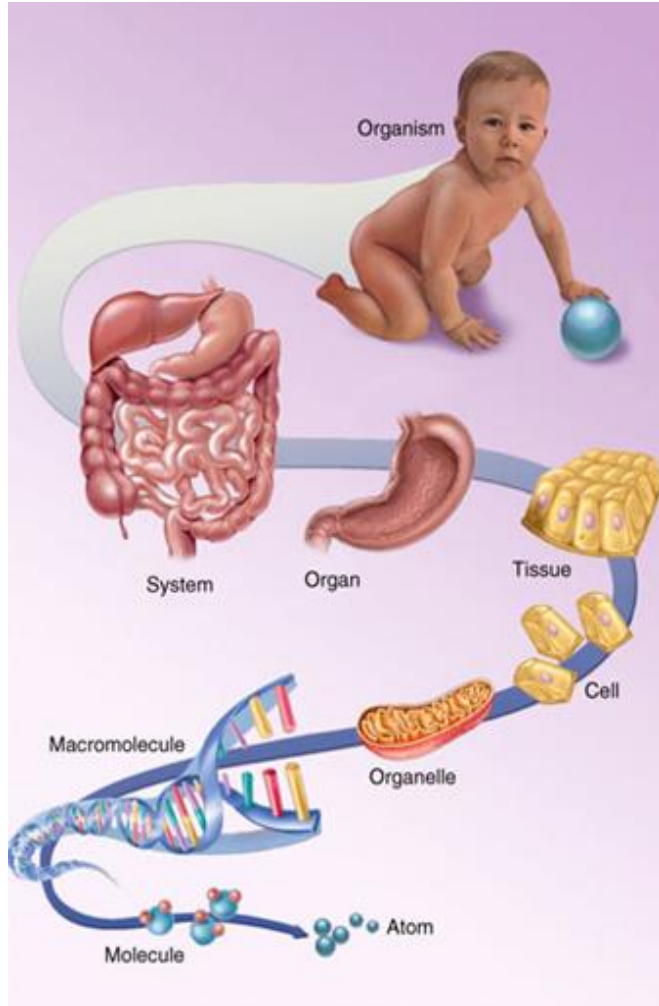


HUMAN ANATOMY FOR DENTAL STUDENTS



د. باسم المظفر Prof. Abbas AY TAHER

L1/2 اهلا وسهلا بطلبتنا الاعزاء



COLLEGE

OF

DENTISTRY

ISLAMIC UNIVERSITY-NAJAF

DENTIST: Is a licensed practitioner who is skilled in the prevention, diagnosis, and treatment of diseases, injuries, and malformations of the teeth, jaws, and mouth and who makes and inserts false teeth.

Dentist = Doctor + Engineer + Artist

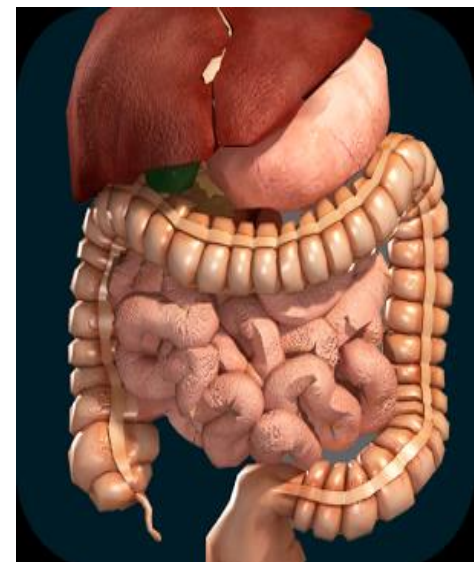
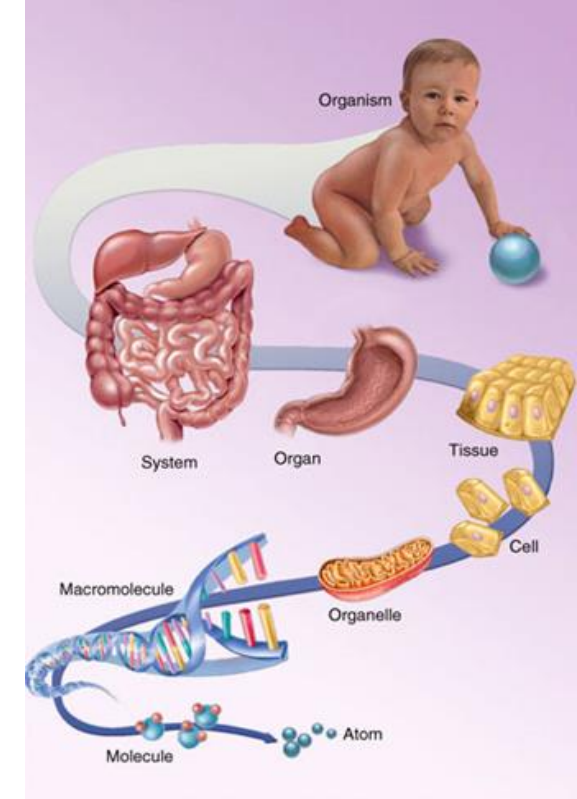
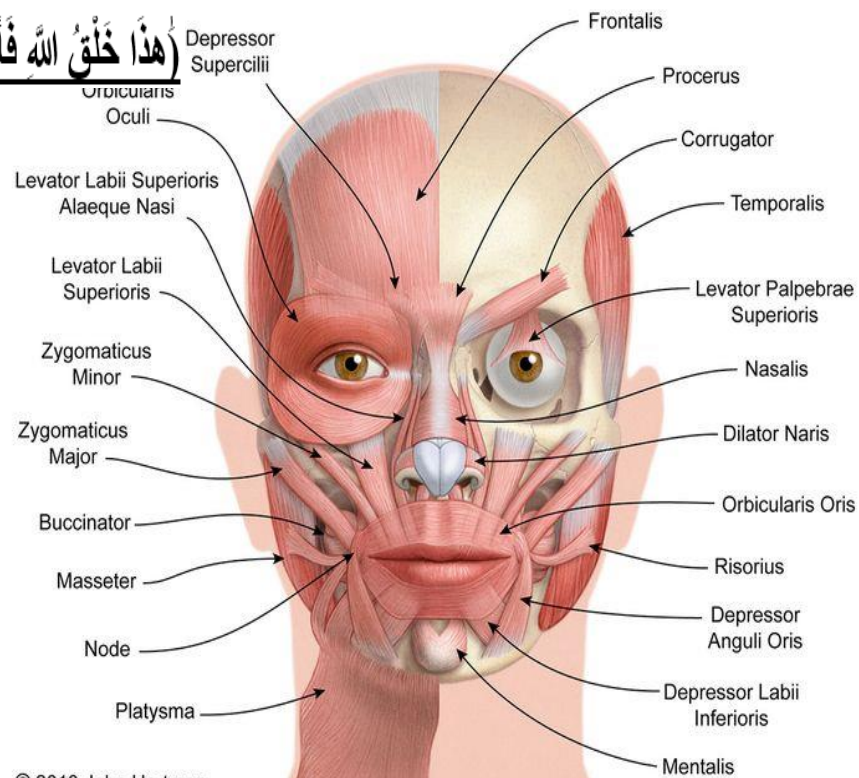


ANATOMY:

Anatomy is the science that studies the **structure of the body**.

سبحان الذي خلق فابعد من الذرة جعل خلقا سويا

هَذَا خَلَقَ اللهُ فَأَرُونِي مَاذَا خَلَقَ الَّذِينَ مِنْ دُونِهِ بَلِ الظَّالِمُونَ فِي ضَلَالٍ مُّبِينٍ



BRANCHES OF ANATOMY

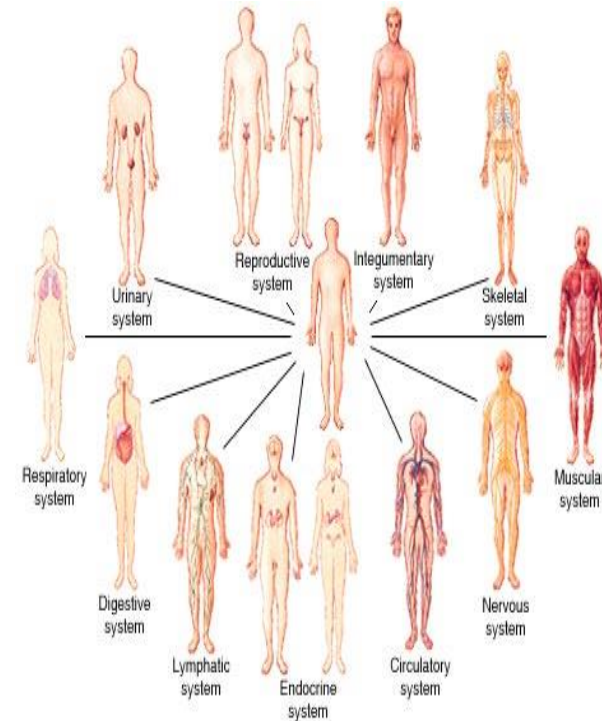
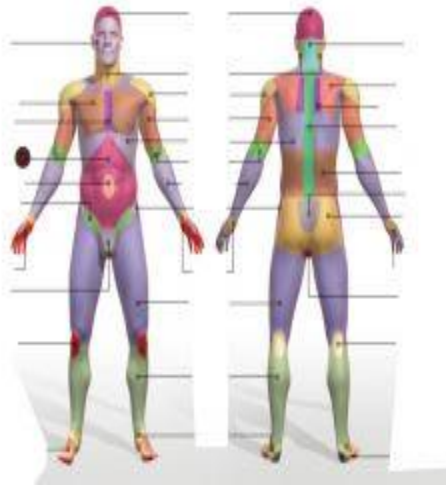
1. Gross anatomy

It is the study of structures that can be examined without the use of a microscope.

