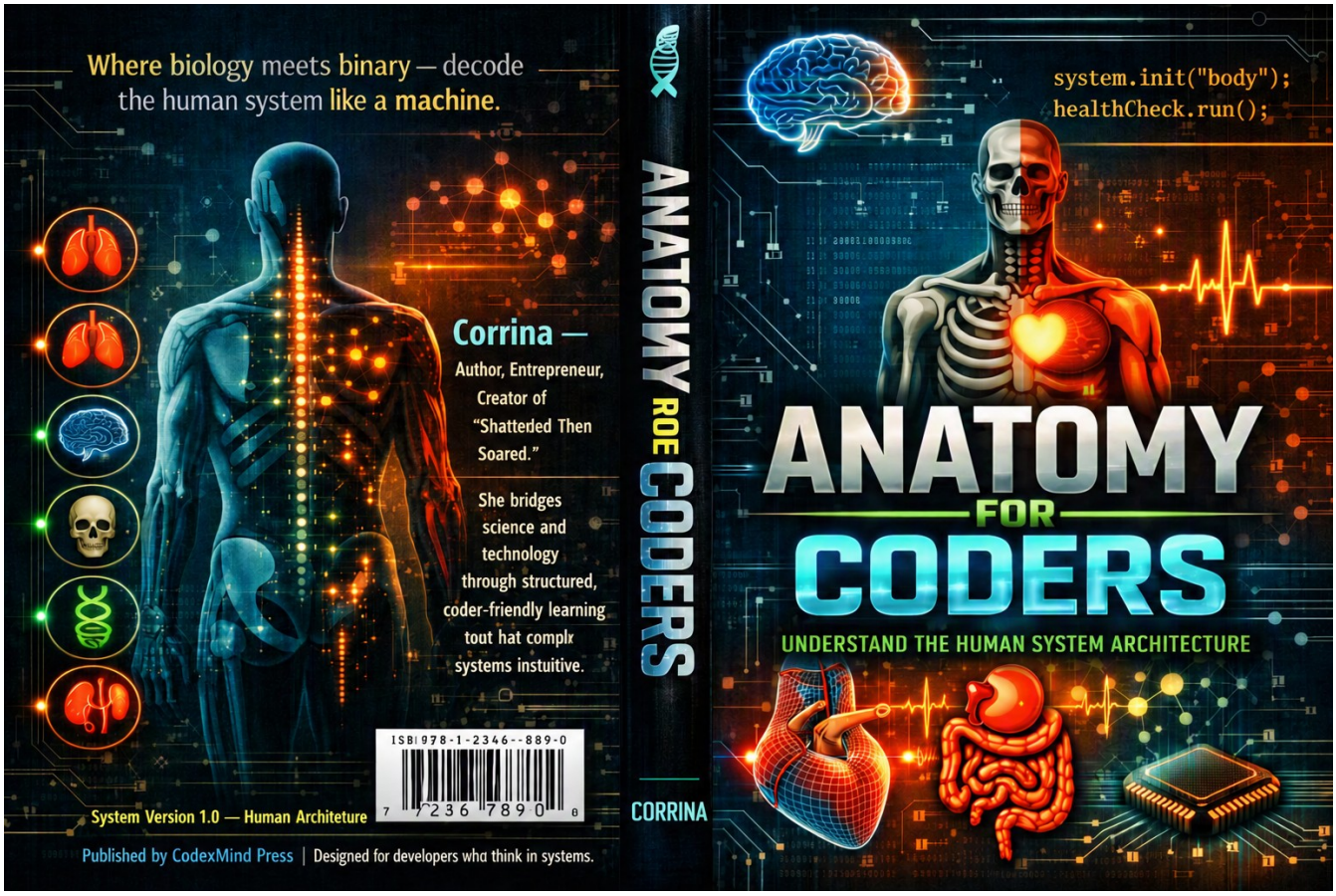


Anatomy for Coders

A practical anatomy and medical terminology study guide for CPC learners

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Student Edition • System Version 1.0

How to Use This Book

This book teaches the anatomy language that medical coders need to read diagnoses, imaging reports, operative notes, pathology reports, and procedure descriptions accurately. It is organized by body system so students can connect structure, function, terminology, documentation, and code-book navigation.

Use each chapter in the same order: learn the structures, study the word parts, connect the anatomy to documentation, complete the knowledge check, then verify unfamiliar terms in a trusted anatomy source and the current coding references. This book supports instruction; it does not replace official code sets, guidelines, payer policy, or provider documentation.

