



جامعة المستقبل
AL MUSTAQBAL UNIVERSITY
كلية العلوم

قسم الأنظمة الطبية الذكية

General Anatomy and Physiology

(L1) Introduction to Anatomy

Dr. Abdulhusein Mizhir Almaamuri

- **Human Anatomy:**

It is the branch of science that studies the physical **structure** of human body.

- **Physiology:**

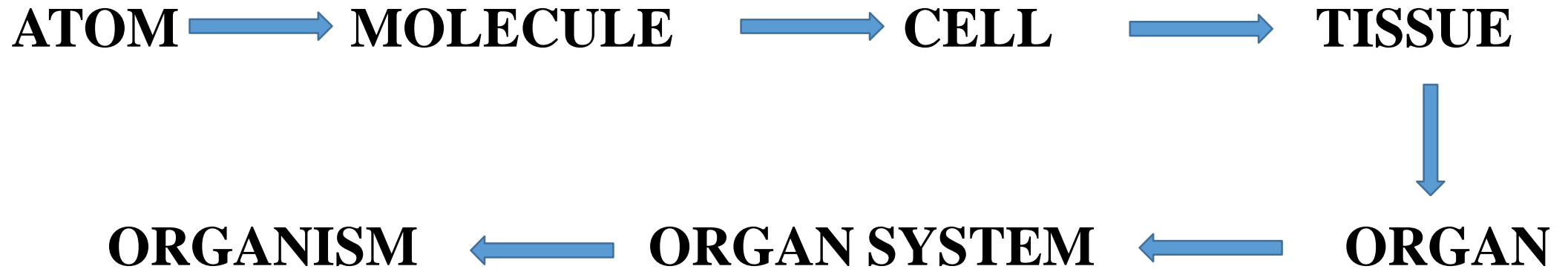
It is the branch of biology that deals with the internal working of living things, including **functions** such as metabolism, respiration and reproduction.

Anatomy is quite distinct from [physiology](#) and [biochemistry](#), which deal respectively with the functions of those parts and the chemical processes involved.

The human body is a complex and intricate piece of engineering in which every structure plays a precise role. There are approximately 200 [bones](#), 650 muscles, 79 [organs](#), and enough [blood vessels](#) to circle the Earth twice!

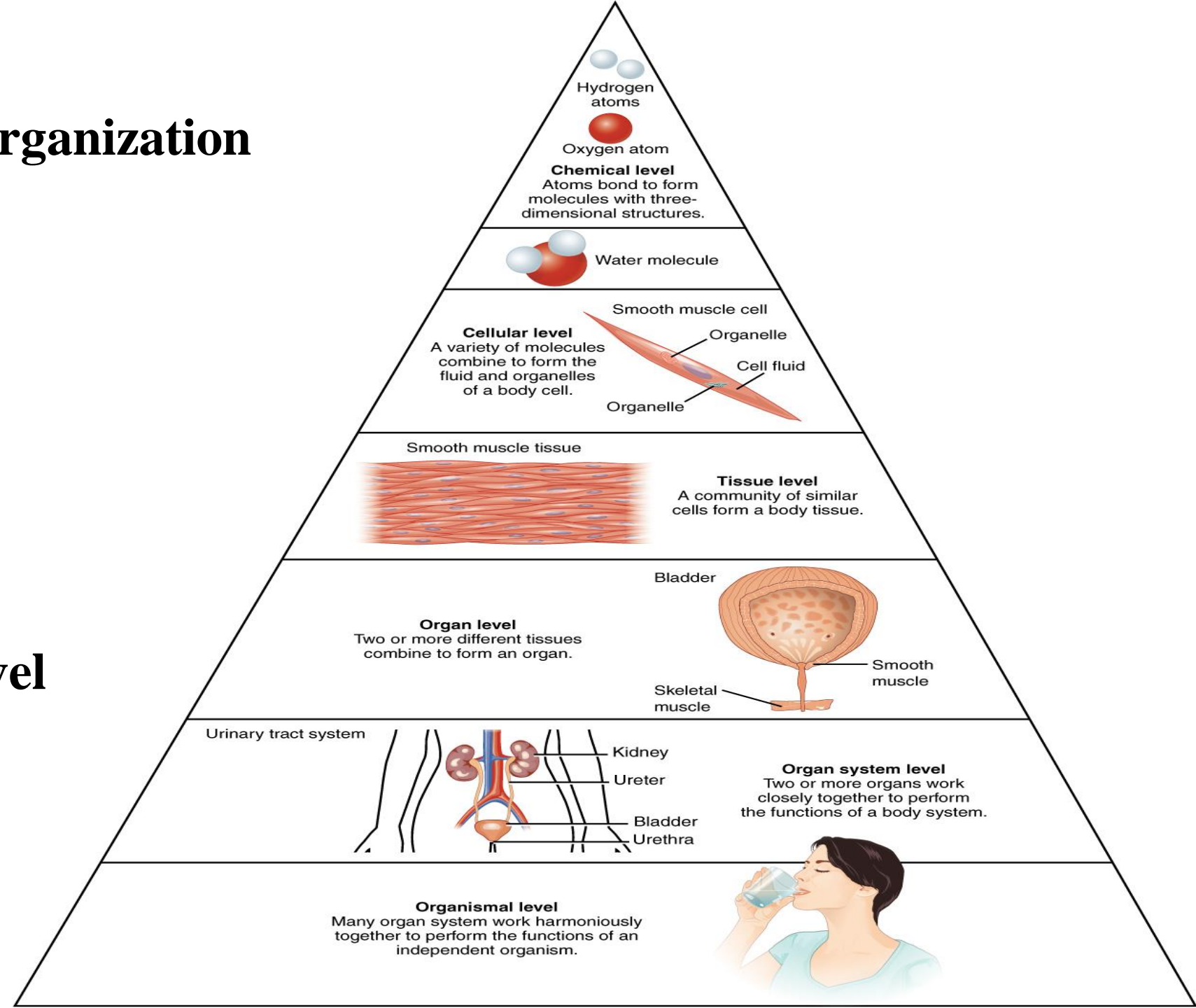
LEVELS OF ORGANIZATION:

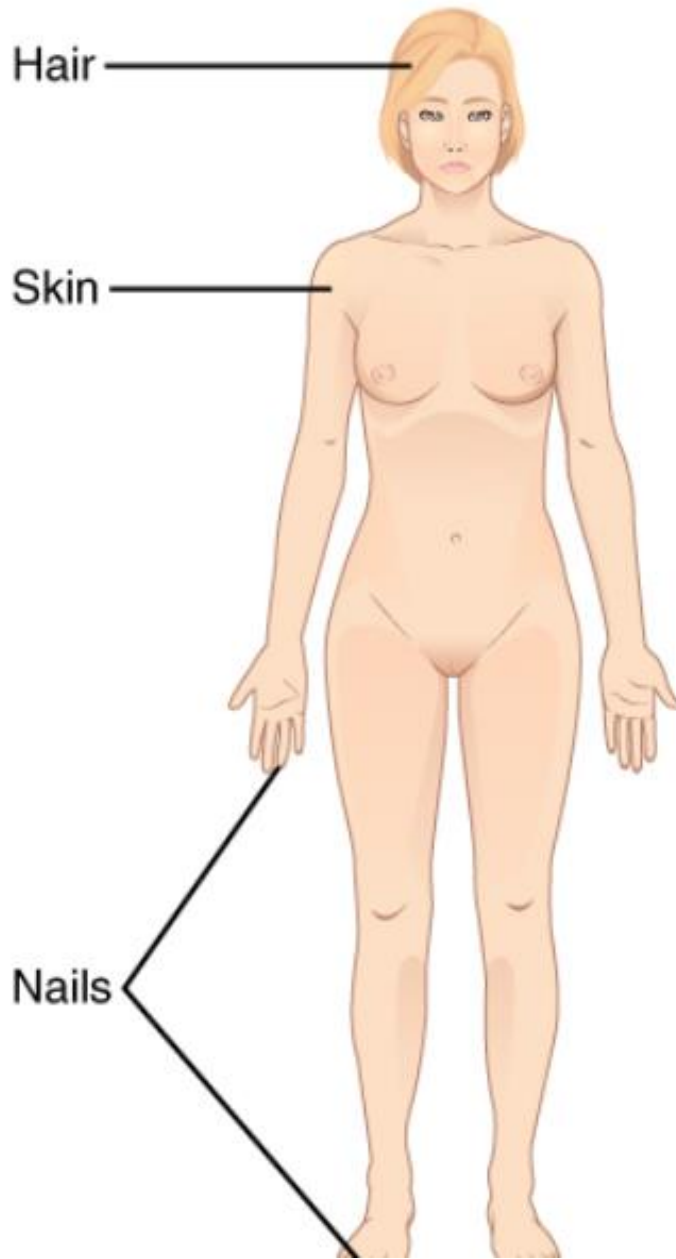
All multicellular organisms are organized at different levels, starting with the cell and ending with the entire organism.



