

# Introduction to Human Anatomy & Physiology

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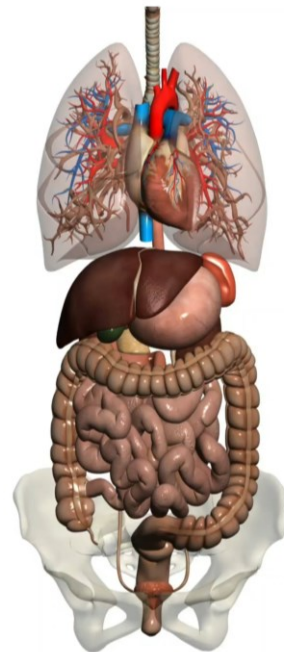
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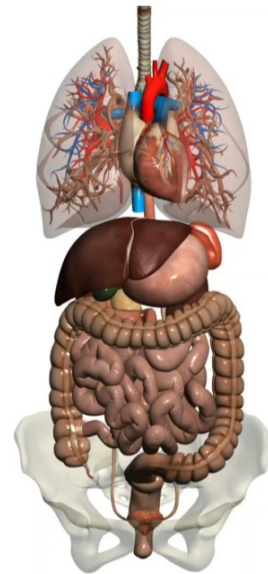
## Contents of the Lecture:

- Introduction, Definitions and Scope
- Level of Structural Organization
- Basic Life Process
- Homeostasis
- Anatomical Terminology



## Introduction to HAP

- World population: 759.43 Crores (2018)
- The human body is rather like a highly technical and sophisticated machine. It operates as a single entity, but is made up of a number of systems that work interdependently and associated with each other.
- Why HAP is important in Biological/Medical/Pharmaceutical Field?**



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## Introduction to HAP

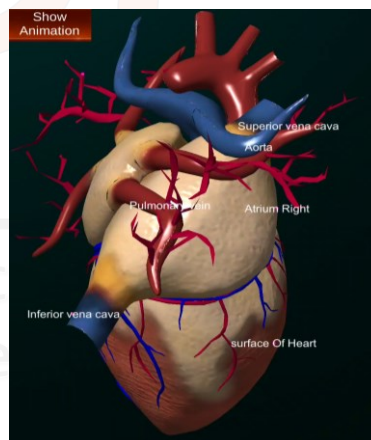
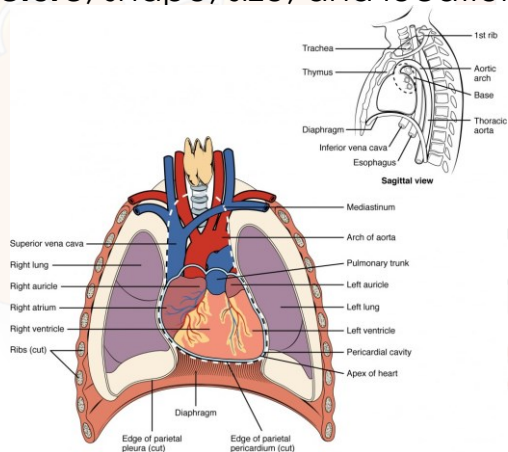
- Why HAP is important in Biological/Medical/Pharmaceutical Field?– To understand the biological system of the body to makes healthy of human beings.**
- Anatomy-Physiology → Pathophysiology → Pharmacology → HEALTHY Life**
- Anatomy-Physiology: Science/Study of Human Body**
- Pathophysiology: Study of Human Physiology in Disease Condition**
- Pharmacology: Science of drugs (Interaction between drugs and living body)**
- Healthy Life- for surviving in Life**

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## Introduction to HAP

### 💡 **Anatomy-Physiology: Science/Study of Human Body**

- 💡 **Human Anatomy:** is the branch of biomedical sciences dealing with the **structure**, shape, size, and location of various parts of the body.

