MEDICAL TERMINOLOGY · STUDY GUIDE

Final Exam Study Guide

The final covers all fourteen chapters. Each chapter here is shorter than in the exam guides: three paragraphs of what to know, the points to lock in, one table, two worked cases, the traps and six new self-test items. If a chapter feels shaky, go back to its exam guide for the full treatment. The long cram sheet at the end pulls the rules, look-alikes, numbers and safety abbreviations of the whole course into one place. Work two chapters a day and the whole course fits into a week.

WHAT THIS GUIDE COVERS

- Word building: chapters 1, 2 and 3 (word parts and vowel rules; suffixes; prefixes).
- The body map and the outer systems: chapters 4, 5 and 6 (body structure and directions; skin; bones, joints and muscles).
- Circulation and defense: chapters 7 and 8 (heart and vessels; blood, lymph and immunity).
- The tubes: chapters 9, 10 and 11 (respiratory; digestive; urinary).
- Reproduction, nerves and hormones: chapters 12, 13 and 14 (reproduction, obstetrics and newborn; nervous system, psychiatry and senses; endocrine, abbreviations and documentation).
- Every chapter carries what to know, a table, two worked cases, the traps and a six-item self-test, and the cram sheet holds the whole course.

CHAPTER 1

How Medical Words Are Built

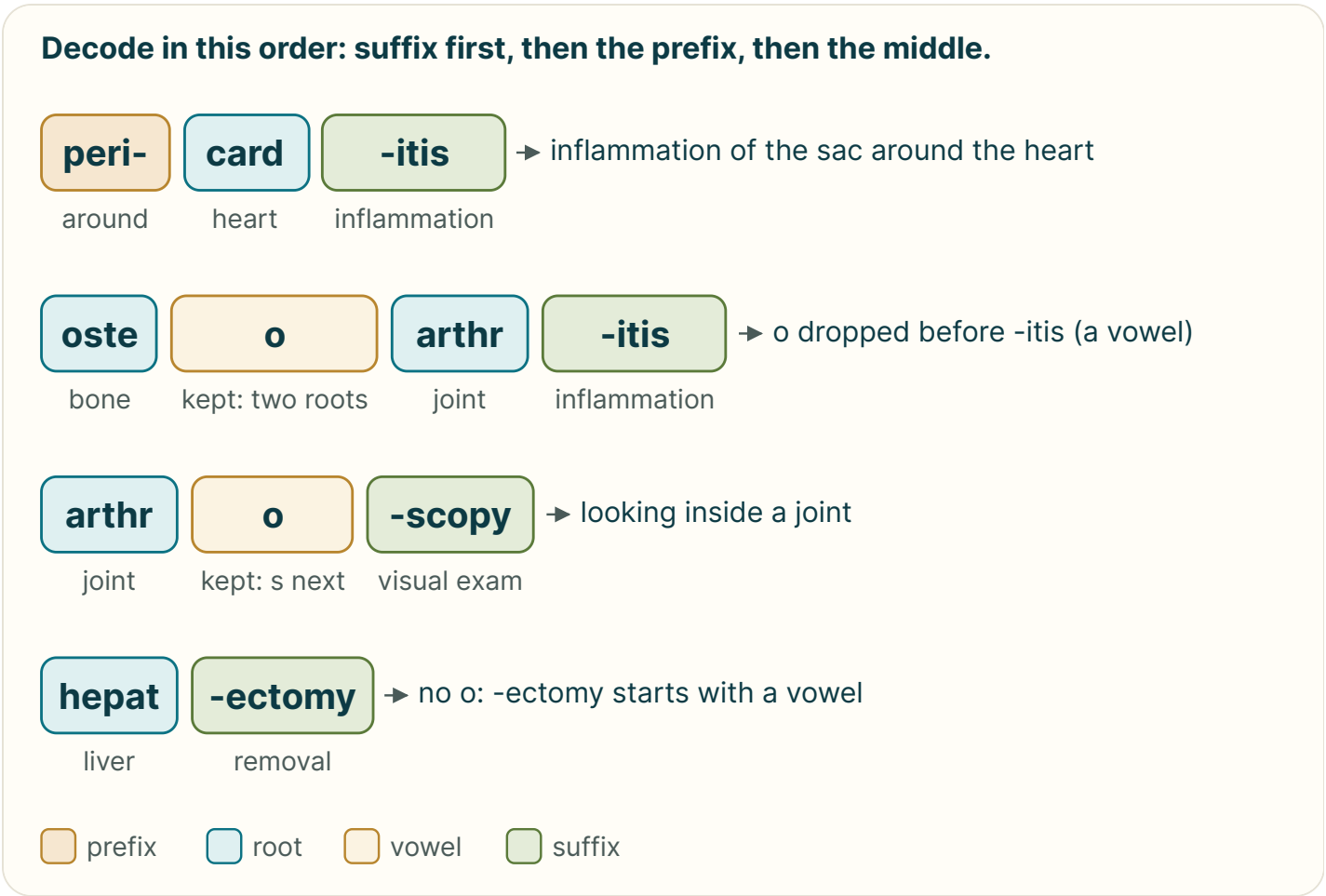
Read it in full: **Chapter 1 in the textbook**. Practice it in the lab: **Near Misses: The Roots That Trip Everyone** and **Say It, Spell It, Pluralize It**.

What to know

Every term is built from four parts: a **root** naming a structure or substance, a **combining vowel** (almost always o) that makes it sayable, a **suffix** saying what is happening, and an optional **prefix** for position, number, time or degree. A root with its vowel is a combining form, written gastr/o.

Keep the vowel before a consonant suffix (arthroscopy), drop it before a vowel suffix (arthritis), keep it between two roots (osteoarthritis). Prefixes never take one. Decode suffix first, prefix second, middle last, then confirm the clinical meaning. Greek roots tend to name disease and surgery (nephrectomy); Latin roots name structure (renal).

Learn look-alikes as pairs: ile/o (ileum) and ili/o (ilium), my/o and myel/o, arteri/o, ather/o and arthr/o, ureter/o and urethr/o, pyel/o and py/o. The p is silent in initial ps-, pn-, pt-. Keep Greek and Latin plurals. Eponyms drop the possessive. On the Do Not Use list: U, IU, Q.D., Q.O.D., trailing zeros and missing leading zeros.



Every term is built from the same four parts. Keep the o before a consonant and between two roots, drop it before a vowel, and never put one after a prefix.

LOCK THESE IN

- Root, vowel, suffix, prefix; vowel kept before a consonant and between roots.
- Decode suffix first.
- -ectomy removes, -tomy cuts, -stomy opens.
- Write unit, International Unit, daily, 1 mg, 0.5 mg.
- Dysphagia is swallowing; dysphasia is speech.

Chapter 1 parts and rules

Item	Meaning or rule	Example
combining form	root + vowel + slash	cardi/o, gastr/o
vowel rules	keep, drop, keep between roots	arthroscopy, arthritis, osteoarthritis
nephr/o vs ren/o	Greek disease and surgery vs Latin structure	nephrectomy, renal
cyan/o, erythr/o, leuk/o, melan/o, xanth/o	blue, red, white, black, yellow	cyanosis, xanthoma
-a, -us, -um, -is, -ix	-ae, -i, -a, -es, -ices	vertebrae, bronchi, ova, diagnoses, appendices
-nx, -on, -oma	-nges, -a, -omata	phalanges, ganglia, carcinomata
acronym vs initialism	said as a word vs spelled out	CABG vs COPD

Worked cases

WORKED CASE 1 · DECODE A LONG TERM

Decode electroencephalogram.

SUFFIX

-gram, the record.

ROOTS IN ORDER

electr/o (electricity), encephal/o (brain).

ANSWER

A record of the brain's electrical activity (EEG).

WORKED CASE 2 · BUILD WITH THE RULES

Build "inflammation of the stomach and small intestine."

PARTS

gastr/o + enter/o + -itis.

VOWELS

Keep the o between roots; drop the o of enter/o before -itis.

ANSWER

Gastroenteritis.

TRAPS PEOPLE FALL INTO

- **Adding a vowel after a prefix.** It is subcutaneous, not "suboc..."
- **Reading front to back.** The suffix decides the meaning.
- **Writing ileum for ilium.** Bowel vs hip bone.
- **Swapping the U and IU rules.** unit; International Unit.

Chapter 1 self-test · six items

1. Which part of a term is optional?

A. The prefix
B. The suffix
C. The root
D. The ending

A. The prefix Gastritis has no prefix. Every term has a root and a suffix.

2. Which spelling follows the vowel rules?

A. Hepatoectomy
B. Hepatctomy
C. Hepatectomy
D. Hepatiectomy

C. Hepatectomy -ectomy starts with a vowel, so the o of hepat/o drops.

3. Which pair is Greek root for disease and Latin root for description?

A. Cutaneitis and dermal
B. Dermatitis and subcutaneous
C. Renectomy and nephral
D. Pulmonitis and pneumonary

B. Dermatitis and subcutaneous Derm/o takes disease suffixes; cutane/o gives the descriptive adjective.

4. What is the plural of vertebra?

A. Vertebras
B. Vertebrae
C. Vertebri
D. Vertebrata

B. Vertebrae -a becomes -ae.

5. Which term means a stone in a ureter?

A. Ureterolithiasis
B. Urethrolithiasis
C. Urolithotomy
D. Pyelolithiasis

A. Ureterolithiasis Ureter/o is the tube from kidney to bladder.

6. How is "Q.D." written safely?

A. every day QD
B. q day
C. qd
D. daily

D. daily Q.D. is on the Do Not Use list; write daily.

CHAPTER 2

Suffixes: Conditions, Procedures and Specialties

Read it in full: **Chapter 2 in the textbook**. Practice it in the lab: **Split the Diagnosis** and **Plurals and Practitioners**.

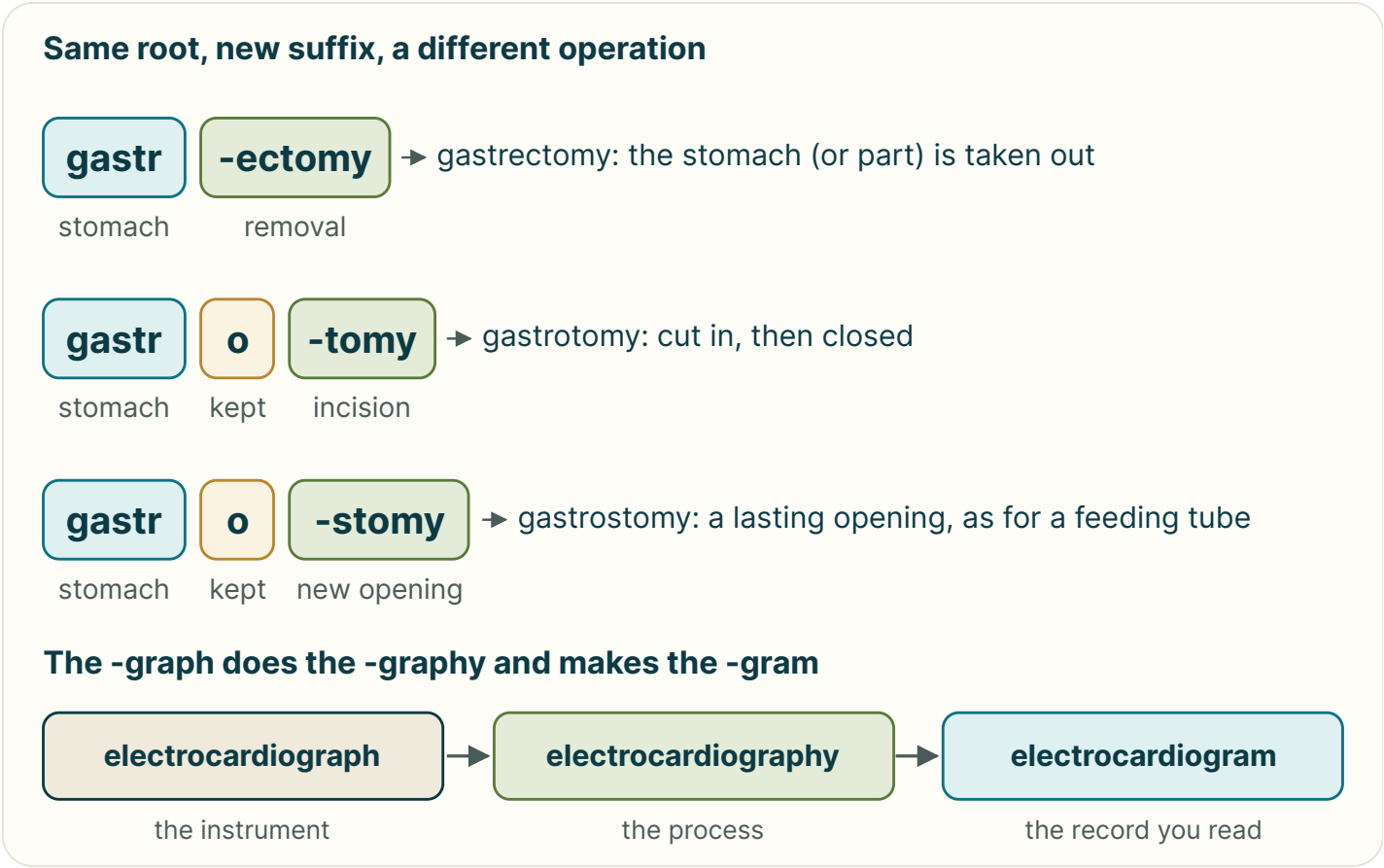
What to know

Suffixes do four jobs: name a condition, a procedure, a specialty or person, or simply make an adjective. The o in "-otomy" and "-ostomy" is the root's vowel, so gastrectomy drops it and gastrostomy keeps it.

