MEDICAL TERMINOLOGY · STUDY GUIDE

Exam 7 Study Guide

This guide covers the last two chapters. The nervous system chapter gives you the structure roots and the deficit suffixes that fill a neurology note, then extends them into psychiatry and into the eye and ear. The endocrine chapter decodes the glands and hormones, then closes the book with documentation: the SOAP note, chart sections and the abbreviations that must never be written. Work one chapter at a time. Read the "what to know" paragraphs, copy the 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 the look-alikes and the safety rules in one place.

WHAT THIS GUIDE COVERS

- Chapter 13 · neur/o, encephal/o, cerebr/o, mening/o, myel/o, radicul/o, gli/o; deficit suffixes and extent prefixes; stroke, TIA, epidural vs subdural; meningitis, hydrocephalus, neural tube defects; MS, ALS, myasthenia gravis; LP, EEG, imaging, GCS; craniotomy vs craniectomy; psychiatry roots and mental status terms; eye and ear roots; unsafe eye and ear abbreviations.
- Chapter 14 · endocrine vs exocrine; aden/o vs adren/o; -tropin vs -trophy; -emia vs -uria; homeostasis and feedback; pituitary, thyroid and parathyroid terms; calc/i vs kal/i; adrenal, pancreas and gonad terms; diabetes mellitus vs insipidus; tests and surgery; endocrine abbreviations; SOAP; chart sections; the Do Not Use list.

CHAPTER 13

The Nervous System, Psychiatry and the Special Senses

Read it in full: **Chapter 13 in the textbook**. Practice it in the lab: **The Neuro Term Forge** and **Root Walk: Through the Eye and Into the Ear**.

What to know

The CNS is the brain and spinal cord; the PNS is the cranial and spinal nerves. **Neur/o** is the busiest root: neurology, neuritis, neuralgia, neuroma, neuropathy, neurorrhaphy (suture of a nerve). Supporting cells are neuroglia (gli/o, glue); most primary brain tumors are gliomas, and

glioblastoma is the most aggressive. Other roots: **encephal/o** brain, **cerebr/o** cerebrum, **cerebell/o** cerebellum, **mening/o** meninges, **myel/o** spinal cord (or marrow), radicul/o and rhiz/o nerve root, dur/o dura mater, ventricul/o ventricle, crani/o skull, cephal/o head, poli/o gray matter, vag/o vagus nerve.

Encephalopathy is any brain disease or dysfunction, often used when a patient is confused and the cause is unknown. Hydrocephalus (hydr/o + cephal/o) is excess CSF in the ventricles. **My/o** is muscle; **myel/o** is spinal cord in neurology and marrow in hematology. Myositis and myelitis are different diseases.

Deficit suffixes: **-plegia** paralysis, **-paresis** weakness, **-esthesia** sensation (paresthesia is pins and needles), **-algesia** pain sensitivity (analgesia removes pain; anesthesia removes all sensation), **-phasia** speech, **-kinesia** movement, **-taxia** coordination, **-lepsy** seizure (narcolepsy), -mnesia memory, -gnosia recognition, -lexia reading, -somnia sleep. Syncope is fainting. Extent prefixes: mono- one limb, hemi- one side, para- both lower limbs (a convention), quadri- or tetra- all four (tetraplegia is preferred). Right hemiparesis with expressive aphasia points to the left frontal lobe.

Phas/o is speech; phag/o is swallowing. **Dysarthria** (arthr/o in its old sense of articulation) is slurred speech from weak muscles: the patient knows the word but cannot say it. Dysphasia is a language problem: the word is unavailable. **Broca aphasia** is nonfluent and expressive (left frontal lobe); **Wernicke aphasia** is fluent but makes no sense, with poor comprehension (left temporal lobe). Bell palsy is one-sided facial weakness (CN VII); trigeminal neuralgia is facial pain (CN V).

Stroke: CVA (cerebrovascular accident) is being replaced by stroke or cerebral infarction. About four of five strokes are **ischemic**; the rest are hemorrhagic. A **TIA** resolves, classically within an hour, with no infarction on imaging; it is a warning. A ruptured cerebral aneurysm causes subarachnoid hemorrhage (SAH), "the worst headache of my life." An **epidural hematoma** sits above the dura, usually arterial, fast, often with a lucid interval. A **subdural hematoma** sits beneath the dura, from torn bridging veins, slow, and may surface weeks later in older adults on anticoagulants.

Meningitis inflames the meninges; encephalitis inflames the brain. Signs: fever, headache, photophobia and nuchal rigidity. Raised intracranial pressure (ICP) shows as papilledema, swelling of the optic disc. Neural tube defects: spina bifida occulta (hidden), meningocele (sac with meninges only) and **myelomeningocele** (meninges and cord, with deficits below). Multiple sclerosis is CNS demyelination; write it out, because MS is on the Do Not Use list. Guillain-Barré syndrome is ascending peripheral weakness. Parkinson disease brings bradykinesia, rigidity and tremor. Dementia is de- + ment/o. **ALS** is a- + my/o + troph/o: muscles wasting as motor neurons die. Myasthenia gravis gives fatigable weakness, ptosis and diplopia.

