

**Ministry of higher education & scientific research
AL-Mustaqbal University College
medical physics department**



Anatomy

Lecture one

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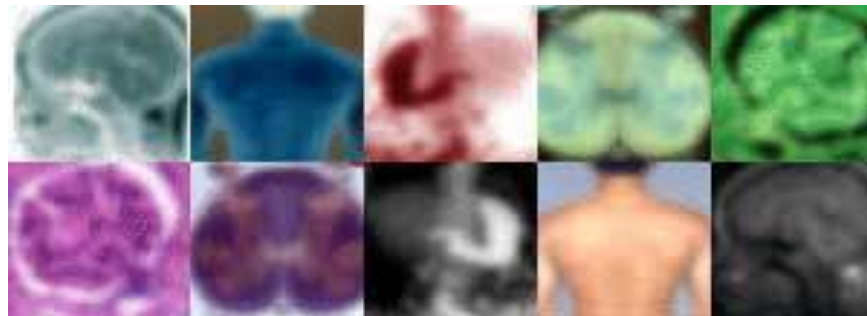
Anatomy

An Overview of Anatomy

- **Anatomy** - The study of the **structure** of the human body
- **Physiology** - The study of body **function**

Branches of Anatomy

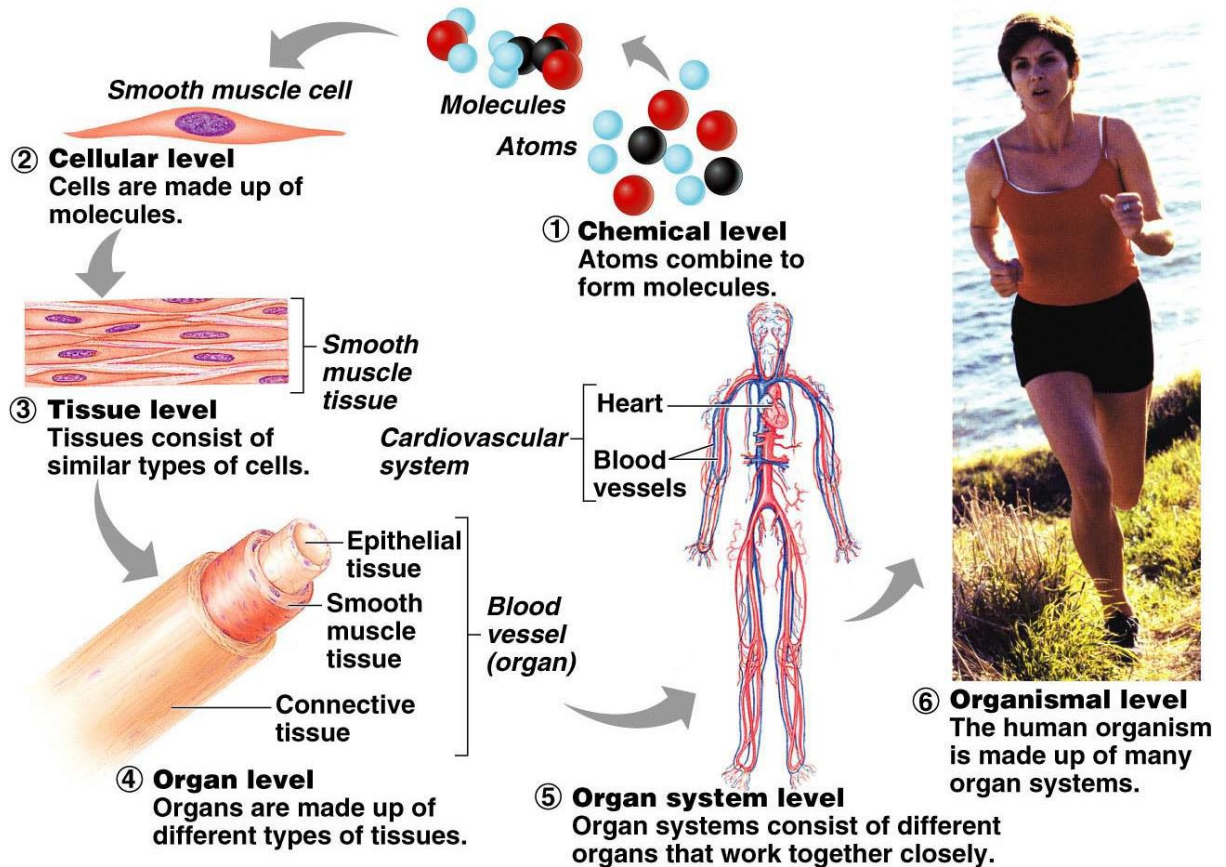
- Surface anatomy
- Gross anatomy
- Microscopic anatomy (histology) -tissues



Structural Organization

- Chemical level – atoms form molecules
- Cellular level – cells and their subunits
- Tissue level – a group of cells performing a common function
- Organ level – a discrete structure made up of more than one tissue
- Organ system – organs working together for a common purpose
- Organism – the result of all simpler levels working together