The Anatomy First Method

- Name the body system.
- Locate the exact organ, segment, layer, vessel, bone, joint, nerve, or tissue.
- Capture side, level, quadrant, lobe, proximal or distal position, and depth.
- Identify the condition or action performed.
- Check the complete report for final diagnoses, findings, pathology, devices, and complications.
- Verify the current alphabetic index, tabular instructions, official guidelines, and applicable payer rules.

Student Learning Routine

Before class	During class	After class
Preview the chapter terms and label unfamiliar words.	Trace structures aloud and connect each one to its function.	Complete the knowledge check without notes.
Bring current code books or approved coding tools.	Mark exact anatomy in sample documentation.	Review missed items and build flash cards.
Write one question for the instructor.	Practice translating medical terms into plain language.	Recheck the answer key only after finishing.

Educational Notice

Coding rules and code sets change. Students and professionals must use the code set and official guidance applicable to the date of service or discharge. Examples in this book are educational and are not claims-submission advice.

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CHAPTER 1

The Language of Anatomy

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Distinguish anatomy from physiology and connect structure to function.
- Use anatomical position, planes, directional terms, regions, and cavities correctly.
- Translate common word parts into anatomical meaning before opening a code book.

Core Structures

Structure	Coder friendly explanation
Anatomical position	Standing upright, face and eyes forward, arms at the sides, palms forward, feet forward.
Sagittal plane	Divides the body into right and left portions.
Coronal plane	Divides the body into anterior and posterior portions.
Transverse plane	Divides the body into superior and inferior portions.
Proximal and distal	Nearer to or farther from the point of attachment.
Superficial and deep	Closer to or farther from the body surface.

System Walkthrough

The dorsal cavity contains the cranial cavity and vertebral canal. The ventral cavity includes the thoracic, abdominal, and pelvic cavities. The diaphragm separates the thoracic cavity from the abdominopelvic cavity.

For coding, location words are evidence. Right versus left, upper versus lower, proximal versus distal, and superficial versus deep may change code selection. Never infer laterality or a specific site that the provider did not document.

Terminology Builder

Word part or term	Meaning
abdomin/o	abdomen
cephal/o	head
cervic/o	neck or cervix, depending on context

Word part or term	Meaning
crani/o	skull
dist/o	far from origin
dors/o	back
later/o	side
medi/o	middle
proxim/o	near origin
ventr/o	front or belly side

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. The wrist is ___ to the elbow.

Answer: _____

2. A cut dividing front and back uses the ___ plane.

Answer: _____

3. The lungs are in the ___ cavity.

Answer: _____

4. True or false: medial means away from the midline.

Answer: _____

5. Why must a coder recognize laterality?

Answer: _____

Chapter Notes

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CHAPTER 2

Cells Tissues and Body Organization

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Describe the hierarchy from cell to organism.
- Identify the four primary tissue types.
- Recognize tissue terms commonly found in pathology and procedure notes.

Core Structures

Structure	Coder friendly explanation
Cell	Smallest living structural and functional unit.
Epithelial tissue	Covers surfaces, lines cavities, and forms glands.
Connective tissue	Supports, binds, protects, stores, and transports.
Muscle tissue	Contracts to create movement.
Nervous tissue	Conducts electrical signals for communication.
Organ	Two or more tissue types working together for a specific function.

System Walkthrough

Epithelial membranes line passages and organs. Connective tissues include bone, cartilage, adipose tissue, tendons, ligaments, and blood. Muscle is skeletal, cardiac, or smooth. Nervous tissue includes neurons and supporting glial cells.

Pathology reports often describe the tissue of origin, behavior, grade, margins, and spread. Coders should distinguish inflammation, degeneration, benign neoplasm, malignant neoplasm, and uncertain behavior without replacing the provider's diagnosis.

Terminology Builder

Word part or term	Meaning
aden/o	gland
cyt/o	cell
epitheli/o	epithelium

Word part or term	Meaning
hist/o	tissue
lip/o	fat
my/o	muscle
neur/o	nerve
oste/o	bone
sarc/o	flesh or connective tissue
squam/o	scale-like or squamous

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. Which tissue type lines hollow organs?

Answer: _____

2. Blood is classified as which broad tissue type?

Answer: _____

3. Which muscle type is found in the heart?

Answer: _____

4. Arrange these from simplest to most complex: organ, cell, tissue, organ system.

Answer: _____

5. What document may identify tissue origin and tumor behavior?

Answer: _____

Chapter Notes

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CHAPTER 3

Integumentary System

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Identify the layers and major appendages of the skin.
- Differentiate common lesion, wound, and burn terminology.
- Connect depth, size, site, and repair complexity to coding documentation.

