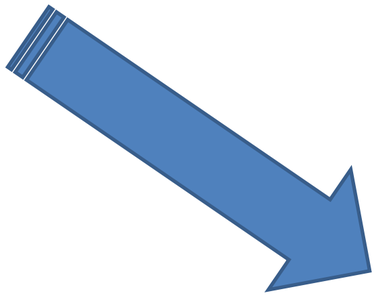
ANATOMY



No thumbnail for body parts!

ANATOMY → Greek word

ANA – BODY

TOMY – CUT

A field in the biological sciences concerned with the identification and description of the body structures of living things

Ancient period:
Cadavers / Carcasses were dissected and study

Modern era:
Non invasive procedures (radiographical images, etc.,)

Branches of Anatomy

Study of structures large enough to be seen with the naked eye, and also includes

Surface anatomy → Study of internal structures as they relate to the overlying skin

Regional anatomy → All structures in one part of the body (such as the abdomen or leg)

Systemic anatomy → Gross anatomy of the body studied by system

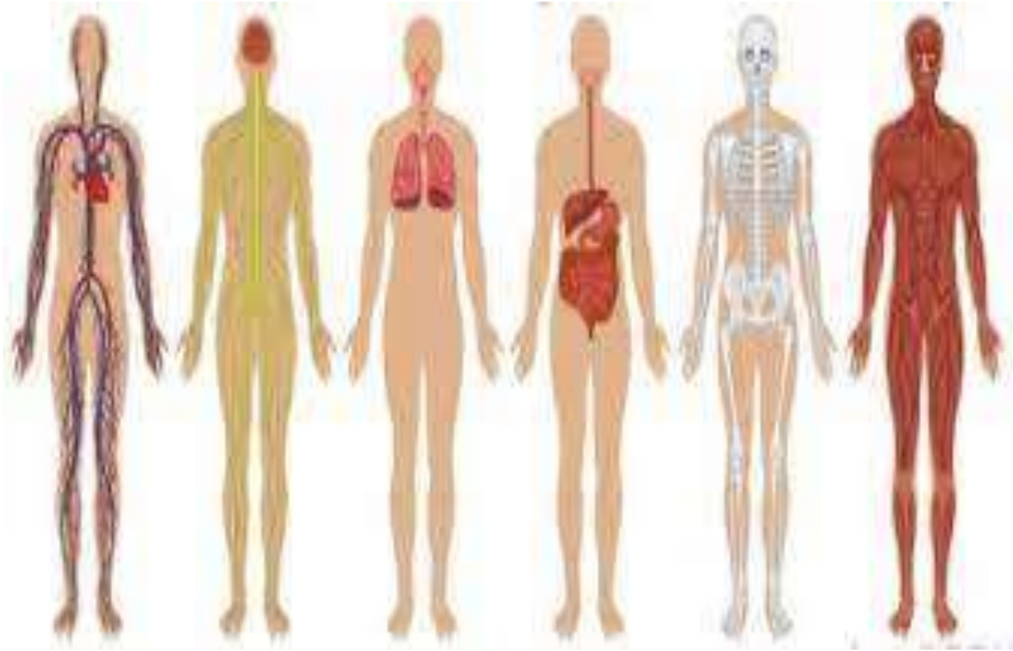
Branches of Anatomy

- **Gross** or macroscopic
  - surface: study of general form (morphology)
  - regional: superficial and internal features in a specific body area
  - systemic: structure of major organ systems
- **Microscopic** (histology) anatomy - cytology
- **Developmental -** from conception to physical maturity
- **Comparative** – anatomical organization of different animals
- **Clinical** – anatomical features that undergo changes during illness
- **Radiographic** – structures visualized by imaging techniques
  - cross-sectional
- **Surgical** – studies landmarks important for surgery

Systemic anatomy

Somatic or voluntary systems

- Osteology – Bones
- Arthrology - Joints
- Myology - muscles
- Dermatology - skin and its appendages

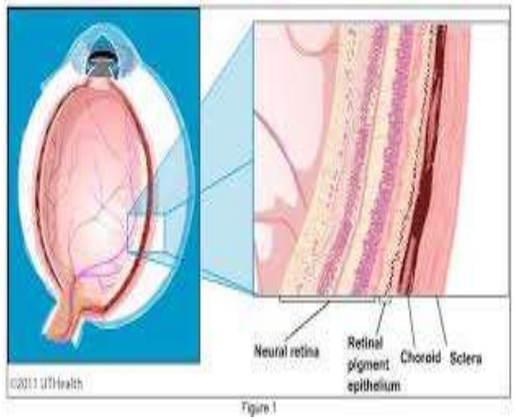


Visceral or involuntary systems

- Alimentary tract
- Respiratory tract
- Urinary tract and Reproductive tract

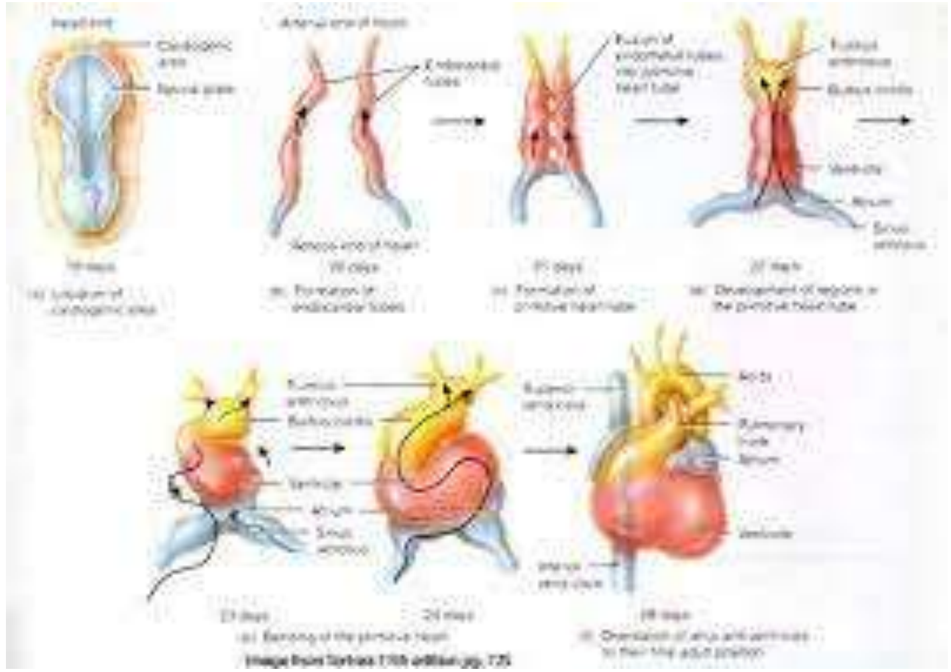
Microscopic Anatomy

Study of structures on a microscopic scale, along with histology (the study of tissues), and embroyolgy (the study of an organism in its immature condition)