Structural Organization



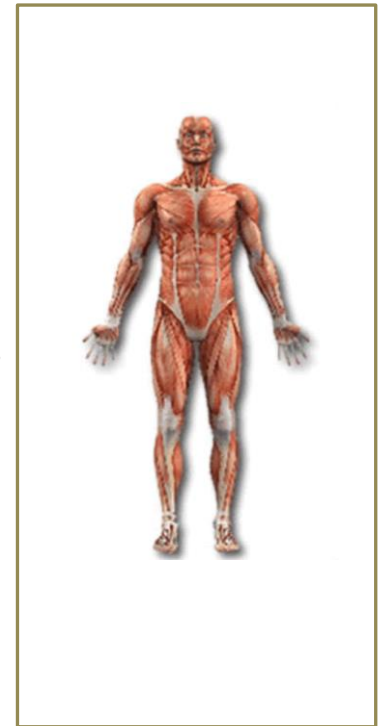
Systemic v. Regional Anatomy

- **Systemic** – study of anatomy by system
- **Regional** – study of anatomy by region



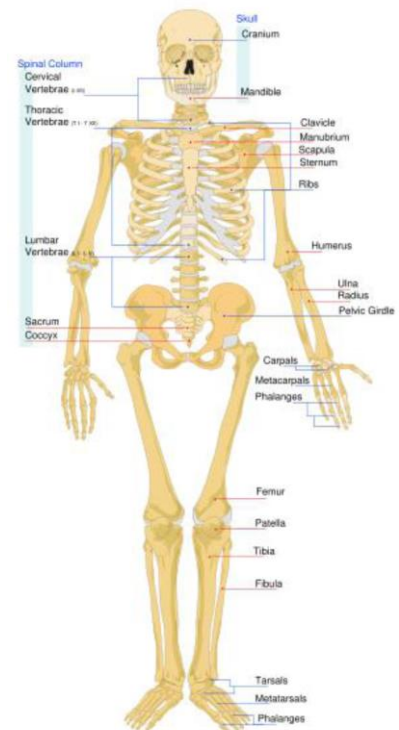
The Integumentary System

- Forms external body covering
- Protects deeper tissues from injury
- Synthesizes vitamin D
- Site of cutaneous receptors (pain, pressure, etc.) and sweat and oil glands



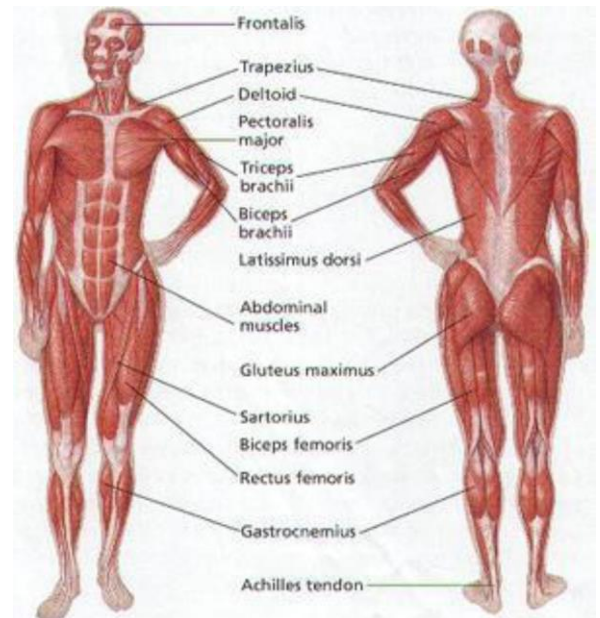
The Skeletal System

- Protects and supports body organs
- Provides a framework for muscles
- Blood cells formed within bones
- Stores minerals



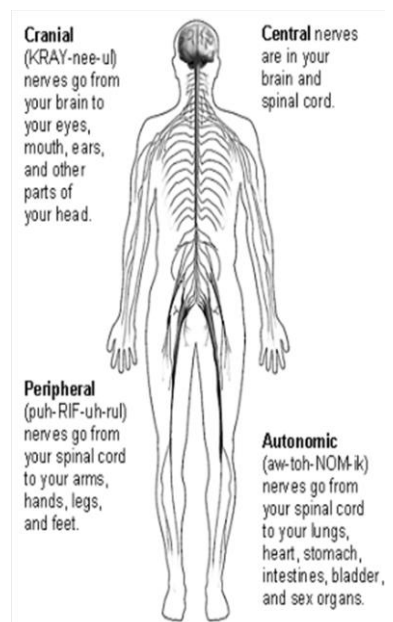
The Muscular System

- Allows manipulation of environment
- Locomotion
- Facial expression
- Maintains posture
- Produces heat