Core Structures

Structure	Coder friendly explanation
Epidermis	Outer avascular epithelial layer.
Dermis	Vascular connective layer containing follicles, glands, vessels, and nerves.
Subcutaneous tissue	Fat and connective tissue beneath the skin; not technically a skin layer.
Sebaceous gland	Produces sebum.
Sweat gland	Produces perspiration for cooling and excretion.
Nail unit	Nail plate, bed, matrix, folds, and supporting structures.

System Walkthrough

Skin protects against injury and microbes, limits fluid loss, regulates temperature, provides sensation, and helps synthesize vitamin D. Lesion words include macule, papule, plaque, vesicle, pustule, nodule, ulcer, and abscess.

Procedure coding often depends on lesion number and size, benign versus malignant status, excised diameter, repair length, anatomic site, depth of debridement, and whether tissue was removed. A biopsy is not the same as complete excision.

Terminology Builder

Word part or term	Meaning
cutane/o	skin
derm/o	skin

Word part or term	Meaning
hidr/o	sweat
kerat/o	horny tissue or keratin
melan/o	black pigment
onych/o	nail
pil/o	hair
seb/o	sebum
subcutane/o	beneath the skin
trich/o	hair

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. Which layer contains most skin glands?

Answer: _____

2. Is subcutaneous tissue part of the skin proper?

Answer: _____

3. A fluid-filled lesion smaller than a blister is commonly called a ____.

Answer: _____

4. Name four details needed for lesion excision coding.

Answer: _____

5. What distinguishes a biopsy from an excision?

Answer: _____

Chapter Notes

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CHAPTER 4

Musculoskeletal System

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Distinguish axial and appendicular skeletons.
- Identify major bones, joints, muscles, tendons, and ligaments.
- Recognize fracture, dislocation, repair, and laterality terminology.

Core Structures

Structure	Coder friendly explanation
Axial skeleton	Skull, vertebral column, ribs, and sternum.
Appendicular skeleton	Shoulder girdles, upper limbs, pelvic girdle, and lower limbs.
Tendon	Connects muscle to bone.
Ligament	Connects bone to bone.
Bursa	Fluid-filled sac that reduces friction.
Synovial joint	Freely movable joint with a capsule and joint cavity.

System Walkthrough

Long bones have a shaft called the diaphysis and ends called epiphyses. Articular cartilage covers joint surfaces. Skeletal muscles work in groups to flex, extend, abduct, adduct, rotate, and stabilize.

Fracture coding requires exact bone, segment, side, displacement, open or closed status, encounter phase, and healing status when documented. Operative notes may name fixation, reduction, grafting, arthroscopy, or joint replacement. Do not confuse a tendon with a ligament.

Terminology Builder

Word part or term	Meaning
arthr/o	joint
burs/o	bursa
chondr/o	cartilage

Word part or term	Meaning
fasci/o	fascia
my/o	muscle
oste/o	bone
spondyl/o	vertebra
ten/o	tendon
tendin/o	tendon
vertebr/o	vertebra

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. What connects muscle to bone?

Answer: _____

2. The femur belongs to which skeletal division?

Answer: _____

3. Movement away from the midline is ____.

Answer: _____

4. List four fracture details a coder should locate.

Answer: _____

5. What structure reduces friction around some joints?

Answer: _____

Chapter Notes

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CHAPTER 5

Cardiovascular and Blood Systems

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Trace blood through the heart and major circulations.
- Distinguish arteries, veins, capillaries, and coronary vessels.
- Interpret common cardiac, vascular, and hematologic terms.

Core Structures

Structure	Coder friendly explanation
Right atrium	Receives systemic venous blood.
Right ventricle	Pumps blood to the lungs.
Left atrium	Receives oxygenated pulmonary venous blood.
Left ventricle	Pumps blood into systemic circulation.
Artery	Carries blood away from the heart.
Vein	Carries blood toward the heart.

System Walkthrough

Blood flows body → venae cavae → right atrium → tricuspid valve → right ventricle → pulmonary valve → pulmonary arteries → lungs → pulmonary veins → left atrium → mitral valve → left ventricle → aortic valve → aorta → body.

Cardiac documentation may identify chamber, valve, vessel, rhythm, ischemia, infarction site, heart failure type, and acuity. Vascular procedure notes specify access, vessel, lesion, device, imaging, and treated territory. Hematology terms describe red cells, white cells, platelets, plasma, clotting, and marrow.

Terminology Builder

Word part or term	Meaning
angi/o	vessel
aort/o	aorta
arteri/o	artery

Word part or term	Meaning
cardi/o	heart
coron/o	heart or crown
hem/o	blood
phleb/o	vein
thromb/o	clot
valv/o	valve
ven/o	vein

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. Which chamber pumps to the lungs?