Conditions: -itis, -osis (increase on a cell root), -iasis (presence of, stones), -pathy, -oma (mass, not always cancer), -emia, -megaly, -malacia, -sclerosis, -stenosis, -ptosis, -cele, -ectasis, -lysis, -

penia. The -rrh family: -rrhage bleeding, -rrhea flow, -rrhexis rupture, -rrhaphy suture repair. Symptoms: -algia, -pnea, -phagia, -phasia, -plegia, -paresis, -emesis, -ptysis.

Looking: -scope and -scopy, -graph, -graphy and -gram, -meter and -metry, -opsy. Surgery: -ectomy, -tomy, -stomy, -plasty, -pexy, -rrhaphy, -desis, -centesis, -tripsy. People: -logy and -logist, -iatry and -iatrist, -iatrics and -ician. Adjectives: -ac, -al, -ar, -ary, -eal, -ic, -ous; -oid, -genic, -form. Mucus is a noun; mucous is an adjective.



Read the suffix first. The root stays the same while the suffix decides whether the stomach is removed, cut into or opened, and the ending tells a machine from a test from a tracing.

LOCK THESE IN

- -rrhaphy is the only surgical -rrh suffix.
- The -graph does the -graphy and makes the -gram.
- -plasty rebuilds, -pexy anchors, -desis fuses.
- -ptosis droops; -ptysis spits.
- -logy is a field; -logist a person.

Chapter 2 suffixes

Suffix	Meaning	Example
-iasis	presence of	cholelithiasis
-ectasis	dilation	bronchiectasis
-cele	hernia, protrusion	meningocele
-rrhage / -rrhea / -rrhexis / -rrhaphy	bleed / flow / rupture / suture	hemorrhage, rhinorrhea, angiorrhexis, herniorrhaphy
-scope / -scopy	instrument / exam	laryngoscope, laparoscopy
-centesis, -tripsy, -desis	drain, crush, fuse	paracentesis, lithotripsy, arthrodesis
-iatrics / -ician	field / practitioner	geriatrics, pediatrician

Worked cases

WORKED CASE 1 · PICK THE SUFFIX

Choose the suffix for each: stitch a hernia closed; crush a kidney stone; anchor a testis in the scrotum.

STITCH

-rrhaphy: herniorrhaphy.

CRUSH

-tripsy: lithotripsy.

ANCHOR

-pexy: **orchiopexy**.

WORKED CASE 2 · INSTRUMENT OR PROCEDURE

Is a "dermatome" a procedure?

ENDING

-tome is a cutting instrument; -tomy is the cut.

ANSWER

No, it is an instrument for cutting thin slices of skin (in Chapter 4 it also names a skin area served by one spinal nerve).

TRAPS PEOPLE FALL INTO

- **Calling every -oma cancer.** Lipoma and hematoma are not.
- **Reading -rrhaphy as bleeding.** It is a suture repair.
- **Mixing -plegia and -paresis.** Paralysis vs weakness.
- **Charting "mucous" as the substance.** The noun is mucus.

Chapter 2 self-test · six items

1. Which suffix means narrowing?

A. -sclerosis
B. -stenosis
C. -ectasis
D. -malacia

B. -stenosis Pyloric stenosis is a narrowed stomach outlet.

2. Bursting forth of blood is named by:

A. -rrhea
B. -rrhexis
C. -rrhage
D. -rrhaphy

C. -rrhage Hemorrhage. -rrhea is flow and -rrhexis rupture.

3. A breathing test measured with a spirometer is:

A. Spirograph
B. Spirogram
C. Spirometry
D. Spiroscope

C. Spirometry -metry is the process of measuring.

4. What does -genic mean in carcinogenic?

A. Resembling
B. Shaped like
C. Pertaining to
D. Producing

D. Producing Carcinogenic means cancer-producing. -oid is resembling.

5. Which pair is field and practitioner?

A. Podiatry and podiatrician
B. Pediatrics and pediatrist
C. Geriatry and geriatrician
D. Podiatry and podiatrist

D. Podiatry and podiatrist -iatry pairs with -iatrist; -iatrics pairs with -ician.

6. What is the plural of appendix in anatomy?

A. Appendices
B. Appendixes
C. Appendixi
D. Appendae

A. Appendices -ix becomes -ices.

CHAPTER 3

Prefixes: Position, Number, Time and Negation

Read it in full: **Chapter 3 in the textbook**. Practice it in the lab: **The Front of the Word** and **Before, During, After**.

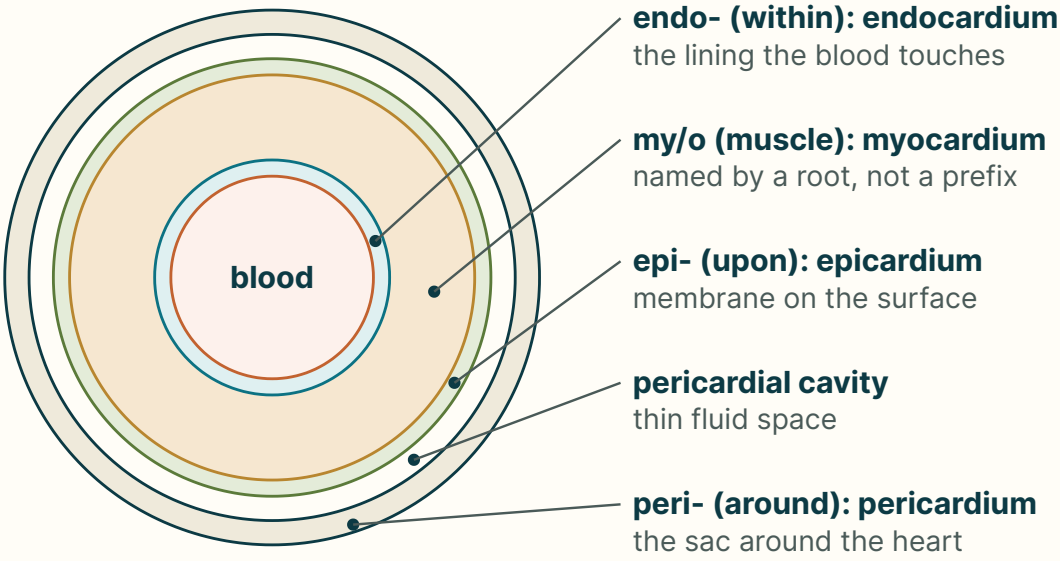
What to know

A prefix qualifies the term, takes no combining vowel and never changes the plural. Assimilation changes a few: a- to an- before a vowel or h, syn- to sym- and in- to im- before b, m or p. Hyper- is above normal and hypo- below normal or under; read the whole word.

Position and direction: endo-, epi-, peri-, sub-, infra-, supra-, inter- (between), intra- (within), extra-, ecto-, retro-, para- (beside, abnormal, assisting), meta- (beyond, change), trans- and per- (through), ab- (away) and ad- (toward), ipsi- and contra-. Number: mono-, uni-, bi-, di-, tri-, quadri-, tetra-, multi-, poly-, primi-, nulli-, pan-; hemi- is a true half, semi- is partial.

Time and speed: pre-, pro-, ante- (before), post-, intra- (during), peri- (around), neo- (new), re-, syn-, tachy- (over about 100 bpm) and brady- (under about 60 bpm). Urine scale: polyuria, oliguria (under about 400 mL in 24 hours), anuria. Negation, opposition and quality: a-, an-, in-, non-, un-; anti-, contra-, de-; dys-, eu-, mal-, pseudo-, ortho-.

Prefixes name the layers



Add -itis: endocarditis, myocarditis, pericarditis.

One root, four positions. Endo-, epi- and peri- move to other organs unchanged: endometrium, epidermis, periosteum.

LOCK THESE IN

- No vowel after a prefix; no change to the plural.
- Inter- between, intra- within; ab- away, ad- toward.
- Ante- before, anti- against.
- A- means absent, not reduced.
- Neoplasm is a new growth, benign or malignant.

Chapter 3 prefixes

Prefix	Meaning	Example
juxta-	near	juxtaglomerular
per- vs peri-	through vs around	percutaneous, pericardial
ana- / cata-	up / down	anabolism, catabolism
dipl/o-	double	diplopia
pro-	before, forward	prognosis, prodrome, prolapse
mal-	bad, poor	malabsorption, malunion
auto-, allo-, xen/o-	self, other, foreign	autoimmune, allograft, xenograft

Worked cases

WORKED CASE 1 · APPLY ASSIMILATION

Build the term for absence of sensation.

PARTS

a- (without) + -esthesia (sensation).

ASSIMILATION

-esthesia starts with a vowel, so a- becomes an-.

ANSWER

Anesthesia.

WORKED CASE 2 · PICK THE HALF

Which is correct: hemicolectomy or semicolectomy?

MEANING

Removal of one true half of the colon.

ANSWER

Hemicolectomy. Semi- means partial, as in semi-Fowler.

TRAPS PEOPLE FALL INTO

- **Mixing hyper- and hypo-.** Opposite meanings, one letter apart.
- **Reading every in- as "not."** Incision means cutting into.
- **Using semi- for one side of the body.** Hemiplegia, never semiplegia.
- **Mixing per- and peri-.** Through vs around.

Chapter 3 self-test · six items

1. Which term means sugar below normal in the blood?

A. Hyperglycemia
B. Glycosuria
C. Hypoglycemia
D. Euglycemia

C. Hypoglycemia Hypo- is below normal.

2. Which prefix in ipsilateral means "same"?

A. contra-
B. ipsi-
C. uni-
D. iso-

B. ipsi- Ipsilateral is on the same side.

3. A woman who has never given birth is a:

A. Primipara
B. Multipara
C. Primigravida
D. Nullipara

D. Nullipara Nulli- means none.

4. Early symptoms that come before an illness are a:

A. Prodrome
B. Prognosis
C. Syndrome
D. Relapse

A. Prodrome Pro- (before) + -drome (running).

5. Which term means normal, easy breathing?

A. Eupnea
B. Dyspnea
C. Apnea
D. Orthopnea

A. Eupnea Eu- means good or normal.

6. A drug that works against fever is an:

A. Antiemetic
B. Antipyretic
C. Antitussive
D. Antecubital

B. Antipyretic Pyret/o is fever. Antitussive works against cough.

CHAPTER 4

Body Structure, Directional Terms and Planes

Read it in full: **Chapter 4 in the textbook**. Practice it in the lab: **Planes, Cuts and Positions** and **The Chart Line Lab**.

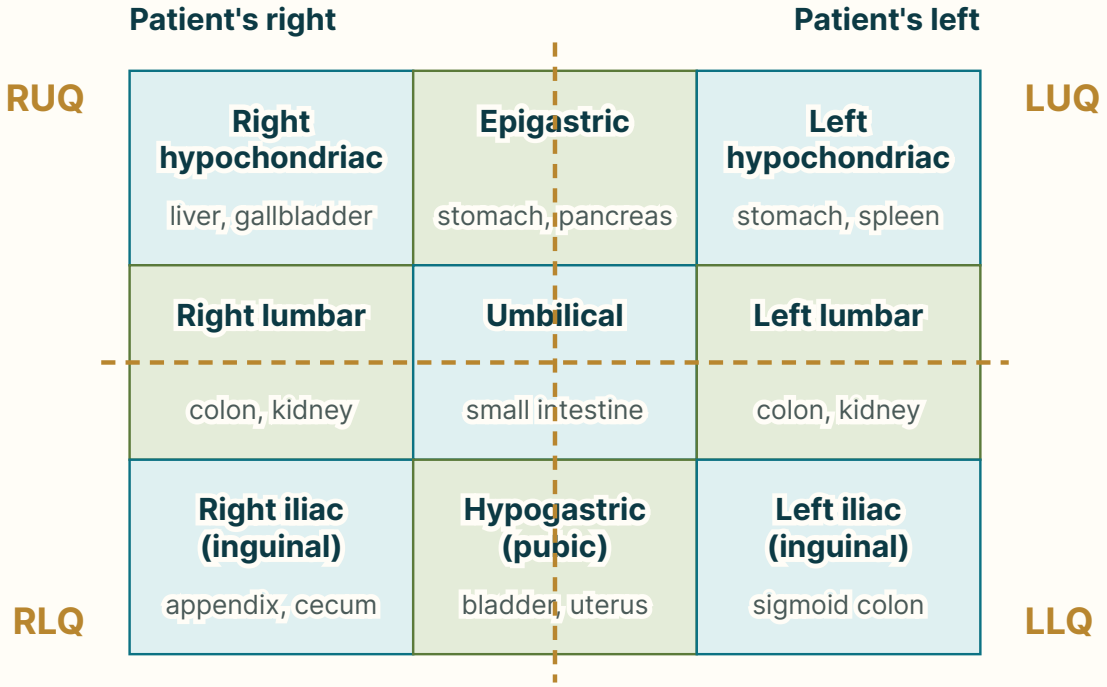
What to know

Levels: cell (cyt/o), tissue (hist/o), organ, system, organism. Four tissues: epithelial, connective, muscle, nervous. -plasia: hyperplasia (too many cells), aplasia, dysplasia (disordered). Local vs systemic; somatic pain is easy to point to, visceral pain is dull.