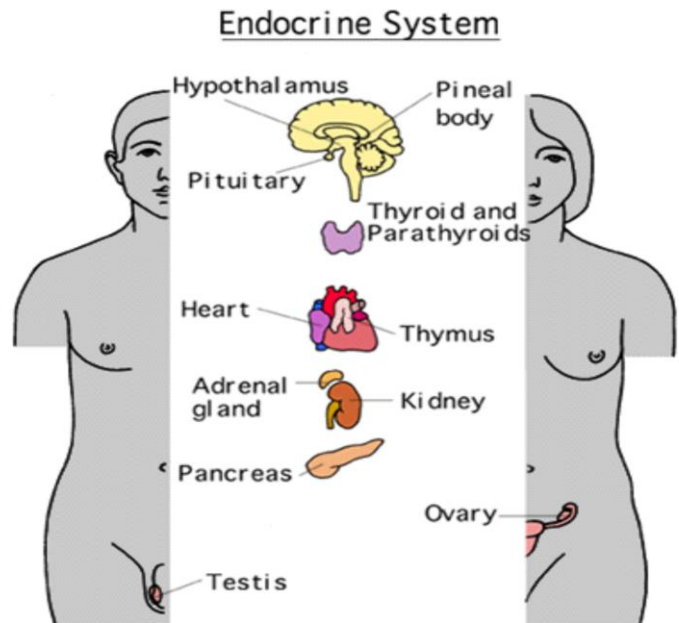
The Nervous System

- Fast-acting control system
- Responds to internal and external changes



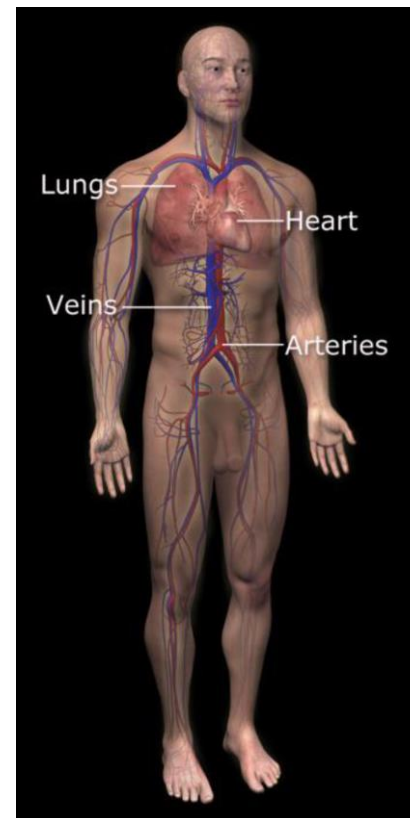
The Endocrine System

- Glands secrete hormones that regulate
- Growth
- Reproduction
- Nutrient use



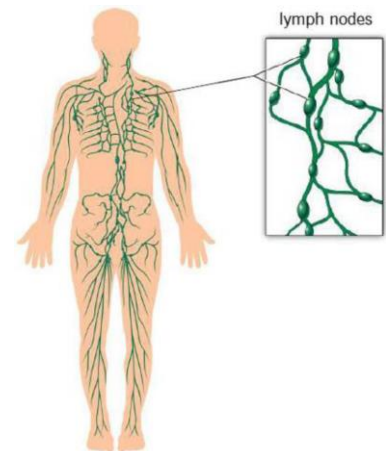
The Cardiovascular System

- Blood vessels transport blood
- Carries oxygen and carbon dioxide
- Also carries nutrients and wastes
- Heart pumps blood through blood vessels



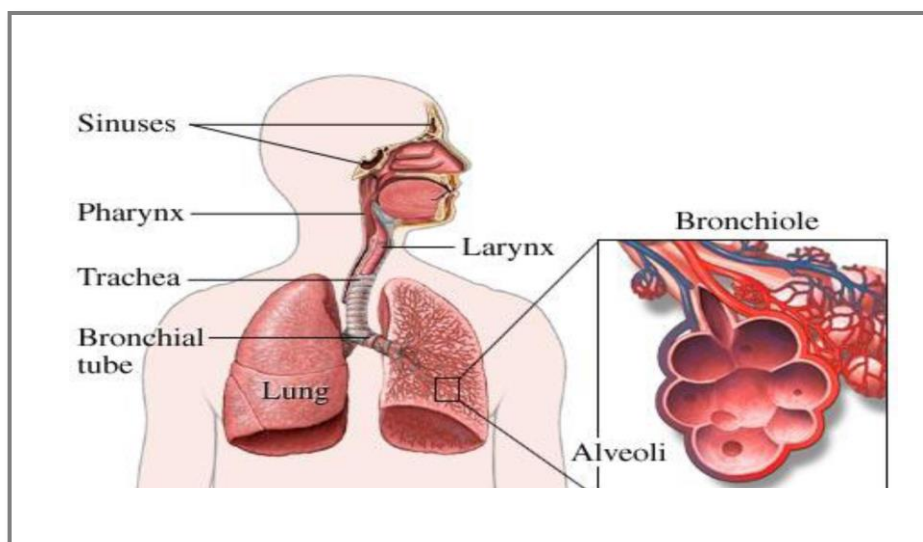
The Lymphatic System

- Picks up fluid leaked from blood vessels
- Disposes of debris in the lymphatic system
- Houses white blood cells (lymphocytes)
- Mounts attack against foreign substances in the body