- There are six levels of organization (from smallest to largest):

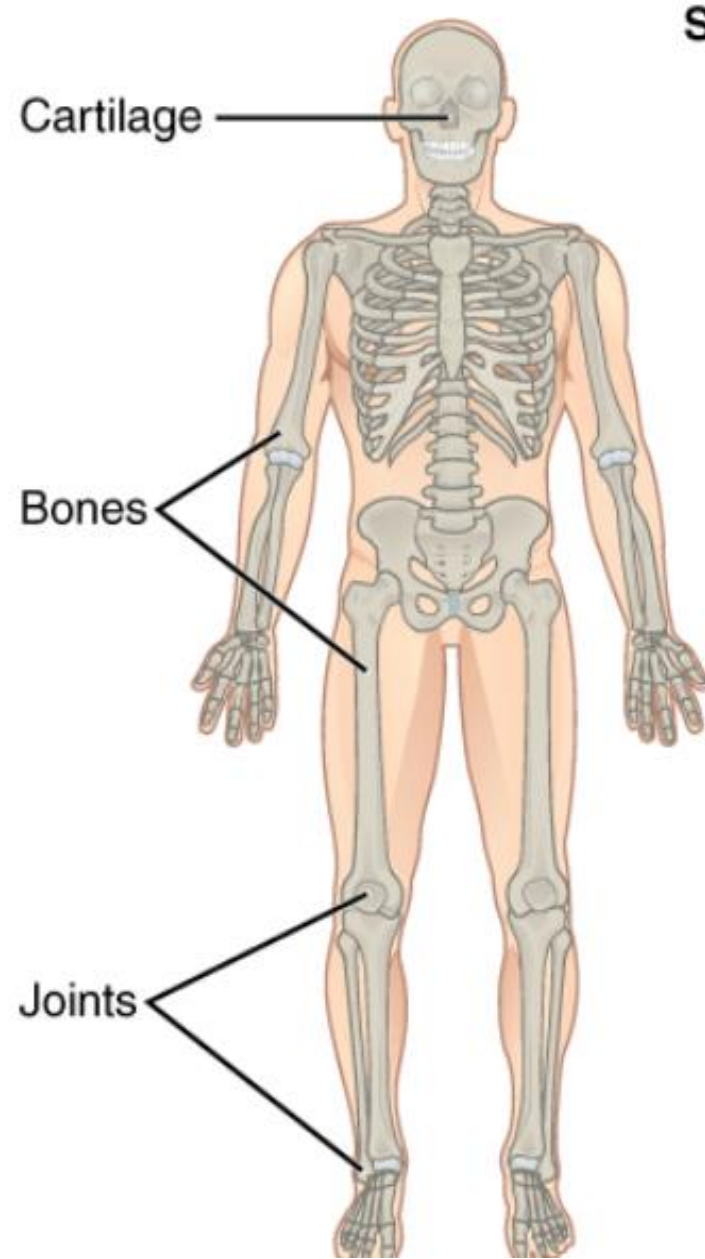
1. The chemical level
2. The cellular level
3. The tissue level
4. The organ level
5. The organ system level
6. The organism level





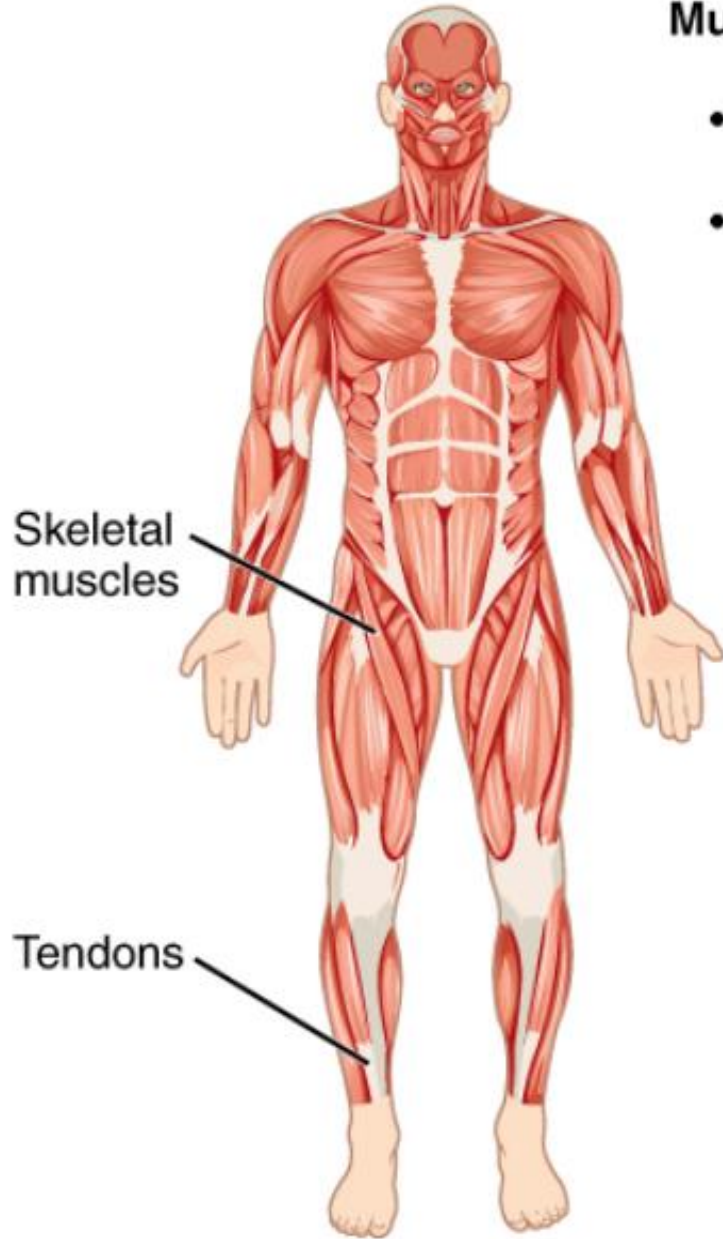
Integumentary System

- Encloses internal body structures
- Site of many sensory receptors



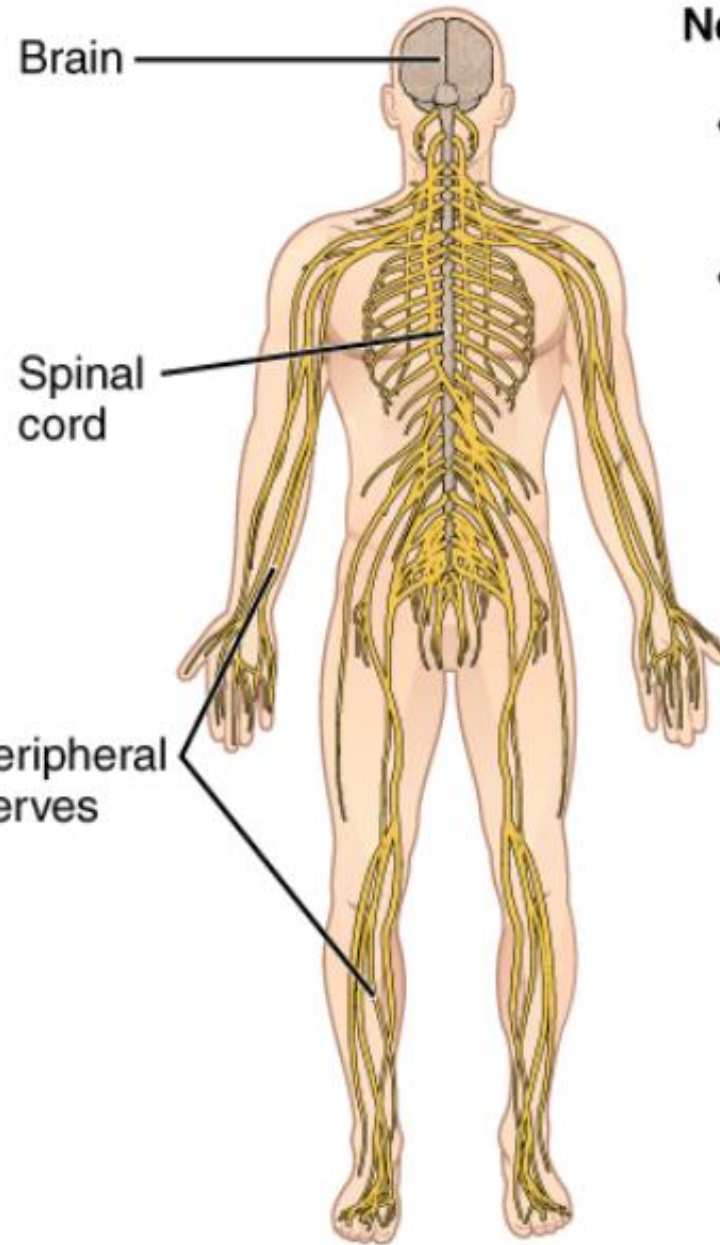
Skeletal System

- Supports the body
- Enables movement (with muscular system)