Tests: a **lumbar puncture** takes CSF between L3 and L4 or L4 and L5, below where the cord ends. Myelography images the cord with contrast. **EEG** records the brain and is central in seizures; EMG records muscle. CT is first in acute stroke because it shows blood; MRI shows soft tissue; PET shows function. The Glasgow Coma Scale scores 3 to 15 (15 fully awake); the NIH Stroke Scale runs 0 to 42; DTRs are graded 0 to 4+. A Babinski sign is normal in infants but abnormal past about age two. Romberg tests position sense.

Operations: **craniotomy** opens the skull and replaces the flap; **craniectomy** removes bone and leaves it out; **ventriculostomy** drains a ventricle. Laminectomy decompresses the cord or a root; discectomy removes a disc (HNP); rhizotomy cuts a nerve root; a VP shunt drains CSF from a ventricle to the peritoneum; carotid endarterectomy removes plaque; thrombectomy removes a clot. Thrombolysis dissolves a clot; write the drug name rather than tPA, which is error-prone.

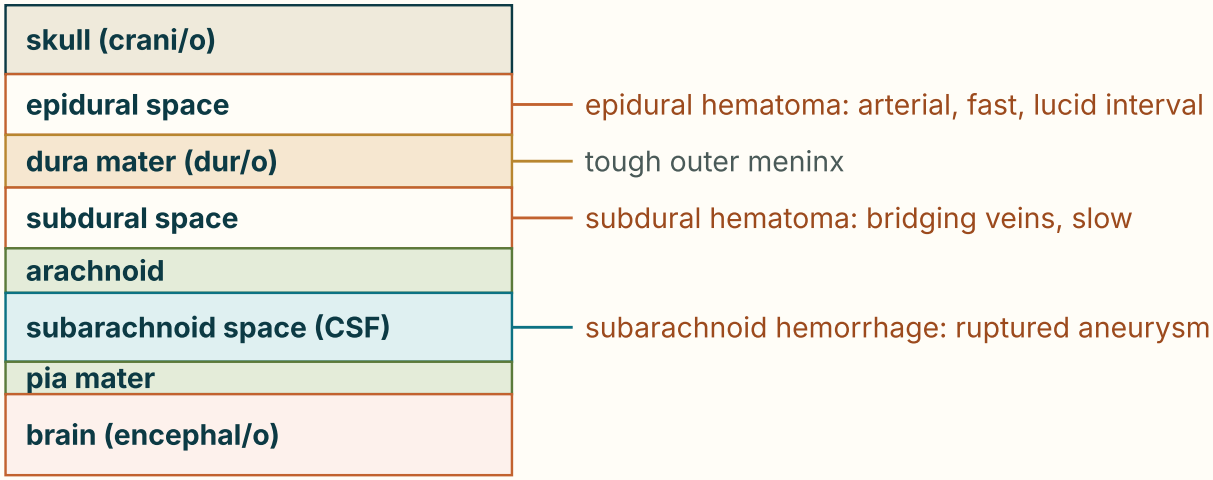
Psychiatry: psych/o, ment/o and phren/o mean mind (phren/o also means diaphragm). **Psychiatry** (-iatry) is the medical field; psychology (-logy) is the study, practiced by a non-physician doctorate. -thymia is mood (dysthymia, euthymic), -phoria is feeling (euphoria, dysphoria), -mania is excessive impulse (kleptomania, pyromania), -phobia is fear (agoraphobia), though in photophobia it means intolerance. **Mood** is what the patient reports; **affect** is what the clinician observes. A **delusion** is a fixed false belief; a **hallucination** is a false perception; an illusion misreads a real stimulus. An obsession is a thought; a compulsion is the behavior. Anhedonia is loss of pleasure. **Delirium** is acute, fluctuating and often reversible; **dementia** is chronic and progressive. Use person-first language: a patient with schizophrenia.

Treatments: antidepressants (SSRIs), anxiolytics (-lytic, loosen), antipsychotics, mood stabilizers, sedative-hypnotics, ECT, TMS and CBT. Terms change with the DSM-5-TR: intellectual disability, bipolar disorder, autism spectrum disorder. Suicidal ideation (SI) records thoughts, qualified as passive or active.

The eye: **ophthalm/o** (specialty), ocul/o (descriptive: intraocular), opt/o (vision). Front to back: blephar/o eyelid, conjunctiv/o, dacry/o and lacrim/o tears, kerat/o and corne/o cornea, irid/o iris, phac/o lens, vitre/o, retin/o, papill/o optic disc, scler/o sclera. Papill/o (optic disc) is not pupill/o (pupil). -opia and -opsia both mean a vision condition: presbyopia, amblyopia, hemianopsia. Cataract is a cloudy lens (phacoemulsification with an IOL); glaucoma damages the optic nerve, often with high IOP (tonometry). Strabismus is misalignment (esotropia, exotropia); nystagmus is rhythmic movement; a hordeolum is a stye.

The ear: ot/o and aur/o ear; audi/o and acous/o hearing; tympan/o and myring/o eardrum; malle/o, incud/o, staped/o ossicles; cochle/o hearing, vestibul/o and labyrinth/o balance. Salping/o here is the eustachian tube. Otitis media; **myringotomy** with tubes; otosclerosis fixes the stapes; tinnitus is ringing; vertigo is false movement. Conductive loss is outer or middle ear; sensorineural (SNHL) is cochlea or CN VIII. -osmia is smell, -geusia taste. **OD, OS, OU** and **AD, AS, AU** are error-prone; write right eye, left ear and so on. Plurals: ganglia, meninges, gyri, sulci, irides, conjunctivae, psychoses, mallei, incudes, stapes.