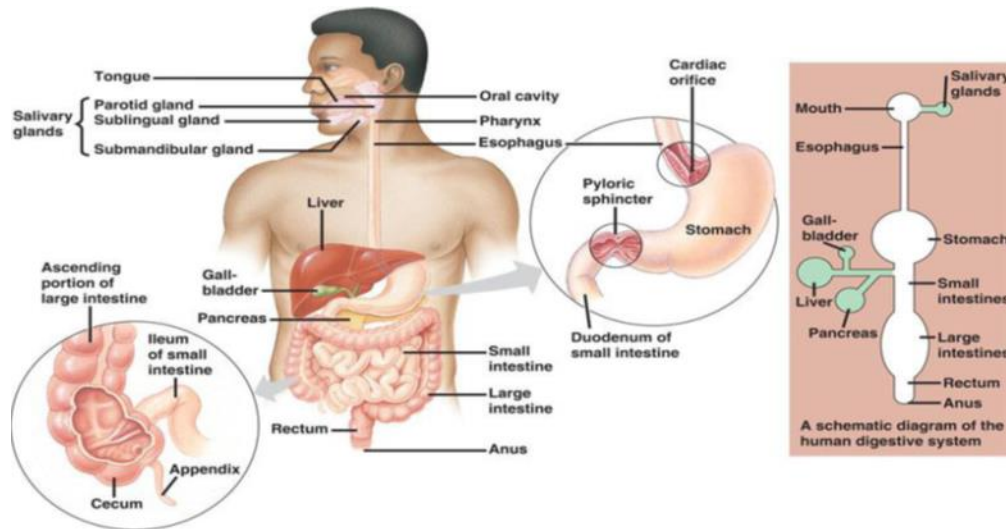
The Respiratory System

- Keeps blood supplied with oxygen
- Removes carbon dioxide
- Gas exchange occurs through walls of air sacs in the lungs



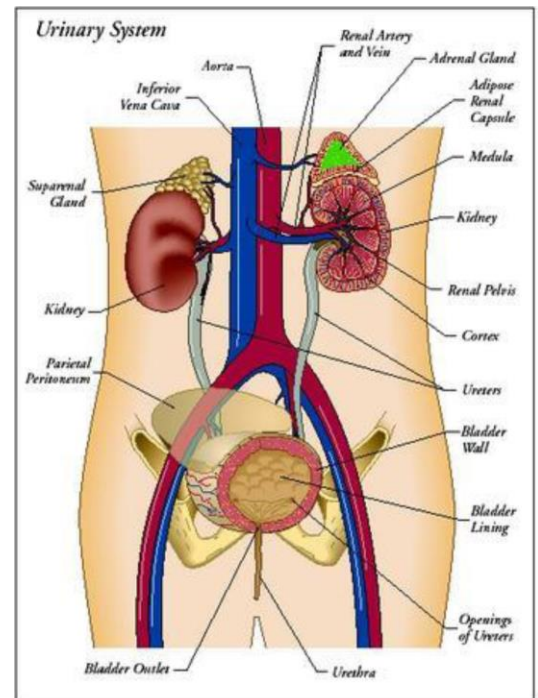
The Digestive System

- Breaks down food into absorbable units
- Indigestible foodstuffs eliminated as feces



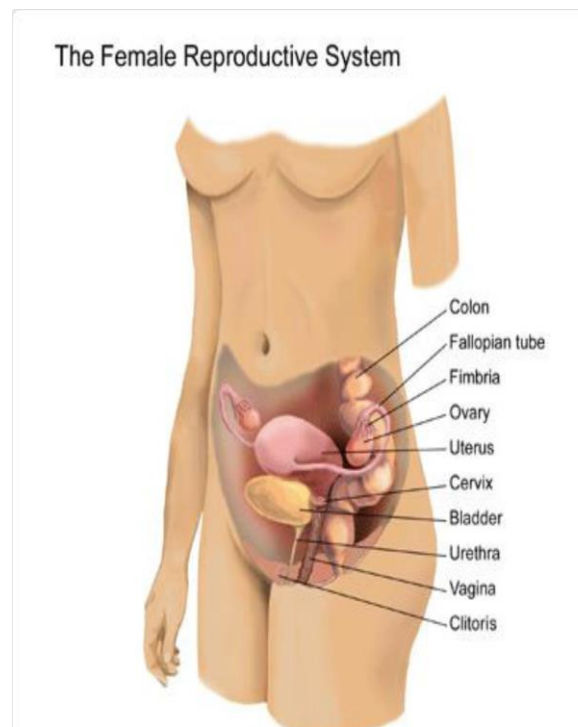
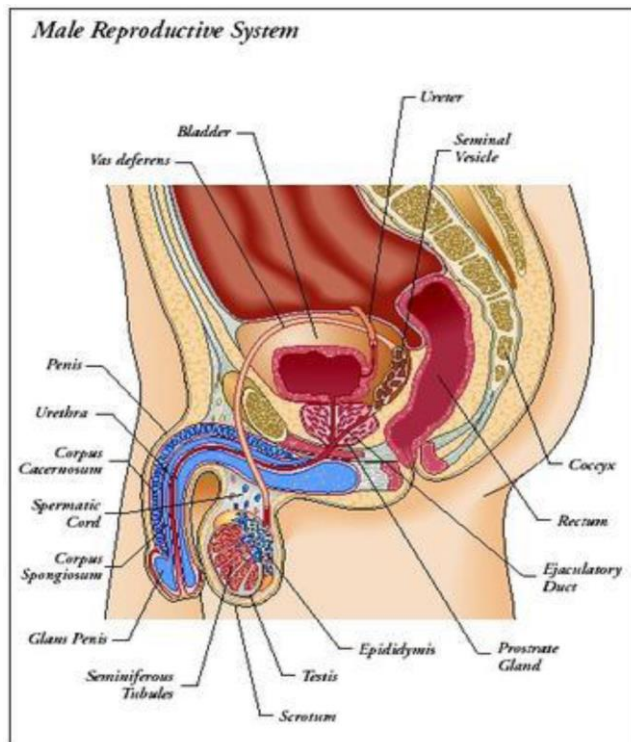
The Urinary System

