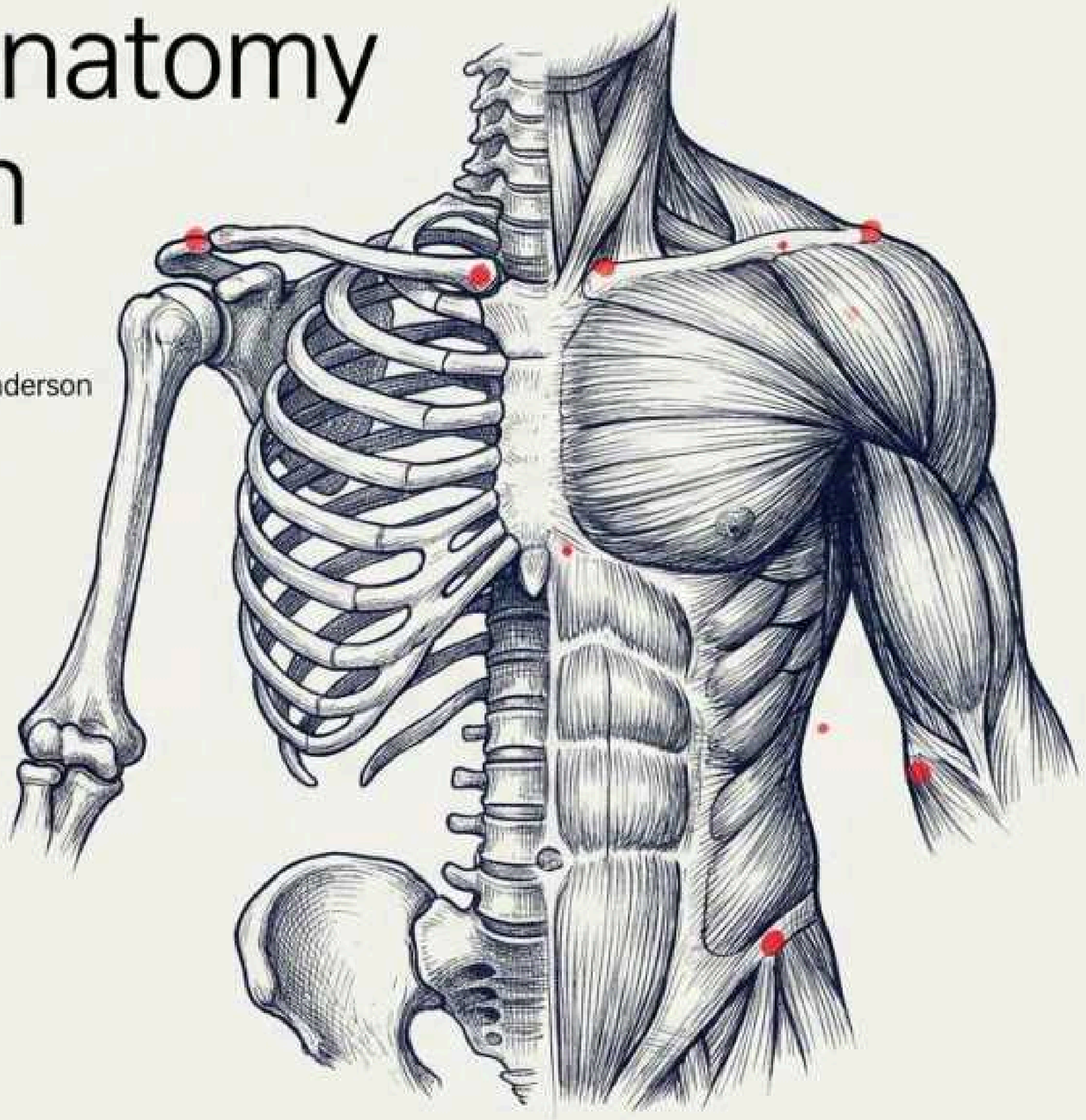
The Language of Anatomy and the Body's Plan

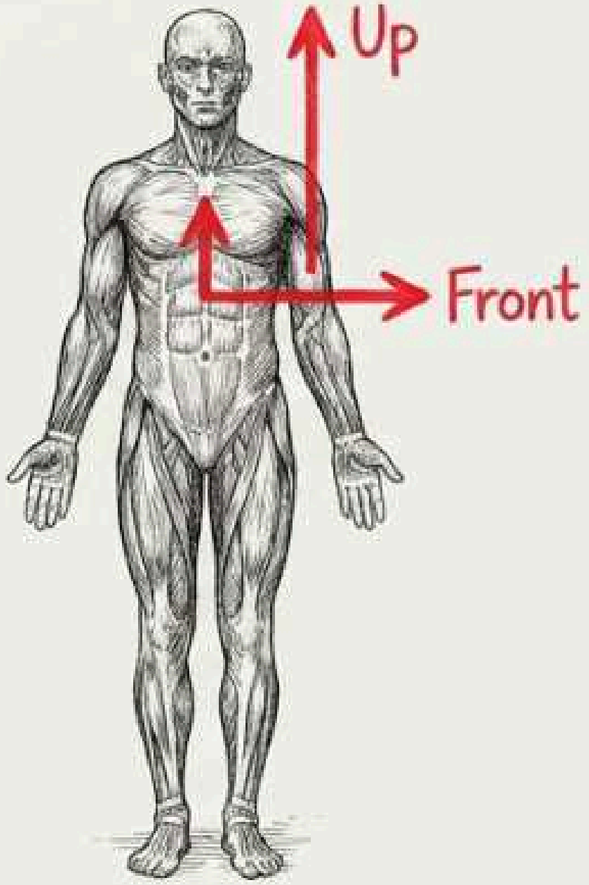
Anderson Academy | MED 501 B
Instructor Contact: garyanderson@mail.grokbot.com | X: @garyanderson

