MEDICAL TERMINOLOGY · STUDY GUIDE

Exam 1 Study Guide

This guide covers the first two chapters. You will learn how every medical word is put together from a few parts, and how to read a new word by starting at the end. Then you will learn the suffixes that tell you whether a word names a disease, a test, an operation or a specialist. Work one chapter at a time. Read the "what to know" paragraphs, copy the word part tables out by hand, then try each worked case with the steps covered. Finish each chapter with its ten self-test items. The cram sheet at the end puts every rule in one place.

WHAT THIS GUIDE COVERS

- Chapter 1 · root, combining vowel, combining form, suffix and prefix; the three vowel rules; decoding suffix first; Greek and Latin doublets; look-alike roots; silent letters and stress; the nine plural patterns; eponyms; the Do Not Use list.
- Chapter 2 · condition suffixes (-itis, -osis, -iasis, -pathy, -oma, -megaly and more); the -rrh family; -scope, -scopy, -graph, -graphy, -gram, -meter, -metry; surgical suffixes from -ectomy to -tripsy; specialty and adjective suffixes; plurals and eponyms.

CHAPTER 1

How Medical Words Are Built

Read it in full: **Chapter 1 in the textbook**. Practice it in the lab: **The Term Builder: Four Blocks, One Word** and **The Decode Bench: Split It, Then Read It Backwards**.

What to know

Medical terms are not a list to memorize. They are built from a small stock of parts. Learn about three hundred parts and you can read tens of thousands of words, even words you have never seen.

There are four parts. The **word root** is the core. It names a body structure, a substance or a quality. In carditis the root is cardi-, heart. In osteoporosis it is oste-, bone. A term can hold more than one

root. Gastroenterology holds gastr- (stomach) and enter- (small intestine). When there are several roots they usually come in anatomical order, the path a scope would take. That is why esophagogastroduodenoscopy lists esophagus, then stomach, then duodenum.

The **combining vowel** is a linking vowel, almost always o and now and then i, that makes the root sayable. A root written with its vowel and a slash is a **combining form**: cardi/o, gastr/o, oste/o, nephr/o. Read the slash as "the vowel comes off when it is not needed." A few forms take i: calc/i (calcium), ov/i (egg) and dent/i (tooth).

The **suffix** sits at the end and decides what kind of word you hold: an inflammation, a disease, a surgery, an imaging study, a specialist or a plain adjective. Change only the suffix and the clinical event changes. Nephritis is kidney inflammation, nephrectomy is kidney removal, nephrology is the study of the kidney and nephromegaly is an enlarged kidney. Every term has a suffix, even if it is only an adjective ending like -ic, -al, -ar, -ous or -eal, which mean "pertaining to."

The **prefix** sits at the front and adjusts position, number, time, or negation and degree. Not every term has one. When it is there it often carries the key detail. Pericarditis is inflammation of the sac around the heart. Endocarditis is inflammation of the inner lining. Myocarditis is inflammation of the heart muscle itself. Prefixes attach straight to what follows, with no combining vowel. A few change shape: a- becomes an- before a vowel (apnea, anemia), and syn- becomes sym- before b, m or p.

Three rules govern the combining vowel. Rule one: keep it before a suffix that starts with a consonant (arthr/o + -scopy = arthroscopy). Rule two: drop it before a suffix that starts with a vowel (arthr/o + -itis = arthritis). Rule three: keep it between two roots, even if the second root starts with a vowel (oste/o + arthr/o + -itis = osteoarthritis). If you find yourself putting an o after a prefix, you have misread the part.

Decode in a fixed order. Read the suffix first, then the prefix if there is one, then the middle from left to right. Then turn the literal reading into plain English. Polyneuropathy is -pathy (disease), poly- (many), neur- (nerve): disease of many nerves. The literal meaning is a doorway, not a full definition. Diarrhea literally means "flowing through," but the working definition is more frequent, larger or looser stools. Decode, then confirm the clinical meaning.

Most organs carry a Greek root and a Latin root. Greek usually gives the words for disease and surgery. Latin usually gives the words for structure and description. The kidney is nephr/o in nephrectomy and ren/o in renal failure. Nobody says "nephral artery" or "renectomy." Skin is derm/o and cutane/o, the mouth is stomat/o and or/o, the vein is phleb/o and ven/o, the lung is pneumon/o and pulmon/o.