All directions assume the anatomical position (standing, facing forward, palms forward), with right and left the patient's. Pairs: superior and inferior, anterior and posterior, medial and lateral, proximal and distal, superficial and deep; -ad means toward. AP is front to back; a standard chest film is PA. Planes: sagittal (right and left), frontal or coronal (front and back), transverse or axial (upper and lower).

Positions: supine, prone, Fowler (about 45 to 60 degrees), semi-Fowler, high Fowler, Trendelenburg (head down), lithotomy, Sims. The dorsal cavity holds brain and cord; the ventral cavity is split by the diaphragm. Retroperitoneal organs: kidneys, adrenals, ureters, most of pancreas and duodenum, aorta, IVC. Peritoneum is not perineum. Four quadrants or nine regions.

Nine regions (grid) and four quadrants (dashed lines through the navel)



Facing the patient, their right is on your left. Quadrants are quick for charting; the nine regions are more precise, and every region name can be decoded.

LOCK THESE IN

- Right and left belong to the patient.
- Proximal nearer the trunk; distal farther.
- Sagittal right and left; coronal front and back; transverse upper and lower.
- Supine face up; prone face down.
- Never pluralize a plural; viscus is singular.

Chapter 4 terms

Term	Meaning	Use
cephalad / caudal	toward the head / toward the tail	incision extended cephalad
parietal / visceral	wall layer / organ layer	pleura, peritoneum
mediastinum	central chest space	heart, esophagus, trachea
hypochondriac region	under the rib cartilage	liver on the right
epigastric / hypogastric	above / below the stomach	upper / lower center
plantar / palmar (volar)	sole / palm	dorsum of foot is its top
ped/o vs pod/o	foot or child vs foot	pediatrics vs podiatrist

Worked cases

WORKED CASE 1 · DECODE A LOCATION

Decode "subcostal incision."

PARTS

sub- (under) + cost/o (rib) + -al.

ANSWER

An incision under the rib.

WORKED CASE 2 · CHOOSE A PLANE

A CT slice divides the body into upper and lower parts. Name the plane.

RULE

Upper and lower is the transverse plane.

ANSWER

Transverse (axial).

TRAPS PEOPLE FALL INTO

- **Describing from your own side.** Use the patient's right and left.
- **Reversing supine and prone.** Supine is on the spine.
- **Writing peritoneum for perineum.** Abdominal lining vs pelvic floor area.
- **Judging heart size on AP alone.** AP magnifies; PA is standard.

Chapter 4 self-test · six items

1. Toward the midline is:

A. Lateral
B. Medial
C. Distal
D. Superficial

B. Medial Medi/o is middle.

2. A plane that splits the body into unequal right and left parts is:

A. Midsagittal
B. Coronal
C. Transverse
D. Parasagittal

D. Parasagittal Para- means beside the midline.

3. Which position is the whole bed tilted head-down?

A. Reverse Trendelenburg
B. High Fowler
C. Sims
D. Trendelenburg

D. Trendelenburg Reverse Trendelenburg tilts head-up.

4. Which organ lies in the LUQ?

A. Appendix
B. Gallbladder
C. Spleen
D. Liver

C. Spleen The spleen and stomach sit in the left upper quadrant.

5. Which root means tissue?

A. hist/o
B. cyt/o
C. kary/o
D. somat/o

A. hist/o Cyt/o is cell and kary/o is nucleus.

6. Disordered cell formation that is not yet cancer is:

A. Aplasia
B. Hyperplasia
C. Dysplasia
D. Neoplasia

C. Dysplasia Dys- means bad or abnormal.

CHAPTER 5

The Integumentary System

Read it in full: **Chapter 5 in the textbook**. Practice it in the lab: **The Pathology Splitter** and **The Wound Note Reader**.

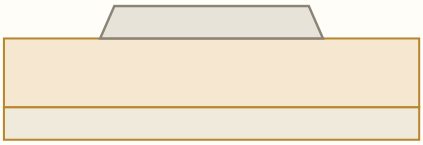
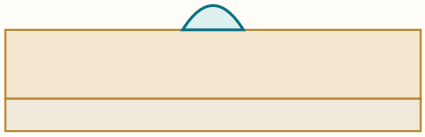
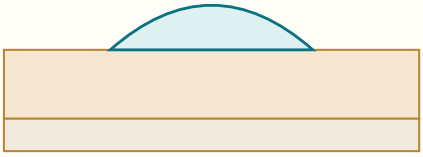
What to know

Skin roots: derm/o, dermat/o (Greek), cutane/o (Latin); -derma is a condition, -dermis a layer. Appendages: seb/o oil; hidr/o and sudor/i sweat (not hydr/o, water); trich/o and pil/o hair; onych/o and ungu/o nail. Fat: adip/o, lip/o, steat/o. Kerat/o is horny tissue in skin, cornea in the eye.

Color: cyan/o, erythr/o, leuk/o, melan/o, xanth/o, alb/o. Primary lesions by type and size: macule and patch, papule and plaque, vesicle and bulla (1 cm cutoff); pustule, nodule, wheal, cyst. Secondary: crust, scale, erosion (no scar), ulcer (scars), fissure, excoriation, lichenification, keloid. Pruritus is itching.

Pathology: cellulitis, folliculitis, furuncle and carbuncle, impetigo, tinea, onychomycosis, verruca, herpes zoster; eczema, psoriasis, vitiligo, alopecia. Cancers: BCC (most common), SCC, melanoma (most deaths); ABCDE. Procedures: biopsy types, ED&C, Mohs, debridement, escharotomy; grafts auto-, allo-, xeno-; STSG and FTSG; TBSA by the rule of nines. Write subcut, not SC or SQ.

Primary lesions: what kind, then how big

	under 1 cm	over 1 cm
Flat color change only	 **macule**	 **patch**
Raised, solid no fluid inside	 **papule**	 **plaque**
Raised, fluid clear fluid inside	 **vesicle**	 **bulla (plural bullae)**

Also primary: nodule (solid, deeper), pustule (pus), wheal (short-lived hive), cyst (enclosed sac).

Two questions name most lesions. Is it flat, solid or fluid-filled, and is it under or over 1 cm across?

LOCK THESE IN

- 1 cm separates macule from patch, papule from plaque, vesicle from bulla.
- Erosion heals without a scar; ulcer scars.
- Pruritus ends in -us.
- Autograft self, allograft human donor, xenograft other species.
- Escharotomy cuts into eschar; it does not remove it.

Chapter 5 terms

Term	Parts	Meaning
onycholysis	onych/o + -lysis	nail loosening
paronychia	par- + onych/o + -ia	infection beside the nail
hyperhidrosis	hyper- + hidr/o + -osis	excess sweating
leukoplakia	leuk/o + plakia	white patch on mucous membrane
actinic keratosis	actin/o (ray) + kerat/o	sun-induced precancerous lesion
rhytidectomy	rhytid/o + -ectomy	face lift
I&D; TBSA	abbreviations	incision and drainage; burn area

Worked cases

WORKED CASE 1 · NAME THE LESION

A 6 mm clear blister appears on a lip. Name it.

TYPE AND SIZE

Fluid-filled and under 1 cm.

ANSWER

A vesicle. Over 1 cm it would be a bulla.

WORKED CASE 2 · DECODE A FUNGAL TERM

Decode dermatomycosis.

PARTS

dermat/o (skin) + myc/o (fungus) + -osis.

ANSWER

A fungal condition of the skin.

TRAPS PEOPLE FALL INTO

- **Spelling pruritis.** It is pruritus.
- **Mixing hidr/o and hydr/o.** Sweat vs water.
- **Reading melena as skin.** It is black stool.
- **Writing SQ.** Write subcut.

Chapter 5 self-test · six items

1. A flat discolored spot 3 cm across is a:

A. Macule
B. Plaque
C. Papule
D. Patch

D. Patch Flat and over 1 cm is a patch.

2. Which root means nail?

A. onych/o
B. trich/o
C. pil/o
D. seb/o

A. onych/o Ungu/o is the Latin nail root; trich/o and pil/o are hair.

3. A scar that spreads beyond the wound edges is a:

A. Cicatrix
B. Keloid
C. Fissure
D. Crust

B. Keloid A cicatrix is any scar; a keloid overgrows it.

4. Which skin cancer causes most skin-cancer deaths?

A. Basal cell carcinoma
B. Squamous cell carcinoma
C. Melanoma
D. Actinic keratosis

C. Melanoma Melanoma is the least common of the three but the most deadly.

5. A graft that takes the whole dermis is abbreviated:

A. STSG
B. FTSG
C. NPWT
D. TBSA

B. FTSG Full-thickness skin graft.

6. What is the plural of ecchymosis?

A. Ecchymoses
B. Ecchymosi
C. Ecchymosises
D. Ecchymosae

A. Ecchymoses -is becomes -es.

CHAPTER 6

The Musculoskeletal System

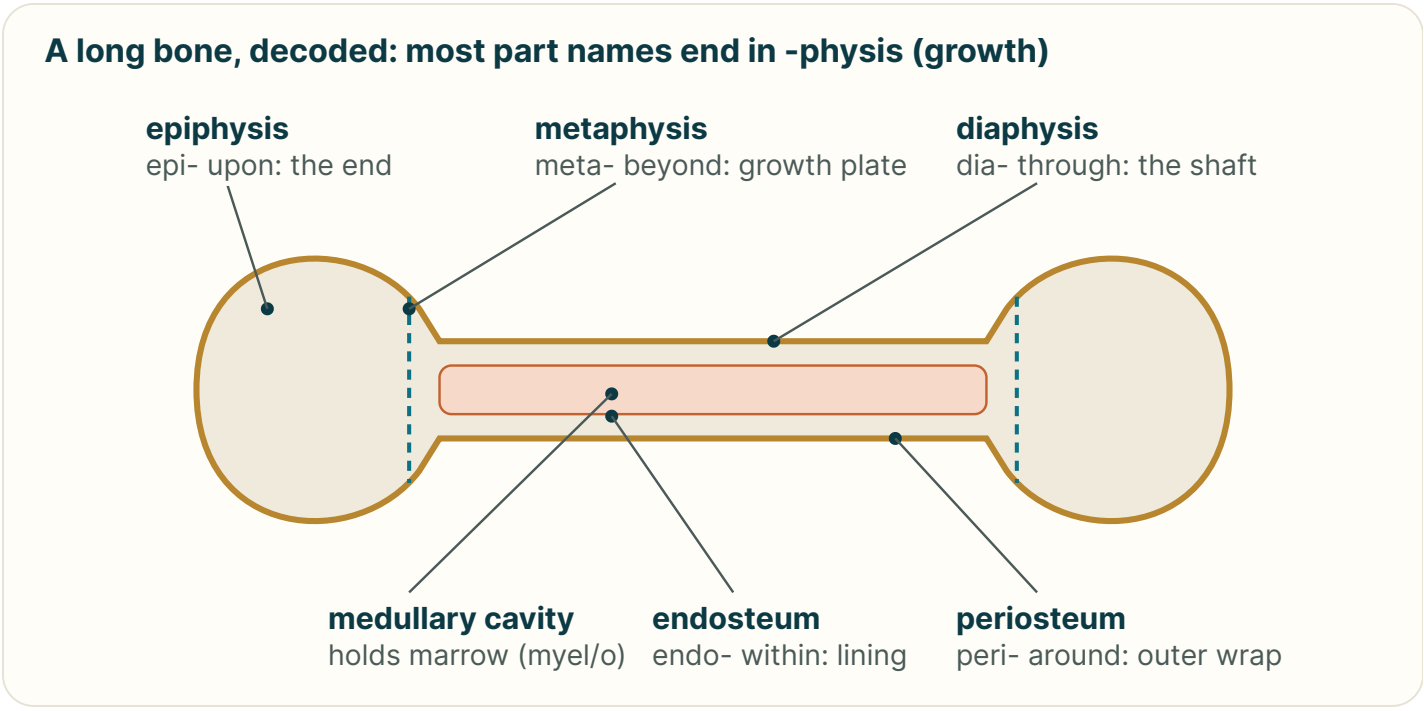
Read it in full: **Chapter 6 in the textbook**. Practice it in the lab: **The Skeleton Root Map** and **The Ortho Chart Reader**.