Answer: _____

2. Which vessels return oxygenated blood from the lungs?

Answer: _____

3. Which valve lies between the left atrium and ventricle?

Answer: _____

4. True or false: all arteries carry oxygenated blood.

Answer: _____

5. Name three details needed from a vascular procedure note.

Answer: _____

Chapter Notes

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CHAPTER 6

Respiratory System

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Trace airflow from nose to alveoli.
- Identify upper and lower respiratory structures.
- Connect lobe, side, approach, and ventilation terms to coding.

Core Structures

Structure	Coder friendly explanation
Pharynx	Shared passage for air and food.
Larynx	Voice box and protected entrance to the trachea.
Trachea	Windpipe leading to the bronchi.
Bronchi	Large conducting airways entering the lungs.
Bronchioles	Smaller airway branches.
Alveoli	Microscopic sacs where gas exchange occurs.

System Walkthrough

The right lung has three lobes; the left has two and a cardiac notch. Pleura forms visceral and parietal layers with a potential space between them. The diaphragm is the primary muscle of quiet inspiration.

Coder-relevant details include upper versus lower respiratory tract, right versus left lung, lobe, infectious organism when confirmed, acute versus chronic disease, respiratory failure type, device dependence, and surgical approach. Bronchoscopy, laryngoscopy, thoracentesis, and pulmonary resection describe different sites and purposes.

Terminology Builder

Word part or term	Meaning
bronch/o	bronchus
laryng/o	larynx
nas/o	nose

Word part or term	Meaning
pharyng/o	pharynx
pleur/o	pleura
pneum/o	lung or air
pulmon/o	lung
rhin/o	nose
thorac/o	chest
trache/o	trachea

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. Where does gas exchange occur?

Answer: _____

2. How many lobes are in the right lung?

Answer: _____

3. What muscle drives quiet inspiration?

Answer: _____

4. What membrane covers the lung surface?

Answer: _____

5. Why does lobe documentation matter?

Answer: _____

Chapter Notes

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CHAPTER 7

Digestive System

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Trace food through the alimentary canal.
- Locate accessory organs and major digestive regions.
- Distinguish endoscopic, excisional, resection, and ostomy terminology.

Core Structures

Structure	Coder friendly explanation
Esophagus	Muscular tube carrying food to the stomach.
Stomach	Mixes food and begins significant protein digestion.
Small intestine	Duodenum, jejunum, and ileum; major site of digestion and absorption.
Large intestine	Cecum, colon, rectum, and anal canal; absorbs water and forms stool.
Liver	Produces bile and performs major metabolic functions.
Pancreas	Produces digestive enzymes and endocrine hormones.

System Walkthrough

The biliary tract includes the liver, hepatic ducts, gallbladder, cystic duct, common bile duct, and drainage into the duodenum. The peritoneum lines the abdominal cavity and covers many abdominal organs.

Endoscopy documentation should identify how far the scope advanced, what was visualized, and whether biopsy, removal, dilation, control of bleeding, or other treatment occurred. Surgery may remove part of an organ, create an anastomosis, or form an ostomy. Exact segment matters.

Terminology Builder

Word part or term	Meaning
chol/e	bile or gall
col/o	colon

Word part or term	Meaning
enter/o	intestine, often small intestine
gastr/o	stomach
hepat/o	liver
or/o	mouth
pancreat/o	pancreas
proct/o	rectum and anus
stomat/o	mouth
esophag/o	esophagus

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. Name the three parts of the small intestine.

Answer: _____

2. Which organ stores and concentrates bile?

Answer: _____

3. What is the first part of the large intestine?

Answer: _____

4. What must an endoscopy note say about scope extent?

Answer: _____

5. What is an ostomy?

Answer: _____

Chapter Notes

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CHAPTER 8

Urinary System

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Trace urine from kidney to exterior.
- Identify nephron structures and major kidney functions.
- Recognize laterality, obstruction, stone, and dialysis terminology.

Core Structures

Structure	Coder friendly explanation
Kidney	Filters blood, balances fluid and electrolytes, and forms urine.
Nephron	Microscopic functional unit of the kidney.
Ureter	Carries urine from kidney to bladder.
Urinary bladder	Stores urine.
Urethra	Carries urine from bladder to exterior.
Renal pelvis	Funnel-shaped collecting area leading to the ureter.

System Walkthrough

Filtration begins in the renal corpuscle. Tubules reabsorb needed substances and secrete others. The kidneys help regulate blood pressure, acid-base balance, red-cell production signals, and vitamin D activation.