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

- Neur/o nerve; encephal/o brain; mening/o meninges; myel/o cord (or marrow); radicul/o root; gli/o glue.
- -plegia paralysis, -paresis weakness; mono-, hemi-, para-, tetra- give the extent.
- Phasia speech, phagia swallowing; dysarthria is slurred, dysphasia is language.
- Epidural: above dura, arterial, fast. Subdural: below dura, venous, slow.
- Craniotomy flap replaced; craniectomy bone left out; ventriculostomy drains.
- Mood reported, affect observed; delusion belief, hallucination perception; delirium acute, dementia chronic.
- Papill/o optic disc, pupill/o pupil; kerat/o cornea here, horny skin elsewhere.
- Write out MS, tPA, OD/OS/OU and AD/AS/AU.

Word parts for nerves, mind, eye and ear

Word part	Meaning	Example term	What it means
neur/o, gli/o	nerve, glue	neuropathy, glioblastoma	nerve disease; aggressive glial tumor
encephal/o, cerebr/o, cerebell/o	brain, cerebrum, cerebellum	encephalitis, cerebral, cerebellar	brain terms
mening/o, dur/o	meninges, dura	meningioma, subdural	meninges tumor; below the dura
myel/o, poli/o	spinal cord, gray	myelitis, poliomyelitis	cord inflammation; gray matter inflammation
radicul/o, rhiz/o, gangli/o	nerve root, root, ganglion	radiculopathy, rhizotomy	root disease; root cut
ventricul/o, crani/o, cephal/o	ventricle, skull, head	ventriculostomy, craniotomy, cephalalgia	drainage; skull opened; headache
-plegia, -paresis	paralysis, weakness	hemiplegia, hemiparesis	one-sided paralysis; weakness
-esthesia, -algesia	sensation, pain	paresthesia, analgesia	tingling; no pain
-phasia, -kinesia, -taxia	speech, movement, coordination	aphasia, bradykinesia, ataxia	deficits
-lepsy, -mnesia, -gnosia, -lexia, -somnia	seizure, memory, recognition, reading, sleep	narcolepsy, amnesia, agnosia, dyslexia, insomnia	deficits

Word part	Meaning	Example term	What it means
psych/o, ment/o, phren/o, schiz/o	mind, mind, mind or diaphragm, split	psychosis, dementia, schizophrenia	mind terms
-thymia, -phoria, -mania, -phobia	mood, feeling, impulse, fear	dysthymia, euphoria, kleptomania, agoraphobia	psychiatric terms
hedon/o, -lalia, -lytic	pleasure, speech, loosening	anhedonia, echolalia, anxiolytic	no pleasure; repeated words; anxiety reducer
ophthalm/o, ocul/o, opt/o	eye, eye, vision	ophthalmoscopy, intraocular, optometry	eye terms
blephar/o, conjunctiv/o, dacry/o	eyelid, conjunctiva, tear	blepharoptosis, conjunctivitis, dacryocystitis	lid, lining, tear sac
kerat/o, irid/o, phac/o, retin/o	cornea, iris, lens, retina	keratitis, iridectomy, aphakia, retinopathy	eye structures
papill/o vs pupill/o	optic disc vs pupil	papilledema vs pupillary	pressure sign vs pupil finding
-opia, -opsia, presby/o, ambly/o	vision, old age, dim	presbyopia, amblyopia, hemianopsia	vision conditions
ot/o, aur/o, audi/o, acous/o	ear, hearing	otalgia, audiometry, presbycusis	ear pain; hearing test; age hearing loss
tympan/o, myring/o, staped/o, cochle/o	eardrum, stapes, cochlea	myringotomy, stapedectomy	eardrum cut; stapes removed

Neuro, psych, eye and ear abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
CNS / PNS	central / peripheral nervous system	CSF	cerebrospinal fluid
CVA, TIA	stroke; transient ischemic attack	ICP, LP	intracranial pressure; lumbar puncture
LOC, A&O ×4	level or loss of consciousness; alert and oriented to person, place, time, situation	GCS, NIHSS	coma and stroke scales
EEG, EMG	brain and muscle recordings	SAH / SDH	subarachnoid / subdural hemorrhage
TBI, SCI	traumatic brain injury; spinal cord injury	ALS, DTR, CN I-XII	motor neuron disease; reflexes; cranial nerves
MS	do not use: write the diagnosis or drug	tPA	error-prone: write the drug name
MSE, MDD, GAD	mental status exam; major depressive disorder; generalized anxiety	OCD, PTSD, ADHD, ASD	psychiatric diagnoses
SI / HI, SUD	suicidal / homicidal ideation; substance use disorder	ECT, CBT, SSRI, TMS	treatments
IOP, VA, EOM, IOL	eye pressure, acuity, movements, lens implant	PERRLA, AMD	pupil check; macular degeneration
SNHL, TM, ENT, HEENT	hearing loss; eardrum; specialty; exam section	OD, OS, OU / AD, AS, AU	eyes / ears: avoid, write out

Worked cases

WORKED CASE 1 · READING A STROKE NOTE

Mr. Farouk's note reads "right hemiparesis with expressive aphasia." Decode it and locate the lesion.

