

HUMAN ANATOMY

INTRODUCTION TO BODY STRUCTURE

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Introduction to Body Structure

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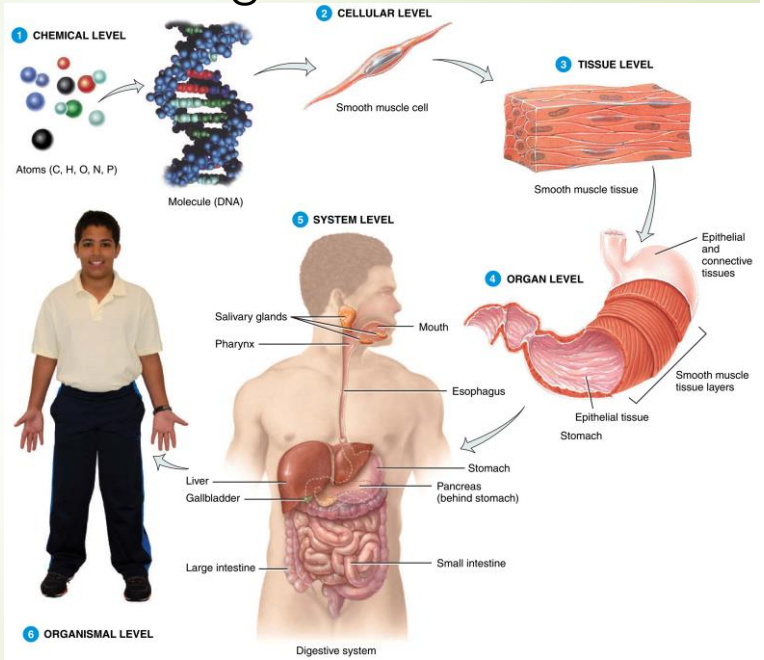
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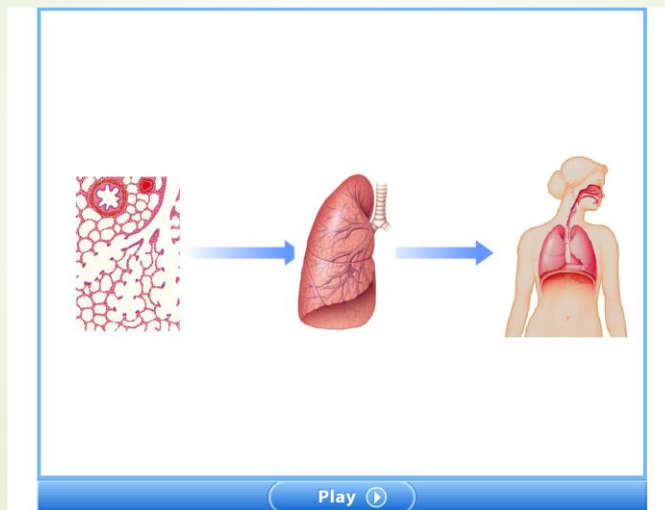
Levels of Structural Organization

The levels of structural organization are chemical, cellular, tissue, organ, system, and organismal.

- ▶ A tissue is a group of similar cells that work together to perform a common function.
- ▶ The body has four basic kinds of tissues: epithelial, nervous, connective, and muscle tissues.