Stone and obstruction documentation should identify kidney versus ureter, side, level, associated hydronephrosis, infection, and procedure. Dialysis access and dialysis status are different concepts. Cystoscopy examines the bladder; ureteroscopy enters the ureter.

Terminology Builder

Word part or term	Meaning
cyst/o	bladder
glomerul/o	glomerulus
nephr/o	kidney

Word part or term	Meaning
pyel/o	renal pelvis
ren/o	kidney
ureter/o	ureter
urethr/o	urethra
urin/o	urine
vesic/o	bladder
lith/o	stone

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. Trace urine after it leaves a kidney.

Answer: _____

2. What is the kidney's functional unit?

Answer: _____

3. Does a ureter carry urine to or from the kidney?

Answer: _____

4. Name three stone details useful to a coder.

Answer: _____

5. What organ is viewed during cystoscopy?

Answer: _____

Chapter Notes

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CHAPTER 9

Nervous System and Special Senses

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Distinguish central, peripheral, somatic, and autonomic divisions.
- Identify major brain, spinal cord, nerve, eye, and ear structures.
- Connect neurologic deficits and anatomic sites to coding documentation.

Core Structures

Structure	Coder friendly explanation
Cerebrum	Largest brain region; cognition, sensation, and voluntary movement.
Cerebellum	Coordinates movement and balance.
Brainstem	Midbrain, pons, and medulla; vital pathways and functions.
Spinal cord	Central pathway between brain and peripheral nerves.
Cranial nerves	Twelve paired nerves arising from the brain or brainstem.
Autonomic system	Controls involuntary smooth muscle, cardiac muscle, and glands.

System Walkthrough

The frontal, parietal, temporal, and occipital lobes have different major functions. Meninges are dura mater, arachnoid mater, and pia mater. Cerebrospinal fluid cushions the brain and spinal cord.

Neurologic coding often depends on dominant side, laterality, specific nerve or brain territory, residual deficit, acuity, and cause. Eye documentation may name eyelid, conjunctiva, cornea, lens, retina, optic nerve, and laterality. Ear documentation distinguishes external, middle, and inner ear.

Terminology Builder

Word part or term	Meaning
cerebr/o	cerebrum
encephal/o	brain

Word part or term	Meaning
mening/o	meninges
myel/o	spinal cord or bone marrow
neur/o	nerve
ocul/o	eye
ophthalm/o	eye
ot/o	ear
retin/o	retina
radicul/o	nerve root

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. What structures make up the central nervous system?

Answer: _____

2. Which brain region coordinates balance?

Answer: _____

3. Name the three meninges.

Answer: _____

4. Which eye structure contains photoreceptors?

Answer: _____

5. Why might dominant-side documentation matter after stroke?

Answer: _____

Chapter Notes

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CHAPTER 10

Endocrine System

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Locate major endocrine glands.
- Explain hormone feedback in practical terms.
- Differentiate gland, hormone, and target-organ language.

Core Structures

Structure	Coder friendly explanation
Pituitary gland	Regulates several other endocrine glands and body functions.
Thyroid gland	Produces hormones that influence metabolism.
Parathyroid glands	Help regulate calcium.
Adrenal glands	Produce cortical and medullary hormones.
Pancreatic islets	Produce insulin, glucagon, and other hormones.
Gonads	Ovaries and testes with reproductive and endocrine functions.

System Walkthrough

Most endocrine control uses negative feedback: a changing level triggers a response that moves the level back toward its set range. The hypothalamus links nervous and endocrine control.

Diabetes documentation requires type, complications, treatment context, and causally linked manifestations as supported by current guidelines and provider documentation. Thyroid and adrenal disorders may be described as hyperfunction, hypofunction, inflammation, neoplasm, or postprocedural state.

Terminology Builder

Word part or term	Meaning
adren/o	adrenal gland
glyc/o	sugar

Word part or term	Meaning
pancreat/o	pancreas
parathyroid/o	parathyroid
pituitar/o	pituitary
thyr/o	thyroid
thyroid/o	thyroid
hormon/o	hormone
insulin/o	insulin
gonad/o	gonad

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. Which gland is often called the master gland?

Answer: _____

2. Which hormone lowers blood glucose?

Answer: _____

3. Where are the adrenal glands?

Answer: _____

4. What feedback mechanism controls many hormones?

Answer: _____

5. Name two coder-relevant diabetes details.

Answer: _____

Chapter Notes

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CHAPTER 11

Reproductive Systems and Obstetric Anatomy

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Identify major male and female reproductive structures.
- Trace sperm and ovum pathways.
- Recognize obstetric location, trimester, fetus, and delivery terminology.