What to know

Bone: oste/o (clinical), oss/e (anatomy). Osteomalacia is soft, osteoporosis is porous, osteopenia is low but not yet porous. Long bone: diaphysis, epiphysis, metaphysis, periosteum, endosteum. Osteoblast builds, osteoclast breaks down. Chondr/o is cartilage; myel/o is marrow or cord.

Each bone has a root: crani/o, cost/o, stern/o, vertebr/o and spondyl/o, clavicul/o, scapul/o, humer/o, radi/o, uln/o, carp/o, phalang/o, ili/o, ischi/o, pub/o, femor/o, patell/o, tibi/o, fibul/o, calcane/o. Joints: arthr/o, synovi/o, burs/o, ten/o and tendin/o (tendinitis), ligament/o. Muscle: my/o, rhabdomy/o, leiomy/o. Sprain is ligament; strain is muscle or tendon.

Fractures: closed, open, transverse, oblique, spiral, comminuted, impacted, compression, greenstick, pathologic, stress; ORIF. Spine curves: kyphosis, lordosis, scoliosis. OA (DJD) vs RA. Gout and podagra. DXA T-score: -1.0 to -2.5 osteopenia; -2.5 or lower osteoporosis. Surgery: osteotomy, arthroplasty (THA, TKA), arthrodesis, laminectomy, fasciotomy. Weight-bearing: NWB, PWB, WBAT.



Prefix plus -physis. The same prefixes (epi-, meta-, dia-, peri-, endo-) appear all over medicine, so one decoded bone teaches a dozen terms.

LOCK THESE IN

- Osteomalacia soft; osteoporosis porous; osteopenia low.
- Craniotomy flap replaced; craniectomy left out.
- Spondyl/o diagnoses; vertebr/o adjectives.
- Sprain ligament; strain muscle or tendon.
- T-score -2.5 or lower is osteoporosis.

Chapter 6 terms

Term	Parts	Meaning
rhabdomyolysis	rhabd/o + my/o + -lysis	skeletal muscle breakdown
ankylosing spondylitis	ankyl/o + spondyl/o + -itis	inflammatory arthritis that can fuse the spine
costochondritis	cost/o + chondr/o + -itis	rib cartilage inflammation
acetabulum	acetabul/o	hip socket
sarcopenia	sarc/o + -penia	age-related muscle loss
podagra	pod/o	gout in the great toe
ORIF	abbreviation	open reduction, internal fixation

Worked cases

WORKED CASE 1 · NAME THE FRACTURE

A twisting fall breaks a tibia with a line that winds around the shaft; the skin is intact. Name it.

LINE

Rotational force gives a spiral line.

SKIN

Intact skin means closed.

ANSWER

A closed spiral fracture.

WORKED CASE 2 · DECODE A JOINT OPERATION

Decode total knee arthroplasty.

PARTS

arthr/o (joint) + -plasty (repair or replacement).

ANSWER

Replacement of the knee joint surfaces (TKA).

TRAPS PEOPLE FALL INTO

- **Reading osteomyelitis as muscle.** Myel/o is marrow here.
- **Spelling tendonitis.** Tendinitis is the correct build.
- **Mixing kyphosis and lordosis.** Upper hump vs lower sway.
- **Mixing chondr/o and condyl/o.** Cartilage vs bony knob.

Chapter 6 self-test · six items

1. Which cell builds new bone?

A. Osteoclast
B. Osteocyte
C. Osteoblast
D. Myeloblast

C. Osteoblast -blast is a building, immature cell.

2. Which root means rib?

A. stern/o
B. crani/o
C. cost/o
D. scapul/o

C. cost/o Intercostal means between the ribs.

3. A partial dislocation is a:

A. Sprain
B. Strain
C. Contracture
D. Subluxation

D. Subluxation The joint surfaces still touch.

4. An incomplete break in a child's bone is a:

A. Comminuted fracture
B. Greenstick fracture
C. Pathologic fracture
D. Stress fracture

B. Greenstick fracture The bone bends and cracks on one side.

5. A sideways curve of the spine is:

A. Kyphosis
B. Lordosis
C. Spondylosis
D. Scoliosis

D. Scoliosis Scoli/o means crooked.

6. Which order means the patient may bear as much weight as is comfortable?

A. WBAT
B. NWB
C. PWB
D. AROM

A. WBAT Weight-bearing as tolerated.

CHAPTER 7

The Cardiovascular System

Read it in full: **Chapter 7 in the textbook**. Practice it in the lab: **The Cardiac Chart Reader** and **Machine, Procedure or Record**.

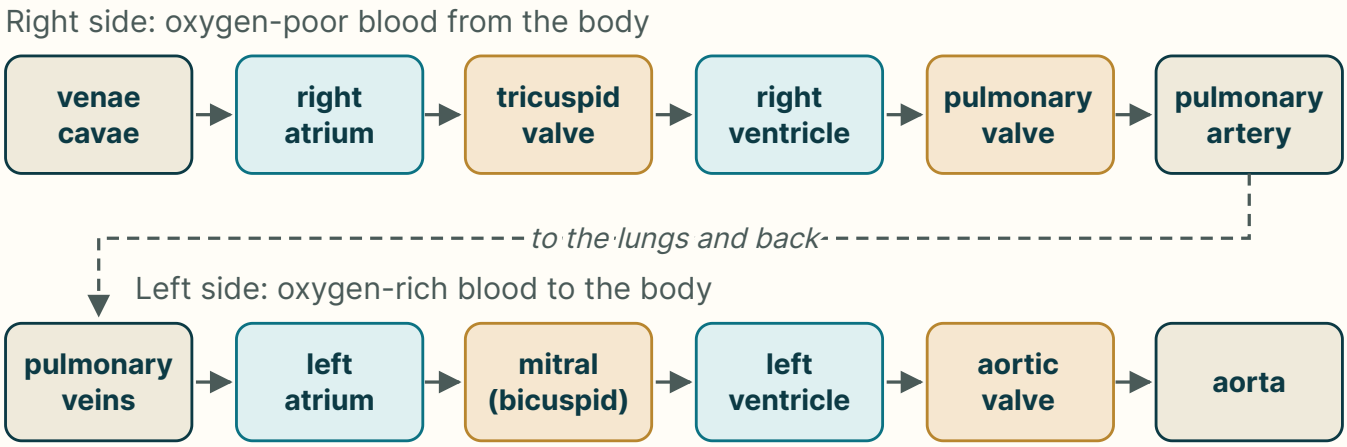
What to know

Cardi/o is the heart; coron/o the crown of arteries that feed it. Wall: endocardium, myocardium, epicardium; pericardium is the sac. Two atria, two ventricles; septa; tricuspid, mitral (bicuspid), pulmonary and aortic valves. Stenosis will not open; regurgitation will not close. Arteries go away from the heart, veins toward it.

Vessels: angi/o, vas/o, vascul/o, arteri/o, ven/o and phleb/o, aort/o. Arteri/o artery, ather/o plaque, arthr/o joint. Ischemia is reversible; infarction is death (MI). A thrombus stays; an embolus travels (DVT to PE). Aneurysm is a bulge; angina comes from "to choke." Left HF backs into the lungs; right HF into the body. EF; HFrEF and HFpEF. Fibrillation, flutter, asystole.

Tests: ECG (P, QRS, T; ST elevation means STEMI), telemetry, Holter, echo (TTE, TEE), stress test, cardiac cath and angiogram, troponin, BNP, D-dimer, INR, ABI. Procedures: angioplasty and stent (PCI, PTCA), endarterectomy, CABG, TAVR, pacemaker, ICD, cardioversion, defibrillation. Drug endings: -olol, -pril, -sartan, -dipine, -statin, -parin.

One-way flow: chambers (boxes) and the valves that guard them (gold)



The pulmonary artery carries oxygen-poor blood: arteries are named for direction (away from the heart), not for oxygen. A valve that will not open is stenotic; one that will not close regurgitates.

Follow the blood, and the valve names fall into place. Tri- has three cusps and the mitral (bi-) has two; the two semilunar valves guard the exits.

LOCK THESE IN

- Coronary means the heart's own arteries.
- Stenosis vs regurgitation.
- Thrombus stays; embolus travels.
- -graph machine, -graphy process, -gram record.
- Anticoagulant, antiplatelet, thrombolytic.

Chapter 7 terms

Term	Parts	Meaning
cardiomyopathy	cardi/o + my/o + -pathy	heart muscle disease
pericardiocentesis	pericardi/o + -centesis	draining the pericardial sac
sphygmomanometer	sphygm/o + man/o + -meter	blood pressure cuff
claudication	Latin, limping	leg pain on walking from poor arterial flow
thrombophlebitis	thromb/o + phleb/o + -itis	inflamed vein with a clot
asystole	a- + systole	no contraction
bruit	French, noise	turbulent flow over an artery

Worked cases

WORKED CASE 1 · DECODE A DEFECT

Decode VSD.

EXPAND

Ventricular septal defect.

ANSWER

A hole in the wall between the two ventricles.

WORKED CASE 2 · READ A DRUG LIST

Name the classes: amlodipine, losartan.

ENDINGS

-dipine and -sartan.

ANSWER

Calcium channel blocker; angiotensin receptor blocker.

TRAPS PEOPLE FALL INTO

- **Building angina from angi/o.** It means choking.
- **Calling arteries "oxygen carriers."** Direction defines them.
- **Mixing arteriosclerosis and atherosclerosis.** Any hardening vs plaque disease.
- **Writing thrombuses.** Thrombi.

Chapter 7 self-test · six items

1. Inflammation of the sac around the heart is:

A. Endocarditis
B. Pericarditis
C. Myocarditis
D. Epicarditis

B. Pericarditis Peri- means around.

2. Which vein root is Greek and used in pathology?

A. ven/o
B. venul/o
C. vas/o
D. phleb/o

D. phleb/o Phlebitis, phlebotomy. Ven/o gives venipuncture.

3. Fluid compressing the heart and blocking filling is:

A. Cardiac tamponade
B. Cardiomyopathy
C. Cor pulmonale
D. Aortic coarctation

A. Cardiac tamponade Treated by pericardiocentesis.

4. Which sign points to left-sided heart failure?

A. Ascites
B. Orthopnea
C. Jugular venous distention
D. Ankle edema

B. Orthopnea Left-sided failure backs blood into the lungs.

5. A drug ending in -statin does what?

A. Lowers LDL cholesterol
B. Blocks beta receptors
C. Dissolves a formed clot
D. Inhibits the ACE enzyme

A. Lowers LDL cholesterol Atorvastatin, simvastatin.

6. What is the plural of atrium?

A. Atriums
B. Atrii
C. Atria
D. Atriae

C. Atria -um becomes -a.

CHAPTER 8

Blood, the Lymphatic System and Immunity

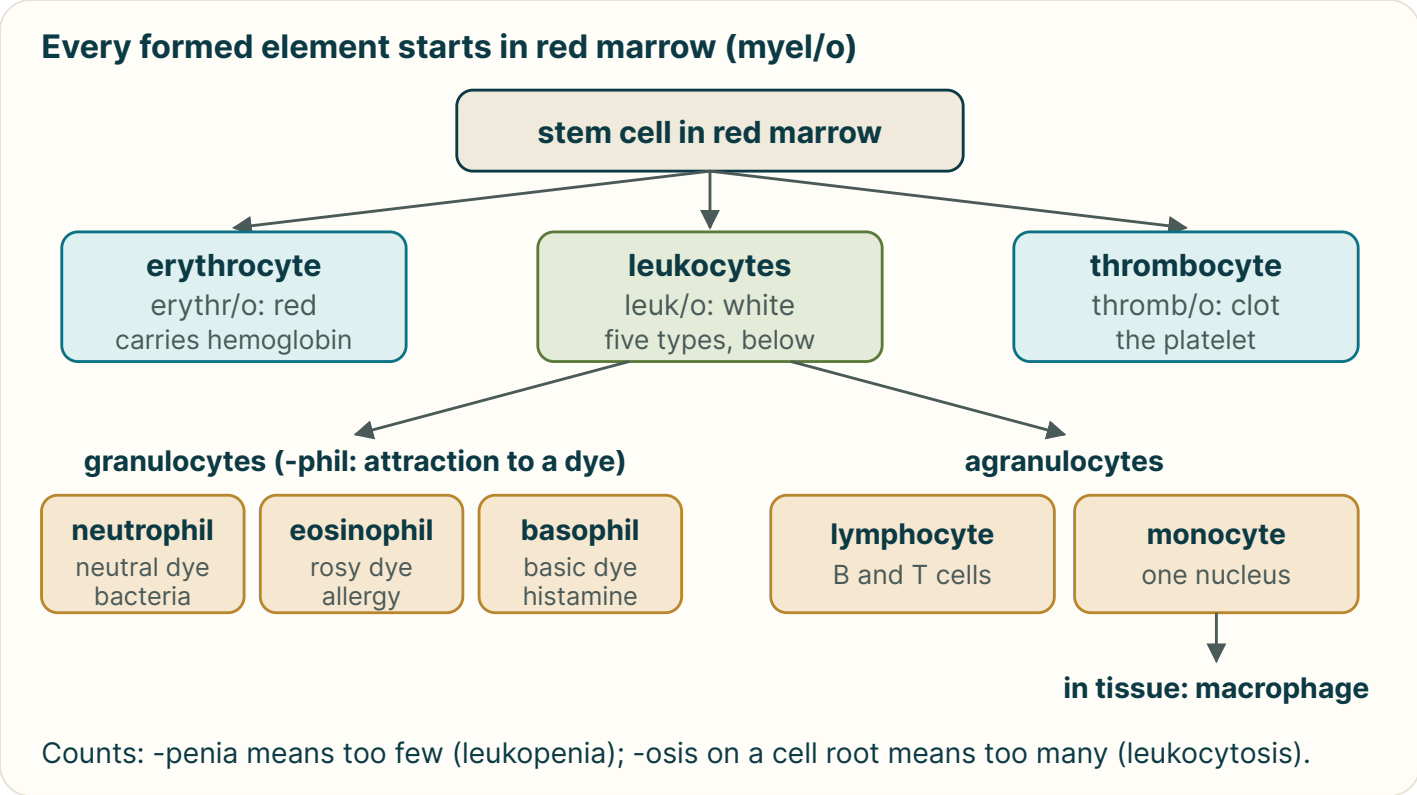
Read it in full: **Chapter 8 in the textbook**. Practice it in the lab: **The Clot and Count Splitter** and **The Smear Descriptor Desk**.