Tissue, Organ, and Organ System

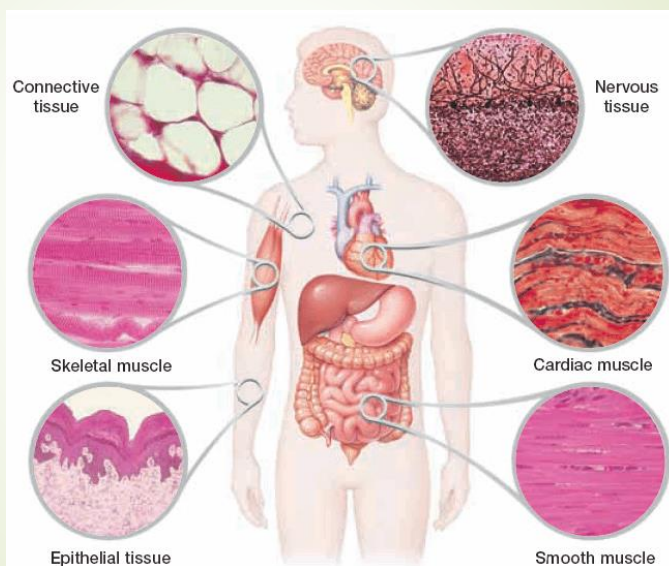


Levels of Structural Organization, *continued*

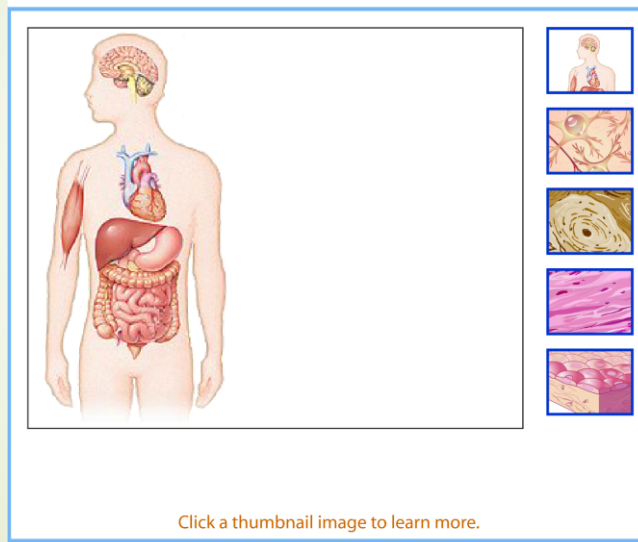
Four Kinds of Tissues

- ▶ **Epithelial tissue** lines most body surfaces and protects other tissues from damage and dehydration.
- ▶ **Nervous tissue** consists of nerve cells, which carry information throughout the body.
- ▶ Various kinds of **connective tissue** support, protect, and insulate the body.
- ▶ **Muscle tissue** enables the movement of body structures by muscle contraction.

Human Body Tissues



Body Tissues



Levels of Structural Organization, *continued*




Stem Cells

- ▶ Embryonic stem cells are early, undifferentiated cells that give rise to all of the types of cells in the developing body.
- ▶ Embryonic stem cells will divide indefinitely.
- ▶ Adult stem cells are not as versatile and do not divide indefinitely.

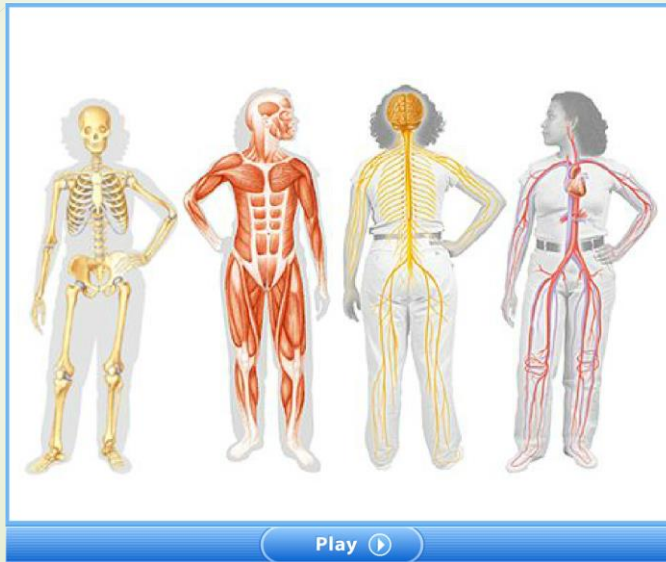
Organ Systems

- Body organs are made of combinations of two or more types of tissues working together to perform a specific function.
- An organ system is a group of organs that work together to carry out major activities or processes. Some organs function in more than one organ system.