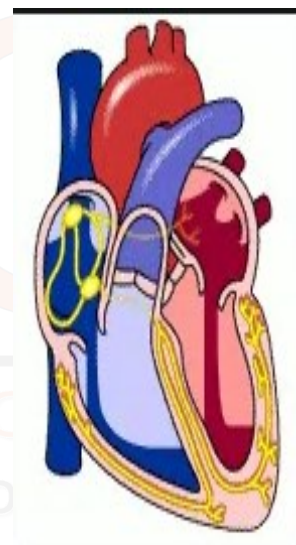
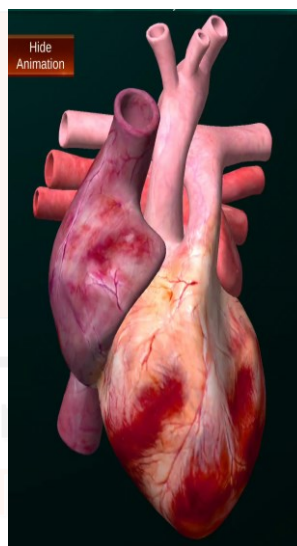


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## Introduction to HAP

### 💡 **Anatomy-Physiology: Science/Study of Human Body**

- 💡 **Human Physiology:** is the branch of biomedical sciences dealing with the normal **functioning** of the various organs in the body. It describes how respective organ works (digests, excretes, breaths, circulates, regulates etc.)

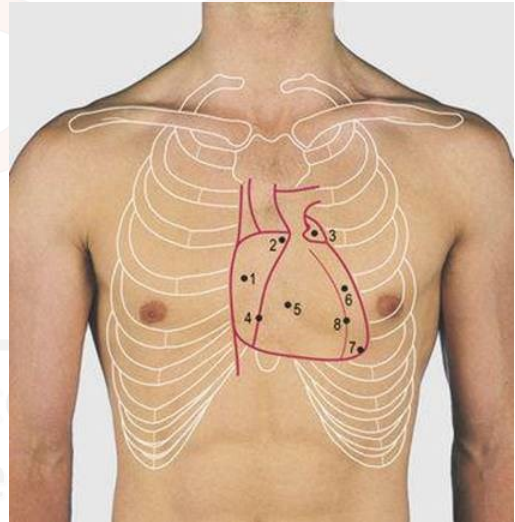


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## Introduction to HAP

### ⚡ SUB DIVISION OF ANATOMY

⚡ **Surface Anatomy** (also called **superficial anatomy** and **visual anatomy**) is the study of form and markings of the body surface, often explored through visualization or palpation (without any “cutting”).



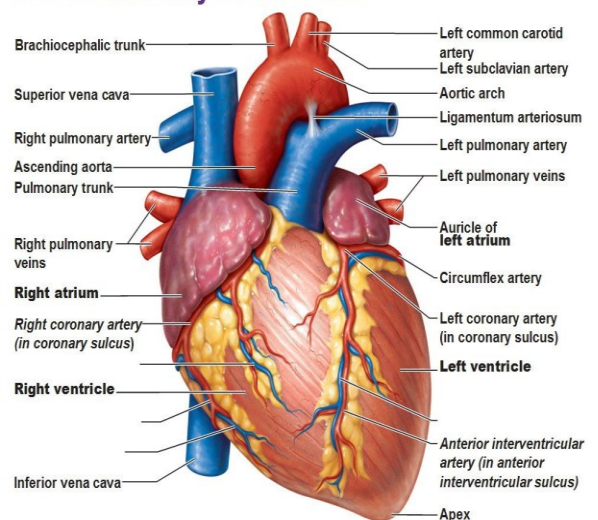
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## Introduction to HAP

### ⚡ SUB DIVISION OF ANATOMY

⚡ **Gross Anatomy** is the study of anatomical structure visible to unaided eye. After making the appropriate surface marking in the prior picture, the gross dissection proceeds through “cutting”

### Gross Anatomy of the Heart Anterior view

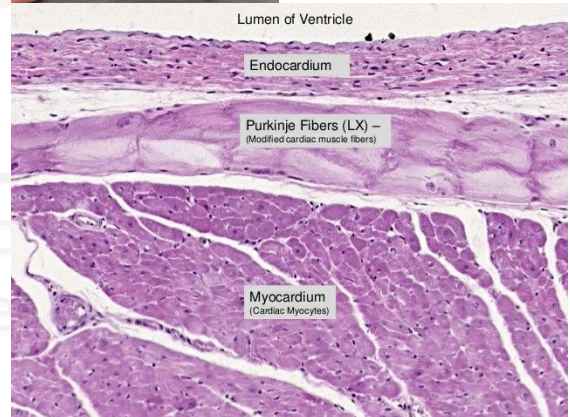


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## Introduction to HAP

### ⚡ SUB DIVISION OF ANATOMY

- ⚡ **Histology** is the study of **tissues**.
- ⚡ **Cytology**, like histology, uses a microscope, but restricts the study to individual **cellular structures**.
- ⚡ **Pathology** is the study of anatomical changes due to **disease**.