STEP 1 · HEMIPARESIS

hemi- (one side) + -paresis (weakness): weakness, not paralysis, of the right side.

STEP 2 · EXPRESSIVE APHASIA

a- (without) + -phasia (speech): trouble producing language, a Broca type.

STEP 3 · LOCATE

Motor pathways cross, and speech production sits on the left in most people.

ANSWER

A lesion in the **left frontal lobe**.

WORKED CASE 2 · EPIDURAL OR SUBDURAL

An older adult on an anticoagulant becomes confused three weeks after a minor fall. A young man is hit on the head, talks normally, then rapidly declines an hour later. Which bleed fits each?

STEP 1 · SLOW, WEEKS LATER, OLDER ADULT

Torn bridging veins below the dura: **subdural hematoma**.

STEP 2 · LUCID INTERVAL, THEN RAPID DECLINE

Arterial bleeding above the dura: **epidural hematoma**.

CHECK

Hemat/oma is a collection of blood, not a tumor.

WORKED CASE 3 · MOOD OR AFFECT

A patient says her mood is "fine," but she speaks in a monotone with little facial expression. How is this charted?

STEP 1 · MOOD

Mood is what she reports: "fine."

STEP 2 · AFFECT

Affect is what the clinician sees: flat.

ANSWER

Mood "fine," **affect flat**. The mismatch is itself clinical information.

WORKED CASE 4 · FIXING UNSAFE EYE ORDERS

An order reads "timolol 1 drop OU twice daily." Rewrite it safely and explain.

STEP 1 · SPOT THE ABBREVIATION

OU (both eyes) is on the ISMP error-prone list with OD and OS.

STEP 2 · REWRITE

"Timolol 1 drop in **both eyes** twice daily."

WHY

OD, OS and OU are easily confused with each other, with AD, AS, AU, and OD also means overdose.

TRAPS PEOPLE FALL INTO

- **Reading myelitis as muscle inflammation.** Myel/o is cord; muscle inflammation is myositis.
- **Swapping -plegia and -paresis.** Paralysis vs weakness changes the severity of a stroke note.
- **Mixing dysarthria and dysphasia.** Motor speech vs language.
- **Mixing anesthesia and analgesia.** All sensation vs pain only.
- **Calling a TIA a mild stroke.** It resolves without infarction; it is a warning.
- **Mixing epidural and subdural.** Above the dura and arterial vs below it and venous.
- **Reading schizophrenia as split personality.** That is dissociative identity disorder.
- **Confusing delirium and dementia.** Acute and often reversible vs chronic and progressive.
- **Mixing papill/o and pupill/o.** Papilledema is optic disc swelling from raised ICP.
- **Reading salping/o as only gynecologic.** In the ear it is the eustachian tube.

Chapter 13 self-test · ten items

1. Which root means nerve root?

A. radicul/o

B. gli/o

C. gangli/o

D. cerebell/o

A. radicul/o Radicul/o is the nerve root, as in radiculopathy. Gli/o is glial tissue and gangli/o a ganglion.

2. Weakness, not paralysis, of one side of the body is:

A. Hemiparesis
B. Hemiplegia
C. Paraplegia
D. Monoplegia

A. Hemiparesis -paresis is weakness. -plegia is paralysis.

3. A patient knows what he wants to say but his speech is slurred from weak muscles. This is:

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

D. Dysarthria Dysarthria is a motor speech problem. Dysphasia and aphasia are language problems.

4. Which bleed sits above the dura, is usually arterial and may follow a lucid interval?

A. Subdural hematoma
B. Epidural hematoma
C. Subarachnoid hemorrhage
D. Intracerebral hemorrhage

B. Epidural hematoma Epi- means upon. A subdural hematoma sits below the dura and comes from veins.

5. A sac containing both meninges and spinal cord tissue is a:

A. Meningocele
B. Encephalocele
C. Myelomeningocele
D. Spina bifida occulta

C. Myelomeningocele The word names what is in the sac: myel/o (cord) and mening/o (meninges).

6. Which operation removes part of the skull and leaves it out?

A. Craniotomy
B. Ventriculostomy
C. Laminectomy
D. Craniectomy

D. Craniectomy -ectomy removes. A craniotomy replaces the bone flap.

7. A fixed false belief that persists despite evidence is a:

A. Delusion
B. Hallucination
C. Illusion
D. Compulsion

A. Delusion A hallucination is a false perception; an illusion misreads a real stimulus.

8. Swelling of the optic disc from raised intracranial pressure is:

A. Pupilledema
B. Presbyopia
C. Papilledema
D. Exophthalmos

C. Papilledema Papill/o is the optic disc. Pupill/o is the pupil.

9. An incision in the eardrum to drain fluid is a:

A. Stapedectomy
B. Myringotomy
C. Tympanometry
D. Mastoidectomy

B. Myringotomy Myring/o is the eardrum. Tympanometry tests eardrum mobility.

10. Which abbreviation should be written out on an order?

A. CSF for spinal fluid
B. OS for left eye
C. EEG for brain tracing
D. GCS for coma scale

B. OS for left eye OD, OS and OU are on the ISMP error-prone list. Write "left eye."

CHAPTER 14

The Endocrine System, Abbreviations and Documentation

Read it in full: **Chapter 14 in the textbook**. Practice it in the lab: **The Endocrine Term Forge** and **The Night Shift Chart Desk**.