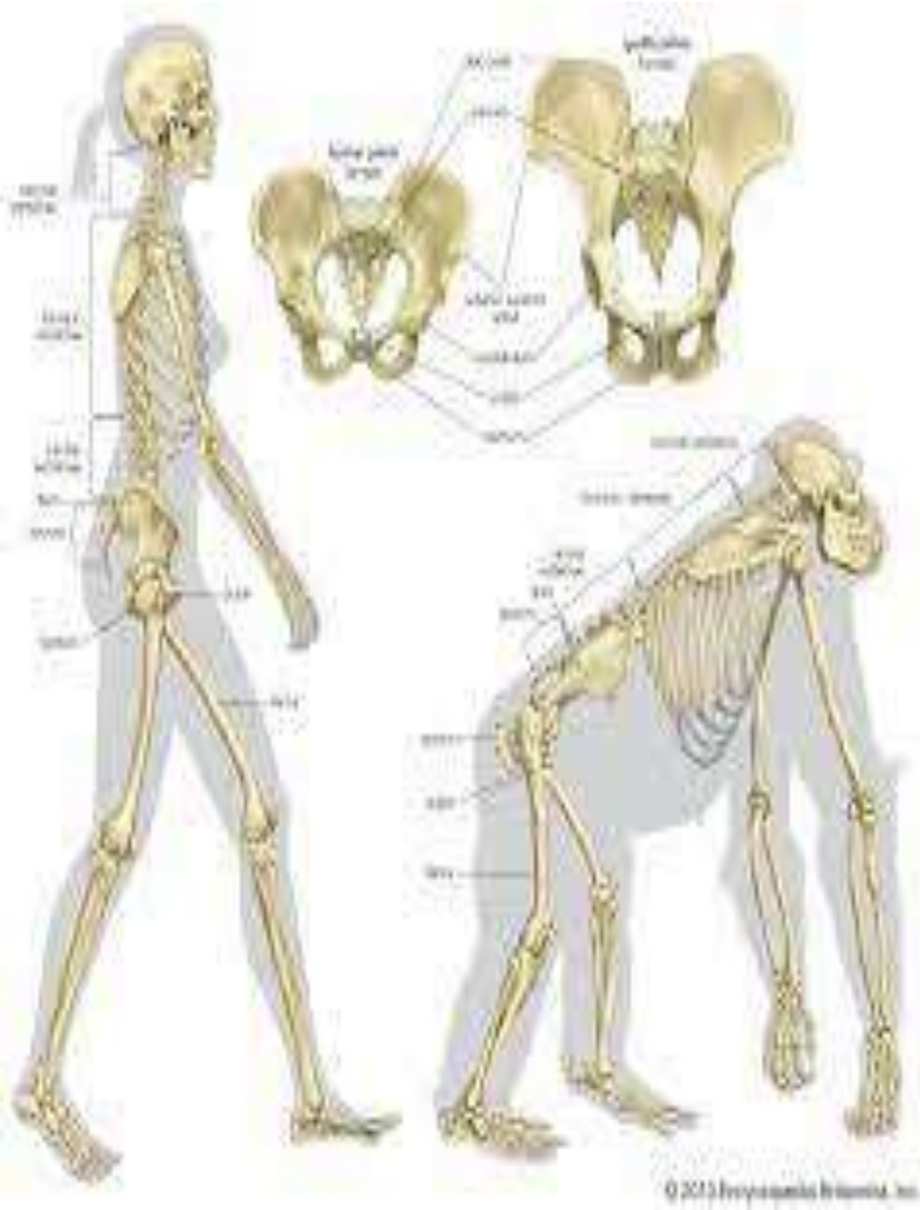
Developmental Anatomy

Developmental anatomy the field **of embryology** concerned with the changes that cells, tissues, organs, and the body as a whole undergo from a germ cell of each parent to the resulting offspring



Comparative Anatomy

Comparative anatomy is **the study of similarities and differences in the anatomy of different species**

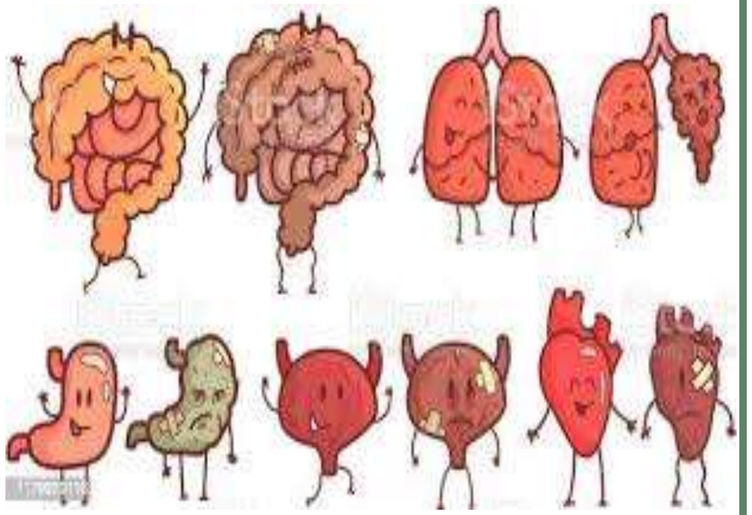


Clinical Anatomy

Clinical anatomy is an interesting and powerful way to learn difficult anatomical aspects in a **clinical context**.

The cases are structured systematically, starting with the patient's complaints, followed by the diagnostic and management approaches.

Then integrated with anatomy knowledge help us learn the importance of various anatomical structures.

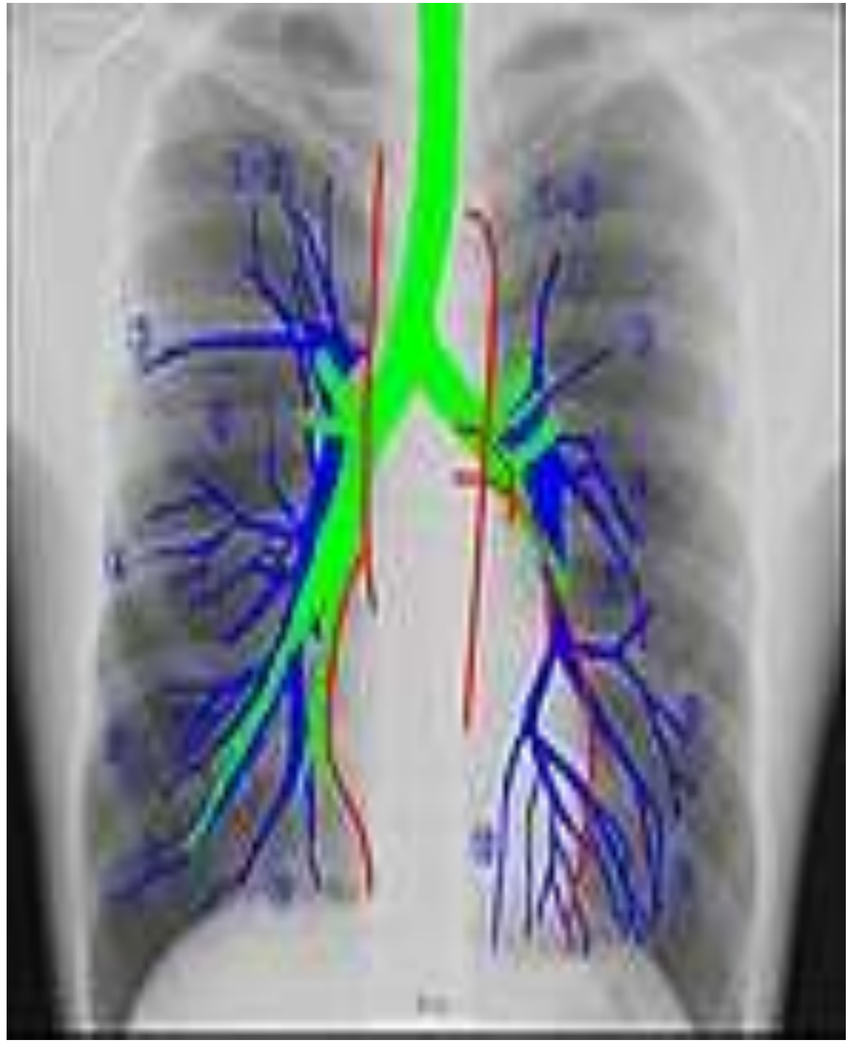


Radiographic Anatomy

Studies body structures that can be evaluated using x-rays (radiographs or CT scans).

Knee joint →

1. Medial condyle of femur ; 2.Tibial intercondylar eminence;
3 Tibial plateau; 4 Tibia;
5.Fibula; 6.Fibular head;
7. Lateral condyle of tibia; 8.Joint space;
9. Lateral condyle of femur; 10.Patella;
11. Femur



Actual outcome!

How medicos interpret!

Surgical Anatomy

Application of anatomy in surgical diagnosis, treatment and dissection.