Core Structures

Structure	Coder friendly explanation
Ovary	Produces ova and hormones.
Uterine tube	Transports the ovum; common site of fertilization.
Uterus	Muscular organ supporting pregnancy.
Testis	Produces sperm and testosterone.
Epididymis	Stores and matures sperm.
Prostate	Gland surrounding the proximal male urethra.

System Walkthrough

Female structures include ovaries, uterine tubes, uterus, cervix, vagina, and external genitalia. Male structures include testes, epididymides, ductus deferens, seminal vesicles, prostate, urethra, and penis.

Obstetric coding depends on pregnancy status, gestational age, trimester, fetus number when applicable, complication, encounter purpose, and outcome. Anatomy also determines whether pregnancy is intrauterine or ectopic and identifies the site of many gynecologic and urologic procedures.

Terminology Builder

Word part or term	Meaning
cervic/o	cervix or neck, by context
hyster/o	uterus
mamm/o	breast

Word part or term	Meaning
oophor/o	ovary
orch/o	testis
prostat/o	prostate
salping/o	uterine tube
uter/o	uterus
vagin/o	vagina
vas/o	vessel or ductus deferens, by context

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. Where does fertilization usually occur?

Answer: _____

2. Which structure stores and matures sperm?

Answer: _____

3. What lower uterine structure opens into the vagina?

Answer: _____

4. Name four obstetric details coders look for.

Answer: _____

5. Why must cervic/o be interpreted in context?

Answer: _____

Chapter Notes

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CHAPTER 12

Lymphatic and Immune Systems

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Describe lymph flow and immune organ functions.
- Identify major lymphatic structures.
- Differentiate localized infection, systemic response, and neoplastic terminology.

Core Structures

Structure	Coder friendly explanation
Lymph	Fluid returned from tissues to the bloodstream.
Lymph node	Filters lymph and supports immune responses.
Spleen	Filters blood and supports immune function.
Thymus	Site of T-cell maturation, especially in early life.
Tonsils	Lymphatic tissue guarding entrances to respiratory and digestive tracts.
Bone marrow	Produces blood cells and supports B-cell development.

System Walkthrough

Lymphatic capillaries collect excess tissue fluid. Larger vessels pass lymph through nodes and return it to venous circulation. Immune defenses include barriers, innate responses, and adaptive responses involving lymphocytes and antibodies.

Coding must separate a localized infection from sepsis and must follow official guidance for sequencing and causal relationships. Neoplasms of lymphoid and blood-forming tissues are classified by cell lineage and site, not simply by a visible lump.

Terminology Builder

Word part or term	Meaning
immun/o	immune protection
lymph/o	lymph
lymphaden/o	lymph node

Word part or term	Meaning
splen/o	spleen
thym/o	thymus
tonsill/o	tonsil
myel/o	bone marrow or spinal cord
leuk/o	white
phag/o	eat or engulf
ser/o	serum

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. What do lymph nodes filter?

Answer: _____

2. Which organ filters blood and supports immunity?

Answer: _____

3. Where do T cells mature?

Answer: _____

4. Where are many blood cells produced?

Answer: _____

5. May a coder equate infection with sepsis?

Answer: _____

Chapter Notes

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CHAPTER 13

Medical Imaging Procedures and Operative Language

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Match common imaging methods to the anatomy they display.
- Decode procedure verbs and approach terms.
- Extract anatomy from operative and diagnostic reports.

Core Structures

Structure	Coder friendly explanation
Radiograph	Uses ionizing radiation for projection images.
CT	Uses x-rays and computer reconstruction for cross-sectional images.
MRI	Uses magnetic fields and radiofrequency signals; strong soft-tissue contrast.
Ultrasound	Uses sound waves; useful for real-time and vascular imaging.
Endoscopy	Direct internal visualization with a scope.
Nuclear medicine	Uses radiotracers to assess physiology and distribution.

System Walkthrough

Procedure verbs carry meaning: biopsy samples; excision removes a lesion or portion; resection removes all of a body part in certain coding systems; repair restores; replacement substitutes; dilation widens; drainage releases fluid or gas; fusion joins.

Use a consistent report-reading sequence: indication, preoperative diagnosis, postoperative diagnosis, approach, exact site and side, structures inspected, actions performed, devices or grafts, imaging guidance, findings, specimens, complications, and final documentation.