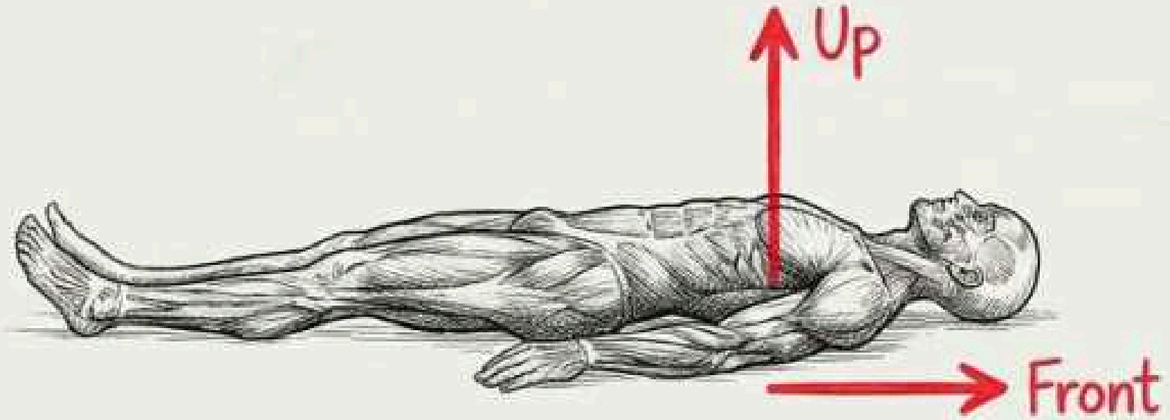


Topics at a glance:
Anatomical position, machintical, planes and directional terms, body regions and cavities, and the levels of organisation from cells to systems.

Everyday Language Relies on Shifting Perspectives

¶ 1.1





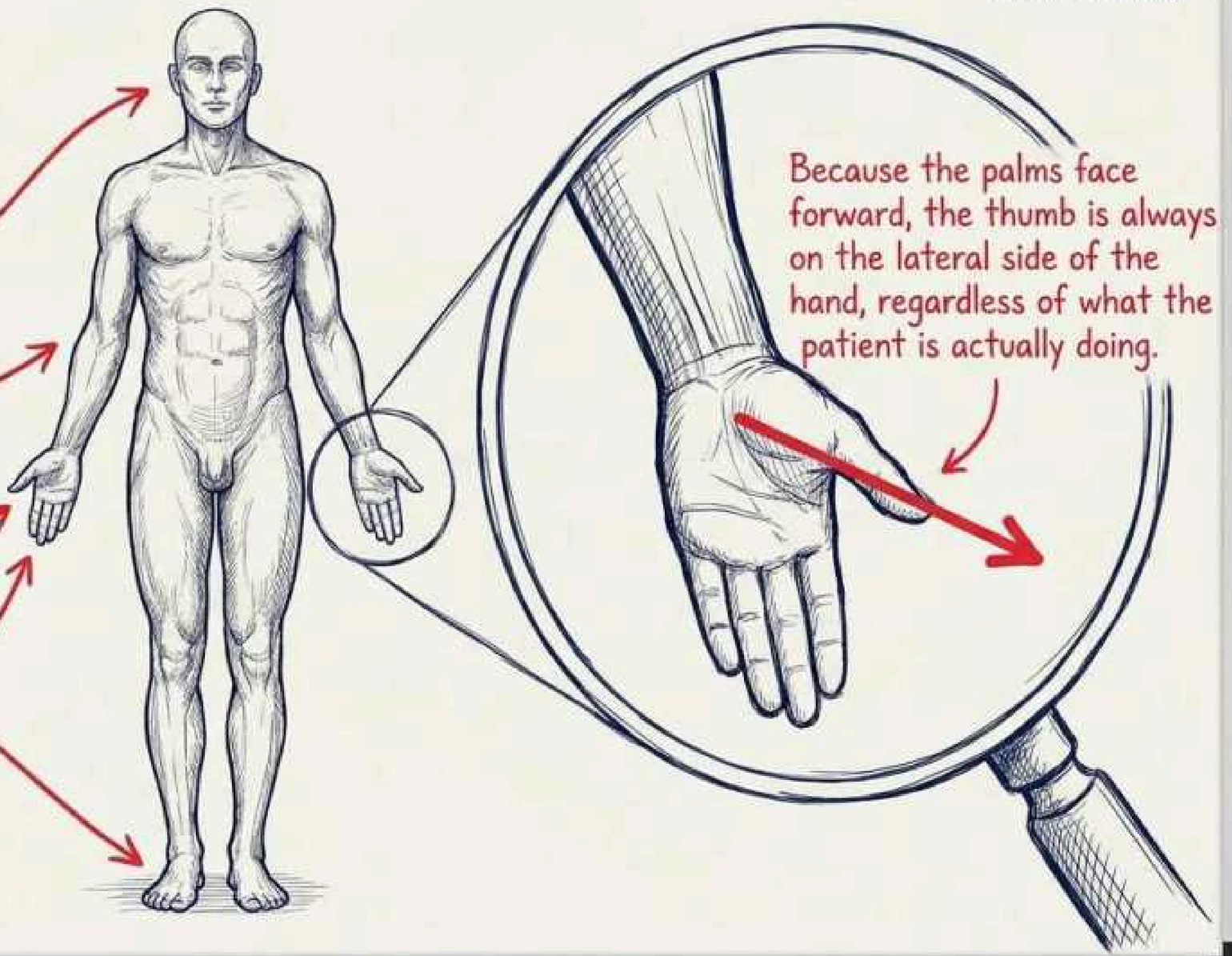
Everyday Language + Movement = Confusion

Every science requires precise language. Anatomy's language exists so two people can describe the exact same location on a body without confusion. To solve the problem of shifting perspectives, anatomists engineered a fixed reference posture and a set of terms with absolute meanings.