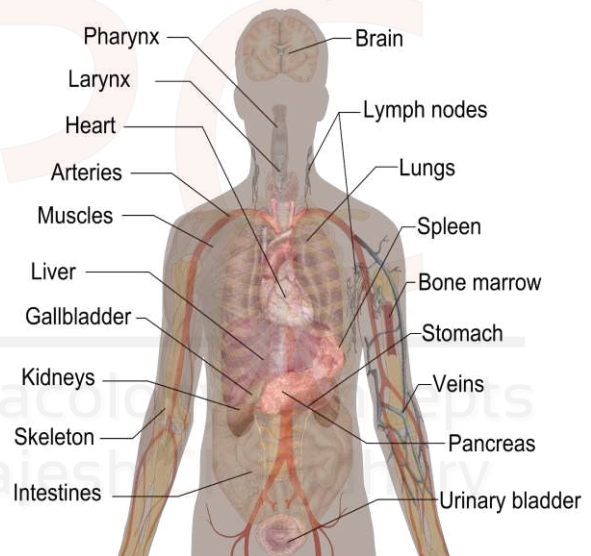


## Introduction to HAP

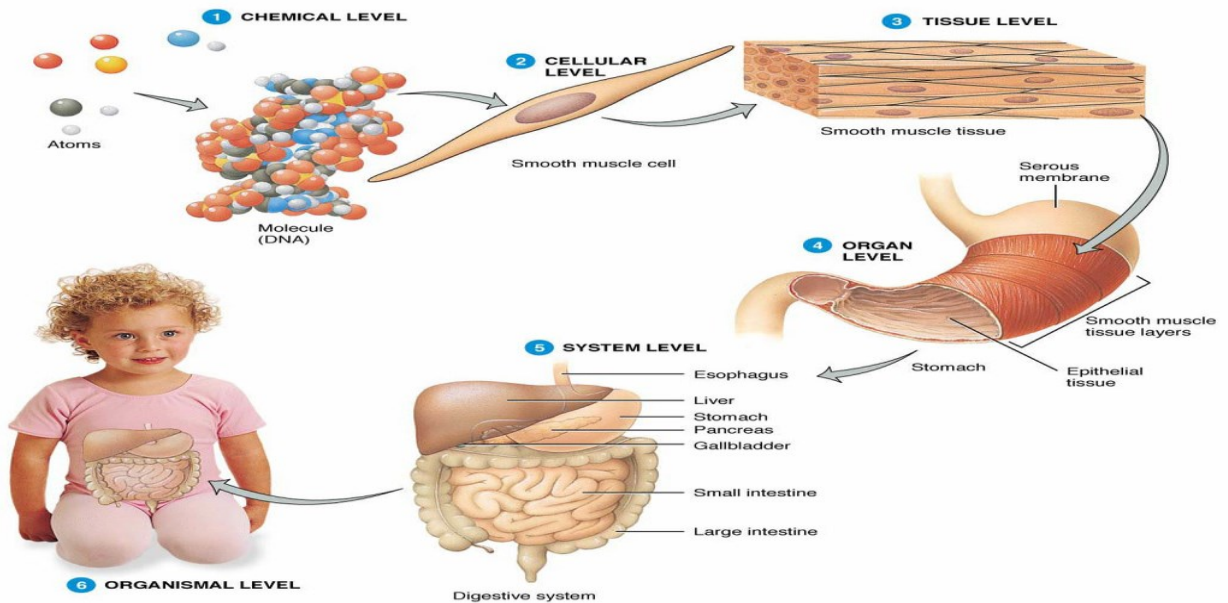
### ⚡ SUB DIVISION OF PHYSIOLOGY

- ⚡ **Pathophysiology** is the study of physiological changes due to **disease**
- ⚡ **Neurophysiology-** functional property of neurons
- ⚡ **Endocrinology-** functional property of Hormone
- ⚡ **Immunology-** Defense system of the body against foreign substance
- ⚡ **Organ Physiology**

