrorrhea urethroscopy/urethroscope urethrospasm urethropexy urethroplasty	Bladder         Urethra
vesicotomy vesicocele vesicoclysis vesicofixation urethr/o urethrorrhaphy urethrostomy urethrostomy urethrotrigonitis urethrodynia/urethralgia urethrodynia/urethralgia urethrectomy urethrography/urethrograph urethrometer urethrometer urethrorrhea urethroscopy/urethroscope urethrospasm urethropexy urethroplasty urethrotomy	Bladder         Urethra
vesicotomy vesicocele vesicoclysis vesicofixation urethr/o urethrorrhaphy urethrostomy urethrostomy urethrotrigonitis urethrodynia/urethralgia urethratresia urethratresia urethrectomy urethrography/urethrograph urethrometer urethrometer urethrorrhea urethroscopy/urethroscope urethrospasm urethropexy urethroplasty urethrotomy urethritis	Bladder         Urethra         Image: State Stat

ureter/o	Ureter
ureteral	
ureteralgia	
ureterectasis	
ureterocolostomy	
ureterocystoscope	
ureterography	
ureterohydronephrosis	
ureteroplasty	
ureteronephrectomy	
ureteropyelitis	
ureteropyelonephrostomy	
ureteropyeloplasty	
ureteropyosis	
ureterolithiasis	
ureteritis	
ureterolithotomy	
ureterocele	
ureterolysis	
ureterectomy	
ureterotomy	
ureterorrhagia	
lith- lith/o	Stone
lithocystotomy	
lithogenesis	
lithology	
litholysis	
lithonephritis	
lithotome	
lithotomy	
lithotripsy	
lithectomy	
nephrolithiasis	
nephrolithotomy	
lithoclast	
azot/o	Urea, Nitrogen
azoturia	
albumin/o- albumin	
albuminaturia	
albuminuria	
ur- ur/o, urin/o	Urea, Urine
uroaynia	
urograpny	
urologist	

urology / urinology	Study of the urinary system, study of urine
uroscopy	
glycosuria	
dysuria	
nocturia	
anuria	
oliguria	
pyuria	
polyuria	
hematuria	
uremia / urinemia	
diuretic	
diuresis	
enuresis	
urinal	
urinalysis	
urinary	
urinate	
urination	
urinometer	
urinoma	
BUN	
OTHER TERMS:	
micturate	
incontinent	
distention	
retention	
stricture	
atony	
bougie	
flank	
Orifice	
trigone	
spnincter	
retroperitoneal	
polycystic kidney	
conex / medulla	
peivis	
pyramid	

BPH	
ATN	

# **Laboratory Tests and Clinical Procedures**

Test/Procedure	Definition
PSA test	
Semen analysis	
Castration	
Circumcision	
Digital rectal examination (DRE)	
Photoselective vaporization of the prostate	
(Green Light PVP)	
Transurethral resection of the prostate	
(TURP)	
Vasectomy	

# URINARY SYSTEM TERMINOLOGY- Key

Term	Meaning
pyel/o	Renal Pelvis
pyelocystitis	Inflammation of the renal pelvis and bladder
pyelostomy	Creation of an opening into the renal pelvis
pyelotomy	Incision of the renal pelvis
pyelonephritis	Inflammation of the kidney and renal pelvis
pyelolithotomy	Removal of a stone from the pelvis of the kidney
	through an incision
pyelectasis	Dilation of the renal pelvis
pyelography	A radiograph of the ureter and renal pelvis
pyeloplasty	Surgical repair of the pelvis of the kidney
pyelitis	Inflammation of the pelvis of the kidney
pyelocystostomosis	Surgical establishment of communication between the
	Kidney and bladder
pyelonephrosis	Any disease of the pelvis of the kidney
pyelopathy	Disease of the renal pelvis
pyeloplication	Shortening of the wall of the dilated renal pelvis
pyeloscopy	Examination of the renal pelvis
retrograde pyelogram	Endoscope is used to visualize the renal pelvis and ureter
IVP	A pyelogram in which a radiopaque material is given
	intravenously
ren/o	Kidney
renography	Radiography of the kidney; recording of the kidney
renal failure = ARF / CRF	Acute rise in the serum creatinine level of 25% or more
	(Can last days or weeks before resolving)
	Chronic (end-stage) renal disease
Rennin	Enzyme produced by the kidney that stimulates
	vasoconstriction and secretion of aldosterone
renogastric	Pertaining to the kidneys and stomach
renogram	Record of the rate of removal of an intravenously injected
	dose of radioactive iodine from the blood of the kidneys
renopathy	Disease condition of the kidney
renal calculi	A stone in the kidney
renal biopsy	Obtaining renal tissue for analysis
renal failure	Acute rise in the serum creatinine level of 25% or more
renal scan	A method of determining renal function, size and shape.
	A radioactive substance that concentrates in the kidneys
glomerul/o	Glomerulus
glomerular	Pertaining to the glomerulus
	Inflammation of the glomeruli
giomeruionephritis	Nephritits in which the lesions involve primarily the
	giomeruli
giomerulopatny	Any disease of the renal glomeruli
giomerulosclerosis	Fibrosis of renal glomeruli associated with protein loss in

	the urine
nephr/o	Kidney
hydrohematonephrosis	Bloody urine distending the pelvis of the kidney
hydronephrosis/nephrohydrosis	Stretching of the renal pelvis as a result of obstruction to
	urinary outflow
nephralgia	Renal pain
nephrectomize	To remove, surgically, one or both kidneys
nephrectomy	Surgical removal of a kidney
nephric	Pertaining to the kidneys
nephridium	A segmented excretory tubule present in many
	invertebrates
nephritis	Inflammation of the kidneys
nephroabdominal	Concerning the kidneys and abdomen
nephrocalcinosis	Calcinosis of the kidney
nephrocardiac	Concerning the kidneys and heart
nephrocele	Renal hernia
nephrocolic	Renal colic; concerning the kidney and the colon
nephrocolopexy	Surgical suspension of the kidney
nephrocoloptosis	Excision of the renal capsule
nephrocystanastomosis	Surgical formation of an artificial connection between the
	kidney and the bladder
nephrocystitis	Inflammation of the kidneys and the bladder
nephrocystosis	Formation of renal cysts
nephrogenetic	Arising in or from the renal organs
nephrography	Radiology of the kidneys
nephrology	The branch of medical science concerned with the
	structure and function of the kidneys
nephroma	Renal tumor
nephromalacia	Abnormal renal softness or softening
nephromegaly	Enlargement of the kidney
nephron	Glomerulus and renal tubule where filtration, reabsorbtion,
	secretion take place
nephropathy	Inflammatory, degenerative & sclerotic lesions of the
	kidney
nephropexy	Surgical fixation of a floating kidney
nephroptosis	Downward displacement of the kidney
nephropyeloplasty	Repair of the kidney
nephropyosis	Purulence of a kidney
nephrorrhagia	Bleeding of the kidney
nephrorrhaphy	Surgical procedure of suturing the kidney
nephrosclerosis	Hardening of the connective tissues of the kidney
nephrosis	Degenerative changes in the kidneys
nephrostomy	The formation of an artificial fistula into the renal pelvis
nephrotomography	Tomography of the kidney after intravenous injection of
	radiopaque contrast medium

nephrotoxin	Toxic substance that damages kidney tissues
nephrotropic	Affecting the kidneys
meat/o	Meatus (passage)
meatal	Pertaining to the flesh
meatorrhaphy	Suture of the severed end of the urethra to the glans penis
meatoscope	A speculum for examining a meatus
meatoscopy	Instrumental examination of a meatus
meatotome	Knife with probe or guarded point for enlarging a meatus
	by direct incision
meatotomy	Incision of urinary meatus to enlarge the opening
cyst- cyst/o	Bladder, Sac
cystalgia/cystodynia	Pain in the bladder
cystectomy	Removal of a cyst or bladder
cystitis	Bladder inflammation usually from urinary tract infection
cystoadenoma	Tumor containing cystic and adenomatous elements
cystocele	A bladder hernia that protrudes into the vagina
cystoenterocele	Hernia of the bladder wall
cystography	Radiograph of cyst into which a contrast medium has
	been instilled
cystojejunostomy	Joining of an adjacent cyst to the jejunum
cystolith	Vesical calculus
cystolithectomy	Excision of a stone from the bladder
cystolithiasis	Formation of stones in the bladder
cystoma	A cystic tumor
cystometrography	Graphic record of bladder pressure at filling stages
cystopexy	Surgical fixation of the bladder to abdominal wall
cystoplasty	Plastic operation on the bladder
cystoplegia	Bladder paralysis
cystoptosis	Prolapse into the urethra of vesical mucous membrane
cystorrhagia	Bleeding of the bladder
cystorrhaphy	Surgical suture of the bladder
cystorrhea	Discharge of mucus from urinary bladder
cystoscope	An instrument for interior examination of the bladder
	and ureter
cystoscopy	Examination of bladder with a cystoscope
cystotomy	Incision of the bladder
cystoureteritis	Inflammation of the ureter and urinary bladder
cystoureterogram	A radiograph of the bladder and ureter obtained after
	instillation of a contrast medium
cystoureterogram	Radiograph of bladder and ureter obtained after
	instillation of a contrast medium
cystourethrography	Radiography of the bladder and urethra
cystourethrography	Radiography of bladder and urethra by using radiopaque
	contrast medium

vesic/o	Bladder
vesicotomy	Incision of the bladder
vesicocele	Hernia of bladder into vagina
vesicoclysis	Injection of fluid into the bladder
vesicofixation	Attachment of the uterus to the bladder or the bladder
	to the abdominal wall
urethr/o	Urethra
urethrorrhaphy	Suture of the urethra
urethrostomy	The formation of a permanent fistula opening
urethrotrigonitis	Inflammation of the urethra and the trigone of the bladder
urethrodynia/urethralgia	Pain in the urethra
urethratresia	Occlusion or imperforation of the urethra
urethrectomy	Surgical excision of urethra
urethrography/urethrograph	Radiography of urethra
urethrometer	Instrument to measure diameter of urethra
urethrorrhea	Abnormal discharge from urethra
urethroscopy/urethroscope	Examination of the mucous membrane of urethra
urethrospasm	Spasmodic stricture of the urethra
urethropexy	Surgical fixation of urethra
urethroplasty	Reparative surgery of urethra
urethrotomy	Incision of urethral stricture
urethritis	Inflammation of urethra
TUR	Transurethral resection
ureter/o	Ureter
ureteral	Concerning the ureter
ureteralgia	Pain in the ureter
ureterectasis	Dilation of the ureter
ureterocolostomy	Implantation of the ureter into the colon
ureterocystoscope	Cystoscope combined with a ureteral catheter
ureterography	Radiography of the ureter after injection of a
	radioactive substance
ureterohydronephrosis	Dilation of the ureter & pelvis of the kidney resulting
	from obstruction
ureteroplasty	Plastic surgery of the ureter
ureteronephrectomy	Kidney and ureter removal
ureteropyelitis	Inflammation of pelvis of the kidney and a ureter
ureteropyelonephrostomy	Removal of the renal pelvis and ureter
ureteropyeloplasty	Plastic surgery of the ureter & renal pelvis
ureteropyosis	Suppurative inflammation within a ureter
ureterolithiasis	Development of a stone in the ureter
ureteritis	Inflammation of the ureter
ureterolithotomy	Surgical incision for removal of a stone from ureter
ureterocele	Cystlike dilation of ureter
ureterolysis	Rupture of a ureter
ureterectomy	Excision of a ureter

ureterotomy	Incision or surgery of the ureter
ureterorrhagia	Hemorrhage from the ureter
lith- lith/o	Stone
lithocystotomy	Incision of the bladder to remove a kidney stone
lithogenesis	Formation of calculi
lithology	Science dealing with calculi
litholysis	Dissolving of stones
lithonephritis	Inflammation of the kidney because of a stone
lithotome	Instrument for performing lithotomy
lithotomy	Incision especially of the bladder for removal of a stone
lithotripsy	Use of shock wave or sound waves to crush the stone
lithectomy	Surgical removal of a calculus
nephrolithiasis	The presence of calculi (stone) in the kidney
nephrolithotomy	Renal incision for removal of a kidney stone
lithoclast	Forceps for breaking up large calculi
azot/o	Urea, nitrogen
azoturia	Increase in nitrogenous compounds
albumin/o- albumin	To provide collide osmotic pressure. Prevent plasma loss
albuminaturia	Presence of albuminates in urine
albuminuria	Amounts of serum protein
ur- ur/o, urin/o	Uria, urine
urodynia	Pain associated with urination
urography	Radiograph of the urinary tract after the introduction of a
	contrast medium
urologist	A physician who specializes in the practice of urology
urology / urinology	Study of the urinary system, study of urine
uroscopy	Examination of the urine
glycosuria	Abnormal amount of glucose in the urine
dysuria	Painful or difficult urination
nocturia	Frequent urination at night (after bedtime)
anuria	Absence of urine
oliguria	Low urine output (less than 400ml/day)
pyuria	Pus in the urine
polyuria	Excessive discharge of urine
hematuria	Blood in the urine
uremia / urinemia	In patients with renal failure
diuretic	Increasing urine secretion
diuresis	The secretion an passage of large amount of urine
enuresis	Involuntary discharge of urine
urinal	Container into which one urinates
urinalysis	Analysis of the urine
urinary	Secreting or containing urine
urinate	Pass urine from the bladder
urination	Release of urine from the body
urinometer	A device for determining the specific gravity of urine

urinoma	A cyst containing urine
BUN	Blood, urea, nitrogen
OTHER TERMS:	
micturate	To pass urine from the bladder
incontinent	Loss of self-control
distention	The state of being distended
retention	The act of keeping possession or holding in place
stricture	Narrowing or constriction of lumen of a tube
atony	Lack of normal tone of strength
bougie	A slender, flexible instrument for exploring and dilating
	the organs
flank	Part of the body between the ribs
orifice	The mouth, entrance, or outlet of any anatomical structure
reflux	A return or backwards flow
trigone	A triangular space between two openings
catheter	A tube passed into the body for evacuating fluids
filtrate	The fluid has been passed through a filter
meatus	Passage or opening
sphincter	Circular muscle constricting an orifice
fulguration	Destruction of tissue using high frequency electric sparks
retroperitoneal	Behind the peritoneum and outside the peritoneal cavity
polycystic kidney	Multiple cysts on or in the kidney
specific gravity	Ratio of weight of substance compared to equal volume
	of water
cortex / medulla	Outer layer of organ as distinguished from inner, or
	medulla
pelvis	Any basin-shaped structure or cavity
pyramid	Any part of the body resembling a pyramid; cone-shaped
	structures making up the medulla of the kidney
BPH	Benign prostatic hypertrophy
ATN	Acute tubular necrosis

# Laboratory Tests and Clinical Procedures

Test/Procedure	Definition
PSA test	Measurement of levels of prostate-specific antigen
	in the blood
Semen analysis	Microscopic examination of ejaculated fluid
Castration	Surgical excision of testicles or ovaries
Circumcision	Surgical procedure to remove the prepuce of the
	penis
Digital rectal examination (DRE)	Finger palpation through the anal canal and rectum
	to examine the prostate gland
Photoselective vaporization of the	Removal of tissue to treat benign prostatic
prostate (Green Light PVP)	hyperplasia using a green light laser (laser TURP)
Transurethral resection of the prostate	Excision of benign prostatic hyperplasia using a

(TURP)	resectoscope through the urethra
Vasectomy	Bilateral surgical removal of a part of the vas
	deferens
# Urologic Case Study #1

Fifty-six year-old women came to the clinic with a chief complaint of painless hematuria and clots. Although she was not a good historian, she denied any history of urolithiasis, pyuria, or previous hematuria. Nocturia had been present about 4 years. Endoscopy showed a carcinoma located about 2cm from the right ureteral orifice. There was no sign of metastasis. A partial cystectomy was carried out and the lesion cleared. A bilateral pelvic lymphadenectomy showed no positive nodes.

- 1. Which of the following was a previous symptom?
  - a. Excessive urination at night
  - b. Blood in the urine
  - c. Pus in the urine
  - d. Sugar in the urine
- 2. The term urologic refers to which system of the body?
  - a. Digestive
  - b. Respiratory
  - c. Endocrine
  - d. Excretory
- 3. The patient's chief complaint was:
  - a. Small amount of urine
  - b. Pain on urination
  - c. Pus in the urine
  - d. Blood in the urine
- 4. What diagnostic procedure was done?
  - a. Lithotripsy
  - b. Urinalysis
  - c. Cystoscopy
  - d. Renal angiography
- 5. What was the patient's diagnosis:
  - a. Malignant tumor of the bladder
  - b. Tumor in the proximal ureter
  - c. Lymph nodes affected by the tumor
  - d. Metastatic tumor of the ureter
- 6. What treatment was done?
  - a. Ureteroileostomy
  - b. Removal of tumor and subtotal removal of the bladder
  - c. No treatment was necessary
  - d. Removal of right ureter

# Case Study #2

An eighteen-year old female athlete presents to the clinic with complaints of fever, dysuria, and shaking chills. Her urinalysis is shown below.

Test	UA Results	Normal
Color	Amber yellow	Amber yellow
Specific gravity	1.040	1.003-1.030
pН	8.4	4.6-8.0
Protein	Negative	Negative
Glucose	Negative	Negative
Ketones	Negative	Negative
Bili	Negative	Negative
WBC	>100	0
Bacteria	Bacilli (rods)	0
Sediment	WBC casts	none

What is the probable diagnosis?

- a. Diabetes mellitus with glycosuria
- b. Glomerulonephritis with staphylococcal infection
- c. Nephritic syndrome with albuminuria
- d. Urinary tract infection with pyelonephritis

# Case Study #3

Test	Normal	UA Results
Color	Amber yellow	Smoky-red (blood in urine): renal
		calculi; tumor; kidney disease; cystitis;
		urinary obstruction
Appearance	Clear	Cloudy (pyuria): urinary tract infection
Specific gravity	1.003-1.030	High: renal calculi; diabetes mellitus
		Low: diabetes insipidus
pН	4.6-8.0	Alkaline: UTI
Protein	None or small amount	Proteinuria: nephritis; renal failure
Glucose	None	Glycosuria: diabetes mellitus
Ketones	None	Ketonuria; diabetes mellitus
Bilirubin	None	Bilirubinuria: hepatitis or gallbladder
		disease
Sediment	none	Casts: nephritis; renal disease

Name the appropriate test for detecting or evaluating each of the following:

- 1. Sugar in urine: \_\_\_\_\_
- 2. Level of bile pigment in urine:
- 3. Hematuria: \_\_\_\_\_
- 4. Albumin in urine: \_\_\_\_\_
- 5. Structures in the shape of renal tubules in urine: \_\_\_\_\_
- 6. Chemical reaction of urine: \_\_\_\_\_
- 7. Dilution or concentration of urine:
- 8. Acetones in urine: \_\_\_\_\_
- 9. Pus in urine: \_\_\_\_\_\_

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Fifty-six year-old women came to the clinic with a chief complaint of painless hematuria and clots. Although she was not a good historian, she denied any history of urolithiasis, pyuria, or previous hematuria. Nocturia had been present about 4 years. Endoscopy showed a carcinoma located about 2cm from the right ureteral orifice. There was no sign of metastasis. A partial cystectomy was carried out and the lesion cleared. A bilateral pelvic lymphadenectomy showed no positive nodes.

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## b. Blood in the urine

- c. Pus in the urine
- d. Sugar in the urine
- 2. The term "urologic" refers to which system of the body?
  - a. Digestive
  - b. Respiratory
  - c. Endocrine
  - d. Excretory
- 3. The patient's chief complaint was:
  - a. Small amount of urine
  - b. Pain on urination
  - c. Pus in the urine
  - d. Blood in the urine
- 4. What diagnostic procedure was done?
  - a. Lithotripsy
  - b. Urinalysis
  - c. Cystoscopy
  - d. Renal angiography
- 5. What was the patient's diagnosis:

## a. Malignant tumor of the bladder

- b. Tumor in the proximal ureter
- c. Lymph nodes affected by the tumor
- d. Metastatic tumor of the ureter
- 6. What treatment was done?
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  - b. Removal of tumor and subtotal removal of the bladder
  - c. No treatment was necessary
  - d. Removal of right ureter

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WBC	>100	0
Bacteria	Bacilli (rods)	0
Sediment	WBC casts	none

What is the probable diagnosis?

- a. Diabetes mellitus with glycosuria
- b. Glomerulonephritis with staphylococcal infection
- c. Nephritic syndrome with albuminuria
- d. Urinary tract infection with pyelonephritis

# Case Study #3

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Color	Amber yellow	Smoky-red (blood in urine): renal
		calculi; tumor; kidney disease; cystitis;
		urinary obstruction
Appearance	Clear	Cloudy (pyuria): urinary tract infection
Specific gravity	1.003-1.030	High: renal calculi; diabetes mellitus
		Low: diabetes insipidus
рН	4.6-8.0	Alkaline: UTI
Protein	None or small amount	Proteinuria: nephritis; renal failure
Glucose	None	Glycosuria: diabetes mellitus
Ketones	None	Ketonuria; diabetes mellitus
Bilirubin	None	Bilirubinuria: hepatitis or gallbladder
		disease
Sediment	none	Casts: nephritis; renal disease

Name the appropriate test for detecting or evaluating each of the following:

- 1. Sugar in urine: glucose
- 2. Level of bile pigment in urine: bilirubin
- 3. Hematuria: color
- 4. Albumin in urine: protein
- 5. Structures in the shape of renal tubules in urine: sediment
- 6. Chemical reaction of urine: pH
- 7. Dilution or concentration of urine: specific gravity
- 8. Acetones in urine: ketones
- 9. Pus in urine: appearance

<b>Course</b> Medical Terminology <b>Unit X</b> Nervous System	<b>Rationale</b> Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the nervous system to discuss common conditions and diseases.
<b>Essential</b> <b>Question</b> What medical terms are associated with the nervous system?	<ul> <li>Objectives</li> <li>Upon completion of this lesson, the student will be able toK <ul> <li>define and decipher common terms associated with the nervous system;</li> <li>identify the basic anatomy of the nervous system;</li> <li>analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course; and</li> <li>research diseases which involve the nervous system</li> </ul> </li> </ul>
<b>TEKS</b> 130.203 (c) 1 A-F 2A-C 3A-C 4A-B	<b>Engage</b> Mr. Smith comes in to Dr. Anderson's office, accompanied by his wife, complaining of memory problems. Is this just part of the natural aging process or is it something more serious?
Prior Student Learning Basic understanding of roots, prefixes, and suffixes Estimated time 4-7 hours	<ul> <li>Key Points</li> <li>Nervous system words to know</li> <li>A. cerebr/o – cerebrum (brain)</li> <li>B. dur/o – dura mater (hard, tough)</li> <li>C. encephal/o – brain</li> <li>D. cephal/o – head</li> <li>E. myel/o – medulla (also marrow)</li> <li>F. myelin/o – myelin (Schwann cells)</li> <li>G. neur/o – nerve</li> <li>H. radic/o, radicul/o – nerve root</li> <li>I. psych/o – mind</li> <li>J. ment/o – mind</li> <li>J. ment/o – mind</li> <li>Kparesis – slight paralysis</li> <li>Lplegia – paralysis, stroke</li> <li>M. gangli/o, ganglion – swelling, ganglion (pl=ganglia)</li> <li>N. mening/i, mening/o – meninges (membrane)</li> <li>O. esthesi/o – sensation</li> <li>P. phas/o – speech</li> <li>Q. poli/o – gray matter</li> <li>R. phren/o – mind (also diaphragm)</li> <li>S. scler/o – hard</li> </ul>

- II. Introduction
  - A. The most highly organized system of the body
  - B. A fast, complex communication system that regulates thoughts, emotions, movements, impressions, reasoning, learning, memory, and choices
  - C. Basic Characteristics
    - 1. Master control system
    - 2. Master communication system
    - 3. Regulates and maintains homeostasis
  - D. Functions
    - 1. Monitors change (stimuli) sensory input
    - 2. Integrates impulses integration
    - 3. Affects responses motor output
- III. Organization of the Nervous System
  - A. CNS (Central Nervous System)
    - 1. The brain and spinal cord
    - 2. Integrates incoming pieces of sensory information, evaluates the information, and initiates the outgoing responses
    - 3. No potential for regeneration
  - B. PNS (Peripheral Nervous System)
    - 1. Made of 12 pairs of cranial nerves and 31 pairs of spinal nerves
    - 2. Afferent (sensory) division
      - a. Carries impulses toward the CNS
      - b. Somatic (skin, skeletal muscles, and joints)
      - c. Visceral (organs within the ventral cavity)
    - 3. Efferent (motor) division
      - a. Somatic carries information to the skeletal muscles (reflex and voluntary control)
      - b. Autonomic involuntary; regulates smooth muscles, cardiac muscle, and glands
        - Sympathetic exits the thoracic area of the spinal cord; involved in preparing the body for "fight or flight"
        - ii. Parasympathetic exits the cervical and lumbar areas of the spinal cord; coordinates the body's normal resting activities (resting and digestingrepairing)
- IV. Histology of Nervous Tissue
  - A. Basic Characteristics
    - 1. Highly cellular
    - 2. Two types of cells neurons and supporting cells (neuroglia)
    - B. Neuroglia characteristics

1. A dense network of supporting cells for nerve tissue 2. Over 900 billion cells 3. Can replace themselves 4. glia = glue5. Supportive scaffolding; insulation; neuron health and growth 6. Six types (four in the CNS, two in the PNS) 7. Tic douloureux – a painful disorder; supporting cells of fibers of the trigeminal nerve (main sensory nerve of the face) degenerate - touch sensations stimulate uninsulated pain fibers - agonizing pain with the softest touch C. Neuroglia 1. Astrocytes – star-shaped cells in the CNS a. Most abundant; cling to neurons and capillaries b. Make tight sheaths around the brain's capillaries forming the blood-brain barrier that regulates the passage of certain molecules into the brain c. Controls the chemical environment (leaked K+, recaptured/recycled neurotransmitters) 2. Microglia – small, ovoid, thorny cells in the CNS; phagaocytic cells that fight infection by engulfing microbes 3. Ependymal – squamous to columnar; some ciliated in the CNS a. Form thin sheaths that line the ventricles and spinal canal b. Help form the Cerebrospinal fluid (CSF) c. There is a permeable barrier between the CSF and the CNS d. Cilia circulate the CSF Oligodendrocytes – in the CNS a. Form myelin sheaths around axons of the CNS b. Forms "white matter" of the brain and spinal cord c. Multiple Sclerosis – a disease of the oligodendrocytes where hard lesions replace the myelin and affected areas are invaded by inflammatory cells; nerve conduction is impaired; chronic deterioration of the myelin of the CNS with periods of remission and relapse; causes: autoimmunity or viral 5. Schwann cells - in the PNS a. Neurolemmocytes b. Form myelin sheaths around the axons of the PNS c. The area between the Schwann cells form gaps called the Nodes of Ranvier d. As each Schwan cell wraps around the axon, its nucleus and cytoplasm are squeezed to the perimeter to form the neurilemma (sheath of Schwann) which is essential for nerve regeneration

- e. Also act as phagocytes (cell debris)
- 6. Satellite/attendant cells in the PNS
  - a. Surround neuron cell bodies within the ganglia
  - b. Control the chemical environment
- D. Neurons
  - 1. Over 100 billion
  - 2. Highly specialized
  - 3. Send messages in the form of nerve impulses
  - 4. Extreme longevity (>100 years)
  - 5. Amitotic (no centrioles)
  - 6. High metabolic rate
  - 7. 3 functional components in common
    - a. receptive/input regions
    - b. conducting component/trigger zone
    - c. secretory/output component
- E. Neuron cell body
  - 1. Nucleus
  - 2. Cytoplasm contains neurofibrils (convey impulses)
  - Nissl bodies for protein synthesis; rough endoplasmic reticulum (ER)
  - 4. No centrioles; therefore they cannot divide by mitosis
  - 5. Axon
    - a. A long, slender fiber that transmits impulses away from the cell body
    - b. One per neuron
    - c. Short, absent, or long (great toe the lumbar region: three to four feet = longest cells in the body)
    - d. The long ones are called nerve fibers
    - e. The largest in diameter have the most rapid conduction
    - f. The distal tip of the axon ends in a synaptic knob or end plate
  - 6. Dendrites
    - a. Short, tapering, diffusely branched (tree-like) fibers
    - b. Carry impulses toward the cell body from sensory receptors or other axons
- F. Myelin sheath
  - 1. Whitish, fatty (protein lipoid), segmented covering of the axons
  - 2. Myelinated fibers conduct nerve impulses rapidly; electrical insulation
  - 3. Unmyelinated fibers conduct impulses slowly
  - White matter myelinated sheaths around the axons of the PNS; gives the tissue a white color and forms myelinated nerves (axons = myelinated tracts)
  - Gray matter concentrations of cell bodies and unmyelinated fibers (in the PNS = ganglia; in the CNS =

- nuclei)
- G. Nerves
  - 1. Bundles of PNS fibers held together by several layers of connective tissue
  - 2. Endoneurium fibrous connective tissue surrounding each nerve fiber
  - Perineurium connective tissue holding together bundles of fibers
  - 4. Epineurium fibrous tissue holding the whole nerve together
- H. Synapse
  - 1. Space between nerve fibers; the place where nerve impulses are transmitted from one neuron to another
  - 2. The axonal terminal contains synaptic vesicles (membrane bound sacs containing neurotransmitters)
  - 3. The receptor region on the dendrite
  - 4. Synaptic cleft microscopic gap that exists between the neurons
- V. Neurons
  - A. Characteristics (see the Neuron Diagram)
    - 1. Excitability the ability to react to a stimuli, physical or chemical
    - 2. Irritability sensory adaptation; with prolonged stimulation, irritability is temporarily lost (i.e. smell)
    - 3. Conductivity the ability to transmit an impulse
      - a. Nonmyelinated fibers = 0.5-1 meter/sec (1 mph)
      - b. Myelinated fibers = 80-130 meters/sec (300 mph)
  - B. Structural classification of neurons the number of processes extending from cell bodies (see the Types Of Neurons Diagram)
    - Multipolar several (three or more) dendrites and one axon; most common; motor
    - Bipolar two processes; one axon and one dendrite at either end of the cell body; rare; retina of the eye, olfactory mucosa, and inner ear
    - Unipolar/pseudounipolar a single process; originates as bipolar then the processes fuse; a single short process from the cell body that divides like a T; ganglia of the PNS as sensory neurons
  - C. The functional classification of neurons the direction in which the nerve impulse travels relative to the CNS
    - Sensory/afferent the dendrites are connected to receptors where stimulus is initiated in the skin/organs and carry an impulse toward the CNS; the axons are connected to other neuron dendrites; they are unipolar except for the bipolar neurons in special sense organs; cell bodies in sensory ganglia outside the CNS

	<ul> <li>Receptors – extroceptors (pain, temperature, touch); interoceptors (organ sensation); proprioceptors (muscle sense, position, movement)</li> </ul>
	<ol> <li>Motor/Efferent – carry messages from the CNS to effectors; the dendrites are stimulated by other neurons and the axons are connected to effectors (muscles and glands); they are multipolar except for some in the autonomic nervous system (ANS)</li> <li>Association/Interneurons – carry impulses from one neuron to another (afferent to efferent); found only in the CNS; lie between the sensory and motor neurons; shuttle signals;</li> </ol>
	99% of the neurons in the body
VI.	Regeneration A. Neurons do not reproduce themselves, but they can regenerate
	<ul> <li>B. If a neuron is cut through a myelinated axon, the proximal portion</li> <li>may survive if the call body is not damaged</li> </ul>
	C. The distal portion will die (degenerate). Macrophages move into
	<ul> <li>D. A neuron cell body reorganizes its Nissl bodies to provide the proteins necessary for axon growth</li> </ul>
	E. The Schwann cells form a regeneration tube that helps guide the axon to its proper destination
	<ul> <li>F. New fibers will eventually fill the myelin sheath and innervate the muscle. Growth occurs at 3-5 mm/day (1mm = 0.04in)</li> </ul>
	G. In the CNS, this repair is unlikely because the neurons lack the neurilemma necessary to form the regeneration tube. Also, the astrocytes quickly fill the damaged area, forming scar tissue. Most CNS injuries cause permanent damage
	<ul> <li>H. Crushing and bruising can also damage nerve fibers, resulting in paralysis. Inflammation of the injury site damages more fibers. Early treatment with methyprednisolone reduces inflammation and decreases the severity of the injury. It must be given within 8 hours to be effective</li> </ul>
VII.	Conduction ("All or None Law") – when stimulated, a nerve fiber will either respond completely or not at all
	A. Electrical – along the nerve
	a. An excess of negative ions on the inside of the
	membrane and an excess of positive ions on the outside of the membrane
	b. The electrical difference is called the membrane
	potential. It is measured in millivolts, so $-70 \text{ mV}$
	indicates that the potential difference has a magnitude

	of 70 mV and the inside of the membrane is negative
2.	With a stimulus, a "sodium pump" is created – three Na+
	move across the membrane and flow into the cell and two
3	K+ diffuse out of the cell; the membrane is now depolarized
5.	because the Na+/K+ exchange can only occur at the node
	so impulses leap from node to node
4.	Before another electrical current can spread along the nerve
	fiber, the membrane must repolarize to its original condition.
	The refractory time is a brief period when a neuron resists
_	restimulation until repolarization is complete
5. D Cha	The impulse can never move backward
B. Che	mical – at the synapse (see the Chemical Synapses Diagram)
1.	This impulse causes Ca++ to enter the axon knob
3.	The Ca++ causes synaptic vesicles to migrate to the
•	presynaptic membrane and release hundreds of
	neurotransmitters into the synaptic cleft
4.	The neurotransmitter binds with receptors on the
	postsynaptic membrane. Function is therefore determined by
F	the post synaptic receptors, not by the neurotransmitter
ວ.	This binding opens channels in the post synaptic membrane,
	temporary depolarization
6.	This causes excitation and the impulse is on its way –
	conduction has occurred
7.	Some neurotransmitters are transported back into the
	presynaptic knob, where they are repackaged into vesicles
O No.	and used again
C. Neu	rotransmitters
1.	muscle, but inhibits cardiac muscle: is also involved with
	memory: a deficiency of ACh could be a cause of
	Alzheimer's
2.	Amines – synthesized from amino acid molecules
	a. Serotonin – a CNS inhibitor; moods, emotions, and
	sleep
	b. Histamine – a CNS stimulant; regulation of water
	c Donamine – has an inhibitory effect on the somatic
	motor system: without dopamine the body has a
	general overstimulation of muscles = Parkinsonian
	tremors; cocaine blocks the uptake of dopamine
	d. Epinephrine – autonomic nervous response, beta
	receptors, and dilation
	e. Norepinephrine – autonomic nervous response, alpha

<ul> <li>receptors, and constriction; antidepressants increase the amount of norepinephrine in brain, relieving depression</li> <li>3. Amino acids <ul> <li>a. Glutamate – CNS excitatory</li> <li>b. Glycine – CNS inhibitory</li> </ul> </li> <li>4. Neuropeptides – short strands of amino acids called polypeptides <ul> <li>a. Enkephalins/endorphins – inhibitory; act like opiates to block pain</li> <li>b. VIP – vasoactive intestinal peptide</li> <li>c. CCK – cholecystokinin</li> </ul> </li> </ul>
d. Substance P – excitatory, transmits pain information
VIII. Reflex – a reflex arc is a conduction route to and from the CNS; a regulatory feedback loop (see the Reflex Arc Diagram)
A. Structure
<ol> <li>Sensory receptor in the PNS</li> </ol>
2. Sensory afferent neuron
3. Interneuron(s) in the CNS
4. Motor efferent neuron
5. Effector (muscle/giand) lissue in the PNS
D. Types 1. Deen tendon reflex – natellar tendon, knee jerk
2 Pupil reflex – to light or dark constricts or dilates
3 Corneal reflex – with touch causes blinking
4. Gag reflex – to touch, sight, and smell
5. Plantar reflex – negative Babinski response; toes curl under
when the sole is stroked
C. First level reflex
1. Predictable, fast, automatic
2. The impulse travels only to the spinal cord
3. Example – jerking your hand away from a hot stove
D. Second level reflex
1. Impulse travels to the brain stem
2. Usually protective 3. Example – courdbing or vomiting
F Third level reflex
1. Learned or conditioned reflex
2. Involves the cerebral cortex
3. Example – bowel or bladder control
F. Ipsilateral – receptors and effectors are located on one side of th
body
G. Contralateral – receptors and effectors are located on opposite
sides of the body

- IX. Central Nervous System (see the Brain Diagram)
  - A. Brain a mass of 12 billion neurons and neuroglia weighing approximately three pounds, and protected by cranial bones
  - B. Cerebrum largest percentage mass of the brain (83% of brain mass); responsible for higher mental functions and the distribution of impulses (see the Gray and White Matter Diagram)
    - Cerebral cortex the outer layer of gray matter; short- and long-term memory
      - a. Convolutions elevated ridges or folds that increase the gray area of brain
      - b. Sulci shallower grooves
      - c. Fissures deep grooves (fetal folds)
        - i. Longitudinal separates the right and left hemispheres; corpus callosum (large fibers that connect the two hemispheres)
        - ii. Transverse separates the cerebrum from the cerebellum
        - iii. Fissure of Rolando divides the frontal and parietal lobes at the coronal suture
        - iv. Fissure of Sylvan/lateral fissure divides the frontal and temporal lobes
    - 2. Cerebral medulla white matter, conduction pathways
    - 3. Divided into right and left hemispheres (the left side governs the right side of the body, the right side governs the left side of the body)
    - 4. Lobes
      - a. Frontal voluntary motor control, learning, planning, and speech
      - b. Parietal sensory, distance, size, shape, and cognitive/intellectual processes
      - c. Occipital vision and visual memory
      - d. Temporal auditory, olfactory, speech, judgment, reasoning, and willpower
  - C. Cerebellum below and posterior to the cerebrum
    - 1. The right and left hemispheres are connected by the central vermis
    - 2. Outer gray, inner white forms the arbor vitae
    - 3. Coordinates muscular movement, posture, balance, running, and walking
    - 4. Damage produces ataxia (a lack of coordination due to errors in speed, force, and direction of movement)
  - D. Brainstem (damage = coma) (see the Pons and Midbrain Diagram)
    - 1. Midbrain the upper part of the brainstem
      - a. Controls postural reflexes and walking
      - b. Visual reflexes and auditory control, 3-4 cranial nerves

2. Pons – a two-way conduction pathway; mixed gray and
white fibers
a. Controls inspiration
b. I ransverse fibers give it a bridge appearance
c. Reflex mediation for 5-8 cranial nerves
3. Medulia obiongata – the bulb (the lowest part before the
foramen magnum); made of white and gray fibers called the
reticular formation
a. 75% of herve fibers cross here
b. Controls vital functions – respiration and circulation
E. Dioneenhalon the area between the carebrum and the midbrain
L. Diencephalon – the area between the celebruin and the midbrain     The low station for concerv
incoming and motor outgoing impulses: damage - increased
sepsitivity to pain and loss of consciousness
2 Hypothalamus – forms the floor of the third ventricle
a Regulates autonomic control
b Cardiovascular control – dilates and constricts
c Temperature control
d. Controls appetite – hunger and thirst
e. Water balance
f. GI control – peristalsis, intestinal secretions
g. Emotional states – fear, anger, pleasure, pain, and
sexual reflexes
h. Sleep control
i. Regulates pituitary secretions
j. CHO and fat metabolism
<ol><li>Epithalamus – contains the pineal body/gland (melatonin)</li></ol>
F. Meninges – three membranous coverings with spaces between
each
<ol> <li>Dura mater – "tough mother"; strong, white, fibrous tissue</li> </ol>
that lines the skull bones; has inward extensions into the
fissures
a. Epidural space – between the bone and the dura mater
b. Subdural space – between the dura and arachnoid
2. Arachnoid – resembles fine cobwebs with fluid (CSF) filling
the spaces
a. Subarachnoid space – between the arachnoid and pla
Idyels 2 Dia mater "tandar mathar": agyara the brain and aningl
5. Pla mater – tender mother, covers the brain and spinal
Corobrognical Eluid (CSE) bothes the skull brain and spinal
o. Cerebrospinal Fluid (Cor) - ballies the Skull, brain, and Spinal cord (see the Spinal Cord Protective Covering Diagram)
1 Serves as a shock absorber for the brain and eninal cord
2 400-500 ml produced daily yet only 140 ml is circulating at
2. Too ooo nii produocu daliy, yet oliiy 1to nii is circulatiliy at

	any time
2	any lime
З.	and subarashapid spaces, and is absorbed back into the
	and subaractition spaces, and is absorbed back line the
Λ	Diouu Dravidaa autrianta and waata ramaval far brain tiaguaa
4. C	Provides numerils and waste removal for brain tissues
5.	It is clear, coloriess, and composed of water, 40-60%
	glucose, NaCl, K+, protein, and a few white blood cells
H. Venti	icles – CSF-filled spaces of the brain; the rich network of
blood	I vessels, the choroid plexus, maintains selective
perm	eability to protect brain tissue
1.	Foramen of Monro – connects the lateral ventricles to the
	third ventricle (behind and below the laterals)
2.	Aqueduct of Sylvus – connects the third and fourth ventricle
3.	In the roof of the fourth ventricle are openings, the foramen
	of Magendie and foramen of Luschka, that allow the CSF to
	move into the cisterna magna, a space behind the medulla
	that is continuous with the subarachnoid space
I. Spina	al cord
1.	Deep grooves – anterior median fissure (deeper) and
	posterior median sulcus
2.	I wo bundles of nerve fibers, called roots, project from each
	side of the cord
	<ul> <li>a. Dorsal nerve root – sensory afferent fibers</li> </ul>
	<ul> <li>b. Dorsal root ganglion – sensory cell bodies</li> </ul>
	c. Ventral nerve root – motor efferent fibers
	d. The nerve roots join together to form a single, mixed
	nerve called a spinal nerve
3.	"Н"
	<ul> <li>The gray matter of cell bodies of interneurons and</li> </ul>
	motor neurons, divided into anterior, posterior, and
	lateral horns
	<ul> <li>b. White matter surrounds gray "H"; divided into anterior,</li> </ul>
	posterior, and lateral columns (large bundles of nerve
	axons divided into smaller bundles called tracts);
	ascending and descending, and lateral organizational
	tracts
	<ul> <li>c. Transcutaneous electrical nerve stimulation unit</li> </ul>
	(TENS) – acts to close the gates of the ascending
	tracts; therefore pain impulses are not allowed to get to
	the brain
	<ul> <li>Lumbar puncture – a spinal tap between the 3rd and</li> </ul>
	4th lumbar vertebrae for CSF diagnostics
Peripheral	Nervous System
A. Cran	ial Nerves – twelve pairs: "On Old Olympus' Towering Top, A
Finn,	and German Grew Some Hops", "Some Say Marry Money

Х.