Anatomical Organization

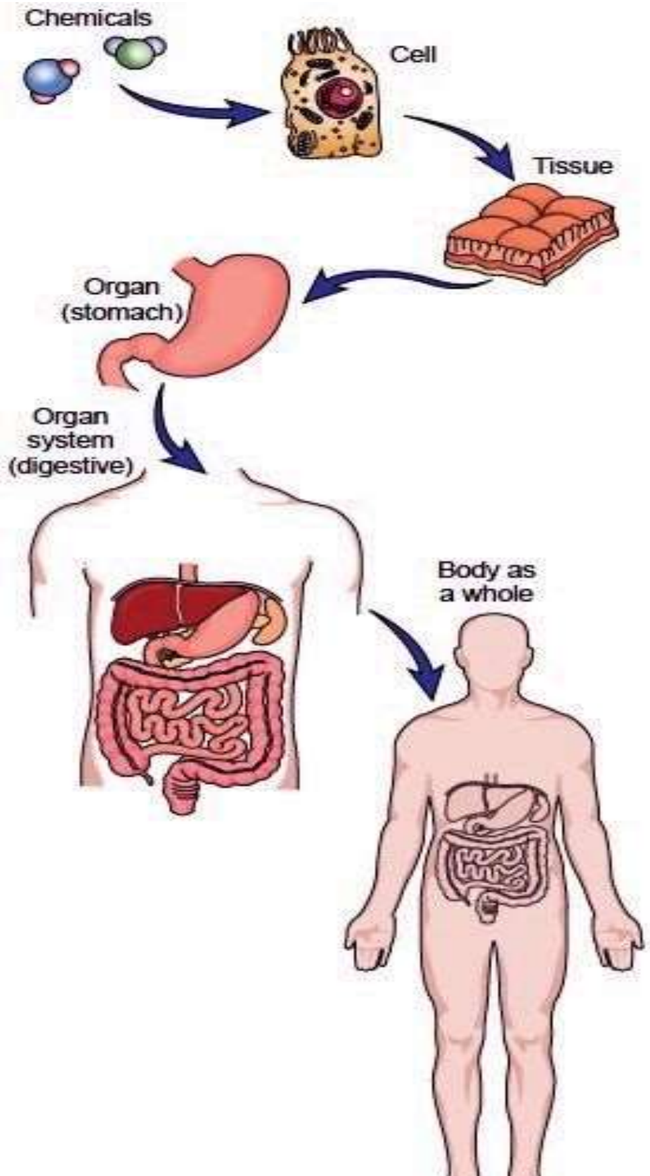
- Cells
- Tissues
- Organs
- Organ Systems
- Organism

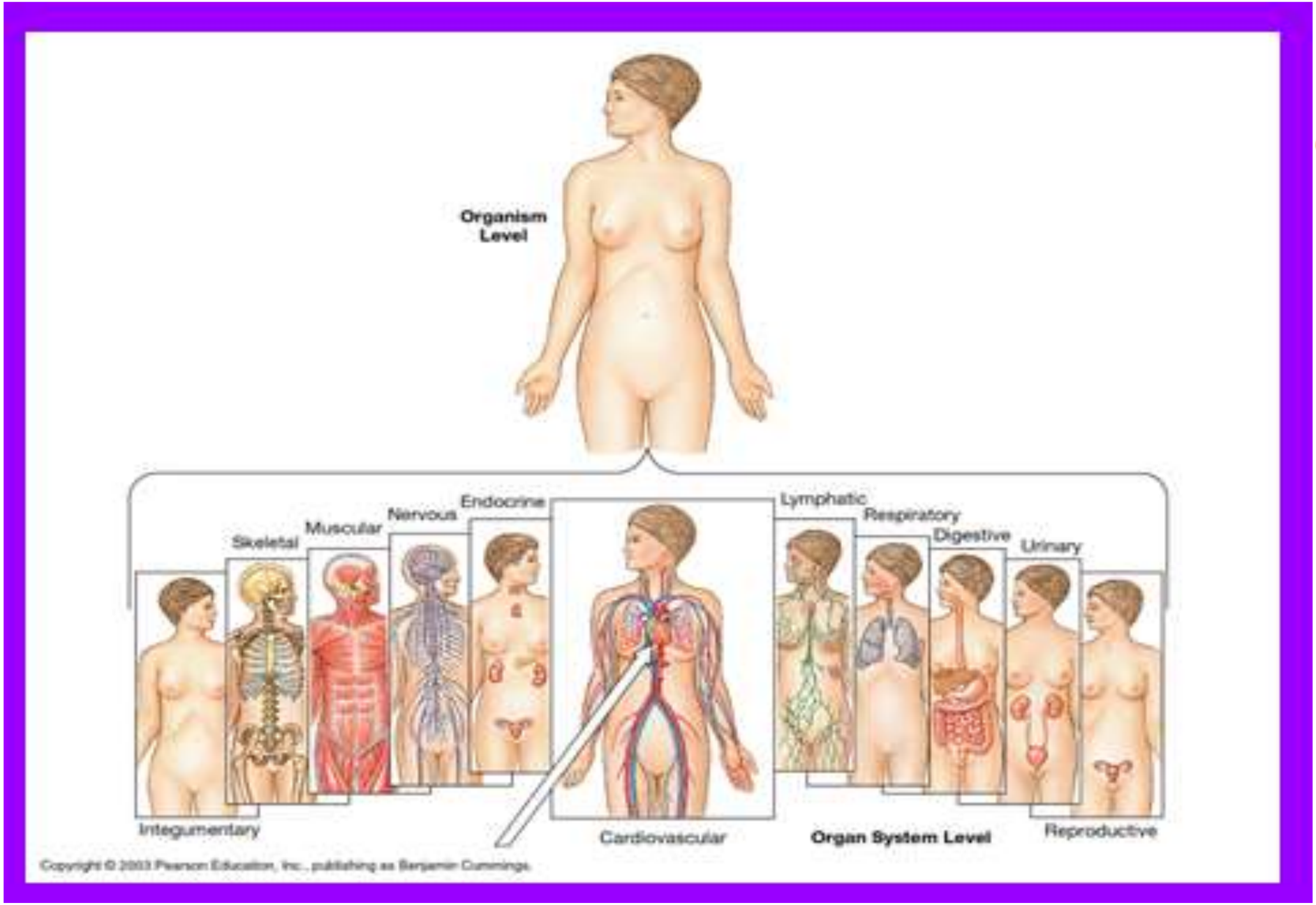
→ **Cell** - Basic unit of organism

→ The **cells** in complex multicellular organisms like people are organized into **tissues**
(Tissue- groups of similar cells that work together on a specific task).

→ **Organs** - structures made up of **two or more tissues** organized to carry out a particular function

→ **Organ systems -** Groups of organs with related functions make up the different .




Organism Level
Integumentary
Skeletal
Muscular
Nervous
Endocrine
Cardiovascular
Lymphatic
Respiratory
Digestive
Urinary
Reproductive
Organ System Level
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A common visual reference point

Standard anatomical position of the human body consists of the :