### Internal organs



# Level of Organization

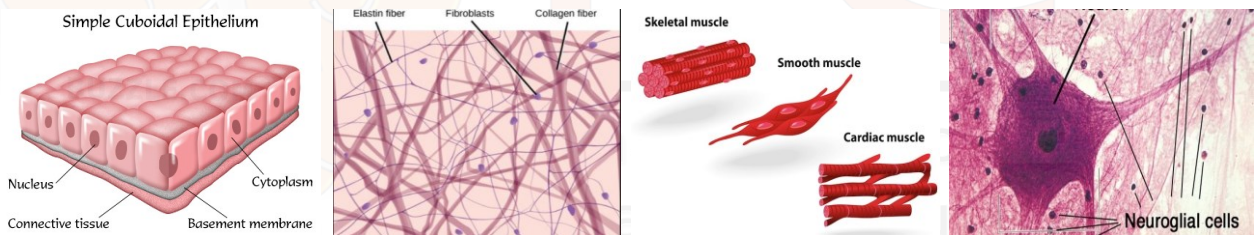


# Level of Organization

**1. Chemical Levels:** Atoms → Molecular Structure (DNA)

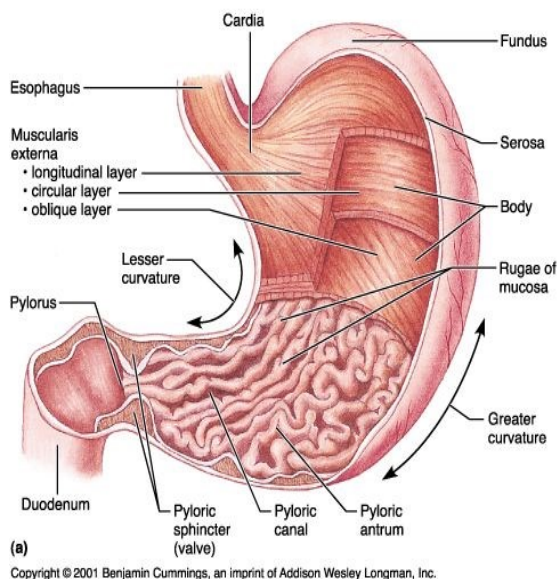
**2. Cellular Level:** Cells are the smallest independent units (structural and Functional unit) of living matter and there are trillions of them within the body.

**3. Tissue level:** **Tissues** are groups of cells that work together to perform a similar function. **e.g., Epithelium, Connective tissue, Muscles, Neurons**



## Level of Organization

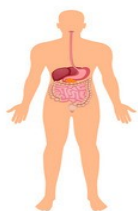
**4. Organ Level: Organs** are structures composed of two or more different types of tissues (all but the simplest of organs have all 4 basic tissues represented.)



## Level of Organization

**4. System Level: Organs** make the system

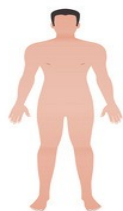
### HUMAN BODY ORGAN SYSTEMS



Digestive System



Muscular System



Integumentary System



Lymphatic System



Endocrine System



Nervous System



Skeletal system



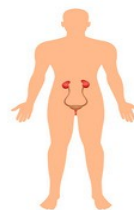
Male Reproductive System



Female Reproductive System



Respiratory system



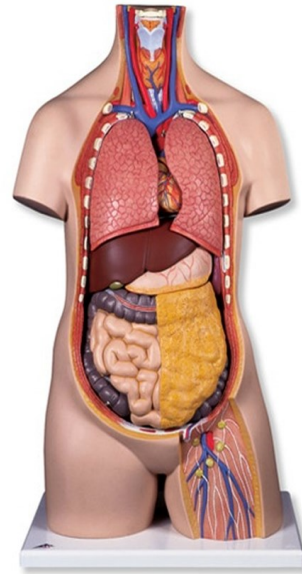
Urinary System



Circulatory system

## Level of Organization

**6. Organismal Level:** An **organism** consists of a collection of organ systems.



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## Basic Life Process

**Six important life processes:**

- 🔦 **Metabolism:** Catabolic & Anabolic Reactions
- 🔦 **Responsiveness:** Response to Internal and External Changes.
- 🔦 **Movement:** Ability to move, contract-relax, & change in posture.
- 🔦 **Growth:** Increase the size of cells/Tissues/Organ (Developments)
- 🔦 **Differentiation:** is the development of a cell from an unspecialized to specialized state
- 🔦 **Reproduction:** Cell division for growth and repair and production of offspring

