## **Chapter 2**

The Human Body in Health and Disease

## **Anatomic Reference Systems**

Describe the location and functions of body parts using:

- Body planes
- Body directions

- Body cavities
- Structural units
- Anatomy is the study of the structures of the body
- **Physiology** is the study of the functions of these structures
- Descriptions of the body are based on the anatomic position standing up, facing forward, arms at sides and palms forward.

## **Body Planes**

#### Ventral Planes – an up and down line



## **Body Planes**

# Horizontal Planes – a flat crosswise line like the horizon

#### **Transverse plane** – also

known as a horizontal plane, cuts the body into top and bottom halves (does not have to be equal)



## **Body Directions**

Body Directions	
<b>Ventral</b> (ventr; -al) refers to the front (or belly) side of the body or organ.	<b>Dorsal</b> (dors; -al)refers to the back of the body or organ.
<b>Anterior</b> (anter; -ior) means situated in the front. Also means forward part of organ.	<b>Posterior</b> (poster; -ior) means situated in the back. Also means the back part of the organ.
<b>Superior</b> means uppermost, above or toward head.	<b>Inferior</b> means lowermost, below or towards the feet.
<b>Cephalic</b> (cephal; -ic) means towards the head.	<b>Caudal</b> (caud; -al) means towards the lower part of the body.
<b>Proximal</b> means situated nearest the midline or beginning of a structure.	<b>Distal</b> means situated farthest from the midline or end of a structure.
<b>Medial</b> means the direction toward or nearer the midline.	Lateral means the direction toward or nearer the side, away from midline.

## **Body Directions**



## **Major Body Cavities**

**Dorsal Cavity** 

- Cranial (crani; -al) Cavity is located within the skull
- Spinal Cavity is located within the spinal column

Ventral Cavity has 3 parts and contains many of the organs that maintain homeostasis (constant internal environment)

- Thoracic (thorac; -ic) Cavity or chest cavity
- Abdominal (abdomin; -al) Cavity or abdomen
- Pelvic Cavity is the space formed by the pelvic bones.

## **Major Body Cavities**



#### Quadrants of the Abdomen



#### **Regions of the Thorax and Abdomen**



## Peritoneum

Membrane that protects and supports the organs located in the abdominal cavity

- Periton = peritoneum
  - parietal peritoneum
  - visceral peritoneum
  - mesentery
  - $\circ$  retroperitoneal
  - Peritonitis
  - Ascites

### Laparoscopic Procedures

Is the visual examination of the interior of the abdomen with the use of a laparoscope (lapar/o; - scope)

## Cytology

The study of the formation, structure, and function of cells, including: (cyt; -ology)

- Chromosomes 23 pairs
- DNA 2 long, coiled molecules make up chromosomes. Contain (functional units of heredity).
- Genetics (gene; -tics) is the study of how genes are transferred from parents to child.



## **Genetic Disorders**

Are diseases or conditions caused by a defective gene.

- Cystic Fibrosis
- Down Syndrome (Trisomy 21)
- Hemophilia
- Huntington's Disease (HD)/Huntington's Chorea (HC)
- Muscular Dystrophy
- Phenylketonuria
- Sickle Cell Anemia
- Tay-Sachs Disease

## **Congenital Disorders**

Is an abnormal condition that exists as the time of birth

- <u>Developmental Disorders</u>: results from an anomaly or malformation
- <u>Prenatal Influences</u>: mother's health and care she receives before delivery
- <u>Birth Injuries</u>: congenital disorders that were not present before the events surrounding the time of birth

## Histology

The study of tissues, which are composed of cells that join together to perform specific functions, including:

\*Stem Cells: cells with the ability to divide without limit and to give rise to specialized cells

- Epithelial Tissues protective covering for all internal and external surfaces of the body. (epithelium and endothelium)
- Connective Tissues support and connect organs and other body tissues. (dense connective tissue, Adipose (adip; -ose), Loose Connective Tissue, Liquid Connective Tissue
- Muscle Tissue contains cell material with the specialized ability to contract and relax
- Nerve Tissue contains cells with the specialized ability to react
  to stimuli and conduct electrical impulses.

## **Pathology of Tissue Formation**

Aplasia (a-; -plasia) Hypoplasia Hyperplasia Dysplasia Anaplasia

### Glands

Specialized cells that secrete material used elsewhere in the body, including:

- Exocrine Glands secrete their substances into ducts (sweat)
- Endocrine Glands do not have ducts, they flow directly into the bloodstream.

#### Pathology & Procedures of the Glands

Adenectomy (aden; -ectomy) Adenitis (-itis) Adenoma (-oma) Adenomalacia (-malacia) Adenosclerosis (-sclerosis) Adenosis (-osis)

## **Organ and Body Systems**

Body parts are organized into systems according to function Examples:

- Skeletal System
- Muscular System
- Cardiovascular System



## Pathology

Is the study of structure and functional changes caused by disease (path/o; -pathy)

Etiology – study of the causes of disease (eti-; -ology)

## **Types of Disease**

Infectious Disease: illness caused by a pathogenic organism

Idiopathic Disorder: illness with unknown cause

- Organic Disorder:there are pathologic, physical changes that explain the symptoms being experienced by the patient
- Functional Disorder: no detectable physical changes to explain the symptoms of the patient
- Iatrogenic Illness: side effect from a prescribed medical treatment

Nosocomial Infection: infection aquired in a hospital setting that was not present on admission

## **Disease Transmission**

Communicable or contagious- one person to another Contamination- with an infectious agent Bloodborne-through contact with blood or body fluids. STDs

Airborne-droplet contact. Sneezes/coughs

Water or foodborne illnesses-fecal/oral transmission

## **Outbreaks of Diseases**

- Endemic- ongoing presence of a disease ( common cold)
- Epidemic-sudden widespread outbreak (measles)
- Pandemic-outbreak of disease over large geographic area ( AIDS)