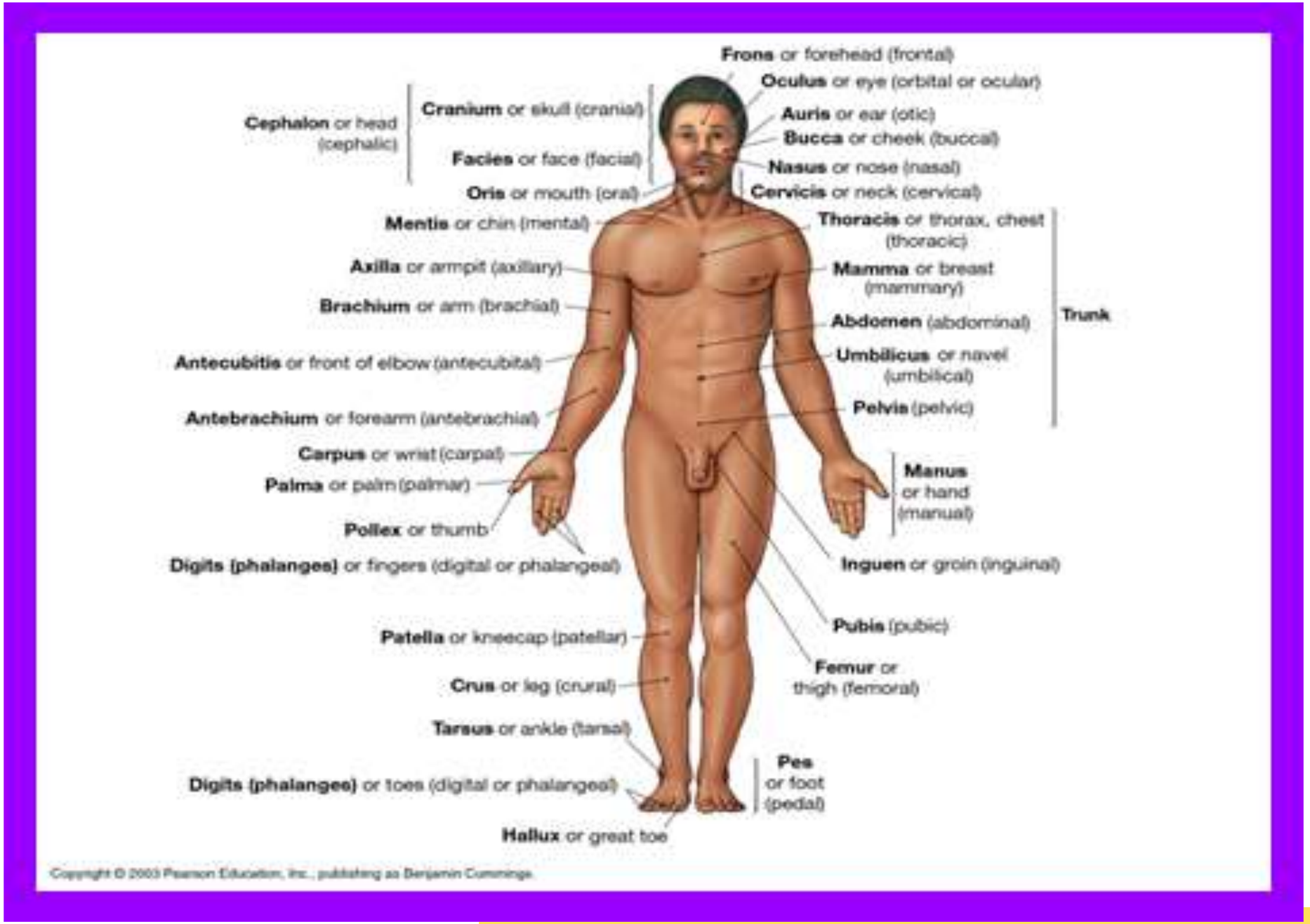
→ Body standing upright

→ Face facing forward

→ Upper limb, or arms, straight hanging at either side and hands held by hips the palms face forward.

→ legs parallel to one another.

→ Feet parallel and toes pointing forward


Frons or forehead (frontal)
Oculus or eye (orbital or ocular)
Auris or ear (otic)
Bucca or cheek (buccal)
Nasus or nose (nasal)
Cervicis or neck (cervical)
Cephalon or head (cephalic)
Cranium or skull (cranial)
Facies or face (facial)
Oris or mouth (oral)
Mentis or chin (mental)
Thoracis or thorax, chest (thoracic)
Mamma or breast (mammary)
Axilla or armpit (axillary)
Brachium or arm (brachial)
Abdomen (abdominal)
Umbilicus or navel (umbilical)
Antecubitis or front of elbow (antecubital)
Pelvis (pelvic)
Trunk
Antebrachium or forearm (antebrachial)
Carpus or wrist (carpal)
Palma or palm (palmar)
Manus or hand (manual)
Pollex or thumb
Digits (phalanges) or fingers (digital or phalangeal)
Inguen or groin (inguinal)
Pubis (pubic)
Patella or kneecap (patellar)
Femur or thigh (femoral)
Crus or leg (crural)
Tarsus or ankle (tarsal)
Pes or foot (pedal)
Digits (phalangee) or toes (digital or phalangeal)
Hallux or great toe
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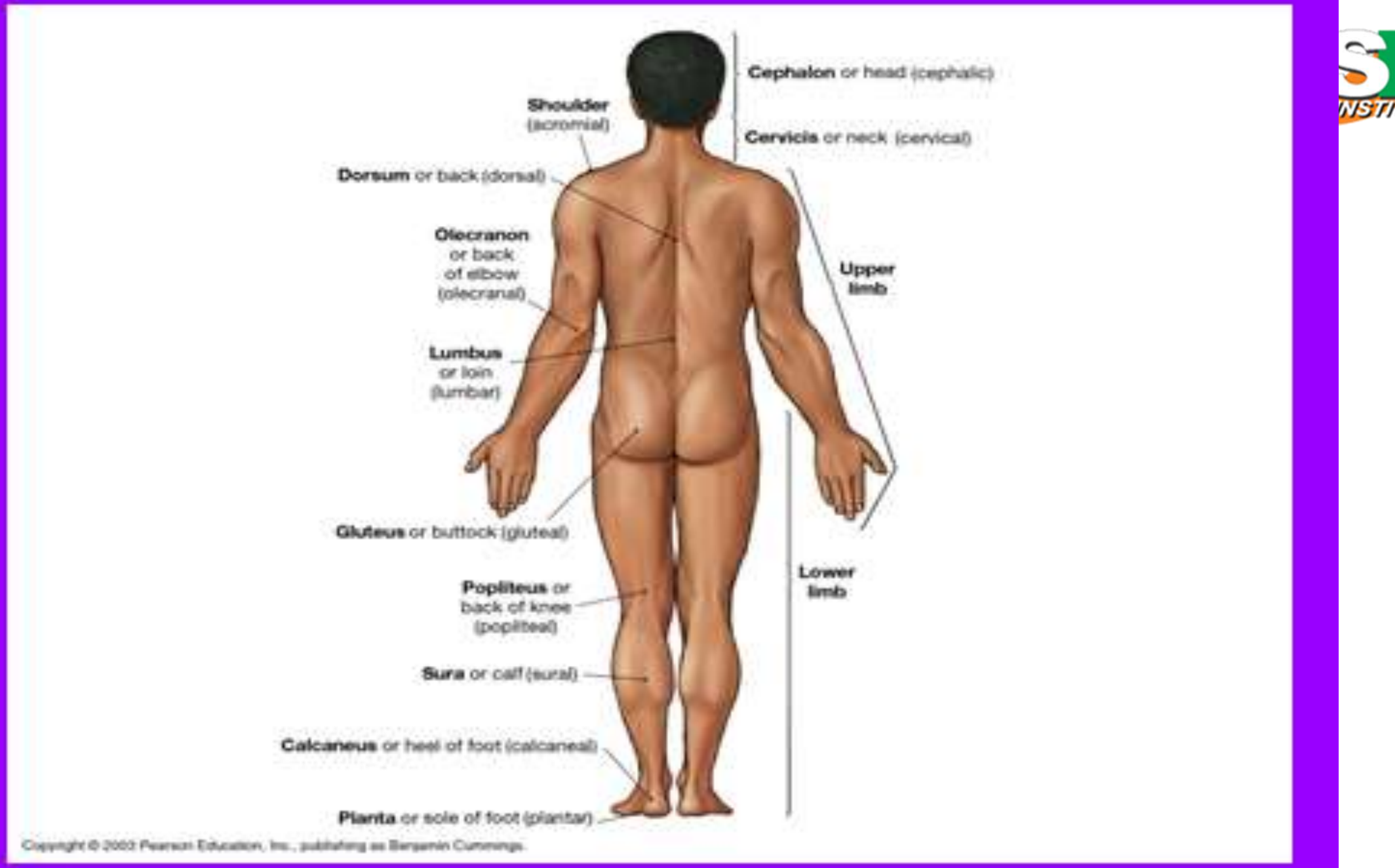
Cephalon or head (cephalic)
Shoulder (acromial)
Cervicis or neck (cervical)
Dorsum or back (dorsal)
Olecranon or back of elbow (olecranal)
Upper limb
Lumbus or loin (lumbar)
Gluteus or buttock (gluteal)
Lower limb
Popliteus or back of knee (popliteal)
Sura or calf (sural)
Calcaneus or heel of foot (calcaneal)
Planta or sole of foot (plantar)
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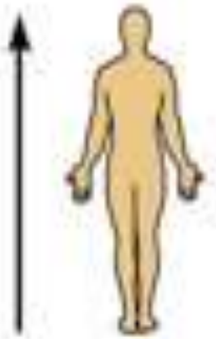
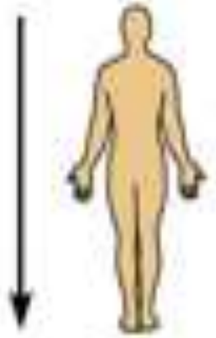
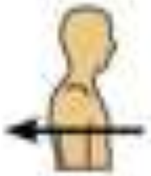
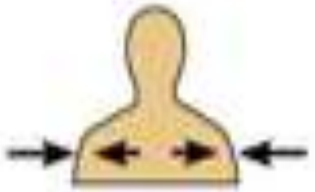
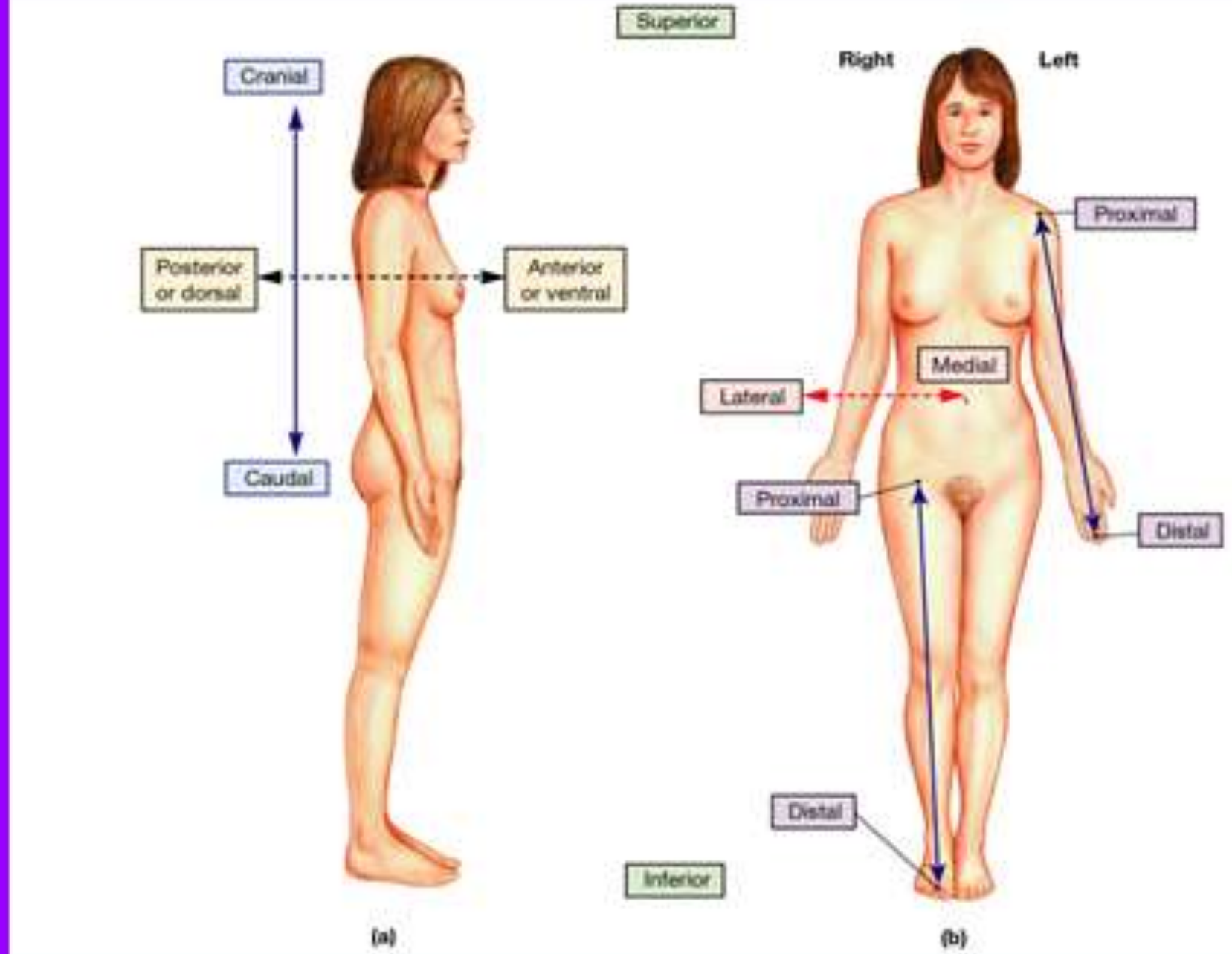
Term	Definition		Example
Superior (cranial)	Toward the head end or upper part of a structure or the body; above		The head is superior to the abdomen.
Inferior (caudal)	Away from the head end or toward the lower part of a structure or the body; below		The navel is inferior to the chin.
Anterior (ventral)*	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.