What to know

Hem/o and hemat/o at the front; -emia at the end. Plasma keeps clotting factors; serum is what remains after clotting. Hematocrit is the red cell share (about 45%). -poiesis is formation; erythropoietin comes from the kidney. Myel/o is marrow here.

Red cells: micro-, macro-, hypochromic, anisocytosis (size), poikilocytosis (shape). Iron deficiency is microcytic hypochromic; pernicious anemia is macrocytic (B12); aplastic is marrow failure; hemolytic raises bilirubin. White cells: neutrophil, eosinophil, basophil (-phil), lymphocyte, monocyte to macrophage. -penia too few; -osis on a cell root too many. ALL, AML, CLL, CML.

Platelet is thrombocyte. Petechiae, purpura, ecchymosis, hematoma. Lymph: lymph/o fluid, lymphangi/o vessel (red streak), lymphaden/o node. Spleen, thymus (T cells), tonsils (tonsillectomy, double l). Antigen provokes; antibody answers. IgE allergy, IgM first, IgG crosses the placenta. Active vs passive, natural vs artificial. CD4 under 200 means AIDS. PT/INR follows warfarin; aPTT follows heparin.



Name the cell, then add the count suffix. Each formed element has a color or job root, and -cyte, -blast, -poiesis, -penia and -osis attach to all of them.

LOCK THESE IN

- Hematuria vs uremia: which end the blood sits on.
- Plasma vs serum.
- Microcytic hypochromic is iron deficiency.
- Lymphadenitis node; lymphangitis vessel.
- Antigen provokes; antibody answers.

Chapter 8 terms

Term	Parts	Meaning
pancytopenia	pan- + cyt/o + -penia	all cell lines low
polycythemia	poly- + cyt/o + -hemia	too many red cells
megakaryocyte	megal/o + kary/o + -cyte	large cell that sheds platelets
agranulocytosis	a- + granul/o + cyt/o + -osis	near-total loss of granulocytes
hemostasis	hem/o + -stasis	stopping bleeding
anaphylaxis	ana- + -phylaxis	severe IgE reaction
apheresis	Greek, taking away	remove one component, return the rest

Worked cases

WORKED CASE 1 · DECODE A COUNT

A note reads "thrombocytopenia." What should you watch for?

PARTS

thromb/o (clot) + cyt/o (cell) + -penia (too few).

ANSWER

Too few platelets: watch for bleeding, petechiae and bruising.

WORKED CASE 2 · NAME THE IMMUNITY

A child gets a measles vaccine. Which immunity?

WHO MAKES ANTIBODIES?

The child's own body: active.

ARRANGED BY MEDICINE?

Yes: artificial.

ANSWER

Artificial active immunity.

TRAPS PEOPLE FALL INTO

- **Reading thrombosis as "more platelets."** It is clot formation.
- **Swapping antigen and antibody.** Provokes vs answers.
- **Spelling tonsilectomy.** Tonsillectomy.
- **Treating serum as plasma.** Serum lacks clotting factors.

Chapter 8 self-test · six items

1. Which hormone from the kidney drives red cell production?

A. Hemoglobin

B. Hemosiderin

C. Erythropoietin

D. Immunoglobulin

C. Erythropoietin EPO falls in chronic kidney disease.

2. Too few neutrophils is:

A. Neutrophilia
B. Neutropenia
C. Leukocytosis
D. Eosinophilia

B. Neutropenia -penia means deficiency.

3. A bruise is an:

A. Petechia
B. Embolus
C. Hemangioma
D. Ecchymosis

D. Ecchymosis Petechiae are pinpoint.

4. Which organ is where T cells mature?

A. Spleen
B. Tonsil
C. Lymph node
D. Thymus

D. Thymus The T stands for thymus.

5. Swelling of an arm after axillary node removal is:

A. Lymphedema
B. Lymphadenitis
C. Lymphangitis
D. Lymphoma

A. Lymphedema Blocked lymph drainage.

6. A clot fragment that travels and lodges elsewhere is an:

A. Thrombus
B. Infarct
C. Embolus
D. Aneurysm

C. Embolus Plural emboli.

CHAPTER 9

The Respiratory System

Read it in full: **Chapter 9 in the textbook**. Practice it in the lab: **The Pathology Splitter** and **The Scalpel and the Chart**.

What to know

Air path: rhin/o and nas/o, pharyng/o, laryng/o, trache/o, bronch/o, bronchiol/o, alveol/o. Pulmon/o and pneumon/o mean lung; pneum/o often means air. Pleura, thorax, phren/o (diaphragm). -thorax names what fills the pleural space. Spir/o breathe, ox/i oxygen, capn/o carbon dioxide.

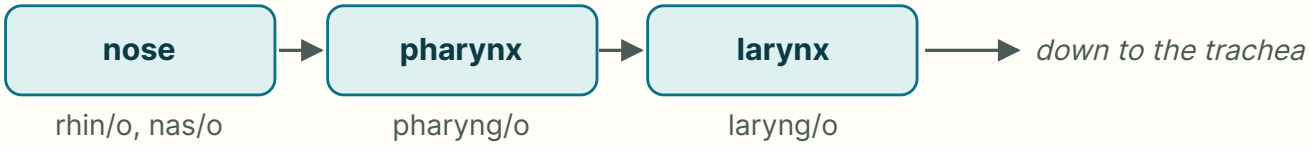
-pnea: eupnea, dyspnea, apnea, tachypnea, bradypnea, orthopnea, hyperpnea, hypopnea. Hypoxemia blood, hypoxia tissue, hypercapnia high CO2. Bronchiectasis widened; atelectasis

collapsed. -ptysis spitting. Asthma reversible; COPD (chronic bronchitis, emphysema) not fully; pneumoconiosis dust; pneumonia; ARDS; PE; pneumothorax.

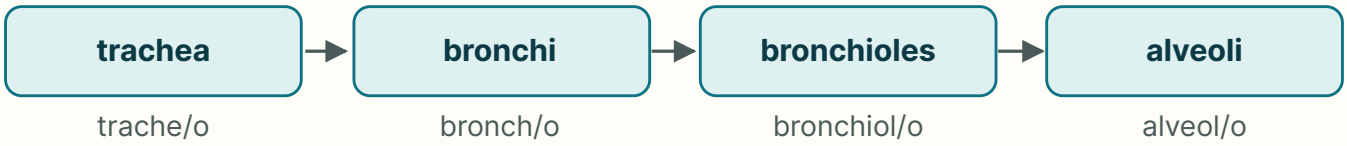
Sounds: crackles, wheezes, rhonchi, stridor (upper airway red flag), friction rub. Spirometry: low FEV1/FVC is obstructive; preserved ratio with small volumes is restrictive. SpO2 vs ABG (only ABG measures PaCO2). Tracheotomy vs tracheostomy; thoracotomy, thoracostomy, thoracentesis; lobectomy, pneumonectomy. CPAP, BiPAP, PEEP, FiO2 (room air 0.21). No left middle lobe.

Walk the airway: one combining form per stop

Upper airway



Lower airway



The pleural space: -thorax names what fills it

pneumothorax air (pneum/o)	**hemothorax** blood (hem/o)	**pyothorax** pus (py/o)	**hydrothorax** water (hydr/o)

Learn the roots in the order air travels. That is also the order a bronchoscope travels and the order a disease spreads down the tract.

LOCK THESE IN

- Pneum/o can mean air.
- -thorax names the contents.
- Hypoxemia blood; hypoxia tissue.
- Low FEV1/FVC is obstruction.
- Tracheostomy is the opening that stays.

Chapter 9 terms

Term	Parts	Meaning
epistaxis	Greek, not decodable	nosebleed
anosmia	an- + -osmia	loss of smell
dysphonia	dys- + -phonia	hoarse voice
empyema	Greek	pus in the pleural space
pleurodesis	pleur/o + -desis	binding the pleural layers
polysomnography	poly- + somn/o + -graphy	sleep study
FiO2	abbreviation	fraction of inspired oxygen

Worked cases

WORKED CASE 1 · NAME THE SOUND

A child has a harsh, high sound on breathing in, audible across the room. Name it and its meaning.

MATCH

Stridor: upper airway obstruction.

ANSWER

Stridor, a red-flag finding, as in croup.

WORKED CASE 2 · DECODE A DUST DISEASE

Decode anthracosis.

PARTS

anthrac/o (coal) + -osis.

ANSWER

Coal-dust lung disease (black lung), a pneumoconiosis.

TRAPS PEOPLE FALL INTO

- **Reading pneumothorax as infection.** Air in the pleural space.
- **Mixing atelectasis and bronchiectasis.** Collapse vs widening.
- **Treating SpO2 as PaO2.** Different scales.
- **Charting a left middle lobe.** It does not exist.

Chapter 9 self-test · six items

1. Which root names the voice box?

A. pharyng/o
B. laryng/o
C. trache/o
D. epiglott/o

B. laryng/o Pharyng/o is the throat.

2. Blood in the pleural space is:

A. Hemothorax
B. Hemoptysis
C. Pyothorax
D. Pneumothorax

A. Hemothorax Hem/o + -thorax.

3. Rapid breathing is:

A. Tachypnea
B. Bradypnea
C. Hyperpnea
D. Apnea

A. Tachypnea Tachy- is fast. Hyperpnea is deep.

4. Low-pitched snoring sounds from secretions in large airways are:

A. Crackles
B. Wheezes
C. Stridor
D. Rhonchi

D. Rhonchi They often clear with a cough.

5. Which device gives one continuous pressure for sleep apnea?

A. BiPAP
B. CPAP
C. PEEP
D. MDI

B. CPAP BiPAP gives two pressures.

6. Removal of an entire lung is a:

A. Lobectomy
B. Segmentectomy
C. Pneumonectomy
D. Pleurectomy

C. Pneumonectomy A lobectomy removes one lobe.

CHAPTER 10

The Digestive System

Read it in full: **Chapter 10 in the textbook**. Practice it in the lab: **Split It, Then Pluralize It** and **The Scope Depth Dial**.