Major Organ Systems of the Human Body

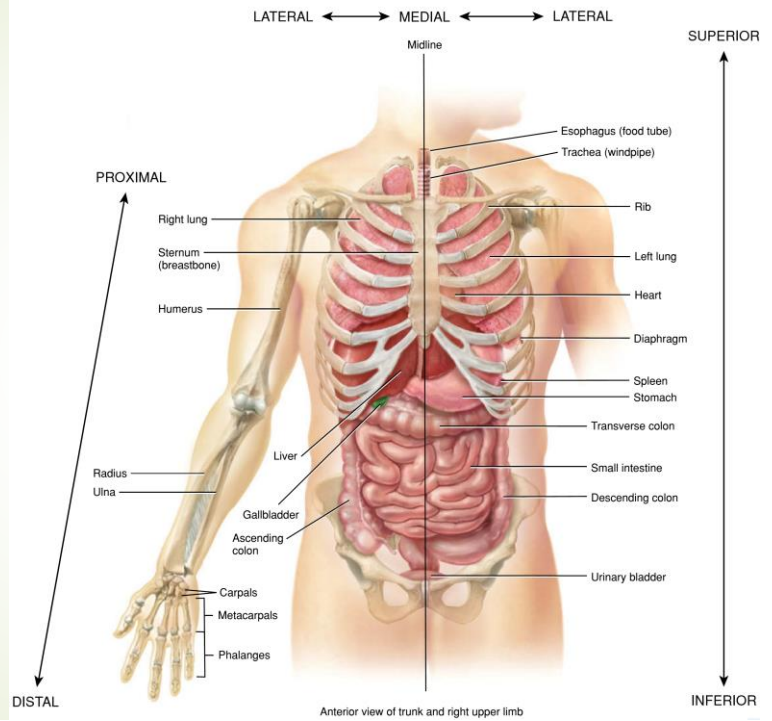
System	Major structures	Functions
Circulatory	Heart, blood vessels, blood (cardiovascular) lymph nodes and vessels, lymph (lymphatic)	Transports nutrients, wastes, hormones, and gases
Digestive	Mouth, throat, esophagus, stomach, liver, pancreas, small and large intestines 	Extracts and absorbs nutrients from food; removes wastes; maintains water and chemical balances
Endocrine	Hypothalamus, pituitary, pancreas and many other endocrine glands	Regulates body temperature, metabolism, development, and reproduction; maintains homeostasis; regulates other organ systems
Excretory	Kidneys, urinary bladder, ureters, urethra, skin, lungs	Removes wastes from blood; regulates concentration of body fluids
Immune	White blood cells, lymph nodes and vessels, skin	Defends against pathogens and disease
Integumentary	Skin, nails, hair	Protects against injury, infection, and fluid loss; helps regulate body temperature
Muscular	Skeletal, smooth, and cardiac muscle tissues	Moves limbs and trunk; moves substances through body; provides structure and support
Nervous	Brain, spinal cord, nerves, sense organs 	Regulates behavior; maintains homeostasis; regulates other organ systems; controls sensory and motor functions
Reproductive	Testes, penis (in males); ovaries, uterus, breasts (in females)	Produces gametes and offspring
Respiratory	Lungs, nose, mouth, trachea	Moves air into and out of lungs; controls gas exchange between blood and lungs
Skeletal	Bones and joints 	Protects and supports the body and organs; interacts with skeletal muscles, produces red blood cells, white blood cells, and platelets

Overview of Organ Systems



Directional Terms

DIRECTIONAL TERM	DEFINITION	EXAMPLE OF USE
Superior (soo'-PĒR-ē-or) (cephalic or cranial)	Toward the head, or the upper part of a structure.	The heart is superior to the liver.
Inferior (in-FĒ-rē-or) (caudal)	Away from the head, or the lower part of a structure.	The stomach is inferior to the lungs.
Anterior (an-TĒR-ē-or) (ventral)*	Nearer to or at the front of the body.	The sternum (breastbone) is anterior to the heart.
Posterior (pos-TĒR-ē-or) (dorsal)	Nearer to or at the back of the body.	The esophagus (food tube) is posterior to the trachea (windpipe).
Medial (MĒ-dē-al)	Nearer to the midline (an imaginary vertical line that divides the body into equal right and left sides).	The ulna is medial to the radius.
Lateral (LAT-er-al)	Farther from the midline.	The lungs are lateral to the heart.
Intermediate (in'-ter-MĒ-dē-at)	Between two structures.	The transverse colon is intermediate to the ascending and descending colons.
Ipsilateral (ip-si-LAT-er-al)	On the same side of the body as another structure.	The gallbladder and ascending colon are ipsilateral.
Contralateral (KON-tra-lat-er-al)	On the opposite side of the body from another structure.	The ascending and descending colons are contralateral.
Proximal (PROK-si-mal)	Nearer to the attachment of a limb to the trunk; nearer to the origination of a structure.	The humerus (arm bone) is proximal to the radius.
Distal (DIS-tal)	Farther from the attachment of a limb to the trunk; farther from the origination of a structure.	The phalanges (finger bones) are distal to the carpals (wrist bones).
Superficial (soo'-per-FISH-al) (external)	Toward or on the surface of the body.	The ribs are superficial to the lungs.
Deep (Internal)	Away from the surface of the body.	The ribs are deep to the skin of the chest and back.