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.

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.


Superior
Cranial
Posterior or dorsal
Anterior or ventral
Caudal
Right
Left
Proximal
Medial
Lateral
Proximal
Distal
Distal
Inferior
(a)
(b)
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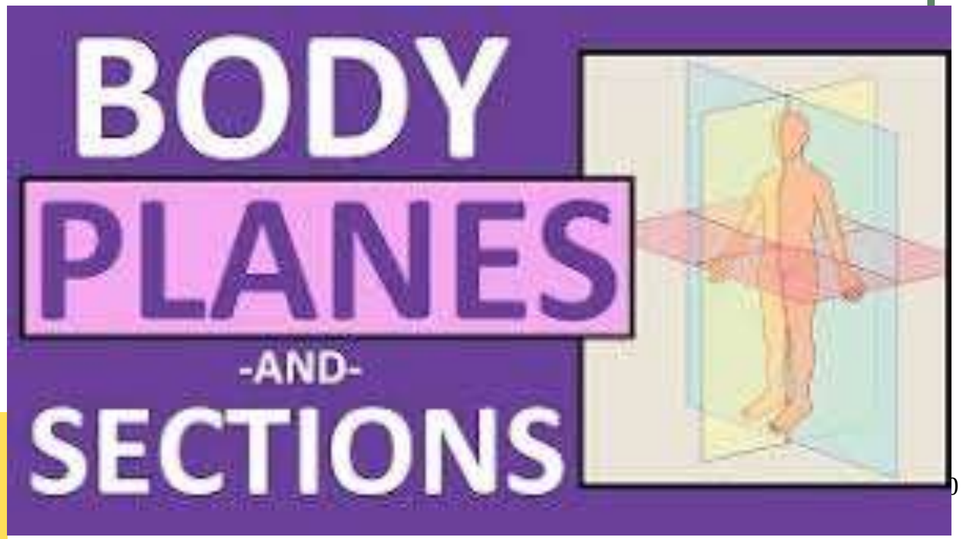
Body planes are hypothetical geometric planes used to divide the body into sections.

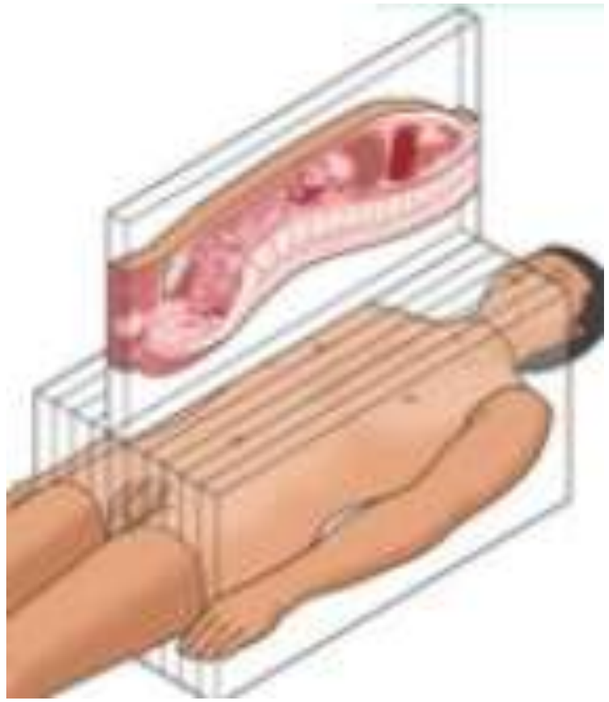
They are commonly used in both human and zoological anatomy to describe the location or direction of bodily structures



Sagittal plane

A vertical line which divides the body into **a left section and a right section.**