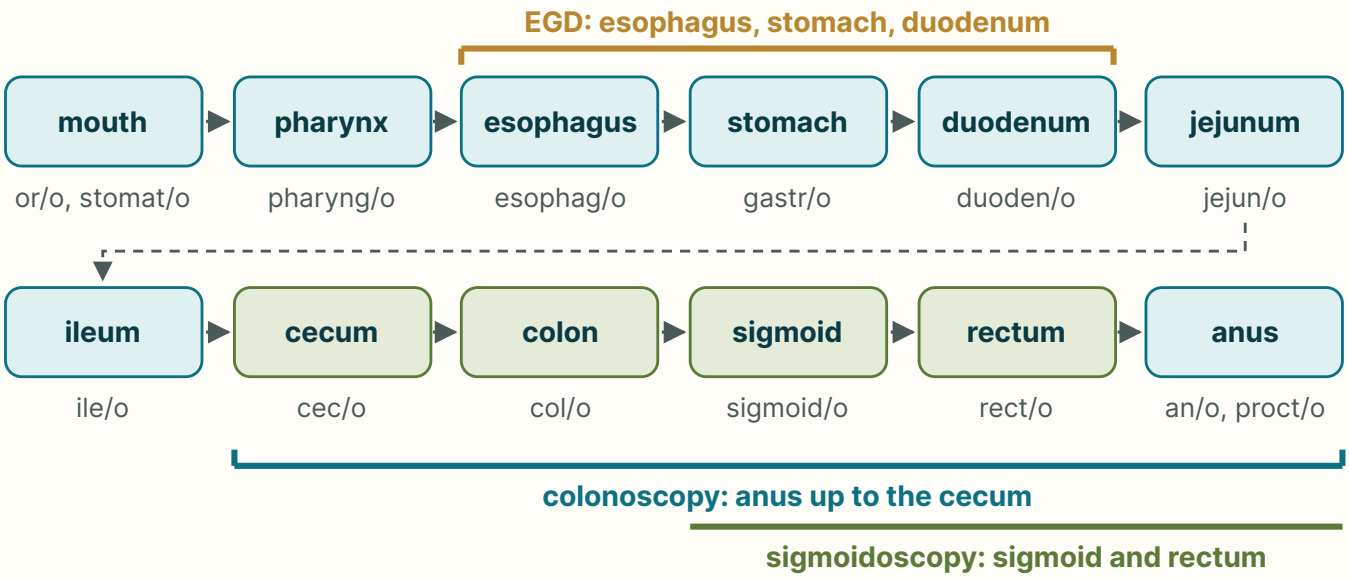
What to know

Tube order: or/o and stomat/o, pharyng/o, esophag/o, gastr/o, pylor/o, duoden/o, jejun/o, ile/o, cec/o, col/o, sigmoid/o, rect/o, an/o, proct/o. Enter/o is the small intestine. Lapar/o is the surgical abdomen root. Ile/o is bowel; ili/o is hip. Col/o is colon; colp/o is vagina.

Suffixes: -pepsia, -phagia, -emesis, -chezia, -orexia, -prandial, -lithiasis, -stalsis. Bile path: chol/e, cholecyst/o, cholangi/o, choledoch/o. -ase is an enzyme; -ose is a sugar. Hematemesis and melena: upper source; hematochezia (BRBPR): usually lower. Jaundice, ascites, cirrhosis, hepatitis, MASH.

Disease: GERD and Barrett esophagus, PUD (H. pylori, NSAIDs), achalasia, gastroparesis, Crohn disease and UC (IBD) vs IBS, diverticulosis vs diverticulitis, intussusception, volvulus, ileus, hernia. Tests: EGD, colonoscopy, sigmoidoscopy, ERCP, MRCP, LFTs, FOBT/FIT, paracentesis. Surgery: -ectomy, -otomy, -ostomy; PEG, J-tube, NG; TPN.

The tube in order, and how far each scope reaches



Green boxes are the large intestine. Enter/o names the small intestine in general.

The scope name is the scope route. Esophagogastroduodenoscopy lists its stops in order; colonoscopy reaches the cecum; sigmoidoscopy sees only the end of the colon.

LOCK THESE IN

- Tube roots in order.
- Chol/e, cholecyst/o, cholangi/o, choledoch/o.
- Melena is upper; hematochezia usually lower.
- Diverticulosis quiet; diverticulitis inflamed.
- IBD inflamed; IBS functional.

Chapter 10 terms

Term	Parts	Meaning
odynophagia	odyn/o + -phagia	painful swallowing
steatorrhea	steat/o + -rrhea	fatty stool
borborygmus	sound word	bowel noise
achalasia	a- + chalasis	LES fails to relax
pancreaticoduodenectomy	pancreat/o + duoden/o + -ectomy	Whipple procedure
parenteral	par- + enter/o	bypassing the gut (TPN)
NPO	nil per os	nothing by mouth

Worked cases

WORKED CASE 1 · DECODE AN ENDOSCOPY

Decode EGD and say what it does not reach.

EXPAND

Esophagogastroduodenoscopy: esophagus, stomach, duodenum.

ANSWER

It **views the upper tract only**; it does not reach the jejunum, ileum or colon.

WORKED CASE 2 · CLASSIFY A LIVER LAB

ALT and AST are high. What do they point to?

MEANING

Enzymes released from injured liver cells.

ANSWER

Hepatocellular injury, such as hepatitis, drugs or alcohol.

TRAPS PEOPLE FALL INTO

- **Reading cyst/o as urinary only.** Cholecyst/o is the gallbladder.
- **Reading anorexia as the eating disorder.** As a symptom it is loss of appetite.
- **Spelling appenditis.** Appendicitis.
- **Mixing dysphagia, dysphasia, dysplasia.** Swallow, speech, cell growth.

Chapter 10 self-test · six items

1. Which root means gums?

A. gloss/o
B. cheil/o
C. sial/o
D. gingiv/o

D. gingiv/o Gingivitis is inflamed gums.

2. Bright red blood passed rectally is:

A. Hematochezia
B. Melena
C. Hematemesis
D. Steatorrhea

A. Hematochezia Usually a lower source.

3. Which is a sugar rather than an enzyme?

A. Lactase
B. Lipase
C. Amylase
D. Lactose

D. Lactose -ose is a sugar; -ase is an enzyme.

4. Inflammation of an outpouching of the colon is:

A. Diverticulosis
B. Diverticulitis
C. Colitis
D. Proctitis

B. Diverticulitis -itis is the inflamed state.

5. A long-term feeding tube placed into the stomach with a scope is a:

A. NG tube
B. J-tube
C. PEG
D. TPN line

C. PEG Percutaneous endoscopic gastrostomy.

6. Telescoping of one bowel segment into the next is:

A. Volvulus
B. Diverticulosis
C. Intussusception
D. Gastroparesis

C. Intussusception Most common in young children.

CHAPTER 11

The Urinary System

Read it in full: **Chapter 11 in the textbook**. Practice it in the lab: **Cut the Kidney Term: Split, Match, Diagnose** and **Won't Hold or Won't Empty: The Lower-Tract Sorter**.

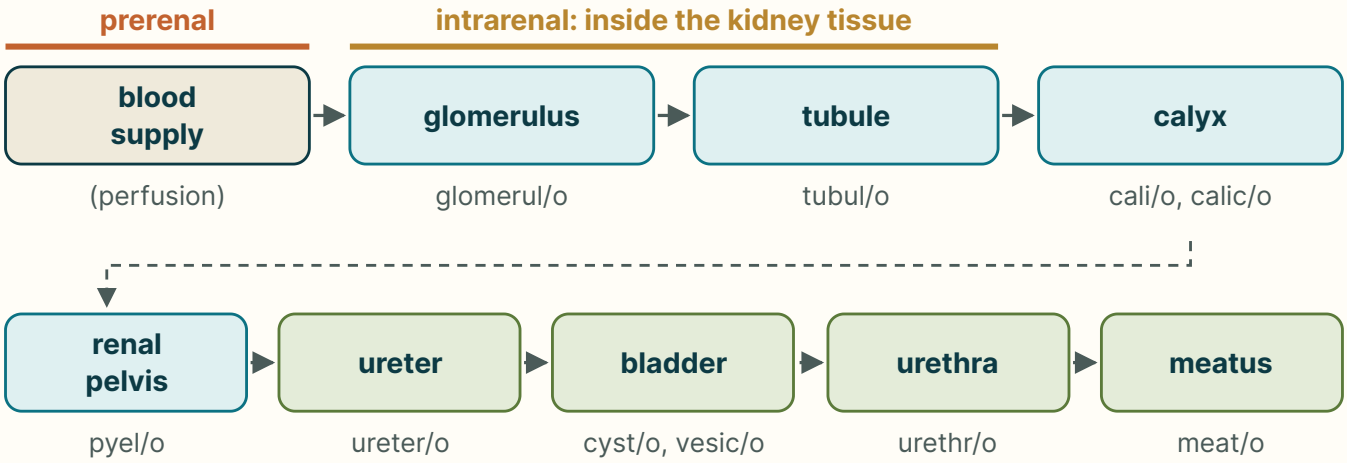
What to know

Ren/o for anatomy, nephr/o for disease and surgery. Flow: glomerulus, tubule, calyx, renal pelvis (pyel/o), ureter, bladder (cyst/o, vesic/o), urethra, meatus. Ureter kidney to bladder; urethra bladder to outside. Pyel/o is not py/o. Female urethra about 4 cm; male about 20 cm.

-uria: hematuria, dysuria, oliguria (under about 400 mL/day or 0.5 mL/kg/hr), anuria (under about 100 mL/day), polyuria, nocturia, pyuria, glycosuria, ketonuria, proteinuria. Diuresis is high output; enuresis is involuntary. Azotemia is the lab; uremia is the sick patient. Red cell casts mean glomerular bleeding.

Nephritic (cells leak) vs nephrotic (protein leaks). Stones and hydronephrosis. AKI: prerenal, intrarenal, postrenal. CKD stage 5 is eGFR under 15 (ESKD). Cystitis, pyelonephritis, CAUTI. Storage vs emptying failure; stress, urge, overflow, functional incontinence; PVR; BPH. Cystoscopy, VCUG, KUB; nephrectomy, nephrotomy, nephrostomy; lithotripsy (ESWL); HD and PD.

Follow the urine, one root per stop, and place each kind of AKI on the line



Ureter/o runs kidney to bladder (two tubes); urethr/o runs bladder to outside (one tube).

The prefix names the place. Pre-, intra- and post- put the cause of an acute kidney injury before, inside or after the kidney on this line.

LOCK THESE IN

- Ureter vs urethra; pyel/o vs py/o.
- Oliguria under about 400 mL/day.
- Azotemia lab; uremia symptoms.
- Prerenal, intrarenal, postrenal.
- Nephrostomy drains through a tube.

Chapter 11 terms

Term	Parts	Meaning
glomerulonephritis	glomerul/o + nephr/o + -itis	inflamed filter
hydronephrosis	hydr/o + nephr/o + -osis	urine backed up in the kidney
nephroptosis	nephr/o + -ptosis	dropped kidney
micturition	Latin	voiding, urination
nephroblastoma	nephr/o + -blastoma	Wilms tumor
trigone	trigon/o	bladder triangle
CVA (here)	abbreviation	costovertebral angle

Worked cases

WORKED CASE 1 · LOCATE THE INFECTION

Burning and frequency, no fever. A week later: fever, flank pain and CVA tenderness. Name each.

FIRST

Lower tract, bladder: cystitis.

SECOND

Infection has climbed to the kidney and pelvis.

ANSWER

Cystitis, then pyelonephritis.

WORKED CASE 2 · SORT A SYMPTOM

An older man has a weak stream, hesitancy and a large PVR. Storage or emptying?

MATCH

Weak stream, hesitancy and retained urine are emptying problems.

ANSWER

Emptying failure, often from BPH.

TRAPS PEOPLE FALL INTO

- **Mixing ureter and urethra.** Two vs one tube.
- **Mixing diuresis and dysuria.** Output vs pain.
- **Calling overflow a storage problem.** It is emptying failure.
- **Reading polycystic kidney as a bladder disease.** Cyst/o here is sac.

Chapter 11 self-test · six items

1. Waking at night to urinate is:

A. Nocturia
B. Enuresis
C. Polyuria
D. Oliguria

A. Nocturia Noct/i means night.

2. The funnel that drains into the ureter is the:

A. Calyx
B. Renal pelvis
C. Glomerulus
D. Trigone

B. Renal pelvis Its root is pyel/o.

3. Leakage because the detrusor contracts on its own is:

A. Stress incontinence
B. Urge incontinence
C. Overflow incontinence
D. Functional incontinence

B. Urge incontinence The hallmark of overactive bladder.

4. AKI from heavy bleeding is classified as:

A. Intrarenal
B. Postrenal
C. Chronic
D. Prerenal

D. Prerenal Poor perfusion before the kidney.

5. Which study images a child voiding to detect reflux?

A. KUB
B. IVP
C. VCUG
D. PVR

C. VCUG Voiding cystourethrogram.

6. Dialysis using the patient's own abdominal lining is:

A. Peritoneal dialysis
B. Hemodialysis
C. Bladder irrigation
D. Nephrostomy drainage

A. Peritoneal dialysis PD uses the peritoneum as the membrane.

CHAPTER 12

The Reproductive Systems, Obstetrics and Neonatology

Read it in full: **Chapter 12 in the textbook**. Practice it in the lab: **Follow the Sperm: The Male Term Splitter** and **The Near-Miss Ward: Look-Alike Drill**.

What to know

Female roots: gynec/o, vulv/o, episi/o, colp/o, vagin/o, cervic/o, hyster/o, metr/o, uter/o, salping/o (also the ear tube), oophor/o, ovari/o, mamm/o, mast/o. Menstrual terms: menarche, menopause, amenorrhea, dysmenorrhea, oligomenorrhea, menorrhagia (heavy on time), metrorrhagia (between periods).