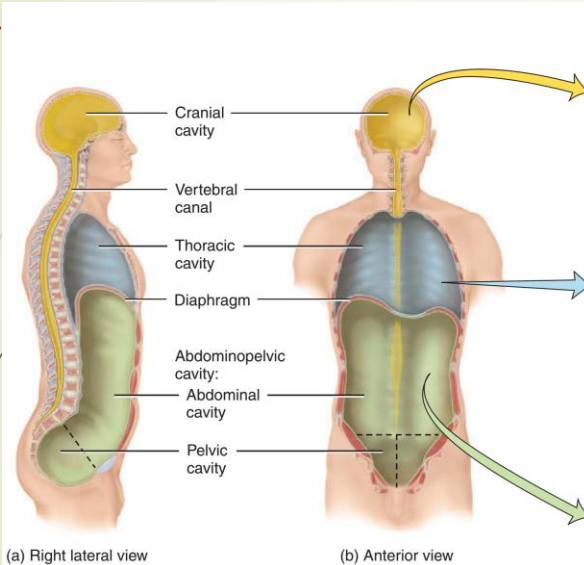


Organ Systems, *continued*

Body Cavities

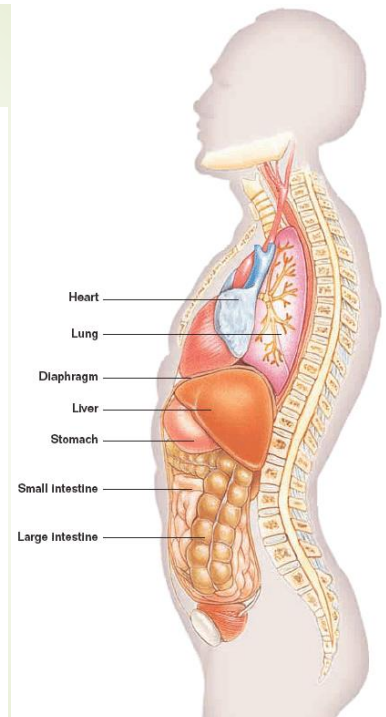
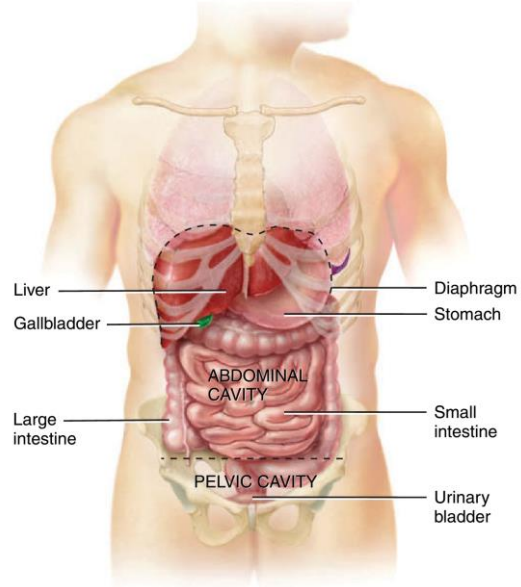
- ▶ The human body contains four large fluid-filled spaces, or body cavities, that house and protect the major internal organs.
- ▶ These body cavities are the thoracic cavity (heart and lungs), cranial cavity (brain), abdominal cavity (digestive organs), and spinal cavity (spinal cord).