Flexion and extension types of movement occur in this plane

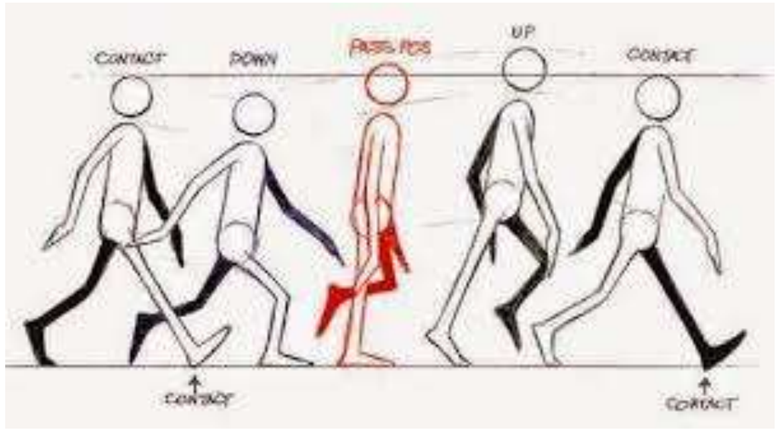


Eg

Kicking a football,

Chest pass in netball,

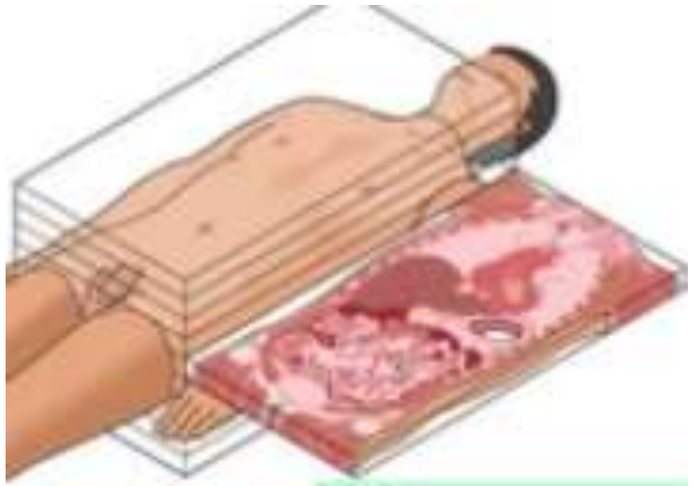
Walking.

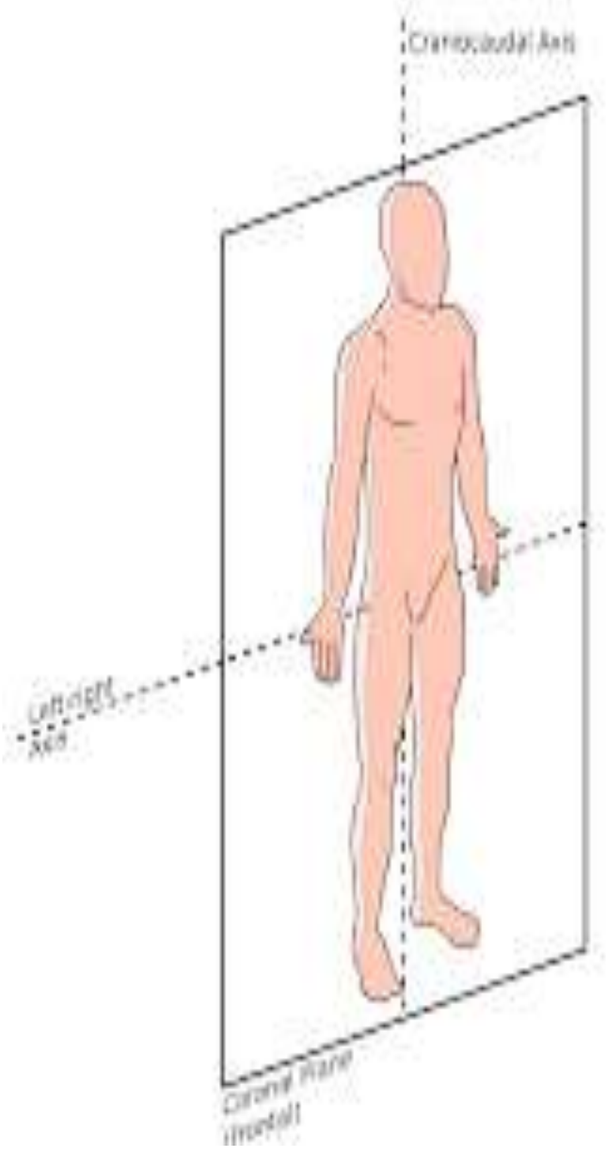


Coronal / Frontal plane

A vertical line which divides the body into **a front (anterior) section and back (posterior) section.**

Abduction and adduction movements occur in this plane





eg

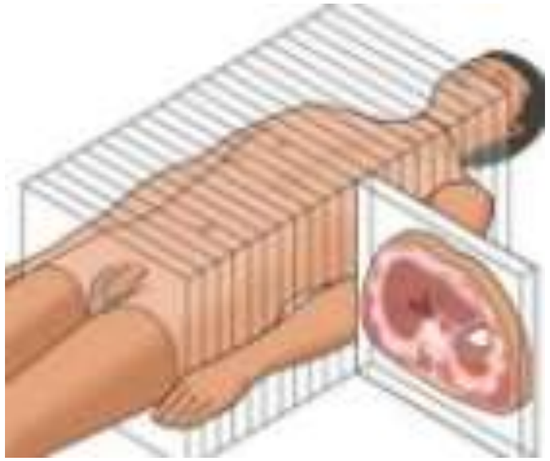
Jumping jack exercises,

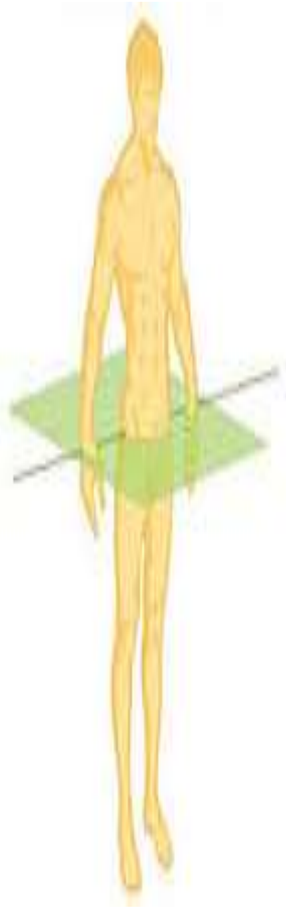
Raising and lowering arms and legs sideways.

Transverse plane

A horizontal line which divides the body into an **upper (superior) section and a lower (inferior) section.**