- Eliminates nitrogenous wastes
- Regulates water, electrolyte, and acid-base balance



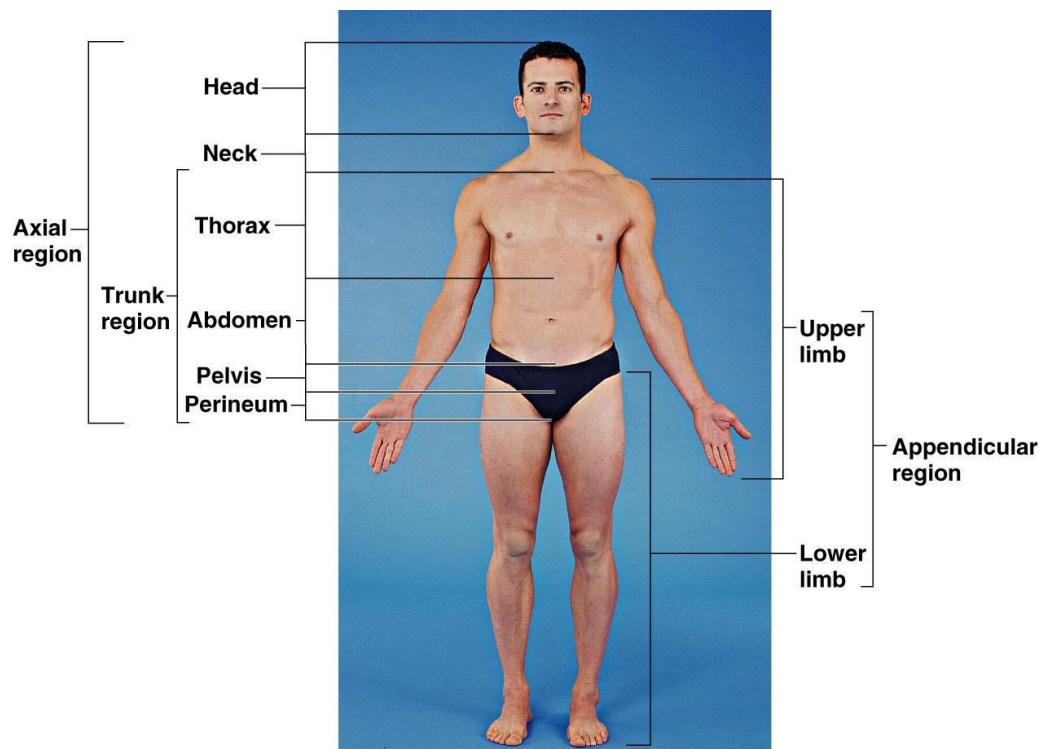
Reproductive System

- Overall function is to produce offspring
- Testes produce sperm and male sex hormones
- Ovaries produce eggs and female sex hormones
- Mammary glands produce milk



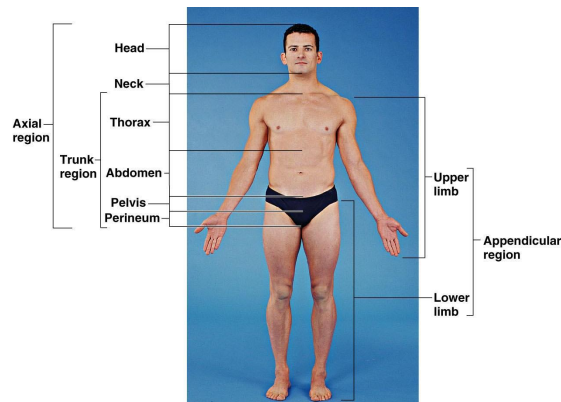
Gross Anatomy – An Introduction

- Anatomical position – a common visual reference point
- Person stands erect with feet together and eyes forward
- Palms face forward with the thumbs pointed away from the body



Gross Anatomy – An Introduction

- Regional terms – names of specific body areas
- Axial region – the main axis of the body
- Appendicular region – the limbs
- Directional terminology
- Refers to the body in anatomical position
- Standardized terms of directions are paired terms



Orientation and Directional Terms

TABLE

1.1 Orientation and Directional Terms

Term	Definition		Example
Superior (cranial)	Toward the head end or upper part of a structure or the body; above		The head is superior to the abdomen.
Inferior (caudal)	Away from the head end or toward the lower part of a structure or the body; below		The navel is inferior to the chin.
Anterior (ventral)*	Toward or at the front of the body; in front of		The breastbone is anterior to the spine.
Posterior (dorsal)*	Toward or at the back of the body; behind		The heart is posterior to the breastbone.