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# Homeostasis

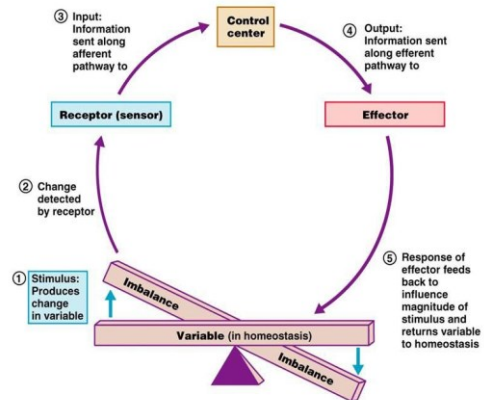
💡 A condition of **equilibrium** (balance) in the body's internal environment. Maintaining the internal environment in steady state

## A. Negative Feedback- oppose

💡 Regulation of BP, HR, Body Temp.  
Blood sugar, etc.

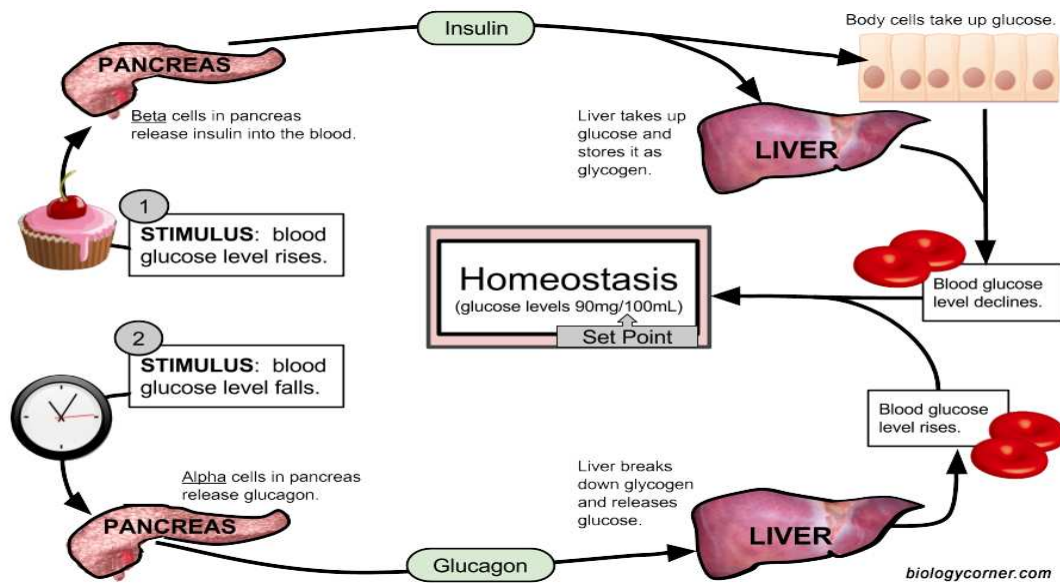
## 2. Positive Feedback: Strengthen

💡 Child Birth and Blood clotting



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# Homeostasis

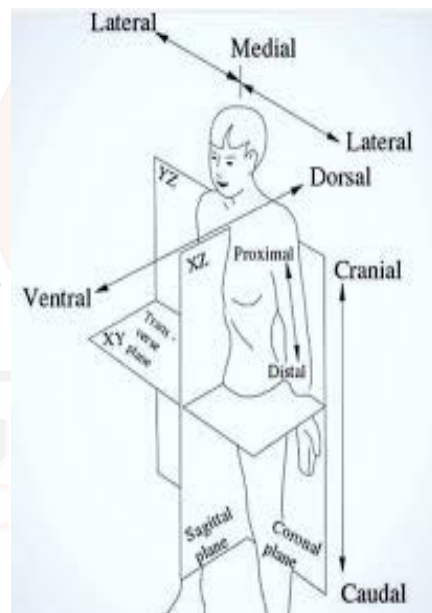


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## Basic Terminology

### Directional term

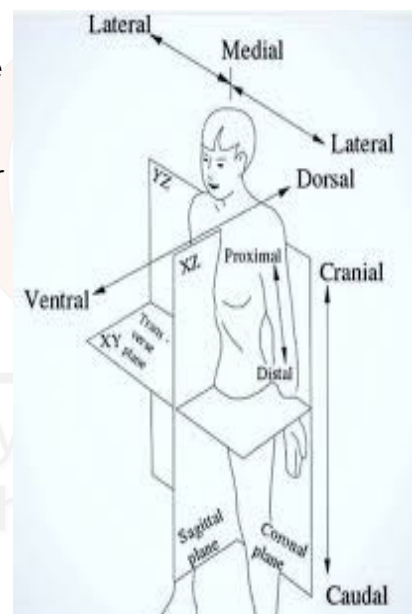
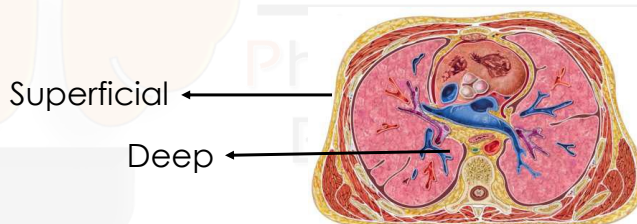
- **Superior/Cranial:** towards the Head; Upper/Top
- **Inferior/Caudal:** away from the head; Lower/Bottom
- **Anterior or ventral** - front; Face side of the body
- **Posterior or dorsal** - back; backward side of the body
- **Medial:** toward the midline of the body
- **Lateral:** away from the midline of the body; Beside.