What to know

Endocrine (endo- + crin/o, secrete within) glands have no duct and release hormones into the blood. **Exocrine** glands release through a duct: sweat, salivary and the enzyme part of the pancreas. The pancreas is both. A hormone travels to a distant target. Endocrinology is the study of internal secretions. Aden/o is gland: adenoma (usually benign), adenocarcinoma, adenomegaly. **Adren/o** (with an extra r) is the adrenal gland. The adenoids are lymphoid tissue, not endocrine.

-tropin names a hormone that stimulates another gland, and **-tropic** is its adjective: thyrotropin, gonadotropin, adrenocorticotropic hormone (ACTH). **-trophy** is a different root meaning nourishment or growth (hypertrophy). **-emia** is in the blood and **-uria** is in the urine: glycemia vs glycosuria. -dipsia is thirst and -phagia eating. Euthyroid means normal thyroid function. Pan- is all: panhypopituitarism.

Homeostasis (home/o + -stasis) keeps the internal state steady through **negative feedback**: a rising hormone shuts off the signal that made it. That is why in primary hypothyroidism the thyroid hormone is low and the **TSH is high**: the pituitary is shouting at a gland that will not answer. Primary means the target gland failed; secondary means the pituitary; tertiary means the hypothalamus.

The pituitary is pituitar/o or **hypophys/o** (hypo- + -physis, growth beneath); surgeons write hypophysectomy, often transsphenoidal (through the sphenoid sinus). The anterior lobe is the adenohypophysis; the posterior lobe, the neurohypophysis, stores hormones made in the hypothalamus. Too much growth hormone before growth plates close causes gigantism; after, **acromegaly** (acr/o, extremities). ADH (anti- + diuretic) conserves water: too little causes diabetes insipidus (lots of dilute urine); too much causes SIADH with hyponatremia (natr/o, sodium).

The thyroid (thyr/o, shield) has two lobes joined by an isthmus and makes T3 and T4, named for their iodine atoms. Excess is hyperthyroidism; the severe form is **thyrotoxicosis**. Graves disease can cause **exophthalmos** (bulging eyes). Deficiency is hypothyroidism, often Hashimoto thyroiditis; severe deficiency is **myxedema** (myx/o, mucus). A **goiter** is enlargement, a size word that says nothing about function, so "euthyroid goiter" is not a contradiction.

Four parathyroid glands (para-, beside) make PTH, which raises blood calcium. Hyperparathyroidism causes hypercalcemia, weak bones and stones; hypoparathyroidism causes hypocalcemia with spasm and tetany, a risk after thyroidectomy. **Calc/i** is calcium (Ca); **kal/i** is potassium (K, from kalium); natr/o is sodium (Na). Hypercalcemia and hyperkalemia are different emergencies.

Adrenal is ad- + ren/o, near the kidney (also suprarenal). The **cortex** (cortic/o) makes cortisol, aldosterone and androgens; the **medulla** (medull/o) makes epinephrine and norepinephrine. Excess cortisol is **Cushing syndrome** (from any source, most often steroid medication); **Cushing disease** is the narrower case of a pituitary adenoma making too much ACTH. Addison disease is adrenal deficiency (low sodium, high potassium, darkened skin). Conn syndrome is excess aldosterone. **Pheochromocytoma** (phe/o dusky + chrom/o color + cyt/o + -oma) is a tumor of the adrenal medulla.

The islets of Langerhans make insulin (beta cells, lowers glucose) and glucagon (alpha cells, raises it). **Diabetes mellitus** (honey-sweet) is a disorder of insulin; **diabetes insipidus** (tasteless) is ADH deficiency. Both cause polyuria and polydipsia; only mellitus involves glucose, so never write just "diabetes." The DM triad is polyuria, polydipsia and polyphagia. Burning fat makes ketones; the emergency is diabetic ketoacidosis (DKA). Long-term complications: retinopathy, nephropathy, neuropathy. Gluc/o, glyc/o and glycos/o all mean sugar; copy the spelling each term uses.

The gonads are endocrine glands too: FSH and LH (the gonadotropins) drive the ovaries (estrogen, progesterone) and testes (testosterone). Hypogonadism is deficient function. Gynecomastia is breast enlargement in a male. Amenorrhea can be the first sign of a pituitary, thyroid or adrenal problem.