Also called Macroscopic Anatomy, has following two main subdivisions

A-Systemic Anatomy (study of **specific systems of the body**)

B-Regional Anatomy (study based on **regions**, parts, or divisions of the body)



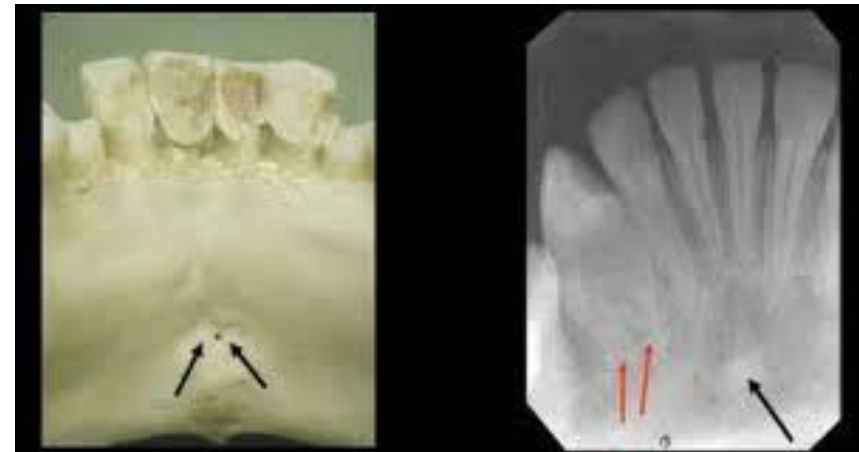
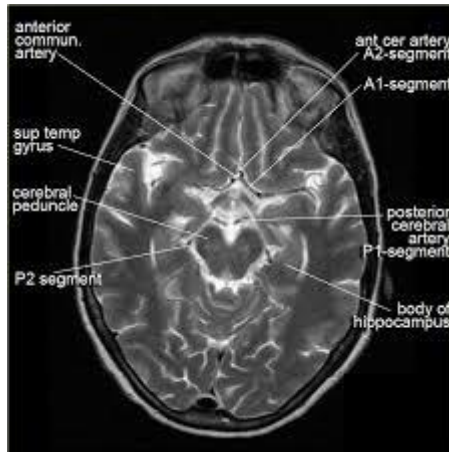
2. SURFACE ANATOMY

Surface anatomy (also called **superficial anatomy** and visual **anatomy**) is the **study of the external features of the body of an animal**. In birds this is termed topography. **Surface anatomy** deals with **anatomical** features that can be studied by sight, without dissection. Surface anatomy **helps the clinician in ascribing the cause of different signs and symptoms to a certain structure in performing diagnostic procedures**, in ascertaining damage done as a result of injury and in planning exploring a certain area of the body.



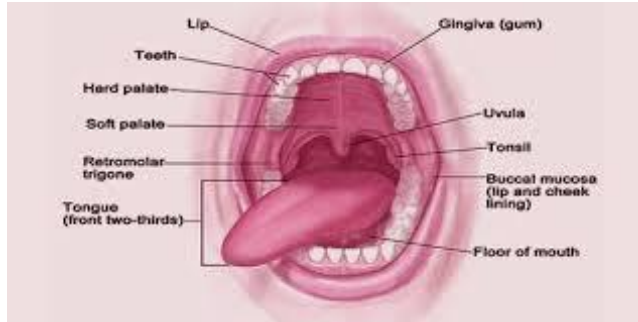
3. RADIO ANATOMY:

Radioanatomy (x-ray **anatomy**) is **anatomy** discipline which involves the **study of anatomy through the use of radiographic films**. The x-ray film represents two-dimensional image of a three-dimensional object due to the summary projection of different **anatomical** structures onto a planar surface. This is the study of the structure of human body that includes the use of several imaging techniques, such as radiography, ultrasonography, echocardiography radioisotope studies, computed tomographic scanning (CT Scanning) and Magnetic resonance imaging (MRI).



4. CLINICAL ANATOMY:

Clinical anatomy is defined as **anatomy** in all its aspects - gross, histologic, developmental and neurologic as applied to **clinical** practice, the application of anatomic principles to the solution of **clinical** problems and/or the application of **clinical** observations to expand anatomic knowledge.



5. APPLIED ANATOMY:

The application of **anatomical** knowledge, in particular the use of normal **anatomical** landmarks, in the diagnosis and treatment of disease.

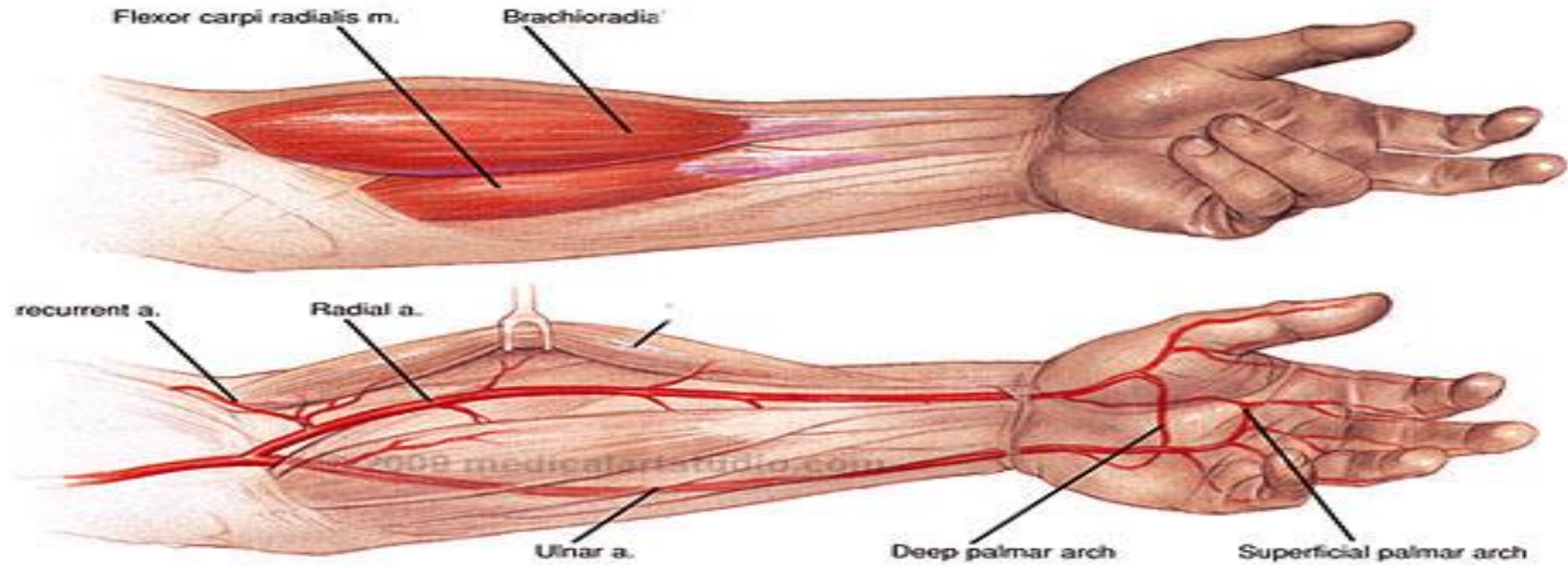
6. COMPARATIVE ANATOMY

Comparative anatomy is the **study of similarities and differences in the anatomy** of different species. It is closely related to evolutionary biology and phylogeny (the evolution of species).



7. SURGICAL ANATOMY:

The application of anatomical knowledge to *surgical* diagnosis and treatment.