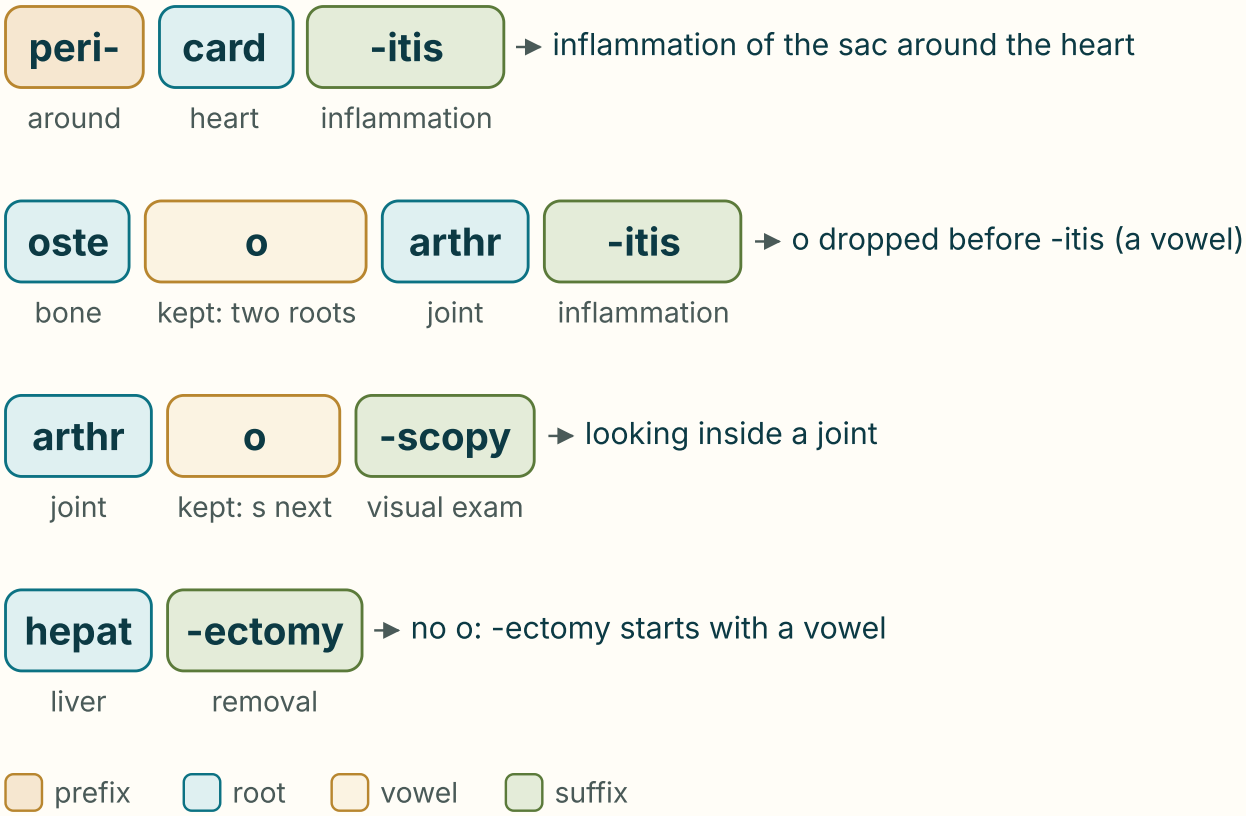
Some roots look almost the same and mean unrelated things. Ile/o is the ileum (the last part of the small intestine) and ili/o is the ilium (the hip bone). They are said the same way, so only spelling separates them. My/o is muscle and myel/o is bone marrow or spinal cord. Arteri/o is artery, ather/o is fatty plaque and arthr/o is joint. Ureter/o is the tube from kidney to bladder, urethr/o is the tube from bladder to the outside. Pyel/o is the renal pelvis and py/o is pus.

Pronunciation has a few fixed rules. At the start of a word the p is silent in ps-, pn- and pt- (psychosis, pneumonia, ptosis), but it is sounded in the middle (apnea, dyspnea). Initial x sounds like z (xiphoid). C and g are soft before e, i and y. Ch usually sounds like k (cholesterol). Rrh sounds like a plain r and signals flow or rupture. Terms ending in -itis stress the long i: appendicitis is ap-en-dih-SYE-tis.

Medical nouns keep their Greek and Latin plurals. Nine patterns cover almost everything: -a to -ae, -us to -i, -um to -a, -is to -es, -ix or -ex to -ices, -oma to -omata or -omas, -nx to -nges, -on to -a, and -ax to -aces. Virus and sinus stay English (viruses, sinuses). Bacteria is already plural.

An **eponym** is a term named after a person, like Parkinson disease or Crohn disease. Style guides now drop the possessive (Down syndrome, not Down's syndrome), and descriptive names are replacing many eponyms: reactive arthritis for Reiter syndrome, uterine tube for fallopian tube. An **acronym** is said as a word (CABG, said "cabbage"). An **initialism** is spelled letter by letter (COPD). The Joint Commission keeps a Do Not Use list of abbreviations that have caused harm. If an abbreviation could be read two ways, spell the word out.

Decode in this order: suffix first, then the prefix, then the middle.



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

- Four parts: root (the structure), combining vowel (makes it sayable), suffix (what is happening), prefix (position, number, time, degree).
- A combining form is root + vowel + slash: gastr/o. The vowel comes off when it is not needed.
- Keep the vowel before a consonant suffix and between two roots. Drop it before a vowel suffix. Prefixes never take one.
- Decode suffix first, prefix second, middle last, then say it in plain English.
- Greek roots name disease and surgery (nephr/o); Latin roots name structure and description (ren/o).
- Learn the look-alikes as pairs: ile/o and ili/o, my/o and myel/o, arteri/o, ather/o and arthr/o, ureter/o and urethr/o, pyel/o and py/o.
- -ectomy removes, -tomy cuts in and closes, -stomy makes a lasting opening.
- Write unit and International Unit in full, never Q.D. or Q.O.D., no trailing zero (1 mg), always a leading zero (0.5 mg).

Word parts from the chapter

Word part	Type	Meaning	Example term
cardi/o	Combining form	heart	cardiology, the study of the heart
gastr/o	Combining form	stomach	gastritis, inflammation of the stomach
hepat/o	Combining form	liver	hepatomegaly, enlarged liver
nephr/o, ren/o	Combining forms	kidney (Greek, Latin)	nephrectomy; renal failure
oste/o	Combining form	bone	osteopenia, too little bone tissue
arthr/o	Combining form	joint	arthroscopy, looking inside a joint
my/o	Combining form	muscle	myalgia, muscle pain
myel/o	Combining form	bone marrow or spinal cord	myelopathy, spinal cord disease
cyan/o, erythr/o, leuk/o, melan/o, xanth/o	Combining forms	blue, red, white, black, yellow	cyanosis, erythema, leukocyte, melanoma, xanthoma
scler/o, malac/o, necr/o	Combining forms	hard, soft, death of tissue	scleroderma, osteomalacia, necrosis
peri-, endo-, epi-, sub-	Prefixes	around, within, upon, under	pericarditis, endoscope, epidermis, subcutaneous