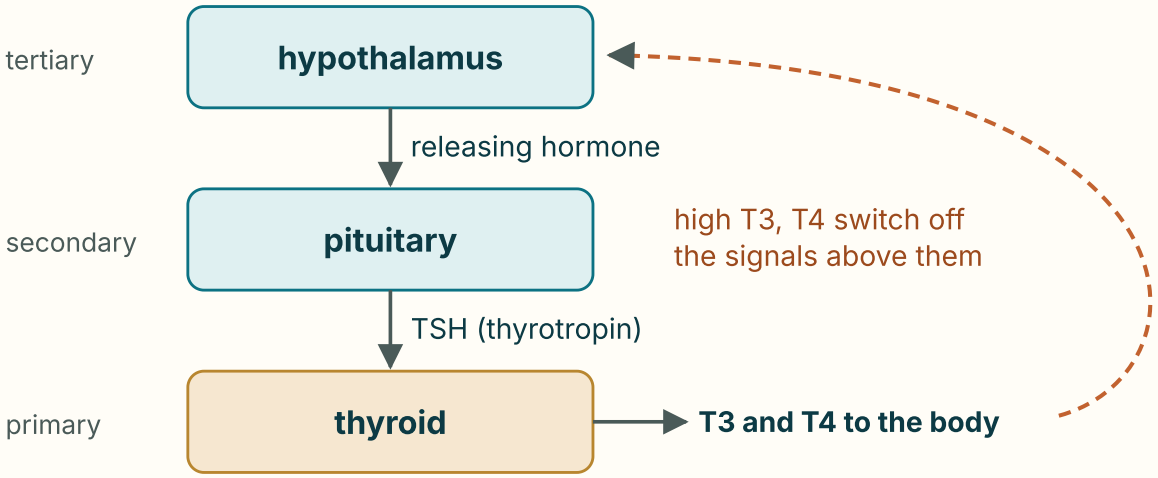
Tests: an assay measures a substance; RIA uses radiation and antibodies. TSH alone screens the thyroid well. Glucose: **FBG** after an overnight fast, random glucose, **OGTT** after a sugar load, and **A1C** (glycosylated hemoglobin), the average over about three months, which cannot improve overnight. RAIU scans iodine uptake; FNA samples a nodule. Surgery is mostly -ectomy on a gland root: thyroidectomy (subtotal or lobectomy), parathyroidectomy, adrenalectomy,

pancreatectomy, hypophysectomy. Plurals: cortices, medullae, isthmi, testes, adenomata or adenomas.

The **SOAP** note: **S**ubjective is what the patient reports; **O**bjective is what you measure or observe (vitals, exam, labs); **A**ssessment is the interpretation or diagnosis; **P**lan is what happens next. Nothing crosses lanes: an interpretation never goes in O. Other formats: narrative, charting by exception, DAR (data, action, response). Chart what you did and saw, chart on time, and never alter an earlier entry; correct it with a dated, signed addendum. Chart sections: CC, HPI, PMH, FH, SH, ROS (subjective), PE (objective), H&P, A&P. NKDA, WNL, PRN, NPO are common; DC or D/C (discharge or discontinue) is banned in many facilities.

The Joint Commission **Do Not Use list**: U or u (write unit), IU (write international unit), Q.D. and Q.O.D. (write daily, every other day), a trailing zero (write 1 mg, not 1.0 mg), a missing leading zero (write 0.5 mg, not .5 mg), MS, MSO4 and MgSO4 (write morphine sulfate or magnesium sulfate). A trailing zero is allowed for lab values or sizes that need the precision, but never in medication orders. Insulin is a high-alert drug: "6U" can read as 60 units. Spell out terms on first use with the abbreviation in parentheses, use your facility's list, write right and left out, and use tall man lettering (HYPERglycemia, HYPOglycemia) where records support it.

Negative feedback: why TSH rises when the thyroid fails



Primary hypothyroidism: the thyroid fails, so T4 is low.

The brake is gone, so the pituitary pushes harder: TSH is high.

If TSH and T4 are both low, suspect the pituitary (secondary).

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

LOCK THESE IN

- Endocrine: ductless, into blood. Exocrine: through a duct. The pancreas is both.
- Aden/o gland; adren/o adrenal. -tropin stimulates; -trophy is growth.
- -emia blood; -uria urine. Calc/i calcium; kal/i potassium; natr/o sodium.
- Negative feedback: primary hypothyroidism means low T4 and high TSH.
- Hyperparathyroidism causes hypercalcemia; parathyroid damage after thyroidectomy causes hypocalcemia.
- Cushing syndrome is the picture; Cushing disease is the pituitary cause.
- Mellitus is sugar; insipidus is ADH. A1C is the three-month average.
- SOAP: patient says, you observe, you conclude, you plan. Never write U, IU, Q.D., Q.O.D., MS, 1.0 or .5.

Word parts for the endocrine system

Word part	Meaning	Example term	What it means
aden/o; crin/o	gland; to secrete	adenoma; endocrinology	gland tumor; study of internal secretions
endo-, exo-	within, outside	endocrine, exocrine	ductless; through a duct
home/o, -stasis	sameness, standing still	homeostasis	steady internal state
-tropin, -tropic	stimulating hormone; acting on	thyrotropin, gonadotropic	thyroid-stimulating; acting on gonads
-trophy	growth, nourishment	hypertrophy	enlarged cells
-dipsia, -phagia	thirst, eating	polydipsia, polyphagia	excess thirst; excess hunger
pituitar/o, hypophys/o	pituitary	hypopituitarism, hypophysectomy	low pituitary function; removal
acr/o, somat/o	extremities, body	acromegaly, somatotropin	enlarged extremities; growth hormone
thyr/o, thyroid/o, iod/o	thyroid, iodine	thyroiditis, radioiodine	inflamed thyroid; radioactive iodine
toxic/o, myx/o	poison, mucus	thyrotoxicosis, myxedema	severe excess; severe deficiency swelling
parathyroid/o, calc/i	parathyroids, calcium	hyperparathyroidism, hypocalcemia	excess PTH; low calcium
natr/o, kal/i	sodium, potassium	hyponatremia, hyperkalemia	low sodium; high potassium
adren/o, adrenal/o	adrenal gland	adrenalectomy	adrenal removed