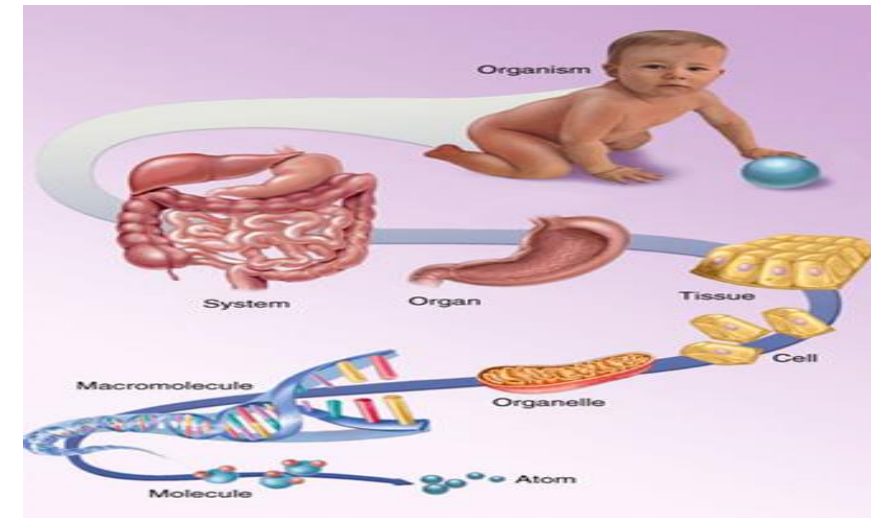


8. DEVELOPMENTAL ANATOMY

It is the Study of **development of human body from the fertilized egg to adult form**. The study of development of human being inside the uterus is normally called Embryology, but in fact it is the study of development from the fertilized egg to the eighth week in utero. Rest of the development in the uterus is the fetal development and can be given the name fetology. In a sequence of studies in the changes that take place from a fertilized egg to the old age and death of human being is developmental anatomy. The different levels of organization that **make up the body** allow for the study of anatomy in various branches.

Levels of organization:

- Atoms form molecules
- Molecules form organelles (essential for cell function)
- Organelles form cells
- Group of cells with the same structure and function forms a tissue
- Two or more different tissues form an organ
- Two or more organs form organ systems
- Multiple systems form the human body.



9. MICROSCOPIC ANATOMY

Structures that cannot be seen with the eye ,need to use a microscope

Cytology = study of cells

Histology = study of tissues

This form of anatomy is better known as histology which is the study of tissues. Specializes cells form different types of tissues. Thus different tissues do not look or function in the same way. Any illness or physiological problems experienced in the body occur at the cellular level.

Light and electron microscopy- Two types of microscopes are used to study tissues and each reveals different aspects. Light microscopes have less magnification than electron microscopes but show color and texture. Specimens can be stained to show only certain aspects. Electron microscopes can magnify an image to show finer detail than an electron microscope but is flat and colorless. Scanning and transmission electron microscopes a power and used to reveal more detail.

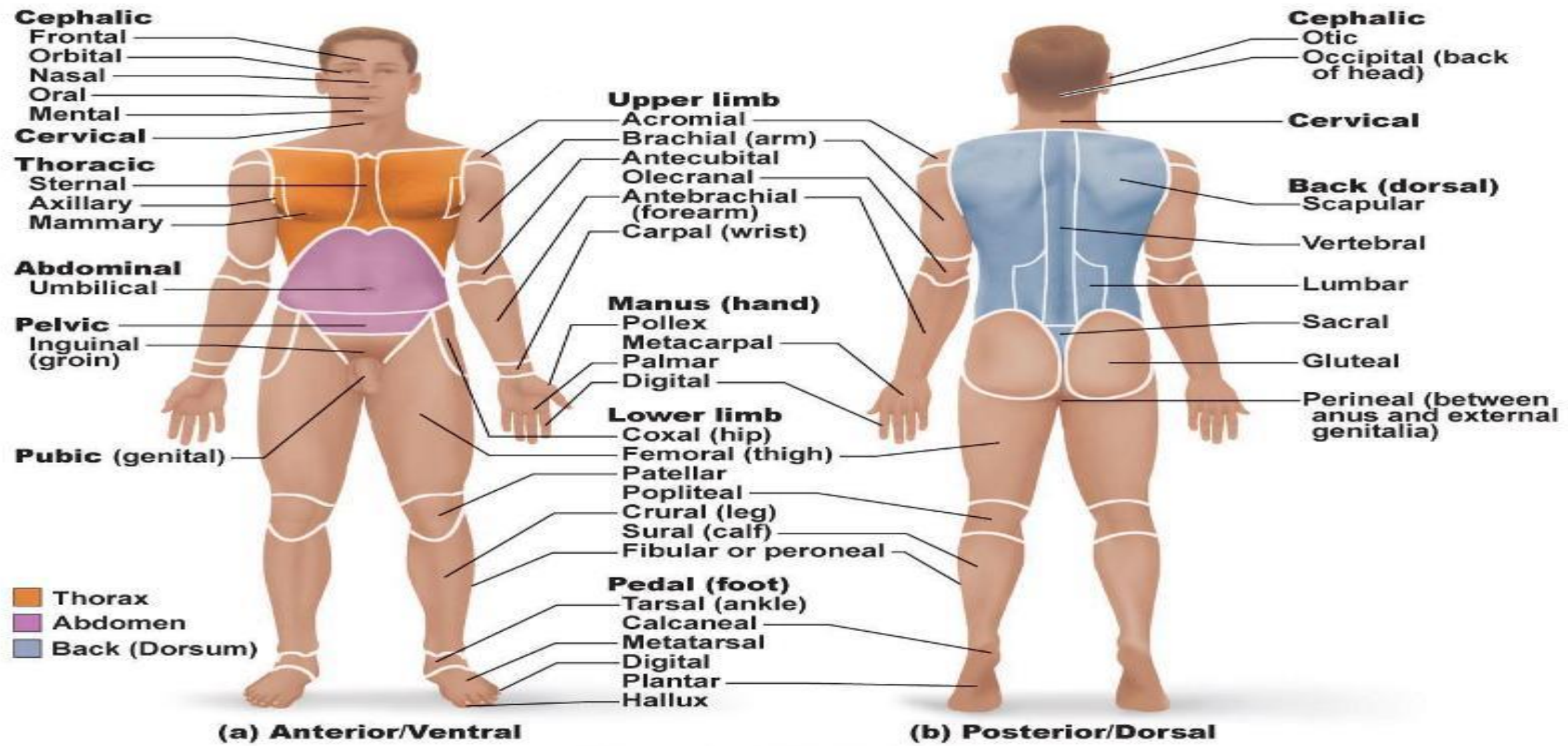
THE METRIC SYSTEM- In the science field **length, volume, and weight** are measured in unit used by the **metric system**. This allows consistency in measurement throughout the world. Reference Appendix A for these measurements and prefixes.

Length is measured in kilometer, meter, centimeter, or millimeter

Volume is measured in kiloliter, liter, or milliliter

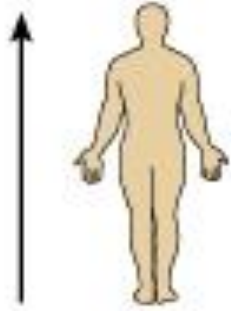
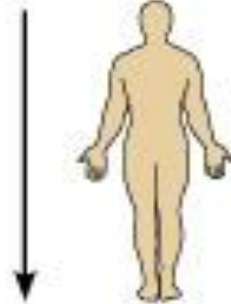
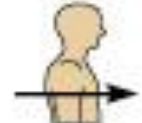
Weight is measured in kilogram, gram, or milligram.

DIRECTIONAL AND REGIONAL TERMS



Directional and Regional terms- These are standard terms based on the anatomical position to precisely describe the location of a certain body part in relation to another

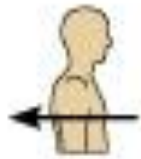
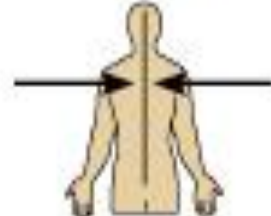

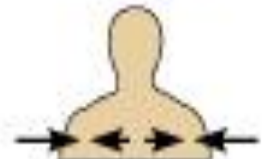
Table 1.1 Orientation and Directional Terms

| 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 |

*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.

Table 1.1

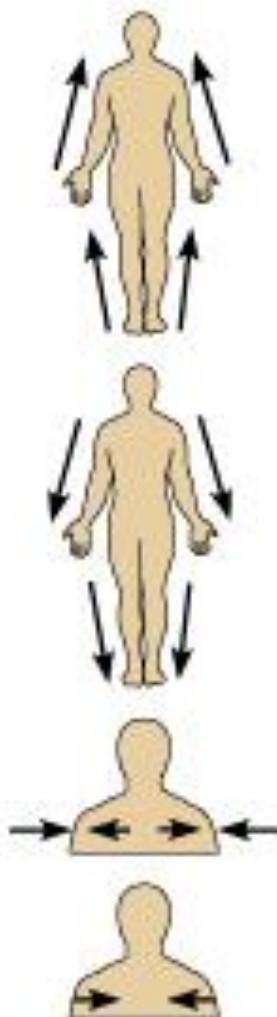
Orientation and Directional Terms

| Term | Definition | | Example |
|---------------------|--|--|--|
| 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 |
| Intermediate | Between a more medial and a more lateral structure |  | The collarbone is intermediate between the breastbone and shoulder |

*Whereas the terms *ventral* and *anterior* are synonymous in humans, this is not the case in four-legged animals. *Vental* 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.