Word part	Type	Meaning	Example term
a-, an-, dys-, eu-	Prefixes	without, difficult, good	apnea, anemia, dysuria, eupnea
hyper-, hypo-	Prefixes	above normal, below normal or beneath	hyperglycemia, hypoglycemia
-itis, -osis, -pathy, -megaly	Suffixes	inflammation, abnormal condition, disease, enlargement	tendinitis, cyanosis, cardiomyopathy, splenomegaly
-ectomy, -tomy, -stomy	Suffixes	removal, incision, new opening	appendectomy, tracheotomy, colostomy
-centesis	Suffix	puncture to withdraw fluid	thoracentesis

Key terms and comparisons: look-alikes and plurals

Pair or pattern	How they differ	Example
ile/o vs ili/o	Ileum (last small intestine) vs ilium (hip bone)	ileostomy vs iliac crest
my/o vs myel/o	Muscle vs marrow or spinal cord	myopathy vs myelopathy
arteri/o vs ather/o vs arthr/o	Artery vs fatty plaque vs joint	arteriosclerosis vs atherosclerosis vs arthralgia
ureter/o vs urethr/o	Kidney to bladder (two tubes) vs bladder to outside (one tube)	ureterolithiasis vs urethritis
pyel/o vs py/o	Renal pelvis vs pus	pyelonephritis vs pyothorax
cyst/o vs cyt/o	Bladder or sac vs cell	cystoscopy vs cytology
col/o vs colp/o	Colon vs vagina	colostomy vs colposcopy
ante- vs anti-	Before vs against	antepartum vs antiemetic
dysphagia vs dysphasia	Swallowing (g for gullet) vs speech (s for speech)	coughing on liquids vs word-finding trouble
-a to -ae; -us to -i; -um to -a	Latin plurals	vertebrae; bronchi; ova, atria, ilia
-is to -es; -ix, -ex to -ices	Greek and Latin plurals	diagnoses, testes; appendices, apices
-nx to -nges; -on to -a; -ax to -aces	Less common plurals	phalanges, larynges; ganglia; thoraces

Abbreviations and safety rules

Write this	Never this	Why
unit	U or u	Read as 0, 4 or cc
International Unit	IU	Read as IV or the number 10
daily; every other day	Q.D.; Q.O.D.	Mistaken for each other and for QID
1 mg	1.0 mg	A missed point reads as 10 mg
0.5 mg	.5 mg	A lost point reads as 5 mg
morphine sulfate; magnesium sulfate	MS, MSO4, MgSO4	The two drugs get confused
multiple sclerosis or mitral stenosis	MS	Same letters, different diseases
bowel sounds or breath sounds	BS	Can also mean blood sugar

Worked cases

WORKED CASE 1 · DECODING A LONG TERM PART BY PART

A chart lists thrombocytopenia. Break it down and say what you would watch for.

STEP 1 · FIND THE SUFFIX

-penia means deficiency or too few. So this is a shortage of something.

STEP 2 · LOOK FOR A PREFIX

There is none. The word starts with a root.

STEP 3 · READ THE MIDDLE IN ORDER

thromb/o is clot. cyt/o is cell. The o after each root stays, because each sits before another root or a consonant.

STEP 4 · LITERAL READING

Clot + cell + too few: too few clotting cells.

STEP 5 · PLAIN ENGLISH

Too few platelets. Watch for bleeding: bruising, petechiae, gum or nose bleeds and oozing from puncture sites.

WORKED CASE 2 · BUILDING A TERM WITH THE VOWEL RULES

Build the term for inflammation of bone and joint, then the term for a scope exam of a joint.

STEP 1 · PICK THE PARTS

Bone is oste/o, joint is arthr/o, inflammation is -itis, visual examination is -scopy.

STEP 2 · JOIN ROOT TO ROOT

oste/o + arthr/o: rule three keeps the o between two roots, even though arthr- starts with a vowel. You get osteoarthr-.

STEP 3 · ADD THE VOWEL SUFFIX

-itis starts with i, so rule two drops the o of arthr/o: **osteoarthritis**.

STEP 4 · ADD THE CONSONANT SUFFIX

arthr/o + -scopy: -scopy starts with s, so rule one keeps the o: **arthroscopy**.

CHECK IT

Say both aloud. "Osteoarthroitis" and "arthrscopy" both break a rule and both sound wrong.

WORKED CASE 3 · CHOOSING BETWEEN LOOK-ALIKE ROOTS

A note on Mr. Delgado says "new myelopathy, weakness in both legs." A student reads it as muscle disease. Is that right?

STEP 1 · SPLIT THE TERM

myel/o + -pathy. The root is myel/o, not my/o.

STEP 2 · RECALL THE MEANING

Myel/o means bone marrow or spinal cord. Context decides which.

STEP 3 · USE THE CONTEXT

New leg weakness is a nerve finding, so here myel/o means spinal cord.

STEP 4 · ANSWER

No. Myelopathy is spinal cord disease. Muscle disease would be myopathy. The two workups go in different directions.

WORKED CASE 4 · FIXING AN UNSAFE ORDER

An order reads "insulin 10 U Q.D." and "folic acid 1.0 mg." Rewrite both safely.

STEP 1 · FIND BANNED ITEMS

U for unit, Q.D. for daily and the trailing zero in 1.0 are all on the Do Not Use list.