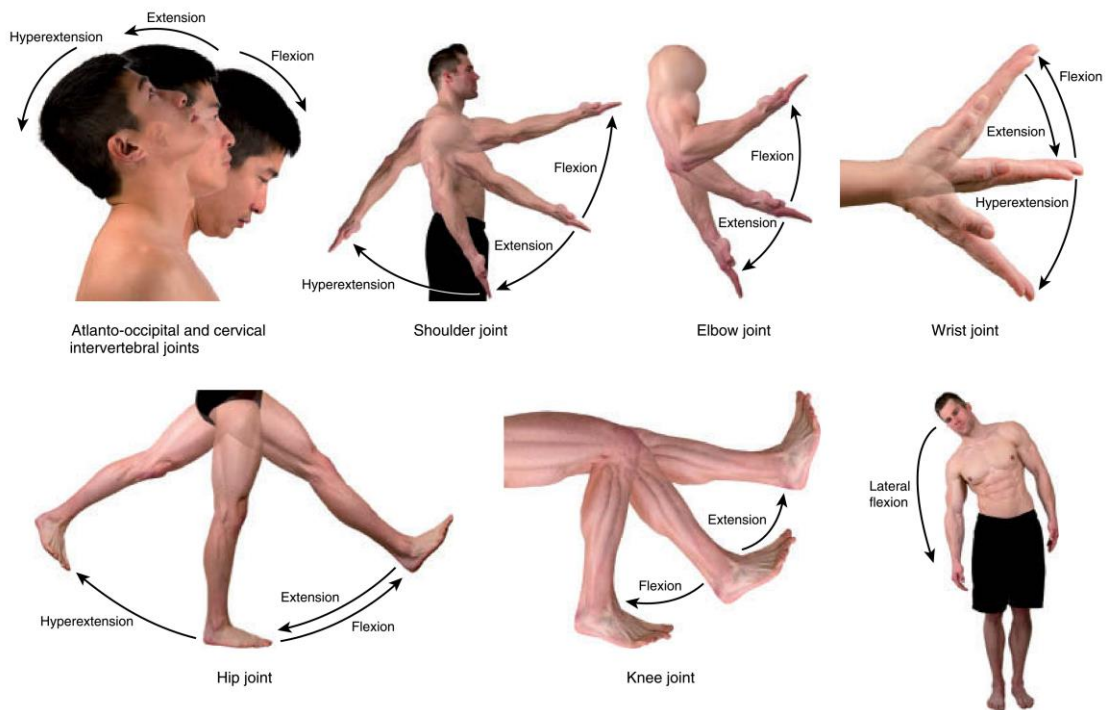
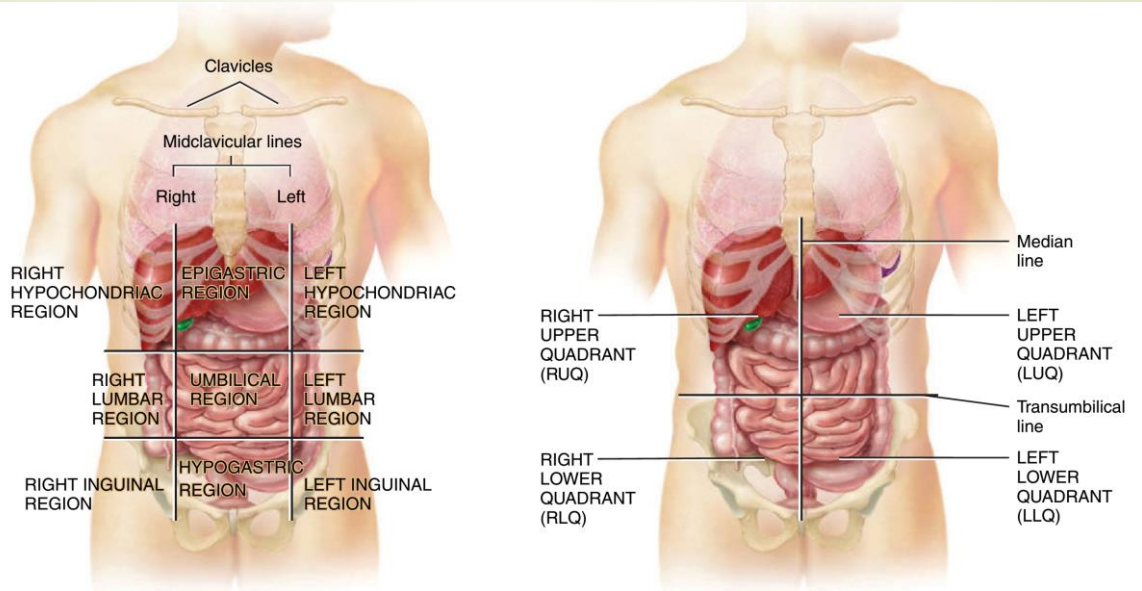
Cavities of the Human Body




CAVITY	COMMENTS
Cranial cavity	Formed by cranial bones and contains brain.
Vertebral canal	Formed by vertebral column and contains spinal cord and the beginnings of spinal nerves.
Thoracic cavity*	Chest cavity; contains pleural and pericardial cavities and the mediastinum.
<i>Pleural cavity</i>	A potential space between the layers of the pleura that surrounds a lung.
<i>Pericardial cavity</i>	A potential space between the layers of the pericardium that surrounds the heart.
<i>Mediastinum</i>	Central portion of thoracic cavity between the lungs; extends from sternum to vertebral column and from first rib to diaphragm; contains heart, thymus, esophagus, trachea, and several large blood vessels.
Abdominopelvic cavity	Subdivided into abdominal and pelvic cavities.
<i>Abdominal cavity</i>	Contains stomach, spleen, liver, gallbladder, small intestine, and most of large intestine; the serous membrane of the abdominal cavity is the peritoneum.
<i>Pelvic cavity</i>	Contains urinary bladder, portions of large intestine, and internal organs of reproduction.

Inside the Human Coelom







Organ Systems, *continued*

Endothermy

- ▶ Like all mammals, humans are endotherms. Humans maintain a fairly constant internal temperature of about 37°C (98.6 °F).
- ▶ The human body uses a great deal of energy to maintain a constant body temperature.



QUESTIONS?



HAVE A
WONDERFUL
DAY

Thank you for being my students!