Table 1.1**Orientation and Directional Terms**

| Term | Definition | Example |
|------------------------|---|---|
| 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 |
| 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 |



BODY PLANES AND SECTIONS-

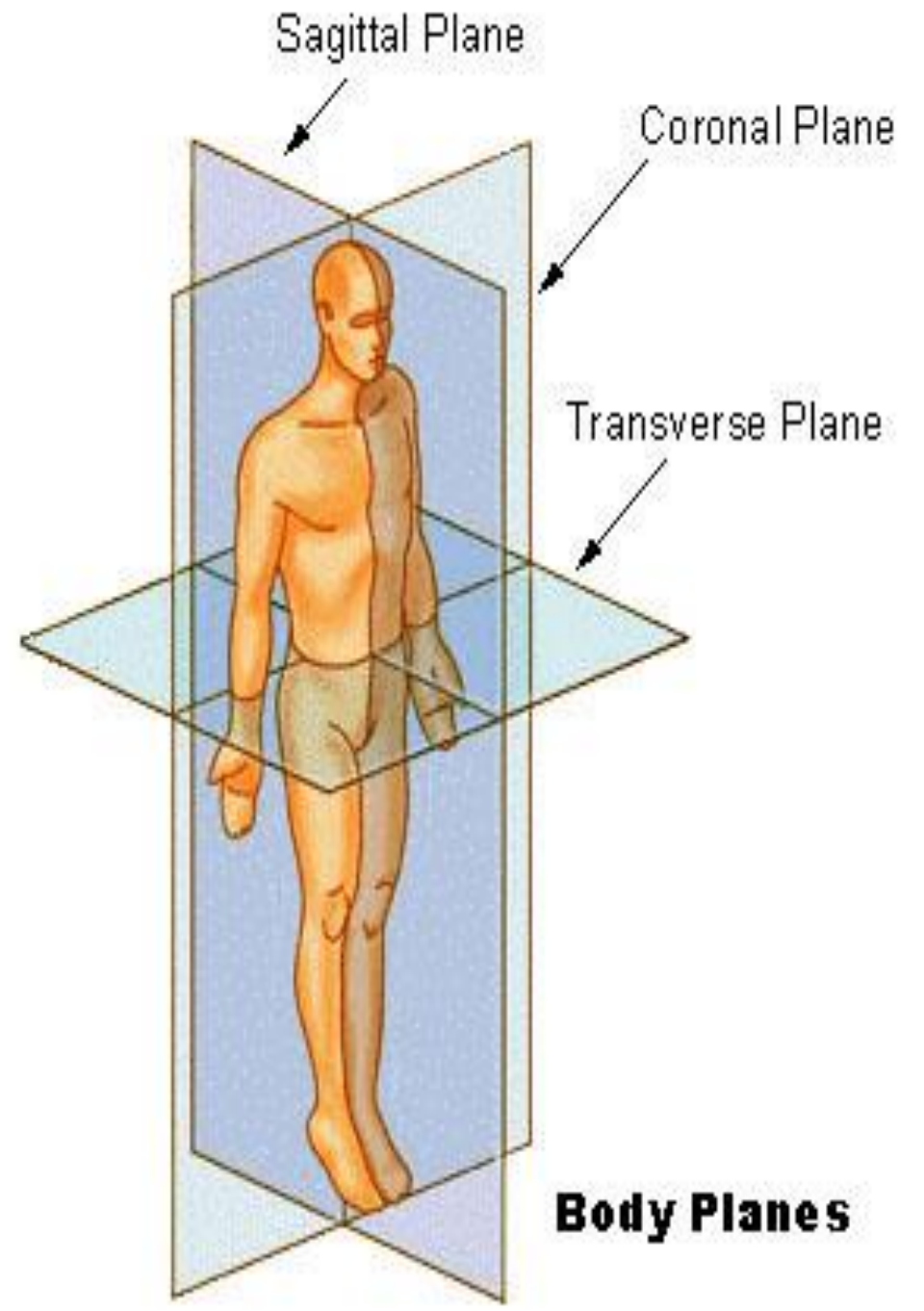
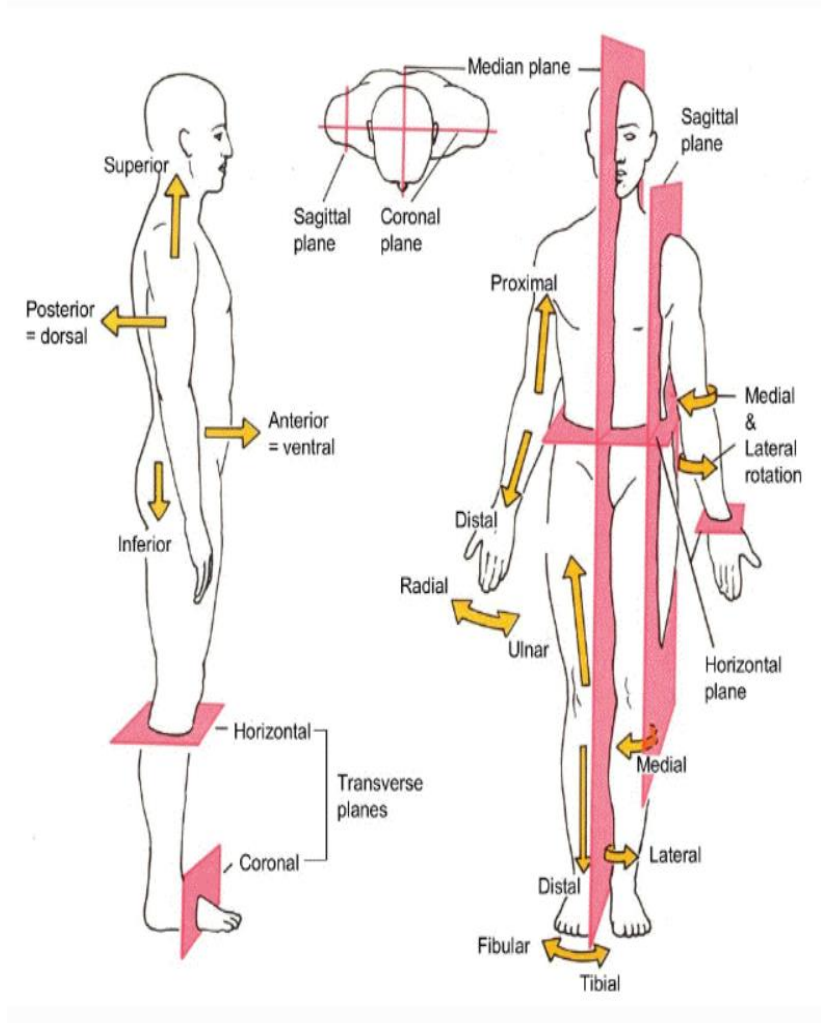
a plane is a flat sectional cut along the body .There are four planes:

- Frontal (coronal)
- Median (midline or sagittal)
- Transverse (horizontal)
- Oblique (diagonal)