Rotation types of movement occur in this plane

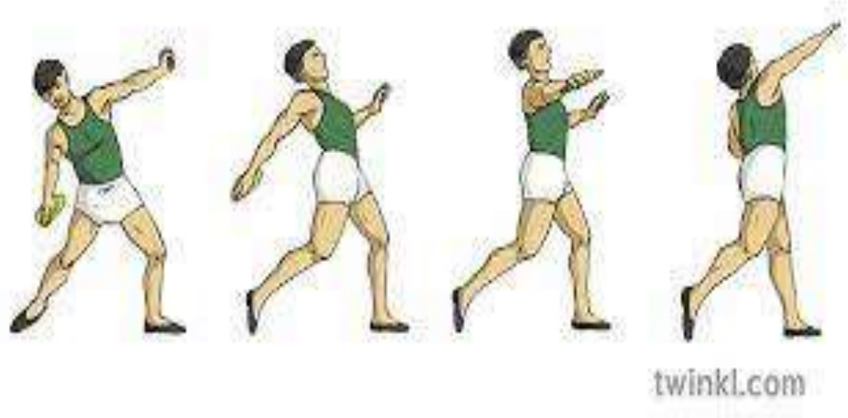




eg.,

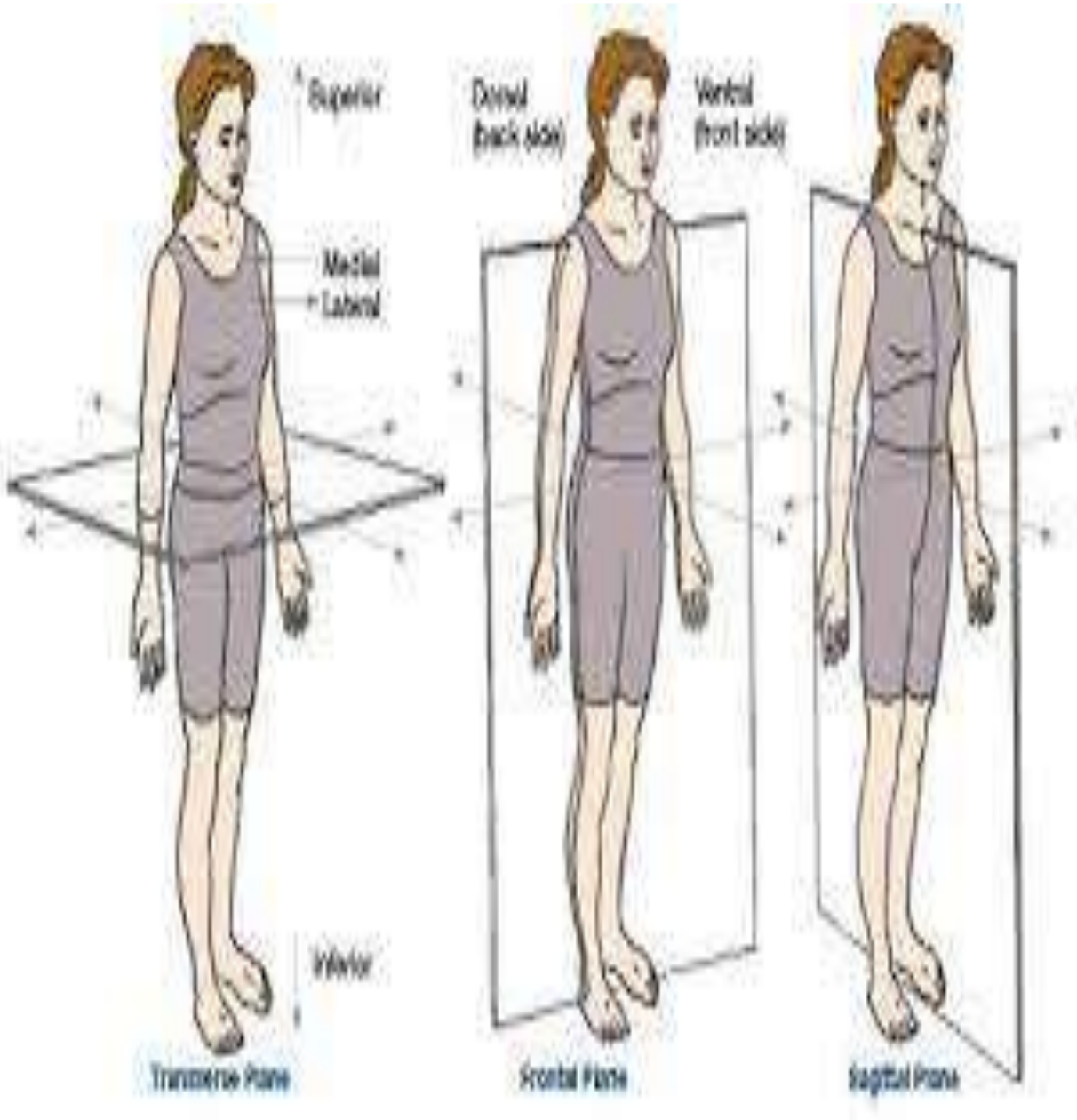
Hip rotation in a golf swing

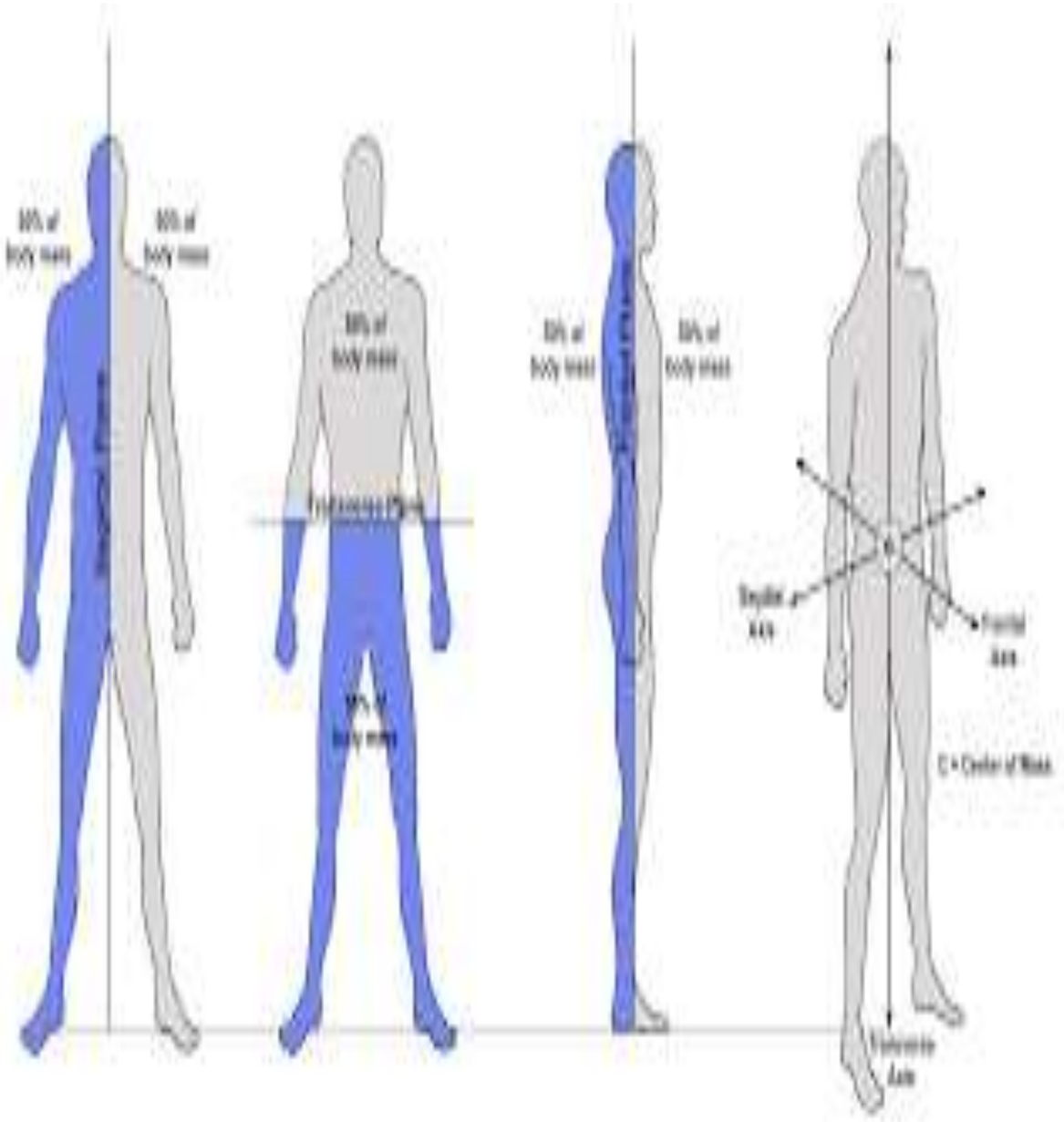
Twisting in a Discus throw



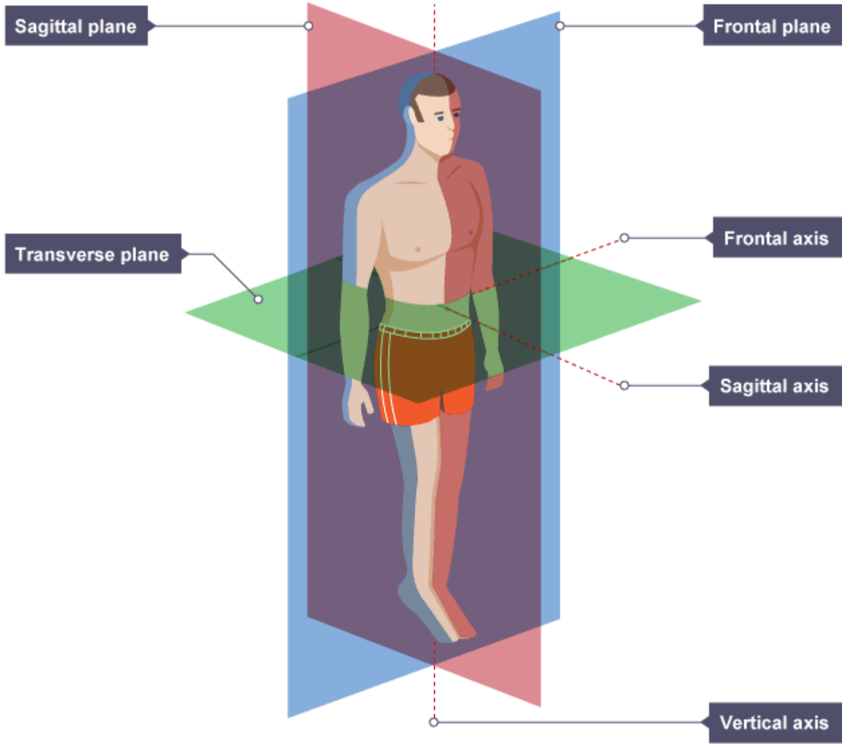
Pivoting in netball

Spinning in Skating


Superior
Medial
Lateral
Inferior
Transverse Plane
Dorsal
(back side)
Ventral
(front side)
Frontal Plane
Sagittal Plane