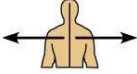
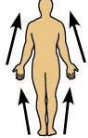
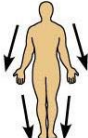
*Whereas the terms *ventral* and *anterior* are synonymous in humans, this is not the case in four-legged animals. *Ventral* specifically refers to the "belly" of a vertebrate animal and thus is the inferior surface of four-legged animals. Likewise,

although the dorsal and posterior surfaces are the same in humans, the term *dorsal* specifically refers to an animal's back. Thus, the dorsal surface of four-legged animals is their superior surface.

Orientation and Directional Terms

TABLE





1.1 Orientation and Directional Terms

Term	Definition		Example
Medial	Toward or at the midline of the body; on the inner side of		The heart is medial to the arm.
Lateral	Away from the midline of the body; on the outer side of		The arms are lateral to the chest.
Proximal	Closer to the origin of the body part or the point of attachment of a limb to the body trunk		The elbow is proximal to the wrist.
Distal	Farther from the origin of a body part or the point of attachment of a limb to the body trunk		The knee is distal to the thigh.

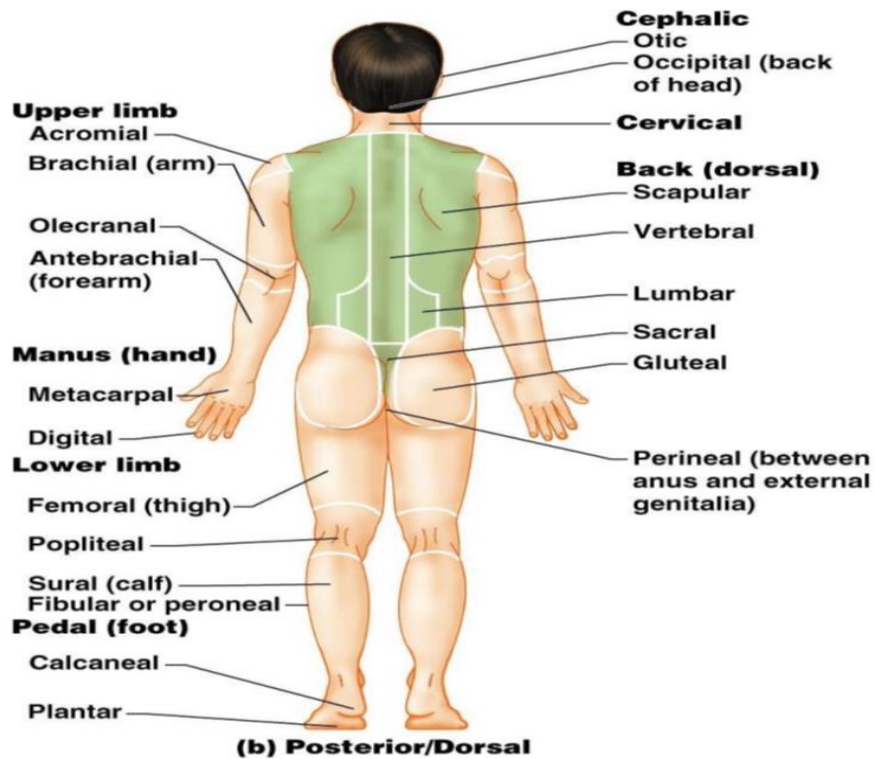
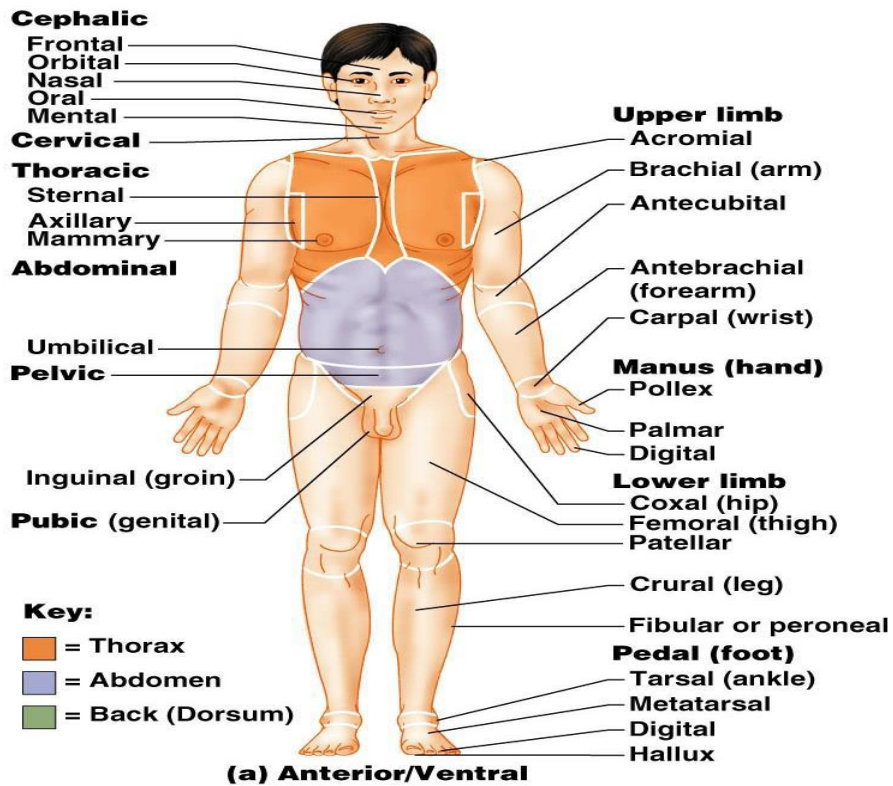
Orientation and Directional Terms