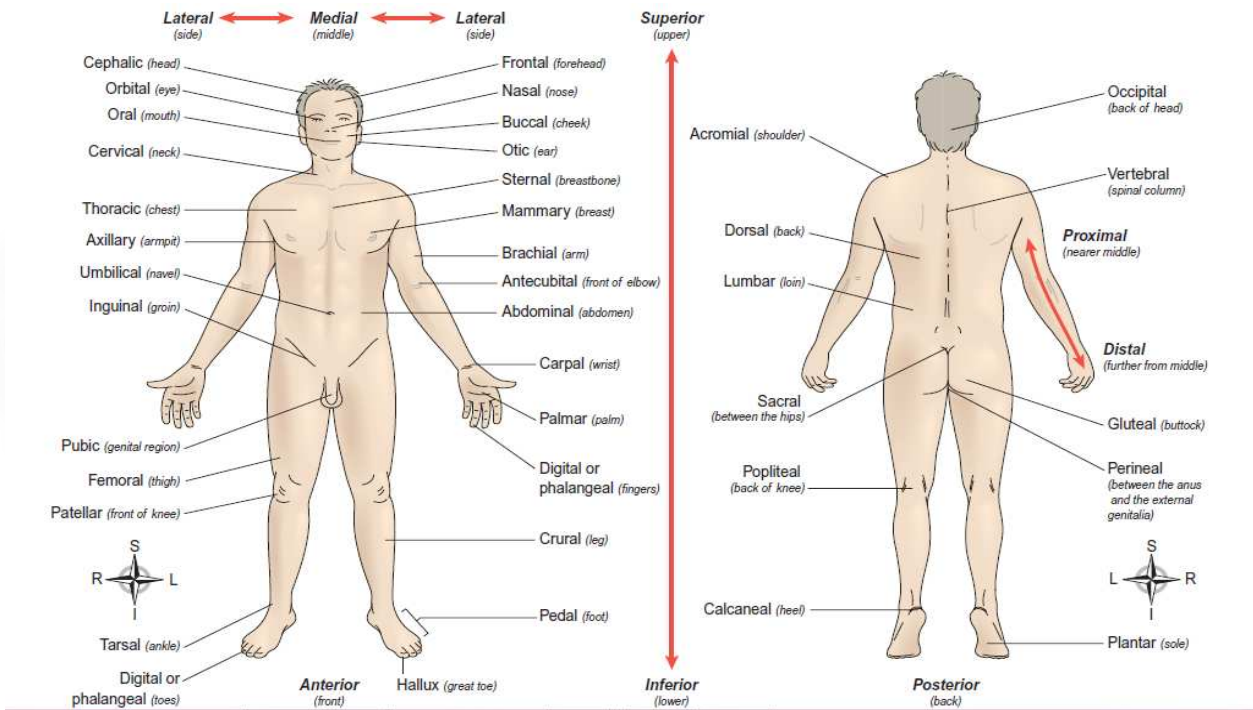


## Basic Terminology

### Directional term

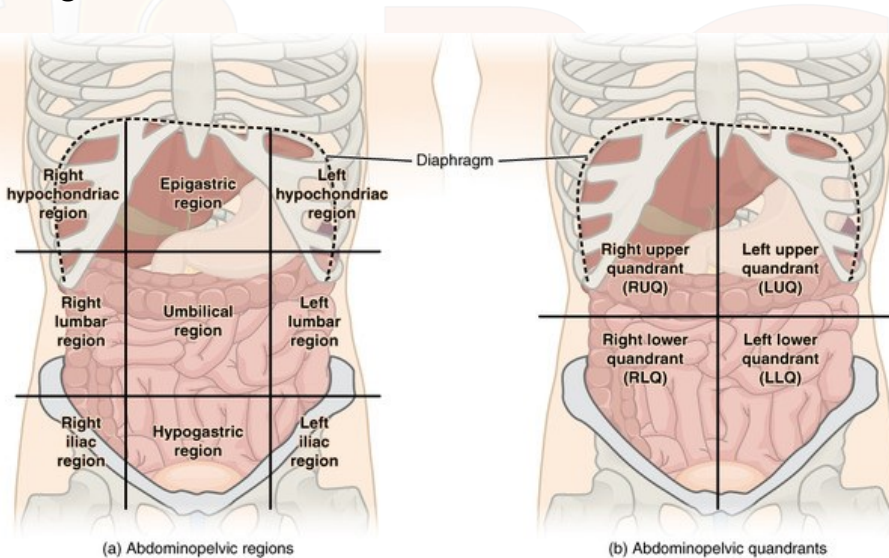
- **Proximal:** toward or nearest the trunk or the point of origin of a part
- **Distal:** away from or farthest from the trunk or the point or origin of a part