	But 1. 2.	My Brother Says, Bad Business, Marry Money" Olfactory – I: sensory, smell Optic – II: sensory, vision
	3. 4. 5.	Trochlear – IV: motor, eye movement and pupil Trochlear – IV: motor, eye movement, peripheral vision Trigeminal – V: both, ophthalmic maxillary, mandibular (sensory): face and head (motor)
	6.	Abducens – VI: motor, abducts eve
	7.	Facial Nerve – VII: both, facial expression, taste, tongue movement
	8.	Vestibulocochlear – VIII: sensory, hearing and balance
	9.	Glossopharyngeal – IX: both, tongue, throat, swallowing
	10	. Vagus – X: both, organ sense (thoracic and abdominal) inhibitor
	11	. Accessory – XI: motor, spinal accessory, shoulder and head movement
	12	. Hypoglossal – XII: motor, tongue and throat movement
	B. Spir	nal Nerves – 31 pairs of mixed nerves attached to the spinal
	cord	I via ventral and dorsal roots
	1.	thoracic, five lumbar (exit the cord at the 1st lumbar vertebra, but do not exit the spinal canal until reaching their
		intervertebral foramina: this gives the cord a "cauda equina"
		look) five sacral one coccydeal
	2.	Each nerve splits into several large branches + rami, which
		subdivide into four complex networks called plexuses (cervical brachial lumbar sacral)
	3.	Dermatome is an area of skin that is mainly supplied by a
		single spinal nerve
XI.	Special Se	enses
	A. Sen	se of taste
	1.	Chemoreceptors respond to chemicals in an aqueous solution
	2.	Taste – gustation
	3.	Taste buds – sensory receptor organs for taste; primarily on
		the tongue papillae
	4.	Primary sensations: sweet, salty, sour, bitter
	5.	Sensitivity
		a. Tip of the tongue – sweet and salty
		b. Sides of the tongue – sour
	-	c. Back of the tongue – bitter
	6.	I hresholds
		a. Bitter – minute amounts
		D. Sour – less sensitive

c. Sweet and salty - least sensitive

7. Anterior 2/3 of tongue sensory stimulation travels via the
facial nerve to the parietal lobe of the cerebral cortex for
interpretation and appreciation of what is being tasted
8. Posterior 1/3 of tongue sensory stimulation travels via the
glossopharyngeal nerve to the medulla oblongata and then
to the parietal lobe of the cerebral cortex for interpretation
9. 80% of taste is actually smell
10. Other influences – thermoreceptors, mechanoreceptors,
from tosto, i.e. shill poppore stimulate the pain recentere)
B Sonso of small
Sense of smell     Specialized neurons with olfactory cilia in the upper nasal
cavity
2. Stimulated by gas molecules or chemicals
3. Sniffing draws air forcefully up into the nose
4. Sensory cells live for an average of 30 day
5. Sensory cells are affected by a variety of factors – age,
nutrition, hormones, drugs, and therapeutic radiation
6. When stimulated, send impulses via the olfactory nerve to
the cerebral cortex for interpretation
<ol><li>Smell memory is long-lasting and stimulation by similar</li></ol>
smells can trigger memories of events that occurred long
ago
<ol> <li>Olfactory receptors are easily fatigued – adaptation occurs</li> </ol>
a. The process of conforming to the environment after
continuous stimulation of a constant intensity
b. These changes in awareness of odors allow us to
continue to function at an optimum level
9. Seven primary odors – noral, musky, camphorous,
10 Homeostatic imbalances
a Anosmias – without smell: some denetic causes head
injuries that tear the olfactory nerves aftereffects of
nasal cavity inflammation (cold, allergy, smoking).
physical destruction of the nasal cavity due to polyps.
aging, zinc deficiency
b. Uncinate fits – olfactory hallucinations, epileptic auras
(transient uncinate fits)
C. Sense of vision (see the Eye Diagram)
1. Anatomy
<ul> <li>a. Eyebrows – physical protection of the eyes; short,</li> </ul>
coarse hairs
<ul> <li>b. Eyelids (palpebrae) – physically protect the eye and</li> </ul>
prevent the cornea from drying via the blink reflex;
medial and lateral canthi (angle of eye); caruncle
(fleshy elevation of the medial canthus which contains

sebaceous and sweat glands to produce "Sandman's eye-sand")

- c. Eyelashes hairs with glands at the base for lubrication; inflammation = a sty
- d. Meibomian glands secrete a lipid tear film spread by blinking; reduces evaporation of the tear film, prevents the tear film from running down the face; gives an even spread over the eyeball; inflammation = chalazion
- Lacrimal glands secrete an aqueous tear film containing globulins and lysozyme; supplies nourishment to the cornea and helps to provide antimicrobial activity; nasolacrimal duct (empties into the nasal cavity; excess tears = tearing, nasal secretions; secretions decrease with age)
- f. Conjunctiva the membrane that lines the eyelid; secretes a mucous tear component that helps reduce surface tension; it accumulates at the medial canthus (corner angle) as "sleep"; inflammation = pinkeye
- g. Extrinsic eye muscles annular ring (tendinous ring from which originate the rectus muscles); rectus muscles (superior, inferior, lateral, and medial each moves the eye in direction of its name); oblique muscles (superior, inferior each moves the eye in the vertical plane when the eye is turned medially by the rectus muscle); diplopia = double vision when movements are not perfectly coordinated, and inability to focus both eyes; strabismus = congenital weakness causing a cross-eyed appearance (the deviant eye becomes functionally blind)
- h. Sclera the outermost white covering of the eyeball; anchor site for muscles
- Cornea the transparent front of the sclera; it has no blood vessels but is richly supplied with sensory nerves; depends on tear film for nutrition, O<sub>2</sub>, and removal of waste; a window for light to enter; extraordinary capacity for regeneration; transplantation without rejection due to avascular nature
- j. Choroid the highly vascular middle layer of eye; dark membrane on the posterior wall inside the eye; provides nutrients to all tunics; pigment absorbs light to prevent scatter and reflection internally
- k. Ciliary body encircles the lens
- Anterior chamber between the cornea and the iris; filled with an aqueous humor that supplies nutrients to the cornea; helps maintain the ocular shape; constantly being formed; excess drains through the canal of

Schlemm to the bloodstream; the amount regulates intraocular pressure; increased pressure = glaucoma, which results in atrophy of the optic nerve and blindness

- m. Iris the visible, colored part of the eye; muscles control pupil size which regulates the amount of light entering the lens; sympathetic = dilation, parasympathetic = constriction
- n. Pupil the round central opening of the iris; allows light to enter
- Lens a transparent spherical structure suspended by suspensory ligaments between the iris and the vitreous humor; being a convex lens – 1/3 of the refractive power of the eye; accommodation = as objects are brought closer to the eye, the ciliary muscles contract and make the lens more convex, increasing its refractive power; (presbyopia = during the aging process, the lens loses elasticity; diabetes – excess glucose draws water into the lens causing opacity changes = cataracts)
- P. Vitreous humor secreted by the retinal cells; makes up the posterior chamber; maintains the shape of the eye, positions the retina against the choroid, and transmits light
- q. Retina the innermost pigment layer of the eye where the rods and cones (visual receptors) are located; absorbs light and recycles visual pigments; visual pigments, rhodopsin (in rods – dim light, peripheral vision) and lodopsin (in cones – bright light, high acuity, color vision), are converted into opsin and reinene (vitamin A derivative) which stimulate the bipolar neurons (converge to form optic nerve); diabetic retinopathy = small, retinal hemorrhages occur due to excess glucose in the blood – disrupts O<sub>2</sub> to the rods and cones – blindness; nyctalopia = deficiency of vitamin A – night blindness
- r. Fovea the focus point for light rays for the best visual acuity; composed mostly of cone cells
- s. Optic disc the "blind spot" where neurons exit the eyeball as the optic nerve
- 2. Sense of sight
  - a. Light waves are bent first by the cornea, the eye's fixed outer lens; bending of the light rays = refraction; the iris, whose pigment gives an eye its color, contracts in bright light and expands in dim light to regulate the amount of light entering the pupil; ciliary muscles

around the inner crystalline lens flex to focus the image precisely on the retina, a thin sheet of nerve tissue

- b. Light floods the retina and activates the photoreceptors, called rods and cones (due to their shape); cones specialize in bright light and are concentrated in a central patch of the retina called the fovea; cones provide acute central vision, rich with color; the colorblind rods enable us to see in dim light; signals from the rods and cones are sent to the cerebral cortex via the optic nerve; as much as 1/3 of the cortex is devoted to visual processing; sight mediates and validates the other senses
- c. At the optic chiasm, the nerve splits, distributing input from each eye to relay stations in the thalamus; this circuitry enables us to see with one eye if necessary; different neurons transmit data about motion, color, fine detail, and depth perception
- d. The visual area of the temporal cortex identifies and recognizes the object; an area of the parietal cortex locates the object in relation to space
- e. Visual acuity the clearness or sharpness of visual perception recorded as two numbers
  - i. The first number represents the distance in feet between the subject and the test chart (Snellen Chart)
  - ii. The second number represents the number of feet away that a person with normal acuity would stand to see clearly
  - iii. 20-20 is considered normal acuity
  - iv. 20-100 means a person can see objects at 20 feet that a person with normal vision can see at 100 feet
  - v. Visual acuity worse than 20-200 after correction is considered legally blind
- f. Homeostatic imbalances
  - i. Myopia nearsighted; focus falls short of the retina; far objects are blurred; radial keratotomy can correct or improve this condition
  - ii. Hyperopia farsightedness; focus falls behind the retina; close objects are blurred
  - iii. Astigmatism the cornea is not spherical; the focused image is distorted
  - iv. Color blindness a congenital lack of one or more types of cones (red, green, blue); sex-linked
- D. Sense of hearing (see the Ear Diagram)
  - 1. Anatomy of the external ear

- Auricle (pinna) the flap that funnels sound waves; helix = rim: lobule = earlobe b. External auditory meatus - the opening to the auditory canal, lined with cerumen/wax glands c. External auditory canal - a short, narrow chamber extends from the auricle to the tympanic membrane d. Tympanic membrane - the eardrum, that stretches across the canal and vibrates in response to sound waves: transmits them to the middle ear Anatomy of the middle ear – tiny cavity in the temporal bone a. Auditory ossicles - three bones that vibrate to transmit sound waves to the inner ear i. Malleus – a hammer-shaped, handle is attached to the tympanic membrane ii. Incus – anvil-shaped iii. Stapes – stirrup-shaped b. Oval/vestibular window - opens to the internal ear c. Round/Cochlear window - covered by a membrane; opens to the internal ear d. Pharyngotympanic/auditory/Eustachian tube - connects the middle ear to the pharynx; helps to equalize pressure so the eardrum will vibrate; children's tubes are more horizontal – otitis media (myringotomy = lancing of the eardrum to relieve pressure - insertion of tubes for drainage of fluid/pus) e. Mastoid sinuses - air spaces in the temporal bone that drain into the middle ear 3. Anatomy of the inner ear – labyrinth, located in the hollowed out portion of the temporal bone a. Vestibule and semicircular canals - involved in equilibrium; maculae found in the utricle and sacule of the vestibule provide information related to head position; crista ampullaris in the semicircular canals respond to angular/rotational movements of the head; tiny otoliths detect changes due to position and stimulate a reflex to restore normal body position b. Cochlea - the snail-like part of the inner ear for hearing; surrounded by perilymph and filled with endolymph fluid i. The upper section is the scala vestibuli ii. The lower section is the scala tympani iii. Reissner's membrane = the floor of the cochlea iv. Basilar membrane = the floor of the cochlea v. Organ of Corti – the receptor organ for hearing –
  - 7. Organ of Corti the receptor organ for hearing the eighth cranial nerve; the sense organ that rests on the basilar membrane, consisting of hair cells; sensory dendrites are wrapped around the

4. The physiol a. Sound throug tympa b. Vibrati the ov c. Presse scala d. A rippl throug inside e. The er bulge higher more of f. The st audito g. Impuls interpr h. Sound of the freque	base of the hair cells axons that form the a logy of hearing d waves are caught h gh the auditory canal unic membrane caus ions move the malle ral window ure is exerted inward vestibuli le starts in the perily gh the vestibular men the organ of Corti indolymph ripple cau up in response to so the upward bulge, the cells are stimulated cells are stimulated timulated cells transport ses travel to the aud reted as sound d volume is determin waves; sound pitch ency of the waves; the	they transmit in auditory (acoustic by the auricle, ch and strike agai ing it to vibrate us, incus, and st d into the perilym mph that is trans mbrane to the er ses the basilar no bund wave vibrat the more cilia are on the basilar mo mit nerve impuls itory cerebral con ed by the height is determined by ne decibel unit is	npulses to the c) nerve nanneled nst the capes against nph of the smitted ndolymph nembrane to tions; the e bent, the embrane es along the rtex – are c (amplitude) y the used for
Decibel	Example of Noise	Dangerous	
0	Lowest audible sound	Time	
30	Quiet library		
50	Refrigerator noise		
70	Noisy restaurant	Critical level	
80	Factory noise	8 + hours	
90	Shop tools	Impairment	
100	Chain saws	< 2 hours	
120	Rock concert	Immediate harm	
140	Gunshot blast	Damage probable	
180	Rocket launchpad	Permanent loss	

5. Homeostatic imbalances

		a. b.	Conduction deafness – something interferes with the conduction of sound vibrations to the fluids of the inner ear, i.e. impacted earwax, perforated/ruptured eardrum, otitis media, otosclerosis of ossicles Sensorineural deafness – damage to the neural structures at any point, from the cochlear hair cells to the auditory cortical cells; can be the gradual loss of receptor cells, exposure to a single loud noise, degeneration of the cochlear nerve, cerebral infarcts, or tumors; treatment can be cochlear implants
		C.	absence of auditory stimuli; can be the first symptom of cochlear nerve degeneration, inflammation of the middle/inner ear, or the side effect of some medications, i.e. aspirin
		d.	Meniere's Syndrome – a labryrinth disorder that affects the semicircular canals and cochlea; transient but repeated attacks of severe vertigo
		e.	Presbycusis – loss of the ability to hear high-pitched sounds; becoming common in young people due to noise
	E. S	Sense of	touch, heat, cold, and pain
		1. Sen	sorv receptors make it possible for the body to respond
		to e	nvironmental stimuli
		2 Rec	entors respond to a stimulus and convert the stimulus to
		2. Neu 2 ne	
		2 Mon	ve impulses travel via afferent concerv neurons to the
		J. Ner brai	n for interpretation
			ch - mechanorecentors/exterocentors: located on the
		hod	v surfaces; respond to touch stretch and pressure
		2000 2	Meissner's corpuscles – in the fingerting ling and
		u.	hairless body parts for fine touch
		b.	Pacinian corpuscles – in the skin, joints, and genitals
			for deep pressure and stretch
		C.	Krause's end bulbs – in the eyelids, lips, and genitals
			for light touch
		d.	Ruffini's corpuscles – found in the skin for continuous
		5 Hea	t/cold – thermorecentors
		6. Pair itchi	n – nocioceptors; free nerve endings for pain, tickling, ng; noci = pain, injury
XII.	Disord	ers of the	e Nervous System
	A. 5	Shingles	<ul> <li>herpes zoster viral infection; causes inflammatory</li> </ul>
	V	esicles a	along the peripheral nerves
	B. 1	Veuralgia	a – a sudden, sharp severe stabbing pain along a nerve

pathway

- C. Neuritis inflammation of a nerve; causes pain, muscular atrophy, hypersensitivity, and paresthesia
- D. Tic douloureux degeneration of the trigeminal nerves; causes repeated, involuntary muscle twitching
- E. Bell's palsy unilateral facial paralysis, sudden onset, viral inflammation of the trigeminal nerve
- F. Poliomyelitis (polio) is a highly infectious viral disease, which mainly affects young children. The virus is transmitted through contaminated food and water, and multiplies in the intestine, from where it can invade the nervous system; permanent paralysis or weakness
- G. Encephalitis a viral inflammation of brain tissue; causes fever, lethargy, weakness, nuchal rigidity and opisthotonos, coma, and death
- H. Meningitis a bacterial or viral inflammation of the meninges; causes headache, fever, sore throat, back and neck pain, and loss of mental alertness
- I. Meningiocele a congenital hernia in which the meninges protrude through an opening in the spinal cord
- J. Epilepsy idiopathic recurring and excessive electrical discharge from neurons causing seizure activity (grand mal, petit mal)
- K. Hydrocephalus an increased accumulation of CSF within the ventricles; causes the cranium to enlarge unless treated with a shunt to remove excess fluid
- L. Parkinson's disease tremors, uncontrolled shaking; related to decreased amounts of dopamine
- M. Huntington's chorea a progressive dementia with bizarre involuntary movements; genetic
- N. Athetosis slow, irregular, twisting, snakelike movements of the hands
- O. Hemiballism jerking and twitching movements of one side of the body; caused by a tumor of the thalamus
- P. Dysmetria an inability to fix the range of movement in muscle activity
- Q. Cerebral palsy a congenital brain disorder/damage causing damage to motor neurons; flaccid or spastic paralysis
- R. Multiple sclerosis autoimmunity destruction of oligodendrocytes leading to demyelination with progressive muscular weakness
- S. Muscular dystrophy a genetic defect in muscle metabolism; causes progressive atrophy
- T. Myasthenia gravis a disease characterized by muscular weakness, possibly due to decreased amounts of acetylcholine at the muscle effector sites
- U. Alzheimer's disease dementia-producing lesions in the cerebral cortex

V. Anencephalic – infants born without a frontal cerebrum; congenital, possibly related to toxins, may be related to a folic acid deficiency in the mother

### Activity

- I. Make flash cards of neurological terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete the Nervous System Worksheet.
- III. Complete the Nervous System Medical Terminology Worksheet.
- IV. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan -

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

V. Research and report on diseases and disorders of the nervous system.

#### Assessment

Successful completion of activities

### Materials

Nervous System worksheet Medical term worksheet

### Accommodations for Learning Differences

For reinforcement, the student will practice terms using flash cards of the nervous system.

For enrichment, the student will choose a disease related to the nervous system and research the disease using the internet. Students will share their findings with the class.

### National and State Education Standards

HLC02.01 Health care workers will know the various methods of giving and obtaining information. They will communicate effectively, both orally and in writing.

#### TEKS

202.1C Student is expected to interpret technical material related to the health science industry.

202.1D Student is expected to organize, compile, and write ideas into reports and summaries.

202.1E Student is expected to plan and prepare effective oral presentations. 202.1F Student is expected to formulate responses using precise language to communicate ideas.

202.2B Student is expected to demonstrate effective communication skills for responding to the needs of individuals in a diverse society. 202.2D Student is expected to accurately interpret, transcribe, and communicate medical vocabulary using appropriate technology

# **College and Career Readiness Standards**

English/language art

B.1 Identify new words and concepts acquired through study of their relationships to other words and concepts.

B2. Apply knowledge of roots and affixes to infer the meanings of new words.

B3. Use reference guides to confirm the meanings of new words or concepts.

Cross- Disciplinary standards-Foundational Skills

A2. Use a variety of strategies to understand the meanings of new words

## Nervous System Worksheet

- 1. What are the major functions of the nervous system?
- 2. Describe the organs of the central nervous system and their functions.
- 3. Describe the parts of the peripheral nervous system and their functions.
- 4. What cell forms the "White Matter"?
- 5. What cell forms the myelin sheaths around the axons of the PNS?
- 6. Explain the difference between the sensory afferent pathway and the motor efferent pathway.
- 7. Differentiate between white and gray matter.
- 8. Describe the meninges:
  - a. dura mater
  - b. arachnoid mater
  - c. pia mater
- 9. Identify and briefly describe the four principle parts of the brain.
  - a. cerebrum
  - b. cerebellum
  - c. brain stem
  - d. diencephalon

10. Describe CSF and identify the areas where it is typically found.

a. CSF is

b. Where is CSF located?

### 11. List the twelve cranial nerves and their main functions.

- a.
- b.
- C.
- d.
- e.
- f.
- g.
- h.
- ...
- i.
- j.
- k.
- I.

12. Describe the following disorders:

- a. Shingles -
- b. Neuralgia -
- c. Neuritis -
- d. Tic Douloureux -
- e. Bell's Palsy -
- f. Poliomyelitis -
- g. Encephalitis -
- h. Meningitis -

- i. Meningiocele -
- j. Epilepsy -
- k. Hydrocephalus -
- I. Parkinson's Disease -
- m. Huntington's Chorea -
- n. Athetosis -
- o. Hemiballism -
- p. Dysmetria -
- q. Cerebral Palsy -
- r. Multiple Sclerosis -
- s. Muscular Dystrophy -
- t. Myasthenia Gravis -
- u. Alzheimer's Disease -
- v. Anencephalic -

## Nervous System Worksheet - Key

- 1. What are the major functions of the nervous system?
  - i. Monitors change (stimuli) sensory input
  - ii. Integrates impulses integration
  - iii. Affects responses motor output
- 2. Describe the organs of the central nervous system and their functions.
  - i. Brain and spinal cord
  - ii. Integrates incoming pieces of sensory information, evaluates the information, and initiates the outgoing responses
- 3. Describe the parts of the peripheral nervous system and their functions.
  - i. Made of 12 pairs of cranial nerves and 31 pairs of spinal nerves
  - ii. Afferent (sensory) division
    - 1. Carries impulses toward the CNS
    - 2. Somatic (skin, skeletal muscles, joints)
    - 3. Visceral (organs within the ventral cavity)
  - iii. Efferent (motor) division
    - 1. Somatic carries information to the skeletal muscles (reflex and voluntary control)
    - 2. Autonomic involuntary; regulates smooth muscles, cardiac muscle, and glands
      - a. Sympathetic exit the thoracic area of the spinal cord and involved in preparing the body for "fight or flight"
      - b. Parasympathetic exit the cervical and lumbar areas of the spinal cord; coordinates the body's normal resting activities ("resting and digesting-repairing")
- 4. What cell forms the "White Matter"? Oligodendrocytes
- 5. What cell forms the myelin sheaths around the axons of the PNS? Schwann cells
- 6. Explain the difference between the sensory/afferent pathway and the motor/efferent pathway.
  - The Sensory/Afferent the dendrites are connected to receptors where stimulus is initiated in the skin/organs, and carry impulses toward the CNS; axons are connected to other neuron dendrites; unipolar except for the bipolar neurons in special sense organs; cell bodies in the sensory ganglia outside the CNS
    - 1. Receptors extroceptors (pain, temperature, touch); interoceptors (organ sensation); proprioceptors (muscle sense, position, movement)

- ii. The Motor/Efferent carry messages from the CNS to effectors; the dendrites are stimulated by other neurons and the axons are connected to effectors (muscles and glands); multipolar except for some in the ANS
- 7. Differentiate between white and gray matter.
  - i. Regions of the CNS which contain myelinated axons are referred to as white matter, and Regions of the CNS which contain mostly nerve cell bodies and unmyelinated axons are referred to as gray matter
- 8. Describe the meninges:
  - a. dura mater the outer layer. The dura mater, or "tough mother," is a doublelayered membrane. One layer is attached to the inner surface of the skull while the other layer forms the outer meningeal layer
  - b. arachnoid mater the middle layer. The arachnoid mater, or "spider mother," has threadlike extensions to span the subarachnoid space and attach it to the innermost membrane (the subarachnoid space is filled with cerebrospinal fluid)
  - c. pia mater the most inner layer. The pia mater, or "soft mother," clings tightly to the surface of the brain and spinal cord
- 9. Identify and briefly describe the four principle parts of the brain.
  - a. cerebrum the largest part of the brain; divided into paired halves known as the cerebral hemispheres. They are connected by a band known as the corpus callosum. The cerebrum is divided into four lobes: frontal, parietal, temporal and occipital. Conscious thought processes, memory storage and retrieval, sensations, and complex motor patterns originate here
  - b. cerebellum a large, cauliflower-like structure found inferior to the occipital lobe of the cerebrum. It has two hemispheres and contains both white and gray matter. The cerebellum provides the precise timing for coordinating skeletal muscle activity and controls balance and equilibrium. It also stores memories of previous movements
  - c. brain stem about the size of a thumb in diameter and approximately three inches long. It is the most inferior brain structure. Its sections include the medulla oblongata, the pons, and the midbrain
  - d. diencephalons superior to the brainstem and surrounded by the cerebral hemispheres. The major structures of the diecephalon include the thalamus and the hypothalamus. The thalamus functions as a relay station for sensory impulses, except for smell. As the impulses pass, we have a basic recognition of whether the sensation will be pleasant or unpleasant. The hypothalamus regulates body temperature, water balance, and metabolism. It is also important in regulating thirst, hunger, blood pressure, pleasure, and the sex drive
- 10. Describe CSF and identify the areas where it is typically found.

- a. CSF is a clear, watery fluid similar to blood plasma. It is continuously formed from the blood by the choroid plexus
- b. Where is CSF located? CSF is found circulating in the ventricles of the brain and in the subarachnoid space surrounding the brain and spinal cord

- 11. List the twelve cranial nerves and their main functions.
  - a. Olfactory sensory, smell
  - b. Optic sensory, vision
  - c. Oculomotor motor, eye movement and pupil
  - d. Trochlear motor, eye movement, peripheral vision
  - e. Trigeminal both, ophthalmic maxillary, mandibular (sensory); face and head (motor)
  - f. Abducens motor, abducts the eye
  - g. Facial Nerve both, facial expression, taste, tongue movement
  - h. Vestibulocochlear sensory, hearing and balance
  - i. Glossopharyngeal both, tongue, throat, swallowing
  - j. Vagus both, organ sense (thoracic and abdominal) inhibitor
  - k. Accessory motor, spinal accessory, shoulder and head movement
  - I. Hypoglossal motor, tongue and throat movement

12. Describe the following disorders:

- a. Shingles herpes zoster viral infection, causes inflammatory vesicles along the peripheral nerves
- b. Neuralgia sudden, sharp severe stabbing pain along a nerve pathway
- c. Neuritis inflammation of a nerve; causes pain, muscular atrophy, hypersensitivity, and paresthesia
- d. Tic Douloureux degeneration of trigeminal nerves causes repeated, involuntary muscle twitching
- e. Bell's Palsy unilateral facial paralysis, sudden onset, viral inflammation of the trigeminal nerve
- f. Poliomyelitis a viral infection of gray matter of the spinal cord causing permanent paralysis or weakness
- g. Encephalitis a viral inflammation of the brain tissue; causes fever, lethargy, weakness, nuchal rigidity and opisthotonos, coma, and death
- h. Meningitis bacterial or viral inflammation of the meninges; causes headache, fever, sore throat, back and neck pain, loss of mental alertness
- i. Meningiocele a congenital hernia in which the meninges protrudes through an opening in the spinal cord
- j. Epilepsy idiopathic recurring and excessive electrical discharge from neurons causing seizure activity (grand mal, petit mal)
- k. Hydrocephalus an increased accumulation of CSF within the ventricles; causes the cranium to enlarge unless treated with a shunt to remove excess fluid
- I. Parkinson's Disease tremors, uncontrolled shaking, related to decreased amounts of dopamine
- m. Huntington's Chorea progressive dementia with bizarre involuntary movements; genetic
- n. Athetosis slow, irregular, twisting, snakelike movements of the hands
- o. Hemiballism jerking and twitching movements of one side of the body; caused by a tumor of the thalamus
- p. Dysmetria the inability to fix the range of movement in muscle activity

- q. Cerebral Palsy a congenital brain disorder/damage causing damage to the motor neurons; flaccid or spastic paralysis
- r. Multiple Sclerosis autoimmunity destruction of the oligodendrocytes leading to demyelination with progressive muscular weakness
- s. Muscular Dystrophy a genetic defect in muscle metabolism; causes progressive atrophy
- Myasthenia Gravis a disease characterized by muscular weakness, possibly due to decreased amounts of acetylcholine at the muscle effector sites
- u. Alzheimer's Disease a dementia producing lesions in the cerebral cortex
- v. Anencephalic infants born without a frontal cerebrum; congenital; possibly related to toxins, may be related to folic acid deficiency in the mother
# Nervous System Medical Terminology Worksheet

Please write the meaning of the terms in the right column.

af	
-al	
-algia	
ambul	
an	
astr/o	
cephal/o	
cerebell/o	
cerebr/o	
crani/o	
-cyte	
dendr/o	
-drome	
dur/o	
-eal	
ef	
encephal/o	
ері	
esthesi/o	
-ferent	
gangli/o	
-glia	
gloss/o	
-graphy	
hemi-	
home/o	
hydr/o	
hypo	
-ia	
-iatry	
-ic	
-ictal	
intra	
-ism	
-itis	

Prefixes, Suffixes, and Root Words:

kino	
-lepsy	
-logy	
-mania	
megal/o	
mening/o	
ment/o	
micr/o	
mon/o	
mot/o	
myel/o	
neur/o	
ocul/o	
olfact	
olig/o	
-ologist	
-ology	
opt/o	
-otomy	
para	
-paresis	
-pathy	
phag/o	
pharyng/o	
phas/o	
phren/o	
-plegia	
poli/o	
poly	
pre-	
psych/o	
quad	
radicul/o	
rhiz/o	
spina	
-stasis	
syn	
tetra-	
-tomy	

|--|

### **Medical Terms**

afferent	
anesthesia	
astrocyte	
cerebrospinal	
craniotomy	
dementia	
dendrites	
dysphagia	
dysphasia	
efferent	
encephalitis	
encephalotomy	
epilepsy	
glossopharyngeal	
hemiparesis	
hemiplegia	
homeostasis	
hydrocephalus	
hypoglossal	
intracranial	
kinesthetic	
megalomania	
meninges	
meningitis	
meningocele	
microencephaly	
microglia	
motor	
myelography	
narcolepsy	
neuralgia	
neuroglia	
neuroglial	
neurology	
oculomotor	
olfactory	

oligodendrocyte	
optic	
paralysis	
paraplegia	
poliomyelitis	
polyneuritis	
quadriplegia	
radiculopathy	
schizophrenia	
somatic	
somnambulism	
spinal	
syndrome	

### **Medical Abbreviations**

amt	
ASA	
ASAP	
bid	
CC	
cm	
dc	
dr	
CNS	
CSF	
g	
gm	
gr	
gtt	
h	
HA	
hs	
IM	
IV	
kg	
lb	
LOC	
mg	
mgm	

ml	
NKA	
NKDA	
noct	
OTC	
OZ	
PDR	
РК	
PM	
ро	
PRN	
q	
qam	
qd	
qday	
q3h	
qid	
R	
Rx	
sig	
tab(s)	
tbsp	
tid	
tsp	
Тх	

## **KEY** - Nervous System Medical Terminology Worksheet

af	to, toward
-al	pertaining to
-algia	pain
ambul	ambulate (walking)
an	without, absence of
astr/o	star
cephal/o	head, brain
cerebell/o	cerebellum
cerebr/o	cerebrum
crani/o	cranium, skull, helmet
-cyte	cell
dendr/o	branches
-drome	symptoms running with
dur/o	dura mater
-eal	pertaining to
ef	away from
encephal/o	brain
ері	on, upon
esthesi/o	feeling or sensation
-ferent	carry
gangli/o	ganglion
-glia	glue
gloss/o	tongue
-graphy	the process of making a picture
hemi-	half
home/o	same
hydr/o	water
hypo	less than
-ia	state of
-iatry	treatment, cure
-ic	pertaining to
-ictal	seizure, attack
intra	within
-ism	condition or state of
-itis	inflammation of
kino	movement
-lepsy	seizure

### Prefixes, Suffixes, and Root Words:

-logy	study of
-mania	madness
megal/o	large
mening/o	meninges
ment/o	mind
micr/o	small
mon/o	one
mot/o	motor, to move
myel/o	spinal cord
neur/o	nerve, neuron
ocul/o	eye
olfact	smell
olig/o	few
-ologist	one who studies
-ology	study of
opt/o	eye
-otomy	to cut into
para	beside, beyond, around
-paresis	slight paralysis
-pathy	disease
phag/o	eating, swallowing
pharyng/o	throat
phas/o	speech
phren/o	diaphragm
-plegia	paralysis
poli/o	gray matter
poly	many
pre-	before
psych/o	mind
quad	four
radicul/o	nerve root
rhiz/o	nerve root
spina	spine
-stasis	standing still
syn	with, together
tetra-	four
-tomy	to cut into
tri	three

### Medical Terms

afferent	to carry towards
anesthesia	without feeling or sensation
astrocyte	star (shaped) cell
cerebrospinal	pertaining to the brain (cerebrum) and spinal cord
craniotomy	to cut into the skull
dementia	to lose one's mind
dendrites	branches
dysphagia	difficulty swallowing
dysphasia	difficulty speaking
efferent	to carry away from
encephalitis	inflammation of the brain
encephalotomy	to cut into the brain
epilepsy	upon (recurrent) seizures
glossopharyngeal	pertaining to the tongue and throat
hemiparesis	half (of the body) slightly paralyzed
hemiplegia	half (of the body) paralyzed
homeostasis	condition of standing still (staying the same)
hydrocephalus	water in the brain
hypoglossal	below the tongue
intracranial	within the skull
kinesthetic	pertaining to movement
megalomania	madness about great or large (having an overinflated ego)
meninges	meninges or coverings of the brain
meningitis	inflammation of the brain coverings (inflammation of the meninges).
meningocele	herniation or protrusion of the meninges
microencephaly	abnormally small head
microglia	small glue
motor	referring to movement
myelography	the process of recording a picture of the spinal cord
narcolepsy	sleep seizures
neuralgia	nerve pain
neuroglia	nerve glue
neuroglial	pertaining to nerve glue
neurology	the study of nerves
oculomotor	movement of the eye
olfactory	referring to smell
oligodendrocyte	specialized nerve cell
optic	pertaining to the eye

paralysis	unable to move
paraplegia	unable to move lower extremities (paralysis)
poliomyelitis	inflammation of the gray matter of the spinal cord
polyneuritis	inflammation of many nerves
quadriplegia	paralysis of four extremities
radiculopathy	nerve root disease
schizophrenia	condition of split mind
somatic	referring to the body
somnambulism	state of sleepwalking
spinal	pertaining to the spine or pertaining to the spinal cord
syndrome	symptoms that run together

### **Medical Abbreviations**

amt	amount
ASA	aspirin
ASAP	as soon as possible
bid	twice a day
СС	cubic centimeter(s)
cm	cubic millimeter(s)
dc	discontinue, discharge
dr	dram
CNS	central nervous system
CSF	cerebrospinal fluid
g	gram
gm	gram
gr	grain
gtt	drop
h	hour
HA	headache
hs	hour of sleep (bedtime)
IM	intramuscular
IV	intravenous
kg	kilogram
lb	pound
LOC	level of consciousness
mg	milligram(s)
mgm	milligram(s)
ml	milliliter(s)
NKA	no known allergies

NKDA	no known drug allergies
noct	nocturnal (night)
OTC	over-the-counter
OZ	ounce
PDR	Physicians' Desk Reference
PK	pain killers
PM	hours between noon and midnight (afternoon/night)
ро	by mouth
PRN	as needed
q	every
qam	every morning
qd	every day
qday	every day
q3h	every three hours
qid	four times a day
R	rectal, right
Rx	"take," prescription
sig	instructions or directions
tab(s)	tablets
tbsp	tablespoon
tid	three times a day
tsp	teaspoon
Тх	treatment, therapy

# **Special Senses Medical Terminology Worksheet**

Please write the meaning of the terms in the right column.

### Prefixes, Suffixes, and Root Words

а	
acou/o	
-al	
-ar	
audi/o	
aur/i	
aur/o	
bi-	
bin-	
blephar/o	
cac/o	
chrom/o	
conjunctiv/o	
core/o	
cor/o	
corne/o	
cry/o	
cyst/o	
dacry/o	
dipl/o	
-eal	
-ectomy	
fov	
gloss/o	
-gram	
hyper	
hypo	
-ic	
-ician	
intra	
irid/o	
-ism	
-ist	
-itis	
kerat/o	

labyrinth/o	
lacrim/o	
laryng/o	
lingu/o	
mastoid/o	
medi	
-meter	
-metr/y	
mon/o	
my/o	
myring/o	
nas/o	
ocul/o	
-ocular	
-ologist	
-ology	
ophthalm/o	
-opia	
opt/o	
or/o	
-ory	
osse/o	
-ostomy	
ot/o	
-otomy	
-ous	
-pathy	
-pexy	
pharyng/o	
-pharynx	
-phobia	
-phonia	
phon/o	
phot/o	
-plasty	
-plegia	
presby	
-ptosis	
pupill/o	

retin/o	
rhin/o	
-rrhea	
scler/o	
-scope	
sens	
staped/o	
-stomy	
-tic	
-tomy	
ton/o	
tympan/o	
vitre/o	

### Medical Terms

achromatism	
acoustic	
audiogram	
audiometer	
audiometry	
auditory	
auricle	
binocular	
blepharitis	
blepharoplasty	
blepharoptosis	
cacophony	
conjunctivitis	
cryopexy	
dacryocystorhinostomy	
diplopia	
fovea	
glossopharyngeal	
hyperopia	
hypoglossal	
intraocular	
iridectomy	
keratometry	

keratoplasty	
keratotomy	
lacrimal	
mastoiditis	
monochromatic	
myopia	
myringotomy	
ophthalmologist	
ophthalmoplegia	
ophthalmoscope	
optometry	
oral	
oropharynx	
ossicles	
otitis media	
otolaryngologist	
otoscope	
photophobia	
presbyopia	
rhinorrhea	
rhinitis	
rhinoplasty	
retinopathy	
sense	
stapedectomy	
tonometer	
tympanitis	
vitrectomy	
vitreous	

### **Medical Abbreviations**

ENT	
I&D	
O.D.	
0.S.	
O.U.	
PEARL	
CC	

cm	
mm	
gtt	
mg	
ml	
oint	
sig	
PRN	
q	
qam	
qd	
qday	
q2h	
qid	
Rx	
tid	
Тх	
U	

## **KEY** - Special Senses Medical Terminology Worksheet

### Prefixes, Suffixes, and Root Words

а	without
acou/o	hearing
-al	pertaining to or expressing relationship
-ar	pertaining to or expressing relationship
audi/o	hearing
aur/i	ear
aur/o	ear
bi-	two
bin-	two
blephar/o	eyelid(s)
cac/o	bad
chrom/o	color
conjunctiv/o	conjunctiva
core/o	pupil
cor/o	pupil
corne/o	cornea
cry/o	cold
cyst/o	sac
dacry/o	tears, tear duct
dipl/o	two
-eal	pertaining to
-ectomy	removal of
fov	pit
gloss/o	tongue
-gram	recorded picture
hyper	above, more than
hypo	below, less than
-ic	pertaining to or expressing relationship
-ician	one who
intra	within
irid/o	iris
-ism	condition of, state of
-ist	a specialist
-itis	inflammation of
kerat/o	cornea

labyrinth/o	labyrinth
lacrim/o	tears
laryng/o	larynx
lingu/o	tongue
mastoid/o	mastoid
medi	middle
-meter	instrument used to measure
-metr/y	measurement
mon/o	one
my/o	muscle, near
myring/o	ear drum
nas/o	nose
ocul/o	eye
-ocular	eye
-ologist	one who studies
-ology	study of
ophthalm/o	eye
-opia	vision
opt/o	vision
or/o	mouth
-ory	referring to
osse/o	bone
-ostomy	creation of an artificial opening
ot/o	ear
-otomy	cut into
-ous	pertaining to
-pathy	disease
-реху	surgical fixation
pharyng/o	pharynx or throat
-pharynx	throat
-phobia	fear of
-phonia	sound
phon/o	sound
phot/o	light
-plasty	surgical repair
-plegia	paralysis
presby	old
-ptosis	drooping
pupill/o	pupil

retin/o	retina
rhin/o	nose
-rrhea	discharge
scler/o	sclera
-scope	instrument to view
sens	feeling
staped/o	stapes
-stomy	to create an artificial opening
-tic	pertaining to
-tomy	to cut into
ton/o	pressure
tympan/o	ear drum
vitre/o	glass-like

### **Medical Terms**

achromatism	(condition of) absence of color vision
acoustic	pertaining to hearing
audiogram	recording of hearing
audiometer	instrument to measure hearing
audiometry	measurement of hearing
auditory	pertaining to hearing
auricle	pertaining to the (outer) ear
binocular	pertaining to two eyes
blepharitis	inflammation of the eyelid(s)
blepharoplasty	surgical repair of the eyelid(s)
blepharoptosis	drooping of the eyelids
cacophony	bad sound
conjunctivitis	inflammation of the conjunctiva
cryopexy	fixation using cold (used to fix the eyelids in some cases)
dacryocystorhinostomy	surgical creation of an opening between the lacrimal sac and the nose (nasal cavity)
diplopia	double vision
fovea	pit
glossopharyngeal	pertaining to the tongue and pharynx
hyperopia	far vision (referring to far- sightedness)
hypoglossal	pertaining to below the tongue
intraocular	pertaining to within the eye
iridectomy	removal of the iris

keratometry	measurement of the cornea
keratoplasty	repair of the cornea (actually refers to a corneal transplant)
keratotomy	incisions into the cornea (used to correct mild to moderate
	myopia or nearsightedness)
	partaining to the tear ducto
Iacrimal menteiditie	pertaining to the tear ducts
mastolollis	
monochromatic	pertaining to a single color
туоріа	
myringotomy	incision into the ear drum
ophthalmologist	one who studies the eyes
ophthalmoplegia	paralysis of the eye(s)
ophthalmoscope	instrument with which to view the eye(s)
optometry	measurement of the eyes
oral	pertaining to the mouth
oropharynx	mouth and throat
ossicles	pertaining to the bones (refers to the tiny middle ear bones)
otitis media	middle ear infection
otolaryngologist	one who studies the ear and larynx
otoscope	instrument to view the ear
photophobia	fear of light (what it really means is to be light sensitive)
presbyopia	aging vision
rhinorrhea	nasal discharge
rhinitis	inflammation of the nose
rhinoplasty	surgical repair of the nose
retinopathy	disease of the retina
sense	feeling
	removal of the stapes (a surgical procedure in which the
	innermost bone (stapes) of the three bones (the stapes, the
stapedectomy	incus, and the malleus) of the middle ear is removed, and
	replaced with a small plastic tube surrounding a short length of
	stainless steel wire (a prosthesis))
tonometer	Instrument to measure pressure (a test that measures the pressure in the eves to check for glaucoma)
tympanitis	inflammation of the ear drum
vitrectomv	removal of the vitreous or removal of the glass-like fluid
	pertaining to glass-like (the thick clear glass-like fluid found in the
vitreous	posterior cavity)

#### **Medical Abbreviations**

ENT	ear, nose, and throat
I&D	incision and drainage
O.D.	ocular dexter (right eye)
0.S.	ocular sinister (left eye)
O.U.	ocular united (both eyes)
PEARL	pupils equal and reactive to light
СС	cubic centimeter
cm	centimeter
mm	millimeter
gtt	drops
mg	milligram
ml	milliliter
oint	ointment
sig	instructions or directions
PRN	as needed
q	every
qam	every morning
qd	every day
qday	every day
q2h	every two hours
qid	four times a day
Rx	prescription or "to take"
tid	three times a day
Тх	treatment
U	unit

#### Course

Medical Terminology

#### Unit XI

The Special Senses

### Essential

**Question:** What medical terms are associated with the special senses?

### TEKS

130.203 (c) (1) (A), (B), (E) (2)(B) (4) (A), (B)

#### Prior Student Learning

None

#### Estimated time

2-3 hours

### Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the eye to discuss common conditions and diseases.

### Objectives

Upon completion of this lesson, the learner should be able to:

- Define and decipher common terms associated with the ear
- Identify the basic anatomy of the ear
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases and disorders which involve the ear

### Engage

Find a free online ear anatomy game. There are several out there. The one I used is puposegames.com. Have the kids play the game naming the parts of the ear. Explain that they will learn terminology related to the ear in this lesson

Key Points

- I. The sense of hearing
  - a. Enhances one's life
  - b. Makes communication easier
  - c. The structure of the ear is divided into three separate regions
- II. Outer Ear
  - a. Sound waves enter the ear through the pinna, or auricle, which is the projecting part or flap of the ear
  - b. The external auditory meatus (auditory canal) leads from the pinna and is lined with numerous glands that secrete a yellowish brown, waxy substance called cerumen, which lubricates and protects the ear
- III. Middle Ear
  - a. Sound waves travel through the auditory canal and strike a membrane, or eardrum
  - b. As the eardrum vibrates, it moves three small bones or ossicles
    - i. Malleus
    - ii. Incus
    - iii. Stapes
  - c. Auditory or Eustachian tube
    - i. A canal leading from the middle ear to the pharynx
    - ii. It is normally closed, but opens on swallowing to equalize pressure
- IV. Inner Ear
  - a. Sound vibrations reach the inner ear via the fluctuation of the oval

	window that separates the middle and inner ears b. Sometimes called the labyrinth c. Cochlea		
	i. Co vib ii. Org iii. Au cor	ntains special auditory liquids through which the rations travel (Perilymph and endolymph) gan of Corti: sensitive auditory receptor ditory nerve fibers end in the auditory cent of the cerebral rtex, where impulse are interpreted and "heard"	
V.	Equilibrium		
	a. The ear is an important organ of equilibrium (balance)		
	canals for	balance	
VI.	Pathway of soun	id vibrations	
	Pinna		
	External auditory canal outer ear Tympanic membrane		
	Malleus Incus Middle ear		
	Stapes	}	
	Oval window	J	
	Cochlea		
	Organ of Corti Auditory nerve	fibers ∫ Inner Ear	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary	a fibers ∫ Inner Ear S }Brain	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term	fibers Brain Meaning	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal	fibers Brain Brain Channel that leads from the pinna to the eardrum	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus	fibers Inner Ear Brain Brain Channel that leads from the pinna to the eardrum Auditory canal	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary <u>Term</u> Auditory canal Auditory meatus Auditory nerve	Fibers Inner Ear Brain Brain Channel that leads from the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers	Fibers Inner Ear Brain Brain Channel that leads from the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers	Fibers Channel that leads from the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII.	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers Auditory tube	Fibers From the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII. Channel between the middle ear and the Fibers compose the fibers compose the fibers compose the vestibulocochlear nerve (cranial nerve VIII. Channel between the middle ear and the fibers compose the vestibulocochlear nerve (cranial nerve VIII. Channel between the middle ear and the fibers compose the fiber	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers Auditory tube	Fibers Fibers Brain Brain Brain Brain Channel that leads from the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII. Channel between the middle ear and the nasopharynx; Eustachian tube.	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers Auditory tube Auricle	Fibers Channel that leads from the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII. Channel between the middle ear and the nasopharynx; Eustachian tube. Flap of the ear; the protruding part of the external	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers Auditory tube	Fibers Brain Brain Brain Brain Channel that leads from the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII. Channel between the middle ear and the nasopharynx; Eustachian tube. Flap of the ear; the protruding part of the external ear, or pinna	
VII.	Organ of Corti Auditory nerve Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers Auditory tube Auricle Cerumen	Fibers Brain Brain Brain Brain Brain Channel that leads from the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII. Channel between the middle ear and the nasopharynx; Eustachian tube. Flap of the ear; the protruding part of the external ear, or pinna Waxy substances secreted by the external ear;	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers Auditory tube Auricle Cerumen	Fibers Brain Brain Brain Brain Meaning Channel that leads from the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII. Channel between the middle ear and the nasopharynx; Eustachian tube. Flap of the ear; the protruding part of the external ear, or pinna Waxy substances secreted by the external ear; also called earwax.	
VII.	Organ of Corti Auditory nerve Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers Auditory tube Auricle Cerumen Cochlea	fibers Brain Brain Brain Meaning Channel that leads from the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII. Channel between the middle ear and the nasopharynx; Eustachian tube. Flap of the ear; the protruding part of the external ear, or pinna Waxy substances secreted by the external ear; also called earwax. Snail-shaped, spirally wound tube in the inner ear;	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers Auditory tube Auricle Cerumen Cochlea	fibers       Inner Ear         fibers       Brain         Brain       Meaning         Channel that leads from the pinna to the eardrum         Auditory canal         Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII.         Channel between the middle ear and the nasopharynx; Eustachian tube.         Flap of the ear; the protruding part of the external ear, or pinna         Waxy substances secreted by the external ear; also called earwax.         Snail-shaped, spirally wound tube in the inner ear; contains hearing-sensitive receptor cells.         Eluid within the labyrinth of the inner ear	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus Auditory nerve fibers Auditory tube Auricle Cerumen Cochlea Endolymph Eustachian tubo	fibers       Inner Ear         fibers       Brain         Brain       Channel that leads from the pinna to the eardrum         Auditory canal       Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII.         Channel between the middle ear and the nasopharynx; Eustachian tube.         Flap of the ear; the protruding part of the external ear, or pinna         Waxy substances secreted by the external ear; also called earwax.         Snail-shaped, spirally wound tube in the inner ear; contains hearing-sensitive receptor cells.         Fluid within the labyrinth of the inner ear.	
VII.	Organ of Corti Auditory nerve Cerebral cortex Vocabulary Term Auditory canal Auditory meatus Auditory meatus Auditory nerve fibers Auditory tube Auricle Cerumen Cochlea Endolymph Eustachian tube	fibers Brain Brain Brain Channel that leads from the pinna to the eardrum Auditory canal Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII. Channel between the middle ear and the nasopharynx; Eustachian tube. Flap of the ear; the protruding part of the external ear, or pinna Waxy substances secreted by the external ear; also called earwax. Snail-shaped, spirally wound tube in the inner ear; contains hearing-sensitive receptor cells. Fluid within the labyrinth of the inner ear. Auditory tube. Second ossicle (bone) of the middle ear: incus	

Labyrinth	Maze-like series of canals of the inner ear, which
	includes the cochlea, vestibule, and semicircular
	cans.
Malleus	First ossicle of the middle ear; malleus means
	hammer.
Oran of Corti	Sensitive auditory receptor area found in the
	cochlea of the inner ear.
Ossicle	Small bone of the ear; includes the malleus, incus
	and stapes.
Oval window	Membrane between the middle ear and the inner
	ear.
Perilymph	Fluid contained in the labyrinth of the inner ear.
Pinna	Auricle; flap of the ear.
Semicircular	Passage in the inner ear associated with
canals	maintaining equilibrium.
Stapes	Third ossicle of the middle ear. Stapes means
	stirrup.
Tympanic	Membrane between the outer and middle ear; also
membrane	called eardrum.
Vestibule	Central cavity of the labyrinth, connecting the
	semicircular canal and the cochlea. The vestibule
	contains two structures, the saccule and utricle that
	help to maintain equilibrium.