TABLE

1.1 Orientation and Directional Terms

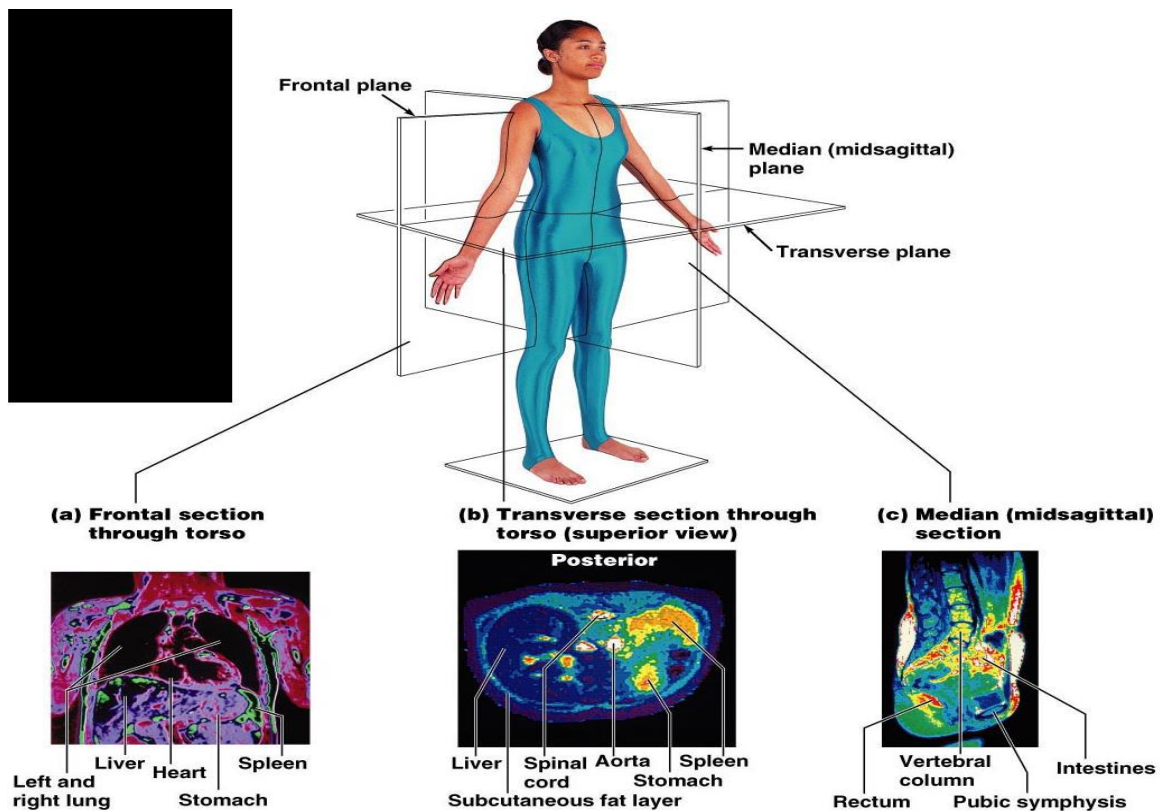
Term	Definition		Example
Superficial (external)	Toward or at the body surface		The skin is superficial to the skeletal muscles.
Deep (internal)	Away from the body surface; more internal		The lungs are deep to the skin.
Ipsilateral	On the same side		The right hand and right foot are ipsilateral.
Contralateral	On opposite sides		The right hand and left foot are contralateral.

Regional Terms

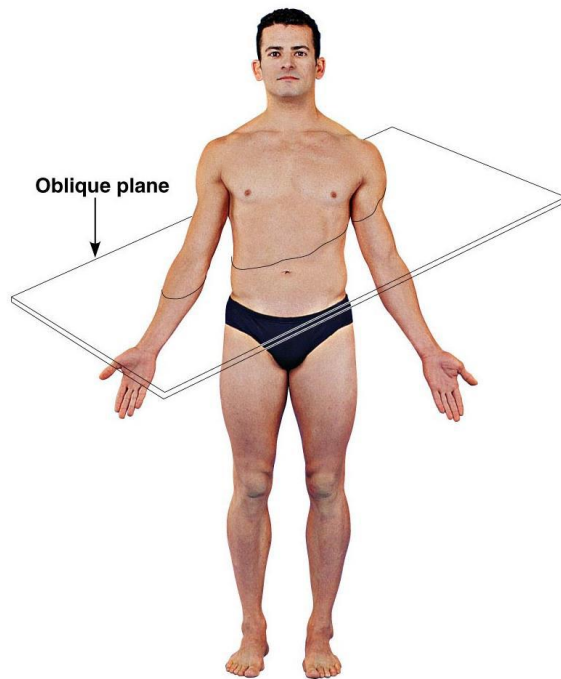


Body Planes and Sections

1. Coronal (frontal) plane - Lies vertically and divides body into anterior and posterior parts
2. Median (midsagittal) plane - Specific sagittal plane that lies vertically in the midline
3. Transverse plane - runs horizontally and divides body into superior and inferior parts