BODY IS 3D

Can be split into three planes

- Sagittal
- Coronal
- Transverse



SAGITTAL PLANE

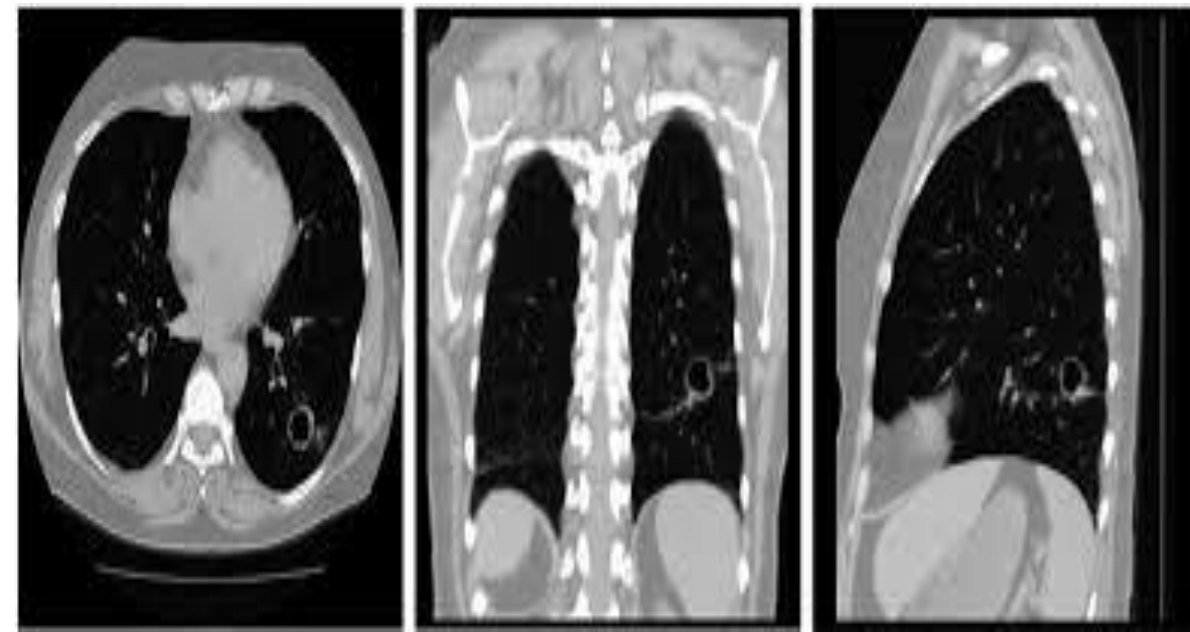
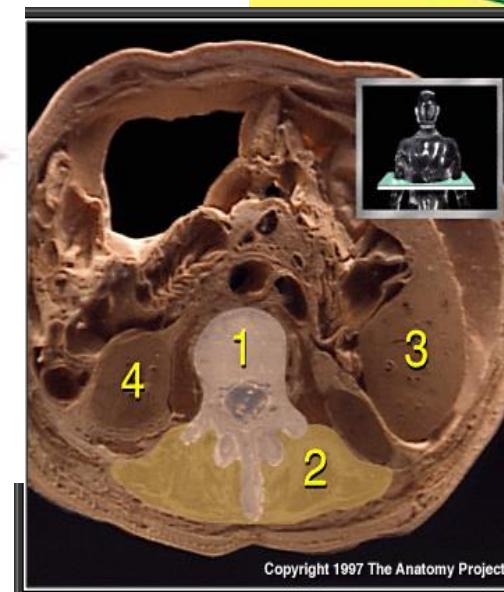
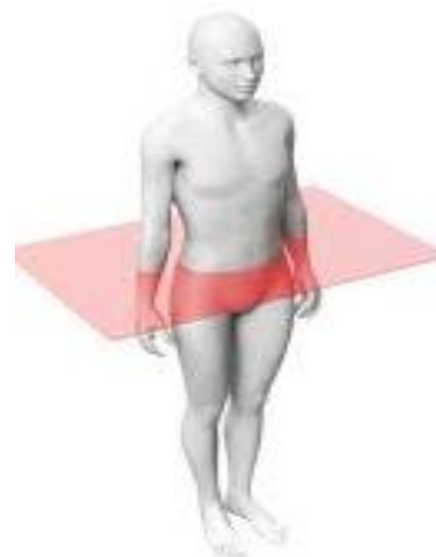
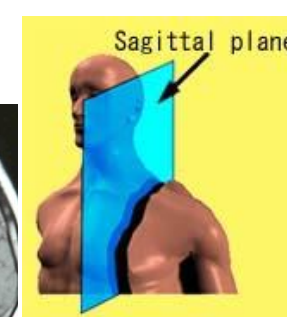
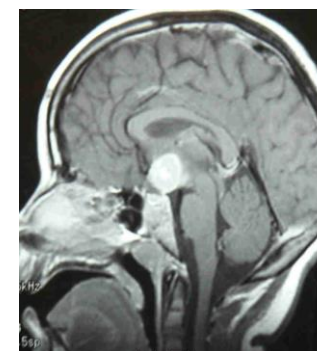
Plane splitting the body into two parts (left and right)
Sagittal section is a cut made longitudinally along the body
If it splits into two equal parts = midsagittal

CORONAL PLANE

Plane which splits body into anterior and posterior section

TRANSVERSE PLANE

Separates body along horizontal plane, also called a cross section
Will divide an organism into superior and inferior parts





VENTRAL

DORSAL



BODY CAVITIES

Opening within body which protects internal organs, and allows transfer of materials/information
two division ;