### VIII. Combining Forms

Combining form	Meaning	Example of term
Acous/o	Hearing	Acoustic
Audi/o	Hearing	Audiogram
Audit/o	Hearing	Auditory
Aur/o, auricul/o	Ear	Aural
Cochle/o	Cochlea	Cochlear
Mastoid/o	Mastoid process	Mastoiditis
Myring/o	Eardrum, tympanic	Myringotomy
	membrane	
Ossicul/o	Ossicle	Ossiculoplasty
Ot/o	Ear	Otic
Salping/o	Eustachian tube,	Salpingopharyngeal
	auditory tube	
Staped/o	Stapes	Stapedectomy
Tympan/o	Eardrum	Tympanoplasty
Vestibu/o	Vestibule	vestibulocochlear

#### IX. Suffices

Cambood		
Suffix	Meaning	Example of term
-acusis or	Hearing	Hyperacusis

-cusis		
-meter	Instrument to	Audiometer
	measure	
-otia	Ear condition	Macrotia

### X. Pathology

Condition	Description
Acoustic neuroma	Benign tumor arising from the acoustic
	vestibulocochlear nerve in the brain
Cholesteatoma	Collection of skin cells and cholesterol in a sac within
	the middle ear.
Deafness	Loss of the ability to hear.
Nerve deafness	Sensorineural hearing loss; results from impairment of
	the cochlea or auditory nerve
Conductive	Hearing loss resulting from impairment of the middle
deafness	ear ossicles and membranes transmitting sound waves
	into the cochlea.
Ménière disease	Disorder of the labyrinth of the inner ear elevated
	endolymph pressure within the cochlea and
	semicircular canals.
Otitis media	Inflammation of the middle ear.
Otosclerosis	Hardening of the bony tissue of the middle ear.
Tinnitus	Sensation of noises (ringing, buzzing,) in the ears.
Vertigo	Sensation of irregular or whirling motion either of
	oneself or of external objects.

### XI. Clinical Procedures

Procedure	Description
Audiometry	Testing the sense of hearing.
Cochlear implant procedure	Surgical insertion of a device that allows sensorineural hearing-impaired persons to hear sound.
Ear thermometry	Measurement of the temperature of the tympanic membrane by detection of infrared radiation from the eardrum.
Otoscopy	Visual examination of the ear canal with an otoscope.
Tuning fork test	Test of ear conduction using a vibration source such as a tuning fork

# XII. Abbreviations

Abbreviation	Definition
AD	Right ear
AOM	Acute otitis media
AS	Left ear

EENT	Eyes, ears, nose, throat	
ENG	Electronystagmography; test of the balance mechanism	
	of the inner ear by assessing eye movements	
ENT	Ears, nose and throat	
ETD	Eustachian tube dysfunction	
HEENT	Head, eyes, ears, nose, and throat	
PE tube	Pressure-equalizing tube ( to treat recurrent episodes of	
	acute otitis media)	
SOM	Serous otitis media	

#### Activity

- I. Make flash cards of ear terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete the Ear Terms Worksheet
- III. Complete the Ear Vocabulary Worksheet
- IV. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan -

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

V. Research and report on diseases and disorders from the Ear

#### Assessment

Successful completion of the activities

#### Materials

Medical Terminology book List of Ear terminology Ear terminology Key Ear vocabulary words worksheet Ear vocabulary worksheet Key Index cards Markers

#### Accommodations for Learning Differences

For reinforcement, the student will practice terms using flash cards of the ear.

For enrichment, the students will contact a local hearing aid center, and interview (in person or on the phone) a staff member asking what the steps are taken to establish the need for and the fitting for a hearing aid.

#### National and State Education Standards

**National Healthcare Foundation Standards and Accountability Criteria:** Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;
- (E) recall directional terms and anatomical planes related to the body structure

130.203 (c) (2) (B) employ increasingly precise language to communicate

- 130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:
  - (A) distinguish medical abbreviations used throughout the health science industry; and
  - (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

#### Texas College and Career Readiness Standards

English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts.

Cross-Disciplinary Standards,

I. Key Cognitive Skills D. Academic Behavior: 1. Self monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

# **HEARING TERMINOLOGY**

### Worksheet

Write the meaning of the word in the right column.

Term	Meaning
aur/o- aur/i-	external ear
auricle aural	
tympan/o-	eardrum
tympanitis	
tympanoplasty	
Tympanohyal	
tympanotomy	
myring/o-	tympanic membrane/eardrum
myringectomy	
myringitis	
myringoplasty	
myringotomy	
ossicl/-	little bones
ossiculectomy	
mastoid/o-	air spaces in mastoid process of temporal bone
mastoiditis	
mastoidalgia	
mastoidectomy	
labyrinth/o-	inner ear (maze)
labyrinthectomy	
labyrinthitis	
labyrinthotomy	
audi/o-	hearing
audible	
audiologist	
audiometer	
audiometry	
acou/o-	hearing
acoustic	
acousticophobia	
ot/o-	ear
macrotia	
microtia	
otalgia	
otitis (external,	
internal, media)	
Otolaryngologist	
otolaryngology	

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otomycosis	
otoneuralgia	
otoplasty	
otorrhea	
otoscope	
	RELATED TERMS:
cochlea	
endolymph	
equilibrium	
malleus=hammer /	
incus=anvil /	
stapes=stirrup	
Ménière disease	
perilymph	
pinna	
presbycusis	
Reissner's membrane	
saccule	
tinnitus	
utricle	
vertigo	
vestibule	

# **HEARING TERMINOLOGY-Key**

Term	Meaning	
aur/o- aur/i-	external ear	
auricle aural	Flap of the ear; the protruding part of the external ear, or	
	pinna	
tympan/o-	eardrum	
tympanitis	Inflammation of the ear drum (otitis media)	
tympanoplasty	Surgical procedure to repair the inflammatory process of	
	the middle ear (repair of the ear drum)	
Iympanohyal	Concerning the tympanic cavity and hyoid arch	
tympanotomy	Incision of the tympanic membrane	
myring/o-	tympanic membrane/eardrum	
myringectomy	Excision of all or part of the tympanic membrane	
myringitis	Inflammation of the tympanic membrane	
myringoplasty	Plastic surgery of the tympanic membrane	
myringotomy	Incision of the tympanic memorane	
OSSICI/-	Ittle bones	
Ossiculectomy	Excision of an ossicle	
mastola/o-	air spaces in mastold process of temporal bone	
mastolulus	Dein in the mesterid	
mastoidagta	Pain in the mastold	
	Evolution of the Johnwinth	
	EXCISION OF the labyment	
	Indianination of the labyrinth	
	hearing	
audible	Capable of being heard	
audiologist	A specialist in audiology	
audiometer	An instrument for testing hearing	
audiometry	I esting of the hearing sense	
acou/o-	hearing	
acoustic	The science of sound	
OVO-		
microtia	Abnormally large ears	
	Pain in the ear	
otitis (external internal	Fain in the ear	
media)	inhammation of the ear	
Otolaryngologist	A specialist in otolaryngology	
otolaryngology	The medical science that includes otology rhinology and	
	laryngology.	
otomycosis	Infection of the external auditory meatus of the ear,	

	caused by fungus	
otoneuralgia	The division of otology that deals with the inner ear,	
	especially its nerve supply and nerve connections with	
	the brain	
otoplasty	Plastic surgery of the ear to correct defects	
otorrhea	Inflammation of ear with purulent discharge	
otoscope	Instrument to examine the ear	
RELATED TERMS:		
cochlea	Snail-shaped, spirally wound tube in the inner ear; contains	
	hearing-sensitive receptor cells.	
endolymph	A pale transparent fluid within the membranous labyrinth	
	of the inner ear	
equilibrium	A state of balance	
malleus=hammer / incus=anvil	Ossicles	
/ stapes=stirrup		
Ménière disease	Disorder of the labyrinth of the inner ear elevated endolymph	
	pressure within the cochlea and semicircular canals.	
perilymph	A pale transparent fluid within the membranous labyrinth	
	of the inner ear	
pinna	The auricle or projected part of the external ear	
presbycusis	Progressive loss of hearing with aging	
Reissner's membrane	A delicate membrane separating the cochlear canal from	
	the scala vestibuli	
saccule	A small sac; the smaller of the two sacs of the	
	membranous labyrinth in the vestibule of the inner ear	
tinnitus	Sensation of noises (ringing, buzzing,) in the ears.	
utricle	Any small sac; the larger of two sacs of the membranous	
	labyrinth in the vestibule of the inner ear	
vertigo	Sensation of irregular or whirling motion either of oneself or	
	of external objects.	
vestibule	Central cavity of the labyrinth, connecting the semicircular	
	canal and the cochlea. The vestibule contains two	
	structures, the saccule and utricle that help to maintain	
	equilibrium.	

# Vocabulary – The Ear Worksheet

#### In the right column, write the meaning of the term.

Term	Meaning
Auditory canal	
Auditory meatus	
Auditory nerve fibers	
Auditory tube	
Auricle	
Cerumen	
Cochlea	
Endolymph	
Eustachian tube	
Incus	
Labyrinth	
Malleus	
Oran of Corti	
Ossicle	
Oval window	
Perilymph	
Pinna	
Semicircular canals	
Stapes	
Tympanic	
membrane	
Vestibule	

# **Combining Forms**

Write the meaning of the term in the center column and give an example of a term using the

combing form.

Combining form	Meaning	Example of term
Acous/o		
Audi/o		
Audit/o		
Aur/o, auricul/o		
Cochle/o		
Matoid/o		
Myring/o		
Ossicul/o		
Ot/o		
Salping/o		
Staped/o		
Tympan/o		

|--|

# Suffixes

Write the meaning of the suffix in the center column and give an example of a term using the suffix.

Suffix	Meaning	Example of term
-acusis or –		
cusis		
-meter		
-otia		

# **Abbreviations**

Write the meaning of the abbreviation in the right column.

Abbreviation	Definition
AD	
AOM	
AS	
EENT	
ENG	
ENT	
ETD	
HEENT	
PE tube	
SOM	

# Pathology of the Ear

Write the description of the condition in the right column.

Condition	Description
Acoustic neuroma	
Cholesteatoma	
Deafness	
Nerve deafness	
Conductive deafness	
Ménière disease	
Otitis media	
Otosclerosis	
Tinnitus	
Vertigo	

# **Clinical Procedures**

### Write the description of the procedure in the right column.

Procedure	Description
Audiometry	
Cochlear implant procedure	
Ear thermometry	
Otoscopy	
Tuning fork test	

# Vocabulary – The Ear

Term	Meaning
Auditory canal	Channel that leads from the pinna to the eardrum
Auditory meatus	Auditory canal
Auditory nerve	Carry impulse from the inner ear to the brain (cerebral cortex).
fibers	These fibers compose the vestibulocochlear nerve (cranial
	nerve VIII.
Auditory tube	Channel between the middle ear and the nasopharynx;
	Eustachian tube.
Auricle	Flap of the ear; the protruding part of the external ear, or pinna
Cerumen	Waxy substances secreted by the external ear; also called
	earwax.
Cochlea	Snail-shaped, spirally wound tube in the inner ear; contains
	hearing-sensitive receptor cells.
Endolymph	Fluid within the labyrinth of the inner ear.
Eustachian tube	Auditory tube.
Incus	Second ossicle (bone) of the middle ear; incus means anvil.
Labyrinth	Maze-like series of canals of the inner ear, which includes the
	cochlea, vestibule, and semicircular cans.
Malleus	First ossicle of the middle ear; malleus means hammer.
Oran of Corti	Sensitive auditory receptor area found in the cochlea of the
	inner ear.
Ossicle	Small bone of the ear; includes the malleus, incus and stapes.
Oval window	Membrane between the middle ear and the inner ear.
Perilymph	Fluid contained in the labyrinth of the inner ear.
Pinna	Auricle; flap of the ear.
Semicircular	Passage in the inner ear associated with maintaining
canals	equilibrium.
Stapes	Third ossicle of the middle ear. Stapes means stirrup.
Tympanic	Membrane between the outer and middle ear; also called
membrane	eardrum.
Vestibule	Central cavity of the labyrinth, connecting the semicircular canal
	and the cochlea. The vestibule contains two structures, the
	saccule and utricle that help to maintain equilibrium.

# **Combining Forms**

Combining form	Meaning	Example of term
Acous/o	Hearing	Acoustic
Audi/o	Hearing	Audiogram
Audit/o	Hearing	Auditory
Aur/o, auricul/o	Ear	Aural
Cochle/o	Cochlea	Cochlear

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Mastoid/o	Mastoid process	Mastoiditis
Myring/o	Eardrum, tympanic	Myringotomy
	membrane	
Ossicul/o	Ossicle	Ossiculoplasty
Ot/o	Ear	Otic
Salping/o	Eustachian tube, auditory	Salpingopharynge
	tube	al
Staped/o	Stapes	Stapedectomy
Tympan/o	Eardrum	Tympanoplasty
Vestibu/o	Vestibule	vestibulocochlear

# Suffixes

Suffix	Meaning	Example of term
-acusis or	Hearing	Hyperacusis
–cusis		
-meter	Instrument to	Audiometer
	measure	
-otia	Ear condition	Macrotia

# Abbreviations

Abbreviation	Definition
AD	Right ear
AOM	Acute otitis media
AS	Left ear
EENT	Eyes, ears, nose, throat
ENG	Electronystagmography; test of the balance
	mechanism of the inner ear by assessing
	eye movements
ENT	Ears, nose and throat
ETD	Eustachian tube dysfunction
HEENT	Head, eyes, ears, nose, and throat
PE tube	Pressure-equalizing tube ( to treat recurrent
	episodes of acute otitis media)
SOM	Serous otitis media

# Pathology of the Ear

Condition	Description
Acoustic neuroma	Benign tumor arising from the acoustic vestibulocochlear nerve
	in the brain
Cholesteatoma	Collection of skin cells and cholesterol in a sac within the
	middle ear.
Deafness	Loss of the ability to hear.
Nerve deafness	Sensorineural hearing loss; results from impairment of the

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	cochlea or auditory nerve
Conductive deafness	Hearing loss resulting from impairment of the middle ear
	ossicles and membranes transmitting sound waves into the
	cochlea.
Ménière disease	Disorder of the labyrinth of the inner ear elevated endolymph
	pressure within the cochlea and semicircular canals.
Otitis media	Inflammation of the middle ear.
Otosclerosis	Hardening of the bony tissue of the middle ear.
Tinnitus	Sensation of noises (ringing, buzzing,) in the ears.
Vertigo	Sensation of irregular or whirling motion either of oneself or of
	external objects.

# **Clinical Procedures**

Procedure	Description
Audiometry	Testing the sense of hearing.
Cochlear implant procedure	Surgical insertion of a device that allows sensorineural hearing-impaired persons to hear sound.
Ear thermometry	Measurement of the temperature of the tympanic membrane by detection of infrared radiation from the eardrum.
Otoscopy	Visual examination of the ear canal within otoscope.
Tuning fork test	Test of ear conduction using a vibration source such as a tuning fork
#### Course

Medical Terminology

#### Unit XI

The Special Senses

#### Essential Question

What medical terms are associated with the Special Senses?

## TEKS

130.203 (c) (1) (A), (B), (E) (2)(B) (4) (A), (B)

#### Prior Student Learning

None

## Estimated time

2 hours

## Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the eye to discuss common conditions and diseases.

### Objectives

Upon completion of this lesson, the learner should be able to:

- Define and decipher common terms associated with the eye
- Identify the basic anatomy of the eye
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- research diseases and disorders which involve the eye

## Engage

Use the website howstuffworksvideos.com to show a video clip of cataract surgery. Explain that they will be learning medical terms associated with the human eye in this lesson.

Key Points

- I. Special Senses
  - A. Allows the human body to react to the environment
  - B. Allows the body to see, hear, taste, smell, tough and to maintain balance
  - C. These senses are found in well-defined regions of the body
  - D. Senses occur because the body has structures that receive the sensation, nerves that carry the sensory message to the brain, and a brain that can interpret and respond to the message
- II. General Senses
  - A. Various senses scattered throughout our body in various regions
  - B. Heat, cold, pain, nausea, hunger, thirst, and pressure or deep touch
- III. Common Sense
  - A. Intuition
  - B. Just knowing how to do a certain task
  - C. What are we born knowing?
  - D. Instinct

## IV. Eye

- A. Organ that controls the special sense of sight
- B. Receives light rays and transmits the rays to the optic nerve, which carries the rays to the brain where they are interpreted as vision or sight

- V. Vision
  - A. Good Vision
    - 1. Adds to the quality of our life
    - 2. Contributes to one's independence
  - B. Challenged Vision
    - 1. Impacts our sense of well-being and independence
    - 2. More than 11 million Americans have a vision problem
      - that is not improved with corrective lenses
- VI. Protection of the eye
  - A. Partially enclosed in a bony socket of the skull
  - B. Eye lids and lashes help keep out dirt and pathogens
  - C. Lacrimal glands produce tears
- VII. Tears
  - A. Produced by the Lacrimal glands
  - B. Constantly moisten and cleanse the eye
  - C. Tears flow across eye and drain through the Lacrimal duct into the nasal cavity
- VIII. Conjunctiva
  - A. Mucous membrane that protects the eye
  - B. Lines the eyelids and covers the front of the eye
  - C. Provides protection and lubrication
  - IX. Sclera
    - A. Outermost layer
    - B. Tough connective tissue
    - C. Frequently referred to as the white of the eye
    - D. Maintains the shape of the eye
    - E. Extrinsic muscles, responsible for moving the eye within the socket are attached to the outside of the sclera
    - F. Contains the cornea: a circular transparent part on the front of the sclera that allows light rays to enter the eye
  - X. Choroid coat
    - A. Middle layer of the eye
    - B. Dark blue vascular layer of the eye between the sclera and retina
    - C. Interlaced with many blood vessels that nourish the eyes
    - D. Pupil
      - 1. Hole in the front of the choroid coat
      - 2. Allows light rays to enter the eye
    - E. Iris
      - 1. Special part of the choroid coat
      - 2. Colored portion of the eye
      - 3. It is a muscle that controls the size of the pupil and regulates the amount of light entering the eye
- XI. Retina
  - A. Innermost layer of the eye
  - B. Made of many layers of nerve cells that transmit the light impulses to the optic nerve

- C. It is a delicate membrane, which continues posterior and joins to the optic nerve D. Two special types of light-sensing cells are in the retina; they contain photo pigments, which cause a chemical change when light hits them 1. Cones: used mainly for light vision Are sensitive to color; located in a depression on the 2. back surface of the retina called the fovea centralis, the area of sharpest vision There are about 3 million cones 3. 4. The human eye can see about 7 million shades of color Ε. Rods 1. Provide black and white images About 100 million rods 2 XII. Lens Α. Circular structure located behind the pupil Suspended in position by ligaments Β. Refracts or bends light rays so the rays will focus on the C. retina XIII. Aqueous humor Α. Clear, watery fluid Fills the space between the cornea and iris B. C. Helps maintain the forward curvature of the eyeball D. Bends or refracts light rays XIV. Vitreous humor Jelly-like substance Α. Β. Fills the area behind the lens Helps maintain the shape of the eyeball C. D. Also bends or refracts light rays E. Series of muscles located in the eye provide for eye movement XV. Refraction of light rays When light rays enter the eye they pass through a series of Α. parts that bend or refract the rays Allows the rays to focus on the retina Β. Rays pass through the cornea, the aqueous humor, the pupil, C. the lens, and the vitreous humor to focus on the retina
  - D. In the retina, the rays or images are picked up by the rods and cones, changed into nerve impulses, and transmitted by the optic nerves to occipital lob of cerebrum, where sight is interpreted
  - E. If rays are not refracted correctly by the various parts, vision can be distorted or blurred

XVI.	Vocabulary	
	Term	Meaning
	Accommodation	Normal adjustment of the eye to focus on objects from far to near.
	Anterior chamber	Area behind the cornea and in front of the lens and iris.
	Aqueous humor	Fluid produced by the ciliary body and found in the anterior chamber
	Biconvex	Consisting of two surfaces that are rounded, elevated, and curved evenly, like part of a sphere.
	Choroid	Middle, vascular layer of the eye, between the retina and the sclera.
	Ciliary body	Structure surrounding the lens that connects the choroid and iris
	Cone	Photoreceptor cell in the retina that transforms light energy into a nerve impulse
	Conjunctiva	Delicate membrane lining the undersurface of the eyelids and covering the anterior eyeball
	Cornea	Fibrous transparent layer of clear tissue that extends over the anterior portion of the eyeball
	Fovea centralis	Tiny pit or depression in the retina that is the region of clearest vision.
	Fundus of the eye	Posterior, inner part of the eye
	Iris	Pigmented (colored) layer that opens and closes to allow more or less light into the eye
	Lens	Transparent, biconvex body behind the pupil of the eye
	Macula	Yellowish region on the retina, lateral to and slightly below the optic disc; contains the fovea centralis, which is the area of clearest vision
	Optic chiasm	Point at which optic nerve fibers cross in the brain
	Optic disc	Region at the back of the eye where the optic nerve meets the retina
	Optic nerve	Cranial nerve carrying impulses from the retina to the brain
	Pupil	Central opening of the eye, surrounded by the iris, through which light rays pass
	Refraction	Bending of light rays by the cornea, lens, and fluids of the eye to bring the rays into focus on the retina
	Retina	Light-sensitive nerve cell layer of the eye containing photoreceptor cells (rods and cones)

Rod	Photoreceptor cell of the retina essential for vision in dim light and for peripheral vision	
Sclera	Tough, white outer coat of the eyeball	
Thalamus	Relay center of the brain. Optic nerve fibers pass through the thalamus on their way to the cerebral cortex	
Vitreous humor	Soft, jelly-like material behind the lens in the vitreous chamber; helps maintain the shape of the eyeball	

## XVII. Combining forms

Combining form	Meaning	Example of term
aque/o	Water	Aqueous humor
blephar/o	Eyelid	Blepharitis
conjuctiv/o	Conjunctiva	Conjunctivitis
cor/o	Pupil	Anisocoria
corne/o	Cornea	Corneal abrasion
cycl/o	Ciliary body or muscle of the eye	cycloplegic
dacry/o	Tears, tear duct	Dacryoadenitis
ir/o, irid/o	Iris	Iritis
Kerat/o	Cornea	Keratitis
Lacrim/o	Tears	Lacrimal
Ocul/o	Eye	Intraocular
Ophthalm/o	Eye	Ophthalmologist
Opt/o, optic/o	Eye, vision	Optic
Palpebr/o	Eyelid	Palpebral
Papill/o	Optic disc; nipple- like	Papilledema
Phac/o, phak/o	Lens of the eye	Phacoemulsification
Pupill/o	Pupil	Pupillary
Retin/o	Retina	Retinitis
Sclerao	Sclera; hard	Corneoscleral
Uve/o	Uvea	Uveitis
Vitre/o	Glassy	Vitreous humor

## XVIII. Combining forms- conditions

Combining form	Meaning	Example of term
Ambly/o	Dull, dim	Amblyopia
Dipl/o	Double	Diplopia
Glauc/o	Gray	Glaucoma
Mi/o	Smaller, less	Miosis
Mydr/o	Widen, enlarge	Mydriasis
Nyct/o	Night	Nyctalopia

Phot/o	Light	Photophobia
Presby/o	Old age	Presbyopia
Scot/o	Darkness	Scotoma
Xer/o	Dry	Xerophthalmia

### XIX. Suffixes

••••••		
Suffix	Meaning	Example of term
-opia	Vision	Hyperopia
-opsia	Vision	Hemianopsia
-tropia	To turn	Esotropia

## XX. Pathology

Condition	Description
Blepharitis	Inflammation of eyelid, causing redness,
	crusting and swelling along lid margins
Cataract	Clouding of the lens, causing decreased vision
Chalazion	Small, hard, cystic mass on the eyelid
Dacryocystitis	Blockage, inflammation and infection of a
	nasolacrimal duct and lacrimal sac, causing
	redness and swelling in the region between the
	nose and the lower lid
Diabetic	Retinal effects of diabetes mellitus: include
retinopathy	microaneurysms, hemorrhages, dilation of
	retinal veins, and neovascularization
Ectropion	Outward sagging and eversion of the eyelid,
	leading to improper lacrimation and corneal
E de la compañía de	drying and ulceration
Entropion	Inversion of the eyelid, causing the lashes to rub
Clausama	against the eye, comear abrasion may result
Glaucoma	Increased intraocular pressure: results in
	vision
Hordeolum	Localized, purulent, inflammatory staphylococcal
(sty)	infection of a sebaceous gland in the evelid
Macular	Progressive damage to the macula of the retina
degeneration	
Nystagmus	Repetitive rhythmic movements of one or both
	eyes
Ptosis	Dropping of upper lid margin as a result of
	neuromuscular problems or trauma
Retinal	Two layers of the retina separate from each
detachment	other
Strabismus	Abnormal deviation of the eye
Xanthelasma	Raised yellowish plaque on eyelid caused by
	lipid disorder

- XXI. Amblyopia
  - A. Lazy eye
  - B. Commonly occurs in early childhood
  - C. Results in poor vision in one eye caused by the dominance of the other eye
  - D. Treatment:
    - 1. Covering good eye to stimulate development of the lazy eye
    - 2. Exercises that strengthen the weak eye
    - 3. Corrective lenses and surgery
  - E. If not treated before 8-9 years of age, blindness of the affected eye may occur
- XXII. Astigmatism
  - A. Abnormal shape of curvature of the cornea that causes blurred vision
  - B. Corrective lenses correct the condition
- XXIII. Cataract
  - A. Normally clear lens becomes cloudy or opaque
  - B. Occurs gradually and is usually a result of aging, but may be the result of trauma
  - C. Symptoms included
    - 1. Blurred vision and halos around lights
    - 2. Gradual loss of vision
    - 3. Milky white pupil in later stages
  - D. Treatment
    - 1. Surgical removal of the lens
    - 2. Implanting of an intraocular lens or prescribing glasses or contacts lenses corrects the vision and compensates for the removed lens
- XXIV. Conjunctivitis or pink eye
  - A. Contagious inflammation of the conjunctiva
  - B. Usually caused by a bacteria or virus
  - C. Symptoms include redness, swelling, pain and pus formation
  - D. Treatment: antibiotics, frequently as eye ointment
- XXV. Glaucoma
  - A. Condition resulting form an increased intraocular pressure
  - B. Caused by an excess amount of aqueous humor
  - C. Common after age 40 and a leading cause of blindness
  - D. Tonometer, an instrument for measuring intraocular pressure, is usually used during every eye examination to check for this condition
  - E. Symptoms
    - 1. Loss of peripheral vision
    - 2. Halos around lights
    - 3. Limited night vision and mild aching
  - F. Treatment
    - 1. Controlled with medications that decrease amount of

fluid produced or improve drainage

2. In severe cases, surgery to create an opening for the flow of aqueous humor

XXVI. Errors of Refraction

	Errors of Refract	lon
	Term	Description
	Astigmatism	Defective curvature of the cornea or lens of the eve
	Hyperopia	Farsightedness
	Myonia	Nearsightedness
	Presbyopia	Impairment of vision as a result of old age
XXVII.	Hyperopia or fars A. Occurs wh image foc B. Difficulty s	sightedness hen light rays are not refracted properly and the uses behind the retina seeing things close up
XXVIII.	Myopia or nearsi A. Occurs wi B. Difficulty s C. Vision is c D. Surgery c	ightedness hen light rays are refracted too sharply seeing things far off corrected by the use of concave lenses an also be used to correct myopia
XXIX.	Presbyopia A. Farsighted B. Occurs as C. Treated w	dness caused by a loss of elasticity in lens a result of the normal aging process vith corrective lenses or "reading glasses"
XXX.	Strabismus A. Condition B. Eyes may C. Caused b D. Treatmen corrective	in which eyes do not move or focus together move inward (cross-eyed), outward, or up or dov y muscle weakness in one or both eyes t includes eye exercises, covering the good eye, e lenses, and surgery on muscles moving the eye
XXXI.	Abbreviations	
	Abbreviation	Definition
	AMD	Age-related macular degeneration
	HEENT	Head, eyes, ears, nose, and throat
	IOL	Intraocular lens
	IOP	Intraocular pressure
	LASIK	Laser in situ keratomileusis
	OD	Right eye
	OS	Left eye
	OU	Both eyes
	PERRLA	Pupils equal, round, reactive to light and accommodation

POAG	Primary open-angle glaucoma
PRK	Photorefractive keratectomy (A laser beam
	flattens the cornea to correct myopia)
VA	Visual acuity
VF	Visual field

XXXII.

#### Diagnostic procedures

Procedure	Description
Fluorescein	Intravenous injection of fluorescein followed
angiography	by serial photographs of the retina through
	dilated pupils
Ophthalmoscopy	Visual examination of the interior of the eye
Slit lamp microscopy	Examination of anterior ocular structures
	under microscopic magnification
Visual acuity test	Clarity of vision is assessed (usually with a
	Snellen chart at 20 feet)
Visual field test	Measurement of the area within which
	objects are seen when the eyes are fixed,
	looking straight ahead without movement of
	the head

#### XXXIII. Treatment procedures

Procedure	Description
Enucleation	Removal of the entire eyeball
Keratoplasty	Surgical repair of the cornea
Laser	Intense, precisely focused light beam
photocoagulation	creates an inflammatory reaction that seals retinal tears and leaky retinal blood vessels
LASIK	Use of an excimer laser to correct errors of refraction (myopia, hyperopia and astigmatism)
Phacoemulsification	Ultrasonic vibrations break up the lens, which then is aspirated through the ultrasonic probe
Sclera buckle	Suture of a silicone band to the sclera over a detached portion of the retina
Vitrectomy	Removal of the vitreous humor

#### Activity

- I. Make flash cards of ear terms and practice putting the terms together with prefixes and suffixes to make new terms
- II. Complete the Eye Terms Worksheet
- III. Complete the Eye Vocabulary Worksheet
- IV. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology

Activity Lesson Plan --

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

V. Research and report on diseases and disorders of the Eye

#### Assessment

Successful completion of the activities

### Materials

Medical Terminology book List of Eye terms Index cards Markers

### Accommodations for Learning Differences

For reinforcement, the student will practice terms using flash cards of the ear.

For enrichment, the student will research and report on the schooling necessary to become an optometrist and an ophthalmologist.

### National and State Education Standards

## National Healthcare Foundation Standards and Accountability Criteria:

Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;
- (E) recall directional terms and anatomical planes related to the body structure

130.203 (c) (2) (B) employ increasingly precise language to communicate 130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:

- (A) distinguish medical abbreviations used throughout the health science industry; and
- (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports

### **Texas College and Career Readiness Standards**

English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships

to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts. *Cross-Disciplinary Standards*,

I. Key Cognitive Skills D. Academic Behavior: 1. Self monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

# Vocabulary – The Eye

In the right column, write the meaning of the term

Term	Meaning
Accommodation	
Anterior chamber	
Aqueous humor	
Biconvex	
Choroid	
Ciliary body	
Cone	
Conjunctiva	
Cornea	
Fovea centralis	
Fundus of the eye	
Iris	
Lens	
Macula	
Optic chiasm	
Optic disc	
Optic nerve	
Pupil	
Refraction	
Retina	
Rod	
Sclera	
Thalamus	
Vitreous humor	

# **Combining Forms**

# Write the meaning of the term in the center column and give an example of a term using the combining form

Combining form	Meaning	Example of term
aque/o		
blephar/o		
conjuctiv/o		
cor/o		
corne/o		
cycl/o		
dacry/o		
ir/o, irid/o		
Kerat/o		

Lacrim/o	
Ocul/o	
Ophthalm/o	
Opt/o, optic/o	
Palpebr/o	
Papill/o	
Phac/o, phak/o	
Pupill/o	
Retin/o	
Sclerao	
Uve/o	
Vitre/o	

# **Combining Forms: Conditions**

Write the meaning of the term in the center column; give an example of a term using the combining form

Combining form	Meaning	Example of term
Ambly/o		
Dipl/o		
Glauc/o		
Mi/o		
Mydr/o		
Nyct/o		
Phot/o		
Presby/o		
Scot/o		
Xer/o		

# **Suffixes**

Write the meaning of the suffix in the center column; give an example of a term using the suffix

Suffix	Meaning	Example of term
-opia		
-opsia		
-tropia		

# **Abbreviations**

Write the meaning of the abbreviation in the right column

Abbreviation	Definition
AMD	
HEENT	
IOL	
IOP	
LASIK	
OD	
OS	
OU	
PERRLA	
POAG	
PRK	
VA	
VF	

# **Errors of Refraction**

Write the meaning of the abbreviation in the right column

Term	Description
Astigmatism	
Hyperopia	
Myopia	
Presbyopia	

# Pathology of the Eye and Eyelid Abnormalities

Write the description of the condition in the right column

Condition	Description
Blepharitis	
Cataract	
Chalazion	
Dacryocystitis	
Diabetic retinopathy	
Ectropion	
Entropion	

Glaucoma	
Hordeolum (sty)	
Macular degeneration	
Nystagmus	
Ptosis	
Retinal detachment	
Strabismus	
Xanthelasma	

# **Diagnostic Procedures**

Write the description of the procedure in the right column

Procedure	Description
Fluorescein	
angiography	
Ophthalmoscopy	
Slit lamp microscopy	
Visual acuity test	
Visual field test	

## **Treatment Procedures**

Write the description of the procedure in the right column

Procedure	Description
Enucleation	
Keratoplasty	
Laser photocoagulation	
LASIK	
Phacoemulsification	
Sclera buckle	
Vitrectomy	

# Vocabulary – The Eye

Term	Meaning		
Accommodation	Normal adjustment of the eye to focus on objects from far to		
	near		
Anterior chamber	Area behind the cornea and in front of the lens and iris		
Aqueous humor	Fluid produced by the ciliary body and found in the anterior		
	chamber		
Biconvex	Consisting of two surfaces that are rounded, elevated, and		
	curved evenly, like part of a sphere		
Choroid	Middle, vascular layer of the eye, between the retina and the		
	sclera		
Ciliary body	Structure surrounding the lens that connects the choroid and iris		
Cone	Photoreceptor cell in the retina that transforms light energy into		
	a nerve impulse		
Conjunctiva	Delicate membrane lining the undersurface of the eyelids and		
	covering the anterior eyeball		
Cornea	Fibrous transparent layer of clear tissue that extends over the		
	anterior portion of the eyeball		
Fovea centralis	Tiny pit or depression in the retina that is the region of clearest		
	vision		
Fundus of the eye	Posterior, inner part of the eye		
Iris	Pigmented (colored) layer that opens and closes to allow more		
	or less light into the eye		
Lens	Transparent, biconvex body behind the pupil of the eye		
Macula	Yellowish region on the retina lateral to, and slightly below, the		
	optic disc; contains the fovea centralis, which is the area of		
	clearest vision		
Optic chiasm	Point at which optic nerve fibers cross in the brain		
Optic disc	Region at the back of the eye where the optic nerve meets the		
	retina		
Optic nerve	Cranial nerve carrying impulses from the retina to the brain		
Pupil	Central opening of the eye, surrounded by the iris, through		
	which light rays pass.		
Refraction	Bending of light rays by the cornea, lens, and fluids of the eye		
	to bring the rays into focus on the retina		
Retina	Light-sensitive nerve cell layer of the eye containing		
	photoreceptor cells (rods and cones)		
Rod	Photoreceptor cell of the retina; essential for vision in dim light		
	and for peripheral vision.		
Sclera	Tough, white outer coat of the eyeball		
Ihalamus	Relay center of the brain: optic nerve fibers pass through the		
	thalamus on their way to the cerebral cortex		
Vitreous humor	Soft, jelly-like material behind the lens in the vitreous chamber;		
	helps maintain the shape of the eyeball		

# **Combining Forms**

Combining form	Meaning	Example of term
aque/o	Water	Aqueous humor
blephar/o	Eyelid	Blepharitis
conjuctiv/o	Conjunctiva	Conjunctivitis
cor/o	Pupil	Anisocoria
corne/o	Cornea	Corneal abrasion
cycl/o	Ciliary body or muscle of the eye	Cycloplegic
dacry/o	Tears, tear duct	Dacryoadenitis
ir/o, irid/o	Iris	Iritis
Kerat/o	Cornea	Keratitis
Lacrim/o	Tears	Lacrimal
Ocul/o	Eye	Intraocular
Ophthalm/o	Eye	Ophthalmologist
Opt/o, optic/o	Eye, vision	Optic
Palpebr/o	Eyelid	Palpebral
Papill/o	Optic disc; nipple-like	Papilledema
Phac/o, phak/o	Lens of the eye	Phacoemulsification
Pupill/o	Pupil	Pupillary
Retin/o	Retina	Retinitis
Sclerao	Sclera; hard	Corneoscleral
Uve/o	Uvea	Uveitis
Vitre/o	Glassy	Vitreous humor

# **Combining Forms: Conditions**

Combining form	Meaning	Example of term
Ambly/o	Dull, dim	Amblyopia
Dipl/o	Double	Diplopia
Glauc/o	Gray	Glaucoma
Mi/o	Smaller, less	Miosis
Mydr/o	Widen, enlarge	Mydriasis
Nyct/o	Night	Nyctalopia
Phot/o	Light	Photophobia
Presby/o	Old age	Presbyopia
Scot/o	Darkness	Scotoma
Xer/o	Dry	Xerophthalmia

# Suffixes

Suffix	Meaning	Example of term
-opia	Vision	Hyperopia
-opsia	Vision	Hemianopsia
-tropia	To turn	Esotropia

# **Abbreviations**

Abbreviation	Definition
AMD	Age-related macular degeneration
HEENT	Head, eyes, ears, nose, and throat
IOL	Intraocular lens
IOP	Intraocular pressure
LASIK	Laser in situ keratomileusis
OD	Right eye
OS	Left eye
OU	Both eyes
PERRLA	Pupils equal, round, reactive to light and accommodation
POAG	Primary open-angle glaucoma
PRK	Photorefractive keratectomy (A laser beam flattens the cornea to
	correct myopia)
VA	Visual acuity
VF	Visual field

# **Errors of Refraction**

Term	Description
Astigmatism	Defective curvature of the cornea or lens of the eye
Hyperopia	Farsightedness
Myopia	Nearsightedness
Presbyopia	Impairment of vision as a result of old age

# Pathology of the Eye and Eyelid Abnormalities

Condition	Description
Blepharitis	Inflammation of eyelid: causes redness, crusting and swelling along
	lid margins
Cataract	Clouding of the lens, causing decreased vision
Chalazion	Small, hard, cystic mass on the eyelid
Dacryocystitis	Blockage, inflammation and infection of a nasolacrimal duct and
	lacrimal sac, causing redness and swelling in the region between the
	nose and the lower lid
Diabetic retinopathy	Retinal effects of diabetes mellitus: include microaneurysms,
	hemorrhages, dilation of retinal veins, and neovascularization
Ectropion	Outward sagging and eversion of the eyelid, leading to improper
	lacrimation and corneal drying and ulceration

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Entropion	Inversion of the eyelid, causing the lashes to rub against the eye; corneal abrasion may result
Glaucoma	Increased intraocular pressure results in damage to the retina and optic nerve with loss of vision
Hordeolum (sty)	Localized, purulent, inflammatory staphylococcal infection of a sebaceous gland in the eyelid
Macular	Progressive damage to the macula of the retina
degeneration	
Nystagmus	Repetitive rhythmic movements of one or both eyes
Ptosis	Dropping of upper lid margin as a result of neuromuscular problems
	or trauma
Retinal detachment	Two layers of the retina separate from each other
Strabismus	Abnormal deviation of the eye
Xanthelasma	Raised yellowish plaque on eyelid caused by lipid disorder

# **Diagnostic Procedures**

Procedure	Description
Fluorescein angiography	Intravenous injection of fluorescein followed by serial
	photographs of the retina through dilated pupils
Ophthalmoscopy	Visual examination of the interior of the eye
Slit lamp microscopy	Examination of anterior ocular structures under microscopic magnification
Visual acuity test	Clarity of vision is assessed (usually with a Snellen chart at 20 feet)
Visual field test	Measurement of the area within which objects are seen when the eyes are fixed, looking straight ahead, without movement of the head.

# **Treatment Procedures**

Procedure	Description
Enucleation	Removal of the entire eyeball
Keratoplasty	Surgical repair of the cornea
Laser photocoagulation	Intense, precisely focused light beam creates an
	inflammatory reaction that seals retinal tears and
	leaky retinal blood vessels
LASIK	Use of an excimer laser to correct errors of
	refraction (myopia, hyperopia and astigmatism)
Phacoemulsification	Ultrasonic vibrations break up the lens, which then
	is aspirated through the ultrasonic probe
Sclera buckle	Suture of a silicone band to the sclera over a
	detached portion of the retina
Vitrectomy	Removal of the vitreous humor

# Vision Terminology Worksheet

Write the meaning in the right column

Term	Meaning
blephar/o-	eyelid
blepharitis	
blepharoplasty	
blepharoplegia	
blepharoptosis	
blepharospasm	
blepharotomy	
blepharopyorrhea	
blepharadenitis, blepharoadenitis	
blepharectomy	
blepharedema	
blepharoadenoma	
blepharoatheroma	
palpebr/a-	Eyelid
palpebritis	
palpebral	
lacrim/o-	tear
lacrimal ducts	
lacrimal glands	
lacrimation	
dacry/o-	Tear
dacryoadenitis	
dacryocystorhinostenosis	
dacryadenalgia	
dacryoadenectomy	
dacryoma	
conjunctiv/o- conjunctiva	
conjunctivitis	
conjunctivoma	
conjunctivoplasty	
scler/o-	hard, "white of the eye" = sclera
sclerotomy	
scleroderma	
scleritis	
scleromalacia	

scleroplasty	
sclerotome	
corne/o-	cornea = transparent anterior coat of eye
corneitis	
corneal transplant	
kerat/o-	horny/cornea (transparent sclera)
keratitis	
keratomalacia	
keratometer	
keratometry	
keratomycosis	
keratoplasty	
keratotome	
keratopathy	
keratorrhexis	
keratoscope	
keratalgia	
keratectasis	
phak/o-	crystalline lens
phakitis	
phakolysis	
phakoma	
aphakia	
retin/o-	retina (internal coat of eyeball)
retinoscope	
retinoblastoma	
retinitis	
retinopathy, diabetic	
choroid-	choroid = vascular middle coat of eye
choroiditis	
choroidopathy	
uvea	second coat of eyeball
uveitis	
uveoplasty	
irid/o-	ir/o- iris (colored circle)
iridectomy	
iridemia	
iralgia, iridalgia	
iritis	
iridotomy	

iridopathy	
iridoplegia	
cor/- core/o-	pupil = opening of the iris
corectasia	
corectopia	
coreometer	
coreometry	
coreoplasty	
pupill/o-	pupil
pupillometer	
pupillometry	
pupilloplegia	
pupilloscopy	
ocul/o- o	еуе
oculomycosis	
oculus dexter	
oculus uterque	
oculus sinister	
ophthalm/o-	еуе
ophthalmic	
ophthalmologist	
ophthalmectomy	
ophthalmoneuritis	
ophthalmomalacia	
ophthalmoptosis	
ophthalmology	
ophthalmoscope	
ophthalmostat	
ophthalmoplasty	
ophthalmometer	
ophthalmoplegia	
ophthalmagra	
ophthalmoblennorrhea	
ophthalmomycosis	
ophthalmiatrics	
orb/-	circle (eyeball)
orbit	
orbital	
opt/o- optic/o-	eye/vision
optic. optical	

optesthesia	
optician	
optometrist	
optomyometer	
-opia	sight
diplopia	
nyctalopia	
hyperopia	
myopia	
phot/o-	Light
photophobia	
photalgia	
photopathy	
photodysphoria	
RELATED TERMS:	1
sty	
Meibomian glands	
chalazion	
arcus	
anterior chamber	
aqueous humor	
glaucoma	
refraction	
cataract	
accommodation	
rods	
cones	
fovea	
astigmatism	
optic disk	

# Vision Terminology-Key

Term	Term Meaning	
blephar/o-	eyelid	
blepharitis	Inflammation of hair follicles along the eyelids	
blepharoplasty	Plastic surgery upon the eyelid	
blepharoplegia	Paralysis of an upper lid	
blepharoptosis	Drooping of the upper lid	
blepharospasm	Twitching or spasmodic contraction of the orbicularis oculi	
blepharotomy	Surgical incision of the eyelid	
blepharopyorrhea	Purulent discharge from the eyelid	
blepharadenitis,	Inflammation of the Meibomian glands	
blepharoadenitis		
blepharectomy	Surgical incision of all or part of eyelid	
blepharedema	Swelling of the eyelids	
blepharoadenoma	Glandular tumor of the eyelids	
blepharoatheroma	Sebaceous cyst of the eyelid	
palpebr/a-	Eyelid	
palpebritis	Inflammation of the eyelid	
palpebral	Concerning an eyelid	
lacrim/o-	tear	
lacrimal ducts	Tear tucks (tubes)	
lacrimal glands	Gland that secrets tears	
lacrimation	Secretion and discharge of tears	
dacry/o-	Tear	
dacryoadenitis	Inflammation of the lacrimal gland	
dacryocystorhinostenosis	Narrowing of the canal connection a lacrimal sac	
dacryadenalgia	Pain in the lacrimal gland	
dacryoadenectomy	Surgical removal of the lacrimal gland	
dacryoma	Tumor of the lacrimal gland	
conjunctiv/o- conjunctiva	Mucous membrane that lines eyelids	
conjunctivitis	Inflammation of conjunctiva	
conjunctivoma	Tumor of the conjunctiva	
	Removal of parts of the cornea, but replacing with flaps	
conjunctivoplasty	from the conjunctiva	
scler/o-	hard, "white of the eye" = sclera	
sclerotomy	Surgical incision of sclera	
	A condition, usually following an extreme infection,	
scleroderma	characterized by edema and induration of the skin	
scleritis	Inflammation of the sclera	
scleromalacia	A softening of the sclera	

scleroplasty	Plastic surgery of the sclera	
sclerotome	Knife used in incision or the sclera	
corne/o-	cornea = transparent anterior coat of eye	
corneitis	Inflammation of the cornea	
corneal transplant	Implantation of the cornea	
kerat/o-	horny/cornea (transparent sclera)	
keratitis	Inflammation of the cornea	
keratomalacia	Softening of the cornea	
keratometer	Used for measuring the curves of the cornea	
keratometry	Measurements of the cornea	
keratomycosis	Fungal infection of the cornea	
keratoplasty	Corneal grafting	
keratotome	Knife for incising the cornea	
keratopathy	Any disease of the cornea	
keratorrhexis	Corneal rupture	
keratoscope	Used for examining the cornea	
keratalgia	Pain in the cornea	
keratectasis	Conical protrusion of the cornea	
phak/o-	crystalline lens	
phakitis	Inflammation of the crystal lens	
phakolysis	Disintegration or removal of the crystalline lens	
phakoma	Microscopic grey white tumor in the retina	
aphakia	Absence of the crystalline lens of the eye	
retin/o-	retina (internal coat of eyeball)	
retinoscope	Instrument used to perform retinoscopy	
retinoblastoma	Malignant glioma of the retina	
retinitis	Inflammation of the retina	
retinopathy, diabetic	Any disorder of the retina	
choroid-	choroid = vascular middle coat of eye	
choroiditis	Inflammation of the choroid	
choroidopathy	Any disease of the choroid	
uvea	second coat of eyeball	
uveitis	Intraocular inflammatory disorder	
uveoplasty	oplasty Reparative operation of the uvea	
irid/o-	ir/o- iris (colored circle)	
iridectomy	Surgical removal of a part of the iris	
iridemia	Bleeding from the iris	
iralgia, iridalgia	Pain felt in the iris	
iritis	Inflammation of the iris	
iridotomy	Incision of the iris without incising a portion	

iridopathy	Disease of the iris	
iridoplegia	Paralysis of the stricture of the iris	
cor/- core/o-	pupil = opening of the iris	
corectasia	Dilation of the pupil resulting from disease	
corectopia	Having the pupil to one side of the iris	
coreometer	Instrument for measurement of the pupil	
coreometry	Measurement of the pupil	
coreoplasty	Operation for artificial formation of pupil	
pupill/o-	pupil	
pupillometer	Device for measurement of the pupil	
pupillometry	Measurement of the diameter of the pupil	
pupilloplegia	Slow reaction of the pupil of the eye	
pupilloscopy	Measurement of eye refraction by effect of light and shadow on the retina	
ocul/o- o	eye	
oculomycosis	Any disease of the eye caused by fungus	
oculus dexter	OD The right eye	
oculus uterque	OU Each eye	
oculus sinister	OS Left eye	
ophthalm/o-	eye	
ophthalmic	Pertaining to the eye	
ophthalmologist	Physician specializing in the eye	
ophthalmectomy	Surgical excision of an eye	
ophthalmoneuritis	Inflamed condition of the optic nerve	
ophthalmomalacia	Abnormal shrinkage or softening of the eye	
ophthalmoptosis	Protrusion of the eyeball	
ophthalmology	The science dealing with the eye and disease	
ophthalmoscope	Instrument for examining interior of the eye	
ophthalmostat	Instrument used to hold the eye still during surgery	
ophthalmoplasty	Ocular plastic surgery	
ophthalmometer	Instrument for measuring error of refraction	
ophthalmoplegia	Paralysis of ocular muscles	
ophthalmagra	Sudden development of eye pain	
ophthalmoblennorrhea	Purulent inflammation of the eye or conjunctiva	
ophthalmomycosis	Any fungus disease of the eye	
ophthalmiatrics	The treatment of eye disease	
orb/-	circle (eyeball)	
	The bony pyramid-shape cavity of the skull that contains	
	and protects the eye	
ordital		

opt/o- optic/o-	eye/vision	
optic, optical	To the eye or sight, to vision the eye or optics	
optesthesia	Visual sensibility, perception of visual stimuli	
optician	One who is a specialist in the making of optical apparatus	
optometrist	A person trained and licensed to examine eyes	
optomyometer	Instrument for determining strength of the eye muscles	
-opia	sight	
diplopia	Double vision	
	A condition which the person can't see in faint light or at	
nyctalopia	night	
hyperopia	Farsightedness	
myopia	Defect in vision in which parallel rays come to a front of the retina	
phot/o-	Light	
photophobia	Unusual intolerance of light	
photalgia	Pain produced by light	
photopathy Pathologic effect caused by light		
photodysphoria	phoria Photophobia, unusual intolerance to light	
RELATED TERMS:		
sty	Inflammatory swelling of one or more glands of the eyelid	
Meibomian glands	Sebaceous glands between the tarsi and conjunctiva of evelids	
chalazion	A small, hard tumor of the evelid	
arcus	Arch	
anterior chamber	Area of eve between lens and cornea	
	Transparent liquid in eves	
	A group of eve diseases characterized by increased	
glaucoma	intraocular pressure	
refraction	Deflection from a straight path	
cataract	An opacity of the lens	
accommodation	Adjustment or adaption	
rods	One of the sensory receptors that detects light	
	One of the sensory receptors that detects light, receiving	
cones	color stimuli	
fovea	A pit or cuplike depression	
	Form of imperfect focus, in which refraction is spread	
astigmatism	over an area of retina instead of sharp focus	
optic disk	I o the eye or to sight	

# Skin Deep – The Integumentary System

## Course

Medical Terminology

## Unit XII

The Integumentary System

#### Essential Question

What medical terms are associated with the integumentary system?