STEP 2 · REPLACE EACH

U becomes unit. Q.D. becomes daily. 1.0 mg becomes 1 mg.

STEP 3 · REWRITE

"insulin 10 units daily" and **"folic acid 1 mg."**

WHY IT MATTERS

10 U can be read as 100. 1.0 mg can be read as 10 mg. Each is a tenfold error.

TRAPS PEOPLE FALL INTO

- **Putting a combining vowel after a prefix.** Prefixes attach directly: sublingual, pericardium, hypertension.
- **Dropping the vowel between two roots.** Osteoarthritis keeps the middle o, even though arthr- starts with a vowel.
- **Reading front to back.** Nephrology, nephropathy and nephrectomy look alike from the front. The suffix tells them apart.
- **Trusting the literal meaning alone.** Decode first, then confirm the clinical definition. Diarrhea is not just "flowing through."
- **Writing ileum for ilium.** They sound the same. Ileum is bowel (e for eat); ilium is hip bone.
- **Mixing my/o and myel/o.** Myopathy is muscle disease; myelopathy is spinal cord disease.
- **Saying the p in pneumonia.** Initial ps-, pn- and pt- have a silent p. In the middle of a word (dyspnea) it is sounded.
- **Making plurals the English way in a chart.** One vertebra, two vertebrae; one diagnosis, two diagnoses. But viruses and sinuses stay English.
- **Swapping U and IU rules.** U becomes unit. IU becomes International Unit. Two rules, two replacements.

Chapter 1 self-test · ten items

1. In the term hepatomegaly, which part names the body structure?

A. hepat/o, the liver

B. -megaly, enlargement

C. the combining vowel o

D. the prefix hep-

A. hepat/o, the liver The root names the structure. Hepat/o is liver; -megaly tells you what is happening to it, and the o only links the parts.

2. Which term correctly applies the combining vowel rules?

A. Neuroalgia
B. Gastrscopy
C. Neuralgia
D. Arthroitis

C. Neuralgia -algia starts with a vowel, so the o of neur/o drops: neuralgia. Gastroscopy keeps its o before s, and arthritis drops it before i.

3. Why does osteoarthritis keep an o between oste- and arthr-?

A. The suffix starts with a consonant
B. The o sits between two roots
C. Arthr- is a Latin root form
D. The term has no prefix at all

B. The o sits between two roots Rule three keeps the combining vowel between two roots, even when the second root begins with a vowel.

4. In what order should you decode an unfamiliar term?

A. Prefix, then middle, then suffix
B. Suffix, then prefix, then middle
C. Middle, then suffix, then prefix
D. Root, then prefix, then suffix

B. Suffix, then prefix, then middle The suffix tells you what kind of word it is, so read it first, then the prefix, then the middle left to right.

5. A surgeon removes part of the colon. Which term fits?

A. Colotomy
B. Colectomy
C. Colostomy
D. Colorrhaphy

B. Colectomy -ectomy is removal. Colotomy is a cut into the colon, and colostomy brings the colon to the skin as a stoma.

6. Which pair shows the Greek root used for surgery and the Latin root used for description?

A. Nephrectomy and renal artery
B. Renectomy and nephral artery
C. Nephritis and nephral vein
D. Renal failure and renectomy

A. Nephrectomy and renal artery Greek nephr/o gives disease and surgery words; Latin ren/o gives the descriptive adjective renal.

7. A patient coughs on thin liquids after a stroke. Which term names this problem?

A. Dysphasia
B. Aphasia
C. Dysphonia
D. Dysphagia

D. Dysphagia Dysphagia uses phag/o, to swallow (g for gullet). Dysphasia uses phas/o, speech.

8. What is the plural of phalanx?

A. Phalanges
B. Phalanxes
C. Phalanxi
D. Phalanxae

A. Phalanges Words ending in -nx change to -nges: phalanx to phalanges, larynx to larynges.

9. How is the p handled in pneumothorax and in apnea?

A. Sounded in both of these two terms
B. Silent in both of these two terms
C. Silent in pneumothorax, sounded in apnea
D. Sounded in pneumothorax, silent in apnea

C. Silent in pneumothorax, sounded in apnea The p in pn-, ps- and pt- is silent only at the start of a word. In the middle of apnea it is sounded.

10. Which is the safe way to write a half milligram dose?

A. .5 mg
B. 0.50 mg
C. .50 mg
D. 0.5 mg

D. 0.5 mg Always use a leading zero and never a trailing zero. A lost point in .5 reads as 5 mg.

CHAPTER 2

Suffixes: Conditions, Procedures and Specialties

Read it in full: **Chapter 2 in the textbook**. Practice it in the lab: **The Operative Suffix Board** and **Tool, Act, Record**.

What to know

A medical word gives its meaning at the end. The suffix tells you whether you are looking at a disease, a symptom, a test, an operation, a specialist or a plain adjective. The root only gives the address. Read the suffix first and walk backward. Myocarditis is -itis (inflammation), card (heart), my/o (muscle): inflammation of the heart muscle.

Suffixes do four jobs. Some name a **condition**: a disease, symptom or abnormal state. Some name a **procedure**: looking, recording, measuring, cutting, repairing or removing. Some name a **specialty or specialist**. Some only turn a root into an adjective or noun. Deciding which job the ending does gets you most of the way to the meaning.

The vowel rule from Chapter 1 explains a spelling puzzle. The true suffixes are -ectomy, -tomy and -stomy. The o you see in "-otomy" and "-ostomy" is the root's own combining vowel, kept because -tomy and -stomy start with consonants. So gastr/o + -ectomy = gastrectomy, but gastr/o + -tomy = gastrotomy and gastr/o + -stomy = gastrostomy.