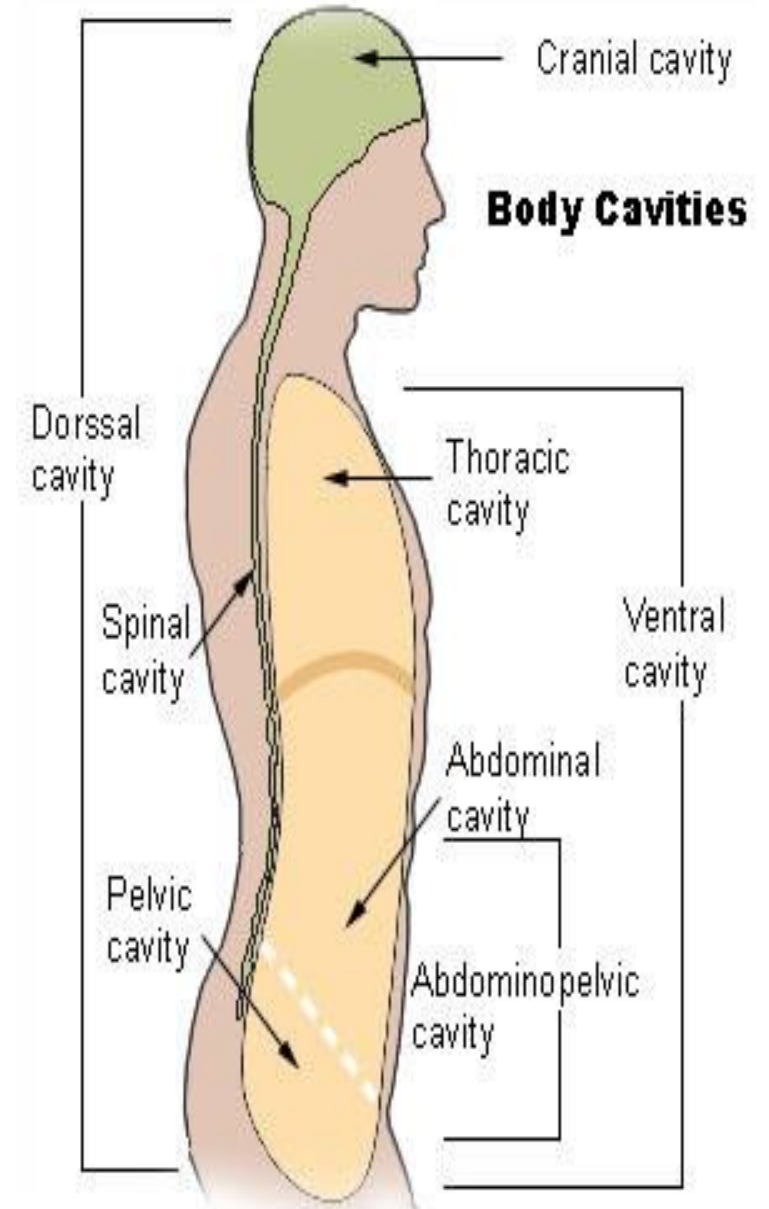
- ❑ Dorsal
- ❑ Ventral

Dorsal Cavities

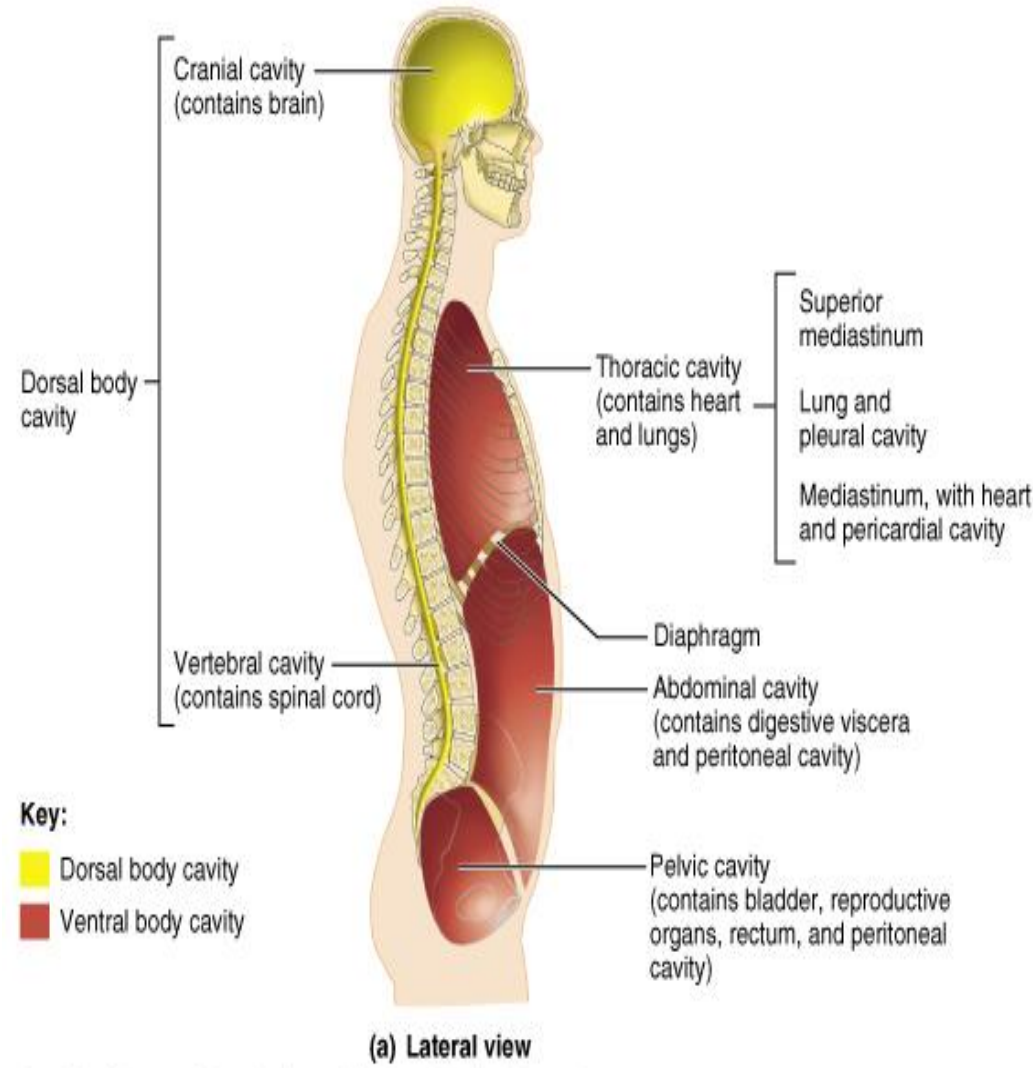
Made up of two smaller cavities

Cranial Cavity – holds and protects **brain**

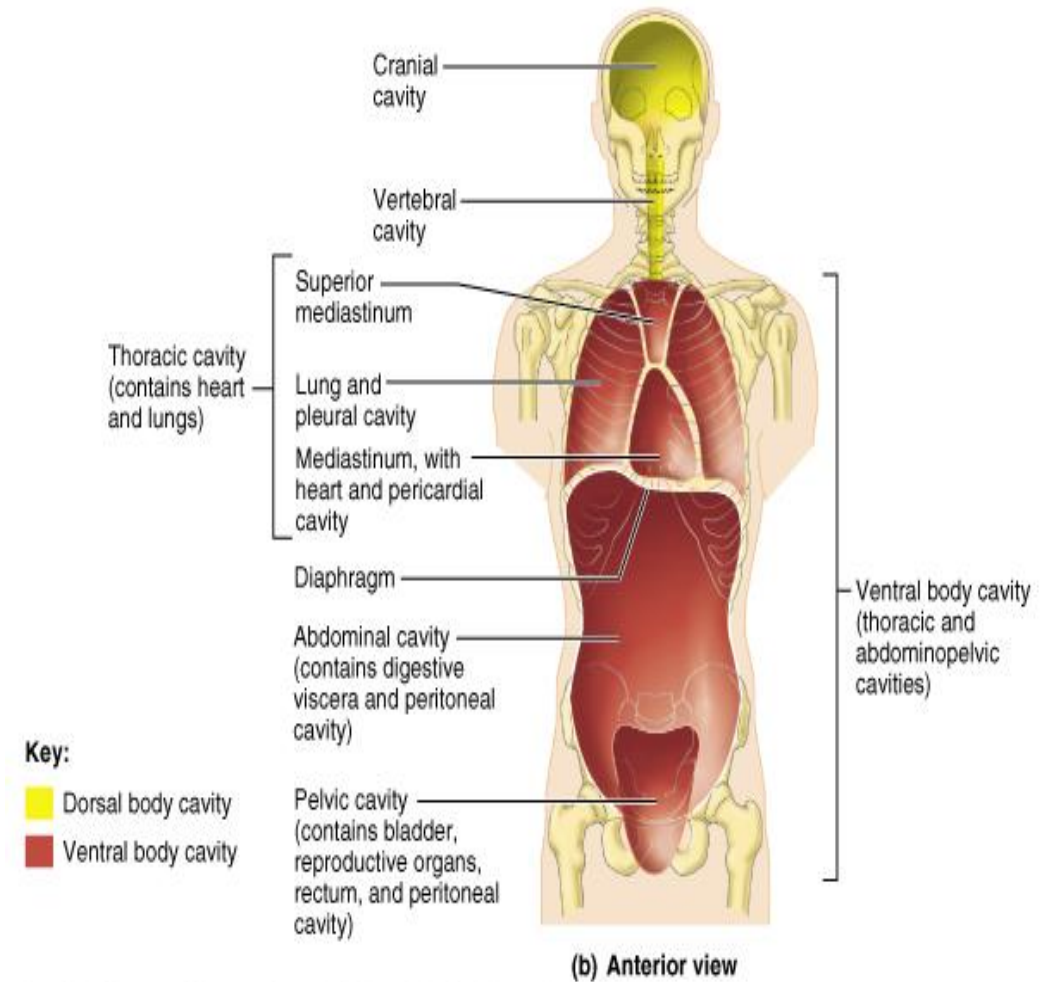
Spinal Cavity – column which runs **through vertebra**
and protects **spinal chord**



Ventral cavities are spaces in the body that are filled with organs and these organs are often surrounded by membranes.



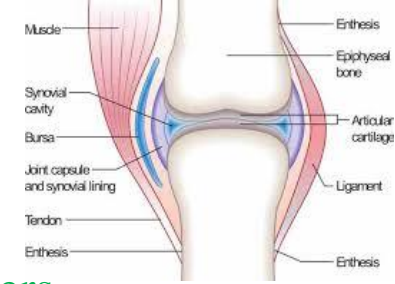
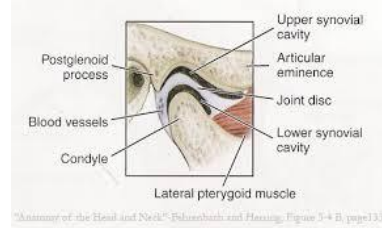
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Other smaller cavities may be created by membranes and are also closed to the environment

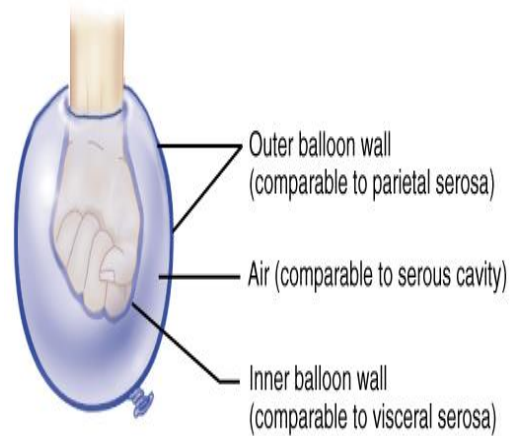
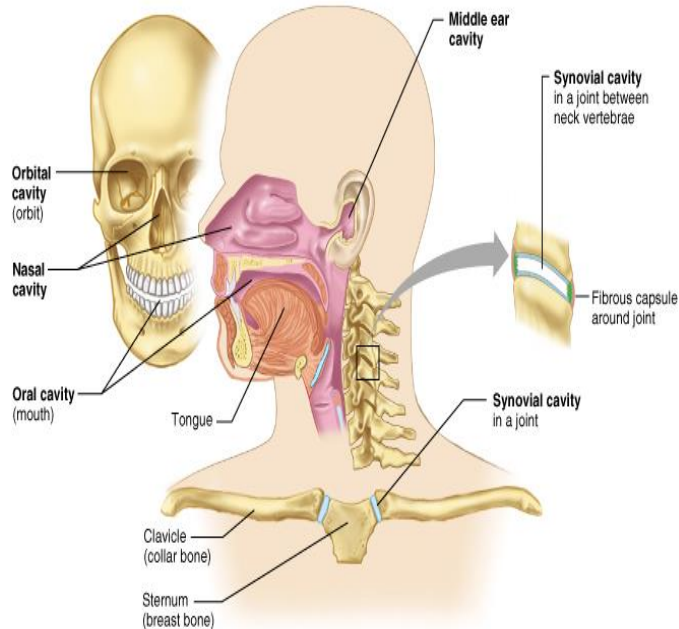
(a) **Synovial cavities**- formed by fibrous layers they **surround joints** and create lubricating fluids to reduce friction



(b) **Serous cavities**- formed by serous membranes (serosa) that **surround organs and contain two membrane layers**