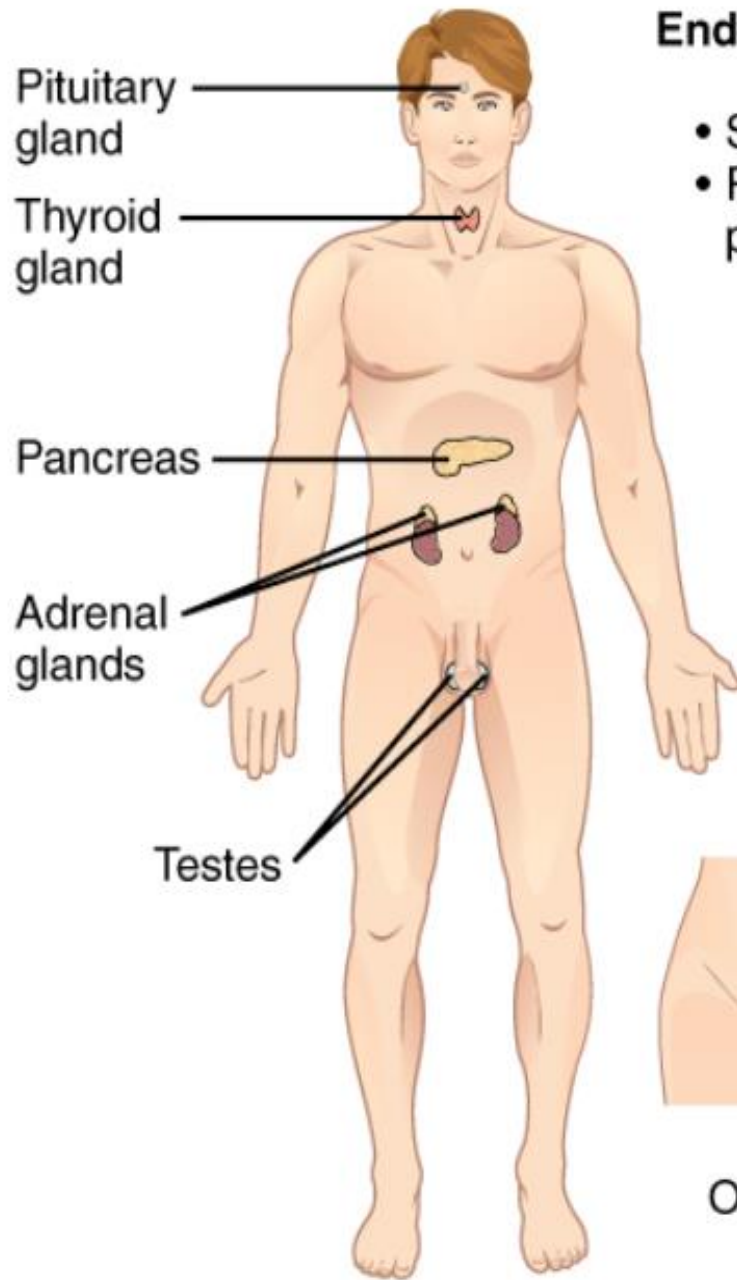
Muscular System

- Enables movement (with skeletal system)
- Helps maintain body temperature



Nervous System

- Detects and processes sensory information
- Activates bodily responses

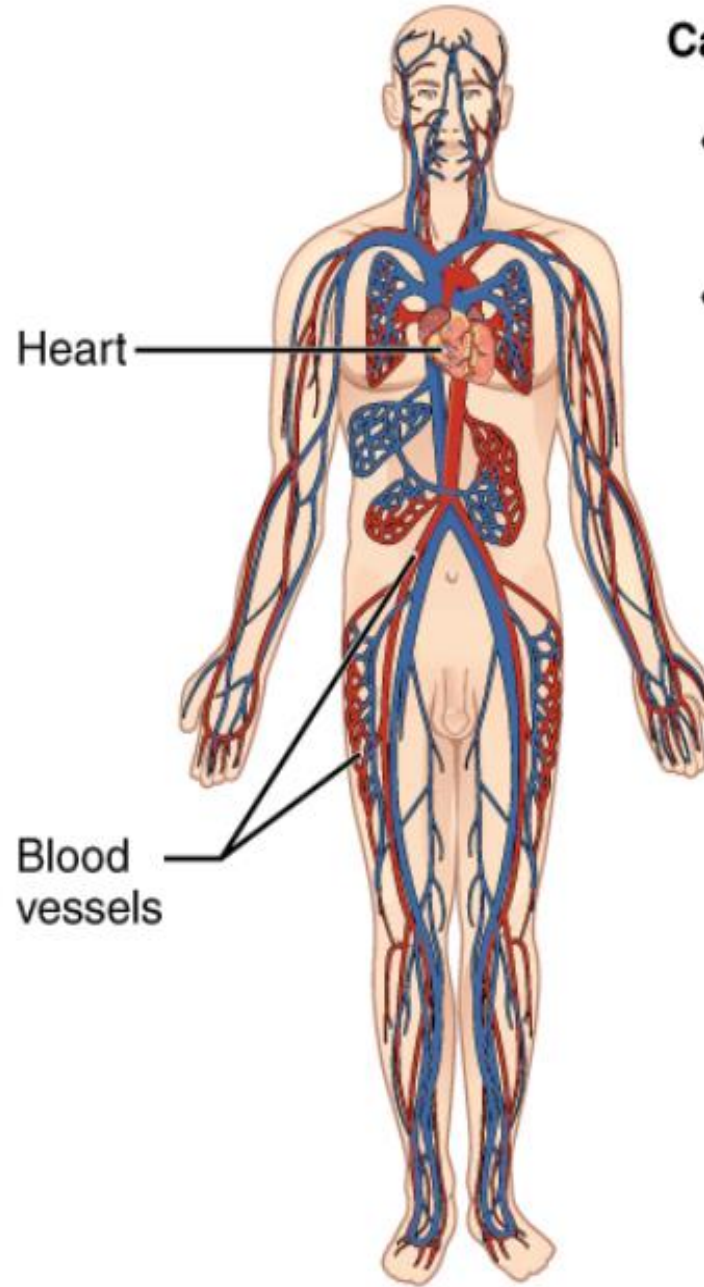


Endocrine System

- Secretes hormones
- Regulates bodily processes