## TEKS

130.203 (c) (1) (A), (C), (F) (2)(A), (B), (C) (3) (A), (B), (C) (4) (A), (B)

### Prior Student Learning

Basic understanding of medical roots, prefixes, and suffixes

## Estimated time

2 hours

### Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the integumentary system to discuss common its conditions and diseases.

## Objectives

Upon completion of this lesson, the learner will be able to:

- Define and decipher common terms associated with the integumentary system
- Identify the basic anatomy of the integumentary system
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Identify the layers of the skin and the accessory structures associated with the skin
- Research diseases which involve the integumentary system

## Engage

Go to the website <u>http://cte.unt.edu/health/curriculum/presentations</u> and open the multimedia presentation about tattoos and piercings. Show the presentation and tell your students that they will be learning about the skin.

## Key Points

1

- Skin
  - A. The largest organ of the body
    - B. Composed of sweat and oil glands, nails, hair, and skin
    - C. A system of specialized tissue
      - 1. Glands that secrete fluids
      - 2. Nerves that carry impulses
      - 3. Blood vessels that assist in the regulation of body temperature
    - D. The body's covering
    - E. Protector
      - 1. A barrier against microorganisms
      - 2. Protects the organs from injury
      - 3. Maintains and regulates body temperature
      - 4. Acts as a receptor for sensation (hot, cold, touch, pain)
      - 5. Guards the deeper tissues against excessive loss of water, salts, and heat
  - F. Removes bodily waste products
- II. Three layers of the skin
  - A. Epidermis a thin, cellular membrane layer

- B. Dermis a dense, fibrous connective tissue
- C. Subcutaneous tissue a fat-containing tissue that joins the skin to the underlying muscle
- III. Epidermis
  - A. Outer layer of the skin
  - B. Cellular layer of the skin
  - C. Composed of epithelium covers both the internal and external surfaces of the body
  - D. No blood vessels, lymphatic vessels, connective tissue, cartilage, or fat
  - E. Depends on the deeper dermis (or corium) layer and its network of capillaries for nourishment
  - F. The deepest layer of the epidermis is the basal layer
    - 1. Cells in the basal layer are always growing and multiplying
    - 2. As basal layer cells divide, they are pushed upwards and away from the blood supply of the dermis layer by a steady stream of younger cells
    - 3. These cells shrink, lose their nuclei, die, and become filled with a hard protein called *keratin*. They are then called *horny cells*, reflecting their keratin composition
    - 4. Within 3 to 4 weeks after living as a basal cell in the deepest part of the epidermis, the horny keratinized cell is sloughed off from the surface of the skin
  - G. Constantly renewing itself
    - 1. Cells die at the same rate at which they are born
    - 2. As new cells rise to the surface, old cells are sloughed off
  - H. Melanocytes are found in the basal layer of the epidermis
    - 1. Contain melanin, a black pigment
    - 2. The amount of melanin accounts for the color differences in skin
    - 3. Darker skin possesses more active melanocytes, not a greater number of melanocytes
    - 4. Melanin in the epidermis is vital for protection against harmful ultraviolet radiation, which can manifest as skin cancer
    - 5. People who are incapable of forming melanin are called *albino*, meaning white
      - a. Their skin and hair are white
      - b. Their eyes are red; due to the absence of pigment, the tiny blood vessels are visible in the iris
- IV. Dermis
  - A. Second layer of the skin, the corium
  - B. Located just below the epidermis
  - C. A living tissue composed of blood, lymph vessels, and nerve fibers

- D. Contains hair follicles, sweat glands, and oil glands
- E. Contains connective tissue cells and fibers
- F. Composed of several types of connective tissues
  - 1. *Histiocytes* protect the body by surrounding foreign materials
  - 2. *Fibroblasts* act to repair injury
  - 3. *Mast cells* contain histamine, a substance released in allergic reactions that causes itching
- G. Fibers in the dermis are composed of collagen
  - 1. "Glue"
  - 2. A fibrous protein material found in bone, cartilage, tendons, and ligaments, as well as the skin
  - 3. Tough but flexible
  - 4. In infants, collagen is loose and delicate, but it becomes harder as the body ages
  - 5. Supports and protects the blood and nerve networks that pass through the dermis
- H. Hair shafts are located in the dermis
  - 1. Hair shafts have bundles of involuntary muscles called *arrector pili* attached to the hair follicles
  - 2. When you are frightened or cold, these muscles contract, the hair stands up, and "goose bumps" appear
- V. Subcutaneous layer
  - A. Made of connective tissue that specializes in the formation of fat
  - B. *Lipocytes* plentiful in the subcutaneous layer, manufacture and store large amounts of fat
  - C. Important in protecting the deeper tissues of the body
  - D. Acts as a heat insulator
  - E. Connects the dermis to the muscles and organs below it
  - F. Fat tissue insulates the inner structures from temperature extremes
- VI. Sebaceous glands
  - A. Produce an oily secretion called *sebum*
  - B. Carried to the edges of the skin by ducts and excreted through openings in the skin called pores
  - C. Lubricates the skin
  - D. Closely associated with hair follicles; their ducts open into the hair follicle
  - E. Influenced by sex hormones
    - 1. Causes them to be over active at puberty
      - a. Excess oil production of the skin at puberty
    - 2. Causes them to be underactive in old age
      - a. Drying of skin as we age
- VII. Sudoriferous glands

- A. Tiny coiled glands found on almost all body surfaces
- B. Produce a watery solution called *sweat* 
  - 1. Helps cool the body
  - 2. Carried to the edges of the skin by ducts and excreted through openings in the skin called pores
  - 3. Perspiration (sweat) is almost pure water, dissolved materials such as salt making up less than 1%.
  - 4. Colorless and odorless
  - 5. The odor produced when sweat accumulates is due to the actions of bacteria
- C. Certain sweat glands, only active from puberty onward, are larger than ordinary sweat glands
- D. Ceruminous glands are classified as modified sweat glands
  - 1. Found in the ear canal
  - 2. Produce a yellow waxy substance called *cerumen* (ear wax)
- E. Diaphoresis
  - 1. comes from the Greek *dia*, meaning "through," and *phoreo* meaning "I carry"
  - 2. "The carrying through of perspiration"
  - 3. Perspiration, especially when copious and medically induced.
- VIII. Hair
  - A. Composed of a network of *horny cells* (hold your giggles, please)
  - B. Hair growth is similar to the growth of the skin's epidermal layer
  - C. Deep-lying cells in the hair roots move forward through the hair follicles (or shafts) that hold the hair fiber
  - D. *Melanocytes* located at the root of the hair follicles supply the melanin pigment for the hair fiber
  - E. Hair color depends on the amount of melanin present
  - F. Because hormone production decreases as we get older, hair loses color and become transparent (gray)
- IX. Nails
  - A. Harder keratin plates that cover the dorsal surface of the last bone of each toe and finger
  - B. Composed of horny cells that are cemented together and can extend indefinitely until cut or broker
  - C. Nails grow in thickness and length by the division of the cells of the nerve root at the base of the nail plate
  - D. Grow approximately 1mm a week
  - E. May re-grow completely in 3-5 months
  - F. Toenails grow more slowly than do fingernails
- X. Integumentary root words

Root Word	What It Means
(Combining forms)	
Acanth/o	Thorny, spiny
Aden/o	Gland
Adip/o	Fat
Alb/o, Albin/o	White
Aut/o	Self
Bi/o	Life
Blephar/o	Eyelid
Carcin/o	Carcinoma (cancer)
Caus/o	Burn
Cutane/o	Skin
Cry/o	Cold
Cyan/o	Blue
De-	Lack of
Derm/o, dermat/o	Skin
Diaphor/o	Produce(s) sweating
Erythem/o	Red
Hidr/o	Sweat
Histi/o	Tissue
Ichthy/o	Dry, scaly
Kerat/o	Hard, horny
Leuk/o	White
Lip/o	Fat
Melan/o	Black
Myc/o	Fungus
Necr/o	Death (body or cell)
Onych/o	Nail
Pachy/o	Thick, heavy
Papill/o	Nipple-like
-phyte	Plant
Pil/o	Hair
Py/o	Pus
Rhytid/o	Wrinkle
Sclera/o	Hardening
Seb/o	Sebum
Squam/o	Scale
Steat/o	Fat, sebum
Trich/o	Hair
Ungu/o	Nail
Xer/o	Dry
Xanth/o	Yellow

## XI. Common Integumentary prefixes and suffices

Prefix	What It Means
Epi-	On, over, upon
Para-	Beside, beyond, around
Per-	Through
Sub-	Under, below
Suffix	What It Means
-itis	Inflammation
-malacia	Softening
-opsy	View of, viewing
-orrhea	Flow, excessive discharge
-phagia	Eating or swallowing
-plasty	Surgical repair

## XII. Common Integumentary conditions

Condition	What it means
Alopecia	Hair loss; can result from the normal aging
	process or be drug- or illness-induced
Bulla	Large vesicle or blister
Cicatrix	Scar left by a healed would
Comedo	Common blackhead caused by a buildup
	of sebum and keratin in a skin pore
Cyst	Small sac or pouch containing fluid or semisolid fluid
Ecchymosis	Purplish macular bruise, hemorrhaging
	into the skin
Fissure	Groove or crack-like sore
Keloid	Abnormally raised, thickened scar
Pacule	A discolored lesion that lies flush with the
	skin (freckles, tattoo marks, and moles)
Papule	Solid elevation of the skin
Petechia	Small pinpoint hemorrhage
Polyp	Mushroom-like growth extending on a stalk
Pruritus	Itching, associated with forms of dermatitis
Purpura	Merging ecchymoses and petechiae over
-	any part of the body
Pustule	Discrete raised area of pus on the skin
Ulcer	Open sore or erosion of the skin
Urticaria	Hives with localized swelling and itching
Vesicle	Collection of clear fluid (blister)
Vitiligo	Loss of pigment in an area of skin or a
-	milk-white patch
Wart	Nipple like neoplasm of the skin; caused
	by papillomavirus

Γ	Wheal	Smooth elevated area that is red and
		itches (such as a hive)

## XIII. Integumentary disease and pathology

Disease/Pathology	What it means
Acne	Inflammatory pustular eruption of skin
Burns	First degree burns – no blisters,
	superficial lesions mainly in the
	epidermis
	Second degree burns – partial thickness
	burn, damage to the epidermis and
	corium, blisters
	Third degree – full thickness burn;
	damaging the epidermis, dermis, and
	subcutaneous layer
Decubitus ulcer	Bedsore
Eczema	Inflammatory skin disease with
	reddened popular lesions – a common
	allergic reaction in children
Gangrene	Death of tissue associated with the loss
	of blood supply
Hemangioma	A cluster of blood vessels that make an
	abnormal but benign growth, often
	protruding from the skin – some
less sting	Dirthmarks are nemangloma
Impetigo	Bacterial inflammatory skin disease
	presenting with vesicles, pustules, and
Karatasis	Thickened area of the epidermic
	White thickened patches on mucous
Leukopiakia	membrane tissue of the tongue or
	cheek
Nevus	Mole
Pemphiqus	Blistering (bullous) eruptions affecting
i ompinguo	the skin and mucous membranes
	("pemphix" is the Greek word for blister)
Psoriasis	Chronic skin aliment with sliver-gray
	scales covering red patches
Rubella	German measles (caused by a virus)
Rubeola	Measles (viral disease)
Scabies	A contagious, parasitic infection of the
	skin with intense pruritus ("scabere"
	means to scratch
Scleroderma	Disorder affecting all connective tissue
	that causes abnormal tissue thickening
	usually on the fingers, hands, or face

Seborrheic Keratosis	Thick, flattened, beige/brown plaques that appear with age, commonly on the hands and face – sometimes called senile warts
Tinea	Infection of the skin caused by a fungus
Varicella	Chickenpox (viral disease)
Verruca	Warts

### XIV. Cancerous Lesions

A. Basal cell carcinoma

- 1. Malignant tumor of the basal cell layer of the epidermis
- 2. The most frequent type of skin cancer
- 3. Slow-growing tumor of the basal layer of the epidermis
- 4. Usually occurs on the upper half of the face, near the nose, and is non-metastasizing
- B. Squamous cell carcinoma
  - 1. Malignant tumor of the squamous epithelial cells of the epidermis
  - 2. The tumor may grow in places other than the skin wherever squamous epithelium is found (mouth, larynx, bladder, esophagus, etc.)
  - 3. It may arise from actinic (sun-related) keratoses and metastasize to the lymph nodes.
  - 4. The treatment for both basal and squamous cell carcinomas is surgical excision or radiation therapy.
- C. Malignant melanoma
  - 1. Cancerous tumor composed of melanocytes
  - 2. Tumors often metastasize into the lungs, liver, and brain after arising in areas of the body where pigmented cells occur
  - Treatment includes excision of the tumor, regional lymphadenectomy and chemotherapy to prevent metastases
- D. Mycosis fungoides
  - 1. A rare, chronic skin disease caused by the infiltration of malignant lymphocytes
  - 2. Characterized by generalized erythroderma and large reddish raised areas (tumors) that spread and ulcerate
  - 3. Treatment with topical nitrogen mustard and radiation can be effective in controlling the disease

#### XV. Laboratory Test

- A. Bacterial analysis
  - 1. Samples of purulent material or exudates are collected and sent to the lab for examination
  - 2. Samples are examined to determine what type of bacteria

are present

- B. Fungal test
  - 1. Scrapings from skin lesions are placed in a growth medium for several weeks
  - 2. Examined microscopically for evidence of fungal growth
- XVI. Clinical Procedures
  - A. Skin biopsy
    - 1. Lesion is removed from the skin and sent to the pathology lab for examination
    - 2. A *punch biopsy* (in cases where complete excision is not feasible) involves the use of a surgical instrument that removes a core of tissue by rotation of its sharp, circular edge
  - B. Skin testing for allergy or disease
    - 1. The *patch test* is performed by applying a small piece of gauze or filter paper to the skin
    - 2. A suspected allergy-causing substance is placed on the piece of gauze
    - 3. If the area becomes reddened or swollen, the result is considered positive (the person has an allergy to that substance)
    - 4. The scratch test
      - a. Scratches are made in the skin
      - b. There is a small amount of test material in the scratches
      - c. The test is "negative" if no reaction occurs
    - 5. *Intradermal tests* are done by injection of a reactive substance between layers of the skin
      - a. Observing the skin for a reaction
      - b. This test is used for detection of sensitivity to infectious agents such as
        - i. Tuberculosis
          - a) Mantoux test
          - b) PPD test
        - ii. Diphtheria
  - C. Debridement
    - 1. Removal of dirt, foreign material, or damaged tissue from a wound to prevent infection and promote healing
  - D. Incisions and drainage
    - 1. Involve cutting open a lesion, such as an abscess, to remove or drain its contents
  - E. Sclerotherapy
    - 1. Used in the treatment of varicose veins. Injecting the vein with a sclerosing solution irritates the tissue, causes swelling, and closes off the vein
  - F. Blepharoplasty
- 1. Surgical reduction of the upper and lower eyelids
- G. Cryotherapy
  - 1. Involves destruction of tissue by freezing it with liquid nitrogen
- H. Dermabrasion
  - 1. Scraping away the top layer of skin using sandpaper or wire brushes to remove tattoos or disfigured skin
- I. Dermatoplasty
  - 1. Surgical reconstruction of the skin. Typically, the surgical replacement of injured or diseased skin
- J. Electrolysis
  - 1. Destruction of tissue by electricity; used to remove unwanted body hair
- K. Laser therapy
  - Removal of skin lesions such as papillomas and hemangiomas using an intense beam of light. This can also be used to remove tattoos or warts from around the nails or on the soles of the feet
- L. Liposuction
  - 1. Surgical removal of fat from subcutaneous tissue by means of suction
- M. Rhytidectomy
  - 1. Removal of wrinkles by removal of excess facial skin (facelift)

#### XVII. Abbreviations

·			
	Abbreviation	What it means	
	or acronym		
	Bx	Biopsy	
	Derm.	Dermatology	
	DLE	Discoid lupus erythematosus	
	SLE	Systemic lupus erythematosus	
	Subcu.	Subcutaneous	
	Ung.	ointment	

#### XVIII. Common Integumentary vocabulary

Word	What it Means
Abrasion	Scraping away of the superficial layer of injured skin
Adenoma	Glandular tumor
Albinism	Lack of pigment in the skin, hair, and eyes
Albino	Person with skin deficient in pigment or melanin
Adipose	Pertaining to fat
Anhidrosis	Lack of sweat
Bullae	Blisters on the skin
Collagen	Structural protein found in skin and connective
	tissues

Cuticle	Band of the epidermis extending from nail wall to nail
	surface
Dermatitis	Inflammation of the skin
Dermatology	Study of the skin and its diseases
Dermatologist	Physician who specialized in skin and its diseases
Diaphoresis	Profuse sweating
Epithelium	Layer of skin forming the outer and inner surfaces of
	the body
Erythema	Red discoloration of the skin
Histiotoma	Fatty tumor of the sebaceous gland
Hypodermic	Under the skin
Hyperhidrosis	Excessive growth of the outer layer of skin
Keratin	Hard protein material found in epidermis, hair, and
	nails
Lipocyte	Fat cell
Lipoma	Tissue or mass containing fat
Lunula	Half-moon shaped white area at the base of a nail
Melanin	Black pigment formed by melanocytes
Onychomycosis	Fungal infection of a nail
Seborrhea	Increased discharge of sebum from glands

#### Activity

- I. Make flash cards of integumentary system terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete Integumentary System Terms Worksheet.
- III. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan http://tevashste.com/decuments/curriculum/principles/medical\_terminology\_activities.pdf)

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf).

IV. Research and report on diseases and disorders of the integumentary system.

#### Assessment

Successful completion of the activities

#### Materials

Medical terminology book List of integumentary terms Index cards Markers Data projector Computer

#### **Accommodations for Learning Differences**

For reinforcement, the student will practice terms using flash cards of the integumentary system.

For enrichment, the student will choose a disease related to the integumentary system and research it using the internet. They will share their findings with the class using multimedia technology.

#### National and State Education Standards

National Healthcare Foundation Standards and Accountability Criteria: Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (C) practice word building skills;
- define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases and treatments

#### 130.203 (c) (2)

(A) demonstrate appropriate verbal and written strategies such as correct pronunciation of medical terms and spelling in a variety of health science scenarios

(B) employ increasingly precise language to communicate

(C) translate technical material related to the health science industry 130.203 (c) (3)

(A) examine medical and dental dictionaries and multimedia resources;

(B) integrate resources to interpret technical materials;

(C) investigate electronic media such as the internet with appropriate supervision

130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:

- (A) distinguish medical abbreviations used throughout the health science industry; and
- (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

Texas College Readiness Standards

English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts. *Cross-Disciplinary Standards*,

I. Key Cognitive Skills D. Academic Behavior: 1. Self monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

## INTEGUMENTARY SYSTEM TERMINOLOGY

epiderm/o-	outer layer of skin
epidermis	
epidermitis	
epidermoma	
epidermal/epidermic	
epidermatoplasty	
epidermodysplasia	
epidermomycosis	
derm/o-, dermat/o-	true skin
dermis	
dermabrasion	
dermalgia	
Contact dermatitis	
Actinic dermatitis	
dermatologist	
dermatology	
dermatofibroma	
dermatome	
dermatosis	
Dermatorrhagia	
dermopathy/dermatopathy	
dermophlebitis	
hypodermic	
intradermal	
cutane/o-, cut/o	
subcutaneous	
kerat/o- horny (though)	changes in skin cells
keratin	<b>X</b>
keratinization	
keratoma	
keratosis	
Actinic keratosis	
onych/o-	nail
onychalgia	
onychectomy	
onychitis	
onychocryptosis	
onychodystrophy	
onychomalacia	

onychomycosis	
onychophagy	
onychotomy	
ungu/a-	nail
ungual	
ungula phalanx	
trich/o-	hair
Trichogenous	
Trichomatosis	
trichoesthesia	
trichomegaly	
trichophagia	
trichoschisis	
trichorrhea	
pil/o-	hair
pilonidal cyst	
pilous-hirsutism	
sudor/o-, sud/o-	sweat
diaphoresis	
Sudatoria	
Sudatorium	
Sudoriferous glands	
hidr/o-	sweat
hidradenitis	
hidrosadenitis	
hidradenoma	
hidrocystoma	
hidrorrhea	
anhidrosis	
hyperhidrosis	
seb/o-	oily (sebum)
Sebaceous glands	
seborrhea	
sebum	
seborrhagia	
papill/o-	nipple-like elevations of the dermis
papillectomy	
papilloma	

papillary	
pachy/	thick
pachyblepharon	
pachyderma	
pachyonychia	
pachypodous	
pachyrhinic	
rhytid/	wrinkle
rhytidectomy	
rhytidoplasty	
myc/o-	fungus
mycosis	
Mycostasis	
mycology	
Mycostate	
mycoid	
xero/-	dry
xerasia	2
xeroderma	
xerocheilia	
Xerosis	
xerostomia	
necr/o-	pertaining to death
necrocytosis	
necrology	
necrologist	
necromania	
necronectomy	
necrophobia	
necrosis	
Other related terms	
abrasion	
abscess	
acne	
adipose	
alopecia	
areola	
albinism	
albino	
adipose	

Biopsy	
anhidrosis	
bleb	
bullae	
carbuncle	
chilblain	
cicatrix	
contusion	
Collagen	
Cuticle	
debridement	
Decubitus ulcer	
ecchymosis	
eczema	
emollient	
ervthema	
exfoliation	
fissure	
furuncle	
gangrene	
hemangioma	
herpes	
impetiao	
Kaposi's sarcoma	
keloid	
laceration	
lesion	
Leukoplakia	
lunula	
Lyme disease	
macule	
melanin	
nevus (pl. nevi)	
nodule	
pallor	
papule	
pediculosis	
pemphigus	
petechiae	
pruritis	
psoriasis	
pustule	
scabies	
Systemic lupus	
tincture	

Tinea pedis	
ulcer	
urticaria	
verruca	
vesicle	
wart	
wheal	

## INTEGUMENTARY SYSTEM TERMINOLOGY- Key

epiderm/o-	Outer layer of the skin
epidermis	Outer layer of the skin
epidermitis	Inflammation of the superficial layers of
	the skin
epidermoma	Tumor of the skin
epidermal/epidermic	Pertaining to the skin
epidermatoplasty	Grafting with pieces of epidermis with the
	underlying layer of the corium
epidermodysplasia	Generalized warts
epidermomycosis	Skin disease caused by a fungus
derm/o-, dermat/o-	True skin
dermis	Layer of the skin lying immediately under
	the epidermis – true skin
dermabrasion	Surgical procedure for removing ache
	Scars, nevi, tattoos or wrinkles of the skin
Contact dormatitie	Pain localized in the skin
Contact dermatitis	Inflammation of the skin due to contact
Actinia dormatitia	With an initiant
Actinic dermatitis	A shusision where a sisting in the sting
dermatologist	A physician who specializes in treating diseases of the skin
dermatology	Science of the skin and its diseases
dermatofibroma	A nonmalignant skin fibroma
dermatome	Instrument for incising the skin or for
	cutting thin slices for transplantation of
	skin
dermatosis	Any disease of the skin in which
	inflammation is not a feature
Dermatorrhagia	Excessive secretion of the sebaceous
	glands
dermopathy/dermatopathy	Any skin disease
dermophlebitis	Inflammation of superficial veins and the
	surrounding skin
hypodermic	Under the skin
intradermal	Within the dermis
cutane/o-, cut/o	Skin
subcutaneous	Beneath the skin
kerat/o- horny (though)	Changes in skin cells
keratin	A tough protein substance in hair, nails,
	and horny tissue

keratinization	Process of keratin formation
keratoma	A callosity; a horny growth
keratosis	Thickened area of the epidermis
Actinic keratosis	A horny, keratotic, premalignant lesion of
	the skin caused by excess exposure to
	sunlight
	· · · · ·
onych/o-	Nail
onychalgia	Pain in the nail
onychectomy	Surgical removal of the nail
onychitis	Inflammation of the nail bed
onychocryptosis	Detachment of the nail from the nail bed
onychodystrophy	Any maldevelopment of a nail
onychomalacia	Abnormal softening of the nail
onvchomvcosis	Fungal infection of the nails
onvchophagy	Nail biting
onvchotomy	Surgical incision of a fingernail or toenail
ungu/a-	Nail
ungual	Pertaining to or resembling the nail
ungula phalanx	Terminal phalanx of each finger and toe
trich/o-	Hair
Trichogenous	Promotion of hair growth
Trichomatosis	Entangled, matted hair caused by skin
	fungus
trichoesthesia	Sensation felt when the hair is touched
trichomegaly	Long, coarse brows
trichophagia	Eating hair
trichoschisis	Splitting of the hairs
trichorrhea	Rapid loss of hair
pil/o-	Hair
pilonidal cyst	Containing hair in a cyst
pilous-hirsutism	Excessive growth of hair
	Ŭ Ŭ
sudor/o-, sud/o-	Sweat
diaphoresis	Sweating
Sudatoria	Excessive sweating
Sudatorium	Hot air bath or any bath to induce
	perspiration
Sudoriferous glands	Glands producing sweat
hidr/o-	Sweat
hidradenitis	Inflammation of the sweat glands

hidrosadenitis	Inflammation of the sweat glands
hidradenoma	Adenoma of the sweat glands
hidrocystoma	Cystic tumor of the sweat glands
hidrorrhea	Abnormal sweating
anhidrosis	Diminished or complete absence of the
	secretion of sweat
hyperhidrosis	Sweating more than what would be
	expected considering the temperature of
	the environment
seb/o-	Oily (sebum)
Sebaceous glands	Oil-secreting gland of the skin
seborrhea	Increase in the amount of sebaceous
	secretion
sebum	A fatty secretion of the sebaceous gland
seborrhagia	Excessive secretions of the sebaceous
5	glands
papill/o-	Nipple-like elevations of the dermis
papillectomy	Excision of any papilla
papilloma	A benign epithelia tumor
papillary	Concerning a nipple
pachy/	Thick
pachyblepharon	A thickening of the border of the eyelid
pachyderma	Unusual thickness of the skin
pachyonychia	Abnormal thickening of the fingernails or
	toenails
pachypodous	Having abnormally thick feet
pachyrhinic	Having a thick, flat nose
rhytid/	Wrinkle
rhytidectomy	Excision of wrinkles using plastic surgery
rhytidoplasty	Elimination of facial wrinkles using plastic
	surgery
myc/o-	Fungus
mycosis	Any disease induced by a fungus
Mycostasis	Stopping the growth of fungi
mycology	The science and study of fungi
Mycostate	Any agent that stops the growth of fungi
· · ·	The growth of lange
mycoid	Fungus-like
mycoid	Fungus-like
xero/-	Fungus-like Dry

xeroderma	Roughness and dryness of the skin
xerocheilia	Dryness of the lips
Xerosis	Abnormal dryness of the skin
xerostomia	Dry mouth
necr/o-	Pertaining to death
necrocytosis	Cellular death or decomposition
necrology	Study of mortality statistics
necrologist	A student of mortally statistics
necromania	Abnormal interest in dead bodies or in
	death
necronectomy	Excision of a necrotic part
necrophobia	Abnormal aversion to dead bodies
necrosis	Death of areas of tissue or bone
	surrounded by healthy parts
Other related terms	
abrasion	Scraping away of the superficial layer of
	injured skin
abscess	Collection of pus in any body part
acne	Inflammatory, pustular eruption of the skin
adipose	Pertaining to fat
alopecia	Hair loss; can result from the normal aging
	process or be drug or illness-induced
areola	A small space or cavity in a tissue
albinism	Lack of pigment in skin, hair, and eyes
albino	Person with skin deficient in pigment or
	melanin
adipose	Pertaining to fat
Biopsy	Obtaining a tissue sample for microscopic
	examination
anhidrosis	Lack of sweat
bleb	An irregularly shaped elevation of the
	epidermis
bullae	A large blister or vesicle filled with fluid
carbuncle	Abscess of the skin, formed by two or
	more boils merging
chilblain	An inflammatory swelling or sore caused
	by exposure to cold
cicatrix	A scar left by a wounded area
contusion	Bruise
Collagen	Structural protein found in the skin and
	connective tissues
Cuticle	Band of epidermis extending from nail wall
	to nail surface
debridement	Removal of dirt, foreign material, or

infection and promote healing	
Decubitus ulcer Bedsore	
ecchymosis The skin discoloration caused by the	
escape of blood into the tissues from	
ruptured blood vessels.	
eczema Inflammatory skin disease with reddene	d
lesions; a common allergic reaction in	
children	
emollient Agent that will soften and sooth	
erythema Red discoloration of the skin	
exfoliation Shedding or casting off of a body surface	e
fissure A groove, natural division, cleft, split or	
deep furrow	
furuncle Boil	
gangrene Death of tissue associated with a loss of	f
blood supply	-
hemangioma A cluster of blood vessels that make an	
abnormal but benign growth often	
protruding from the skin – some	
birthmarks are hemangioma	
herpes Blisters caused by a virus	
impetigo Bacterial inflammatory skin disease	
presenting with vesicles, pustules, and	
crusted lesions; caused by bacteria	
Kaposi's sarcoma A vascular malignancy that appears on	
skin or mucous membranes	
keloid Exuberant scar that forms at the place of	of
the injury and spreads beyond	
laceration Cut or irregular tear of the flesh	
lesion Infected patch of skin	
Leukoplakia White, thickened patches on mucous	
membrane tissue of the tongue or chee	k.
Iunula A crescent shaped area	
Lyme disease Inflammatory disorder accompanied by	
distinctive skin lesions. Caused by tick	
bits.	
macule A flat spot on the skin whose color may	be
lighter or darker	
melanin Black pigment formed by melanocytes	
nevus (pl. nevi) Mole	
nodule A small node or cluster of cells	
pallor Lack of color, paleness	
papule Small bump or pimple	
pediculosis Infestation of lice	
pemphigus Blistering (bullous) eruptions affecting the	ne

	skin and mucous membranes ("pemphix"
	is the Greek word for blister)
petechiae	Small pinpoint hemorrhage
pruritis	A tingling or faintly burning skin sensation
	that promotes a person to scratch
psoriasis	Chronic skin aliment with sliver-gray
	scales covering red patches
pustule	Discrete raised area of pus on the skin
scabies	A highly communicable skin disease
	caused by itch mites
Systemic lupus	Chronic inflammatory disease of
	connective tissue – unknown etiology
tincture	An alcoholic extract of vegetable or animal
	substances
Tinea pedis	A fungal infection of the foot
ulcer	Lesion of the skin
urticaria	Multiple swollen raised areas on the skin
	that are itchy
verruca	Wart
vesicle	Collection of clear fluid (blister)
wart	Nipple like neoplasm of the skin; caused
	by papillomaviruse
wheal	Smooth, elevated area that is red and
	itches (such as a hive)

# Endoarina S

	Endocrine System
Course	Rationale
Medical	Healthcare professionals must have a comprehensive medical
Terminology	vocabulary in order to communicate effectively with other health
	professionals. They should be able to use terminology of the
Unit XIII	endocrine system to discuss common conditions and diseases.
Endocrine	
System	
<b>Essential</b> <b>Question</b> What medical terms are associated with the endocrine	<ul> <li>Objectives</li> <li>Upon completion of this lesson, the student will be able to: <ul> <li>Define and decipher common terms associated with the endocrine system</li> <li>Identify the basic anatomy of the endocrine system</li> <li>Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course</li> </ul> </li> </ul>
svstem?	
<b>TEKS</b> 130.203 (c) 1 A-F 2A-C 3A-C 4A-B	Engage Mrs. Stanhope brings her 3-year-old daughter, Alecia, to Dr. Sanborn for her yearly wellness check up. Dr. Sanborn is a little concerned because Alecia is very small for her age. Dr. Sanborn decides to make a referral to Dr. McClain for an endocrine workup.
<i>"</i> (B	Key Points
Prior Student Learning Basic understanding of roots, prefixes, and suffixes	<ul> <li>I. Endocrine words to know:</li> <li>A. endocrin/o – endocrine (endo=within, crin=secrete)</li> <li>B. hormon/o – hormone (to set into motion)</li> <li>C. pineal (pine cone)</li> <li>D. thyr/o, thyroid/o – thyroid (shield)</li> <li>Ephysis – growth</li> <li>F. adren/o, adrenal/o – adrenal (ad=near, ren=kidney)</li> <li>G. cortic/o – cortex (outer portion)</li> <li>H. parathyroid/o – parathyroid</li> <li>I. thymus – thymus gland</li> </ul>
Estimated time 4-7 hours	<ul> <li>II. Glands <ul> <li>A. Endocrine (see the Endocrine Glands Diagram): Ductless glands that secrete hormones directly into the bloodstream as it flows through the gland</li> <li>B. Exocrine: Carried by a duct to the surface of a tissue</li> <li>C. Gland: any organ or structure that produces a secretion <ol> <li>Exocrine: carried by a duct or organ to the tissues</li> <li>Endocrine: carried by blood or lymph; no ducts</li> </ol> </li> <li>III. Hormone: a biologically active chemical (steroid, amino acid,</li> </ul></li></ul>

	polypeptide, glycoprotein) that combines with specific receptor proteins and regulates the function of other organs	
A. Functions of Hormones		
	1. Regulation of metabolism	
	2. Regulation of growth and development	
	3. Regulation of reproduction	
	4 Regulation of stress response	
	5 Regulation of cell permeability	
	B Secretion and Storage of Hormones	
	1 All are formed by the endoplasmic reticulum	
	2 Transported by the Goldi apparatus that packages	
	the hormones in secretary vesicles which are stored	
	in the extendeem of the ondeering colle	
	2 Waite for a parke or chamical signal to initiate the	
	5. Waits for a herve of chemical signal to initiate the	
	Secretion	
	a. Hormonal stimuli	
	b. Humoral stimuli	
	C. Neural stimuli	
	C. Negative Feedback	
	1. Endocrine glands tend to over-secrete their	
	hormones so the target organ has enough to	
	function properly	
	2. When too much function occurs, some factor feeds	
	back to the endocrine gland to cause a negative	
	effect on the gland and decrease its secretory rate	
	<ol><li>The hormone is monitored and regulated internally</li></ol>	
	D. Transport	
	<ol> <li>Hormones travel to target cells via carrier blood</li> </ol>	
	plasma proteins for specific hormones	
	<ol><li>Target cells have specific receptor proteins for</li></ol>	
	specific hormones	
	3. Target cells become biologically active to regulate	
	the function of other organs when binding occurs	
IV.	Endocrine Glands (see the Pituitary Gland Diagram)	
	A. Pituitary Gland: hypophysis; located in the sella turcica of	
	the sphenoid bone; called the master gland	
V.	Anterior Lobe: adenohypophysis; connected to the	
	hypothalamus by a system of vessels	
	A. ACTH (adrenocorticotrophic hormone): stimulates the	
	adrenal cortex to secrete steroids	
	B. GH. HGH (growth hormone): somatotropin that controls	
	body size by increasing mitosis, increasing cell size and	
	increasing the rate of protein synthesis	
	1 Dwarfism: hyposecretion in children	

	<ol> <li>Simmonds' disease: hyposecretion in adults – lethargy, obesity, premature senility</li> </ol>
	3. Gigantism: hypersecretion in children (tumors)
	4. Acromegaly: adult hypersecretion – enlarged bones
	of the head/hands/feet/face
	C. TSH (thyroid stimulating hormone): stimulates the thyroid
	to secrete thyroxin (14)
	D. Gonadoliopins = $rSH$ and LH 1 ESH (follicle stimulating hormono): stimulates the
	maturation of ovarian follicles and sperm
	2. LH (luteinizing hormone): stimulates corpus luteum
	development (ovulation) and testosterone synthesis
	(ICSH)
	E. LTH (prolactin): promotes growth of breast tissue and
	milk secretion after delivery
	F. MSH (melanocyte sumulating normone): sumulates
	melanin skin pigment ionnation
VI.	Posterior Lobe: neurohypophysis; connected to the
	hypothalamus by a stalk of nerve tissue
	A. ADH (antidiuretic hormone/vasopressin): promotes water
	reabsorption by the kidney tubules, and increases blood
	pressure
	2 Alcohol decreases ADH, so the body retains huid
	3. Diabetes insipidus: decreased ADH secretion
	B. Oxytocin: suckling stimulates oxytocin release, so milk is
	let down; contracts the uterus too
	1. Pitocin: synthetic oxytocin
х <i>и</i> т	
VII.	Adrenal Glands: (see the Adrenal Gland Diagram) two small
	made from cholesterol (I DI ): ACTH secretion from the
	anterior pituitary regulates secretion
	A. Cortex: outer portion, secretes 30+ steroids
	1. Mineralocorticoids: aldosterone; its main function is
	to promote the transport of Na+ and K+ through the
	renal tubules so that Na+ is saved and K+ is
	excreted; secretion increases extracellular fluid
	volume
	a. Typoautenalism. Audison's disease i Decreased blood alucose level = low
	energy
	ii. Decreased immune function = infections

iii. Increased melanin pigmentation = lips and nipples darken; lots of black freckles

iv. Decreased Na+ and water = diuresis, dehydration v. Decreased fluid volume = shock, death, and adrenal crisis b. Hyperadrenalism: Cushing's syndrome Tissue swelling and fat redistribution i. "buffalo torso" and "moon face" ii. Hirsutism: excessive facial hair iii. Increased blood glucose – increased insulin production until the cells burn out; causes Type II diabetes mellitus iv. Rx/Tx: adrenalectomy 2. Glucocorticoids: cortisol (cortisone, prednisone); regulate the amounts of sugars, fats, CHO in the cells; stimulates gluconeogenesis in the liver; Hyperfunction: fat deposits, "moon face" 3. Androgens, estrogens, progesterone: help supplement the other hormones to maintain secondary sexual characteristics 4. Stressful situations a. ACTH from the anterior pituitary is secreted, which then stimulates cortisol secretion from the adrenal cortex which has an antiinflammatory effect b. Cortisol increases the healing rate by decreasing immune reactions (important in inflammatory diseases such as allergic reactions, rheumatoid arthritis, and rheumatic fever) B. Medulla: the central portion; has the same effect as a direct sympathetic nerve response; called the stress hormones: the "fight or flight" response 1. Epinephrine: adrenaline, adrenalin a. Accelerates the heart rate; increases blood pressure; increases heart output b. Weak vasoconstriction in the skin c. Vasodilation of the skeletal and cardiac muscles d. Relaxes the bronchioles; treats severe respiratory distress e. Increases respiration f. Increases the metabolic rate of every cell g. Increases blood glucose levels by increasing glycogen breakdown in the liver h. Increases muscle strength and mental activity i. Decreases GI function

		2.	Nore a. b.	binephrine: noradrenaline Neurotransmitter; a strong vasoconstrictor Increases blood pressure, but slows the heart
		3.	Dopa cardia kidne treat	mine: dilates the systemic arteries; increases ac output; increases flow of blood to the ys; therefore, increases urinary output (used to shock)
			a.	Pheochromocytoma: a tumor of the adrenal medulla; signs and symptoms = hypertension, headaches, sweating, nausea, vomiting, flushed face, tingling of the extremities
			b.	Raynaud's disease: extreme skin vasoconstriction with exposure to cold or stress; causes ischemic pain and pallor, followed by cyanosis and redness of the hands and feet
VIII.	Ovar pituit A.	ries: h ary a Estro char	normo ire the ogen: acteris	nes stimulated by FSH and LH of the anterior n secreted by the ovarian follicles develops and maintains the secondary sexual stics
		1.	Hypo sex c no bo	function (congenital): eunuch; no secondary haracteristics, high voice, no facial hair, taller, ody fat
	B.	2. 3. Prog	Hypo Hype Jestero	function (adult): menopause rfunction: rare tumors of the pituitary gland one: secreted by the corpus luteum during the
		last l preg the p	half of nancy placen	the menstrual cycle; prepares the uterus for and the breasts for lactation; also secreted by ta during pregnancy
IX.	Testo pituit A.	es: ho ary, a Test seco unde 1.	ormon and se osterc ondary er FSH Hypo	e secretion stimulated by LH of the anterior ecreted by the Leydig cells of the testes one: causes the growth and maintenance of sexual characteristics and spermatogenesis I control function
			a.	In children: eunuch; infantile secondary sex characteristics
			b. C. d	In adults: Frohlich's syndrome (obesity, muscle and hair loss, decreased sex drive) Cryptorchidism: undescended testes Castration: removal of the testes
		2.	Hype a.	In children: increased muscle and bone growth, early closure of epiphysis, increased

1	
	secondary sex characteristics
	b. In adults: gynecomastia, overgrowth of the
	breasts
Х.	Pineal Gland (body): above the roof of the 3rd ventricle of the
	brain
	A. Melatonin: suppresses/regulates gonadotropic hormones,
	controls sex drive, delays puberty; some research relates
	it to SAD (Seasonal Affective Disorder)
XI.	Thyroid: (see the Thyroid Diagram) a butterfly-shaped gland
,	on each side of the trachea that covers the $2^{nd}$ through $4^{th}$
	tracheal rings: has a narrow connecting hand called the
	"iethmus"
	$\Lambda$ Thyraxina (T1) and trijadathyranina (T3)
	A. Thyroxine (14) and through through the (13)
	Requires iodine for normone synthesis
	2. Regulates metabolism
	a. Increased metabolic rate
	b. Increases glucose, fat, carbohydrates, and
	vitamin metabolism
	3. Hypofunction
	a. Fetal/congenital (cretinism): decreased mental
	growth, obesity, dwarfism
	<ul> <li>Acquired/adult (myxedema): fatigue,</li> </ul>
	increased desire to sleep, edema, bags under
	the eyes, rough voice, decreased heart rate
	4. Hyperfunction
	a. Graves' disease: an autoimmune disease that
	stimulates TSH; intolerance to heat, increased
	sweating, weight loss, diarrhea, fatique,
	insomnia, exophthalmia (bulging eves)
	b. Thyrotoxicosis: tachycardia, hypertension.
	hyperthermia, nausea, vomiting, diarrhea,
	confusion
	c. Goiter: without dietary iodine, there is a
	decreased amount of T4 and T3, so there is a
	high level of TSH secretion which stimulates
	abnormal growth of the thyroid tissue
	B. Calaitanin: regulates calaium motabolism (vitamin D is
	D. Calcionini. regulates calcium metabolism (vitamini D is
VII	Essential for calcium absorption)
<b>Л</b> П.	Parathyroid Giands: four liny, pea-like structures embedded
	posterior to the thyroid gland
	A. Parathormone: PIH; regulates the amount of calcium
	and phosphorus in the circulating blood, and storage of
	calcium in the bones and teeth
	1. Hypo PTH: hypocalcemia causes tetany with
	laryngeal spasms
	2. Hyper PTH: hypercalcemia

<ul> <li>a. Osteitis: weak, cystic bones and excessive stone production (nephrolithiasis)</li> </ul>
<ul> <li>B. Rickets: a calcium deficiency in children, usually a decrease in vitamin D in the diet</li> </ul>
c. Osteomalacia: adult rickets/renal rickets
d. Osteoporosis: aging bones/decreased calcium
antibodies in early life by maturing the T-cells; atrophies after
puberty XIV Dependence (and the Dependence Diagram) leasted behind the
stomach: secretions are produced by the Islets of Langerbans
A. Glucagon: secreted by the alpha cells: converts glycogen
to glucose in the liver, thereby increasing blood sugar
B. Insulin: secreted by the beta cells; regulates the transport
and storage of glucose into the cells; decreases blood
glucose levels
C. Effects of pancreatic hormones
1. After a meal, blood sugar increases, insulin
secretion increases, and glucagon secretion
decreases to lower the high plasma glucose
2 With fasting blood sugar decreases insulin
2. With lasting, blood sugar decreases, insulin secretion decreases, and ducadon secretion
increases to keep plasma ducose concentrations
up to a safe minimum level
D. Diagnostic Tests for Pancreatic Function
1. FBS: fasting blood sugar
2. GTT: glucose tolerance test
3. Two-hour postprandial test
E. Diabetes Mellitus: insulin deficiency; inherited; 5 million in
the USA
<ol> <li>Type I: insulin dependent diabetes (IDDM)</li> </ol>
a. Juvenile; rapid onset
b. Hereditary predisposition
c. Viral destruction of beta cells
d. Body lacks the ability to produce insulin
I. RX/IX: INSUIN INJECTIONS
2. Type II. IIoII-IIIsuiiii dependeni diabetes (NIDDM)
b. Obesity causes beta cells to overreact but
they become less responsive: therefore, a
decrease in insulin secretion
c. Rx/Tx: diet; oral replacements
3. Symptoms
a. Polydipsia: excessive thirst
<ul> <li>b. Polyphagia: excessive eating with weight loss</li> </ul>

- c. Polyuria: excessive urination with dehydration
- d. Glycosuria: sugar in the urine due to an increase in blood glucose
- 4. Complications
  - a. Atherosclerosis and heart disease
  - Retinopathy: increased blood glucose destroys the retina; the second leading cause of blindness
  - c. Renal disease: glucose destroys the nephrons
  - d. Circulatory deficiency: gangrene and amputations
- 5. Side effects
  - Diabetic coma: hyperglycemia caused by eating too much or too little insulin causes increased blood glucose (normal = 70-100 mg/100 ml)
    - i. Ketoacidosis: byproduct of fat metabolism
    - ii. Acetone breath: fruity odor; nausea, vomiting
    - iii. Kussmaul's breathing: rapid, deep, labored
    - iv. Restlessness, confusion, coma
    - v. Rapid, weak pulse; low BP
    - vi. Skin warm, dry, and flushed
    - vii. Tx: insulin
  - b. Insulin shock: hypoglycemia caused by not eating or too much exercise so that the body has too much insulin
    - i. Dizziness, headache, nervousness
    - ii. Full, rapid pulse
    - iii. Diaphoresis
    - iv. Pale, cold skin
    - v. Tremors, seizures
    - vi. Loss of consciousness, coma
    - vii. Normal breathing, normal BP
    - viii.Tx: sugar ASAP

### Activity

- I. Make flash cards of endocrine terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete the Endocrine System Worksheet.
- III. Complete the Endocrine System Medical Terminology Worksheet.
- IV. Review media terms with the students using review games

such as the "fly swatter game" or the "flash card drill" (See the Medical Terminology Activities Lesson Plan -<u>http://texashste.com/documents/curriculum/principles/medical</u> <u>terminology\_activities.pdf</u>).