The Fixed Reference Posture: Anatomical Position

¶ 1.2

- ☑ - Body standing upright
- ☑ - Facing forward
- ☑ - Feet together
- ☑ - Arms at the sides
- ☑ - Palms facing forward



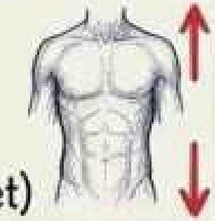
The Directional Compass Replaces Relative Terms

¶ 1.3

Top vs Bottom

Vertical Axis:

Superior (Toward the head) ⟷ Inferior (Toward the feet)



Front vs Back (angled depth)



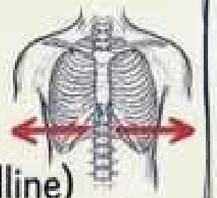
Depth Axis:

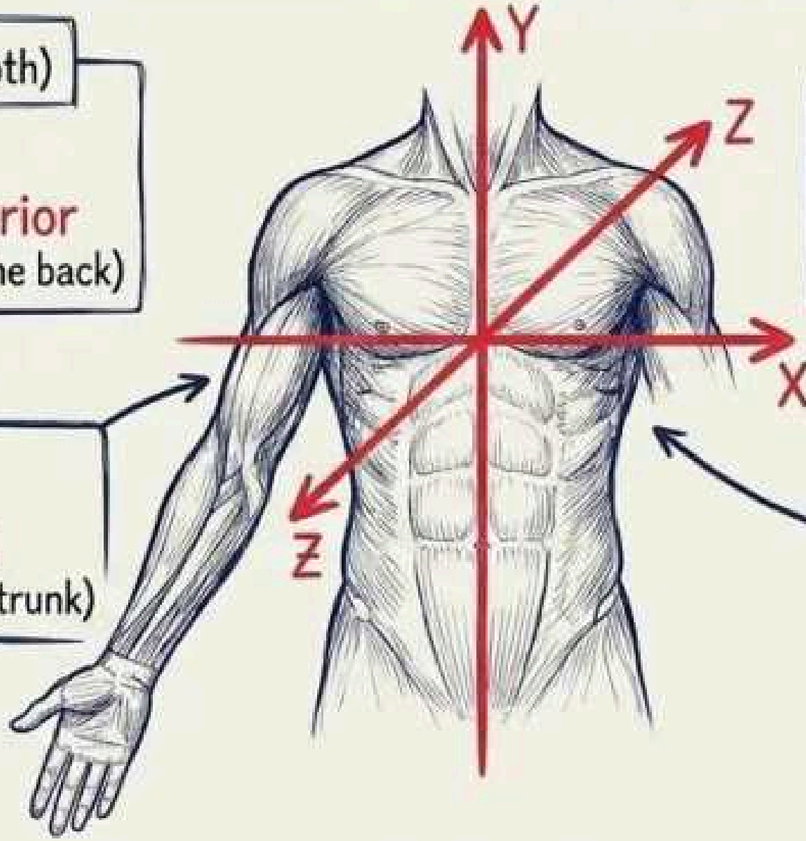
Anterior (Toward the front) ⟷ Posterior (Toward the back)

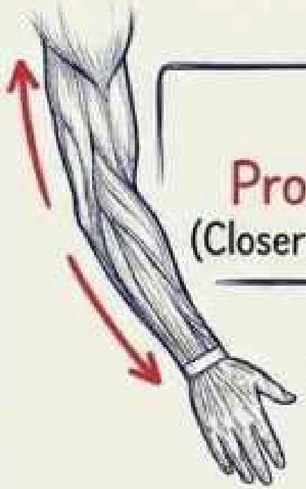
Center vs Edges

Horizontal Axis:

Medial (Toward the midline) ⟷ Lateral (Away from midline)







Limb Vectors:

Proximal ⟷ Distal

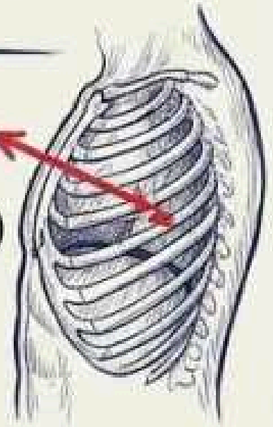
(Closer to trunk) (Farther from trunk)

Note: The wrist is distal to the elbow.

Surface Proximity:

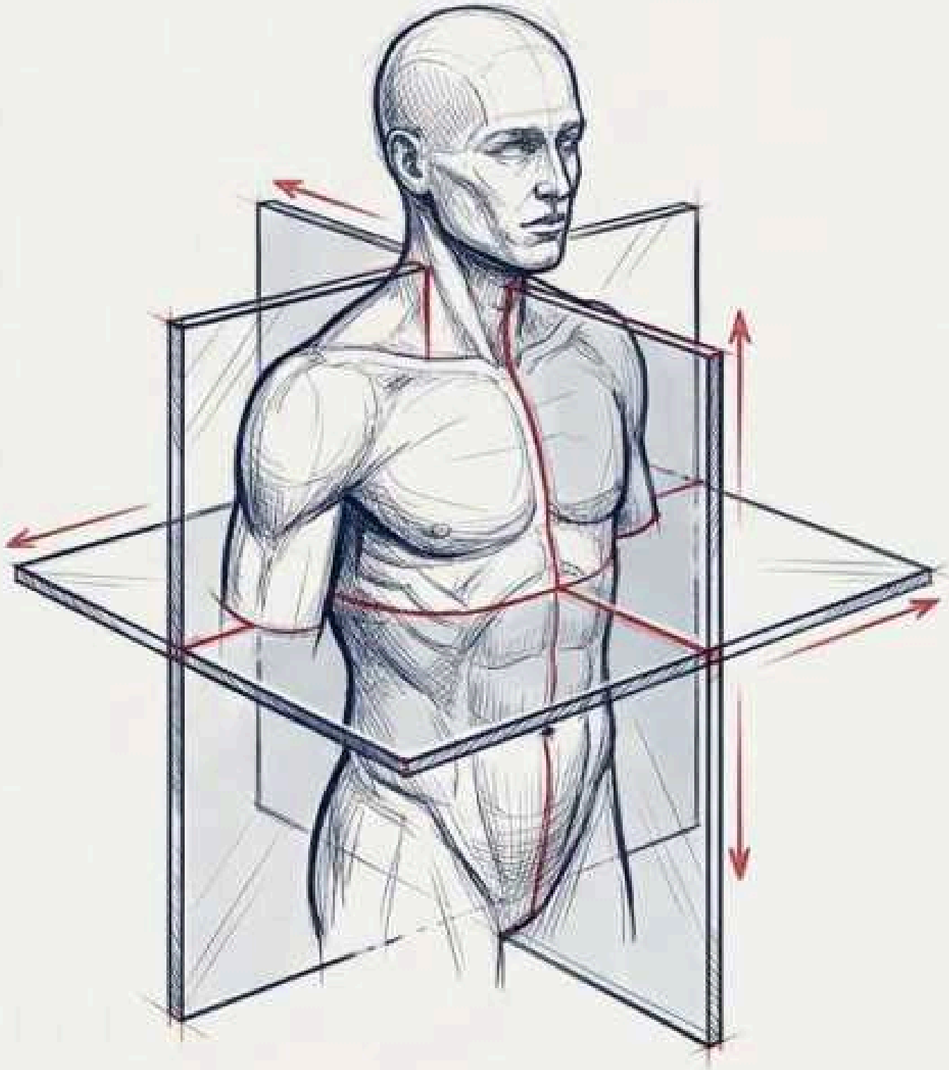
Superficial ⟷ Deep

(Near the surface) (Farther in)



Slicing the Subject via Imaginary Planes

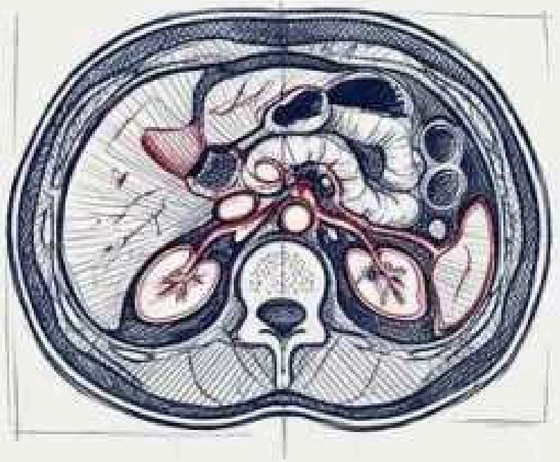
¶ 1.4



Sagittal Plane: Divides into left and right parts.
(Median sagittal plane runs exactly down the middle).

Coronal / Frontal Plane: Divides into front and back parts.

Transverse / Axial Plane: Divides into upper and lower parts.

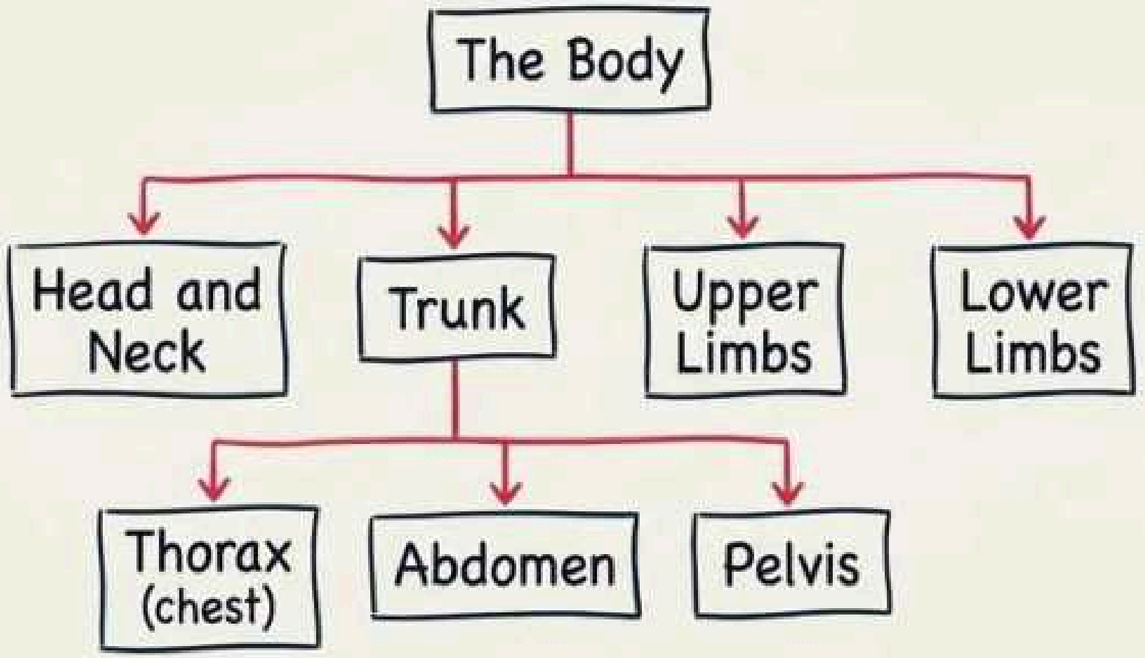


These planes are critical in modern medicine; CT and MRI scans reveal the body as a stack of slices across these exact planes.