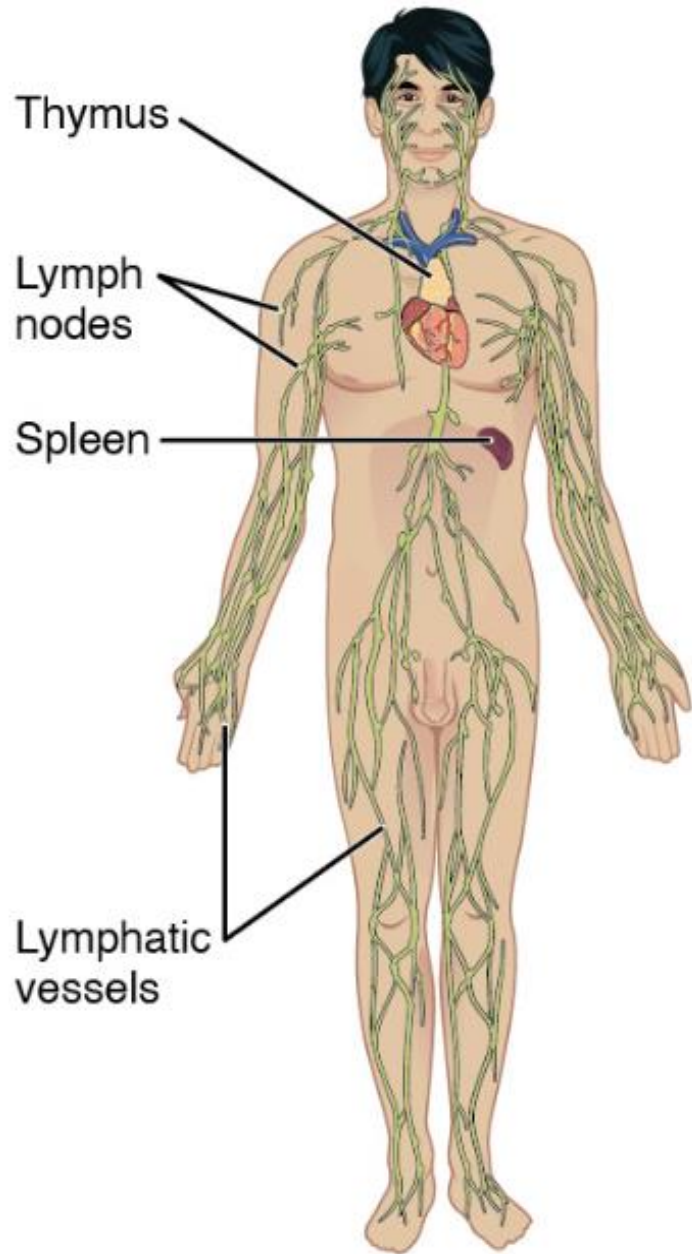


Ovaries



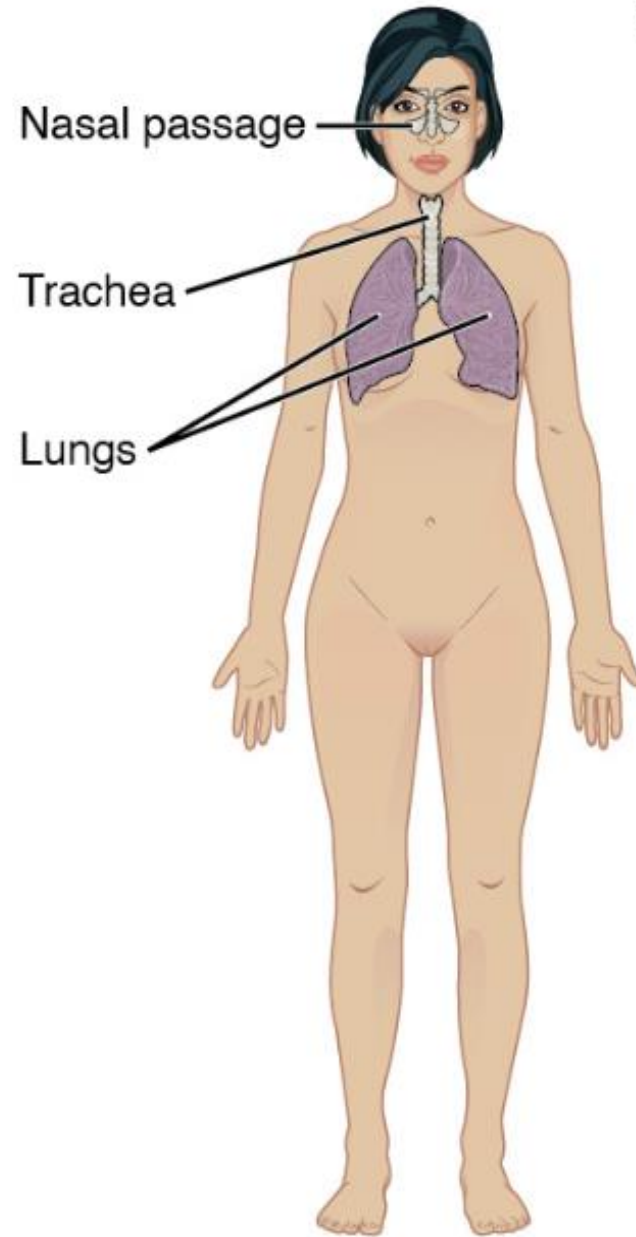
Cardiovascular System

- Delivers oxygen and nutrients to tissues
- Equalizes temperature in the body



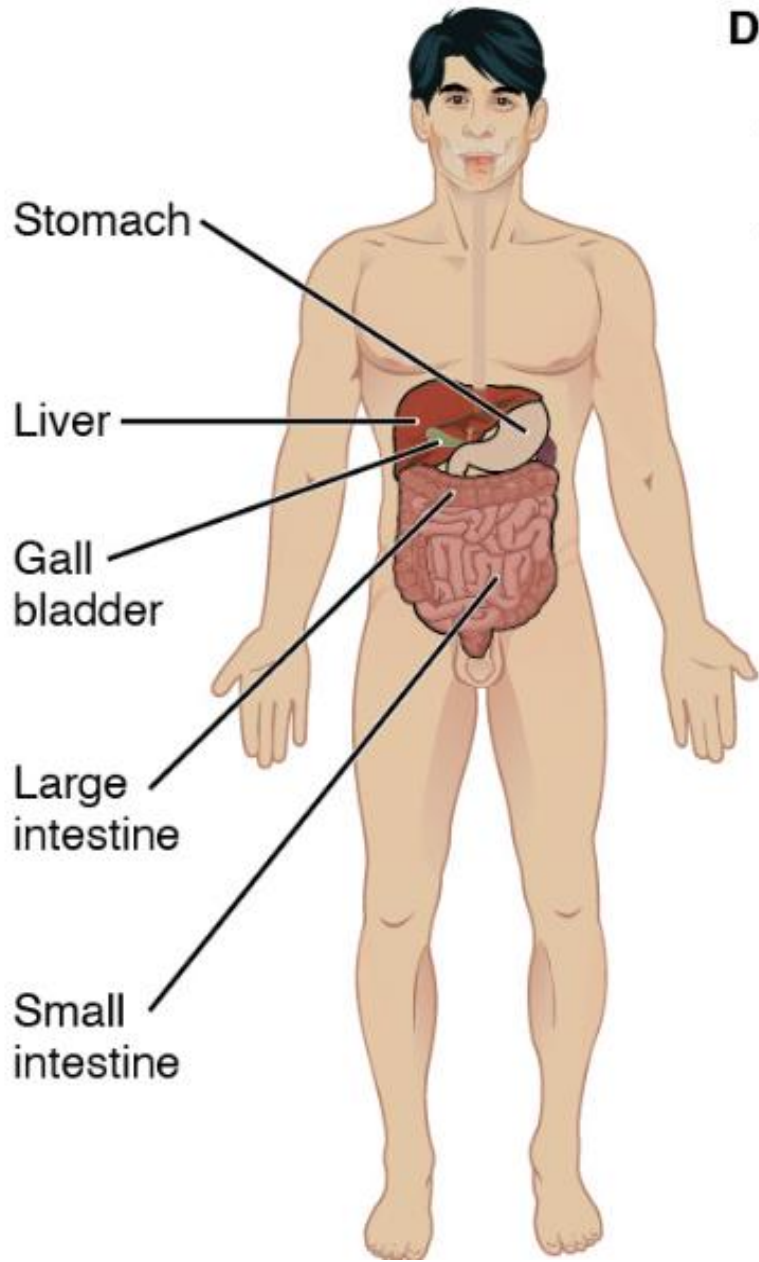
Lymphatic System

- Returns fluid to blood
- Defends against pathogens



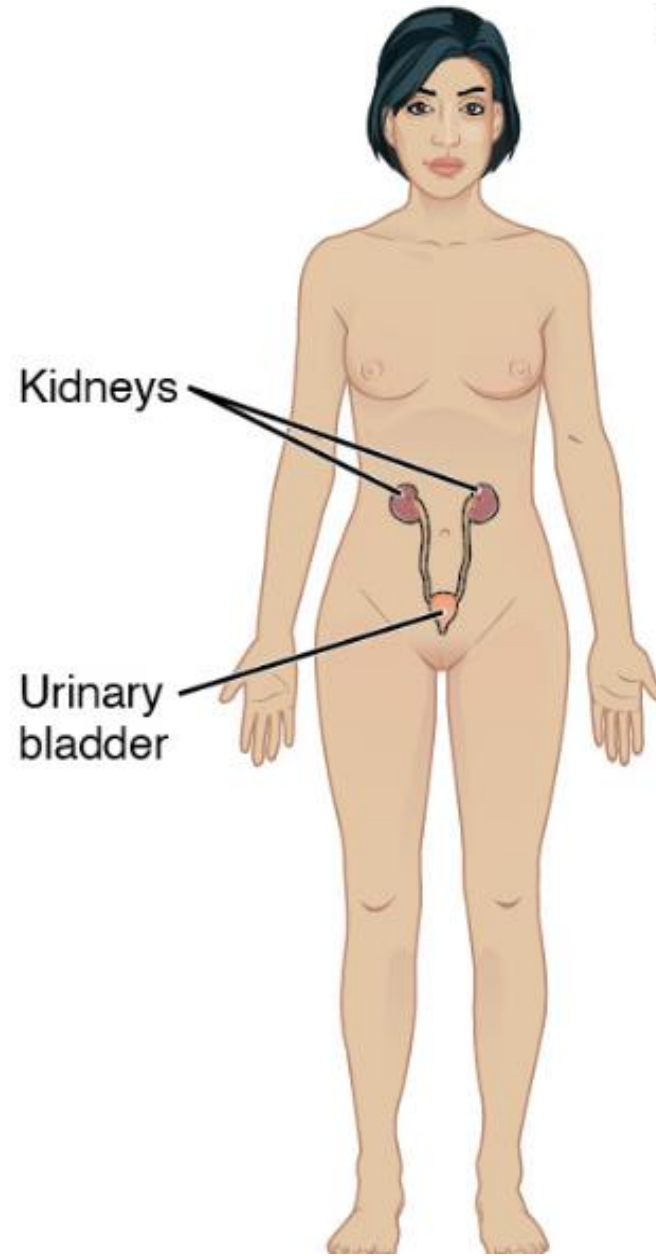
Respiratory System