Terminology Builder

Word part or term	Meaning
angiography	imaging of vessels
arthroscopy	endoscopic examination of a joint

Word part or term	Meaning
bronchoscopy	endoscopic examination of airways
laparoscopy	endoscopic examination or surgery in the abdomen
-ectomy	surgical removal
-otomy	incision into
-ostomy	creation of an opening
-plasty	repair or reshaping
-scopy	visual examination
-centesis	surgical puncture

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. Which modality uses sound waves?

Answer: _____

2. What does -ectomy mean?

Answer: _____

3. What is the difference between -otomy and -ostomy?

Answer: _____

4. Name five anatomy fields to extract from an operative note.

Answer: _____

5. Which modality generally gives strong soft-tissue contrast without ionizing radiation?

Answer: _____

Chapter Notes

_____

_____

_____

_____

CHAPTER 14

Coder Anatomy Review and Case Practice

Why this matters for coders: Accurate code selection begins with accurate reading of anatomical detail. This chapter focuses on the structures and documentation clues most likely to affect specificity.

Learning Objectives

- Apply anatomy knowledge to short coding scenarios.
- Identify missing documentation before code selection.
- Use a repeatable anatomy-first review method.

Core Structures

Structure	Coder friendly explanation
Step 1 Identify the system	Start with the organ system and chief condition or service.
Step 2 Pinpoint the structure	Name organ, subsite, layer, segment, vessel, nerve, bone, or joint.
Step 3 Add position details	Capture side, quadrant, lobe, level, proximal/distal, and surface/depth.
Step 4 Define the action	Determine what happened: examination, biopsy, removal, repair, drainage, insertion, or other action.
Step 5 Check evidence	Reconcile the assessment, report body, pathology, imaging, and final diagnosis.
Step 6 Verify rules	Use the current code set, tabular instructions, guidelines, and payer rules.

System Walkthrough

Case A: A note says “repair of arm laceration” but omits exact location, length, and repair complexity. Do not guess. Query or use the documentation available under applicable rules.

Case B: A colonoscopy reaches the cecum and removes one sigmoid polyp by snare. The anatomy supports a complete colon examination, and the action and lesion site must be captured.

Case C: Imaging shows a left distal ureteral stone with hydronephrosis. The organ pathway, side, segment, and obstruction relationship guide diagnosis specificity.

Case D: A right rotator cuff repair involves tendons around the shoulder, not the elbow or wrist. The operative note determines which tendon, approach, and additional work are reportable.

Terminology Builder

Word part or term	Meaning
site	the exact structure treated
side	right, left, bilateral, or not stated
segment	specific part of an organ, bone, vessel, or nerve
depth	tissue layer reached or removed
approach	open, percutaneous, endoscopic, or other documented route
action	what the clinician actually performed
device	implant, graft, stent, catheter, or prosthesis
guidance	imaging or navigation used and documented
pathology	tissue diagnosis when available
encounter	clinical phase and purpose

Documentation Lens

As you read a report, underline the exact site and circle every qualifier: side, segment, depth, level, lobe, quadrant, approach, action, device, and confirmed relationship. If the documentation does not support a required detail, do not create it from assumption.

Knowledge Check

1. What should a coder do when required anatomy is absent?

Answer: _____

2. What proves a colonoscopy reached the cecum?

Answer: _____

3. Which details make the ureteral stone case specific?

Answer: _____

4. Is the rotator cuff a bone or a tendon group?

Answer: _____

5. What is the final step before code assignment?

Answer: _____

Chapter Notes

Appendix A Major Structures Quick Reference

Region	Structures to verify
Head and neck	brain, skull, meninges, eyes, ears, nose, sinuses, oral cavity, pharynx, larynx, thyroid, major vessels and nerves
Thorax	heart, lungs, pleura, mediastinum, trachea, bronchi, esophagus, ribs, sternum
Abdomen	liver, gallbladder, stomach, pancreas, spleen, small intestine, colon, kidneys, ureters, peritoneum
Pelvis	bladder, rectum, reproductive organs, pelvic floor, major vessels and nerves
Upper limb	shoulder, humerus, elbow, radius, ulna, wrist, hand, joints, muscles, tendons, nerves, vessels
Lower limb	hip, femur, knee, tibia, fibula, ankle, foot, joints, muscles, tendons, nerves, vessels
Back and spine	cervical, thoracic, lumbar, sacral and coccygeal regions; vertebrae, discs, spinal cord, nerve roots

Common Paired Structures

Eyes, ears, lungs, kidneys, ureters, ovaries, uterine tubes, testes, extremities, and many vessels and nerves require careful laterality review. A midline organ can still have right and left portions or lobes.