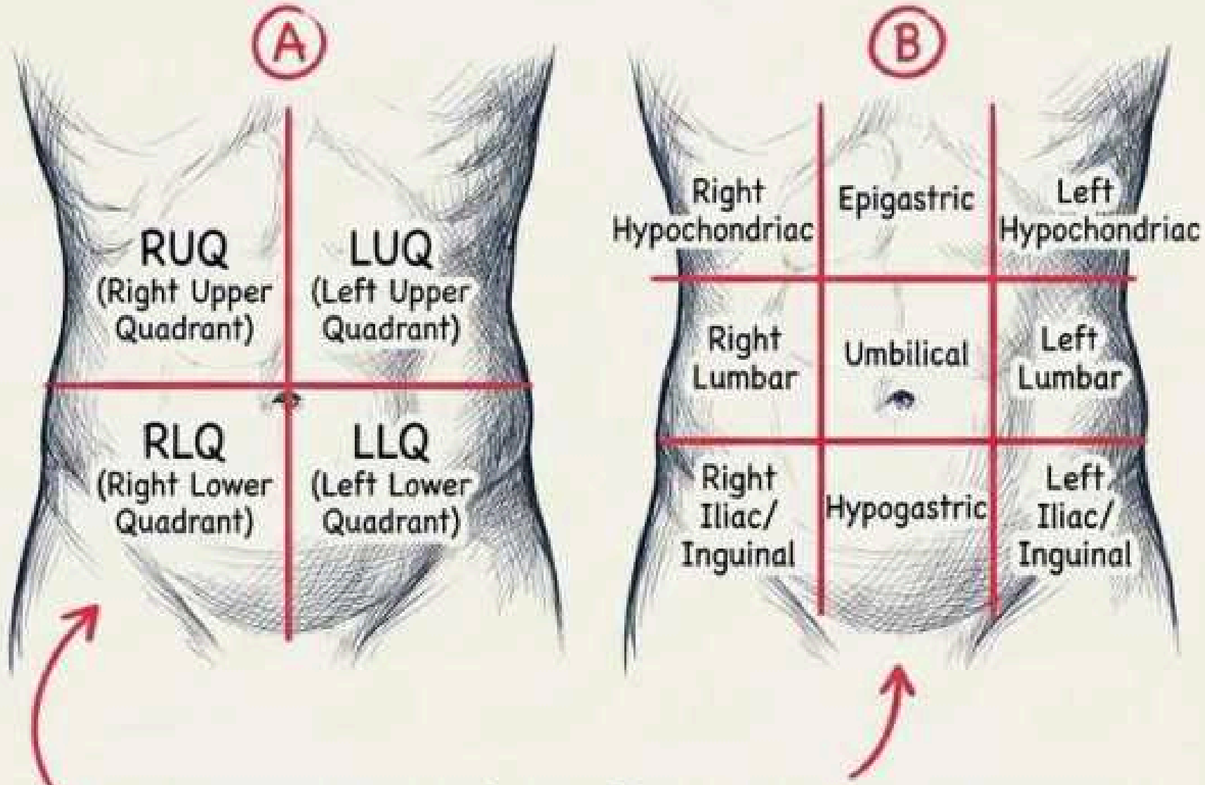
Mapping the Body's Regions and Clinical Zones

¶ 1.5

Macro Hierarchy



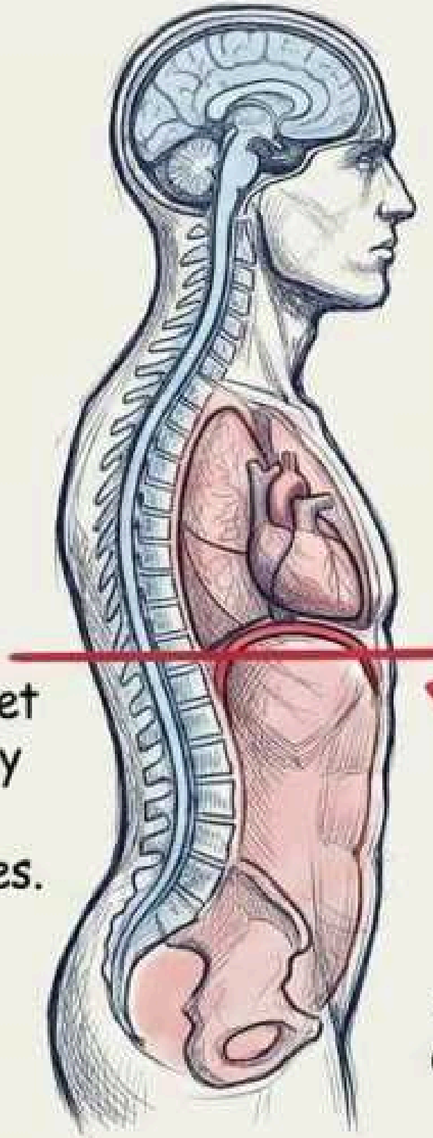
Micro Zoning



Doctors divide the front of the abdomen into these quadrants and regions to pinpoint precisely where a pain or swelling lies (to be detailed in lecture four).

The Great Internal Cavities

¶ 1.6



A dome-shaped sheet of muscle physically separating thoracic and abdominal spaces.

Diaphragm: A dome-shaped sheet of muscle physically separating thoracic and abdominal spaces.

Dorsal (Back) Cavities: Protected by bone.

- Cranial cavity (holds the brain)
- Vertebral canal (holds the spinal cord)

Ventral (Front) Cavities: Inside the trunk.