Four endings do most diagnostic work. **-itis** is inflammation. **-osis** is an abnormal condition, and on a blood cell root it means an increase in those cells (leukocytosis). **-iasis** is also an abnormal condition, often "presence of," usually stones (cholelithiasis). **-pathy** is disease in general, used when the cause is mixed or not named (diabetic nephropathy). **-oma** is a tumor or mass and is not automatically cancer: a lipoma is a benign fatty mass and a hematoma is a collection of clotted blood. Cancer is signaled by carcin/o and sarc/o. **-emia** is a blood condition.

Another family tells you what happened to the tissue. -megaly is enlargement, -malacia softening, -sclerosis hardening, -stenosis narrowing, -ptosis drooping, -cele hernia or protrusion, -ectasis dilation, -lysis breakdown and -penia deficiency. Bronchiectasis is widened airways. Atelectasis (atel/o, incomplete, + -ectasis) is incomplete expansion, a collapsed lung. Same suffix, opposite picture. Do not confuse -ptosis (drooping) with -ptysis (spitting, as in hemoptysis, coughing up blood).

The **-rrh family** has four members. -rrhage or -rrhagia is bursting forth, rapid bleeding. -rrhea is a flow or discharge. -rrhexis is rupture. -rrhaphy is the odd one out: it is a surgical repair by

suturing, not a symptom. Menorrhagia is heavy menstrual bleeding; menorrhea is normal menstrual flow.

Symptom suffixes often attach to prefixes. -algia and -dynia are pain, -pnea is breathing, -phagia is swallowing or eating, -phasia is speech, -uria is a urine condition, -plegia is paralysis and -paresis is partial paralysis or weakness. Hemiplegia is paralysis of one side; hemiparesis is weakness of one side. -emesis is vomiting, -esthesia is sensation and -trophy is development or nourishment.

Diagnostic suffixes come in sets. The bare form is the instrument and adding -y makes it the process. **-scope** is the viewing instrument and **-scopy** the exam. **-graph** is the recording instrument, **-graphy** the process and **-gram** the record. **-meter** measures and **-metry** is measuring. **-tome** is a cutting instrument and **-tomy** the cut. Say it as a sentence: the -graph does the -graphy and makes the -gram. A patient is scheduled for angiography and the radiologist reads the angiogram. ECG and the older EKG mean the same test.

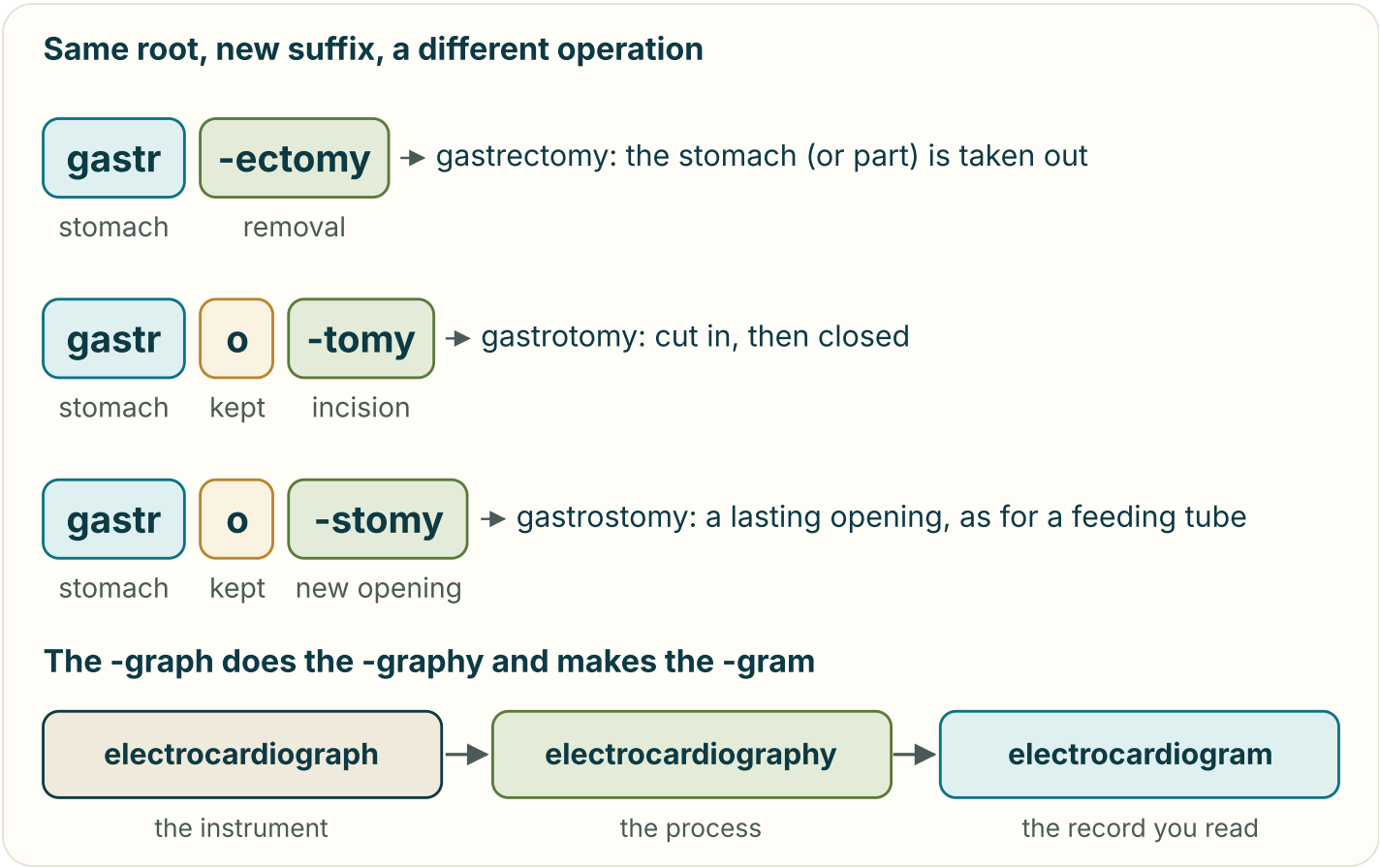
Surgical suffixes are precise verbs. **-ectomy** removes. **-tomy** cuts in and closes. **-stomy** makes a lasting opening. A tracheotomy is the incision; a tracheostomy is the opening that is kept and used. A gastrojejunostomy joins the stomach to the jejunum. **-plasty** rebuilds (arthroplasty, angioplasty). **-pexy** anchors a structure in place (orchiopexy, nephropexy). **-rrhaphy** sutures (herniorrhaphy). **-desis** fuses to stop motion (arthrodesis). **-centesis** drains fluid by puncture (thoracentesis, paracentesis, amniocentesis). **-tripsy** crushes (lithotripsy). -clast names a cell that breaks something down, like the osteoclast.