Common Segment Words

Term	Meaning in context
proximal	closer to origin or attachment
distal	farther from origin or attachment
superior	above
inferior	below
anterior	toward the front
posterior	toward the back
medial	toward the midline
lateral	away from the midline

Term	Meaning in context
ipsilateral	same side
contralateral	opposite side

Appendix B Answer Key

Use this key after completing each chapter. Equivalent wording is acceptable when the anatomical meaning is correct.

Chapter 1 The Language of Anatomy

Item	Answer
1	distal
2	coronal
3	thoracic
4	false
5	Because right, left, bilateral, or unspecified documentation can lead to different code choices.

Chapter 2 Cells Tissues and Body Organization

Item	Answer
1	epithelial
2	connective
3	cardiac muscle
4	cell, tissue, organ, organ system
5	pathology report

Chapter 3 Integumentary System

Item	Answer
1	dermis
2	no
3	vesicle
4	site, size, number, and pathology/behavior; repair may also matter
5	A biopsy samples tissue for diagnosis; an excision aims to remove the lesion.

Chapter 4 Musculoskeletal System

Item	Answer
1	tendon
2	appendicular
3	abduction
4	bone/site, laterality, displaced status, open/closed status; encounter and healing may also apply
5	bursa

Chapter 5 Cardiovascular and Blood Systems

Item	Answer
1	right ventricle
2	pulmonary veins
3	mitral valve
4	false
5	treated vessel/territory, access, lesion, device, and imaging are relevant

Chapter 6 Respiratory System

Item	Answer
1	alveoli
2	three
3	diaphragm
4	visceral pleura
5	It identifies a more specific anatomic site and may affect diagnosis or procedure code selection.

Chapter 7 Digestive System

Item	Answer
1	duodenum, jejunum, ileum
2	gallbladder
3	cecum
4	the furthest anatomic point reached/visualized
5	A surgically created opening from an internal organ to the body surface.

Chapter 8 Urinary System

Item	Answer
1	ureter, bladder, urethra
2	nephron
3	from the kidney
4	site, side, obstruction/hydronephrosis, infection, or procedure
5	urinary bladder

Chapter 9 Nervous System and Special Senses

Item	Answer
1	brain and spinal cord
2	cerebellum
3	dura mater, arachnoid mater, pia mater
4	retina
5	It can affect the specificity of deficit coding.

Chapter 10 Endocrine System

Item	Answer
1	pituitary

Item	Answer
2	insulin
3	on top of the kidneys
4	negative feedback
5	type and documented complication; treatment and manifestations may also matter

Chapter 11 Reproductive Systems and Obstetric Anatomy

Item	Answer
1	uterine tube
2	epididymis
3	cervix
4	trimester, gestational age, fetus number, complication, encounter purpose, outcome
5	It can refer to the neck or the uterine cervix.

Chapter 12 Lymphatic and Immune Systems

Item	Answer
1	lymph
2	spleen
3	thymus
4	bone marrow
5	No; sepsis requires provider documentation and guideline-based coding.

Chapter 13 Medical Imaging Procedures and Operative Language

Item	Answer
1	ultrasound
2	surgical removal

Item	Answer
3	-otomy is an incision; -ostomy creates an opening
4	site, side, segment, approach, structures inspected/treated; device and guidance may also matter
5	MRI

Chapter 14 Coder Anatomy Review and Case Practice

Item	Answer
1	Follow query policy or code only to the supported level; never guess.
2	Documentation of the cecum and/or recognized cecal landmarks.
3	left side, distal ureter, and associated hydronephrosis/obstruction
4	a group of tendons and associated muscles
5	Verify the current code set, instructions, guidelines, and applicable rules.

Appendix C References and Further Study

OpenStax. Anatomy and Physiology 2e. Rice University. https://openstax.org/details/books/anatomy-and-physiology-2e

Centers for Medicare and Medicaid Services. ICD-10 resources and annual Official Guidelines for Coding and Reporting. https://www.cms.gov/medicare/coding-billing/icd-10-codes

Centers for Disease Control and Prevention, National Center for Health Statistics. ICD-10-CM resources. https://www.cdc.gov/nchs/icd/icd-10-cm/

Use the current edition of the coding manuals required by your course or examination. For CPT content, use the current CPT Professional codebook and official American Medical Association resources. CPT is a registered trademark of the American Medical Association.

Instructor Use Suggestions

- Assign one chapter before the related coding-book section.
- Have students label anatomy on a blank diagram from an authorized source.
- Ask students to highlight anatomic specificity in de-identified sample notes.
- Require students to explain why missing anatomy changes code selection.
- Use the knowledge checks as opening reviews or low-stakes quizzes.