50% of
body mass
50% of
body mass
50% of
body mass
50% of
body mass
50% of
body mass
50% of
body mass
Sagittal
Axis
Frontal
Axis
C = Center of Mass
Transverse
Axis

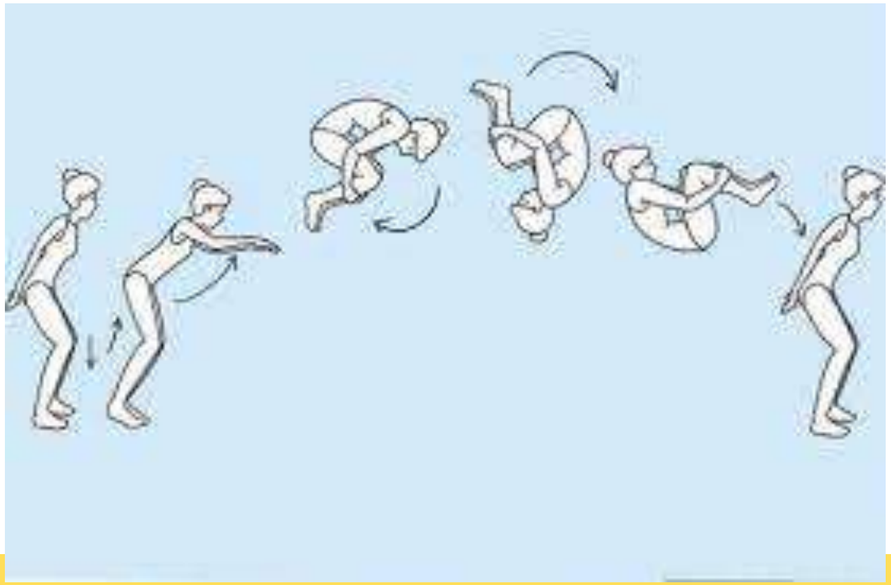
An axis is an imaginary line at right angles to the plane, about which the body rotates or spins.

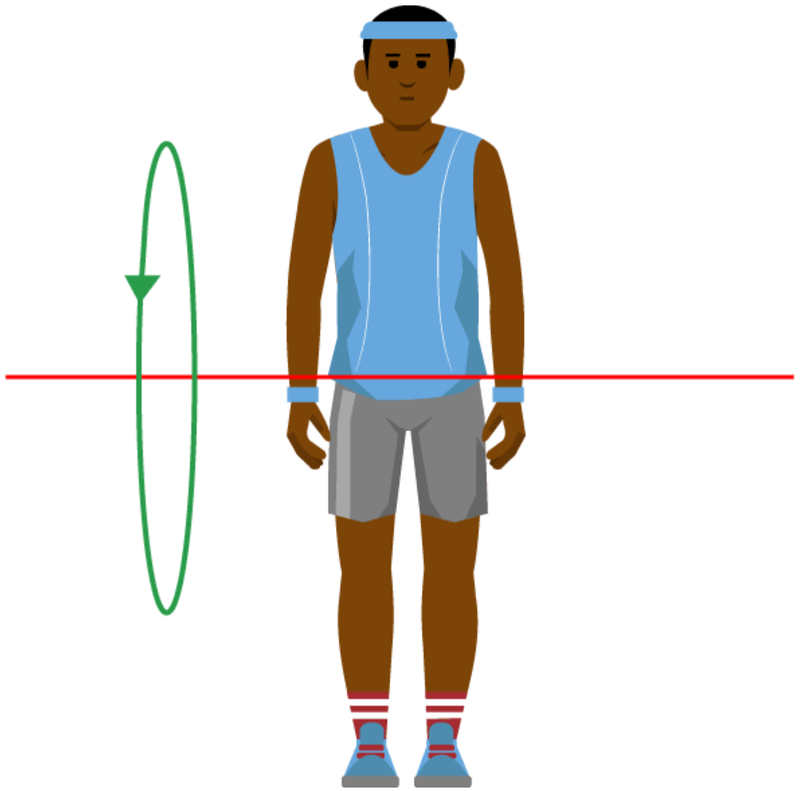


Frontal axis

This line runs from left to right through the centre of the body.

For example, when a person performs a somersault they rotate around this axis.

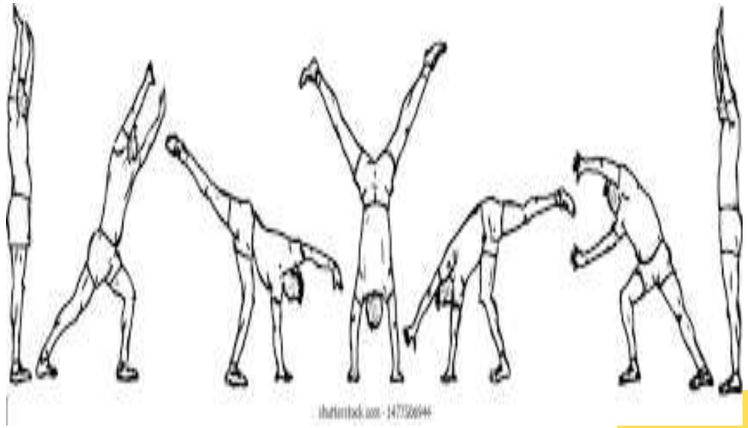


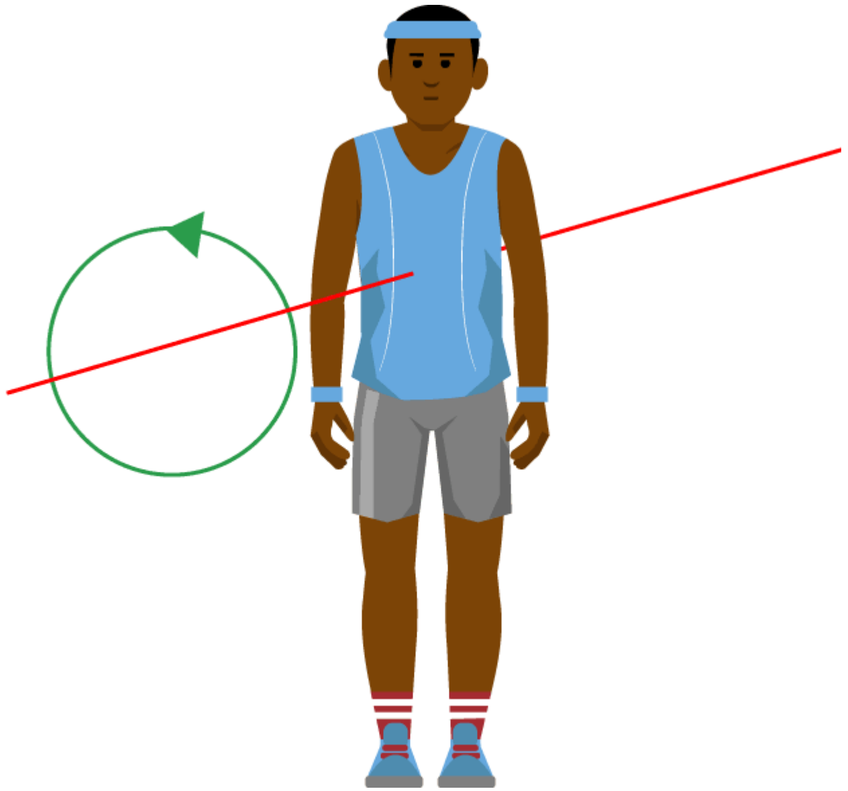


Sagittal (also known as the antero-posterior) axis

This line runs from front to back through the centre of the body.

For example, when a person performs a cartwheel they are rotating about the sagittal axis.





Vertical axis

This line runs from top to bottom through the centre of the body.

For example, when a skater performs a spin they are rotating around the vertical axis.