V. Research and report on diseases and disorders of the endocrine system.

#### Assessment

Successful completion of activities

#### Materials

Endocrine System Worksheet KEY - Endocrine System Worksheet Endocrine System Medical Terminology Worksheet KEY - Endocrine System Medical Terminology Worksheet

#### Accommodations for Learning Differences

For reinforcement, the student will practice terms of the endocrine system using flash cards.

For enrichment, the student will choose a disease related to the endocrine system and research the disease using the internet. Students will share their findings with the class.

#### National and State Education Standards

National Healthcare Foundation Standards and Accountability Criteria Health care workers will know the various methods of giving and obtaining information. They will communicate effectively, both orally and in writing.

#### TEKS

130.203 (c)(1)(A) identify abbreviations, acronyms, and symbols;

130.203 (c)(1)(B) identify the basic structure of medical words;

130.203 (c)(1)(C) practice word-building skills;

130.203 (c)(1)(D) research the origins of eponyms;

130.203 (c)(1)(E) recall directional terms and anatomical planes related to body structure;

130.203 (c)(1)(F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases, and treatments.

130.203 (c)(2)(A) demonstrate appropriate verbal and written strategies such as correct pronunciation of medical terms and spelling in a variety of health science scenarios;

130.203 (c)(2)(B) employ increasingly precise language to communicate;

130.203 (c)(2)(C) translate technical material related to the health science industry.

130.203 (c)(3)(A) examine medical and dental dictionaries and multimedia resources;

130.203 (c)(3)(B) integrate resources to interpret technical materials;

130.203 (c)(3)(C) investigate electronic media such as the Internet with appropriate supervision.

130.203 (c)(4)(A) distinguish medical abbreviations used throughout the health science industry; and

130.203 (c)(4)(B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

## College and Career Readiness Standards

English/language art

B.1 Identify new words and concepts acquired through study of their relationships to other words and concepts.

B2. Apply knowledge of roots and affixes to infer the meanings of new words.

B3. Use reference guides to confirm the meanings of new words or concepts.

Cross- Disciplinary standards-Foundational Skills

A2. Use a variety of strategies to understand the meanings of new words

## **Endocrine System Worksheet**

- 1. State the general functions of the endocrine system.
- 2. Define the term *hormone* and describe how a hormone functions.
- Identify the major endocrine glands in terms of location.
   a. Pituitary:
  - b. Thyroid:
  - c. Adrenals:
  - d. Pancreas:
- 4. Identify the endocrine gland that produces the following hormones: a. GH:
  - b. TSH:
  - c. ACTH:
  - d. Thyroxine:
  - e. Epinephrine (adrenaline)
  - f. Norepinephrine (noradrenaline)
  - g. Cortisol:
  - h. Glucagon:
  - i. Insulin:

- 5. Identify the functions of the following hormones: a. GH:
  - b. TSH:
  - c. ACTH:
  - d. Thyroxine:
  - e. Epinephrine (adrenaline):
  - f. Norepinephrine (noradrenaline):
  - g. Cortisol:
  - h. Glucagon:
  - i. Insulin:
- Describe the diseases or disorders of the endocrine system.
   a. Acromegaly:
  - b. Diabetes Mellitus:
  - c. Dwarfism:
  - d. Gigantism:
  - e. Hyperthyroidism:
  - f. Hypothyroidism:

### **KEY** - Endocrine System Worksheet

- State the general functions of the endocrine system. The endocrine system is responsible for coordinating and regulating bodily cells, tissues, organs, and systems to maintain homeostasis by secreting chemicals known as hormones. Unlike the nervous system, the effects of the endocrine system are sustained for longer periods of time. The endocrine system works primarily through negative feedback mechanisms.
- 2. Define the term *hormone* and describe how a hormone functions. Hormones are chemical messengers released by one tissue (gland) and transported by the bloodstream to reach other target tissues. The target tissue is where the effect of the hormone is actually observed.
- Identify the major endocrine glands in terms of location.
   a. Pituitary: brain, attached to hypothalamus
  - b. Thyroid: just below the thyroid cartilage (Adam's apple) of the larynx
  - c. Adrenals: superior to each kidney
  - d. Pancreas: lies in the fold of the duodenum, posterior to the stomach and the peritoneal membranes
- 4. Identify the endocrine gland that produces the following hormones. a. GH: pituitary
  - b. TSH: pituitary
  - c. ACTH: pituitary
  - d. Thyroxine: thyroid
  - e. Epinephrine (adrenaline): adrenal
  - f. Norepinephrine (noradrenaline): adrenal
  - g. Cortisol: adrenal
  - h. Glucagon: pancreas
  - i. Insulin: pancreas

- 5. Identify the functions of the following hormones.
  - a. GH: stimulates cell growth by increasing protein synthesis
  - b. TSH: triggers the release of thyroid hormones
  - c. ACTH: stimulates the release of steroid hormones (glucocorticoids like cortisol) from the adrenal glands
  - d. Thyroxine: acts to increase metabolism by improving energy utilization, oxygen consumption, growth, and development
  - e. Epinephrine (adrenaline): helps us with our emergency and stress response
  - f. Norepinephrine (noradrenaline): helps us with our emergency and stress response
  - g. Cortisol: promotes glucose and glycogen and synthesis in the liver in a process called gluconeogenesis to support the body's cells with adequate glucose to produce ATP
  - h. Glucagon: increases blood sugar levels by stimulating the liver to convert glycogen to glucose and form glucose from amino acids
  - i. Insulin: decreases blood sugar levels by stimulating the liver to convert glucose to glycogen and facilitating the diffusion of glucose into the body's cells, where it can be used for energy or stored as lipids
- 6. Describe the diseases or disorders of the endocrine system.
  - a. Acromegaly: a hypersecretion of the growth hormone during adulthood
  - b. Diabetes Mellitus: the inability of the body to regulate its blood glucose level. Type 1 Diabetes Mellitus occurs when the body fails to produce sufficient insulin. Type 2 Diabetes Mellitus occurs when the body cells become resistant to the effects of insulin
  - c. Dwarfism: a hyposecretion of the growth hormone during childhood, resulting in a small person who has a normally proportioned bodily frame
  - d. Gigantism: a hypersecretion of the growth hormone during childhood, resulting in a person who grows to a very large size
  - e. Hyperthyroidism: the hypersecretion of thyroid hormones

f. Hypothyroidism: the hyposecretion of thyroid hormones

## **Endocrine System Medical Terms Worksheet**

Please write the meaning of the terms in the right column.

## Prefixes, Suffixes, and Root Words

а	
acr/o	
aden/o	
adren/o	
-al	
ana	
andr/o	
angi/o	
-ary	
calc/i	
cata	
cortic/o	
-crine	
dips/o	
-dipsia	
diure	
-drome	
dys	
-ectomy	
-emia	
end/o	
endocrin/o	
-esis	
eu	
ex/o	
-gen	
gluc/o	
glyc/o	
gonad/o	
hormone	
hyper	
hypo	
-ic	
-ism	
-itis	

kal/i	
lact	
-malacia	
-megaly	
men/o	
natri	
neur/o	
-oid	
-ologist	
-ology	
-oma	
ophthalm/o	
-osis	
pancreat/o	
parathyroid	
-pathy	
-penia	
-phagia	
pineal	
pituitary	
-plasia	
poly	
pro	
-rrhea	
syn	
thym/o	
thyr/o	
-tic	
toxic/o	
-tropic	
-uria	

## **Medical Terms**

acromegaly	
adenoma	
adenomalacia	
adrenalectomy	
adrenocorticohyperplasia	

adrenocorticotropic	
adrenopathy	
amenorrhea	
anabolism	
antidiuretic	
calcipenia	
catabolism	
dysmenorrhea	
endocrine	
endocrinologist	
endocrinopathy	
exocrine	
euthyroid	
exophthalmic	
glucocorticoid	
glycosuria	
gonadotropic	
hormone	
hypercalcemia	
hyperglycemia	
hyperkalemia	
hypernatremia	
hyperparathyroidism	
hyperthyroidism	
hypocalcemia	
hypoglycemia	
hypokalemia	
hyponatremia	
hypothyroidism	
neurohormone	
pancreatitis	
parathyroidoma	
pineal	
pituitary	
polydipsia	
polyphagia	
polyuria	
prolactin	
syndrome	

thyroidectomy	
thyrogenic	
thyroparathyroidectomy	
thyrotoxicosis	
thyrotropic	

#### **Medical Abbreviations**

BS	
FBS	
GTT	
Na+	
К	
sq	
U	
UA	
Õ	
õ	
>	
<	

## **KEY** - Endocrine System Medical Terms Worksheet

а	without
acr/o	extremity or extremities
aden/o	gland
adren/o	adrenal gland
-al	pertaining to
ana	up, back, apart
andr/o	male
angi/o	vessel
-ary	pertaining to
calc/i	calcium or stone
cata	to break down or apart
cortic/o	cortex
-crine	to secrete
dips/o	thirst
-dipsia	thirst
diure	to urinate
-drome	running
dys	painful or difficult
-ectomy	removal or excision
-emia	referring to a blood condition
end/o	within
endocrin/o	endocrine
-esis	pertaining to
eu	true, good, normal
ex/o	outside, out
-gen	to produce
gluc/o	sugar
glyc/o	sugar
gonad/o	gonads or the reproductive organs
hormone	to excite; urging on
hyper	above, greater than
hypo	below, less than
-ic	pertaining to
-ism	state of or condition of
-itis	inflammation of or infection of
kal/i	potassium
lact	milk

## Prefixes, Suffixes, and Root Words

-malacia	softening
-megaly	enlargement
men/o	menstruation
natri	sodium
neur/o	nervous, neuron
-oid	resembling
-ologist	one who studies, a specialist
-ology	the study of
-oma	tumor, mass
ophthalm/o	еуе
-osis	condition of
pancreat/o	pancreas
parathyroid	four small glands on the back of the thyroid
-pathy	disease
-penia	deficiency or lack of
-phagia	eating (or swallowing)
pineal	pineal gland; shaped like a pine cone
pituitary	pituitary or master gland
-plasia	growth or development
poly	many
pro	to come before
-rrhea	discharge or flow
syn	with, together
thym/o	thymus gland
thyr/o	thyroid gland
-tic	pertaining to
toxic/o	poison
-tropic	influencing
-uria	to urinate

### **Medical Terms**

acromegaly	enlargement of the extremities	
adenoma	tumor of a gland	
adenomalacia	softening of the adrenal gland	
adrenalectomy	removal of the adrenal gland	
adrenocorticohyperplasia	increased development of the adrenal cortex	
adrenocorticotropic	pertaining to influencing the adrenal cortex	
adrenopathy	disease of the adrenal gland	
amenorrhea	absence of menstrual flow	
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anabolism	referring to a building up process (required for growth and repair of body tissues; for example, dehydration synthesis)	
antidiuretic	reducing the formation of urine	
calcipenia	deficiency of calcium	
catabolism	referring to a destructive process or one that breaks down substances (such as hydrolysis or digestion)	
dysmenorrhea	painful menstrual flow	
endocrine	to secrete within or the endocrine system (refers to a system of glands that secrete their products [hormones] directly into the bloodstream)	
endocrinologist	one who studies the endocrine system or an endocrine system specialist	
endocrinopathy	disease(s) of the endocrine glands or system	
exocrine	to secrete without (refers to those organs which secrete their products through ducts such as salivary glands and the pancreas). Please note: the pancreas is both an endocrine gland and an exocrine gland	
euthyroid	resembling normal thyroid function	
exophthalmic	pertaining to eyes slightly out	
glucocorticoid	"resembling sugar from the cortex." Refers to a group of hormones produced by the adrenal cortex that play a role in sugar metabolism	
glycosuria	sugar in the urine	
gonadotropic	of a substance which encourages the development or activity of the ovaries and testes	
hormone	to excite (refers to a group of chemical messengers that effect on other bodily organs, and are secreted into the blood by glands)	
hypercalcemia	high levels of calcium in the blood	
hyperglycemia	high levels of sugar in the blood	
hyperkalemia	high levels of potassium in the blood	
hypernatremia	high levels of sodium in the blood	
hyperparathyroidism	a condition of excessive parathyroid secretion	
hyperthyroidism	a condition of excessive thyroid secretion	
hypocalcemia	low levels of calcium in the blood	
hypoglycemia	low levels of sugar in the blood	
hypokalemia	low levels of potassium in the blood	
hyponatremia	low levels of sodium in the blood	
hypothyroidism	a condition of low thyroid secretion	
neurohormone	"to excite from the nerves" (refers to hormones produced by nervous tissue)	
pancreatitis	inflammation of the pancreas	

parathyroidoma	a mass or tumor in the parathyroids	
pineal	pertaining to the pineal gland	
pituitary	pertaining to the pituitary gland	
polydipsia	excessive thirst	
polyphagia	excessive hunger	
polyuria	excessive urination Note: the three "polys" are classic symptoms of diabetes mellitus	
prolactin	pertaining to before milk (this hormone stimulates the production of milk by the mammary glands)	
syndrome	symptoms that run together	
thyroidectomy	removal of the thyroid gland	
thyrogenic	produced by the thyroid gland	
thyroparathyroidectomy	removal of the thyroid and parathyroids	
thyrotoxicosis	a toxic condition of the thyroid gland (this is related to hyperactivity of the thyroid gland)	
thyrotropic	pertaining to influencing the thyroid gland	

#### **Medical Abbreviations**

BS	blood sugar	
FBS	fasting blood sugar	
GTT	glucose tolerance test	
Na+	sodium	
К	potassium	
sq	subcutaneous	
U	units	
UA	urinalysis	
Õ	increased amount	
õ	decreased amount	
>	greater than	
<	less than	

# The Female Reproductive System

<b>Course</b> Medical Terminology <b>Unit XIV</b>	Rationale Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the Reproductive system to discuss common conditions and diseases.		
The Reproductive System <b>Essential</b> <b>Question</b> What medical terminology is associated with the Female Reproductive	<ul> <li>Objectives</li> <li>Upon completion of this lesson, the learner should be able to: <ul> <li>Define and decipher common terms associated with the female reproductive system</li> <li>Identify the basic anatomy of the female reproductive system</li> <li>Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course</li> <li>Research diseases which involve the female reproductive system</li> </ul> </li> </ul>		
System? <b>TEKS</b> 130.203 (c)(1) (A), (B), (E), 2(B), 4 (A), (B)	<ul> <li>Show a childbirth video and tell the students that they will be learning about terms related to the female reproductive system during this unit. There are lots of websites that have childbirth videos. The one I used was <i>howstuffworksvideos.com</i>.</li> <li>Key Points (May use power point presentation which is provided.)</li> </ul>		
<b>Prior Student</b> <b>Learning</b> None Estimated time	<ul> <li>I. Gynecology         <ul> <li>A. The study of the female reproductive system</li> <li>B. Obstetrics (Latin <i>obstetrix</i> means midwife)                 <ul> <li>Specialty concerned with pregnancy and the delivery of the fetus</li> </ul> </li> </ul> </li> </ul>		
3-5 hours	<ul> <li>C. Neonatology: the study of the care and treatment of the newborn</li> <li>II. Reproductive System <ul> <li>A. Function is to produce a new life</li> <li>B. Both males and females have the same types of organs</li> <li>1. Gonads or sex glands</li> <li>2. Ducts or tubes to carry the sex cells and secretions</li> <li>3. Accessory organs</li> </ul> </li> <li>III. Ovaries <ul> <li>A. Female gonads (sex glands)</li> <li>B. Small almond-shaped glands</li> <li>C. Located in the pelvic cavity and attached to the uterus by ligaments</li> <li>D. Follicles <ul> <li>Thousands of small sacs in the ovaries</li> </ul> </li> </ul></li></ul>		

- 2. Each follicle contains an immature ovum (female sex cell)
- 3. When an ovum matures, the follicle enlarges and then ruptures to release the mature ovum
- 4. Process is called ovulation and usually occurs about once a month
- E. Hormone Production
  - 1. Aids in development of the reproductive organs
  - 2. Produces secondary sexual characteristics
- IV. Menstrual Cycle
  - A. Ovum are present from birth; when mature are released from the ovary (ovulation) in 21-28 day cycles
  - B. Menarche: the occurrence of the first cycle
  - C. Menstruation
    - 1. Shedding of the uterine lining and bleeding
    - 2. Occurs if the egg is not fertilized
  - D. Days 1-5
    - 1. Discharge of blood fluid containing disintegrated endometrial cells, glandular secretions and blood cells
  - E. Days 6-12
    - 1. Bleeding ceases and the endometrium begins to repair itself.
    - 2. The ovum grows in the follicle
  - F. Days 13-14
    - 1. Ovulatory period: the ovum leaves the ovary
  - G. Days 15-28
    - 1. Endocrine organ secretes the hormone progesterone which stimulates the building up of the lining of the uterus in anticipation of fertilization
  - H. Menopause
    - 1. When all eggs have been released or
    - 2. Hormone production diminished
    - 3. Menstruation ends
- V. Fallopian Tubes
  - A. Two tubes, each about 5 inches long
  - B. Attached to the upper part of the uterus
  - C. Lateral ends of the tubes are located above the ovaries, but have no direct connection to ovaries
  - D. Lateral end has finger-like projections called Fimbriae, which help move the ovum released by the ovary into the fallopian tube
  - E. Serve as passageway for ovum as it moves from the ovary to the uterus
    - 1. Peristalsis: rhythmic movement of muscle layer of the tube that helps move ovum down toward the

uterus

- 2. Cilia: hair-like structures on lining of tubes that keep the ovum moving toward the uterus
- F. Fertilization, union of ovum with a sperm to create a new life; usually takes place in the fallopian tubes
- VI. Fertilization
  - A. Coitus (copulation, sexual intercourse) occurs
  - B. The sperm travel into the fallopian tube
  - C. One sperm penetrates the ovum (female sex cell)
  - D. The fertilized ovum is known as a zygote
- VII. Zygote
  - A. 2-8 weeks embryo
  - B. 8 to 38-40 weeks fetus
  - C. Gestation: the period of development within the uterus
- VIII. Uterus
  - A. Hollow, muscular pear-shaped organ
  - B. Located behind the urinary bladder, but in front of the rectum
  - C. Three parts
    - 1. **Fundus** or top section: where fallopian tubes attach
    - 2. Body or **corpus**: the middle section
    - 3. **Cervix** or narrow bottom: section that attaches to the vagina
  - D. Functions
    - 1. Organ of menstruation
    - 2. Allows for the development and growth of the fetus
    - 3. Contracts to aid in expulsion of fetus during birth
  - E. There are three layers of the uterus
    - 1. Endometrium
      - a. Inner layer of specialized epithelium
      - b. Provides for implantation of a fertilized ovum
      - c. Aids in the development of the fetus
      - d. If fertilization does not occur, endometrium deteriorates and causes the bleeding known as menstruation
    - 2. Myometrium
      - a. Muscular middle layer
      - b. Allows for expansion of uterus during pregnancy
      - c. Contracts to expel the fetus during birth
    - 3. Perimetrium
      - a. Serous membrane outer layer
- IX. Vagina
  - A. Muscular tube that connects cervix of uterus with the outside
  - B. Functions

- 1. Passageway for menstrual flow
- 2. Received the sperm and semen from the male
- 3. Female organ of copulation or intercourse
- 4. Acts as the birth canal during delivery of infant
- C. Lined with a mucous membrane
  - 1. Arranged in folds called rugae
  - 2. Rugae allow the vagina to enlarge during childbirth and intercourse
- X. Bartholin's Glands
  - A. Also called vestibular glands
  - B. Two small glands located on either side of the vaginal opening
  - C. Secreted mucus for lubricating during intercourse
- XI. Vulva
  - A. Structures that form the external female genital area
  - B. Mons veneris
    - 1. Triangular pad of fat covered with hair
    - 2. Lies over the pubic area
  - C. Labia majora
    - 1. Two large folds of fatty tissue
    - 2. Covered with hair
    - 3. Enclose and protect the vagina
  - D. Labia minora
    - 1. Two smaller hairless folds of tissue
    - 2. Located within the labia majora
  - E. Vestibule
    - 1. Area of the vulva inside the labia minora
    - 2. Contains the openings to urethra and vagina
    - 3. Clitoris
      - a. Area of erectile tissue
      - b. Located at the junction of the labia minora
      - c. Produces sexual arousal when stimulated directly or indirectly during intercourse
    - 4. Perineum
      - a. Area between the vagina and anus in the female
      - b. Can be used to describe entire pelvic floor in both the male and female

#### XII. Breast

- A. Mammary glands
- B. Contain lobes separated into sections by connective and fatty tissue
- C. Milk ducts located in tissue exit on surface at nipple
- D. Main function is the secretion of milk or **lactation** after childbirth

Vocubulary	M	
Word	Meaning	
Adnexa uteri	Fallopian tubes, ovaries, and supporting ligament	
Amnion	Innermost membranous sac surrounding the	
	developing fetus	
Areola	Dark-pigmented area surrounding the breast nipple	
Bartholin's	Small mucus-secreting exocrine glands at the	
Glands	vaginal orifice	
Cervix	Lower, neck-like portion of the uterus	
Chorion	Outermost layer of the two membranes	
	surrounding the embryo; it forms the fetal part of the placenta	
Clitoris	Organ of sensitive erectile tissue anterior to the	
	opening of the female urethra	
Coitus	Sexual intercourse; copulation	
Corpus	Empty ovarian follicle that secretes progesterone	
luteum	after release of the egg cell. (luteum means yello	
	(corpus means body)	
Cul-de-sac	Region in the lower abdomen, midway between t	
	rectum and the uterus	
Embryo	Stage in prenatal development from 2 to 8 weeks	
Endometrium	Inner, mucous membrane lining of the uterus	
Estrogen	Hormone produced by the ovaries (promotes	
-	female secondary sex characteristics)	
Fallopian	One of a pair of ducts through which the ovum	
tube	travels to the uterus	
Fertilization	Union of the sperm cell and ovum from which the embryo develops	
Fetus	Stage in prenatal development from 8-39 or 40 weeks	
Fimbriae	Finger- or fringe-like projections at the end of the	
(singular:	fallopian tubes	
fimbria)		
Follicle-	Secreted by the pituitary gland to stimulate	
stimulating	maturation of the egg cell (ovum)	
Hormone		
(FSH)		
Gamete	Male or female sexual reproductive cell; sperm ce	
	or ovum	
Genitalia	Reproductive organs; also called genitals	
Gestation	Period from fertilization of the ovum to birth	
Gonad	Female or male reproductive organ that produces	
	sex cells and hormones: ovary or testis	
Gynecology	Study of the female reproductive organs including	
,	the broost	

Human	Hormone produced by the placenta to sustain	
chorionic	pregnancy by stimulating the ovaries to produce	
gonadotropin	estrogen and progesterone	
(hCG)		
Hymen	Mucous membrane partially or completely covering	
	the opening to the vagina	
Labia	Lips of the vagina; labia majora are the larger,	
	outermost lips and labia minora are the smaller,	
	innermost lips	
Lactiferous	Tubes that carry milk within the breast	
Ducts		
Luteinizing	Hormone produced by the pituitary gland;	
Hormone	promotes ovulation	
(LH)		
Mammary	Nipple of the breast	
Papilla		
Menarche	Beginning of the first menstrual period and ability	
	to reproduce	
Menopause	Gradual ending of menstruation	
Myometrium	Muscle layer of the uterus	
Neonatology	Branch of medicine that studies the disorders and	
	care of the newborn (neonate)	
Obstetrics	Branch of medicine concerned with pregnancy and	
	childbirth	
Orifice	An opening	
Ovarian	Developing sac enclosing each ovum within the	
follicle	ovary	
Ovary	One of a pair of female organs (gonads) on each	
	side of the pelvis	
Ovulation	Release of the ovum from the ovary	
Ovum	Mature egg cell. Plural: ova	
Parturition	Act of giving birth	
Perineum	In females, the area between the anus and the	
	vagina	
Pituitary	Endocrine gland at the base of the brain. It	
gland	produces hormones to stimulate the ovaries	
Placenta	Vascular organ that develops in the uterine wall	
	during pregnancy and serves as a connection	
	between maternal and fetal bloodstreams	
Pregnancy	Condition in a female of having a developing	
	embryo and tetus	
Progesterone	Hormone produced by the corpus luteum in the	
	ovary and the placenta of pregnant women	
Puberty	Age in life when secondary sex characteristics	
	appear and gametes are produced	

Uterine	Outermost layer surrounding the uterus
serosa	
Uterus	Hollow, pear-shaped muscular female organ in
	which the embryo and fetus develop
Vagina	Muscular, mucosa-lined tube extending from the
	uterus to the exterior of the body
Vulva	External female genitalia that includes the labia,
	hymen, clitoris and vaginal orifice
Zygote	Stage in prenatal development from fertilization
	and implantation to 2 weeks

#### XIV. Combining Forms

Combining	Meaning	Example of
Form		term
Amni/o	Amnion	amniocentesis
Cervic/o	Cervix, neck	endocervicitis
Chori/o,	Chorion	chorionic
chorion/o		
Colp/o	Vagina	colposcopy
Culd/o	cul-de-sac	culdocentesis
Episolo	Vulva	episiotomy
galactic	Milk	galactorrhea
gyneo/o	woman, female	gynecomastia
Hyster/o	Uterus, womb	hysterectomy
Lact/o	Milk	lactation
Mamm/o	Breast	mastitis
Men/o	Menses, menstruation	amenorrhea
Metro/o, metri/o	Uterus	metrorrhagia
My/o, myom/o	Muscle, muscle tumor	myometrium
Nat/i	Birth	neonatal
Obstetro/o	Pregnancy and childbirth	obstetrics
0/0	Egg	oogenesis
Oophor/o	Ovary	oophorectomy
Ov/o	Egg	ovum
Ovary/o	Ovary	ovarian
Ovul/o	Egg	anovulatory
Vagin/o	Vagina	vaginal orifice
Vulv/o	Vulva	vulvovaginitis

#### XV. Suffixes

Suffixes	Meaning	Example of
		term
-arche	Beginning	Menarche
-cyesis	Pregnancy	Pseudocyesis
-gravida	Pregnant	Primigravida

-parous	Bearing, bringing forth	Primiparous
-rrhea	Discharge Leucorrhea	
-salphinx	Fallopian tube	Pyosalpinx
-tocia	Labor, birth Dysocia	
-version	Act of turning	Cephalic version

#### XVI. Prefixes

Prefixes	Meaning	Example of
		term
Dys-	Painful	Dyspareunia
Endo-	Within	Endometritis
In-	In	Involution of the
		uterus
Intra-	Within	Intrauterine
Multi-	Many	Multipara
Nulli-	Non, not, none	Nulligravida
Pre-	Before	Prenatal
Primi-	First	Primipara
Retro-	Backward	Retroversion

XVII. Breast Tumors

- A. Can be benign or malignant
- B. Symptoms
  - 1. Lump or mass in the breast tissue
  - 2. Change in breast size or shape
  - 3. Discharge from the nipple
- C. Early detection of tumors is important
- XVIII. Self-examination of the Breast
  - A. American Cancer Society recommends that an adult female do a BSE every month at the end of menstruation or on a scheduled day of the month after menopause
  - B. Breast should be examined in front of a mirror to observe for changes in appearance; in a warm shower after soaping the breast; and while lying flat, in a supine position
  - C. A physician should be contacted immediately if any abnormalities are found
- XIX. American Cancer Society Recommendations
  - A. BSE every month
  - B. Women between 35-40 years of age should have a baseline mammogram
  - C. Women between 40-49 should have a mammogram every 1-2 years
  - D. After age 50 yearly mammogram
  - E. Mammograms and ultrasonography can often detect tumors or masses up to 2 years before the tumor or mass can be felt
- XX. Cancer of the Cervix or Uterus

- A. Cervical cancer
  - 1. Detected early by a pap smear
  - 2. Symptoms: abnormal vaginal discharge, bleeding
- B. Uterine cancer
  - 1. Symptoms: enlarged uterus, watery discharge
  - 2. Abnormal bleeding
- C. Treatment
  - 1. Hysterectomy: surgical removal of uterus and cervix
  - 2. Panhysterectomy: surgical removal of the uterus, ovaries and fallopian tubes
  - 3. Chemotherapy and/or radiation

#### XXI. Endometriosis

- A. Abnormal growth of endometrial tissue outside the uterus
- B. Tissue can be carried by fallopian tubes, by blood or lymph or through surgery
- C. Becomes embedded in a structure in the pelvic area, such as ovaries or peritoneal tissues, and constantly grows and sheds
- D. Can cause sterility if fallopian tubes become blocked with scar tissue
- E. Symptoms
  - 1. Pelvic pain
  - 2. Abnormal bleeding
  - 3. Dysmenorrhea
- F. Treatment
  - 1. Varies with age of patient and degree of abnormal growth
  - 2. Can include hormonal therapy, pain meds, surgical removal of affected organs
- XXII. Ovarian Cancer
  - A. Malignant tumor of the ovary (adenocarcinoma)
  - B. One of the most common causes of cancer deaths in women
  - C. Frequently occurs between 50-65 years of age
  - D. Initial symptoms are vague: abdominal discomfort, mild gastrointestinal disturbances such as constipation or diarrhea
  - E. As the disease progresses, pain, abdominal distention and urinary frequency occur
- XXIII. Pelvic Inflammatory Disease
  - A. PID
  - B. Inflammation and infection of the cervix, endometrium of the uterus, fallopian tubes and. at times, ovaries
  - C. Causes: pathogenic organisms such as bacteria, viruses and fungi
  - D. Symptoms: lower abdominal pain, fever, purulent vaginal

discharge

- E. Treatment: antibiotics, increased fluids, rest, pain medications
- XXIV. Premenstrual Syndrome
  - A. PMS
  - B. Group of symptoms that appear 3-14 days before menstruation
  - C. Large percentage of women experience some degree of PMS
  - D. Cause is unknown, but may result from a hormonal or biochemical imbalance, poor nutrition, or stress
  - E. Symptoms vary
    - 1. Nervousness, irritability, depression
    - 2. Headache and backache
    - 3. Edema, abdominal bloating, temporary weight gain
    - 4. Constipation
    - 5. Breast tenderness and enlargement
- XXV. Sexually transmitted diseases
  - A. STDs
  - B. Venereal diseases affect both males and females
  - C. Incidence of STDs has increased greatly in recent years, especially among young people
  - D. If STDs are not treated, they can cause serious chronic conditions and in some cases, sterility or death
- XXVI. Acquired Immune Deficiency Syndrome
  - A. Cause: virus called human immunodeficiency virus (HIV)
  - B. Virus attacks the body's immune system
  - C. Causes body to lose its ability to fight off certain infections and diseases, eventually causing death
  - D. Spread through sexual secretions, blood, and from an infected mother to her infant during pregnancy or child birth
  - E. HIV does not live long outside the body and is not transmitted by casual, nonsexual contact
  - F. Individuals infected with HIV can remain free of any symptoms for years after infection
  - G. During this asymptomatic time, infected individuals can transmit virus to any other individual with whom they exchange sexual secretions, blood or blood products
  - H. After this initial asymptomatic period, many individuals develop HIV symptomatic infections, formerly called AIDS-related complex (ARC)
  - I. Prevention of AIDS is the best method of dealing with AIDS
    - 1. Standard precautions should be followed while handling blood, body and sexual secretions
    - 2. Avoid high-risk sexual activities such as multiple partners and homosexual activities

- 3. Use a condom and an effective spermicide as a protective barrier during intercourse
- 4. Avoid use of drugs and sharing IV needles
- 5. Females infected with HIV should avoid pregnancy
- 6. Everyone must become concerned with eliminating the transmission of AIDS

XXVII. Chlamydia

- A. One of the most frequently occurring STDs
- B. Caused by several strains of the Chlamydia organism, a specialized bacterium that lives as an intracellular parasite
- C. Symptoms: similar to those of gonorrhea
  - 1. Males: burning on urination and a mucous discharge
  - 2. Females: frequently asymptomatic; may have a vaginal discharge, PID, may cause sterility if not related

XXVIII. Gonorrhea

- A. Caused by the gonococcus bacteria
- B. Symptoms
  - 1. Males: greenish-yellow discharge, burning on urination, sore throat, and swollen glands
  - 2. Females: frequently asymptomatic
    - a. May experience dysuria, lower abdominal pain and vaginal discharge
    - b. Infected women can transmit gonococcus organisms to infant's eyes during delivery, causing blindness
      - I. To prevent this, a drop of silver nitrate or antibiotic is routinely placed in eyes of newborn
- C. Treatment with antibiotics

XXIX. Herpes

- A. Viral disease caused by the herpes simplex virus type II
- B. Symptoms: burning sensation, fluid-filled vesicles that rupture and form painful ulcers, and painful urination
- C. After the sores heal, virus becomes dormant
- D. Treatment: directed toward promoting healing and easing discomfort
- E. No cure
- XXX. Pubic Lice
  - A. Parasites that are usually transmitted sexually, although they can be spread by contact with clothes, bed linen, and items containing the lice
  - B. Symptoms: intense itching and redness of perineal area
  - C. Treatment: wash all clothing and bed linen with medication that kills lice to destroy any lice or nits (eggs)

XXXI. Syphilis

- A. Caused by a bacteria called spirochete, a slender spiral organism
- B. Symptoms occur in stages
- C. Early diagnosis and treatment of syphilis with antibiotics can cure disease during first two stages
- D. Primary stage
  - 1. Painless chancre or sore appears
  - 2. Usually on penis of male and in vulva or cervix of female
  - 3. Chancre heals within a few weeks
- E. Second stage
  - 1. Occurs if the chancre is not treated
  - 2. Organism enters the bloodstream
  - 3. Causes a non-itching rash, sore throat, fever and swollen glands
  - 4. Symptoms also disappear in a period of weeks
- F. Third stage
  - 1. Occurs years later after spirochete has damaged vital organs
  - 2. Damage to heart and blood vessels causes cardiovascular disease
  - 3. Damage to spinal cord causes characteristic gait and paralysis
  - 4. Brain damage causes metal disorders, deafness and blindness
  - 5. Damage is irreversible and death occurs
- XXXII. Clinical Tests and Procedures

Test or Procedure	Definition
Pap test	Microscopic examination of stained
	cells removed from the vaginal cervix
Pregnancy test	Blood or urine test to detect the
	presence of hCG
Hysterosalpingograph	X-ray imaging of the uterus and
y (HSG)	fallopian tubes after injection of contrast
	material
Mammography	X-ray imaging of the breast
Breast ultrasound	Technologies using sound waves and
imaging	magnetic waves to created images of
	breast tissue
Breast MRI	Technologies using magnetic waves to
	create images of breast tissue
Pelvic	Recording images of sound waves as
ultrasonography	they bounce off organs in the pelvic
	region
Aspiration	Withdrawal of fluid from a cavity or sac

	with an instrument using suction
Contorization	
Cauterization	Destruction of tissue by burning
Colposcopy	Visual examination of the vagina and
	cervix using a colposcope
Conization	Removal of a cone-shaped section of
	the cervix
Cryosurgery	Use of cold temperatures to destroy
	tissue
Culdocentesis	Needle aspiration of fluid from the cul-
	de-sac
Dilation and curettage	Widening the cervix and scraping off
(D&C)	the endometrial lining of the uterus
Eventeration	Removal of internal organs within a
Exerticitation	cavity
	Visual examination of the abdominal
саратовсору	
Tubal line tion	Cavity using an endoscope
I ubai ligation	Blocking the fallopian tubes to prevent
	fertilization from occurring
Abortion AB	Spontaneous or induced termination of
	pregnancy before the embryo or fetus
	can exist on its own.
Amniocentesis	Needle puncture of the amniotic sac to
	withdraw amniotic fluid for analysis
Cesarean section	Surgical incision of the abdominal wall
	and uterus to deliver a fetus
Chronic villus	Sampling of placental tissues for
sampling (CVS)	prenatal diagnosis
Fetal monitoring	Continuous recording of the fetal heart
3	rate and maternal uterine contractions
	to reduce fetal distress during labor
In vitro fertilization	Egg and sperm cells are combined
(IVF)	outside the body in a laboratory dish (in
(,	vitro) to facilitate fertilization
Pelvimetry	Measurement of the dimensions of the
i civinicu y	maternal palvis
	ווומנכווומו אבועוט

#### XXXIII. Abbreviations

Abbreviation	Meaning
AB	Abortion
AFP	Alpha-fetoprotein: high levels in amniotic fluid of
	fetus or maternal serum indicate increased risk
	of neurologic birth defects in the infant
ASCUS	Atypical squamous cells of undetermined
	significance
AUB	Abnormal uterine bleeding

BRCA1,	Breast cancer 1 and 2: genetic mutations
BRCA 2	associated with increased risk for breast cancer
BSE	Breast self-examination
Ca 125	Protein marker elevated in ovarian cancer
C-section	Cesarean section
CIN	Cervical intraepithelial neoplasia
CIS	Carcinoma in situ
CS	Cesarean Section
CVS	Chorionic villus sampling
Сх	Cervix
D&C	Dilation and curettage
DCIS	Ductal carcinoma in situ
DES	Diethylstilbestrol: an estrogen compound used in
	the treatment of menopausal problems involving
	estrogen defiance
DUB	Dysfunctional uterine bleeding
ECC	Endocervical curettage
EDC	Estimated date of confinement
EMB	Endometrial biopsy
FHR	Fetal heart rate
FSH	Follicle-stimulating hormone
G	Gravid: pregnant
GnRH	Gonadotropin-releasing hormone
GYN	Gynecology
hCG or HCG	Human chorionic gonadotropin
HDN	Hemolytic disease of the newborn
HPV	Human papillomavirus
HRT	Hormone replacement therapy
HSG	Hysterosalpingography
IUD	Intrauterine device
IVF	In vitro fertilization
LAVH	Laparoscopically assisted vaginal hysterectomy
LEEP	Loop electrocautery excision procedure
LH	Luteinizing hormone
LMP	Last menstrual period
LSH	Laparoscopic supracervical hysterectomy
Multip	Multipara; multiparous
OB	Obstetrics
OCPs	Oral contraceptive pills
Pap test	Papanicolaou smear: test for cervical or vaginal
	cancer
Path	Pathology
PID	Pelvic inflammatory disease
PMS	Premenstrual syndrome
Primip	Primipara; primiparous

RDS	Respiratory distress syndrome of the newborn
SLN, SNB	Sentinel lymph node biopsy
TAH-BSO	Total abdominal hysterectomy with bilateral
	salpingo-oophorectomy
TRAM flap	Trans-rectus abdominis musculocutaneous flap
	for breast reconstruction
UAE	Uterine artery embolization
VH	Vaginal hysterectomy

#### Activity

- I. Make flash cards of female reproductive system terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete Female Reproductive System Terms Worksheet.
- III. Complete the Female Reproductive System Vocabulary Worksheet.
- IV. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan -

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

V. Research and report on diseases and disorders from the Female Reproductive system.

#### Assessment

Successful completion of the activities

#### Materials

Medical Terminology book List of Female Reproductive terms Female Reproductive Terms Key Female Reproductive System Vocabulary Worksheet Key Female reproductive system power point Index cards Markers

#### Accommodations for Learning Differences

For reinforcement, the student will practice terms using flash cards of the female reproductive system.

For enrichment, the students will research an assigned STD and report back to the class on his/her findings.

#### National and State Education Standards National Healthcare Foundation Standards and Accountability Criteria:

Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

#### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;
- (E) recall directional terms and anatomical planes related to the body structure

130.203 (c) (2) (B) employ increasingly precise language to communicate

130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:

- (A) distinguish medical abbreviations used throughout the health science industry; and
- (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

#### **Texas College and Career Readiness Standards**

English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

**1**. Identify new words and concepts acquired through study of their relationships to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts.