Male roots in sperm order: orchi/o, epididym/o, vas/o, vesicul/o, prostat/o, urethr/o, pen/o; balan/o, scrot/o, spermat/o, andr/o. Pathology: endometriosis, leiomyoma, PID, PCOS, cystocele, BPH (hyperplasia), cryptorchidism, torsion, hydrocele, varicocele. Procedures: colposcopy, HSG, TAH-BSO, myomectomy, hysterotomy vs hysterectomy, vasectomy and vasovasostomy, TURP.

Gravida counts pregnancies; para counts deliveries at viability (twins add one). GTPAL: term 37 weeks or later, preterm 20 to 37, abortions before 20. Pregnancy roots: amni/o, chori/o, placent/o, nat/o, part/o, toc/o. Preeclampsia (after 20 weeks, proteinuria not required), eclampsia, ectopic, previa, abruptio. Lochia; puerperium. Newborn: first 28 days; Apgar 0 to 10; SGA, AGA, LGA; RDS; hyperbilirubinemia and kernicterus.

Reading G4 T2 P1 A1 L3, letter by letter

G	T	P	A	L
4	2	1	1	3
gravida	**term**	**preterm**	**abortions**	**living**
pregnancies, any outcome	births at 37 weeks or later	births at 20 to 37 weeks	losses before 20 weeks	children now

Check 1: T + P + A = 2 + 1 + 1 = 4 = G (she is not pregnant now).

Check 2: term babies + preterm babies = 2 + 1 = 3 = L.

Para counts deliveries at viability (T + P = 3), not babies: twins add one, not two.

Two quick sums catch most GTPAL errors. If T + P + A does not match G (allowing for a current pregnancy), something in the history was miscounted.

LOCK THESE IN

- Menorrhagia vs metrorrhagia.
- Salping/o and vas/o each have two meanings.
- BPH is hyperplasia.
- Gravida vs para; twins add one.
- Antepartum mother; prenatal infant.

Chapter 12 terms

Term	Parts	Meaning
salpingo-oophorectomy	salping/o + oophor/o + -ectomy	tube and ovary removed
adenomyosis	aden/o + my/o + -osis	endometrial glands in uterine muscle
galactorrhea	galact/o + -rrhea	milk discharge not from nursing
azoospermia	a- + zo/o + sperm/o + -ia	no sperm in semen
dystocia	dys- + -tocia	difficult labor
oligohydramnios	olig/o + hydr/o + amni/o	too little amniotic fluid
omphalocele	omphal/o + -cele	protrusion through the navel

Worked cases

WORKED CASE 1 · WRITE A HISTORY

Ms. Salcedo has had three pregnancies: one term birth, one miscarriage at 10 weeks, and she is pregnant now. Write G and P.

GRAVIDA

Three pregnancies including this one: G3.

PARA

One delivery at viability: P1.

ANSWER

G3 P1; in GTPAL, G3 T1 P0 A1 L1.

WORKED CASE 2 · PICK THE OPERATION

Fibroids are removed but the uterus is kept for future pregnancy. Name it.

PARTS

my/o + -oma (fibroid) + -ectomy.

ANSWER

Myomectomy. A hysterectomy would remove the uterus.

TRAPS PEOPLE FALL INTO

- **Writing prostrate.** Prostate.
- **Counting twins as para 2.** Para counts pregnancies delivered.
- **Mixing hysterotomy and hysterectomy.** Cut vs removal.
- **Reading congenital as inherited.** Present at birth.

Chapter 12 self-test · six items

1. Painful menstruation is:

A. Amenorrhea
B. Menorrhagia
C. Dysmenorrhea
D. Oligomenorrhea

C. Dysmenorrhea Dys- means painful.

2. Which root is the breast root used for surgery?

A. mamm/o
B. lact/o
C. galact/o
D. mast/o

D. mast/o Mastectomy; mamm/o is used for imaging.

3. Dilated scrotal veins form a:

A. Hydrocele
B. Varicocele
C. Spermatocele
D. Rectocele

B. Varicocele Varic/o is a twisted vein.

4. Postpartum uterine discharge is:

A. Meconium
B. Colostrum
C. Lochia
D. Leukorrhea

C. Lochia It goes rubra, serosa, alba.

5. Implantation outside the uterine cavity is an:

A. Placenta previa
B. Abruptio placentae
C. Hydatidiform mole
D. Ectopic pregnancy

D. Ectopic pregnancy Ec- (out) + top (place).

6. The newborn period covers the first:

A. 28 days
B. 7 days
C. 6 weeks
D. 12 months

A. 28 days Neonatology covers the first 28 days.

CHAPTER 13

The Nervous System, Psychiatry and the Special Senses

Read it in full: **Chapter 13 in the textbook**. Practice it in the lab: **Near-Miss Ward: The Neuro Look-Alikes** and **The Mental Status Sorter**.

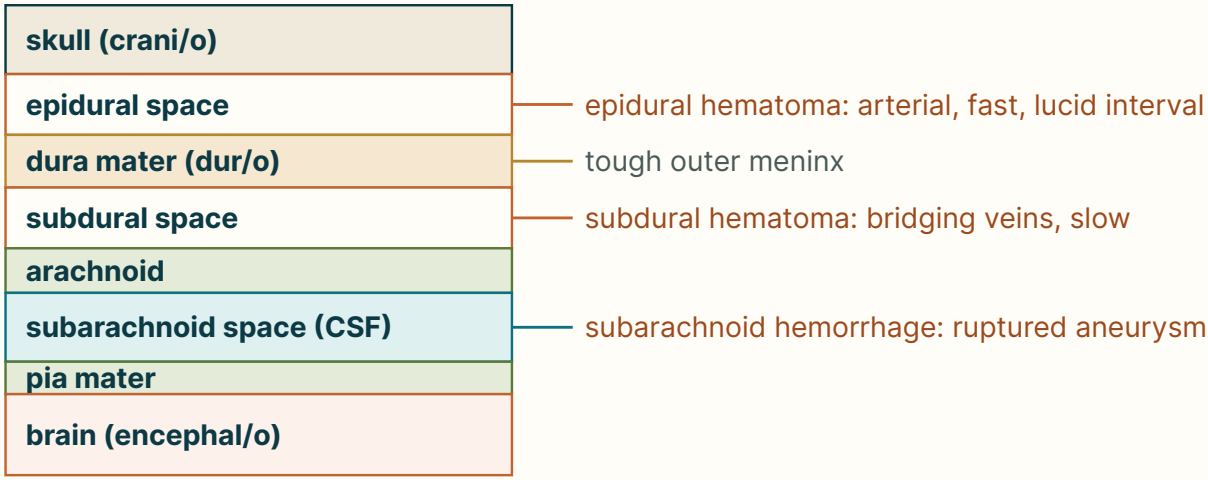
What to know

Roots: neur/o, gli/o, encephal/o, cerebr/o, cerebell/o, mening/o, dur/o, myel/o, radicul/o, ventricul/o, crani/o. Deficits: -plegia, -paresis, -esthesia, -algesia, -phasia, -kinesia, -taxia, -lepsy; extent prefixes mono-, hemi-, para-, tetra-. Dysarthria is motor speech; dysphasia is language. Broca nonfluent; Wernicke fluent.

Stroke (ischemic about four in five), TIA, SAH, epidural (above dura, arterial, fast) vs subdural (below, venous, slow). Meningitis, hydrocephalus, myelomeningocele, MS (write it out), ALS, myasthenia gravis. LP at L3 to L5, EEG, GCS 3 to 15. Craniotomy, craniectomy, ventriculostomy, VP shunt, laminectomy.

Psychiatry: psych/o, ment/o, phren/o; -thymia, -phoria, -mania, -phobia. Mood vs affect; delusion vs hallucination vs illusion; obsession vs compulsion; delirium vs dementia; person-first language. Eye: ophthalm/o, blephar/o, kerat/o, irid/o, phac/o, retin/o, papill/o vs pupill/o; cataract, glaucoma, strabismus. Ear: ot/o, audi/o, myring/o, staped/o; conductive vs sensorineural loss. Write out OD, OS, OU, AD, AS, AU.

Layers over the brain: the prefix places the bleed



The meninges are dura, arachnoid and pia: mening/o. Meningitis inflames them.

Epi- is above the dura; sub- is below it. Read the prefix and you know the layer, the usual vessel and how fast the patient may decline.

LOCK THESE IN

- -plegia paralysis; -paresis weakness.
- Epidural fast and arterial; subdural slow and venous.
- Mood reported; affect observed.
- Delirium acute; dementia chronic.
- Papill/o disc; pupill/o pupil.

Chapter 13 terms

Term	Parts	Meaning
glioblastoma	gli/o + blast/o + -oma	aggressive glial tumor
radiculopathy	radicul/o + -pathy	nerve root disease
ataxia	a- + -taxia	lack of coordination
anhedonia	an- + hedon/o + -ia	loss of pleasure
presbyopia	presby/o + -opia	age-related near focus loss
dacryocystitis	dacry/o + cyst/o + -itis	inflamed tear sac
presbycusis	presby/o + -cusis	age-related hearing loss

Worked cases

WORKED CASE 1 · DECODE A SPINAL DEFECT

Decode meningocele and say how it differs from myelomeningocele.

PARTS

mening/o (meninges) + -cele (protrusion).

ANSWER

A sac containing meninges only; a myelomeningocele also contains spinal cord, with deficits below.

WORKED CASE 2 · NAME THE HEARING LOSS

Otosclerosis fixes the stapes. Which type of hearing loss?

WHERE

The stapes is in the middle ear.

ANSWER

Conductive hearing loss. Cochlea or CN VIII damage would be sensorineural.

TRAPS PEOPLE FALL INTO

- **Mixing myelitis and myositis.** Cord vs muscle.
- **Mixing anesthesia and analgesia.** All sensation vs pain.
- **Reading schizophrenia as split personality.** Different disorder.
- **Writing OS on an order.** Write left eye.

Chapter 13 self-test · six items

1. Lack of muscle coordination is:

A. Aphasia
B. Apraxia
C. Ataxia
D. Agnosia

C. Ataxia Tax/o means coordination or order.

2. Which scale scores eye, verbal and motor response from 3 to 15?

A. Glasgow Coma Scale
B. NIH Stroke Scale
C. Apgar score
D. DTR grading

A. Glasgow Coma Scale GCS; 15 is fully awake.

3. A drug that reduces anxiety is an:

A. Antipsychotic
B. Anxiolytic
C. Antiemetic
D. Analgesic

B. Anxiolytic -lytic means loosening or reducing.

4. Inflammation of the eyelid is:

A. Keratitis
B. Blepharitis
C. Iritis
D. Retinitis

B. Blepharitis Blephar/o is the eyelid.

5. Clouding of the lens is a:

A. Glaucoma
B. Chalazion
C. Strabismus
D. Cataract

D. Cataract Repaired by phacoemulsification.

6. Which is chronic and progressive?

A. Dementia
B. Delirium
C. A TIA
D. Syncope

A. Dementia Delirium is acute and often reversible.

CHAPTER 14

The Endocrine System, Abbreviations and Documentation

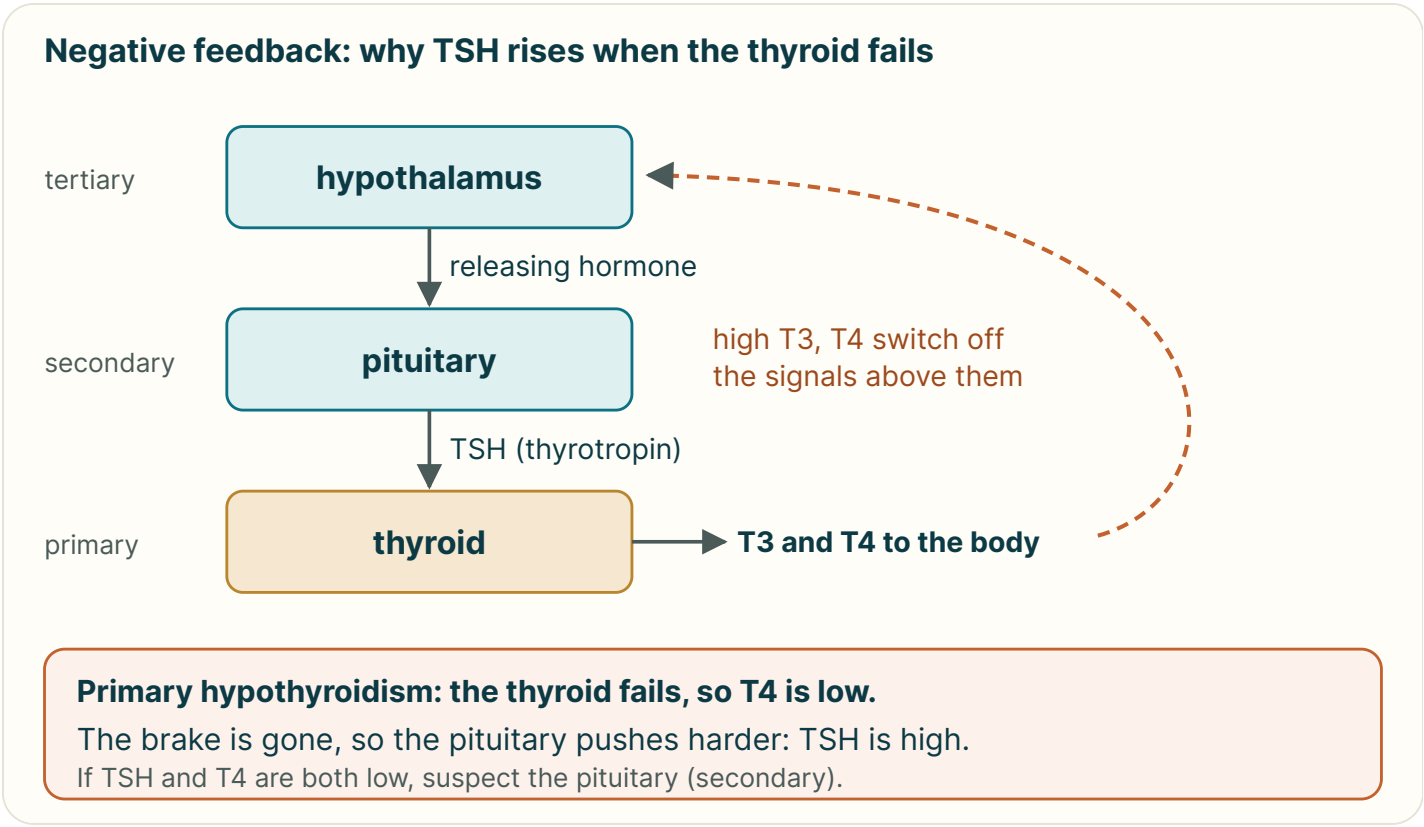
Read it in full: **Chapter 14 in the textbook**. Practice it in the lab: **The Neck Gland Splitter** and **The Look-Alike Ward**.