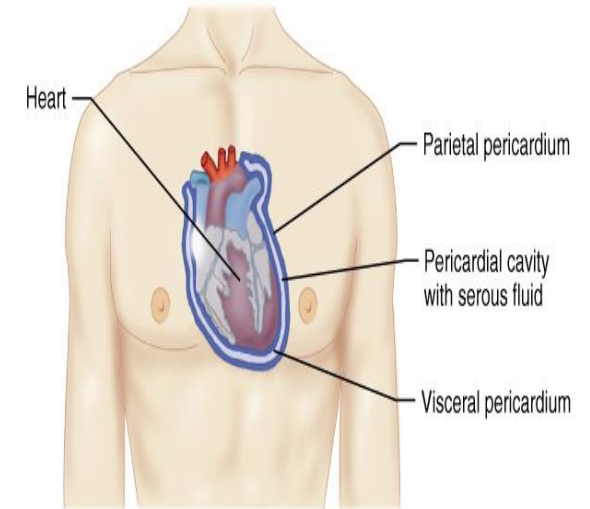
1. **parietal serosa**- membrane layer that **forms the outer part** of the cavity
2. **visceral serosa**- membrane layer that **forms the inner part** of the cavity and is closer to the organ (viscera)

Some cavities are smaller and open to the outside environment: nasal, oral, orbital (eye), ear cavities



(a)

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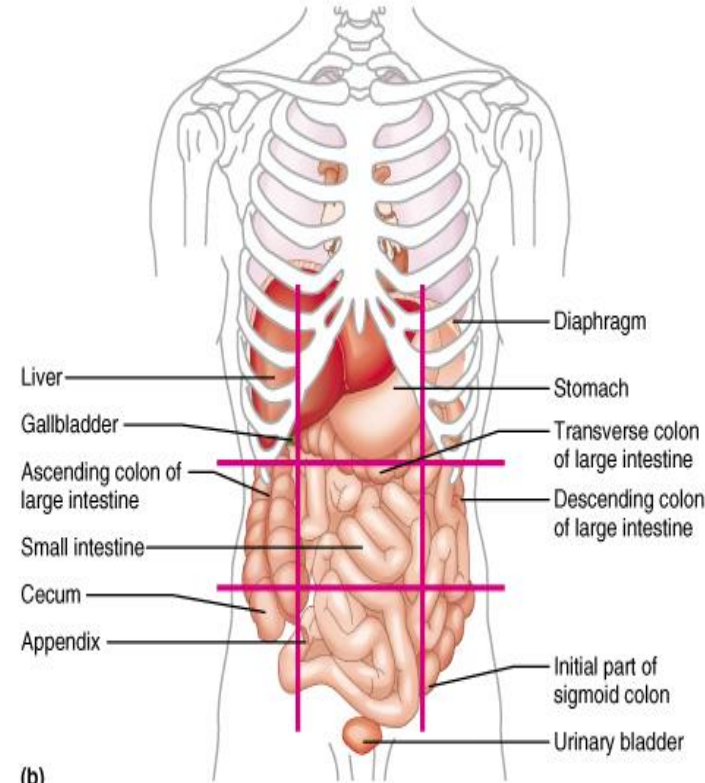
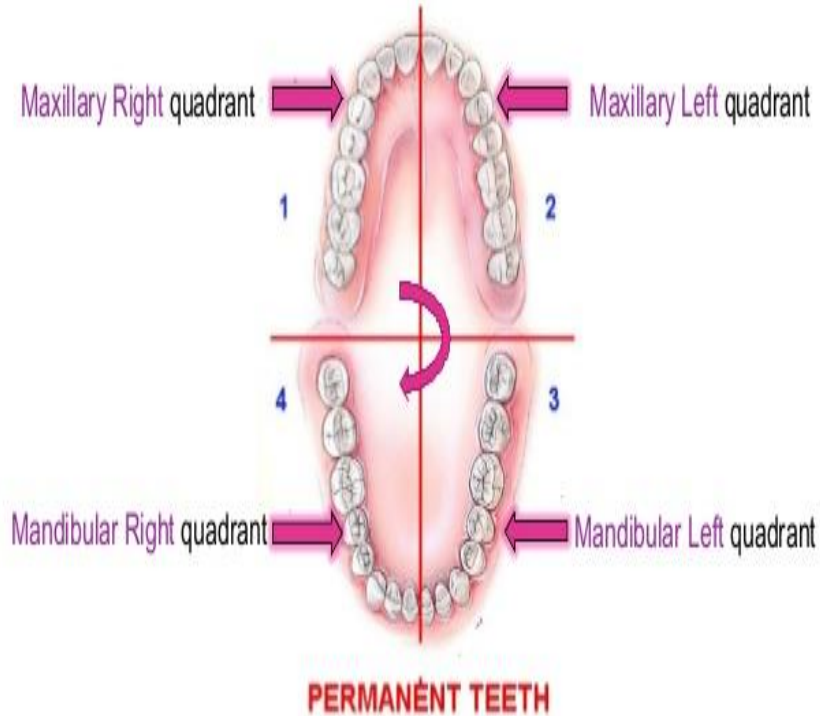


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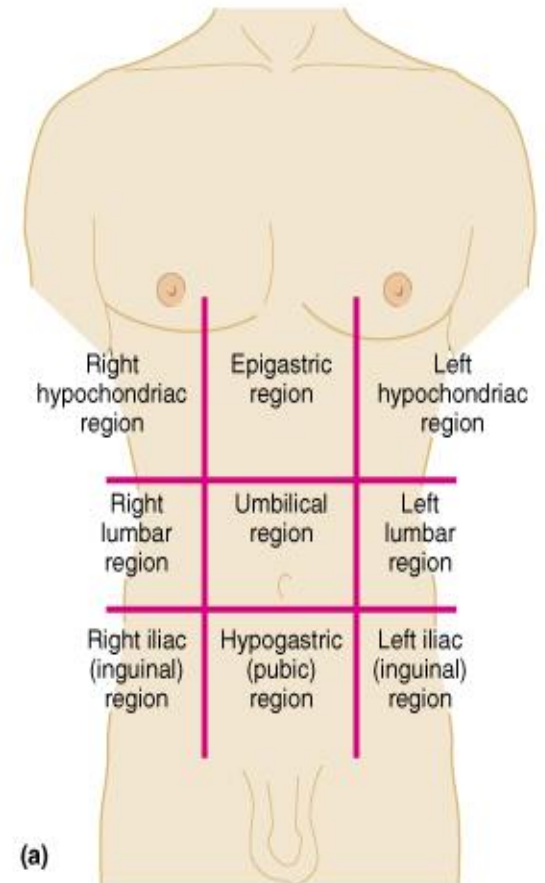
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BODY QUADRANTS AND REGIONS.

To facility its study, the **abdominopelvic region** can also be **divided into different regions and quadrants**. There are **four quadrants** and **nine regions**. it is essential for those going into the health professions.