- Removes carbon dioxide from the body
- Delivers oxygen to blood



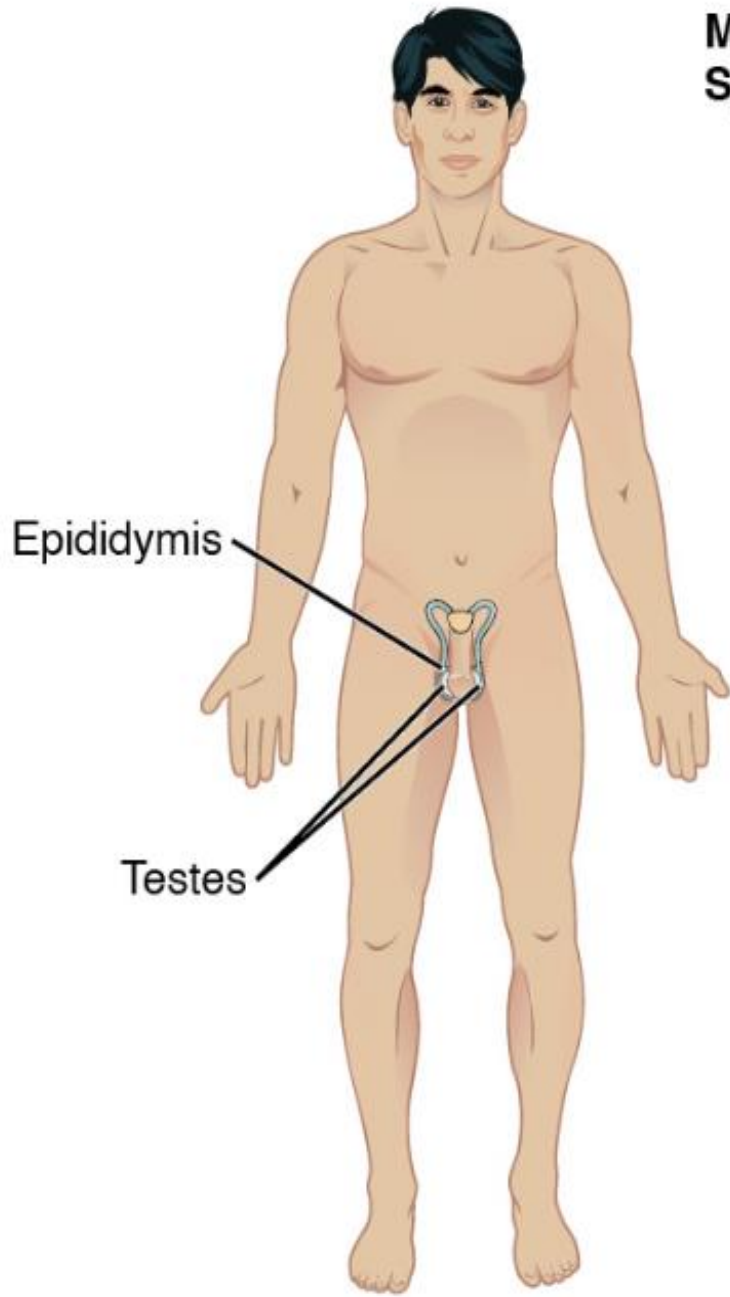
Digestive System

- Processes food for use by the body
- Removes wastes from undigested food



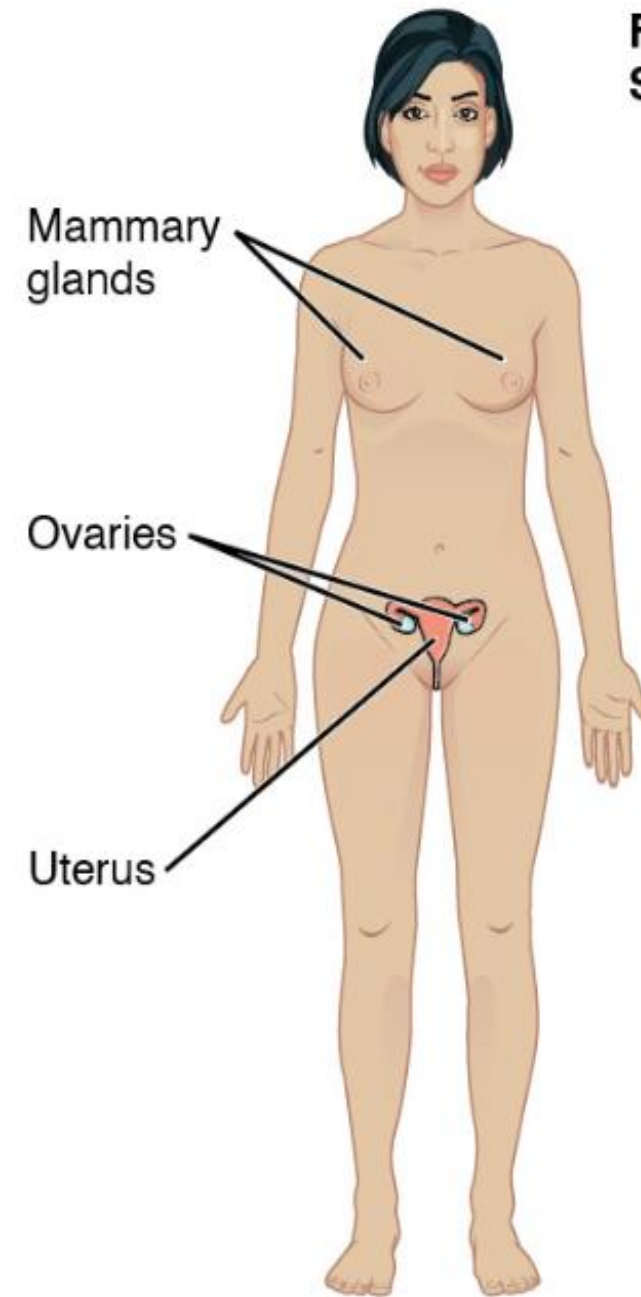
Urinary System

- Controls water balance in the body
- Removes wastes from blood and excretes them