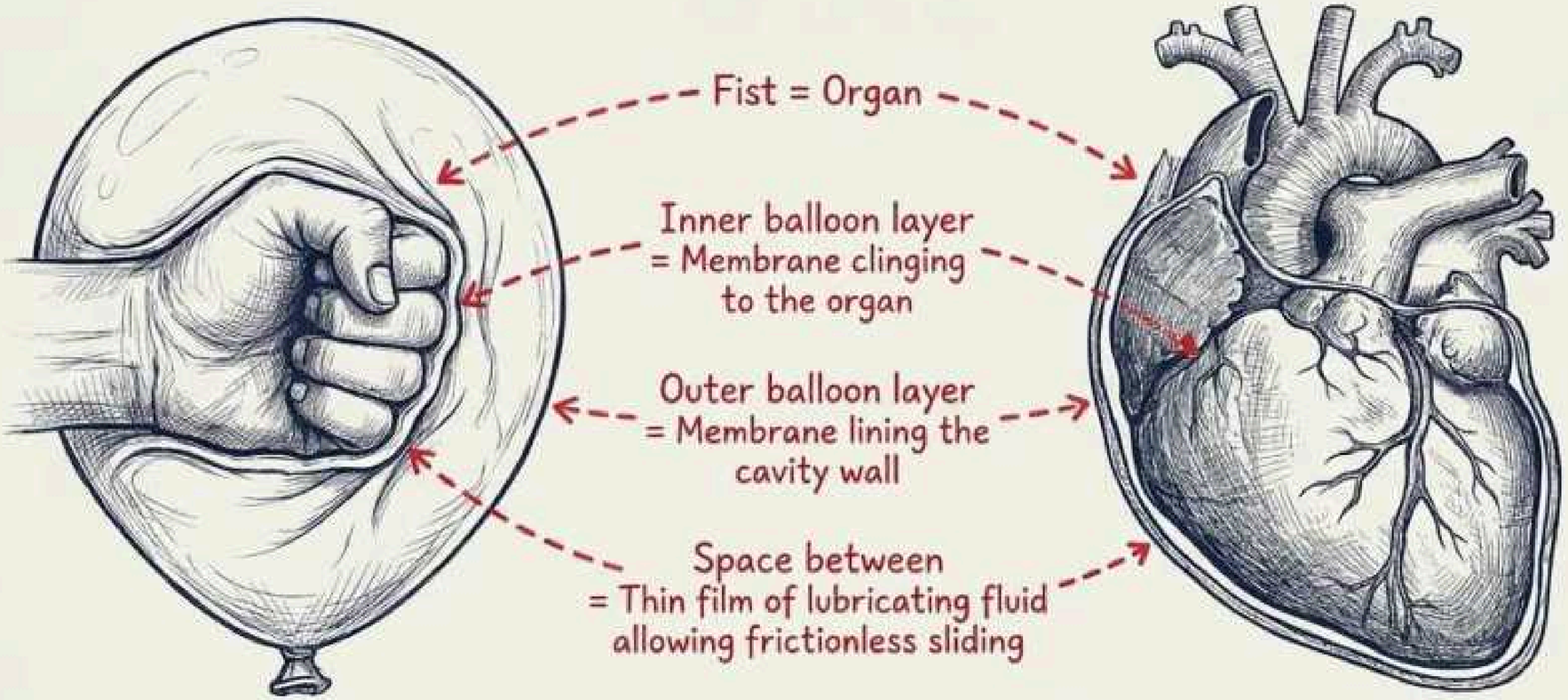
- Thoracic cavity (holds the heart and lungs)
- Abdominal cavity (continues downward into...)
- Pelvic cavity

Serous Membranes Provide the Friction Solution

¶ 1.7

The Analogy

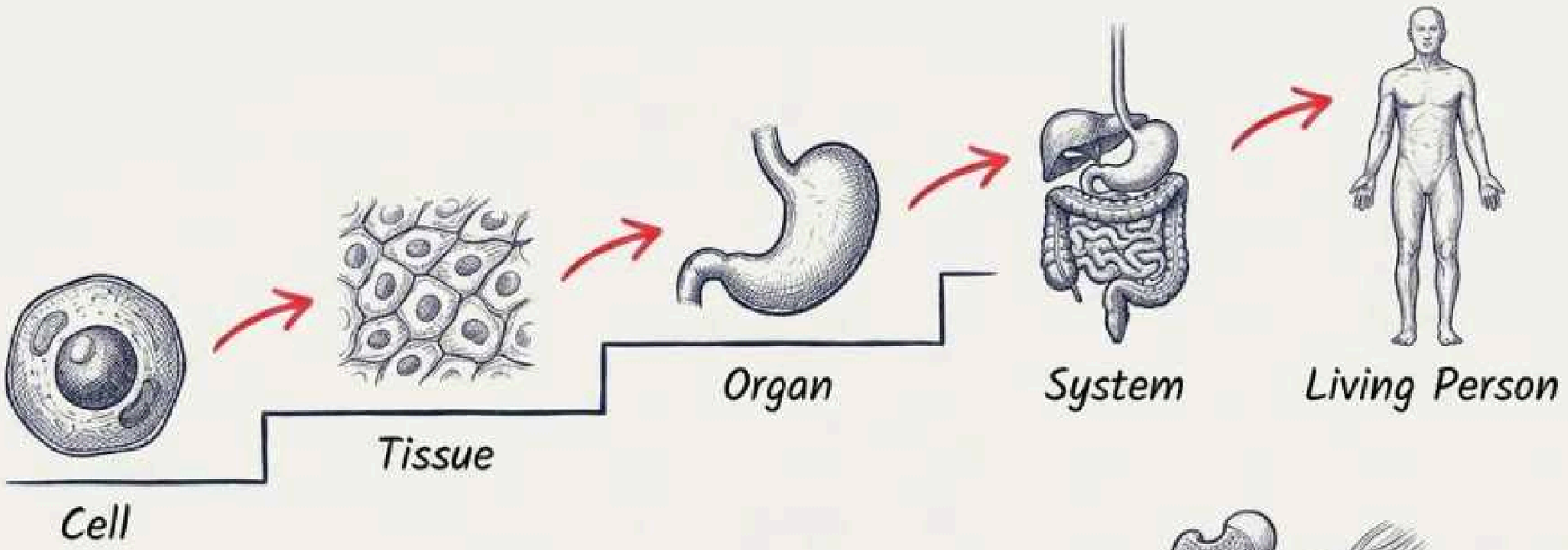
The Anatomy



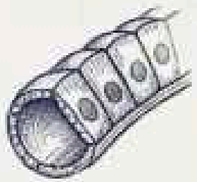
Lungs	→	Pleura
Heart	→	Pericardium
Abdominal organs	→	Peritoneum

The Upward Assembly of the Human Machine

¶ 1.8



1. Epithelium: Covers surfaces and lines tubes.



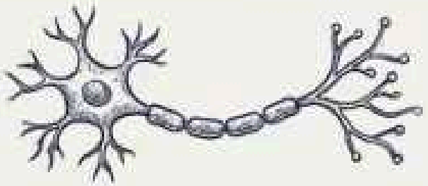
2. Connective: Supports and binds (includes bone, cartilage, fat, and blood).