-logy is the study of and **-logist** is the specialist. You are referred to cardiology and seen by a cardiologist. From Greek iatros (healer), -iatry pairs with -iatrist (psychiatry, podiatrist) and -iatrics pairs with -ician (pediatrics, pediatrician; geriatrics, geriatrician). For the eye, an ophthalmologist is a physician and surgeon, an optometrist measures vision and prescribes correction, and an optician fits lenses.

Adjective suffixes such as -ac, -al, -ar, -ary, -eal, -ic and -ous mean "pertaining to" and carry no diagnosis. Three carry a shade of meaning: -oid (resembling), -genic (producing or originating in)

and -form (shaped like, as in vermiform). Mucus is the substance and mucous is the adjective, so mucous membranes secrete mucus. Serum is the fluid and serous is the adjective.

Plurals follow the same patterns as Chapter 1: vertebra to vertebrae, bronchus to bronchi, ovum to ova, diagnosis to diagnoses, appendix to appendices, carcinoma to carcinomata or carcinomas, phalanx to phalanges, ganglion to ganglia. Eponyms cannot be decoded, so the field is moving to descriptive names and dropping the possessive: Alzheimer disease, granulomatosis with polyangiitis for Wegener granulomatosis.



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

- Read the suffix first. It names the category: condition, procedure, specialty or description.
- The o in "-otomy" and "-ostomy" belongs to the root: gastrectomy drops it, gastrostomy keeps it.
- -itis inflammation, -osis abnormal condition (increase of cells), -iasis presence of (stones), -pathy disease, -oma mass (not always cancer).
- The -rrh family: -rrhage bleeding, -rrhea flow, -rrhexis rupture, -rrhaphy suture repair (the only surgical one).
- Instrument, process, record: -scope/-scopy, -graph/-graphy/-gram, -meter/-metry, -tome/-tomy.
- -ectomy removes, -tomy cuts in, -stomy opens, -plasty rebuilds, -pexy anchors, -rrhaphy sutures, -desis fuses, -centesis drains, -tripsy crushes.
- -logy is a field and -logist a person; -iatry pairs with -iatrist, -iatrics with -ician.
- -plegia is paralysis and -paresis is weakness; -ptosis is drooping and -ptysis is spitting.

Condition and symptom suffixes

Suffix	Meaning	Example term	What it means
-itis	inflammation	pericarditis	inflammation of the sac around the heart
-osis	abnormal condition; increase of cells	leukocytosis	increased white blood cells
-iasis	abnormal condition, presence of	cholelithiasis	presence of gallstones
-pathy	disease	neuropathy	disease of the nerves
-oma	tumor, mass	lipoma	benign fatty mass
-emia	blood condition	anemia	too few red cells or too little hemoglobin
-ism	state, condition	hyperthyroidism	state of excess thyroid activity
-megaly	enlargement	hepatomegaly	enlarged liver
-malacia	softening	osteomalacia	softening of bone
-sclerosis	hardening	atherosclerosis	hardening of arteries from plaque
-stenosis	narrowing	pyloric stenosis	narrowed stomach outlet
-ptosis	drooping, prolapse	blepharoptosis	drooping upper eyelid
-cele	hernia, protrusion	meningocele	meninges pushing through a defect
-ectasis	dilation, expansion	bronchiectasis	permanently widened airways

Suffix	Meaning	Example term	What it means
-lysis	breakdown, separation	hemolysis	destruction of red cells
-penia	deficiency	thrombocytopenia	too few platelets
-rrhage, -rrhea, -rrhexis	bleeding, flow, rupture	hemorrhage, rhinorrhea, angiorrhexis	rapid blood loss; nasal discharge; vessel rupture
-algia, -dynia	pain	myalgia	muscle pain
-pnea, -phagia, -phasia	breathing, swallowing, speech	dyspnea, dysphagia, aphasia	hard breathing; hard swallowing; loss of speech
-plegia, -paresis	paralysis, weakness	paraplegia, hemiparesis	lower body paralysis; one-sided weakness
-emesis, -ptysis	vomiting, spitting	hematemesis, hemoptysis	vomiting blood; coughing up blood