Male Reproductive System

- Produces sex hormones and gametes
- Delivers gametes to female



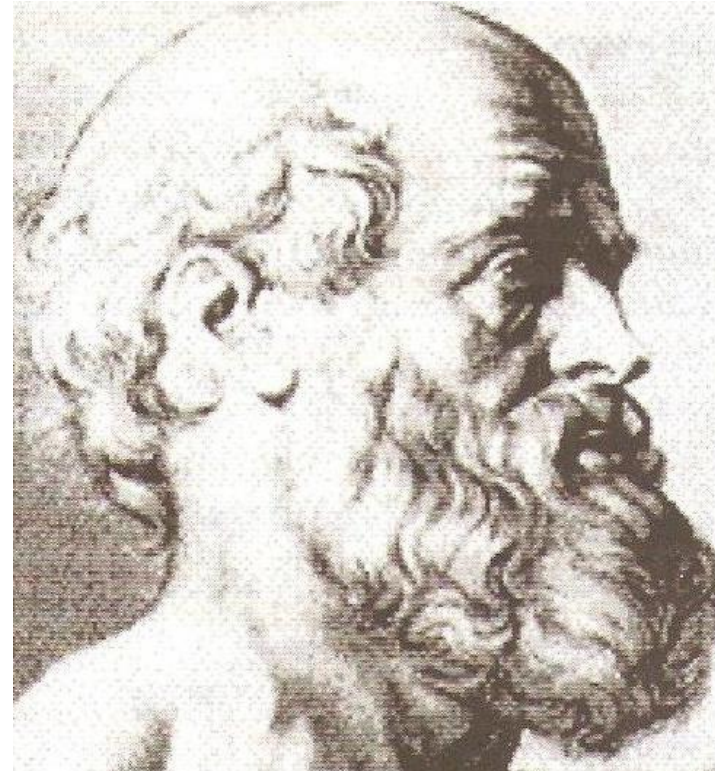
Female Reproductive System

- Produces sex hormones and gametes
- Supports embryo/fetus until birth
- Produces milk for infant

HISTORY OF ANATOMY

HIPPOCRATES(460-377BC)

- Greek physician
- Father of Medicine
- His name is memorialized in the *Hippocratic oath*
- Humoral theory :
Four body humors –
 - blood
 - phlegum
 - yellow bile
 - black bile
- Attributed diseases to natural causes .



HISTORY OF ANATOMY

HEROPHILUS (about 325BC)

- **Father of Anatomy**
- Performed:
 - vivi-sections (dissections of living humans) and dissections of human cadavers
- regarded brain as seat of intelligence
- described cerebrum, cerebellum, fourth ventricle
- first to identify nerves as sensory or motor.



GROSS ANATOMY

- **REGIONAL ANATOMY**

- Head and neck
- Brain
- Thorax
- Abdomen
- Upper Limb
- Lower limb

- **SYSTEMIC ANATOMY**

- Integumentary system
- Skeletal system
- Muscular system
- Nervous system
- Cardiovascular system
- Lymphatic system
- Endocrine system
- Digestive system, Respiratory system, Urogenital system

Directional Terms

In describing the location or direction of a given point in the body, it is always assumed that the subject is in the **anatomical position**, that is, upright, with face front, arms at the sides with palms forward, and feet parallel, as shown in the small diagram.

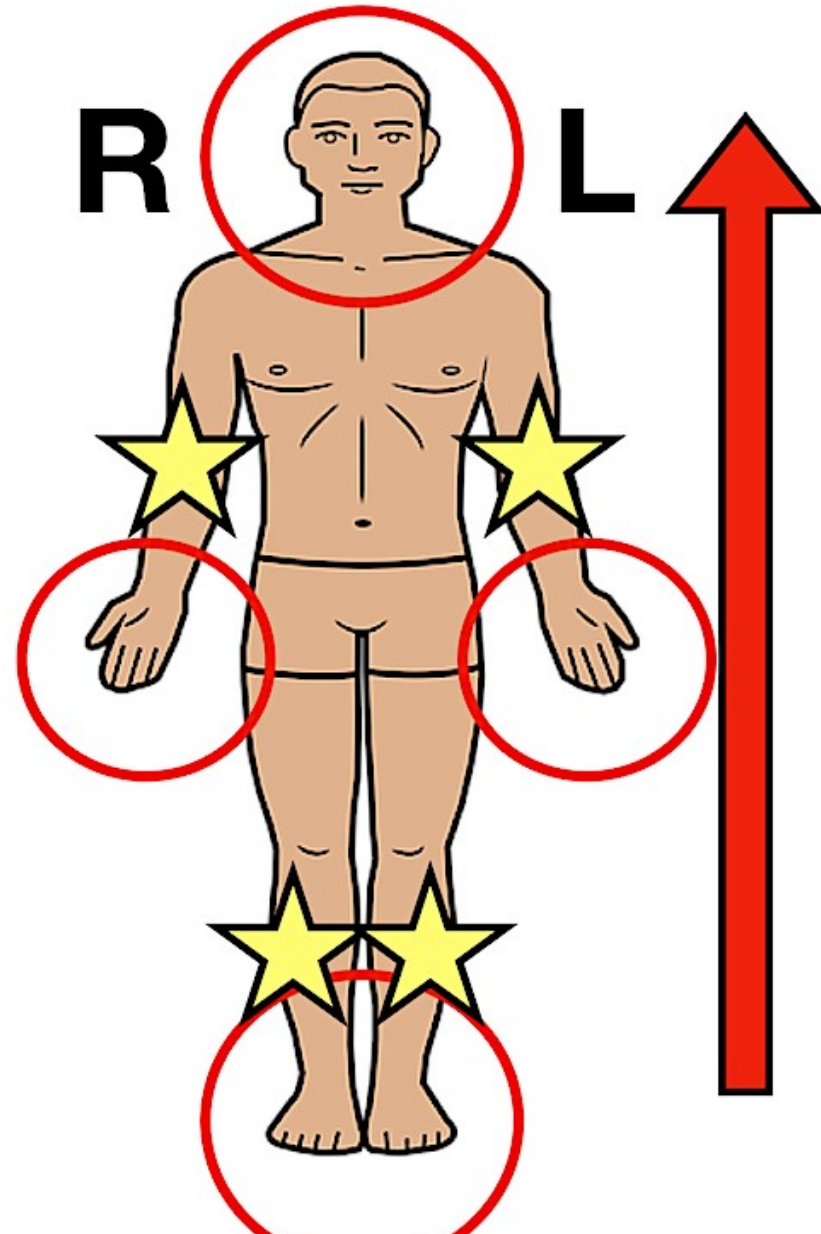
Planes of Section, that is, directions in which the body can be cut.

A frontal plane, also called a **coronal plane**, is made at right angles to the midline and divides the body into anterior and posterior parts.

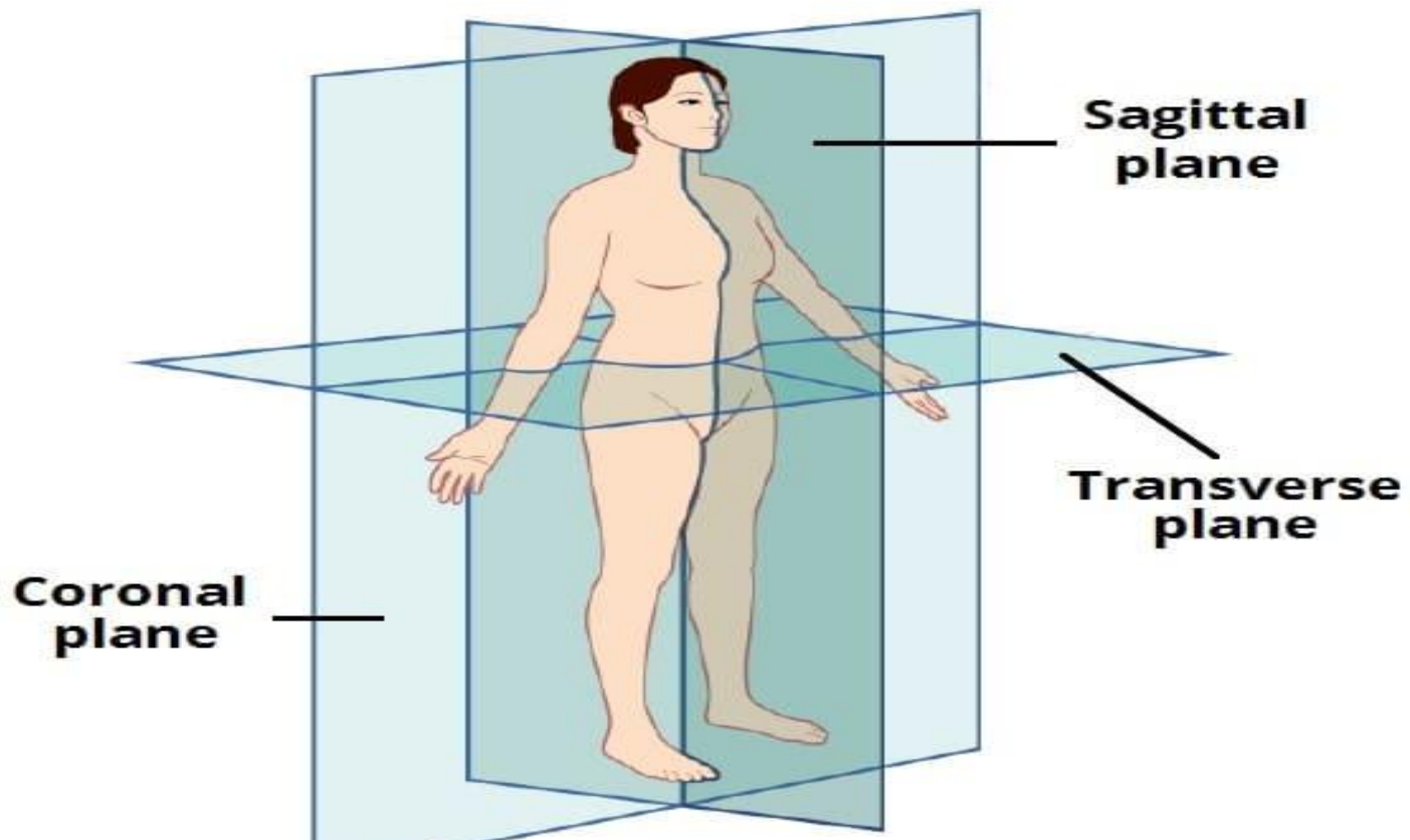
A sagittal (vertical) plane passes from front to back and divides the body into right and left portions. If the plane passes through the midline, it is a **medial plane**.