Cross-Disciplinary Standards,

I. Key Cognitive Skills D. Academic Behavior: 1. Self-monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits:

1. Work independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

# Female Reproductive System Terms Write the definition of the term in the right column

Term	Definition
cervic/o- cervix	(neck) pl=cervices)
cervical	· · · · · · · · · · · · · · · · · · ·
cervical cap	
cervicectomy	
cervicitis	
cervicocolpitis	
cervicovaginitis	
cervicovesical	
colp/o-	vagina (sheath)
colpalgia	
colpectomy	
colpitis	
colpocele	
colpopexy	
colpoplasty	
colpoptosis	
colporrhagia	
colpotomy	
vagin/o-	Vagina
vaginal	
vaginapexy	
vaginocele	
vaginogenic	
vaginography	
vaginometer	
vaginopathy	
vaginopexy	
vaginoplasty	
vaginoscope	
Culd/o	Cul-de-sac (blind pouch)
culdocentesis	
culdoscope	
culdoscopy	
vulv/o-	vulva (covering)
Vulval, vulvar	
vulvectomy	
vulvismus	
vulvitis	
vulvocrural	

vulvopathy	
vulvouterine	
vulvovaginitis	
episi/o-	vulva and perineum
episioelectrorrhaphy	•
episioperineoplasty	
episioperineorrhaphy	
episioplasty	
episiorrhaphy	
episiostenosis	
episiotomy	
gyn/o- gynec/o-	woman, female
gynecogenic	
gynecoid	
gynecologic	
gynecologist	
gynecology	
gynecomania	
gynecomastia	
Gynoplastics, gynoplasty	
gynephobia	
avnopathy/avnecopathy	
gjilopaalijigjilooopaalij	
hymen/o-	hymen (membrane)
hymenal	hymen (membrane)
hymen/o- hymenal hymenectomy	hymen (membrane)
hymenal hymenectomy hymenitis	hymen (membrane)
hymen/o- hymenectomy hymenitis hymenology	hymen (membrane)
hymen/o- hymenectomy hymenitis hymenology hymenorrhaphy	hymen (membrane)
hymen/o- hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome	hymen (membrane)
hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome hymenotomy	hymen (membrane)
hymen/o- hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome hymenotomy metr/o- metr/a- metr/i-	hymen (membrane)
hymen/o- hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome hymenotomy <b>metr/o- metr/a- metr/i-</b> endometritis	hymen (membrane)
hymen/o- hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome hymenotomy <b>metr/o- metr/a- metr/i-</b> endometritis metralgia	hymen (membrane)
hymen/o- hymenal hymenectomy hymenology hymenology hymenorrhaphy hymenotome hymenotomy <b>metr/o- metr/a- metr/i-</b> endometritis metralgia metritis	hymen (membrane)
hymen/o- hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome hymenotomy <b>metr/o- metr/a- metr/i-</b> endometritis metralgia metritis metrocele	hymen (membrane)
hymen/o- hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome hymenotomy <b>metr/o- metr/a- metr/i-</b> endometritis metralgia metritis metrocele metropathy	hymen (membrane)
hymen/o- hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome hymenotomy <b>metr/o- metr/a- metr/i-</b> endometritis metralgia metritis metrocele metropathy metroperitonitis	hymen (membrane)
hymen/o- hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome hymenotomy <b>metr/o- metr/a- metr/i-</b> endometritis metralgia metritis metrocele metropathy metroperitonitis metroplasty	hymen (membrane)
hymen/o- hymenal hymenectomy hymenectomy hymenology hymenology hymenorrhaphy hymenotome hymenotome hymenotomy <b>metr/o- metr/a- metr/i-</b> endometritis metralgia metritis metrocele metropathy metroperitonitis metroplasty metrorrhagia	hymen (membrane)
hymen/o- hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome hymenotome hymenotomy <b>metr/o- metr/a- metr/i-</b> endometritis metralgia metralgia metrocele metropathy metroperitonitis metroplasty metrorrhagia metrorrhagia	hymen (membrane)
hymen/o- hymenal hymenectomy hymenectomy hymenology hymenology hymenorrhaphy hymenotome hymenotome hymenotomy <b>metr/o- metr/a- metr/i-</b> endometritis metralgia metritis metralgia metrocele metropathy metroperitonitis metroplasty metrorrhagia metrorrhea metrostaxis	hymen (membrane)
hymen/o- hymenal hymenectomy hymenitis hymenology hymenorrhaphy hymenotome hymenotomy metr/o- metr/a- metr/i- endometritis metralgia metritis metrocele metropathy metroperitonitis metroplasty metrorrhagia metrorrhagia	hymen (membrane)

uteritis	
uterocele	
uterometer	
uteropexy	
uteroplasty	
uterorectal	
uteroscope	
uterotonic	
uterotubal	
hyster/o-	uterus (womb)
hysteritis	
hysterocele	
hysterogram	
hysterology	
hysterometer	
hysteropathy	
hysteropexy	
hysterorrhaphy	
hysteroscopy	
hysterotomy	
men/o-	menstruation (month)
amanannaa	
duamanarrhaa	
dysmenorrhea monophania	
dysmenorrhea menophania	
dysmenorrhea menophania menorrhagia	
dysmenorrhea menophania menorrhagia menorrhalgia	
dysmenorrhea menophania menorrhagia menorrhalgia menorrhea menostasis	
dysmenorrhea menophania menorrhagia menorrhalgia menorrhea menostasis	
dysmenorrhea menophania menorrhagia menorrhalgia menostasis menostasis menostasis	
dysmenorrhea menophania menorrhagia menorrhalgia menostasis menostasis menostasis menostasis	ovary (bearing eggs)
dysmenorrhea menophania menorrhagia menorrhalgia menostasis menostasis menostaxis menoxenia <b>oophor/o-</b> oophoralgia	ovary (bearing eggs)
dysmenorrhea menophania menorrhagia menorrhalgia menostasis menostasis menostaxis menoxenia <b>oophor/o-</b> oophoralgia oophoritis	ovary (bearing eggs)
dysmenorrhea menophania menorrhagia menorrhalgia menostasis menostasis menostaxis menoxenia <b>oophor/o-</b> oophoralgia oophoritis oophoropexy	ovary (bearing eggs)
dysmenorrheamenophaniamenorrhagiamenorrhalgiamenorrheamenostasismenostaxismenoxeniaoophor/o-oophoralgiaoophoritisoophoropexyoophoroplasty	ovary (bearing eggs)
dysmenorrheamenophaniamenorrhagiamenorrhalgiamenorrhalgiamenostasismenostasismenostasismenoxeniaoophor/o-oophoralgiaoophoropexyoophoroplastyoophorotomy	ovary (bearing eggs)
dysmenorrheamenophaniamenorrhagiamenorrhalgiamenorrheamenostasismenostasismenostasismenoxeniaoophor/o-oophoralgiaoophoropexyoophoroplastyoophorrhagia	ovary (bearing eggs)
dysmenorrheamenophaniamenorrhagiamenorrhalgiamenorrheamenostasismenostasismenoxeniaoophor/o-oophoralgiaoophoropexyoophoroplastyoophorrhagiaperineocele	ovary (bearing eggs)
dysmenorrheamenophaniamenorrhagiamenorrhalgiamenorrhalgiamenorrheamenostasismenostasismenoxeniaoophor/o-oophoralgiaoophoropexyoophoroplastyoophorrhagiaperineoceleperineometer	ovary (bearing eggs)

salping/o-	fallopian tube (also eustachian tube)
salpingian	
salpingectomy	
salpingitis	
salpingocele	
salpingography	
salpingolithiasis	
salpingopexy	
salpingoplasty	
salpingostomy	
mamm/o- mamm/-	Breast
mammalgia	
mammaplasty/mammoplasty	
mammectomy	
Mammogram/ mammography	
mammose	
mammotomy	
mast/o-	Breast
mastadenitis	
mastitis	
mastography	
mastology	
mastopathy	
mastopexy	
mastoplasty	
mastorrhagia	
mastotomy	
perimastitis	
mammill/a-	Nipple
mammilla	
mammillary	
mammilliform	
mammilliplasty	
mammillitis	
lact/o-	Milk
lactocele	
lactometer	
lactorrhea	
nat/o	Birth
natal	
natality	
prolactin	

par/o- part/o- partur/o-	bear, to give birth, labor
ante partum	
parturiometer	
parturiphobia	
postpartum	
puerper/o-	Childbirth
pueperant	
pueperium	
pueperous	
puerpera	
puerperal	
toco-	Birth
tocodynagraph,	
tocodynamometer	
tocograph, tocometer	
tocology	
tocolysis	
tocophobia	
tocus	
oompal/o-	umbilicus, navel
omphalic	
omphalitis	
omphalocele	
omphalorrhagia	
omphalotomy	
amni/o- amnion/o-	amnion (inner fetal membrane)
amniography	
amniorrhea	
amnioscope	
amnioscopy	
amniotitis	
chori/o-	chorion (forms the placenta)
choriogenesis	
chorioepithelioma,	
choriocarcinoma	
chorioma	
embry/o-	embryo (to be full)
embryectomy	
embryocidal	
embryology	
embryopathy	
embryoscopy	
embryulcia	

fet/o- fet/i-	fetus, unborn child
fetal	
fetalism	
fetology	
fetoscope	
fetoscopy	
fetotoxic	
gravid/o-	pregnant
gravid	
gravida	
gravidism	
graviditas, gravidity	
gravidocardiac	
cyes/o- cyes/i-	Pregnancy
pseudocyesis	
MORE F	EMALE REPRODUCTIVE TERMS:
climacteric	
conization	
curettage	
estrogen	
infertility	
insemination	
introitus	
intrauterine device (IUD)	
OBSTETF	RIC/NEONATOLOGY TERMINOLOGY
abruptio placentae	
afterbirth	
apgar scoring	
ballottment	
BOW- bag of waters	
Braxton Hicks	
breech	
Cesarean	
crowning	
ectopic	
engorgement	
epidural	
lanugo	
lightening	
miscarriage	
premature	
prolapsed cord	
quickening	

stillbirth	
trimester	
zygote	

# Female Reproductive System Terms

cervic/o- cervix	(neck) pl=cervices)
cervical	Pertaining to the cervix, or neck, of an organ
convical cap	Device of flexible material designed to cover the uterine
	cervix for the purpose of preventing pregnancy
cervicectomy	Removal of the cervix uteri
cervicitis	Inflammation of the cervix uteri
cervicocolpitis	Inflammation of the cervix and vagina
cervicovaginitis	Inflammation of the cervix of the uterus and vagina
cervicovesical	Pertaining to the cervix uteri and bladder
colp/o-	vagina (sheath)
colpalgia	Vaginal pain
colpectomy	Surgical removal of the vagina
colpitis	Inflammation of the vagina
colpocele	Hernia into the vagina
colpopexy	Suture of a relaxed and prolapsed vagina to the abdominal wall
colpoplasty	Plastic surgery of the vagina
colpoptosis	Prolapse of the vagina
colporrhagia	Excessive vaginal discharge; vaginal hemorrhage
colpotomy	Incision into the wall of the vagina
vagin/o-	Vagina
vaginal	Pertaining to the vagina or to any enveloping sheath
vaginapexy	Repair of a relaxed and prolapsed vagina
vaginocele	Vaginal hernia
vaginogenic	Developed from or originating in the vagina
vaginography	X-ray of the vagina
vaginometer	Device for measuring the length and expansion of the vagina
vaginopathy	Any disease of the vagina
vaginopexy	Fixation of the vagina
vaginoplasty	Plastic surgery on the vagina
vaginoscope	Instrument for inspection of the vagina
Culd/o	Cul-de-sac (blind pouch)
culdocentesis	Obtaining material from the posterior vaginal cul-de-sac
culdoscope	An endoscope used in performing an culdoscopic
	Examination of the viscera of the pelvic cavity of the
culdoscopy	female
vulv/o-	vulva (covering)
vulval, vulvar	Relating to the vulva (that portion of the female external genitalia posterior to the mons veneris)
	genitalia posterior to the mons veneris)

vulvectomy	Excision of the vulva	
vulvismus	Painful spasm of the vagina	
vulvitis	Inflammation of the vulva	
vulvocrural	Relating to the vulva and thigh	
vulvopathy	Any disorder of the vulva	
vulvouterine	Relating to the vulva and uterus	
vulvovaginitis	Inflammation of both the vulva and the vagina, or of the vulvovaginal glands	
episi/o-	vulva and perineum	
episioelectrorrhaphy	Suturing the vulva and perineum for the support of a prolapse of the uterus	
episioperineoplasty	Plastic surgery of the perineum and vulva	
episioperineorrhaphy	Surgical narrowing of vagina and vulva	
episioplasty	Plastic surgery on the vulva	
episiorrhaphy	Suture of a lacerated perineum	
episiostenosis	Narrowing of the vulvar slit	
episiotomy	Incision of perineum at end of second stage of labor to prevent spontaneous laceration	
gyn/o- gynec/o-	woman, female	
gynecogenic	Producing female characteristics	
gynecoid	Resembling the female of the species	
gynecologic	Pertaining to gynecology or study of diseases peculiar to women	
gynecologist	Physician who specializes in gynecology	
gynecology	The study of the diseases of female reproductive organs, including the breasts	
gynecomania	Abnormal sex desire in the male	
gynecomastia	Development of abnormally large mammary gland in the male	
gynoplastics, gynoplasty	Reparative surgery of female genitalia	
gynephobia	Abnormal aversion to the company of women	
gynopathy/gynecopathy	Pertaining to diseases of women	
hymen/o-	hymen (membrane)	
hymenal	Portaining to the hymon (a fold of muccus membrane that	
	partially covers the entrance of the vagina)	
hymenectomy	partially covers the entrance of the vagina) Incision or removal of the hymen	
hymenectomy hymenitis	Incision or removal of the hymen	
hymenectomy hymenitis hymenology	Incision or removal of the hymen Inflammation of the hymen Science of the membranes and their diseases	
hymenectomy hymenitis hymenology hymenorrhaphy	Pertaining to the hymen (a fold of miccous memorale that partially covers the entrance of the vagina)         Incision or removal of the hymen         Inflammation of the hymen         Science of the membranes and their diseases         Plastic operation on the hymen to restore it to its preruptured state	
hymenectomy hymenitis hymenology hymenorrhaphy hymenotome	Pertaining to the hymen (a fold of midcous membrane that partially covers the entrance of the vagina)         Incision or removal of the hymen         Inflammation of the hymen         Science of the membranes and their diseases         Plastic operation on the hymen to restore it to its preruptured state         Knife used to divide membranes	

metr/o- metr/a- metr/i-	Uterus	
endometritis	Inflammation of the endometrium	
metralgia	Pain in the uterus	
metritis	Inflammation of the uterus	
metrocele	Uterine hernia	
metropathy	Any uterine disease	
metroperitonitis	Inflamed condition of uterus and peritoneum	
metroplasty	Any plastic operation of the uterus	
metrorrhagia	Bleeding from the uterus	
metrorrhea	Abnormal uterine discharge	
metrostaxis	Persistent but slight hemorrhage from the uterus	
uter/o-	uterus	
uteralgia	Uterine pain	
uteritis	Inflammation of the uterus	
uterocele	Hernia containing the uterus	
uterometer	Device for measuring the uterus and determining its	
	position	
uteropexy	Fixation of the uterus to the abdominal wall	
uteroplasty	Plastic surgery of the uterus	
uterorectal	Concerning the uterus and rectum	
uteroscope	Device for viewing the uterine cavity	
uterotonic	Giving muscular tone to the uterus	
uterotubal	Relating to the uterus and oviducts	
hyster/o-	uterus (womb)	
hysteritis	Inflammation of the uterus	
hysterocele	Hernia of the uterus	
hysterogram	Roentgenogram of the uterus	
hysterology	Sum of that which is known about the uterus	
hysterometer	Device for measuring the uterus	
hysteropathy	Any uterine disorder	
hysteropexy	Surgical fixation of the uterus	
hysterorrhaphy	Suture of the womb	
hysteroscopy	Inspection of the uterus using an endoscope	
hysterotomy	Incision of the uterus, cesarean section	
men/o-	menstruation (month)	
amenorrhea	Absence or suppression of menstruation	
dysmenorrhea	Pain in association with menstruation	
menophania	First appearance of menses at puberty	
menorrhagia	Excessive bleeding at the time of the menstrual period	
menorrhalgia	Painful menstruation	
menorrhea	Normal menstruation	
menostasis	Suppression of the menses	
menostaxis	Prolonged menstruation	

menoxenia	Abnormal menstruation	
oophor/o-	ovary (bearing eggs)	
oophoralgia	Pain in an ovary	
oophoritis	Inflamed condition of the ovary	
oophoropexy	Fixation of a displaced ovary	
oophoroplasty	Plastic surgery on the ovary	
oophorotomy	Surgical incision of the ovary	
oophorrhagia	Hemorrhage from an ovulatory site	
perineocele	Hernia in the region of the perineum, between the rectum and the vagina	
perineometer	Apparatus for measuring pressure produced in the vagina when muscles are contracted	
perineoplasty	Preparative surgery on the perineum	
salping/o-	fallopian tube (also eustachian tube)	
salpingian	Concerning the fallopian or eustachian tube	
salpingectomy	Surgical removal of the fallopian tube	
salpingitis	Inflammation of the fallopian tube	
salpingocele	Hernial protrusion of a fallopian tube	
salpingography	Radiographic study of the fallopian tube	
salpingolithiasis	Presence of calculi in the fallopian tube	
salpingopexy	Fixation of a fallopian tube	
salpingoplasty	Plastic surgery of the fallopian tube	
salpingostomy	Surgical opening of a fallopian tube	
mamm/o-mamm/-	Breast	
mammalgia	Pain in the breast	
mammaplasty/mammoplasty	Surgical reconstruction of the breasts	
mammectomy	Removal of the breast	
Mammogram/mammography	X-Ray of the breast	
mammose	Having unusually large breasts	
mammotomy	Surgery of a breast	
mast/o-	Breast	
mastadenitis	A mammary gland inflammation	
mastitis	Inflammation of the breast	
mastography	X-ray of the breasts	
mastology	Branch of medicine concerned with study of the breasts	
mastopathy	Any disease of the mammary glands	
mastopexy	Correction of a pendulous breast by surgical fixation	
mastoplasty	Plastic surgery of the breast	
mastorrhagia	Hemorrhage from the breast	
mastotomy	Surgical incision of the breast	

perimastitis	Inflammation of the fibrous tissues around a breast	
mammill/a-	Nipple	
mammilla	Any structure resembling a nipple	
mammillary	Shaped like or concerning a nipple	
mammilliform	Shaped like a nipple	
mammilliplasty	Plastic operation on a nipple	
mammillitis	Inflammation of a nipple	
lact/o-	Milk	
lactocele	Pertaining to milk	
lactometer	A device for determining the specific gravity of milk	
le ste rrh e e	The discharge of mild between nursing and after weaning	
lacionnea	of offspring	
nat/o	Birth	
natal	Pertaining to birth	
natality	The birth rate	
prolactin	Hormone which stimulates formulation of milk	
par/o- part/o- partur/o-	bear, to give birth, labor	
ante partum	Before onset of labor	
parturiometer	Device for determining force of contractions	
parturiphobia	Fear of childbirth	
postpartum	After childbirth	
puerper/o-	Childbirth	
pueperant	A woman in labor, or who has recently delivered	
pueperium	The period of 42 days after childbirth	
pueperous	In the period following childbirth	
puerpera	A woman during pueperium	
puerperal	Concerning pueperium	
toco-	Birth	
Tocodynagraph,	Device for measuring uterine contractions	
tocodynamometer	Device for measuring dienne contractions	
Tocograph, tocometer	Device for estimating and recording contractions	
tocology	Science of parturition and obstetrics	
tocolysis	Inhibition of uterine contractions	
tocophobia	Fear of childbirth	
tocus	Parturition, childbirth	
oompal/o-	umbilicus, navel	
omphalic	Concerning the umbilicus, or navel	
omphalitis	Inflammation of the navel	
omphalocele	Hernia of the navel	
omphalorrhagia	Umbilical hemorrhage	
omphalotomy	Division of an umbilical cord at birth	
amni/o- amnion/o-	amnion (inner fetal membrane)	

amniorrhea	Escape of amniotic fluid		
amnioscope	Device for looking inside amniotic cavity		
amnioscopy	Visual examination of the fetus		
amniotitis	Inflammation of the amnion		
chori/o-	chorion (forms the placenta)		
choriogenesis	Formation of the chorion (a membrane over the		
	blastocyst)		
chorioepithelioma, choriocarcinoma	An extremely rare, very malignant cancer of the uterus		
chorioma	A tumor of the chorion		
embry/o-	embryo (to be full)		
embryectomy	Removal of an extrauterine embryo		
embryocidal	Anything that kills an embryo		
embryology	Study of the embryo		
embryopathy	Any pathological condition in the embryo		
embryoscopy	Direct visualization of the embryo		
embryulcia	Forcible removal of the fetus		
fet/o- fet/i-	fetus, unborn child		
fetal	Pertaining to a fetus		
fetalism	Retention of fetal structures after birth		
fetology	Study of fetuses		
fetoscope	Device used for direct visualization of fetus		
fetoscopy	Process of visualizing fetus		
fetotoxic	Anything that is toxic to the fetus		
gravid/o-	pregnant		
gravid	Pregnant		
gravida	A pregnant woman		
gravidism	State of being pregnant		
graviditas, gravidity	Pregnancy		
gravidocardiac	Pertaining to cardiac disorders caused by pregnancy		
cyes/o- cyes/i-	Pregnancy		
pseudocyesis	False pregnancy		
MORE F	EMALE REPRODUCTIVE TERMS:		
climacteric	The period marking the end of a woman's fertility		
conization	Excision of a cone of tissue		
curettage	Removal of necrotic tissue		
estrogen	Hormones produced by the ovary, the female sex hormones		
infertility	Inability or diminished ability to produce offspring		
insemination	Discharge or introduction of semen into the vagina		
introitus	An opening or entrance to a cavity, such as the vagina		
intrauterine device (IUD)	Device placed in the uterus to prevent pregnancy		

OBSTETRIC/NEONATOLOGY TERMINOLOGY		
abruptio placentae	Premature detachment of placenta	
afterbirth	Placenta and membranes expelled after birth of child	
apgar scoring	System of scoring infant's physical condition after birth	
ballottment	A palpatory technique used to detect floating objects in the body	
BOW- bag of waters	The membrane enclosing the fetus	
Braxton Hicks	Intermittent, painless uterine contractions; false labor	
breech	The nates, or buttocks	
Cesarean	Removal of fetus by incision into the uterus	
crowning	Stage in delivery when fetal head presents at vulva	
ectopic	In an abnormal position	
engorgement	Vascular congestion; distension	
epidural	Located over or upon the skin	
lanugo	Downy hair covering the body	
lightening	Descent of presenting part of the fetus into the pelvis	
miscarriage	Lay term for termination of pregnancy at any time before fetal viability	
premature	Before full term or development	
prolapsed cord	Expulsion of umbilical cord prematurely	
quickening	First movements of fetus in utero	
stillbirth	Dead at birth	
trimester	A three month period	
zygote	Fertilized ovum	

# Female Reproductive System Vocabulary Worksheet

Word	Write the definition of each word
Adnexa uteri	
Amnion	
Areola	
Bartholin glands	
Cervix	
Chorion	
Clitoris	
Coitus	
Corpus luteum	
Cul-de-sac	
Embryo	
Endometrium	
Estrogen	
Fallopian tube	
Fertilization	
Fetus	
Fimbriae (singular:	
fimbria)	
Follicle-stimulating	
hormone	
(FSH)	
Gamete	
Genitalia	
Gestation	
Gonad	
Gynecology	
Human chorionic	
gonadotropin (hCG)	
Hymen	
Labia	
Lactiferous ducts	
Luteinizing hormone (LH)	
Mammary papilla	
Menarche	
Menopause	
Myometrium	
Neonatology	
Obstetrics	
Orifice	
Ovarian follicle	
Ovary	
Ovulation	
Ovum	

Parturition	
Perineum	
Pituitary gland	
Placenta	
Pregnancy	
Progesterone	
Puberty	
Uterine serosa	
Uterus	
Vagina	
vulva	
Zygote	

# **Combining Forms**

Combining Form	Meaning	Term	Define each term
Amni/o	Amnion	Amniocentesis	
Cervic/o	Cervix, neck	Endocervicitis	
Chori/o, chorion/o	Chorion	chorionic	
Colp/o	Vagina	colposcopy	
Culd/o	cul-de-sac	culdocentesis	
Episolo	Vulva	episiotomy	
galactic	Milk	galactorrhea	
gyneo/o	woman, female	gynecomastia	
Hyster/o	Uterus, womb	hysterectomy	
Lact/o	Milk	Lactation	
Mamm/o	Breast	Mastitis	
Men/o	Menses, menstruation	Amenorrha	
Metro/o, metri/o	Uterus	Metrorrhagia	
My/o, myom/o	Muscle, muscle tumor	Myometrium	
Nat/i	Birth	Neonatal	
Obstetro/o	Pregnancy and	Obstetrics	
	childbirth		
0/0	Egg	Oogenesis	
Oophor/o	Ovary	Oophorectomy	
Ov/o	Egg	Ovum	
Ovary/o	Ovary	Ovarian	
Ovul/o	Egg	Anovulatory	
Vagin/o	Vagina	Vaginal orifice	
Vulv/o	Vulva	Vulvovaginitis	

### Suffixes

Suffixes	Meaning	Example of term	Define each example
-arche	Beginning	Menarche	
-cyesis	Pregnancy	Psedocyesis	
-gravida	Pregnant	Primigravida	
-parous	Bearing, bringing forth	Primiparous	
-rrhea	Discharge	Leucorrhea	
-salphinx	Fallopian tube	Pyosalpinx	
-tocia	Labor, birth	dysocia	
-version	Act of turning	Cephalic version	

#### Prefixes

Prefixes	Meaning	Example of term	Define each example
Dys-	Painful	Dyspareunia	
Endo-	Within	Endometritis	
In-	In	Involution of the uterus	
Intra-	Within	Intrauterine	
Multi-	Many	Multipara	
Nulli-	Non, not, none	Nulligravida	
Pre-	Before	Prenatal	
Preimi-	First	Primipara	
Retro-	Backward	Retroversion	

### Abbreviations

Abbreviation	Write the meaning of the abbreviation below
AB	
AFP	
ASCUS	
AUB	
BRCA1, BRCA	
2	
BSE	
Ca 125	
C-section	
CIN	

CIS	
CS	
CVS	
Сх	
D&C	
DCIS	
DES	
DUB	
ECC	
EDC	
EMB	
FHR	
FSH	
G	
GnRH	
GYN	
hCG or HCG	
HDN	
HPV	
HRT	
HSG	
IUD	
IVF	
LAVH	
LEEP	
LH	
LMP	
LSH	
Multip	
OB	
OCPs	
Pap test	
Path	
PID	
PMS	
Primip	
RDS	
SLN, SNB	
TAH-BSO	
TRAM flap	
UAE	
VH	
## Female Reproductive System Vocabulary Worksheet

Word	Meaning	
Adnexa uteri	Fallopian tubes, ovaries, and supporting ligaments	
Amnion	Innermost membranous sac surrounding the developing fetus	
Areola	Dark-pigmented area surrounding the breast nipple	
Bartholin glands	Small mucus-secreting exocrine glands at the vaginal orifice	
Cervix	Lower, neck-like portion of the uterus	
Chorion	Outermost layer of the two membranes surrounding the	
	embryo; it forms the fetal part of the placenta	
Clitoris	Organ of sensitive erectile tissue anterior to the opening of the	
	female urethra	
Coitus	Sexual intercourse; copulation	
Corpus luteum	Empty ovarian follicle that secretes progesterone after release	
	of the egg cell. ( <i>luteum</i> means yellow) ( <i>corpus</i> means body)	
Cul-de-sac	Region in the lower abdomen, midway between the rectum and	
	the uterus	
Embryo	Stage in prenatal development from 2-8 weeks	
Endometrium	Inner, mucous membrane lining of the uterus	
Estrogen	Hormone produced by the ovaries (Promotes female	
	secondary sex characteristics)	
Fallopian tube	Une of a pair of ducts through which the ovum travels to the	
E a utilizza ti a u	uterus	
Fertilization	Union of the sperm cell and ovum from which the embryo	
Fotuo	develops Store in proportel development from 8 20 or 40 weeks	
Felus Fimbrico (cinquilor:	Stage in prenatal development from 8-39 of 40 weeks	
fimbria)	tubes	
Folliclo-stimulating	Secreted by the pituitary gland to stimulate maturation of the	
bormone	equiced by the pituliary gland to sumulate maturation of the	
(FSH)		
Gamete	Male or female sexual reproductive cell: sperm cell or ovum	
Genitalia	Reproductive organs: also called genitals	
Gestation	Period from fertilization of the ovum to hirth	
Gonad	Female or male reproductive organ that produces sex cells and	
	hormones: ovary or testis	
Gynecology	Study of the female reproductive organs including the breast	
Human chorionic	Hormone produced by the placenta to sustain pregnancy by	
gonadotropin (hCG)	stimulation the ovaries to produce estrogen and progesterone	
Hymen	Mucous membrane partially or completely covering the	
	opening to the vagina	
Labia	Lips of the vagina; labia majora are the larger, outermost lips	
	and labia minora are the smaller, innermost lips	
Lactiferous ducts	Tubes that carry mild within the breast	
Luteinizing hormone (LH)	Hormone produced by the pituitary gland; promotes ovulation	

Mammary papilla	Nipple of the breast		
Menarche	Beginning of the first menstrual period and ability to reproduce		
Menopause	Gradual ending of menstruation		
Myometrium	Muscle layer of the uterus		
Neonatology	Branch of medicine that studies the disorders and care of the		
	newborn (neonate)		
Obstetrics	Branch of medicine concerned with pregnancy and childbirth		
Orifice	An opening		
Ovarian follicle	Developing sac enclosing each ovum within the ovary		
Ovary	One of a pair of female organs (gonads) on each side of the		
	pelvis		
Ovulation	Release of the ovum from the ovary		
Ovum	Mature egg cell. Plural: ova		
Parturition	Act of giving birth		
Perineum	In females, the area between the anus and the vagina		
Pituitary gland	Endocrine gland at the base of the brain. It produces		
	hormones to stimulate the ovaries		
Placenta	Vascular organ that develops in the uterine wall during		
	pregnancy and serves as a connection between maternal and		
	fetal bloodstreams		
Pregnancy	Condition in a female of having a developing embryo and fetus		
Progesterone	Hormone produced by the corpus luteum in the ovary and the		
	placenta of pregnant women		
Puberty	Age in life when secondary sex characteristics appear and		
	gametes are produced		
Uterine serosa	Outermost layer surrounding the uterus		
Uterus	Hollow, pear-shaped muscular female organ in which the		
	embryo and fetus develop		
Vagina	Muscular, mucosa-lined can extending from the uterus to the		
	exterior of the body		
vulva	External female genitalia and includes the labia, hymen, clitoris		
	and vaginal orifice		
Zygote	Stage in prenatal development from fertilization and		
	implantation to 2 weeks		

## **Combining Forms**

Combining Form	Meaning	Example of term
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Cervic/o	Cervix, neck	Endocervicitis
Chori/o, chorion/o	Chorion	chorionic
Colp/o	Vagina	colposcopy
Culd/o	cul-de-sac	culdocentesis
Episolo	Vulva	episiotomy
galactic	Milk	galactorrhea
gynec/o	woman, female	gynecomastia
Hyster/o	Uterus, womb	hysterectomy
Lact/o	Milk	Lactation
Mamm/o	Breast	Mastitis
Men/o	Menses, menstruation	Amenorrha
Metro/o, metri/o	Uterus	Metrorrhagia
My/o, myom/o	Muscle, muscle tumor	Myometrium
Nat/i	Birth	Neonatal
Obstetro/o	Pregnancy and childbirth	Obstetrics
0/0	Egg	Oogenesis
Oophor/o	Ovary	Oophorectomy
Ov/o	Egg	Ovum
Ovary/o	Ovary	Ovarian
Ovul/o	Egg	Anovulatory
Vagin/o	Vagina	Vaginal orifice
Vulv/o	Vulva	Vulvovaginitis

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Intra-	Within	Intrauterine
Multi-	Many	Multipara
Nulli-	Non, not, none	Nulligravida
Pre-	Before	Prenatal
Primi-	First	Primipara
Retro-	Backward	Retroversion

## Abbreviations

Abbreviation	Meaning	
AB	Abortion	
AFP	Alpha-fetoprotein – high levels in amniotic fluid of fetus or maternal serum;	
	indicates increased risk of neurologic birth defects in the infant	
ASCUS	Atypical squamous cells of undetermined significance	
AUB	Abnormal uterine bleeding	
BRCA1,	Breast cancer 1 and 2 – genetic mutations associated with increased risk	
BRCA 2	for breast cancer	
BSE	Breast self-examination	
Ca 125	Protein marker elevated in ovarian cancer	
C-section	Cesarean section	
CIN	Cervical intraepithelial neoplasia	
CIS	Carcinoma in situ	
CS	Cesarean Section	
CVS	Chorionic villus sampling	
Cx	Cervix	
D&C	Dilation and curettage	
DCIS	Ductal carcinoma in situ	
DES	Diethylstilbestrol – an estrogen compound used in the treatment of	
	menopausal problems involving estrogen defiance	
DUB	Dysfunctional uterine bleeding	
ECC	Endocervical curettage	
EDC	Estimated date of confinement	
EMB	Endometrial biopsy	
FHR	Fetal heart rate	
FSH	Follicle-stimulating hormone	
G	Gravid, pregnant	
GnRH	Gonadotropin-releasing hormone	
GYN	Gynecology	
hCG or HCG	Human chorionic gonadotropin	
HDN	Hemolytic disease of the newborn	
HPV	Human papillomavirus	
HRT	Hormone replacement therapy	
HSG	Hysterosalpingography	
IUD	Intrauterine device	
IVF	In vitro fertilization	

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LAVH	Laparoscopically assisted vaginal hysterectomy
LEEP	Loop electrocautery excision procedure
LH	Luteinizing hormone
LMP	Last menstrual period
LSH	Laparoscopic supracervical hysterectomy
Multip	Multipara; multiparous
OB	Obstetrics
OCPs	Oral contraceptive pills
Pap test	Papanicolaou smear – test for cervical or vaginal cancer
Path	Pathology
PID	Pelvic inflammatory disease
PMS	Premenstrual syndrome
Primip	Primipara; primiparous
RDS	Respiratory distress syndrome of the newborn
SLN, SNB	Sentinel lymph node biopsy
TAH-BSO	Total abdominal hysterectomy with bilateral salpingo-oophorectomy
TRAM flap	Trans-rectus abdominis musculocutaneous flap for breast reconstruction
UAE	Uterine artery embolization
VH	Vaginal hysterectomy

#### Course

Medical Terminology

#### Unit XIV The Reproductive System

## Essential

**Question:** What medical terms are associated with the male reproductive system?

#### TEKS

130.203 (c) (1)(A), (B), (E) 2(B), 4 (A), (B)

#### Prior Student Learning None

Estimated time

2-3 hours

#### Teacher note:

STDs are covered in the Female Reproductive System lesson plan.

#### Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the Reproductive system to discuss common conditions and diseases.

#### Objectives

Upon completion of this lesson, the learner should be able to:

- Define and decipher common terms associated with the male reproductive system
  - Identify the basic anatomy of the male reproductive system
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases which involve the male reproductive system

#### Engage

Show a Transurethral resection of the prostate (TURP) procedure video and tell the students that they will be learning about terms related to the male reproductive system. There are many websites that have medical procedure videos.

#### Key Points

- I. Reproductive System
  - A. Function is to produce a new life
  - B. Both males and females have the same types of organs
    - 1. Gonads or sex glands
    - 2. Ducts or tubes to carry the sex cells and secretions
    - 3. Accessory organs

#### II. Testes

- A. Two male gonads or sex glands
- B. Located in the scrotum (sac suspended between the thighs outside the body) where the temperature is lower, and more conducive to the production of sperm
- C. Produces the male sex cell called sperm or spermatozoa
- D. Produces male hormones
  - 1. Main hormone is testosterone
  - 2. Aids in maturation of sperm
  - 3. Also is responsible for the secondary male sex characteristics such as body hair, facial hair, larger muscles and deeper voice
- III. Epididymis
  - A. Tightly coiled tube about 20 feet long

- B. Located above the testes in the scrotum
- C. Receives the sperm from the testes
- D. Stores the sperm while they mature and become motile
- E. Produces a fluid that becomes part of the semen (fluid
  - ejaculated from the male urethra)
- IV. Vas deferens
  - A. Also called the ductus deferens
  - B. Receives the sperm and fluid from the Epididymis
  - C. One on each side, the vas deferens joins with the Epididymis
    - 1. Extends up into the abdominal cavity
    - 2. Curves behind the urinary bladder
    - 3. Joins with a seminal vesicle
  - D. Acts as a passageway and as a temporary storage area for sperm
  - E. Are cut during a vasectomy to produce sterility in the male
- V. Seminal vesicles
  - A. Two small pouch-like tubes
  - B. Located behind the bladder by the junction of the vas deferens and the ejaculatory ducts
  - C. Contain a glandular lining that produces a thick yellow fluid
    - 1. Rich in sugar and other substances
    - 2. Provides nourishment for the sperm
    - 3. Fluid also makes up a large part of the semen
- VI. Ejaculatory ducts
  - A. Two short tubes
  - B. Formed by the union of vas deferens and seminal vesicles
  - C. Carry the sperm and fluids, known as semen, through the prostate gland into the urethra
- VII. Prostate gland
  - A. Doughnut-shaped gland
  - B. Located below the urinary bladder on either side of the urethra
  - C. Produces an alkaline secretion
  - D. Muscular tissue in the prostate contracts during ejaculation (expulsion of the semen from the body ) to aid in the expulsion of the semen into the urethra
  - E. When the prostate contracts, it also closes off the urethra and prevents the passage of urine through the urethra
- VIII. Cowper's glands
  - A. Two small glands located below the prostate
  - B. Connected by small tubes to the urethra
  - C. Produces mucus that serves as a lubricant for intercourse
- IX. Urethra
  - A. Tube that extends from the urinary bladder through the penis to the outside of the body
  - B. Carries urine from the urinary bladder and semen from the reproductive tubes

- X. Penis
  - A. External male reproductive organ, located in front of the scrotum
  - B. Glans penis
    - 1. Enlarged structure at distal end
    - 2. Covered with a prepuce or foreskin
    - 3. Circumcision is a surgical removal of the prepuce
  - C. Made of spongy erectile tissue
    - 1. During sexual arousal, the spaces in this tissue become filled with blood
    - 2. Causes an erection of the penis
  - D. Functions
    - 1. Male organ of copulation or intercourse
    - 2. Deposits the semen in the vagina
    - 3. Provides for the elimination of urine from the bladder through the urethra
- XI. Vocabulary

Word	Meaning	
Bulbourethral	A pair of exocrine glands near the male urethra;	
glands	also called Cowper glands	
Ejaculation	Ejection of sperm and fluid from the male urethra	
Ejaculatory duct	Tube through which semen enters the male urethra	
Epididymis	One of a pair of long, tightly coiled tubes on top of	
	each testis; carries sperm from the somniferous	
	tubules to the vas deferens	
Erectile dysfunction	Inability of an adult male to achieve an erection; impotence	
Flagellum	Hair-like projection on a sperm cell that makes it	
	motile	
Fraternal twins	Two infants born of the same pregnancy from two	
	separate egg cells fertilized by two different sperm	
	cells	
Glans penis	Sensitive tip of the penis	
Identical twins	Two infants resulting from division of one fertilized	
	egg into two distinct embryos	
Parenchyma	The essential distinctive cells of an organ	
Penis	Male external organ of reproduction	
Perineum	External region between the anus and scrotum in	
	the male	
Prepuce	Foreskin; fold of skin covering the tip of the penis	
Prostate gland	Exocrine gland at the base of the male urinary	
	bladder	
Scrotum	External sac that contains the testes	
Semen	Spermatozoa (sperm cells) and seminal fluid	
Seminal vesicles	Paired sac-like male exocrine glands that secrete	
	fluid into the vas deferens	

Seminiferous	Narrow, coiled tubules that produce sperm in the	
tubules	testes	
Spermatozoon	Sperm cell (Plural: spermatozoa)	
Stroma	Supportive, connective tissue of an organ	
Testis	Male gonad that produces spermatozoa and the hormone testosterone (Plural: testes)	
Testosterone	Hormone secreted by the interstitial tissue of the testes (responsible for male sex characteristics)	
Vas deferens	Narrow tube that carries sperm from the epididymis into the body and toward the urethra; also called ductus deferens	

#### XII. Combining forms

Combining Form	Meaning	Example of terms
Andr/o	Male	Androgen
Balan/o	Penis	Balanitis
Cry/o	Cold	Cryogenic
Crypt/o	Hidden	Cryptorchidism
Epididym/o	Epididymis	Epididymitis
Gon/o	Seed	Gonorrhea
Hydr/o	Water, fluid	Hydrocele
Orch/o,	Testis, testicle	Orchiectomy
orchi/,orchid/o		
Pen/o	Penis	Penile
Prostat/o	Prostate gland	Prostatitis
Semin/i	Semen, seed	Seminiferous tubules
Sperm/o, spermat/o	Spermatozoa, semen	Spermolytic
Terat/o	Monster	Teratoma
Test/o	Testis, testicle	Testicular
Varic/o	Varicose veins	Varicocele
Vas/o	Vessel, duct; vas	Vasectomy
	deferens	
Zo/o	Animal life	Azoospermia

#### XIII. Suffixes

Suffix	Meaning	Example of terms
-genesis	Formation	Spermatogenesis
-one	Hormone	Testosterone
-реху	Fixation, put in place	Orchiopexy
-stomy	New opening	Vasovasostomy

#### XIV. Epididymitis

- A. Inflammation of the Epididymis
- B. Caused by pathogenic organisms such as gonococcus, streptococcus, or staphylococcus

- C. Symptoms
  - 1. Intense pain in testes
  - 2. Swelling and fever
- D. Treatment
  - 1. Antibiotics
  - 2. Cold applications
  - 3. Scrotal support and pain medications
- XV. Orchitis
  - A. Inflammation of the testes
  - B. Causes
    - 1. Mumps
    - 2. Pathogens
    - 3. Injury
  - C. Symptoms
    - 1. Swelling of the scrotum
    - 2. Pain and fever
  - D. Treatment
    - 1. Antibiotics in indicated
    - 2. Antipyretics for fever
    - 3. Scrotal support
    - 4. Pain medications
- XVI. Prostatic hypertrophy (hyperplasia)
  - A. Enlargement of the prostate gland
  - B. Common in men over age 50
  - C. Causes
    - 1. Benign condition caused by inflammation, tumor or a change in hormonal activity
    - 2. Malignant or cancerous condition
  - D. PSA
    - 1. Blood test
    - 2. Prostatic-specific antigen (PSA)
    - 3. Detects a substance released by cancer cells to aid in early diagnosis of prostate cancer
  - E. Symptoms
    - 1. Difficulty in starting to urinate
    - 2. Frequent urination, nocturia, and dribbling
    - 3. Urinary infections
    - 4. Urinary retention if urethra is blocked
  - F. Treatment
    - 1. Initial: fluid restriction, antibiotics for infections and prostatic massage
    - 2. Prostatectomy; surgical removal of all or part of the prostate
    - 3. Malignant condition: prostatectomy, orchiectomy, radiation, and estrogen therapy ( to decrease the effects of testosterone)

- KVII. Testicular cancer
  - A. Highly malignant form of cancer that can metastasize
  - B. Occurs most frequently in men from age 20-35
  - C. Symptoms include painless swelling of the testes, a heavy feeling and an accumulation of fluid
  - D. Treatment: orchiectomy or surgical removal of the testis, chemotherapy and/or radiation
  - E. Recommendation is that men begin monthly testicular selfexaminations at the age of 15
- VIII. Testicular self-exam
  - A. Examine the testicles after a warm shower when the scrotal skin is relaxed
  - B. Examine each testicle separately with both hands by placing the index and middle fingers under the testicle and the thumbs on top
  - C. Roll tactical gently between the fingers to feel for lumps, nodules, or extreme tenderness
  - D. Look for signs of swelling or change in appearance
  - E. Report any abnormalities to a physician as soon as possible

#### XIX. Abbreviations

Abbreviation	Meaning	
BPH	Benign prostatic hyperplasia	
DRE	Digital rectal examination	
ED	Erectile dysfunction	
GU	Genitourinary	
HPV	Human papillomavirus	
HSV	Herpes simplex virus	
NSU	Nonspecific urethritis	
PID	Pelvic inflammatory disease	
PIN	Prostatic intraepithelial neoplasia	
PSA	Prostate-specific antigen	
PVP	Photoselective vaporization of the prostate	
RPR	Rapid plasma regain test (test for syphilis)	
STD	Sexually transmitted disease	
STI	Sexually transmitted infection	
TRUS	Transrectal ultrasound examination	
TUIP	Transurethral incision of the prostate	
TUMT	Transurethral microwave thermotherapy	
TUNA	Transurethral needle ablation (radiofrequency	
	energy destroys prostate tissue)	
TURP	Transurethral resection of the prostate	

Test/Procedure	Definition
PSA test	Measurement of levels of prostate-specific antigen in the blood
Semen analysis	Microscopic examination of ejaculated fluid
Castration	Surgical excision of testicles or ovaries
Circumcision	Surgical procedure to remove the prepuce of the penis
Digital rectal examination (DRE)	Finger palpation through the anal canal and rectum to examine the prostate gland
Photoselective vaporization of the prostate (Green Light PVP)	Removal of tissue to treat benign prostatic hyperplasia using a green light laser (laser TURP)
Transurethral resection of	Excision of benign prostatic hyperplasia
the prostate (TURP)	using a resectoscope through the urethra
Vasectomy	Bilateral surgical removal of a part of the vas deferens

#### XX. Laboratory Test and Clinical Procedures

#### Activity

- I. Make flash cards of female reproductive system terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete Male Reproductive System Terms Worksheet
- III. Complete the Male Reproductive System Vocabulary Worksheet
- IV. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan -

http://texashste.com/documents/curriculum/principles/medical\_terminology\_activities.pdf)

V. Research and report on diseases and disorders from the Male Reproductive system

#### Assessment

Successful completion of the activities

#### Materials

Medical Terminology book List of Male Reproductive terms Male Reproductive Terms Key List of Male Reproductive Vocabulary worksheet and Key Index cards Markers

#### **Accommodations for Learning Differences**

For reinforcement, the student will practice terms using flash cards of the male reproductive system.

For enrichment, the students will the students will research an assigned STD and report back to the class on his/her findings.