Diagnostic, surgical and specialty suffixes

Suffix	Meaning	Example term	What it means
-scope / -scopy	viewing instrument / visual exam	laryngoscope / laparoscopy	tool for the voice box; exam inside the abdomen
-graph / -graphy / -gram	instrument / process / record	electrocardiograph / mammography / arteriogram	machine; breast imaging; artery image
-meter / -metry	measuring instrument / measuring	spirometer / audiometry	breath meter; hearing test
-opsy	viewing (tissue)	biopsy	removing and viewing living tissue
-tome / -tomy	cutting tool / incision	dermatome / craniotomy	skin slicer; cut into the skull
-ectomy	removal	cholecystectomy	removal of the gallbladder
-stomy	new opening	ileostomy	opening from ileum to abdominal wall
-plasty	repair, reconstruction	rhinoplasty	reshaping the nose
-pexy	fixation	orchiopexy	fixing an undescended testis
-rrhaphy	suturing	herniorrhaphy	repairing a hernia by suture
-desis	fusion	arthrodesis	fusing a joint
-centesis	puncture to withdraw fluid	thoracentesis	draining the pleural space

Suffix	Meaning	Example term	What it means
-tripsy	crushing	lithotripsy	crushing a stone
-logy / -logist	study of / specialist	nephrology / nephrologist	kidney field; kidney specialist
-iatry / -iatrist	field of treatment / practitioner	psychiatry / podiatrist	mind; foot
-iatrics / -ician	field / practitioner	geriatrics / pediatrician	older adults; children
-oid, -genic, -form	resembling, producing, shaped like	lipoid, carcinogenic, vermiform	fat-like; cancer-producing; worm-shaped
-ac, -al, -ar, -ary, -eal, -ic, -ous	pertaining to	cardiac, renal, pulmonary, esophageal	adjectives only, no diagnosis

Worked cases

WORKED CASE 1 · ONE ROOT, FOUR SUFFIXES

Arthr/o is joint. Build the term for each order: fuse the joint, replace the joint, drain fluid from the joint, image the joint.

STEP 1 · MATCH EACH VERB TO A SUFFIX

Fuse is -desis. Replace or rebuild is -plasty. Drain fluid by puncture is -centesis. Image is -graphy.

STEP 2 · APPLY THE VOWEL RULE

All four suffixes start with a consonant, so the o of arthr/o stays.

STEP 3 · WRITE THE TERMS

Arthrodesis, arthroplasty, arthrocentesis, arthrography. The image produced is the arthrogram.

CHECK IT

Four orders, one root. Only the suffix changes the act.

WORKED CASE 2 · TRACHEOTOMY OR TRACHEOSTOMY

Ms. Ferreira returns from surgery with a tube in a maintained opening in her neck that will be used for ventilation. Which term belongs in the note?

STEP 1 · NAME WHAT WAS MADE

An opening that is kept and used, not just a cut.

STEP 2 · MATCH THE SUFFIX

-tomy is a cut made and closed. -stomy is a lasting opening.

STEP 3 · ANSWER

Tracheostomy (tray-kee-OS-toh-mee). The tracheotomy is the incision that created it.

WORKED CASE 3 · SORTING THE -RRH FAMILY

Place each in the right job: menorrhagia, rhinorrhea, angiorrhexis, colporrhaphy.

STEP 1 · FIND EACH ENDING

-rrhagia, -rrhea, -rrhexis, -rrhaphy.

STEP 2 · GIVE EACH MEANING

-rrhagia is bursting forth, -rrhea is flow, -rrhexis is rupture, -rrhaphy is suturing.

STEP 3 · READ THE TERMS

Menorrhagia is heavy menstrual bleeding. Rhinorrhea is nasal discharge. Angiorrhexis is a ruptured vessel. Colporrhaphy is suture repair of the vagina.

STEP 4 · SPOT THE ODD ONE

Colporrhaphy is the only procedure. The other three are conditions.

WORKED CASE 4 · INSTRUMENT, PROCESS OR RECORD

Label each: spirometer, spirometry, electrocardiogram, electrocardiograph.

STEP 1 · THE BARE ENDING IS A TOOL

Spirometer and electrocardiograph are instruments. You could point at them.

STEP 2 · -Y IS THE PROCESS

Spirometry is the breathing test someone performs.

STEP 3 · -GRAM IS THE RECORD

The electrocardiogram is the tracing a clinician reads.

ANSWER

Instrument: spirometer, electrocardiograph. Process: spirometry. Record: electrocardiogram.

TRAPS PEOPLE FALL INTO

- **Thinking every -oma is cancer.** A lipoma is benign and a hematoma is clotted blood. Look for carcin/o or sarc/o for malignancy.
- **Treating -rrhaphy as a symptom.** It is the one surgical member of the -rrh family: repair by suture.
- **Mixing -ptosis and -ptysis.** Blepharoptosis is a drooping eyelid. Hemoptysis is coughing up blood.
- **Calling the machine the procedure.** Nobody is scheduled for an angiograph. The -graph does the -graphy and makes the -gram.
- **Lumping the "fix it" suffixes.** -plasty rebuilds, -pexy anchors, -rrhaphy sutures, -desis fuses.
- **Confusing -plegia with -paresis.** Hemiplegia is paralysis of one side. Hemiparesis is weakness of one side.
- **Charting "copious mucous."** Mucus is the noun. Mucous is the adjective, as in mucous membrane.
- **Calling a person by the field name.** You go to cardiology; you see a cardiologist.

Chapter 2 self-test · ten items

1. A note reads leukocytosis. What does -osis mean on a blood cell root?

A. A shortage of those cells
B. Inflammation of the cells
C. An increase in those cells
D. A tumor made of the cells

C. An increase in those cells On a blood cell root, -osis means an increase. A shortage would take -penia, as in leukopenia.