Word part	Meaning	Example term	What it means
cortic/o, medull/o	cortex, medulla	adrenocortical, adrenomedullary	outer and inner adrenal
phe/o, chrom/o	dusky, color	pheochromocytoma	adrenal medulla tumor
pancreat/o, insulin/o	pancreas, insulin	pancreatitis, insulinoma	inflamed pancreas; insulin tumor
gluc/o, glyc/o, glycos/o	sugar	glucagon, hyperglycemia, glycosuria	sugar terms
ket/o, keton/o	ketones	ketoacidosis, ketonuria	acid emergency; ketones in urine
gonad/o, andr/o, estr/o	sex glands, male, female	hypogonadism, androgen, estrogen	gonad terms
ophthalm/o + ex-	eye + out	exophthalmos	bulging eyes

Endocrine and documentation abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
ACTH	adrenocorticotropic hormone	ADH	antidiuretic hormone
GH, PRL	growth hormone; prolactin	TSH, T3, T4, FT4	thyroid stimulating hormone and thyroid hormones
PTH	parathyroid hormone	FSH / LH	the gonadotropins
DM, T1DM, T2DM	diabetes mellitus and its types	DI	diabetes insipidus
DKA, HHS	diabetic ketoacidosis; hyperosmolar hyperglycemic state	SIADH	inappropriate ADH, causes hyponatremia
FBG / FBS / FPG, OGTT	fasting glucose; glucose tolerance test	HbA1C, A1C	average glucose over about 3 months
RAIU, FNA	iodine uptake scan; fine-needle aspiration	BMP / CMP	metabolic panels
SOAP	subjective, objective, assessment, plan	CC, HPI	chief complaint; history of present illness
PMH, FH, SH, ROS	past, family, social history; review of systems	PE, H&P, A&P	exam; history and physical; assessment and plan
NKDA, WNL, PRN, NPO	no known drug allergies; normal limits; as needed; nothing by mouth	DC, D/C	ambiguous: discharge or discontinue

The Do Not Use list

Do not use	Why it is dangerous	Write instead
U, u	read as 0, 4 or cc	unit
IU	read as IV or 10	international unit
Q.D., QD, q.d., qd	period read as I: daily becomes four times a day	daily
Q.O.D., QOD, q.o.d., qod	read as daily or four times a day	every other day
Trailing zero (1.0 mg)	read as 10 mg	1 mg
No leading zero (.5 mg)	read as 5 mg	0.5 mg
MS, MSO4, MgSO4	morphine or magnesium sulfate confused	morphine sulfate; magnesium sulfate

Worked cases

WORKED CASE 1 · READING A THYROID LAB PATTERN

Ms. Bauer has a TSH of 14.2 and a low free T4. Name the problem and its level.

STEP 1 · WHICH HORMONE IS LOW?

Free T4, the thyroid's own hormone, is low.

STEP 2 · WHAT IS THE PITUITARY DOING?

TSH is high: negative feedback has removed the brake, so the pituitary is pushing hard.

STEP 3 · PLACE THE FAULT

The pituitary is working; the thyroid itself is failing.

ANSWER

Primary hypothyroidism. If both TSH and T4 were low, the fault would be secondary (pituitary).

WORKED CASE 2 · SORTING FINDINGS INTO SOAP

Place each line: "Reports fatigue and cold intolerance." "TSH 14.2; thyroid diffusely enlarged." "Primary hypothyroidism, likely Hashimoto thyroiditis." "Start thyroid hormone; recheck TSH in 6 weeks."

STEP 1 · PATIENT REPORT

Fatigue and cold intolerance: **S**.

STEP 2 · MEASURED AND OBSERVED

TSH and exam: **O**.

STEP 3 · INTERPRETATION

The diagnosis: **A**.

STEP 4 · NEXT STEPS

Medication and recheck: **P**.

WORKED CASE 3 · FIXING AN INSULIN ORDER

An order reads "regular insulin 6U SQ Q.D." Rewrite it safely.

STEP 1 · FIND THE PROBLEMS

U is banned (read as 0: 60 units). Q.D. is banned. SQ is error-prone (Chapter 5).

STEP 2 · REPLACE EACH

U to units, SQ to subcut, Q.D. to daily.

ANSWER

"Regular insulin 6 units subcut daily." Read back any verbal insulin order.

WORKED CASE 4 · DECODING A LONG ENDOCRINE TERM

Decode pheochromocytoma and panhypopituitarism.

STEP 1 · PHEOCHROMOCYTOMA

phe/o (dusky) + chrom/o (color) + cyt/o (cell) + -oma (tumor): a tumor of dusky-staining cells, in the adrenal medulla.

STEP 2 · PANHYPOPITUITARISM

pan- (all) + hypo- (deficient) + pituitar/o + -ism (condition).

ANSWER

An adrenal medulla tumor; and **deficiency of all pituitary hormones**.

TRAPS PEOPLE FALL INTO

- **Mixing aden/o and adren/o.** Any gland vs the adrenal gland.
- **Mixing -tropin and -trophy.** A stimulating hormone vs growth in tissue size.
- **Mixing calc/i and kal/i.** Calcium (Ca) vs potassium (K).