3. Muscle: Contracts.



4. Nervous: Carries signals.



Organ Systems Cannot Exist in Isolation

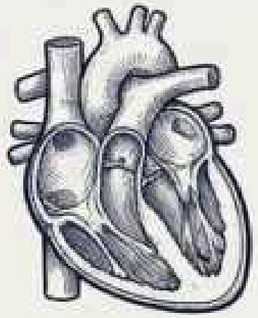
¶ 1.9



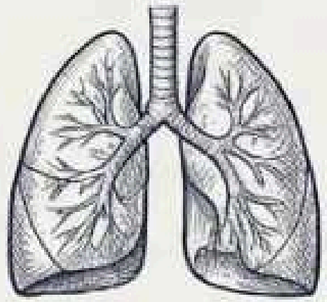
Skeletal



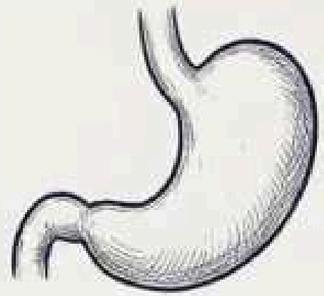
Muscular



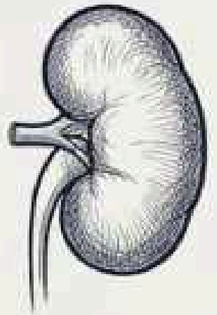
Cardiovascular



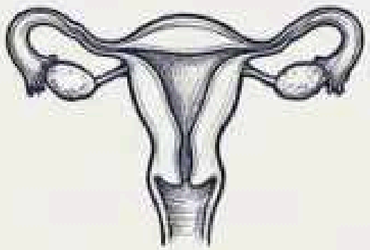
Respiratory



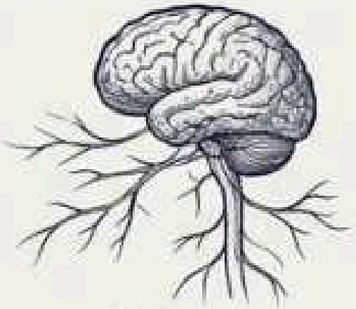
Digestive



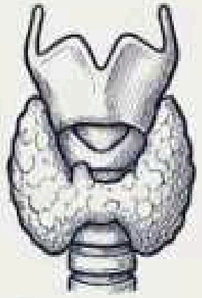
Urinary



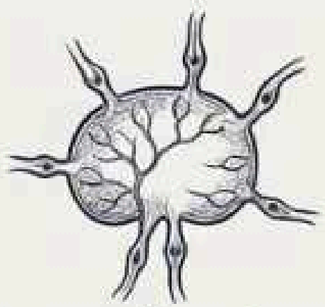
Reproductive



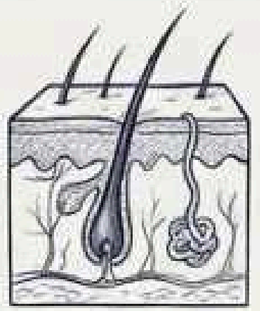
Nervous



Endocrine



Immune/Lymphatic



Skin

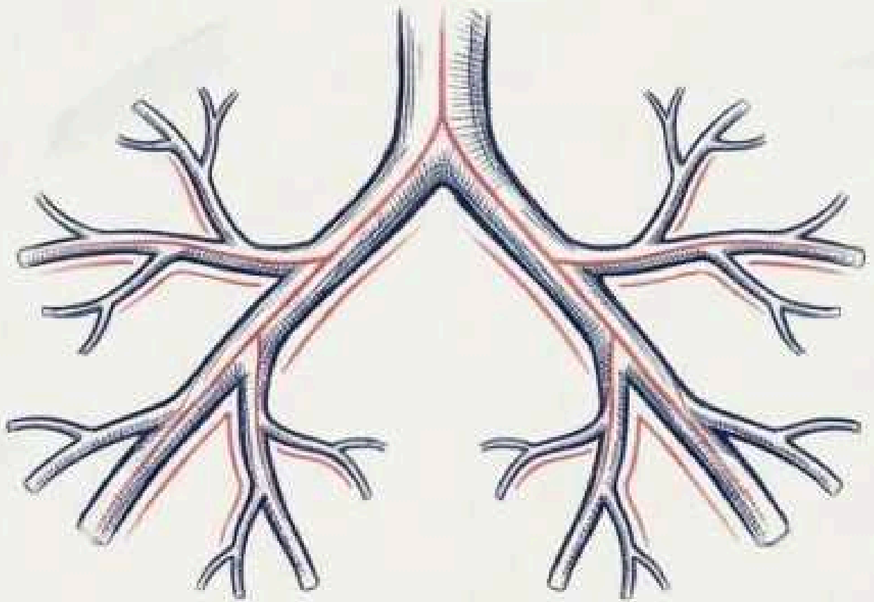
The body is divided into 11 organ systems (Skeletal, Muscular, Cardiovascular, Respiratory, Digestive, Urinary, Reproductive, Nervous, Endocrine, Immune/Lymphatic, Skin). This division closely corresponds to the second-year Medical School courses.

Functional anatomy is the active study of how these distinct systems share physical space and constantly depend on one another.