#### National and State Education Standards

National Healthcare Foundation Standards and Accountability Criteria Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

#### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;
- (E) recall directional terms and anatomical planes related to the body structure

130.203 (c) (2) (B) employ increasingly precise language to communicate

130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:

- (A) distinguish medical abbreviations used throughout the health science industry; and
- (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports

Texas College and Career Readiness Standards English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

**1**. Identify new words and concepts acquired through study of their relationships to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts. *Cross-Disciplinary Standards*,

I. Key Cognitive Skills D. Academic Behavior: 1. Self-monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work

independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

Name:	
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## Male Reproductive System Vocabulary-Worksheet Write the meaning of the term or abbreviation in the right column

Word	Meaning
Bulbourethral glands	
Ejaculation	
Ejaculatory duct	
Epididymis	
Erectile dysfunction	
Flagellum	
Fraternal twins	
Glans penis	
Identical twins	
Parenchyma	
Penis	
Perineum	
Prepuce	
Prostate gland	
Scrotum	
Semen	
Seminal vesicles	
Seminiferous tubules	
Spermatozoon	
Stroma	
Testis	
Testosterone	
Vas deferens	

## **Combining Forms**

Combining Form	Meaning
Andr/o	
Balan/o	
Cry/o	
Crypt/o	
Epididym/o	
Gon/o	
Hydr/o	
Orch/o,	
orchi/,orchid/o	
Pen/o	
Prostat/o	
Semin/i	

Sperm/o, spermat/o	
Terat/o	
Test/o	
Varic/o	
Vas/o	
Zo/o	

## Suffixes

Suffix	Meaning	
-genesis		
-one		
-pexy		
-stomy		

## Abbreviations

Abbreviation	Meaning
BPH	
DRE	
ED	
GU	
HPV	
HSV	
NSU	
PID	
PIN	
PSA	
PVP	
RPR	
STD	
STI	
TRUS	
TUIP	
TUMT	
TUNA	
TURP	

## Male Reproductive System Vocabulary

Word	Meaning		
Bulbourethral glands	A pair of exocrine glands near the male urethra; also called		
	Cowper glands		
Ejaculation	Ejection of sperm and fluid from the male urethra		
Ejaculatory duct	Tube through which semen enters the male urethra		
Epididymis	One of a pair of long, tightly coiled tubes on top of each testis;		
	carries sperm form the somniferous tubules to the vas deferens		
Erectile dysfunction	Inability of an adult male to achieve an erection; impotence		
Flagellum	Hair-like projection on a sperm cell that makes it motile		
Fraternal twins	Two infants born of the same pregnancy from two separate egg		
	cells fertilized by two different sperm cells		
Glans penis	Sensitive tip of the penis		
Identical twins	Two infants resulting from division of one fertilized egg into two		
	distinct embryos.		
Parenchyma	The essential distinctive cells of an organ		
Penis	Male external organ of reproduction		
Perineum	External region between the anus and scrotum in the male		
Prepuce	Foreskin; fold of skin covering the tip of the penis		
Prostate gland	Exocrine gland at the base of the male urinary bladder		
Scrotum	External sac that contains the testes		
Semen	Spermatozoa (sperm cells) and seminal fluid		
Seminal vesicles	Paired sac-like male exocrine glands that secrete fluid into the		
	vas deferens		
Seminiferous tubules	Narrow, coiled tubules that produce sperm in the testes		
Spermatozoon	Sperm cell (Plural: spermatozoa)		
Stroma	Supportive, connective tissue of an organ		
Testis	Male gonad that produces spermatozoa and the hormone		
	testosterone (Plural: testes)		
Testosterone	Hormone secreted by the interstitial tissue of the testes;		
	responsible for male sex characteristics		
Vas deferens	Narrow tube that carries sperm from the epididymis into the body		
	and toward the urethra; also called ductus deferens		

## **Combining Forms**

Combining Form	Meaning	Example of terms
Andr/o	Male	Androgen
Balan/o	Penis	Balanitis
Cry/o	Cold	Cryogenic
Crypt/o	Hidden	Cryptorchidism
Epididym/o	Epididymis	Epididymitis
Gon/o	Seed	Gonorrhea
Hydr/o	Water, fluid	Hydrocele
Orch/o, orchi/,orchid/o	Testis, testicle	Orchiectomy

Pen/o	Penis	Penile
Prostat/o	Prostate gland	Prostatitis
Semin/i	Semen, seed	Seminiferous tubules
Sperm/o, spermat/o	Spermatozoa, semen	Spermolytic
Terat/o	Monster	Teratoma
Test/o	Testis, testicle	Testicular
Varic/o	Varicose veins	Varicocele
Vas/o	Vessel, duct; vas deferens	Vasectomy
Zo/o	Animal life	Azoospermia

## Suffixes

Suffix	Meaning	Example of terms
-genesis	Formation	Spermatogenesis
-one	Hormone	Testosterone
-pexy	Fixation, put in place	Orchiopexy
-stomy	New opening	Vasovasostomy

## Abbreviations

Abbreviation	Meaning
BPH	Benign prostatic hyperplasia
DRE	Digital rectal examination
ED	Erectile dysfunction
GU	Genitourinary
HPV	Human papillomavirus
HSV	Herpes simplex virus
NSU	Nonspecific urethritis
PID	Pelvic inflammatory disease
PIN	Prostatic intraepithelial neoplasia
PSA	Prostate-specific antigen
PVP	Photoselective vaporization of the prostate
RPR	Rapid plasma regain test (test for syphilis)
STD	Sexually transmitted disease
STI	Sexually transmitted infection
TRUS	Transrectal ultrasound examination
TUIP	Transurethral incision of the prostate
TUMT	Transurethral microwave thermotherapy
TUNA	Transurethral needle ablation (radiofrequency energy destroys
	prostate tissue)
TURP	Transurethral resection of the prostate

Ν	ame	:	

## Male Reproductive System Terminology Worksheet

In the right column write the meaning of the term appearing in the left column

Term	Meaning
andro-	man
androgen	
android	
andrology	
andromorphous	
androphobia	
balan/o- glans penis	glans penis
balanitis	
balanoblennorrhea	
balanocele	
balanoplasty	
balanoposthitis	
balanopreputial	
balanorrhagia	
phall/o-	penis
phallalgia	
phallic	
phalliform	
phallitis	
phallocampsis	
phallocrypsis	
phallodynia	
phalloid	
phalloncus	
phalloplasty	
phallorrhagia	
phallus	
epididym/o-	epididymis (pl=epididymides)
epididymectomy	
epididymitis	
epididymodeferentectomy	
epididymography	
epididymo-orchitis	
epididymotomy	
epididymovasostomy	

test/o	- testis (pl=testes)
testalgia	
testicular	
testicle	
testitis	
testoid	
testopathy	
orch/o- orchi/o- orchid/o-	testicle, testis
anorchadism	
cryptorchidism	
orchialgia/orchidalgia	
orchichorea	
orchidoncus	
orchidoptosis	
orchiectomy/orchidectomy	
orchiepididymitis	
orchilytic/orchiolytic	
orchiopexy/orchidopexy	
orchioplasty/orcheoplasty	
orchitis/orchiditis	
orchotomy/orchiotomy/orchidotomy	
polyorchidism	
synorchidism	
prostat/o-	prostate gland
BPH	
prostatic	
prostatism	
prostatitis	
prostatocystitis	
prostatocystotomy	
prostatodynia	
prostatomegaly	
prostatorrhea	
vas/o-	vessel, duct (vas deferens)
vasalgia	
vasectomy	
vasitis	
vasoepididymostomy	
vasoligation	
vaso-orchidostomy	

vasorrhaphy	
vasosection	
vasotomy	
vasovesiculectomy vasovasotomy	
vasovesiculitis	
vesicul/o-	seminal vesicles
vesicular	
vesiculase	
vesiculectomy	
vesiculitis	
vesiculography	
vesiculotomy	
sperm/o- spermat/o	- sperm (seed)
oligospermia	
spermicidal	
spermatemphraxis	
spermatic	
spermatism	
spermatitis	
spermatoblast	
spermatocele	
spermatocyst	
spermatocystotomy	
spermatoid	
spermatology	
spermatolysis	
spermatopathy	
spermatophobia	
spermatorrhea	
spermatoschesis	
spermatoxin	
spermatozoon	
spermaturia	
spermectomy	
scrot-	scrotum (pouch)
scrotal	
scrotectomy	
scrotitis	
scrotocele	

scrotoplasty	
scrotum	
OTHER R	ELATED TERMINOLOGY
chancer	
chlamydia	
circumcision	
coitus	
condom	
Condyloma	
ejaculation	
erectile	
genital herpes	
genital warts	
gonorrhea	
hydrocele	
impotence	
penile	
prepuce/foreskin	
priapism	
puberty	
semen	
STD's	
sterility	
syphilis	
torsion	
urethra	

## Male Reproductive System Terminology-Key

Term	Meaning
andro-	man
	A substance producing or stimulating the
androgen	development of the male characteristics
android	Resembling a male; manlike
andrology	The scientific study of a men's health
	Resembling a male in physical structure and
andromorphous	appearance Markid face of the mole cov
androphobia	Morbid fear of the male sex
balan/o- glans penis	gians penis
holonitio	An inflammation of the penis usually caused by
balanius	Inflammation of the skin covoring the glaps penis
balanoplennormea	Protrucion of the glans panis
balanocele	Ploticion of the glans perio
balanoplasty	
balanoposthitis	Inflammation of the glans penis
balanopreputial	Pertaining to the gians penis and prepuce
balanorrhagia	Balanitis with pus formation
phall/o-	penis
phallalgia	Pain in the penis
phallic	Concerning the penis
phalliform	Shaped like a penis
phallitis	Inflammation of penis
phallocampsis	Painful downward curvature of the penis when erect
phallocrypsis	Contraction of the penis so that it is almost invisible
phallodynia	Pain in the penis
phalloid	Similar to a penis
phalloncus	A tumor or swelling on the penis
phalloplasty	Reparative or plastic surgery on the penis
phallorrhagia	Hemorrhage from the penis
phallus	An artificial penis
epididym/o-	epididymis (pl=epididymides)
epididymectomy	Removal of the epididymis
epididymitis	Inflammation of the epididymis
epididymodeferentectomy	Excision of the epididymis
epididymography	Radiography of the epididymis and seminal vesicle
Epididymo-orchitis	Inflammation of the epididymis and the testes
epididymotomy	Incision into the epididymis
epididymovasostomy	A surgical anastomosis (joining) between the

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	epididymis and the vas
test/o	- testis (pl=testes)
testalgia	Orchialgia; pain in the testis
Testicular	Relating to a tentacle
testicle	Testis
Testitis	Inflammation of a testis
Testoid	Resembling a testis
Testopathy	Any disease of the testes
orch/o- orchi/o- orchid/o-	testicle, testis
anorchadism	Absence of one or both testes
cryptorchidism	Undescended testicles
orchialgia/orchidalgia	Pain in the testes
orchichorea	Involuntary jerking movements of the testicles
orchidoncus	
orchidoptosis	Downward displacement of the testes
orchiectomy/orchidectomy	Excision of a testicle
orchiepididymitis	Inflammation of a testicle and epididymis
orchilytic/orchiolytic	Destruction of testicular tissue
	The suturing of an undescended testicle to fix it in the
orchiopexy/orchidopexy	scrotum
orchioplasty/orcheoplasty	Plastic repair of the testicle
orchitis/orchiditis	Inflammation of a testes
orchotomy/orchiotomy/orchidotomy	
polyorchidism	Condition of having more than two testicles
synorchidism	Union of partial fusion of the testicles
prostat/o-	prostate gland
BPH	Denign prostatic hypertrophy
prostatic	Concerning the prostate gland
prostatism	Any condition of the prostate gland that interferes with
prostatistis	Inflammation of the prostate
	Inflammation of the prostatic urethra involvement the
prostatocystitis	bladder
prostatocystotomy	Incision of the prostate and bladder
	The condition of having the symptoms and signs of
	prostatitis but no evidence of inflammation of the
prostatodynia	prostate
Prostatomegaly	Enlargements of the prostate gland
prostatorrhea	Abnormal discharge from the prostate land
vas/o-	Vessel, auct (Vas deterens)
vasalgia	Pain in a vessel of any kind

vasectomy	Removal of all or part of the vas deferens
vasitis	Inflammation of the ductus deferens
	The formation of a passage between the vas deferens
vasoepididymostomy	and the epididymis
vasoligation	
vaso-orchidostomy	end of the vas deferens
vasorrhaphy	Surgical suture of the vas deferens
vasosection	Surgical division of the vas deferens
vasotomy	Incision of the vas deferens
vasovesiculectomy vasovasotomy	Excision of the vas deferens and seminal vesicles
	Inflammation of the vas deferens and seminal
vasovesiculitis	vesicles
vesicul/o-	seminal vesicles
vesicular	Pertaining to vesicles
vesiculase	An enzyme in prostatic fluid
vesiculectomy	Partial or complete excision of a vesicle
vesiculitis	Inflammation of a vesicle
vesiculography	X-ray of the seminal vesicles
vesiculotomy	Surgical incision into a vesicle
sperm/o- spermat/o	- sperm (seed)
oligospermia	Deficient amount of sperm in seminal fluid
spermicidal	Destructive to spermatozoa
spermatemphraxis	An obstruction to emission of semen
spermatic	Pertaining to sperm
spermatism	Ejaculation of semen
spermatitis	Inflammation of the spermatic cord
spermatoblast	The rudimentary spermatozoon
spermatocele	A cystic tumor of the epididymis containing sperm
spermatocyst	A seminal vesicle
spermatocystotomy	Removal of the seminal vesicles
spermatoid	Resembling a spermatozoon
spermatology	Study of the seminal fluid
spermatolysis	Dissolution or destruction of sperm
spermatopathy	Disease of sperm cells or their secreting glands
spermatophobia	A fear of sperm
spermatorrhea	Abnormally frequent involuntary loss of sperm
spermatoschesis	Suppression of the semen
spermatoxin	A toxin that causes death of sperm
spermatozoon	The mature male sex or germ cell

spermaturia	Semen discharged with urine
spermectomy	Resection of a portion of the spermatic cord or duct
scrot-	scrotum (pouch)
scrotal	Concerning the scrotum, the double pouch of the male containing the testicles
scrotectomy	Excision of part of the scrotum
scrotitis	Inflammation of the scrotum
scrotocele	Hernia in the scrotum
scrotoplasty	Plastic surgery on the scrotum
scrotum	The double pouch of the male containing the testicles
OTHER	RELATED TERMINOLOGY
chancer	A hard, syphilitic primary ulcer
Chlamydia	A genus of microorganisms causing a wide variety of diseases, often transmitted sexually
circumcision	Surgical removal of the end of the prepuce of the penis
coitus	Sexual intercourse between man and woman
condom	A thin sheath worn over the penis to prevent pregnancy and spread of disease
condyloma	A wart-like growth, usually near the anus
eiaculation	Ejection of sperm and fluid form the male urethra
erectile	Able to become erect
genital herpes	Infection of the genital skin and mucosa with herpes simplex virus, usually caused by sexual contact
genital warts	An elevation of the skin caused by human papillomavirus, usually caused by sexual contact
gonorrhea	A contagious catarrhal infection of the genital mucous membrane
hydrocele	Sac of clear fluid in the scrotum
impotence	Unable to copulate, or sterile
penile	Having to do with the penis
prepuce/foreskin	The fold of skin over the glans penis in the male
priapism	Abnormal continued erection of the penis
	Period of life when a person becomes
puberty	functionally capable of reproduction
semen	Fluid containing spermatozoa

STD's	Sexually transmitted diseases
sterility	Inability to reproduce
	An infectious, chronic sexually transmitted
syphilis	disease
torsion	Twisting of the spermatic cord
urethra	A canal for the discharge of urine

## Pharmacology Terminology

#### Course

Medical Terminology

#### Unit XV

Diagnostic Procedures and Pharmacology

#### Essential Question

What medical terms are used in pharmacology?

130.203 (c)(1) (A), (B), (C), (F).

2(B), 4 (A), (B),

5 (B), (C),(D),

#### TEKS

# (E)

#### Prior Student Learning

Basic medical terminology: roots, prefixes and suffixes

#### Estimated time

6 hours

#### Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology related to Pharmacology when discussing medications.

#### Objectives

Upon completion of this lesson, the student will be able to:

- Identify the various routes of drug administration
- Differentiate among the various classes of drugs
- Define and decipher common terms associated with pharmacology
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course

#### Engage

Go to youtube.com and show the *Medication Administration: Safe Practices* video clip (3 min, 18 sec). There are actually about 18 videos in this series. Explain to your class that they will be learning terms related to medications and the administration of medications.

#### **Key Points**

Please note that the outline of this lesson plan is written to correspond with the Pharmacology power point presentation which is provided.

- I. Drugs
  - a. Used to prevent or treat diseases or medical conditions
  - b. Derived from plants
  - c. Obtained from yeast, molds and fungi
  - d. Obtained from animals
  - e. Synthesized in the laboratory
- II. Pharmacist
  - a. Prepares and dispenses drugs
    - i. Pharmacy or drugstore
    - ii. Prescribed by a physician
  - b. Takes about 7 years of study to receive a Doctor of Pharmacy degree
  - c. Consults with health care professionals concerning drugs
  - d. Answers patients' questions about prescription needs
- III. Pharmacy technician
  - a. Helps licensed pharmacists provide medications and other health care products
  - b. Certification Pathways

1       Certificate       1-4 months       \$500-\$2,000         2       Diploma       12 months       \$4,000-\$8,000         3       Degree       2-3 years       \$12,000-\$22,000         IV.       Pharmacologist <ul> <li>a. MD (doctor of medicine)</li> <li>b. PhD (doctor of medicine)</li> <li>c. Specializes in pharmacology</li> </ul> V.       Pharmacology – study of preparation, properties, uses and actidrugs; has many subdivisions of study         a.       Medicinal chemistry         i.       Study of new drug synthesis         ii.       Study of new drug synthesis         ii.       Study of drug effects in the body         1.       Both biochemical and physiological effects drugs on the body, or microorganism or pawithin or on the body         2.       Studies the relationship between drug concentration and effect	1       Certificate       1-4 months       \$500-\$2,000         2       Diploma       12 months       \$4,000-\$8,000         3       Degree       2-3 years       \$12,000-\$22,000         IV.       Pharmacologist       .       .         a.       MD (doctor of medicine)       .       .         b.       PhD (doctor of medicine)       .       .         c.       Specializes in pharmacology       V.       Pharmacology – study of preparation, properties, uses and act drugs; has many subdivisions of study         a.       Medicinal chemistry       .       Study of new drug synthesis         ii.       Study of new drug synthesis       .       .         iii.       Study of drug effects in the body       1.       Both biochemical and physiological effects drugs on the body of drug some concentration and effect         ii.       Studies the relationship between drug concentration and effect       .       .         ii.       Studies drug absorption       1.       .       How drugs pass into the bloodstream         iii.       Distribution into body compartments       .       .       Metabolism: changes that drugs undergo within the body         v.       Excretion: removal of the drug from the body       .       Excretion: removal of the drug from the body <tr< th=""></tr<>
2       Diploma       12 months       \$4,000-\$8,000         3       Degree       2-3 years       \$12,000-\$22,000         IV.       Pharmacologist <ul> <li>a. MD (doctor of medicine)</li> <li>b. PhD (doctor of medicine)</li> <li>c. Specializes in pharmacology</li> </ul> V.       Pharmacology – study of preparation, properties, uses and actidrugs; has many subdivisions of study <li>a. Medicinal chemistry                 <ul> <li>i. Study of new drug synthesis</li> <li>ii. Studies the relationship between chemical structubiological effects</li> <li>b. Pharmacodynamics</li> <li>i. The study of drug effects in the body</li> <li>1. Both biochemical and physiological effects drugs on the body, or microorganism or pawithin or on the body</li> <li>2. Studies the relationship between drug concentration and effect</li> </ul> </li>	2       Diploma       12 months       \$4,000-\$8,000         3       Degree       2-3 years       \$12,000-\$22,000         IV.       Pharmacologist       .       .         a. MD (doctor of medicine)       b. PhD (doctor of medicine)       .         c. Specializes in pharmacology       V.       Pharmacology – study of preparation, properties, uses and act drugs; has many subdivisions of study         a. Medicinal chemistry       i. Study of new drug synthesis       ii. Study of new drug synthesis         ii. Study of new drug synthesis       ii. Study of drug effects in the body       1. Both biochemical and physiological effects drugs on the body, or microorganism or pawithin or on the body         2. Studies drug absorption       1. How drugs pass into the bloodstream         iii. Distribution into body compartments       iv. Metabolism: changes that drugs undergo within the body         v. Excretion: removal of the drug from the body       c. Pharmacokinetics         i. The mathematical description of drug disposition body over time       ii. Appearance and disappearance         d. Molecular pharmacology       i. Involves the interaction of drugs and subcellular or such as DNA, RNA and enzymes         ii. Provides important information about the mechar action of drugs
<ul> <li>3 Degree 2-3 years \$12,000-\$22,000</li> <li>IV. Pharmacologist <ul> <li>a. MD (doctor of medicine)</li> <li>b. PhD (doctor of medicine)</li> <li>c. Specializes in pharmacology</li> </ul> </li> <li>V. Pharmacology – study of preparation, properties, uses and actidrugs; has many subdivisions of study <ul> <li>a. Medicinal chemistry</li> <li>i. Study of new drug synthesis</li> <li>ii. Studies the relationship between chemical structubiological effects</li> </ul> </li> <li>b. Pharmacodynamics <ul> <li>i. The study of drug effects in the body</li> </ul> </li> <li>1. Both biochemical and physiological effects drugs on the body, or microorganism or pawithin or on the body</li> <li>2. Studies the relationship between drug concentration and effect</li> </ul>	<ul> <li>3 Degree 2-3 years \$12,000-\$22,000</li> <li>IV. Pharmacologist <ul> <li>a. MD (doctor of medicine)</li> <li>b. PhD ( doctor of medicine)</li> <li>c. Specializes in pharmacology</li> </ul> </li> <li>V. Pharmacology – study of preparation, properties, uses and act drugs; has many subdivisions of study <ul> <li>a. Medicinal chemistry</li> <li>i. Study of new drug synthesis</li> <li>ii. Studies the relationship between chemical structure biological effects</li> </ul> </li> <li>b. Pharmacodynamics <ul> <li>i. The study of drug effects in the body</li> <li>1. Both biochemical and physiological effects drugs on the body, or microorganism or pawithin or on the body</li> <li>2. Studies the relationship between drug concentration and effect</li> <li>ii. Studies drug absorption <ol> <li>How drugs pass into the bloodstream</li> <li>Distribution into body compartments</li> <li>K. Metabolism: changes that drugs undergo within the body</li> </ol> </li> <li>c. Pharmacokinetics <ol> <li>The mathematical description of drug disposition body over time</li> <li>Appearance and disappearance</li> <li>Molecular pharmacology <ol> <li>Involves the interaction of drugs and subcellular or such as DNA, RNA and enzymes</li> <li>Provides important information about the mechar action of drugs</li> </ol> </li> </ol></li></ul></li></ul>
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concentration and effect	concentration and effect ii. Studies drug absorption 1. How drugs pass into the bloodstream iii. Distribution into body compartments iv. Metabolism: changes that drugs undergo within the body v. Excretion: removal of the drug from the body c. Pharmacokinetics i. The mathematical description of drug disposition body over time ii. Appearance and disappearance d. Molecular pharmacology i. Involves the interaction of drugs and subcellular end such as DNA, RNA and enzymes ii. Provides important information about the mechan action of drugs

- ii. Studies in animals are required by law before new drugs can be tested in humans
- VI. Chemical Name
  - a. Specifies the chemical makeup of a drug
  - b. The chemical name is often long and complicated
- VII. Generic name
  - a. Shorter and less complicated
  - b. Identifies the drug legally and scientifically
  - c. Becomes public property after 17 years of use by the original manufacturer
  - d. Only one generic name for each drug
- VIII. Brand name
  - a. Trademark name is the private property of the individual drug manufacturer and no competitor may use it
  - b. Often has the super script<sup>®</sup> after or before the name, indicating that it is a registered brand name
  - c. Drugs can have several brand names, because each manufacturer producing the drug gives it a different name
    - i. Example: Aspirin is a registered trademark owned by Bayer
    - ii. Bayer<sup>®</sup> Aspirin
  - d. Specific Prescriptions
    - i. When a specific brand name is ordered on a prescription by a physician, it must be dispensed by the pharmacist
    - ii. No other brand name may be substituted
  - IX. Standards
    - a. Food and Drug Administrations (FDA)
      - i. Has legal responsibility for deciding if a drug may be distributed or sold
      - ii. Strict standards for effectiveness and purity
      - iii. Requires extensive experimental testing in animals and humans before it approves a new drug
    - b. United States Pharmacopeia (USP)
      - i. An independent committee of doctors, pharmacologist, pharmacists and manufacturers
      - ii. Review the available commercial drugs and appraises their effectiveness
      - iii. To be approved the drug must be safe, clinically useful and available in pure form
      - iv. If a drug has USP after is name, it has met the standards of the Pharmacopeia
  - X. References
    - a. Hospital Formulary
      - i. Most complete and up-to-date listings of drugs
      - ii. Gives information about the characteristics of drugs and their clinical usage as approved by that particular

hospital

- iii. Published yearly
- b. Physician's Desk Reference (PDR)
  - i. Published by a private firm
  - ii. Drug manufacturers pay to have their products listed
  - iii. Useful reference with several indexes to identify drugs
  - iv. List precautions, warnings about side effects and information about the recommended dosage and administration of each drug
  - v. Published yearly
- XI. Administration of Drugs
  - a. Route
    - i. How the drug is taken into the body
    - ii. Determines how well it is absorbed into the blood
    - iii. Determines the speed and duration of action of the drug
    - iv. Oral Administration
      - 1. Given by mouth
      - 2. Slowly absorbed into the bloodstream through the stomach or intestines
      - 3. Convenient for the patient
      - 4. Disadvantages include:
        - a. May be destroyed in the digestive tract
        - b. If unable to pass through the intestinal wall, it will be ineffective
        - c. Slow to act
    - v. Sublingual Administration
      - 1. Placed under the tongue
      - 2. Dissolves in the saliva
      - 3. Rapid absorption
    - vi. Rectal Administration
      - 1. Suppositories and aqueous solutions are inserted into the rectum
      - 2. Used when oral administration is difficult
    - vii. Parenteral Administration
      - 1. Injection of a drug from a syringe through a hollow needle
      - 2. There are several types of Parenteral injections and instillation
        - a. Intracavity instillation: injection into a body cavity
        - b. Intradermal injection: shallow injection made into the upper layers of the skin
        - c. Subcutaneous Injection (SC)
          - i. Small needle is introduced into the subcutaneous tissue
          - ii. Usually on the upper arm, thigh or abdomen

- d. Intramuscular injection
  - i. Used for large volume of solution injections
  - ii. Buttock or upper arm is the usual site for IM injections
- e. Intrathecal instillation: injection in the space under the membranes surrounding the spinal cord and brain
- f. Intravenous injection (IV)
  - i. Injection given directly into a vein
  - ii. Used when an immediate effect is desired
- g. Pumps
  - i. Battery-powered pumps may be used for continuous administration of drugs by SC or IV
- h. Inhalation
  - i. Gases taken into the nose or mouth
  - Absorbed into the bloodstream through the thin walls of air sacs in the lungs
  - iii. Aerosols
    - 1. Particles of drug suspended in air
    - 2. Administered by inhalation
- i. Topical application
  - i. Drugs applied locally on the skin or mucous membranes
    - 1. Antipruitics (against itching)
    - 2. Antiseptics (Against infection)
    - 3. Transdermal patches
      - a. Hormone replacement therapy
      - b. Pain meds
      - c. Many others
- XII. Vehicles for drug administration
  - a. Hypodermic syringes
  - b. Ampule
    - i. Small glass or plastic container containing a single dose of drug
  - c. Vial
    - i. Glass container with a metal-enclosed rubber seal
  - d. Capsules: small soluble containers used for a dose of medication for swallowing
  - e. Tablets: small solid pills containing a dose of medication
  - f. Caplets: coated like a capsule, but solid like a tablet

- XIII. Drug Actions and Interactions
  - a. Receptor
    - i. The target substance with which the drug interacts to produce its effects
    - ii. Drug may cross the cell membrane to reach it's intracellular receptor
    - iii. Drug may react with a receptor on the cell's surface
  - b. Dose
    - i. Amount of drug administered
    - ii. Usually measured in milligrams or grams
  - c. Schedule
    - i. Exact timing and frequency of drug administration
  - d. Additive Action
    - i. The combination of two similar drugs is equal to the sum of the effects of each
    - ii. Example: if drug A kills 10% of the infection and drug B kills 20% of the infection, then using A and B together would kill 30% of the infection
  - e. Synergism
    - i. Response
      - 1. Desired and beneficial effect of a drug
  - f. Tolerance
    - i. Effects of a given dose diminish as treatment continues
    - ii. Increasing amounts are needed to produce the same effect
  - g. Addiction
    - i. Physical and psychological dependence on and craving for a drug
    - ii. Presence of clear unpleasant effects when the drug is withdrawn
  - h. Controlled substances
    - i. Drugs that produce tolerance and dependence
    - ii. Have potential for abuse or addiction
    - iii. Class (Schedule) I: most dangerous drugs that have no recognized medicinal use
    - iv. Class (Schedule) II: dangerous substance with general medical indications and high potential for abuse and addiction
    - v. Class (Schedule) III: carries less potential for abuse, but casual use can lead to psychological addiction and dependence
    - vi. Class (Schedule) IV: carries low potential for abuse but a risk of psychological or limited physical dependence
    - vii. Class (Schedule) V: least dangerous drugs
- XIV. Drug Toxicity
  - a. The poisonous and potentially dangerous effects of some drugs

- b. Idiosyncrasy
  - i. An example of an unpredictable type of drug toxicity
  - ii. Unexpected effect that appears in the patient after administration of a drug
- c. latrogenic
  - i. Produced by treatment
  - ii. Mistakes in drug use
  - iii. Due to unrecognized individual sensitivity to a certain agent
- d. Side effects
  - i. Toxic effects that result routinely result from the use of a drug
  - ii. Often occur with the usual therapeutic dosage of a drug
  - iii. Generally tolerable or acceptable
- e. Contraindications
  - i. Factors in a patient's condition that make the use of a drug dangerous
  - ii. Reason's not to use the drug in question
- XV. Classes of Drugs
  - a. Analgesics: alges/=sensitivity to pain
    - i. Drug that lessens pain
    - ii. Mild
    - iii. Narcotic
    - iv. Nonsteroidal Anti-inflammatory drugs (NSAIDs)
  - b. Anesthetics
    - i. Agent that reduces or eliminates sensation
      - 1. General anesthetic
      - 2. Local anesthetic
  - c. Antibiotics
    - i. A chemical substance produced by a microorganism: bacterium, yeast, or mold
    - ii. Vagina: moniliasis or candidiasis
  - d. Antiviral
    - i. Used against infections due to viruses
      - 1. Herpes viruses
      - 2. Epstein-Barr virus
      - 3. Cytomegalovirus
      - 4. HÍV
  - e. Anticoagulants
    - i. Prevent clotting of blood
    - ii. Prevent formation of clots or breakup clots in blood vessels
      - 1. Heparin: a natural anticoagulant
      - 2. Warfarin (Coumadin); manufactured; blocks vitamin K
      - 3. Tissue-type plasminogen activator (tPS) dissolves clots

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- f. Antiplatelet drugs
  - i. Reduce the tendency of platelets to stick together
    - 1. Aspirin (ASA)
    - 2. Plavix
- g. Anticonvulsants
  - i. Prevents or reduces the frequency of convulsions in some types of epilepsy
  - ii. Depresses abnormal spontaneous activity of the brain, without affecting normal brain function
- h. Antidepressants
  - i. Treat symptoms of depression
  - ii. Elevate mood and increase physical activity
  - iii. Increase mental alertness
  - iv. Improve appetite and sleep patterns
- i. Anti-Alzheimer drugs
  - i. Used to treat symptoms of Alzheimer disease
  - ii. Act by aiding brain neurotransmitters
- j. Antidiabetic drugs
  - i. Used to treat diabetes mellitus
  - ii. Insulin
  - iii. Insulin pump
  - iv. Oral antidiabetic drugs
- k. Antihistamines
  - i. Drugs that block the action of histamine
    - 1. Histamine causes allergic symptoms (Hives, bronchial asthma , hay fever)
  - ii. Cannot cure the allergic reaction; only relieves its symptoms
  - iii. Many have strong antiemetic qualities (used to prevent nausea)
- I. Antiosteoporosis Drugs
  - i. Used to treat osteoporosis (bone loss)
- m. Cardiovascular Drugs
  - i. Act on the heart or blood vessels to treat a variety of conditions; hypertension, angina, MI, CHF and others
  - ii. Some help the heart to beat more effectively
  - iii. Angiotensive-converting enzyme (ACE)
    - Dilate blood vessels to lower blood pressure, improve the performance of the heart and reduce its workload
  - iv. Angiotensive II receptor blockers (ARBs)
    - 1. Lower blood pressure by preventing angiotensive from acting on receptors in blood vessels
  - v. Antiarrhythmics
    - 1. Reverse abnormal heart rhythms
    - 2. Slow the response of heart muscle to nervous system stimulation

3. Slow the rate the nervous system impulses are carried through the heart vi. Beta-blockers 1. Decrease muscular tone in blood vessels 2. Decrease output of the heart 3. Decrease blood pressure vii. Calcium channel blockers 1. Dilate blood vessels 2. Lowers blood pressure 3. Used to treat angina and arrhythmias viii. Cholesterol-binding drugs 1. Bind to dietary cholesterol and prevent its uptake from the GI track ix. Cholesterol-lowering drugs (statins) 1. Used to control high levels of cholesterol in the blood 2. Lowers cholesterol by reducing its production in the liver x. Diuretics 1. Reduce the volume of blood in the body by promoting the kidneys to remove water and salt through urine 2. Used to treat hypertension and CHF n. Endocrine Drugs i. Androgens: normally made by the testes and adrenal glands 1. Used for male hormone replacement 2. Used to treat endometriosis and anemia ii. Antiandrogens: interfere with the production of androgens or interfere with their binding in tissues 1. Used to treat prostate cancer iii. Estrogens: female hormones normally produced by the ovaries 1. Used for symptoms associated with menopause and postmenopausal osteoporosis iv. Aromatase inhibitors 1. Reduce the amount of estrogen in the blood 2. Are effective against breast cancer v. Selective estrogen receptor modulator (SERM) 1. Has estrogen-like effects on bone and on lipid metabolism 2. Used to treat postmenopausal osteoporosis and breast cancer vi. Thyroid hormone: used to treat low output of hormone from the thyroid gland 1. Calcitonin: used to treat osteoporosis 2. Glucocorticoids help reduction of inflammation as

well as arthritis, skin allergic conditions, GI ailments, and malignant conditions

- vii. Parathyroid hormone (PTH)
  - 1. Used to treat osteoporosis
  - 2. Stimulates new bone formation
- viii. Growth hormone release-inhibiting factor
  - Can be manufactured and given to treat GI symptoms associated with acromegaly and other tumors
  - 2. Inhibits the production of natural growth hormone
- o. Gastrointestinal Drugs
  - i. Antacids
    - 1. Neutralize the hydrochloric acid in the stomach
    - 2. Used to relieve symptoms of peptic ulcer, esophagitis and reflux
    - ii. Antiulcer Drugs
      - 1. Blocks secretion of acid by cells in the lining of the stomach
      - 2. Used to treat gastric and duodenal ulcers and Gastroesophageal reflux disease (GERD)
    - iii. Antidiarrheal medications
      - 1. Relieve diarrhea and diminishes colon peristalsis
    - iv. Cathartics: relieve constipation and promote defecation
      - 1. Laxatives: mild cathartics
      - 2. Purgatives: strong cathartics
- p. Respiratory Drugs
  - i. Bronchodilators
    - 1. Open bronchial tubes
    - 2. Administered by injection or aerosol inhalers
  - ii. Steroid drugs: reduce chronic inflammation in respiratory passageways
  - iii. Leukotriene modifiers: prevent asthma attacks
- q. Sedative-Hypnotics
  - i. Used to treat insomnia and sleep disorders
  - ii. Depress the CNS and promote drowsiness (sedatives) and sleep (Hypnotics)
  - iii. Barbiturates and benzodiazepines are two major categories of sedative-hypnotics
- r. Stimulants
  - i. Act on the brain to speed up vital processes (heart and respirations)
  - ii. Increase alertness and inhibit hyperactive behavior
  - iii. Amphetamines: used to prevent narcolepsy (seizures of sleep), suppresses appetite and calms hyperkinetic children
- iv. Caffeine: cerebral stimulant: used to treat headaches s. Tranguilizers
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- i. Useful for controlling anxietyii. Benzodiazepines: minor tranquilizersiii. Phenothiazines
- iv. Major tranquilizers

XVI. Vocabulary

Term	Meaning
addiction	Physical and psychological dependence on and
	craving for a drug
additive action	Drug action in which the combination of two
	similar drugs is equal to the sum of the effects of
	each
aerosol	Particles of drug suspended in air
anaphylaxis	Exaggerated hypersensitivity reaction to a
	previously encountered drug or foreign protein
antagonistic action	Combination of two drugs gives less than an
	additive effect (action)
antidote	Agent given to counteract an unwanted effect of
	a drug
brand name	Commercial name for a drug; trademark or trade
	name
chemical name	Chemical formula for a drug
contraindications	Factors that prevent the use of a drug or
	treatment
controlled substances	Drugs that produce tolerance and dependence
	and have a potential for abuse or addiction
dependence	Prolonged use of a drug that may lead to
	physiologic need for its actions in the body
dose	Amount of drug administrated, usually measured
	in milligrams
food and drug	U.S government agency having the legal
administration (FDA)	responsibility for enforcing proper drug
	manufacture and clinical use
generic name	Legal noncommercial name of a drug
iatrogenic	Condition caused by treatment (drug or
	procedures) given by physicians or medical
	personnel
idiosyncratic reaction	Unexpected effect produced in particularly
	sensitive patient but not seen in most people
inhalation	Administration of drugs in gaseous or vapor from
	through the nose of mouth
medicinal chemistry	study of new drugs synthesis; relationship
	between chemical structure and biological effects
molecular	Study of interaction of drugs and their target
pharmacology	molecules such as enzymes, or cell surface
	receptors
oral administration	Drugs given by mouth

parenteral	Drugs are given by injection into the skin.
administration	muscles, or veins (any route other than the
	digestive tract). Examples are subcutaneous.
	Intradermal, intramuscular, intravenous,
	intrathecal, and intracavity injections
pharmacist	Specialist in preparing and dispensing drugs
pharmacy	Location for preparing and dispensing drugs
phannacy	Also the study of preparing and dispensing drugs
pharmacodynamics	Study of the effects and strengths of a drug within
p	the body
pharmacokinetics	Study of drug concentrations in tissues and body
	fluids over a period of time.
Pharmacologist	Specialists who develop and test drugs for
ç	medicinal use.
Pharmacology	Study of the preparation, properties, uses and
	actions of drugs.
Physician's Desk	(PDR) Reference book that lists drug products
Reference	
Receptor	Target substance with which a drug interacts in
	the body
Rectal administration	Drugs are inserted through the anus into the
	rectum
Resistance	Lack of beneficial response
Response	Desired and beneficial effect of a drug
Schedule	Exact timing and frequency of drug administration
Side effect	Adverse reaction, usually minor, that routinely
	results from the use of a drug
Sublingual	Drugs are given by placement under the tongue
administration	
Synergism	Combination of two drugs causes an effect that is
	greater than the sum of the individual effects of
	each drug alone
Syringe	Instrument for introducing or withdrawing fluids
	from the body
Tolerance	Larger and larger drug doses must be given to
	achieve the desired effect
Topical application	Drugs are applied locally on the skin or mucous
	membranes of the body (ointments, creams,
	lotions)
Toxicity	Harmful effects of a drug
Toxicology	Study of the harmful chemicals and their effects
	on the body
Transport	Movement of a drug across a cell membrane into
	body cells
United States	Authoritative list of drugs, formulas and
Pharmacopeia	preparations that sets a standard for drug

	manufacturing and dispensing
Vitamin	Substance found in foods and essential in small
	quantities for growth and good health

### KVII. Classes of Drugs and Related Terms

Term	Meaning
ACE inhibitor	Lowers blood pressure
amphetamine	Central nervous system stimulant
analgesic	Relieves pain
androgen	Male hormone
anesthetic	Reduces or eliminates sensation (general or
	locally)
angiotensin II	Lowers blood pressure by preventing angiotensive
receptor blocker	from acting on receptors in blood vessels
antacid	Neutralizes acid in the stomach
antiandrogen	Slows the uptake of androgens or interferes with
	their effect in tissues
	Charging and the second
antibiotic	Chemical substance, produced by a plant or
	microorganism, that has the ability to inhibit or
antiaganulant	Drevente blood eletting
anticoaguiant	Prevents blood clotting
anticonvuisant	Prevents convulsions
antidepressant	Relieve symptoms of depression
antidiapetic	Drug given to prevent or treat diabetes meilitus
antidiarrneai	Prevents diarrnea
antiemetic	Prevents hausea and vomiting
antinistamine	Blocks the action of histamine and helps prevent
	symptoms of allergy
antinauseant	Relieves nausea and vomiting; antiemetic
antiplatelet	Reduces the tendency of platelets to stick together
antiulcer	Inhibits the secretion of acid by cells lining the
	stomach
antiviral	Acts against viruses such as herpes viruses and
	HIV
aromatase inhibitor	Reduces estrogen in the blood by blocking the
	enzyme Aromatase
bactericidal	Kills bacteria
bacteriostatic	Inhibits bacterial growth
beta-blocker	Blocks the action of epinephrine at sites on
	receptors of heart muscle cells, muscle lining of
	blood vessels, and bronchial tubes
bisphosphonate	Prevents bone loss in osteoporosis and osteopenia

caffeine	Central nervous system stimulant
calcium channel	Blocks the entrance of calcium into heart muscle
blocker	and muscle lining of blood vessels; also called
	calcium antagonist
cardiac glycoside	Increases the force of contraction of the heart
cardiovascular drug	Acts on the heart and blood vessels
cathartic	Relieves constipation
cholesterol-binding drug	Binds to dietary cholesterol and prevents its uptake from the gastrointestinal tract
cholesterol-lowering drug	Lowers cholesterol by preventing its production by the liver; statin
diuretic	Increases the production of urine and thus reduces the volume of fluid in the body; antihypertensive
emetic	Promotes vomiting
endocrine drug	A hormone or hormone-like drug
gastrointestinal drug	Relieves systems of diseases in the
	gastrointestinal tract
glucocorticoid	Hormone from the adrenal cortex that raises blood
	sugar and reduces inflammation
hypnotic	Produces sleep or a trance-like state
laxative	Weak cathartic
narcotic	Habit-forming drug that relieves pain by producing stupor or insensibility
progestin	Female hormone that stimulates the uterine lining
	during pregnancy and is also used in treatment of
	abnormal uterine bleeding and for hormone
	replacement therapy
purgative	Relieves constipation (strong cathartic)
respiratory drug	I reats asthma, emphysema, and infections of the
	respiratory system
sedative	A mildly hypnotic drug that relaxes without
atives de et	necessarily producing sleep
Stimulant	Excites and promotes activity
tronguilizor	Controls anyiety and source disturbances of
tranquilizer	behavior
	Dellaviol

# XVIII. Combining Forms

Combining Form	Meaning
aer/o	Air
alges/o	Sensitivity to pain
bronch/o	Bronchial tube
chem./o	Drug
cras/o	Mixture

cutane/o	skin
derm/o	Skin
erg/o	Work
esthes/o	Feeling, sensation
hist/o	Tissue
hypn/o	Sleep
iatr/o	treatment
lingu/o	Tongue
myc/o	Mold, fungus
narc/o	Stupor
or/o	Mouth
pharmacy/o	Drug
prurit/o	Itching
thec/o	Sheath
pyret/o	Fever
tox/o	Poison
toxic/o	Poison
vas/o	Vessel
ven/o	Vein
vit/o	life

# XIX. Prefixes

Prefix	Meaning
Ana-	Upward, excessive,
	again
Anti-	against

# XX. Abbreviations

Abbreviation	Meaning
a.c., ac	Before meals
ACE	Angiotensive-converting enzyme
ad lib	Freely, as desired
APAP	Acetaminophen (Tylenol)
ARB	Angiotensin II receptor blocker
b.i.d., bid	Two times a day
C	with
Caps	Capsules
Сс	Cubic centimeter
FDA	US Food and Drug Administration
gm, g	Gram
gtt	Drops
h	Hour

h.s., hs	At bedtime
H <sub>2</sub> blocker	Histamine H <sub>2</sub> receptor antagonist
HRT	Hormone Replacement therapy
IM	Intramuscular
INH	Isoniazid – antituberculosis agent
IV	Intravenous
MAOI	Monoamine oxidase inhibitor
mg	Milligram
mil, ml	Milliliter
NPO	Nothing by mouth
NASID	Nonsteroidal anti-inflammatory drug
p	After (post)
p.c., pc	After meals
PCA	Patient-controlled analgesia
PDR	Physician's Desk Reference
PO, p.o., po	By mouth
p.r.n., prn	As needed; as necessary
Pt	Patient
q	Every
q.h., qh	Every hour
q2h	Every 2 hours
q.i.d., qid	Four times a day
q.s., qs	Sufficient quantity
qAM	Every morning
qPM	Every evening
Rx	Prescription
S	Without
SERM	Selective estrogen receptor
	modulator
Sig.	Directions – how to take the
	medication
SL	Sublingual
S.O.S.	If it is necessary
SSRI	Selective serotonin reuptake inhibitor
SQ	Subcutaneous
tab	Tablet
TCA	Tricyclic antidepressant
t.i.d., tid	Three times daily

# Activity

- I. Make flash cards of pharmacology terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete the Pharmacology Combining Forms Worksheet.
- III. Complete the Pharmacology Vocabulary Worksheet.
- IV. Complete the Classes of Drugs Worksheet
- V. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan --<u>http://texashste.com/documents/curriculum/principles/medical\_termin</u> <u>ology\_activities.pdf</u>)

#### Assessment

Successful completion of the activities

#### Materials

Computer and data projector Index cards Classes of drugs worksheet and key Markers Pharmacology combining forms, prefixes & abbreviation worksheet & Key Pharmacology vocabulary worksheet & Key

#### **Accommodations for Learning Differences**

For reinforcement, the student will practice terms using flash cards related to pharmacology.

For enrichment, the students will research various medications and report back to the class the drug type, uses, therapeutic effects, and side effects of the medication.

#### National and State Education Standards

#### National Healthcare Foundation Standards and Accountability Criteria:

Foundation Standard 2: Communications 2.21 Use roots, prefixes, and suffixes to communicate information 2.22 Use medical abbreviations to communicate information

# TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;
- (E) recall directional terms and anatomical planes related to the body structure
- (F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases, and treatments.

130.203 (c) (2) (B) employ increasingly precise language to communicate

- 130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:
  - (A) distinguish medical abbreviations used throughout the health science industry; and
  - (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

130.203(c)(5)(B) translate medical terms to conversational language to facilitate communication;

- (C) distinguish medical terminology associated with medical specialists such as geneticist, pathologists, and oncologist;
- (D) summarize observations using medical terminology; and
- (E) correctly interpret contents of medical scenarios.