A transverse plane passes horizontally, dividing the body into superior and inferior parts.

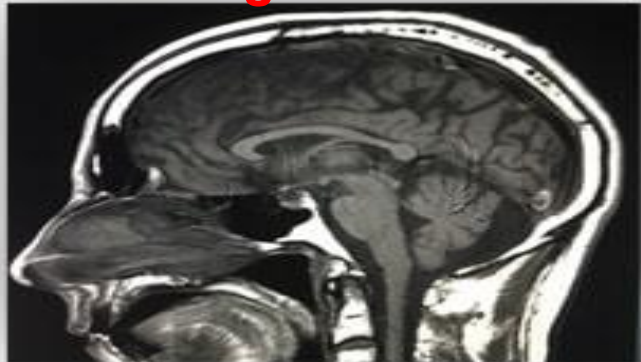
Anatomical Position



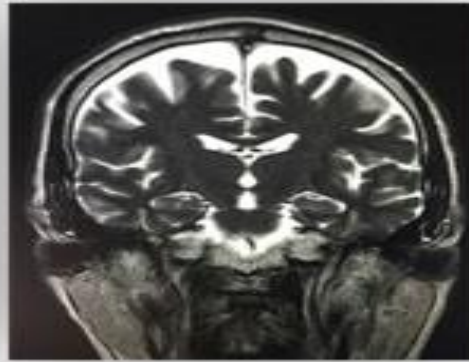
- Standing upright
- Head and eyes directed straight ahead
- Upper limbs at the sides
- Upper limbs slightly away from trunk
- Palms facing forward
- Thumbs pointing away from body
- Lower limbs parallel
- Feet flat on the ground and facing forward



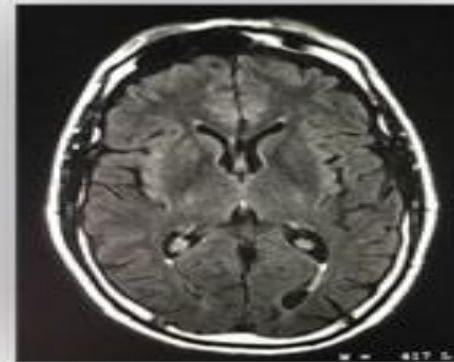
Sagittal



coronal



transverse.



The anatomical terms of location

Medial and Lateral

Imagine a line in the sagittal plane, splitting the right and left halves evenly.

This is the midline. **Medial** means towards the midline, **lateral** means away from the midline.

Examples:

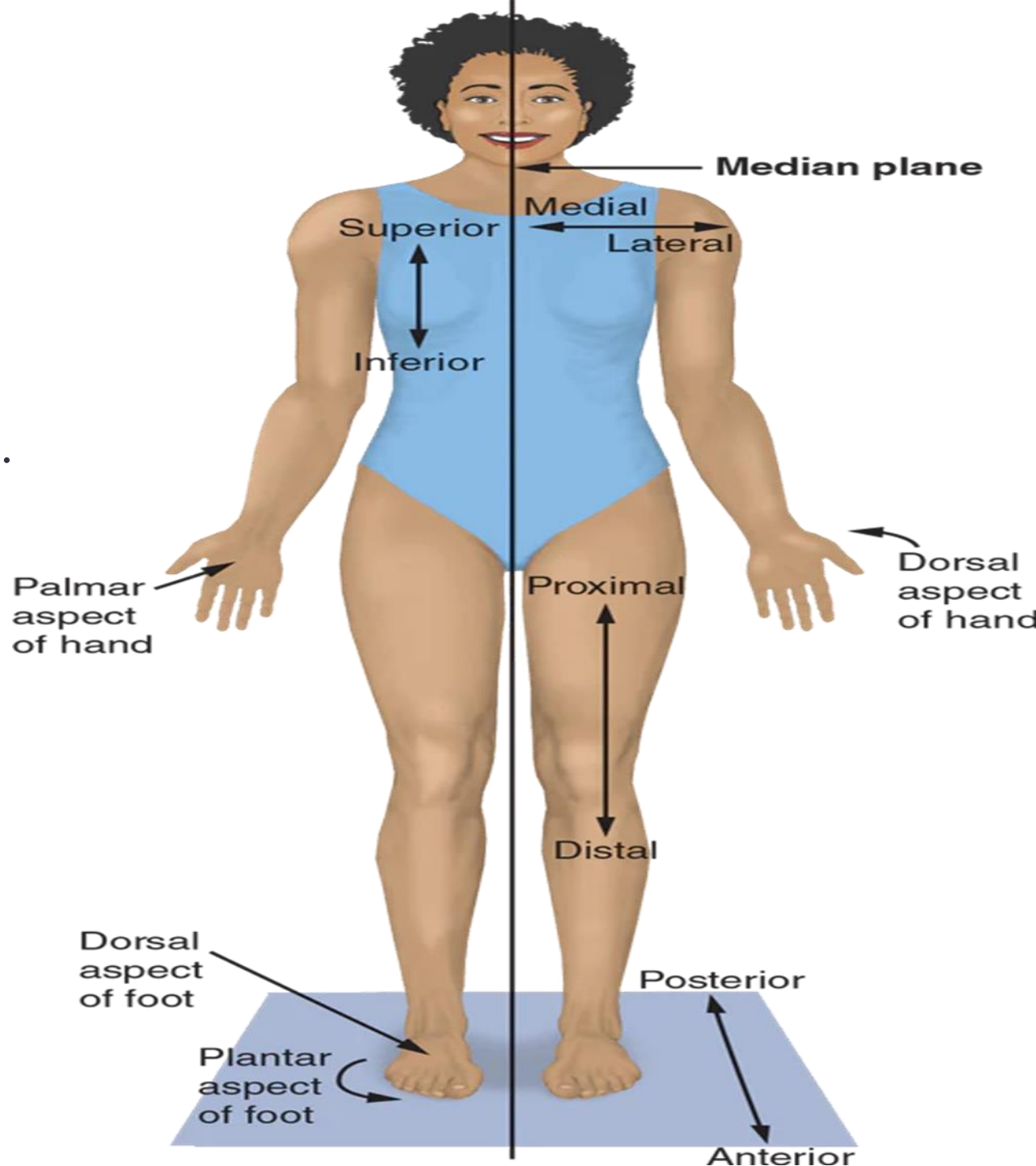
- *The eye is lateral to the nose.*
- *The nose is medial to the ears*

Superior and Inferior

Superior (Cranial) means ‘higher’,

Inferior (Caudal) means ‘lower’.