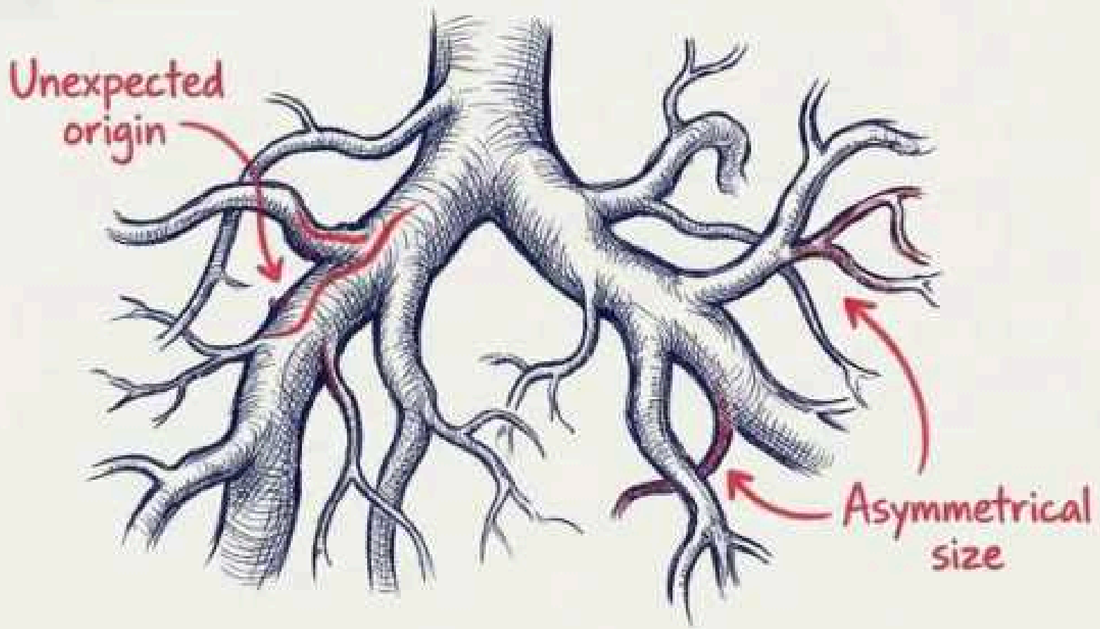
The Rule of Biological Variation

¶ 1.10

The Textbook



The Patient



The diagram is a guide, not a photograph.

The fundamental idea underlying all of anatomy is variation. No real body is exactly typical. Arteries branch differently, organs shift in size and position, and some people are born lacking certain structures entirely. Surgeons and radiologists must always anticipate this variation.

The Takeaway Challenge

¶ 1.11



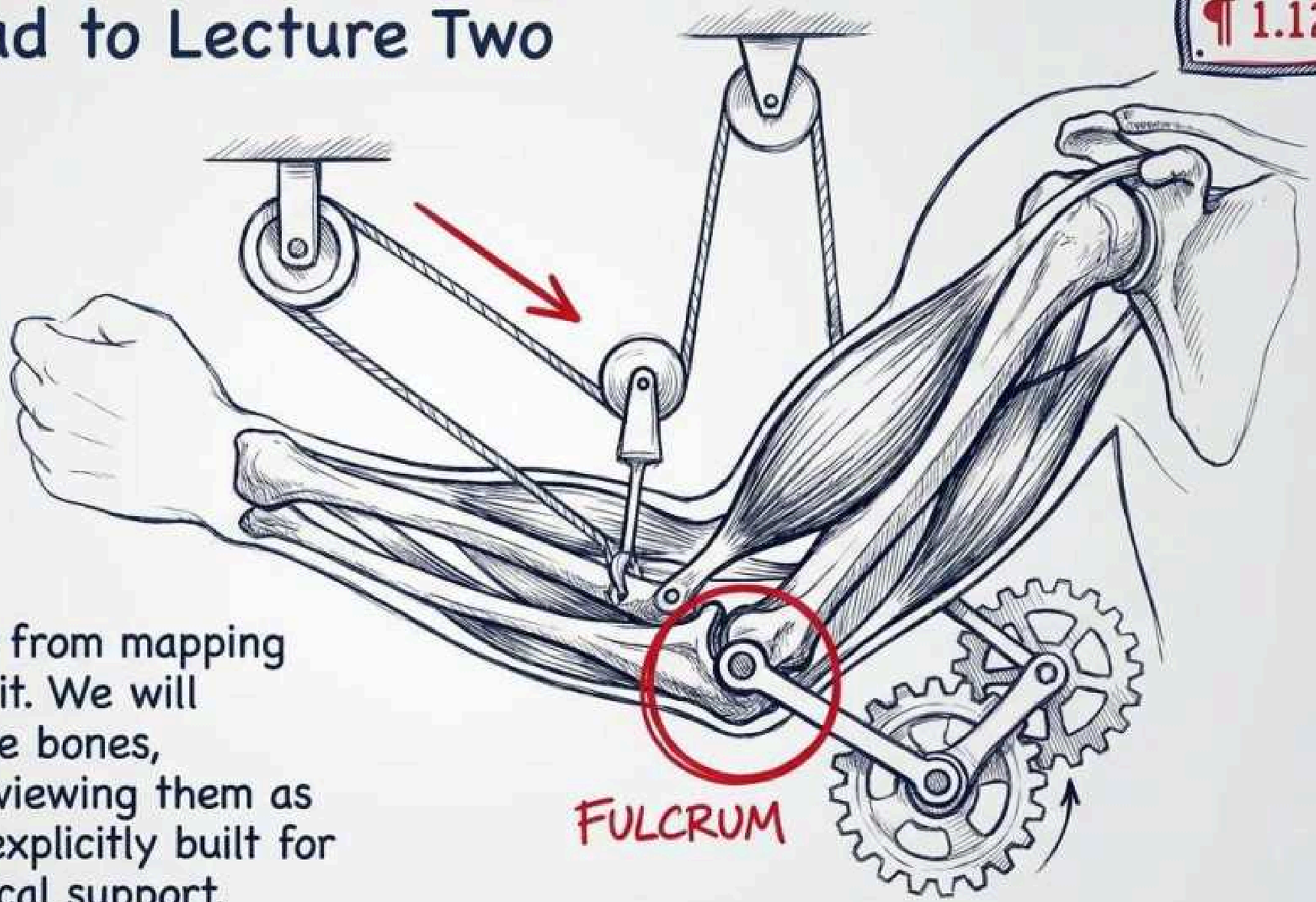
Task: Describe the position of your nose relative to your ear.

Everyday language:	Anatomical terms:
Words like "Above" or "Beside" change completely depending on whether you lie down or stand up.	The nose is Anterior and Medial to the ear.

The anatomical description remains mathematically true regardless of the patient's actual posture, proving the utility of the system.

Looking Ahead to Lecture Two

¶ 1.12



Next time, we move from mapping the body to moving it. We will examine will examine bones, joints, and muscles, viewing them as biological machines explicitly built for movement and physical support.