#### Texas College and Career Readiness Standards

English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts. *Cross-Disciplinary Standards*,

I. Key Cognitive Skills D. Academic Behavior: 1. Self-monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

# PHARMACOLOGY WORKSHEET

# **Combining Forms**

Combining Form	Meaning
aer/o	
alges/o	
bronch/o	
chem./o	
cras/o	
cutane/o	
derm/o	
erg/o	
esthes/o	
hist/o	
hypn/o	
iatr/o	
lingu/o	
myc/o	
narc/o	
or/o	
pharmacy/o	
prurit/o	
thec/o	
pyret/o	
tox/o	
toxic/o	
vas/o	
ven/o	
vit/o	

# Prefixes

Prefix	Meaning
Ana-	
Anti-	

# Abbreviations

Abbreviation	Meaning
a.c., ac	
ACE	
ad lib	
APAP	
ARB	
b.i.d., bid	
C	
Caps	
Cc	
FDA	

gm, g	
gtt	
h	
h.s., hs	
H <sub>2</sub> blocker	
HRT	
IM	
INH	
IV	
MAOI	
mg	
mil, ml	
NPO	
NASID	
p	
р.с., рс	
PCA	
PDR	
РО, р.о., ро	
p.r.n., prn	
Pt	
q	
q.h., qh	
q2h	
q.i.d., qid	
q.s., qs	
qAM	
qPM	
Rx	
s	
SERM	
Sig.	
SL	
S.O.S.	
SSRI	
SQ	
tab	
ТСА	
t.i.d., tid	

## PHARMACOLOGY WORKSHEET KEY

# Combining Forms -- Key

Combining Form	Meaning
aer/o	Sir
alges/o	Sensitivity to pain
bronch/o	Bronchial tube
chem./o	Drug
cras/o	Mixture
cutane/o	Skin
derm/o	Skin
erg/o	Work
esthes/o	Feeling, sensation
hist/o	Tissue
hypn/o	Sleep
iatr/o	Treatment
lingu/o	Tongue
myc/o	Mold, fungus
narc/o	Stupor
or/o	Mouth
pharmacy/o	Drug
prurit/o	Itching
thec/o	Sheath
pyret/o	Fever
tox/o	Poison
toxic/o	Poison
vas/o	Vessel
ven/o	Vein
vit/o	Life

# Prefixes – Key

Prefix	Meaning
Ana-	Upward, excessive, again
Anti-	Against

# Abbreviations – Key

Abbreviation	Meaning
a.c., ac	Before meals
ACE	Angiotensive-converting enzyme
ad lib	Freely, as desired
APAP	Acetaminophen (Tylenol)
ARB	Angiotensin II receptor blocker
b.i.d., bid	Two times a day
C	with
Caps	Capsules
Cc	Cubic centimeter

FDA	US Food and drug Administration
gm, g	Gram
gtt	Drops
h	Hour
h.s., hs	At bedtime
H <sub>2</sub> blocker	Histamine H <sub>2</sub> receptor antagonist
HRT	Hormone replacement therapy
IM	Intramuscular
INH	Isoniazid – antituberculosis agent
IV	Intravenous
MAOI	Monoamine oxidase inhibitor
mg	Milligram
mil, ml	Milliliter
NPO	Nothing by mouth
NASID	Nonsteroidal anti-inflammatory drug
p	After (post)
p.c., pc	After meals
PCA	Patient-controlled analgesia
PDR	Physician's Desk Reference
PO, p.o., po	By mouth
p.r.n., prn	As needed; as necessary
Pt	Patient
q	Every
q.h., qh	Every hour
q2h	Every 2 hours
q.i.d., qid	Four times a day
q.s., qs	Sufficient quantity
qAM	Every morning
qPM	Every evening
Rx	Prescription
S	Without
SERM	Selective estrogen receptor modulator
Sig.	Directions – how to take the medication
SL	Sublingual
S.O.S.	If it is necessary
SSRI	Selective serotonin reuptake inhibitor
SQ	Subcutaneous
tab	Tablet
TCA	Tricyclic antidepressant
t.i.d., tid	Three times daily

# Pharmacology Vocabulary-Worksheet

Term	Meaning
addiction	
additive action	
aerosol	
anaphylaxis	
antagonistic action	
antidote	
brand name	
chemical name	
contraindications	
controlled substances	
dependence	
dose	
food and drug	
administration (FDA)	
generic name	
iatrogenic	
idiosyncratic reaction	
inhalation	
medicinal chemistry	
molecular pharmacology	
oral administration	
parenteral administration	
pharmacist	
pharmacy	
pharmacodynamics	
pharmacokinetics	
Pharmacologist	
Pharmacology	
Physician's Desk	
Reference	
receptor	
rectal administration	
resistance	
response	
schedule	
side effect	
sublingual administration	
synergism	
syringe	
tolerance	
topical application	
toxicity	
toxicology	
transport	
United States	

Pharmacopeia	
vitamin	

# Pharmacology Vocabulary -- Key

Term	Meaning
addiction	Physical and psychological dependence on and craving for a
	drug
additive action	Drug action in which the combination of two similar drugs is
	equal to the sum of the effects of each
aerosol	Particles of drug suspended in air
anaphylaxis	Exaggerated hypersensitivity reaction to a previously
	encountered drug or foreign protein
antagonistic action	Combination of two drugs gives less than an additive effect
	(action)
antidote	Agent given to counteract an unwanted effect of a drug
brand name	Commercial name for a drug; trademark or trade name
chemical name	Chemical formula for a drug
contraindications	Factors that prevent the use of a drug or treatment
controlled substances	Drugs that produce tolerance and dependence and have a
	potential for abuse or addiction
dependence	Prolonged use of a drug that may lead to physiologic need for
	its actions in the body
dose	Amount of drug administrated, usually measured in milligrams
food and drug	U.S government agency having the legal responsibility for
administration (FDA)	enforcing proper drug manufacture and clinical use
generic name	Legal noncommercial name of a drug
iatrogenic	Condition caused by treatment (drug or procedures) given by
	physicians or medical personnel
idiosyncratic reaction	Unexpected effect produced in particularly sensitive patient but
	not seen in most people
inhalation	Administration of drugs in gaseous or vapor from through the
	nose of mouth
medicinal chemistry	study of new drugs synthesis; relationship between chemical
	structure and biological effects
molecular pharmacology	Study of interaction of drugs and their target molecules such as
	enzymes, or cell surface receptors
oral administration	Drugs given by mouth
parenteral administration	Drugs are given by injection into the skin, muscles, or veins
	(any route other than the digestive tract). Examples are
	intrathead and intracevity injections
pharmacist	Specialist in proparing and disponsing drugs
pharmacy	Leastion for proparing and disponsing drugs
phannacy	preparing and dispensing drugs. Also the study of
pharmacodynamics	Study of the effects and strengths of a drug within the body
pharmacokinetics	Study of drug concentrations in tissues and body fluids over a
Pharmacokineuco	period of time.
pharmacologist	Specialists who develop and test drugs for medicinal use.

pharmacology	Study of the preparation, properties, uses and actions of drugs.
Physician's Desk	(PDR) Reference book that lists drug products
reference	
receptor	Target substance with which a drug interacts in the body
rectal administration	Drugs are inserted through the anus into the rectum
resistance	Lack of beneficial response
response	Desired and beneficial effect of a drug
schedule	Exact timing and frequency of drug administration
side effect	Adverse reaction, usually minor, that routinely results from the
	use of a drug
sublingual administration	Drugs are given by placement under the tongue
synergism	Combination of two drugs causes an effect that is greater than
	the sum of the individual effects of each drug alone
syringe	Instrument for introducing or withdrawing fluids from the body
tolerance	Larger and larger drug doses must be given to achieve the desired effect
topical application	Drugs are applied locally on the skin or mucous membranes of the body (ointments, creams, lotions)
toxicity	Harmful effects of a drug
toxicology	Study of the harmful chemicals and their effects on the body
transport	Movement of a drug across a cell membrane into body cells
United States	Authoritative list of drugs, formulas and preparations that sets a
Pharmacopeia	standard for drug manufacturing and dispensing
vitamin	Substance found in foods and essential in small quantities for
	growth and good health

# Pharmacology-Classes of Drugs and Related Terms

Term	Meaning
ACE inhibitor	
amphetamine	
analgesic	
androgen	
anesthetic	
angiotensin II receptor blocker	
antacid	
antiandrogen	
antiarrhythmic	
antibiotic	
anticoagulant	
anticonvulsant	
antidepressant	
antidiabetic	
antidiarrheal	
antiemetic	
antihistamine	
antinauseant	
antiplatelet	
antiulcer	
antiviral	
aromatase inhibitor	
bactericidal	
bacteriostatic	
beta-blocker	
bisphosphonate	
caffeine	

calcium channel blocker	
cardiac glycoside	
cardiovascular drug	
cathartic	
cholesterol-binding drug	
cholesterol-lowering drug	
diuretic	
emetic	
endocrine drug	
gastrointestinal drug	
glucocorticoid	
hypnotic	
laxative	
narcotic	
progestin	
purgative	
respiratory drug	
sedative	
stimulant	
thyroid hormone	
tranquilizer	

# Pharmacology -- Classes of Drugs and Related Terms -- Key

Term	Meaning	
ACE inhibitor	Lowers blood pressure	
amphetamine	Central nervous system stimulant	
analgesic	Relieves pain	
androgen	Male hormone	
anesthetic	Reduces or eliminates sensation (general or locally)	
angiotensin II receptor	Lowers blood pressure by preventing angiotensive from acting	
blocker	on receptors in blood vessels	
antacid	Neutralizes acid in the stomach	
antiandrogen	Slows the uptake of androgens or interferes with their effect in tissues	
antiarrhythmic	Treats abnormal heart rhythms	
antibiotic	Chemical substance, produced by a plant or microorganism,	
	that has the ability to inhibit or destroy foreign organisms in the body	
anticoagulant	Prevents blood clotting	
anticonvulsant	Prevents convulsions	
antidepressant	Relieve symptoms of depression	
antidiabetic	Drug given to prevent or treat diabetes mellitus	
antidiarrheal	Prevents diarrhea	
antiemetic	Prevents nausea and vomiting	
antihistamine	Blocks the action of histamine and helps prevent symptoms of	
	allergy	
antinauseant	Relieves nausea and vomiting; antiemetic	
antiplatelet	Reduces the tendency of platelets to stick together and form a	
antiulcer	Inhibits the secretion of acid by cells lining the stomach	
antiviral	Acts against viruses such as bernes viruses and HIV	
antivital	Reduces estragen in the blood by blocking the enzyme	
	Aromatase	
bactericidal	Kills bacteria	
bacteriostatic	Inhibits bacterial growth	
beta-blocker	Blocks the action of epinephrine at sites on receptors of heart	
	muscle cells, muscle lining of blood vessels, and bronchial	
	tubes	
bisphosphonate	Prevents bone loss in osteoporosis and osteopenia	
caffeine	Central nervous system stimulant	
calcium channel blocker	Blocks the entrance of calcium into heart muscle and muscle lining of blood vessels: also called calcium antagonist	
cardiac glycoside	Increases the force of contraction of the heart	
cardiovascular drug	Acts on the heart and blood vessels	
cathartic	Relieves constipation	
cholesterol-binding drug	Binds to dietary cholesterol and prevents its uptake from the	
	gastrointestinal tract	

cholesterol-lowering drug	Lowers cholesterol by preventing its production by the liver;
	statin
diuretic	Increases the production of urine and thus reduces the volume
uluielle	
	of fluid in the body; antihypertensive
emetic	Promotes vomiting
endocrine drug	A hormone or hormone-like drug
gastrointestinal drug	Relieves systems of diseases in the gastrointestinal tract
alucocorticoid	Hormone from the adrenal cortex that raises blood sugar and
5	reduces inflammation
hypnotic	Produces sleep or a trance-like state
laxative	Weak cathartic
narcotic	Habit-forming drug that relieves pain by producing stupor or
	inconsibility
progestin	Female hormone that stimulates the uterine lining during
	pregnancy and is also used in treatment of abnormal uterine
	bleeding and for hormone replacement therapy
purgative	Relieves constipation (strong cathartic)
respiratory drug	Treats asthma, emphysema, and infections of the respiratory
respiratory drug	evetere
	system
sedative	A mildly hypnotic drug that relaxes without necessarily
	producing sleep
stimulant	Excites and promotes activity
thyroid hormone	Stimulates cellular metabolism
tronguilizor	Controls anyioty and source disturbances of behavior
lianquilizei	

#### Course

Medical Terminology

#### Unit XV

Diagnostic Procedures and Pharmacology

#### Essential Question

What medical terms are used in psychiatry?

## TEKS

130.203 (c)(1) (A), (B), (C), (F). 2(B), 4 (A), (B), 5 (B), (C),(D), (E)

#### Prior Student Learning

Basic medical terminology: roots, prefixes and suffixes

## Estimated time

6-8 hours

## Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology related to psychiatry when discussing medications.

#### Objectives

Upon completion of this lesson, the student will be able to:

- Know the difference between a psychiatrist, a psychologist, and other mental health specialist
- Define and decipher common terms that describe psychiatric symptoms
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Apply new knowledge to understanding medical terms in their proper contexts

## Engage

Show the ink blots to the class one at a time. Have students write what they think the ink blots resemble. After all ink blots have been shown and students have recorded their thoughts, have a few students share observations as you again hold up each ink blot. Explain to the class that during this lesson, they will be learning works associated with the field of psychiatry.

## **Key Points**

- I. Psychiatry -- The branch of medicine that deals with the diagnosis, treatment and prevention of mental illness
- II. Psychiatrist
  - a. Completes the same medical training as physicians and receives an MD degree
  - Then spends a variable number of years training in the methods and practice of psychotherapy and psychopharmacology
  - c. 4 years of residency training
  - d. Extra years of fellowship training
- III. Psychotherapy
  - a. Psychological techniques for treating mental disorders
  - b. Psychopharmacology
  - c. Drug therapy

- IV. Types of Psychiatrists
  - a. Child Psychiatrists Specializes in the treatment of children
  - Forensic psychiatrists Specializes in the legal aspects of psychiatry, such as the determination of mental competence in criminal cases
  - c. Psychoanalysts
    - i. Completes 3-5 years of training in a special psychotherapeutic technique called psychoanalysis
    - ii. A patient freely relates his or her thoughts and associations to the analyst, who does not interfere
    - iii. Interpretations are offered at appropriate times
- V. Psychologist
  - a. Nonmedical professional
  - b. Trained in methods of psychotherapy, analysis and research
  - c. PhD or EdD degree program in a specific field of interest
    - i. Clinical psychology (patient –oriented)
    - ii. Experimental research
    - iii. Social psychology (focusing on social interaction and the ways the actions of others influence the behavior of the individual)
- VI. Clinical psychologist
  - a. Can use various methods of psychotherapy to treat patients
  - b. Cannot prescribe drugs
  - c. Cannot prescribe electroconvulsive therapy
  - d. Trained in the use of tests to evaluate various aspects of mental health and intelligence
  - e. IQ test
    - i. Wechsler Adult Intelligence Scale
    - ii. Stanford-Binet intelligence Scale
  - f. Personality Test
- VII. Rorschach technique (Inkblots)
- VIII. Thematic Apperception Test (Pictures used to stimulate stories)
- IX. Graphomotor projection test (Draw a person test)
- X. Bender-Gestalt Test (draw geometric designs )
- XI. Minnesota Multiphasic Personality Inventory (true-false questions that reveal aspects of personality)
- XII. Other non-physicians
  - a. Social workers
  - b. Psychiatric nurses
  - c. Licensed mental health clinicians
- XIII. Psychiatric Clinical symptoms
  - a. Amnesia: loss of memory
  - b. Anxiety: varying degrees of uneasiness, apprehension and dread
  - c. Apathy: absence of emotions; lack of interest or motivation

- d. Compulsion: uncontrollable urge to perform an act repeatedly
- e. Conversion: anxiety becomes bodily symptoms, such as blindness, deafness or paralysis, that does not have a physical basis
- f. Delusion: a fixed, false belief that cannot be changed by logical reasoning or evidence
- g. Dissociation: uncomfortable feelings are separated from their real object
- h. Dysphoria: sadness, hopelessness
- i. Euphoria: exaggerated feeling of well-being
- j. Hallucination: false or unreal sensory perception(hearing voices not present, seeing things not present)
- k. Labile Variable: undergoing rapid emotional change
- I. Mania: elation or irritability, associated with distractibility, hyperactivity, talkativeness, injudicious acts, flight of ideas and racing thoughts
- m. Mutism: little speech and negative or minimal thought and behavior
- n. Obsession: involuntary, persistent idea or emotion
- o. Paranoia: overly suspicious system of thinking: fixed delusion that one is being harassed, persecuted or unfairly treated

#### XIV. Psychiatric Disorders

- a. Freud believed that personality is made up of three major parts
  - i. Id
    - 1. Represents the unconscious instincts and psychic energy present from birth
    - 2. Contains basic drives that seek immediate gratification
  - ii. Ego
    - 1. Central coordinating branch of the personality
    - 2. It is the mediator between the id and the outside world
  - iii. Superego
    - 1. Internalized conscience and moral part of the personality
    - 2. Encompasses the sense of discipline derived from parental authority and society
- b. Freud believed that when conflicts arise between two or more of these aspects, psychological disorders would occur
- c. Psychosis: used to describe mental illness
- d. Involves significant impairment of reality testing with false beliefs, hallucinations and strange behavior
- XV. Defense mechanism
  - a. Techniques people use to ward off the anxiety produced by conflicts

- XVI. Anxiety Disorders
  - a. Characterized by anxiety
  - b. unpleasant tension, distress, troubled feelings and avoidance behavior
  - c. Panic disorder is a period of intense fear or discomfort in which symptoms develop abruptly
    - i. Palpitations, sweating, trembling, SOB, feeling of choking, chest pain
    - ii. Nausea, feeling dizzy, feelings of unreality, fear of losing control, fear of dying, hot flashes, numbness
    - iii. Recurrent, unexpected panic attacks
    - iv. Reaches a peak within 10 minutes
    - v. Persistent concerns about having another panic attack
    - vi. Can happen in other anxiety disorders
  - d. Phobic disorders: characterized by irrational or debilitation fears
    - i. Can be associated with a situation or specific object
    - ii. Object that it fears is often symbolic of an unconscious conflict
    - iii. The victim goes to extreme lengths to avoid the object of his fear
    - iv. Panic attacks can occur in anticipation of a phobic situation
  - e. Agoraphobia: fear of being in open, crowded, public places
    - i. Persons with this disorder limit their normal activities to avoid situations that trigger their anxiety
    - ii. Feels more comfortable at home
  - f. Social phobia: fear of situations in which the affected person is open to public scrutiny which could result in possible embarrassment
    - i. Example: fear of speaking in public, using public lavatories or eating in public
  - g. Claustrophobia: fear of closed-in places
  - h. Acrophobia: fear of heights
  - i. Zoophobia: fear of animals
  - j. Obsessive-compulsive disorder (OCD)
    - i. Involves recurrent thoughts and repetitive acts that dominate the patient's life
    - ii. Experiences anxiety if he is prevented from performing special rituals
    - iii. Often consumes time and interferes with the individual's social or occupational functioning
  - k. Post-traumatic stress disorder: development of symptoms following exposure to a traumatic event
    - i. Intense fear, helplessness, insomnia, nightmares and

diminished responsiveness to the external world

- Flashbacks and anxiety often triggered by reminders occur in episodes long after a life-threatening event
  Deeple queid aituations with reminders
- iii. People avoid situations with reminders
- I. Generalized anxiety disorder (GAD)
  - i. Chronic anxiety and exaggerated worry and tension even when there is little or nothing to provoke such feelings
- XVII. Delirium
  - a. An acute, temporary disturbance of consciousness characterized by mental confusion and psychotic symptoms
    - i. Rambling, irrelevant or incoherent speech
    - ii. Sensory misperception
    - iii. Disorientation as to time, place, or person with memory impairment
  - b. Caused by a variety of conditions:
    - i. Drug intoxication or withdrawal
    - ii. Seizure or head trauma
    - iii. Metabolic disturbances (hypoxia, hypoglycemia, electrolyte imbalances, hepatic or renal failure
  - c. Delirium tremens: brought on by stopping alcohol consumption suddenly after prolonged periods of alcohol ingestion

#### XVIII. Dementia

- a. A general, gradual loss of intellectual abilities
- b. Impairment of judgment, memory and abstract thinking
- c. Changes in personality
- d. Difficulty with language and simple ADLs
- XIX. Dissociative Disorder
  - a. Condition involving breakdown in memory, identity or perception
  - b. Persons with this disorder escape reality through amnesia, fugue (sudden travel away from home or work) or alternate identities
- XX. Eating Disorders
  - a. Severe disturbances in eating behavior
  - b. Anorexia nervosa
    - i. Refusal to maintain a minimally normal body weight
    - ii. Intensely afraid of gaining weight
    - iii. Relentless attempt to diet and compulsion to over activity
  - c. Bulimia nervosa
    - i. Binge eating followed by purging
    - ii. Self-induced vomiting and misuse of laxatives or enemas
- XXI. Mood Disorders

- a. A condition of prolonged, intense abnormal mood, that dominates an individual's entire mental life
- b. Bipolar disorder
  - i. Manic episodes (euphoria) alternating with depressive episodes
  - ii. Hypomania Bipolar disorder I: more manic episodes, often alternating with major depressive episodes
  - iii. Bipolar disorder II: recurrent major depressive episodes alternating with hypomanic episodes
- c. Cyclothymic disorder
  - i. Mild form of bipolar disorders
  - ii. Characterized by at least 2 years of hypomania and numerous depressive episodes that do not meet the criteria that defines a major depressive episode
- Depressive disorders: marked by occurrence of one or more major depressive episodes without a history of mania or hypomania
- e. Major depression
  - i. Episodes of severe dysphoria (sadness, hopelessness) and changes in weight and sleep disorders
  - ii. Feelings of worthlessness, difficulty thinking or concentrating, and thoughts of death or suicide
- f. Dysthymia (dysthymic disorder)
  - i. Depressed mood that persists over a 2-year period but is not as severe as major depression
- g. Seasonal Affective Disorder
  - i. Relationship between the onset on an episode of depressive disorder and a particular period of the year
  - ii. Regular appearance of depression for approximately 60 days, between the beginning of October and the end of November
- h. A change from depression to mania or hypomania also may occur within a 60-day period from mid-February to mid-April
- XXII. Personality Disorders
  - a. Antisocial
    - i. No loyalty to or concern for others
    - ii. Without moral standards
    - iii. Acts only in response to desires and impulses
    - iv. Cannot tolerate frustration and blames others when at fault
  - b. Borderline
    - i. Instability in interpersonal relationships and sense of self
    - ii. Alternating involvement with and rejection of people
    - iii. Frantic efforts are made to avoid real or imagined abandonment

- c. Histrionic
  - i. Emotional, attention-seeking, immature and dependent
  - ii. Irrational outburst and tantrums
  - iii. Flamboyant and theatrical
  - iv. Having general dissatisfaction with self and angry feelings about the world
- d. Narcissistic
  - i. Grandiose sense of self-importance or uniqueness
  - ii. Preoccupation with fantasies of success and power
- e. Paranoid
  - i. Continually suspicious and mistrustful of other people, but not to a psychotic degree
  - ii. Jealous and overly concerned with hidden motives of others
  - iii. Quick to take offense
- f. Schizoid
  - i. Emotionally cold and aloof
  - ii. Indifferent to praise or criticism or the feelings of others
  - iii. Few friendships and rarely appears to experience strong emotions (anger or joy)
- XXIII. Developmental Disorders --Characterized by delays in the development of socialization and communication skills
  - a. Autism: commonly appearing during the first 3 years of life. Autistic people may exhibit traits such as resistance to change, using gestures instead of words, repeating words, tantrums, not wanting to be touched, little eye contact, sensitivity to sound, uneven gross/fine motor skills and obsessive attachment to objects
  - b. Asperger syndrome
    - i. Sometimes referred to as a less severe type of autism
    - ii. Usually have normal language skills and normal intelligence
    - iii. Don't know how to interact with others
    - iv. Difficulty with abstract concepts
    - v. Repetitive and restricted patterns of behavior
- XXIV. Schizophrenia
  - a. Chronic psychotic disorder
    - i. Delusions: belief that internal thoughts are broadcast to the external world
    - ii. Hallucinations: voices or sounds that do not exist
    - iii. Thought disorder: ideas shift from one subject to another, completely unrelated
    - iv. Disorder of movement: involuntary movements, mannerisms or clumsiness, uncoordinated
    - v. Flat affect; no signs of expression

- vi. Impaired interpersonal functioning and relationship to the external word
- b. Catatonic type: the patient is mute and does not move or react to the outside environment
- c. Disorganized type: patient exhibits disorganized speech and behavior and flat or inappropriate affect
- d. Paranoid type: the patient experiences prominent delusions of grandeur or persecution and auditory hallucinations
- e. Residual type: flat affect, fatigue, withdrawal, and lack of motivation
- XXV. Sexual Disorders
  - a. Paraphilia: recurrent intense sexual urges, fantasies, or behavior that involve unusual objects, activities or situations
    - i. Exhibitionism: compulsive need to expose one's body, particularly the genitals
    - ii. Fetishism: use of nonliving objects as substitutes for a human sexual love object
    - iii. Sexual masochism: sexual gratification is gained by being humiliated, beaten, bound or otherwise made to suffer by another person
    - iv. Sexual sadism: sexual gratification is gained by inflicting physical or psychological pain or humiliation on others
    - v. Transvestic fetishism: cross-dressing
    - vi. Voyeurism: sexual excitement is achieved by observing unsuspecting people who are naked, or engaged in sex
  - b. Sexual dysfunctions: disturbances in sexual desire or change in sexual response
    - i. Gender Identity Disorder
      - 1. A strong and persistent cross-gender identification with the opposite sex
      - 2. Preference for cross-dressings and cross-gender roles
      - 3. Persistent fantasies about being the other sex
- XXVI. Somatoform Disorders
  - a. Patient's mental conflicts are expressed as physical symptoms
  - b. Conversion disorder: loss of physical functioning that suggest a physical disorder but is instead an expression of a psychological conflict or need
  - c. Hypochondriasis: a preoccupation with body aches, pains and discomforts in the absence of real illness
- XXVII. Substance-related Disorders
  - a. Characterized by symptoms and behavioral changes associated with regular use of substances that affect the central nervous system
    - i. Psychological dependence: compulsion to continue

taking a drug despite adverse consequences

- ii. Physical dependence: onset of withdrawal symptoms when the drug is discontinued abruptly
- iii. Tolerance: declining effect of the drug so that the dose must be increased to give the same effect
- b. Alcohol: dependence often associated with the use and abuse of alcohol, and sometimes leads to abuse of more lethal drugs
- c. Amphetamines: CNC stimulants are taken orally or intravenously
- d. Cannabis: class of drugs includes all substance with psychoactive properties derived from the cannabis plant
- e. Cocaine: a stimulant drug that produces euphoria as well as vasoconstriction, tachycardia and hypertension
- f. Hallucinogens: produce a state of CNC excitement, hyperactivity, hallucinations, delusions, hypertension and mood changes.
- g. Opioids: group includes heroin and morphine and synthetic drugs with morphine-like action, such as codeine
- h. Sedatives, hypnotics or anxiolytics: these drugs have a soothing relaxing, euphoric effect and also can produce sleep

XXVIII. Therapeutic Modalities

- a. Psychotherapy: treatment of emotional disorders by using psychological techniques
- b. Cognitive Behavioral Therapy (CBT): short-term, focused psychotherapy or a wide range of psychological problems
- c. Family Therapy: treatment of an entire family to help members resolve and understand their conflicts and problems
- d. Group Therapy: a group with a health professional leader as moderator; patients with similar problems gain insight into their own personalities through discussions and interactions with each other
- e. Hypnosis: a trance state is created to help recovery of deeply repressed memories
- f. Insight-oriented Psychotherapy: uses face-to-face discussion of life problems and associated feelings
- g. Play Therapy: the child uses play with toys to express conflicts and feelings that he or she is unable to communicate in a direct manner
- Psychoanalysis: long-term and intense form of psychotherapy seeks to influence behavior and resolve internal conflicts by allowing patients to bring their unconscious emotions to the surface
- i. Sex Therapy: can help people overcome sexual dysfunctions
- j. Supportive Psychotherapy: the therapist offers encouragement, support and hope to patients facing difficult life transitions and

events

#### XXIX. Drug Therapy

- a. Antianxiety and antipanic agents: drugs lessen anxiety, tension, and agitation
- b. Antidepressants: drugs gradually reverse depressive symptoms and return the patient to a more even state
- c. Anti-obsessive-compulsive disorder agents: are prescribed to relieve the symptoms of OCD
- d. Antipsychotics: these drugs modify psychotic symptoms and behavior
- e. Hypnotics: used to produce sleep and relieve insomnia
- f. Mood stabilizers: used primarily to treat patients with maniapredominant form of bipolar disease
- g. Stimulants: prescribed for attention-deficit hyperactivity disorder (ADHD)

Term	Meaning
affect	External expression of emotion response
amnesia	Loss of memory
anorexia nervosa	Eating disorder with excessive dieting and refusal to maintain a normal body weight
anxiety disorders	Characterized by unpleasant tension, distress, and avoidance behavior; examples are panic disorder, phobias, obsessive-compulsive disorder, post-traumatic stress disorder, and generalized anxiety disorder
apathy	Absence of emotions; lack of interest or emotional involvement
autism	Pervasive development disorder characterized by inhibited social interaction and communication, and by restricted, repetitive behavior
bipolar disorder	Mood disorder with alternating periods of mania and depression
bulimia nervosa	Eating disorder with binge followed by vomiting, purging and depression
cannabis	Substances (cannabis plant) from which marijuana is made
compulsion	Uncontrollable urge to perform an act repeatedly
conversion disorder	Condition marked by physical symptoms with no organic basis appearing as a result of anxiety and unconscious inner conflict
defense mechanism	Unconscious technique (coping mechanism) a person uses to resolve or conceal conflicts and anxiety; it

#### XXX. Vocabulary

	protects the individual against anxiety and stress; examples are acting out, denial and repression	
delirium	Confused thinking, disorientation, changes in alertness.	
	difficulty paying attention, and fearfulness. This is	
	usually a reversible impairment in thinking. Delirium	
	tremens is associated with alcohol withdrawal	
delusion	Fixed, false belief that cannot be changed by logical	
	reasoning or evidence	
dementia	Loss of intellectual abilities with impairment of	
	memory, judgment and reasoning as well as changes in	
	personality	
depression	Major mood disorder with chronic sadness, loss of	
	energy, hopelessness worry, and discouragement and,	
	commonly, suicidal impulses and thoughts	
dissociative disorder	Chronic or sudden disturbance in memory, identity, or	
	consciousness; examples are multiple personality	
	disorder, psychogenic disorders, amnesia, and fugue	
ego	Central coordinating branch of the personality or mind	
fugue	Flight from customary surroundings; dissociative	
	disorder	
gender identity	the opposite sex	
disorder	False sensory perceptions: operay form instinctual	
nallucination	Faise sensory perceptions; energy form instinctual	
id	Major unconscious part of the personality (operay from	
iu	instinctual drives and desires	
lahila	Instable: undergoing rapid emotional change	
mania	Extreme excitement, hyperactive elation, and agitation	
mood disorders	Prolonged emotion dominates a person's life	
mutism	Nonreactive state with inability to speak (aphonia)	
obsessive-compulsive	Anxiety disorder in which recurrent thoughts and	
••••••	repetitive acts dominate behavior	
paranoia	Overly suspicious system of thinking; fixed delusions	
•	that one is being harassed, persecuted, or unfairly	
	treated	
Paraphilia	Recurrent intense sexual urge, fantasy, or behavior that	
	involves unusual objects, activities, or situations	
personality disorders	Lifelong personality patterns marked by inflexibility and	
	impairment of social functioning	
pervasive	Group of childhood disorders characterized by delays in	
developmental	socialization and communication skills (examples:	
disorders	autism, Asperger syndrome	

phobia	Irrational or disabling fear of an object or situation	
post-traumatic stress disorder	Anxiety-related symptoms appear after personal experience of a traumatic event	
projective (personality) test	Diagnostic personality test using unstructured stimuli to evoke responses that reflect aspects of an individual's personality.	
psychiatrist	Physician with medical training in the diagnosis, prevention and treatment of mental disorders.	
psychologist	Non-medical professional (PhD or EdD) specializing in mental processes and how the brain functions in health and disease	
psychosis	A disorder marked by loss of contact with reality; often with delusions and hallucinations	
reality testing	Psychological process that distinguishes fact from fantasy	
repression	Defense mechanism by which unacceptable thoughts, feelings, and impulses are automatically pushed into the unconscious, out of awareness	
schizophrenia	Chronic psychotic disorder that may include hallucinations, disorganized speech and behavior, flat affect, and lack of initiative	
sexual disorders	Paraphilia and sexual dysfunctions	
somatoform disorder	Presence of physical symptoms that cannot be explained by an actual physical disorder or other well-described mental disorder such as depression	
substance-related disorder	Regular overuse of psychoactive substance that effect the central nervous system (alcohol and other drugs)	
superego	Internalized conscience and moral part of the personality	

# XXXI. Psychiatric Therapy Terms

Term	Meaning
Amphetamines	Central nervous system stimulants that may be used to treat attention deficit-hyperactivity disorder and depression
Atypical antipsychotics	Drugs that treat psychotic symptoms and behavior
Benzodiazepines	Drugs that lessen anxiety, tension, agitation and panic attacks

Cognitive behavioral	Focuses on the connection between behavior and	
therapy	thoughts. Conditionings used to relieve anxiety and	
	improve symptoms of illness	
Electroconvulsive	Electric current is used to produce a change in brain	
therapy	wave patterns with resulting convulsions and loss of	
	consciousness: effective in the treatment of major	
	depression. Modern techniques use anesthesia, so the	
	convulsion is not observable	
Family therapy	Treatment of an entire family to resolve and shed light	
	on conflicts	
Free association	Psychoanalytic technique in which the patient	
	verbalizes, without censorship, the passing contents of	
	his or her mind	
Group therapy	Group of patients with similar problems gain insight	
	into their personalities through discussion and	
	interaction with each other	
Hypnosis	Trance (state of altered consciousness) is used to	
	increase the pace of psychotherapy	
Insight-orientated	Face-to-face discussion of life problems and associated	
therapy	feelings. The patient tells his or her story and has the	
	opportunity to connect emotional patterns in his or her	
	life history with present concerns; also called	
	psychodynamic therapy	
Lithium	Medication used to treat the manic stage of manic-	
	depressive illness	
Neuroleptic drug	Any drug that favorably modifies psychotic symptoms.	
	Examples are Phenothiazines such as Chlorpromazine	
	(Thorazine)	
Phenothiazines	Antipsychotic (neuroleptic) drugs	
Play therapy	Treatment in which a child, through use of toys in a	
	playroom setting, expresses conflicts or feelings they	
	are unable to communicate in a direct manner	
Psychoanalysis	Long-term and intense form of psychotherapy that seeks	
	to influence behavior and resolve internal conflicts by	
	allowing patients to bring their unconscious emotions to	
	the surface	
Psychodrama	Group therapy in which patient expresses feeling	
	through acting out family and social roles with other	
	patients	
Psychopharmacology	Treatment of psychiatric disorders with drugs	
Sedatives	Drugs that lessen anxiety	
Supportive	Offering encouragement, support, and hope to patients	

psychotherapy	facing difficult transitions and events	
Transference	Psychoanalytic process in which the patient relates to	
	the therapist as though the therapist were a prominent	
	childhood figure	
Tricyclic	Drugs used to treat severe depression	
antidepressants		

# XXXII. Combining Forms

Combining Form	Meaning
Anxi/o	Uneasy, anxious,
	distressed
Aut/o	Self
Hallucin/o	Hallucination, to wander
	in the mind
Hypn/o	Sleep
Latr/o	Treatment
Ment/o	Mind
Neur/o	Nerve
Phil/o	Attraction to, love
Phren/o	Mind
Psych/o	Mind
Schiz/o	Split
Somat/o	Body

#### XXXIII. Prefixes

Prefix	Meaning
a-, an-	No, not
cata-	Down
hypo-	Deficient, less than,
	below
para-	Abnormal

### XXXIV. Suffixes

Suffix	Meaning
-genic	Produced by
-leptic	To seize hold of
-mania	Obsessive preoccupation
-phobia	Fear (irrational and often

		disabling)
-ph	oria	Feeling, bearing
-th	ymia	Mind

### XXXV. Abbreviations

Abbreviation	Meaning
AD	Alzheimer's disease a form of dementia
ADHD	Attention deficit hyperactivity disorder
ADLs	Activities of daily living
AIMS	Abnormal involuntary movement scale used to
	monitor signs of tardive dyskinesia
ASD	Autism spectrum disorder
BZD	Benzodiazepine
СА	Chronological age
СВТ	Cognitive behavioral therapy
CNS	Central nervous system
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders,
	4 <sup>th</sup> edition, revised
DT	Delirium tremens
ECT	Electroconvulsive therapy
GAD	Generalized anxiety disorder
IQ	An IQ test is a standardized test to determine mental
	age of an individual. The average person is considered
	to have an IQ of between 90 and 110. Those who score
	below 70 are considered mentally retarded.
LSD	Lysergic acid diethylamide a hallucinogen
MA	Mental age as determined by psychological tests
MAOI	Monoamine oxidase inhibitor- examples: moclobemide
	(Aurorix), phenelzine (Nordil), selegiline (Deprenyl), and
	tranylcypromine (Parnate)
MDD	Major depressive disorder
MMPI	Minnesota Multiphasic Personality Inventory
MR	Mental retardation
OCD	Obsessive-compulsive disorder
PDD	Pervasive developmental disorder includes autism and
	Asperger syndrome
PTSD	Post-traumatic stress disorder
Rx	Therapy
SAD	Seasonal affective disorder
SNRI	Serotonin norepinephrine reuptake inhibitor
	examples: duloxetine (Cymbalta), venlafaxine (Effexor),

	desvenlafaxine (Pristiq)
SSRI	Selective serotonin reuptake inhibitor examples:
	fluoxetine (Prozac), paroxetine (Paxil), sertraline (Zoloft)
ТАТ	Thematic Apperception Test
ТСА	Tricyclic antidepressants
TD	Tardive dyskinesia
THC	Delta-9-tetrahydrocannabinol active ingredient in
	marijuana
WAIS	Wechsler Adult Intelligence Scale
WISC	Wechsler Intelligence Scale for Children
Ψ	Symbol for psych-
ΨRx	Psychotherapy

#### Activity

- I. Make flash cards of the psychology terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete the Psychiatric Combining Forms Worksheet.
- III. Complete the Psychiatric Vocabulary Worksheet.
- IV. Review media terms with the students using review games such as the "Fly Swatter Game" or the "Flash Card Drill" (see the Medical Terminology Activity Lesson Plan – <u>http://texashste.com/documents/curriculum/principles/medical\_termin ology\_activities.pdf</u>.
- V. Research and report on diseases and disorders related to psychology.

#### Assessment

Successful completion of the activities

#### Materials

Computer and data projector Disease report rubric Index cards Ink Blots List of psychiatric terms worksheet and key Markers
Psychiatric combining forms, prefixes and abbreviation worksheet and key

#### **Accommodations for Learning Differences**

For reinforcement, the student will practice terms using flash cards related to psychology.

For enrichment, the students will research various psychiatric disorders. Share findings with the class using a multimedia presentation.

#### National and State Education Standards

#### **National Healthcare Foundation Standards and Accountability Criteria:** Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

### TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;
- (E) recall directional terms and anatomical planes related to the body structure
- (F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases, and treatments.
- 130.203 (c) (2) (B) employ increasingly precise language to communicate
- 130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:
  - (A) distinguish medical abbreviations used throughout the health science industry; and
  - (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

130.203(c)(5)(B) translate medical terms to conversational language to facilitate communication;

- (C) distinguish medical terminology associated with medical specialists such as geneticist, pathologists, and oncologist
- (D) summarize observations using medical terminology; and
- (E) correctly interpret contents of medical scenarios.

#### **Texas College and Career Readiness Standards**

English and Language Arts

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships to other words and concepts.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

3. Use reference guides to confirm the meanings of new words or concepts.

#### Cross-Disciplinary Standards

I. Key Cognitive Skills D. Academic Behavior: 1. Self-monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

# **Psychiatric Terms-Worksheet**

Term	Meaning
affect	
amnesia	
anorexia nervosa	
anxiety disorders	
apathy	
autism	
bipolar disorder	
bulimia nervosa	
cannabis	
compulsion	
conversion disorder	
defense mechanism	
delirium	
delusion	
dementia	
depression	

dissociative disorder	
ego	
fugue	
gender identity disorder	
hallucination	
id	
labile	
mania	
mood disorders	
mutism	
obsessive-compulsive	
paranoia	
paraphilia	
personality disorders	
pervasive developmental disorders	
phobia	
post-traumatic stress disorder	

projective (personality) test	
psychiatrist	
psychologist	
psychosis	
reality testing	
repression	
schizophrenia	
sexual disorders	
somatoform disorder	
substance-related disorder	
superego	

# Psychiatry Therapy Terms

Term	Meaning
Amphetamines	
Atypical antipsychotics	
Benzodiazepines	
Cognitive behavioral therapy	
Electroconvulsive therapy	
Family therapy	
Free association	
Group therapy	
Hypnosis	
Insight-orientated therapy	
Lithium	
Neuroleptic drug	
Phenothiazines	
Play therapy	
Psychoanalysis	

Psychodrama	
Psychopharmacology	
Sedatives	
Supportive psychotherapy	
Transference	
Tricyclic antidepressants	

# **Psychiatric Terms**

Term	Meaning
affect	External expression of emotion response
amnesia	Loss of memory
anorexia nervosa	Eating disorder with excessive dieting and refusal to maintain a normal body weight
anxiety disorders	Characterized by unpleasant tension, distress, and avoidance behavior; examples are panic disorder, phobias, obsessive- compulsive disorder, post-traumatic stress disorder, and generalized anxiety disorder
apathy	Absence of emotions; lack of interest of emotional involvement
autism	Pervasive development disorder characterized by inhibited social interaction and communication, and by restricted, repetitive behavior
bipolar disorder	Mood disorder with alternating periods of mania and depression
bulimia nervosa	Eating disorder with binge followed by vomiting, purging and depression
cannabis	Substances (cannabis plant) from which marijuana is made
compulsion	Uncontrollable urge to perform an act repeatedly
conversion disorder	Condition marked by physical symptoms with no organic basis appearing as a result of anxiety and unconscious inner conflict
defense mechanism	Unconscious technique (coping mechanism) a person uses to resolve or conceal conflicts and anxiety. It protects the individual against anxiety and stress; examples are acting out, denial and repression
delirium	Confused thinking, disorientation, changes in alertness, difficulty paying attention, and fearfulness. This usually a reversible impairment in thinking. Delirium tremens is associated with alcohol withdrawal
delusion	Fixed, false belief that cannot be changed by logical reasoning or evidence
dementia	Loss of intellectual abilities with impairment of memory, judgment and reasoning as well as changes in personality
depression	Major mood disorder with chronic sadness, loss of energy, hopelessness worry, and discouragement and, commonly, suicidal impulses and thoughts

dissociative disorder	Chronic or sudden disturbance in memory, identity, or consciousness; examples are multiple personality disorder, psychogenic disorders, amnesia, and fugue
ego	Central coordinating branch of the personality or mind
fugue	Flight from customary surroundings; dissociative disorder
gender identity disorder	Strong and persistent cross-gender identification with the opposite sex
hallucination	False sensory perception; energy form instinctual drives and desires
id	Major unconscious part of the personality (energy from instinctual drives and desires
labile	Unstable; undergoing rapid emotional change
mania	Extreme excitement, hyperactive elation, and agitation
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mutism	Nonreactive state with inability to speak (aphonia)
obsessive-compulsive	Anxiety disorder in which recurrent thoughts and repetitive acts dominate behavior
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personality disorders	Lifelong personality patterns marked by inflexibility and impairment of social functioning
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projective (personality) test	Diagnostic personality test using unstructured stimuli to evoke responses that reflect aspects of an individual's personality
psychiatrist	Physician with medical training in the diagnosis, prevention and treatment of mental disorders
psychologist	Non-medical professional (PhD or EdD) specializing in mental processes and how the brain functions in health and disease
psychosis	A disorder marked by loss of contact with reality; often with delusions and hallucinations
reality testing	Psychological process that distinguishes fact from fantasy

repression	Defense mechanism by which unacceptable thoughts, feelings, and impulses are automatically pushed into the unconscious, out of awareness
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superego	Internalized conscience and moral part of the personality

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	conditioning used to relieve anxiety and improve symptoms of
	illness
Electroconvulsive therapy	Electric current is used to produce a change in brain wave
	patterns with resulting convulsions and loss of consciousness;
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	techniques use anesthesia, so the convulsion is not
	observable
Family therapy	Treatment of an entire family to resolve and shed light on
	conflicts
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	feelings. The patient tells his or her story and has the
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Transference	Psychoanalytic process in which the patient relates to the therapist as though the therapist were a prominent childhood figure
Tricyclic antidepressants	Drugs used to treat severe depression

## **Combining Forms**

Combining Form	Meaning
Anxi/o	
Aut/o	
Hallucin/o	
Hypn/o	
latr/o	
Ment/o	
Neur/o	
Phil/o	
Phren/o	
Psych/o	
Schiz/o	
Somat/o	

### Suffixes

Suffix	Meaning
-genic	
-leptic	
-mania	
-phobia	
-phoria	
-thymia	

## Prefixes

Prefix	Meaning
a-, an-	
cata-	
hypo-	
para-	

### Abbreviations

Abbreviation	Meaning
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ADHD	
ADLs	
AIMS	
ASD	
BZD	
СА	
СВТ	
CNS	
DSM-IV-TR	
DT	
ECT	
GAD	
IQ	
LSD	
MA	
MAOI	
MDD	
MMPI	
MR	
OCD	
PDD	
PTSD	
Rx	
SAD	
SNRI	
SSRI	
TAT	
ТСА	
TD	
THC	
WAIS	
WISC	
Ψ	
ΨRx	

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Ment/o	Mind
Neur/o	Nerve
Phil/o	Attraction to, love
Phren/o	Mind
Psych/o	Mind
Schiz/o	Split
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IQ	An IQ test is a standardized test to determine mental age of an individual.
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MR	Mental retardation
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PDD	Pervasive developmental disorder includes autism and Asperger syndrome
PTSD	Post-traumatic stress disorder
Rx	Therapy
SAD	Seasonal affective disorder
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	(Cymbalta), venlafaxine (Effexor), desvenlafaxine (Pristiq)
SSRI	Selective serotonin reuptake inhibitor examples: fluoxetine (Prozac),
	paroxetine (Paxil), sertraline (Zoloft)
TAT	Thematic Apperception Test
ТСА	Tricyclic antidepressants
TD	Tardive dyskinesia
тнс	Delta-9-tetrahydrocannabinol active ingredient in marijuana
WAIS	Wechsler Adult Intelligence Scale

### Abbreviations

WISC	Wechsler Intelligence Scale for Children
Ψ	Symbol for psych-
ΨRx	Psychotherapy

## Ink Blot Images