What to know

Endocrine glands are ductless; exocrine use ducts. Aden/o gland; adren/o adrenal. -tropin stimulates; -trophy is growth. -emia blood; -uria urine. Negative feedback: primary hypothyroidism means low T4, high TSH. Primary, secondary, tertiary name the failed level.

Pituitary (hypophys/o): acromegaly, gigantism, panhypopituitarism, ADH (diabetes insipidus, SIADH with hyponatremia). Thyroid: thyrotoxicosis, Graves and exophthalmos, Hashimoto, myxedema, goiter. Parathyroid: PTH raises calcium; calc/i calcium, kal/i potassium, natr/o sodium. Adrenal cortex and medulla; Cushing syndrome vs disease; Addison; pheochromocytoma. Diabetes mellitus vs insipidus; DKA; FBG, OGTT, A1C.

SOAP: subjective, objective, assessment, plan, with no crossing lanes. Correct with a dated, signed addendum. Chart sections: CC, HPI, PMH, FH, SH, ROS, PE, H&P, A&P. Do Not Use: U, IU, Q.D., Q.O.D., trailing zero, missing leading zero, MS, MSO4, MgSO4. Insulin is high-alert: write units. Tall man lettering separates HYPERglycemia and HYPOglycemia.



Read hormone pairs as a loop. Primary, secondary and tertiary name which level of this loop has failed.

LOCK THESE IN

- Aden/o vs adren/o; -tropin vs -trophy.
- Low T4 with high TSH is primary hypothyroidism.
- Calc/i calcium; kal/i potassium.
- Mellitus sugar; insipidus ADH.
- SOAP lanes; Do Not Use list.

Chapter 14 terms

Term	Parts	Meaning
hypophysis	hypo- + -physis	pituitary gland
adenohypophysis	aden/o + hypophysis	anterior pituitary
myxedema	myx/o + -edema	severe hypothyroid swelling
thyrotoxicosis	thyr/o + toxic/o + -osis	severe thyroid excess
ketoacidosis	ket/o + acid + -osis	DKA
euthyroid	eu- + thyroid	normal thyroid function
NKDA; WNL	abbreviations	no known drug allergies; within normal limits

Worked cases

WORKED CASE 1 · PLACE A LAB IN A LOOP

TSH is low and free T4 is high. What is happening?

FEEDBACK

High thyroid hormone switches off TSH.

ANSWER

Hyperthyroidism from the thyroid itself (the pituitary is responding normally).

WORKED CASE 2 · FIX A CHART LINE

A note reads "Pt anxious; A: tachycardia 118." Is the SOAP placement right?

PROBLEM

A measured heart rate is objective data, not an assessment.

ANSWER

Move "heart rate 118" to O. The assessment is the interpretation, such as a suspected cause.

TRAPS PEOPLE FALL INTO

- **Expecting TSH to follow T4.** They move in opposite directions in thyroid disease.
- **Reading goiter as a function word.** Size only.
- **Writing only "diabetes."** Mellitus or insipidus.
- **Altering an old entry.** Use a dated, signed addendum.

Chapter 14 self-test · six items

1. Which hormone conserves water at the kidney?

A. ACTH
B. TSH
C. ADH
D. PTH

C. ADH Antidiuretic hormone; too little causes diabetes insipidus.

2. Which gland makes PTH?

A. Thyroid
B. Parathyroid
C. Pituitary
D. Adrenal

B. Parathyroid PTH raises blood calcium.

3. Bulging eyes in Graves disease are called:

A. Exotropia
B. Nystagmus
C. Strabismus
D. Exophthalmos

D. Exophthalmos Ex- (out) + ophthalm/o (eye).

4. The adrenal medulla makes:

A. Cortisol
B. Aldosterone
C. Insulin
D. Epinephrine

D. Epinephrine The cortex makes cortisol and aldosterone.

5. "Reports cold intolerance" belongs in which SOAP section?

A. Subjective
B. Objective
C. Assessment
D. Plan

A. Subjective It is what the patient reports.

6. Which is on the Do Not Use list?

A. mg
B. mL
C. IU
D. PRN

C. IU Write international unit.

ONE PAGE

Cram sheet

The whole course on one long sheet. Cover the right column and see if you can rebuild each row.

Building rules

Rule	What it says	Example
Four parts	root, combining vowel, suffix, prefix	peri/card/itis
Vowel rules	keep before a consonant and between roots; drop before a vowel	arthroscopy, osteoarthritis, arthritis
Prefixes	no vowel, no plural change; a- to an-, syn- to sym-	anemia, symphysis
Decoding	suffix, prefix, middle, then plain English	polyneuropathy
Greek vs Latin	disease and surgery vs structure	nephrectomy, renal
Silent letters	initial ps-, pn-, pt-; x sounds like z	pneumonia, xiphoid

Suffixes

Group	Members
Condition	-itis, -osis, -iasis, -pathy, -oma, -emia, -megaly, -malacia, -sclerosis, -stenosis, -ptosis, -cele, -ectasis, -lysis, -penia
-rrh family	-rrhage bleed, -rrhea flow, -rrhexis rupture, -rrhaphy suture
Symptoms	-algia, -pnea, -phagia, -phasia, -plegia, -paresis, -emesis, -ptysis, -uria, -esthesia
Looking	-scope, -scopy; -graph, -graphy, -gram; -meter, -metry; -opsy
Surgery	-ectomy, -tomy, -stomy, -plasty, -pexy, -rrhaphy, -desis, -centesis, -tripsy, -clasis
People	-logy, -logist; -iatry, -iatrist; -iatrics, -ician
Hormones and growth	-tropin, -tropic stimulate; -trophy, -plasia grow

Prefixes

Group	Members
Position	endo-, epi-, peri-, sub-, infra-, supra-, inter-, intra-, retro-, para-, meta-, ecto-, extra-, juxta-
Direction	trans-, per-, ab-, ad-, dia-, ana-, cata-, ipsi-, contra-
Number	mono-, uni-, bi-, di-, tri-, quadri-, tetra-, multi-, poly-, primi-, nulli-, pan-, hemi-, semi-
Quantity	hyper-, hypo-, olig/o-, macro-, micro-, iso-, homeo-
Time and speed	pre-, pro-, ante-, post-, peri-, intra-, neo-, re-, syn-, tachy-, brady-
Negation and quality	a-, an-, in-, anti-, contra-, de-, dys-, eu-, mal-, pseudo-, ortho-, auto-, allo-, xen/o-

Look-alikes across the course

Pair	The difference
ile/o vs ili/o	ileum (bowel) vs ilium (hip)
my/o vs myel/o vs myc/o	muscle vs marrow or cord vs fungus
arteri/o vs ather/o vs arthr/o	artery vs plaque vs joint
ureter/o vs urethr/o; pyel/o vs py/o	kidney-to-bladder vs bladder-to-outside; pelvis vs pus
col/o vs colp/o; hidr/o vs hydr/o	colon vs vagina; sweat vs water
aden/o vs adren/o; calc/i vs kal/i	gland vs adrenal; calcium vs potassium
papill/o vs pupill/o; perine/o vs peritone/o	optic disc vs pupil; pelvic floor vs abdominal lining
dysphagia, dysphasia, dysplasia, dysarthria	swallowing, language, cell growth, motor speech
-ptosis vs -ptysis; -tropin vs -trophy	drooping vs spitting; stimulating vs growth
ante- vs anti-; inter- vs intra-; ab- vs ad-	before vs against; between vs within; away vs toward
salping/o; vas/o; kerat/o; phren/o	two tubes; vessel or duct; cornea or horny skin; mind or diaphragm

Body systems at a glance

System	Core roots
Skin	derm/o, dermat/o, cutane/o, kerat/o, seb/o, hidr/o, trich/o, onych/o
Musculoskeletal	oste/o, chondr/o, arthr/o, my/o, ten/o, spondyl/o, cost/o, crani/o
Cardiovascular	cardi/o, coron/o, angi/o, arteri/o, ven/o, phleb/o, thromb/o, embol/o
Blood and lymph	hem/o, erythr/o, leuk/o, thromb/o, lymph/o, lymphaden/o, splen/o, immun/o
Respiratory	rhin/o, laryng/o, trache/o, bronch/o, alveol/o, pneum/o, pleur/o, spir/o
Digestive	esophag/o, gastr/o, enter/o, col/o, hepat/o, chol/e, cholecyst/o, pancreat/o
Urinary	ren/o, nephr/o, pyel/o, ureter/o, cyst/o, urethr/o, -uria
Reproductive	hyster/o, salping/o, oophor/o, colp/o, orchi/o, prostat/o, amni/o, nat/o
Nervous and senses	neur/o, encephal/o, mening/o, myel/o, psych/o, ophthalm/o, ot/o, audi/o
Endocrine	aden/o, crin/o, hypophys/o, thyr/o, adren/o, gluc/o, glyc/o, calc/i

Numbers to know

Item	Value
Heart rate (adult)	tachycardia over about 100; bradycardia under about 60 bpm
Urine output	oliguria under about 400 mL/day or 0.5 mL/kg/hr; anuria under about 100 mL/day
Lesion size	1 cm separates macule/patch, papule/plaque, vesicle/bulla
DXA T-score	-1.0 to -2.5 osteopenia; -2.5 or lower osteoporosis
Fowler	semi 30 to 45; Fowler 45 to 60; high 60 to 90 degrees
Room air FiO2	0.21 (21 percent)
CKD stage 5	eGFR under 15
GTPAL	term 37 weeks or later; preterm 20 to 37; abortion before 20
Newborn	first 28 days; preterm before 37 weeks; post-term after 42
Scores	Apgar 0 to 10; GCS 3 to 15; NIHSS 0 to 42
CD4 (HIV)	under 200 means AIDS
A1C	average glucose over about 3 months

Plurals

Ending	Rule and examples
-a	-ae: vertebrae, bursae, bullae, pleurae, fimbriae
-us	-i: bronchi, alveoli, thrombi, emboli, nevi, calculi, glomeruli (viruses, sinuses stay English)
-um	-a: ova, atria, diverticula, bacteria, strata
-is	-es: diagnoses, metastases, testes, keratoses, anastomoses
-ix, -ex	-ices: appendices, cervices, cortices, apices, varices
-nx	-nges: phalanges, larynges, pharynges, salpinges, meninges
-on, -oma	-a: ganglia, spermatozoa; -omata or -omas
Irregular	comedones, epididymides, corpora lutea, irides, adnexa (plural only), viscus/viscera

Safety and documentation

Item	Rule
Do Not Use	U, IU, Q.D., Q.O.D., trailing zero, missing leading zero, MS, MSO4, MgSO4
Write instead	unit, international unit, daily, every other day, 1 mg, 0.5 mg, drug name in full
Error-prone	SC, SQ (write subcut); OD, OS, OU, AD, AS, AU (write out); tPA (drug name)
Ambiguous	MS, PE, BS, CP, DM, PT, DC, PVD, MI: spell out
SOAP	S reported; O measured or observed; A interpretation; P next steps
Corrections	dated, signed addendum; never alter an entry
Eponyms	no possessive: Down syndrome, Crohn disease, Cushing syndrome

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