2. Why is it gastrectomy but gastrostomy?

A. Gastrostomy has an extra root in it
B. -ectomy starts with a vowel; -stomy does not
C. The o in -ostomy is part of the suffix
D. Gastrectomy is the older Latin form

B. -ectomy starts with a vowel; -stomy does not The true suffixes are -ectomy and -stomy. The o drops before a vowel and stays before a consonant.

3. Which -rrh suffix names a surgical procedure?

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

B. -rrhaphy -rrhaphy is repair by suturing. The other three name bleeding, rupture and flow.

4. A kidney is anchored back into place after it has dropped. Which suffix names this?

A. -plasty
B. -desis
C. -rrhaphy
D. -pexy

D. -pexy -pexy is surgical fixation or suspension, as in nephropexy. -plasty rebuilds and -desis fuses.

5. Which term names the image a radiologist reads after contrast in an artery?

A. Arteriography
B. Arteriograph
C. Arterioscope
D. Arteriogram

D. Arteriogram -gram is the record produced. -graphy is the process and -graph is the instrument.

6. Which word names a benign mass, not a cancer?

A. Carcinoma
B. Osteosarcoma
C. Lipoma
D. Melanoma

C. Lipoma Lip/o + -oma is a benign fatty mass. Carcin/o and sarc/o mark cancers, and melanoma is a malignancy too.

7. Fluid is drained from the abdomen with a needle. Which term fits?

A. Paracentesis
B. Thoracentesis
C. Amniocentesis
D. Laparotomy

A. Paracentesis -centesis is puncture to withdraw fluid. Paracentesis drains the abdomen; thoracentesis drains the chest.

8. Which pair names a field and the person who practices it?

A. Pediatrics and pediatrist
B. Podiatry and podiatrician
C. Psychiatry and psychiatrician
D. Geriatrics and geriatrician

D. Geriatrics and geriatrician -iatrics pairs with -ician, and -iatry pairs with -iatrist (podiatrist, psychiatrist).

9. Coughing up blood from the airways is:

A. Hematemesis
B. Hemoptosis
C. Hemoptysis
D. Hemorrhea

C. Hemoptysis -ptysis means spitting. Hematemesis is vomiting blood, and -ptosis means drooping.

10. What is the plural of ganglion?

A. Ganglia
B. Ganglions
C. Ganglii
D. Gangliae

A. Ganglia Words ending in -on change to -a: ganglion to ganglia, spermatozoon to spermatozoa.

ONE PAGE

Cram sheet

Everything from chapters 1 and 2 in one place. Cover the right column and see if you can rebuild each row.

Rules to know

Rule	What it says	Example
Four parts	Root, combining vowel, suffix, prefix	peri/card/itis
Vowel rule one	Keep the vowel before a consonant suffix	arthroscopy
Vowel rule two	Drop the vowel before a vowel suffix	arthritis, gastrectomy
Vowel rule three	Keep the vowel between two roots	osteoarthritis, gastroenterology
Prefixes	Attach directly, no vowel; a- becomes an- before a vowel	sublingual; apnea, anemia
Decoding order	Suffix, prefix, middle, then plain English	polyneuropathy
Greek vs Latin	Greek for disease and surgery, Latin for structure	nephrectomy; renal
Silent letters	p silent in initial ps-, pn-, pt-; x sounds like z	psychosis, xiphoid
Stress	-itis stresses the long i	ap-en-dih-SYE-tis

Word parts to know

Group	Parts and meanings
Condition	-itis inflammation; -osis condition or increase; -iasis presence of; -pathy disease; -oma mass; -emia blood condition
Structural change	-megaly enlarge; -malacia soften; -sclerosis harden; -stenosis narrow; -ptosis droop; -cele hernia; -ectasis dilate; -lysis break down; -penia too few
-rrh family	-rrhage bleed; -rrhea flow; -rrhexis rupture; -rrhaphy suture
Symptoms	-algia, -dynia pain; -pnea breathing; -phagia swallowing; -phasia speech; -plegia paralysis; -paresis weakness; -emesis vomiting; -ptysis spitting
Looking	-scope, -scopy; -graph, -graphy, -gram; -meter, -metry; -opsy
Surgery	-ectomy remove; -tomy cut; -stomy open; -plasty rebuild; -pexy anchor; -rrhaphy suture; -desis fuse; -centesis drain; -tripsy crush
People and fields	-logy, -logist; -iatry, -iatrist; -iatrics, -ician
Adjectives	-ac, -al, -ar, -ary, -eal, -ic, -ous; -oid resembling; -genic producing; -form shaped like
Colors	cyan/o blue; erythr/o red; leuk/o white; melan/o black; xanth/o yellow

Key terms and comparisons

Pair	The difference
ile/o vs ili/o	ileum (bowel) vs ilium (hip)
my/o vs myel/o	muscle vs marrow or spinal cord
arteri/o vs ather/o vs arthr/o	artery vs plaque vs joint
ureter/o vs urethr/o	kidney to bladder vs bladder to outside
pyel/o vs py/o	renal pelvis vs pus
tracheotomy vs tracheostomy	the cut vs the lasting opening
dysphagia vs dysphasia	swallowing vs speech
mucus vs mucous	noun vs adjective

Plurals and abbreviations

Item	Rule or safe form
-a, -us, -um	-ae, -i, -a: vertebrae, bronchi, ova
-is, -ix or -ex	-es, -ices: diagnoses, appendices
-oma, -nx, -on, -ax	-omata or -omas, -nges, -a, -aces
English plurals that stay	viruses, sinuses
U and IU	Write unit and International Unit
Q.D. and Q.O.D.	Write daily and every other day
Zeros	1 mg (no trailing zero); 0.5 mg (leading zero)
Acronym vs initialism	CABG said as a word; COPD spelled out

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