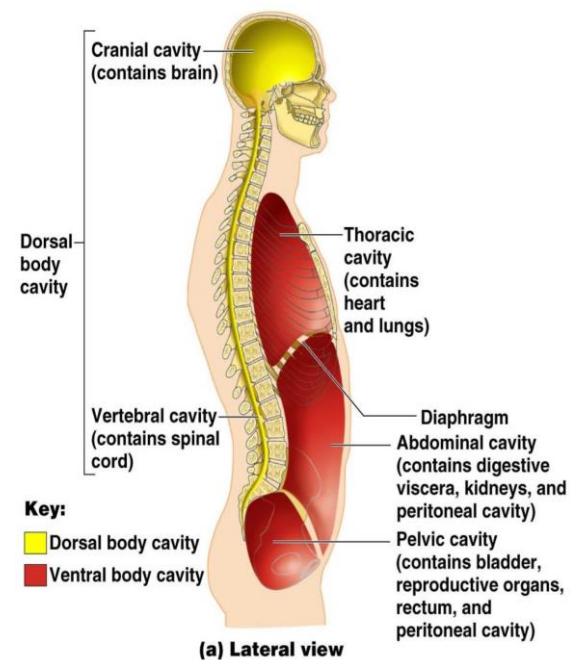


4. Oblique section through the trunk



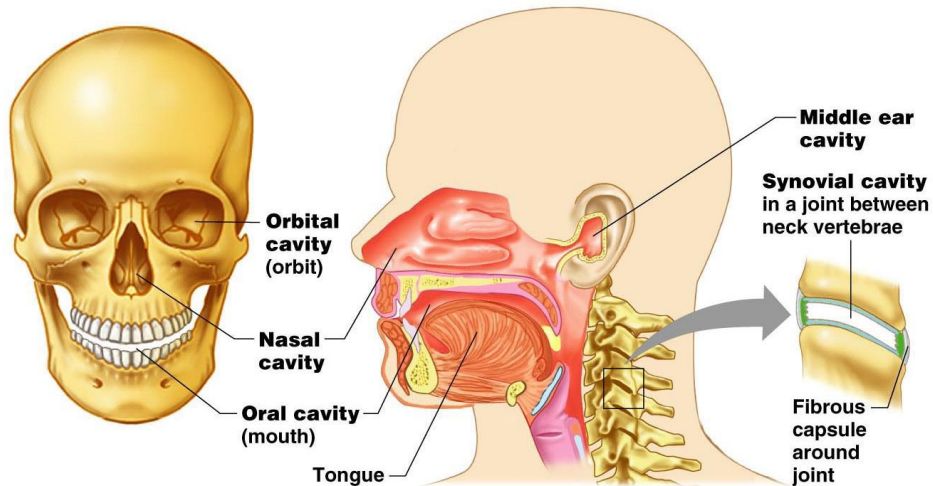
Body Cavities and Membranes

- Dorsal body cavity
- Cavity subdivided into the cranial cavity and the vertebral cavity.
- Cranial cavity houses the brain.
- Vertebral cavity runs through the vertebral column and encloses the spinal cord



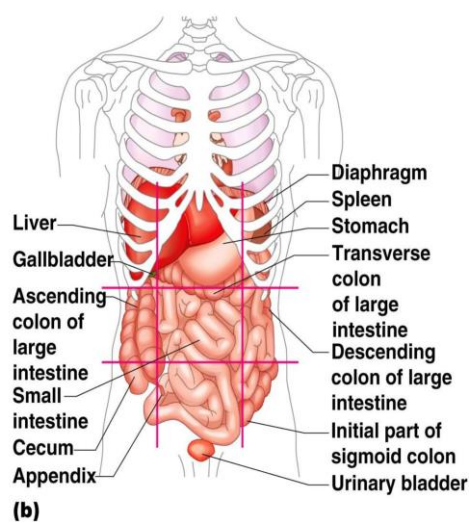
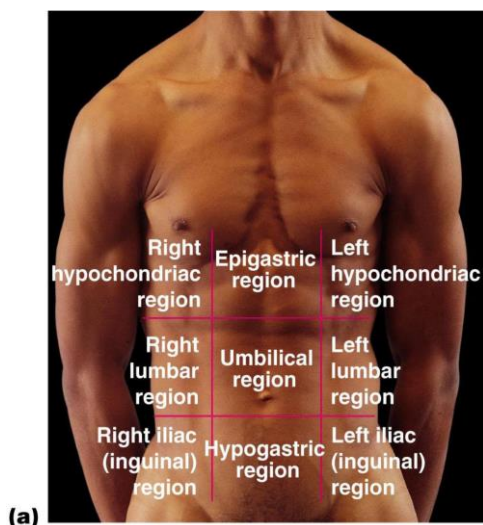
Other Body Cavities

- Oral cavity
- Nasal cavity
- Orbital cavities
- Middle ear cavities
- Synovial cavities



Abdominal Regions and Quadrants

- Abdominal regions divide the abdomen into nine regions



Abdominal Quadrants

- Abdominal quadrants divide the abdomen into four quadrants
- Right upper and left upper quadrants
- Right lower and left lower quadrants