The head is superior to the neck;
the umbilicus is inferior to the sternum.



Anterior and Posterior

Anterior (Frontal) refers to the ‘front’, and **posterior (dorsal)** refers to the ‘back’. Putting this in context, the heart is posterior to the sternum because it lies behind it. Equally, the sternum is anterior to the heart because it lies in front of it.

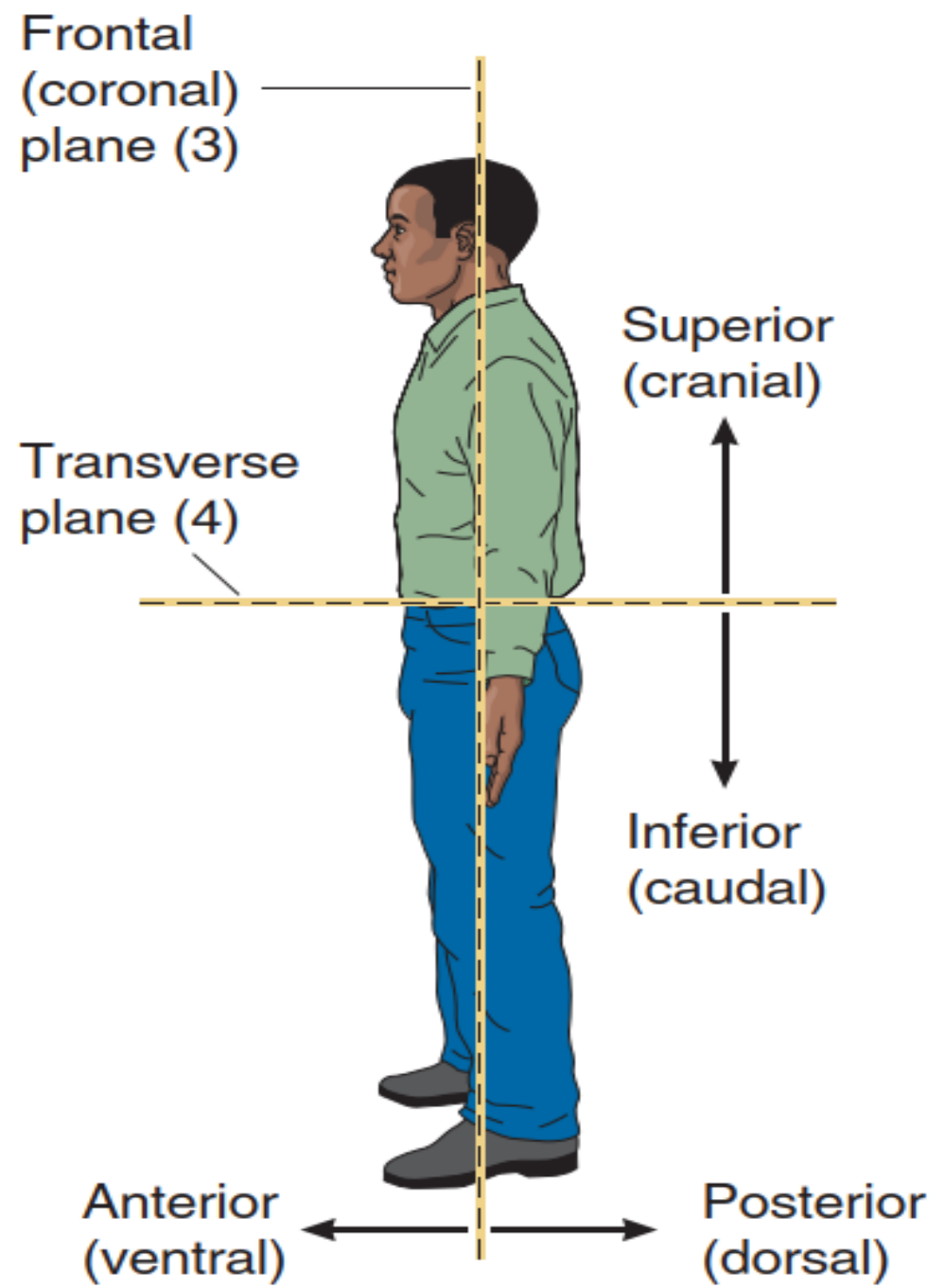
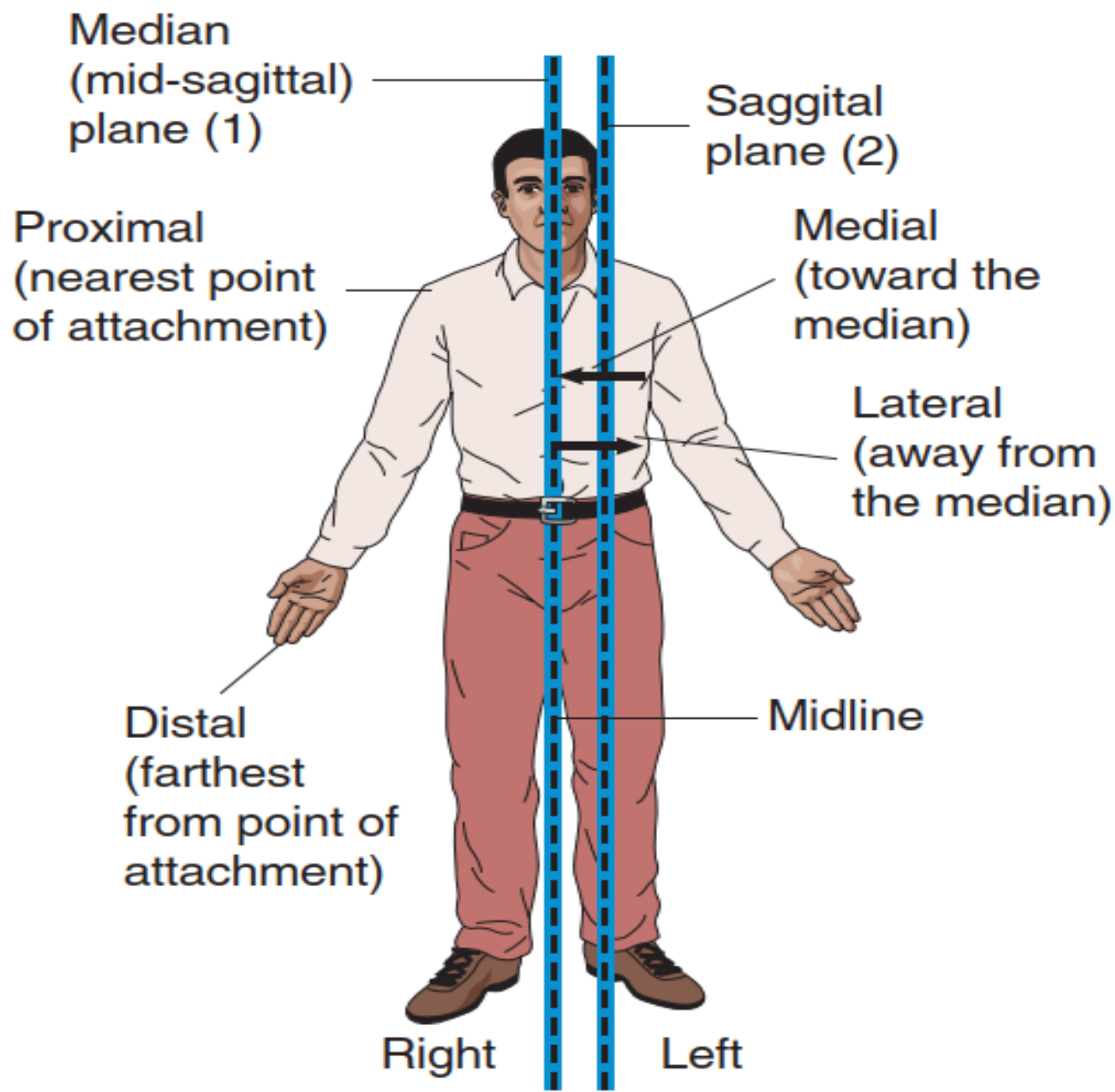
Proximal and Distal

The terms **proximal** and **distal** are used in structures that are considered to have a beginning and an end (such as the upper limb, lower limb and blood vessels). They describe the position of a structure with reference to its origin – proximal means closer to its origin, distal means further away.

Examples:

The wrist joint is distal to the elbow joint.

The knee joint is proximal to the ankle joint.



THANK YOU!