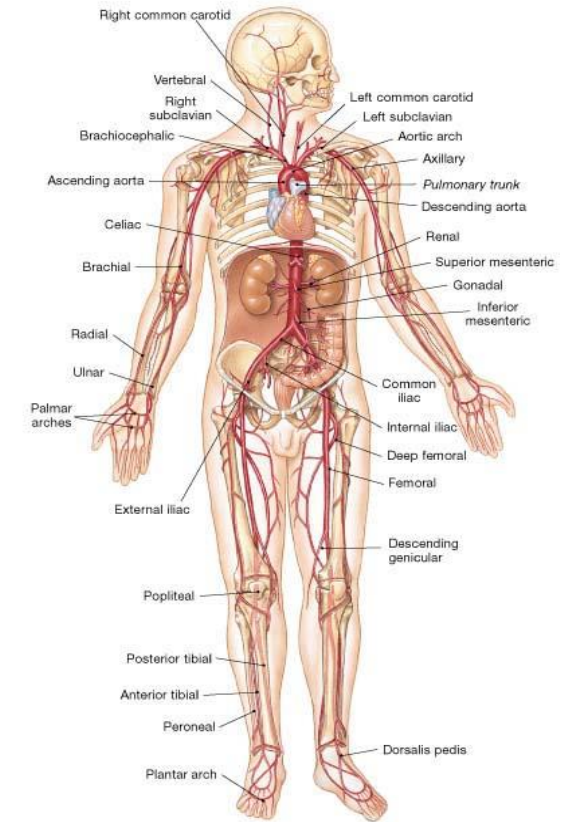
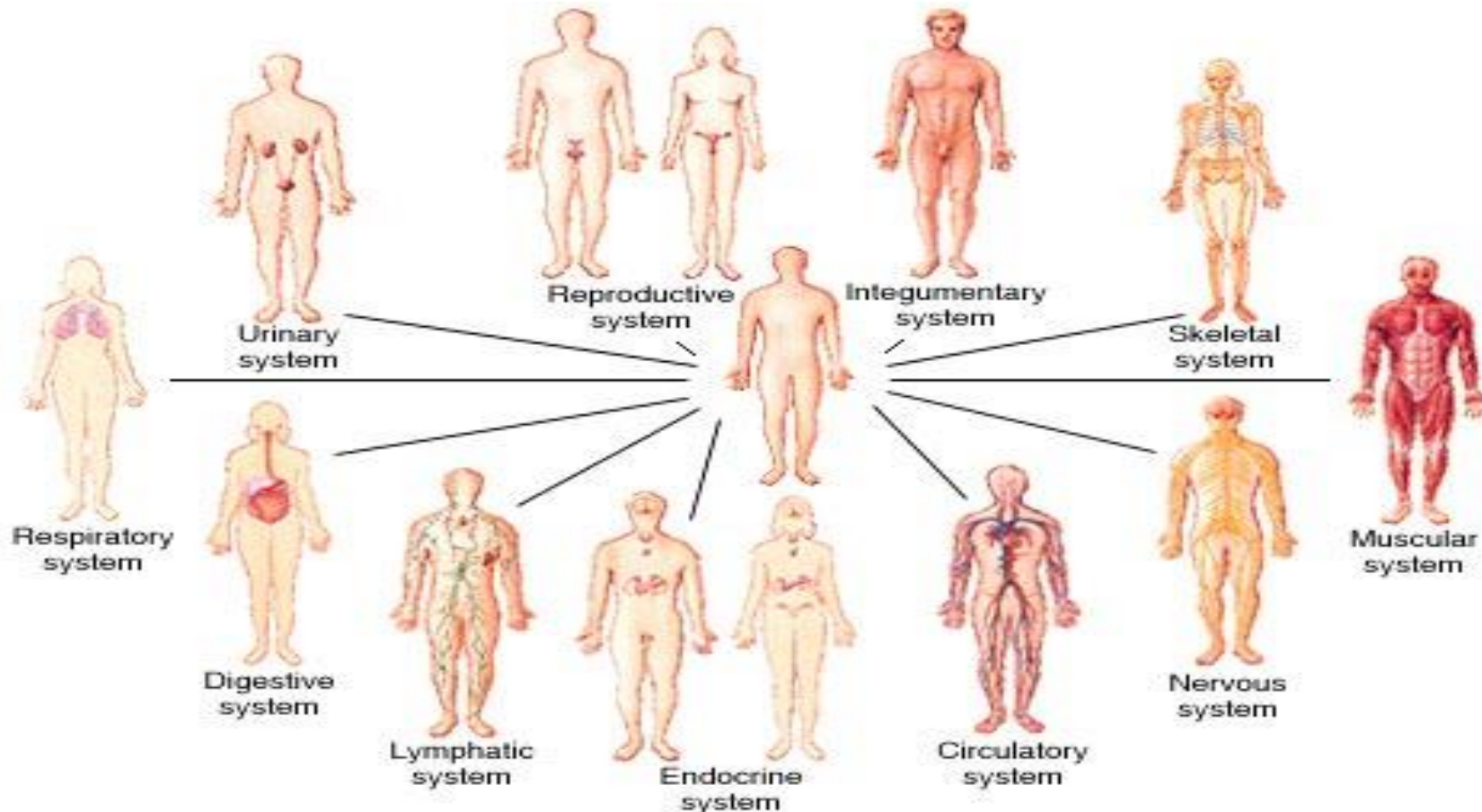


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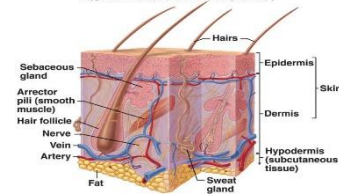
Systemic anatomy is the study of the **structure of organ systems**, such as the skeletal system or the muscular system. For **example**, the heart, blood, and blood vessels form the **cardiovascular system**, which distributes oxygen and nutrients throughout the body.



• **FIGURE 21-22** An Overview of the Systemic Arterial System

BODY SYSTEMS

- Integumentary

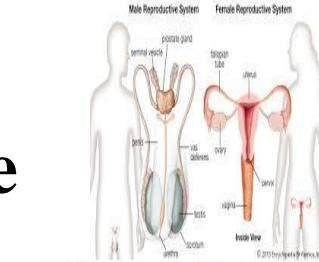


- Circulatory



- Respiratory

- Reproductive

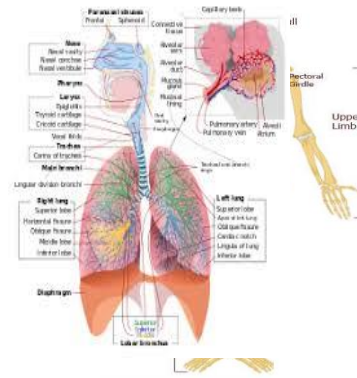


- Muscular

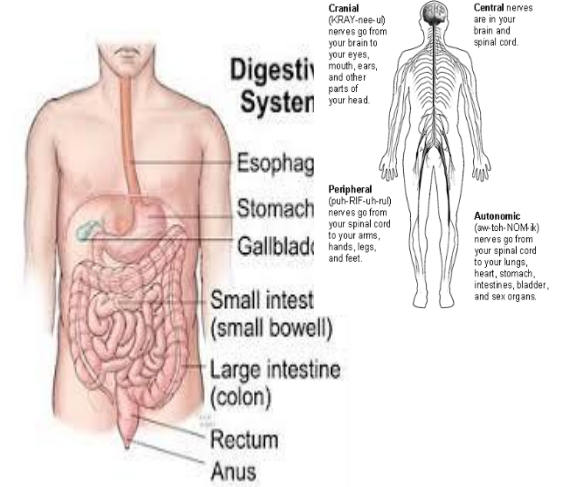


- Lymphatic

Skeletal



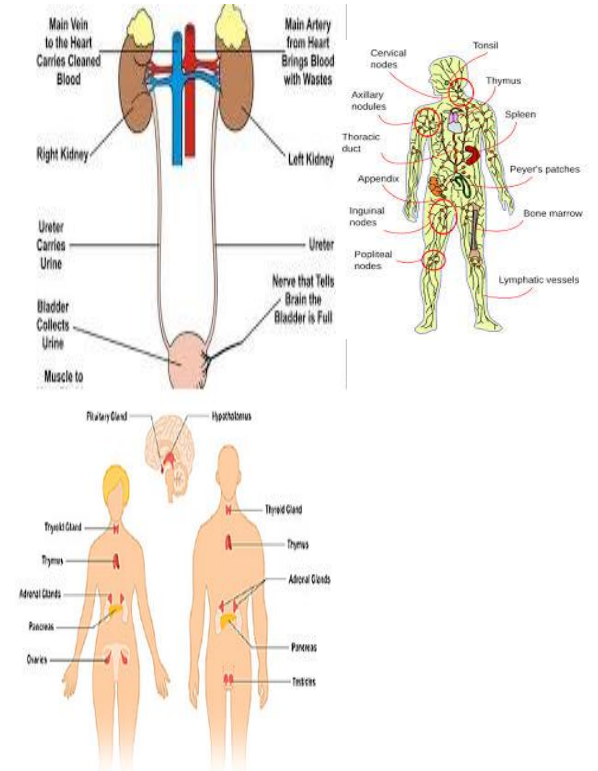
Digestive



Urinary

Nervous

Endocrine



BODY SYSTEMS AND FUNCTION:

There are 11 systems in the body,

Integumentary system (skin, hair, nails) Forms the external body covering and protects deeper tissues from injury. Houses cutaneous receptors, sweat glands, oil glands, and synthesizes vitamin D.

Skeletal system (bones, joints) Supports and protects the body's organs. Provides a framework muscles use (movement). Bones also store minerals and create blood cells.

Muscular system (skeletal muscles) Maintains posture and produces movement (locomotion). Produces heat.

Lymphatic system (red bone marrow, thymus, lymphatic vessels, thoracic duct, spleen, lymph nodes) Houses white blood cells (lymphocytes) involved in immunity. Returns leaked fluid from blood vessels to the blood and disposes debris within the lymphatic stream.

Respiratory system (nasal cavity, pharynx, larynx, trachea, bronchus, lung) Removes carbon dioxide and continually supplies blood with oxygen. Gaseous exchanges occur in the respiratory system (lungs).

Circulatory (Cardiovascular) System: Carries blood and nutrients to the cells of the body, Carries waste away from the cells, such as carbon dioxide. Main Parts:

Heart ,Blood (made up of plasma, red blood cells, white blood cells & platelets),Veins

Arteries

Excretory System: Removes wastes from blood, Removes harmful substances from blood

Regulates body fluids . Main Parts ,Kidneys ,Urinary bladder

Reproductive System: Produce offspring ,Males- make sperm, Females- make eggs

Digestive system (oral cavity, esophagus, liver, stomach, small intestine, large intestine, rectum, anus) Breaks down food to be absorbed and eliminates indigestible waste.

Nervous system (brain, spinal cord, nerves) Control system of the body, responds to internal and external changes, activates muscles and glands.

Endocrine system (pineal gland, pituitary gland, thyroid gland, thymus, adrenal gland, pancreas, ovary, testis) Glands from the endocrine system secrete hormones that regulate many processes like growth, metabolism, and reproduction.

