Lec one : Introduction to anatomy and human body , level of organization , anatomical position , body regions and cavities, body planes and sections, directional terms

What is anatomy?

 Anatomy includes those structures that can be seen grossly (without the aid of magnification) and microscopically (with the aid of magnification).

* Gross or macroscopic anatomy-that is, the study of structures that can be seen without using a microscopic.
* Microscopic anatomy also called histology is the study of cells and tissues using a microscope

Anatomy forms the basis for the practice of medicine. Anatomy leads the physician toward an understanding of patient's disease, whether he or she is carrying out a physical examination or using the most advanced imaging techniques. Anatomy is also important for dentists, chiro practors, physical therapists, and all others involved in any aspect of patient treatment that begins with an analysis of clinical signs. The ability to interpret a clinical observation correctly is therefore the endpoint of a sound anatomical understanding

How can gross anatomy be studied?

The term anatomy is derived from the Greek word temnein

meaning "to cut .

" Clearly, therefore, the study of anatomy is linked, at its root, to dissection, although dissection of cadavers by students is now augmented, or even in some cases replaced, by viewing prosected (previously dissected) material and plastic models, or using computer teaching modules and other learning aids

Anatomy can be studied following either a regional or a

systemic approach

. With a regional approach, each region of the body is studied separately and all aspects of that region are studied at the same time. For example, if the thorax is to be studied, all of its structures are examined

This includes the vasculature, the nerves, the bones the muscles, and all other structures and organs located in the region of the body defined as the thorax. After studying this region, the other regions of the body (i.e. , the abdomen, pelvis, lower limb, upper limb, back, head, and neck)are studied in a similar fashion

• In contrast, in a systemic approach, each system of the body is studied and followed throughout the entire body. For example, a study of the cardiovascular system looks at the heart and all of the blood vessels in the body When this is completed, the nervous system (brain spinal cord, and all the nerves) might be examined in detail. This approach continues for the whole body until every system, including the nervous, skeletal, muscular

gastrointestinal, respiratory, lymphatic, and reproduce tive systems, has been studied

Each of these approaches has benefits and deficiencies?

The regional approach works very well if the anatomy course involves cadaver dissection but falls short when it comes to understanding the continuity of an entire system throughout the body.

Similarly, the systemic approach fosters an understanding of an entire system throughout the body, but it is very difficult to coordinate this directly with a cadaver dissection or to acquire sufficient detail

Important anatomical terms

**The anatomical position**

The anatomical position is the standard reference position of the body used to describe the location of structures .

The body is in the anatomical position when standing upright with feet together, hands by the side and face looking forward. The mouth is closed and the facial expression is neutral. The rim of bone under the eyes is in the same horizontal plane as the top of the opening to the ear, and the eyes are open and focused on something in the distance. The palms of the hands face forward with the fingers straight and together and with the pad of the thumb turned 90° to the pads of the fingers. The toes point Forward

**Anatomical planes**

Three major groups of planes pass through the body in the anatomical position

1. Coronal planes are oriented vertically and divide the body into anterior and posterior parts.
2. Sagittal planes also are oriented vertically but are at right angles to the coronal planes and divide the body into right and left parts. The plane that passes through the center of the body dividing it into equal right and left halves is termed the median sagittal plane.
3. Transverse, horizontal, or axial planes divide the body into superior and inferior parts.

**Terms to describe location**

Three major pairs of terms are used to describe the location of structures relative to the body as a whole or to other structures.

1. Anterior (ventral) and posterior (dorsal)
2. Medial and lateral,
3. Superior and inferior

• 1. Anterior (or ventral) and posterior (or dorsal)

describe the position of structures relative to the "front"

 and "back" of the body. For example, the nose is an

anterior (ventral) structure, whereas the vertebral column is a posterior (dorsal) structure. Also, the nose is anterior to the ears and the vertebral column is pos terior to the sternum.

Medial and lateral describe the position of structures 2.

 relative to the median sagittal plane and the sides of

the body. For example, the thumb is lateral to the little finger. The nose is in the median sagittal plane and is medial to the eyes, which are in turn medial to the external ears.

3. Superior and inferior describe structures in reference to the vertical axis of the body. For example, the head is superior to the shoulders and the knee joint is inferior to the hip joint.

**Other terms used to describe positions include proximal**

**and distal, cranial and caudal, and rostral**

**Proximal and distal are** used with reference to being closer to or farther from a structure's origin, particulary in the limbs.. For example, the hand is distal to the elbow joint. The glenohumeral joint is proximal to theelbow joint.

These terms are also used to describe he relative positions of branches along the course of linear structures, such as airways, vessels, and nerves For example, distal branches occur farther away toward the ends of the system, whereas proximal branches

occur closer to and toward the origin of the system.

 **Cranial (toward the head) and caudal (toward the tail)**

are sometimes used instead of superior and inferior respectively.

**Rostral is used**, particularly in the head, to describe the position of a structure with reference to the nose. For example, the forebrain is rostral to the hindbrain

**Superficial and deep**

Two other terms used to describe the position of structures

in the body are superficial and deep.

These terms are used to describe the relative positions of two structures with respect to the surface of the body. For example, the sternum is superficial to the heart, and the stomach is deep

to the abdominal wall

Superficial and deep can also be used in a more absolute

fashion to define two major regions of the body.

The superficial region of the body is external to the outer layer of deep fascia.

Deep structures are enclosed by this layer.

 Structures in the superficial region of the body include the

skin, superficial fascia, and mammary glands.

Deep structures include most skeletal muscles and viscera. Superficial wounds are external to the outer layer of deep fascia

whereas deep wounds penetrate through it.