- **Superficial:** towards the surface
- **Deep:** towards to core of the body





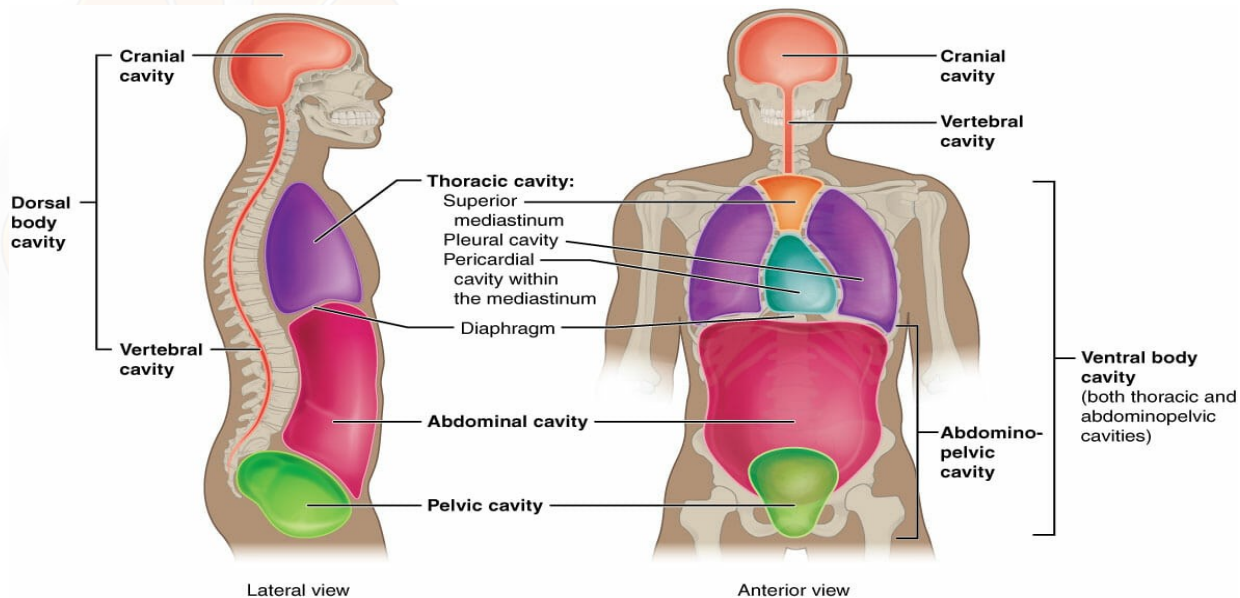
# Basic Terminology

## Abdominal Regions



# Basic Terminology

## Body Cavities



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