- **Expecting TSH to follow T4.** In primary hypothyroidism, T4 is low and TSH is high.
- **Reading goiter as a function word.** It only means enlargement.
- **Using Cushing syndrome and disease interchangeably.** Picture from any cause vs the pituitary cause.
- **Writing only "diabetes."** Mellitus and insipidus are unrelated diseases.
- **Putting interpretation in O.** O is measured or observed; conclusions go in A.
- **Thinking a trailing zero is always banned.** It is banned in medication orders, allowed for lab precision.

Chapter 14 self-test · ten items

1. Which gland type releases its product through a duct?

A. Exocrine

B. Endocrine

C. Pituitary

D. Adrenal

A. Exocrine Exo- means outside. Endocrine glands are ductless and release into the blood.

2. Which suffix names a hormone that stimulates another gland?

A. -trophy

B. -physis

C. -tropin

D. -stasis

C. -tropin Thyrotropin stimulates the thyroid. -trophy means growth or nourishment.

3. In primary hypothyroidism, what happens to TSH?

A. It falls
B. It stays normal
C. It disappears
D. It rises

D. It rises Low thyroid hormone removes the negative feedback, so the pituitary releases more TSH.

4. Enlarged hands, feet and jaw in an adult point to:

A. Gigantism
B. Myxedema
C. Acromegaly
D. Goiter

C. Acromegaly Acr/o (extremities) + -megaly. Gigantism occurs before growth plates close.

5. Which term means too much potassium in the blood?

A. Hypercalcemia
B. Hypernatremia
C. Hyperglycemia
D. Hyperkalemia

D. Hyperkalemia Kal/i comes from kalium, symbol K. Calc/i is calcium and natr/o is sodium.

6. After a thyroidectomy, which lab is watched because of nearby glands?

A. Calcium
B. Glucose
C. Cortisol
D. Sodium

A. Calcium The parathyroids sit behind the thyroid; damaging them causes hypocalcemia.

7. Excess cortisol from long-term prescribed steroids is best called:

A. Cushing disease
B. Cushing syndrome
C. Addison disease
D. Conn syndrome

B. Cushing syndrome Syndrome names the picture from any cause. Cushing disease is the pituitary adenoma cause.

8. Which test reflects average blood glucose over about three months?

A. FBG
B. OGTT
C. RAIU
D. A1C

D. A1C Glucose binds hemoglobin for the life of the red cell. FBG is a single fasting value.

9. "TSH 14.2, thyroid diffusely enlarged" belongs in which SOAP section?

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

B. Objective Lab values and exam findings are measured or observed.

10. Which is the safe way to write the insulin dose?

A. 10 U
B. 10 u
C. 10 units
D. 10.0 units

C. 10 units U is read as 0, 4 or cc, and a trailing zero is banned in medication orders.

ONE PAGE

Cram sheet

Everything from chapters 13 and 14 in one place. Cover the right column and see if you can rebuild each row.

Word parts to know

Group	Parts and meanings
Nervous system	neur/o; gli/o; encephal/o; cerebr/o; cerebell/o; mening/o; dur/o; myel/o; radicul/o, rhiz/o; ventricul/o; crani/o; poli/o
Deficits	-plegia; -paresis; -esthesia; -algesia; -phasia; -kinesia; -taxia; -lepsy; -mnesia; -gnosia; -lexia; -somnia
Mind	psych/o; ment/o; phren/o; schiz/o; -thymia; -phoria; -mania; -phobia; hedon/o; -lalia; -lytic
Eye	ophthalm/o; ocul/o; opt/o; blephar/o; conjunctiv/o; dacry/o, lacrim/o; kerat/o; irid/o; phac/o; retin/o; papill/o; pupill/o; -opia
Ear and senses	ot/o; aur/o; audi/o; acous/o; tympan/o, myring/o; staped/o; cochle/o; vestibul/o; -osmia; -geusia
Endocrine	aden/o; crin/o; -tropin; hypophys/o; thyr/o; parathyroid/o; adren/o; cortic/o; medull/o; pancreat/o; gluc/o, glyc/o; ket/o; calc/i; kal/i; natr/o

Key terms and comparisons

Pair	The difference
-plegia vs -paresis	paralysis vs weakness
dysarthria vs dysphasia	motor speech vs language
Broca vs Wernicke	nonfluent, frontal vs fluent, poor comprehension, temporal
epidural vs subdural	above dura, arterial, fast vs below, venous, slow
craniotomy vs craniectomy	flap replaced vs left out
mood vs affect	reported vs observed
delusion vs hallucination	false belief vs false perception
delirium vs dementia	acute, fluctuating vs chronic, progressive
conductive vs sensorineural	outer or middle ear vs cochlea or CN VIII
aden/o vs adren/o	gland vs adrenal
-tropin vs -trophy	stimulating hormone vs growth
mellitus vs insipidus	insulin and glucose vs ADH
Cushing syndrome vs disease	any cause vs pituitary adenoma

Numbers and safety rules

Item	Value or rule
Lumbar puncture site	L3 to L4 or L4 to L5
GCS; NIHSS; DTRs	3 to 15; 0 to 42; 0 to 4+
TIA	resolves, classically within an hour, no infarction
A1C	average glucose over about 3 months
SOAP	S reported; O measured; A interpretation; P next steps
Do Not Use	U, IU, Q.D., Q.O.D., trailing zero, missing leading zero, MS, MSO4, MgSO4
Error-prone	OD, OS, OU, AD, AS, AU, tPA: write them out
Corrections	dated, signed addendum; never alter an entry

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