

# Introduction to Human Anatomy

## Introduction to Human Anatomy

A concise, organized overview for students beginning their study of the human body.

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## 1. What Is Anatomy?

| Aspect            | Description                                                                                                                                                                                       |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Definition</b> | The scientific study of the shape, size, and relationships of body structures.                                                                                                                    |
| <b>Branches</b>   | <ul style="list-style-type: none"><li>• <b>Gross (macroscopic) anatomy</b> – structures visible to the naked eye.</li><li>• <b>Microscopic anatomy</b> – cells and tissues (histology).</li></ul> |
| <b>Purpose</b>    | Provides the foundation for understanding physiology, pathology, surgery, and all health-related professions.                                                                                     |

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## 2. Levels of Structural Organization

1. **Chemical Level** – atoms & molecules (e.g., water, proteins).
  2. **Cellular Level** – basic unit of life (e.g., neuron, muscle fiber).
  3. **Tissue Level** – groups of similar cells + extracellular matrix.
    - **Epithelial, Connective, Muscle, Nervous** tissues.
  4. **Organ Level** – two or more tissue types performing a specific function (e.g., heart, kidney).
  5. **Organ System Level** – organs that work together (e.g., circulatory system).
  6. **Organismal Level** – the complete human body.
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## 3. Major Body Systems (Overview)

| System               | Primary Organs                    | Main Functions                                             |
|----------------------|-----------------------------------|------------------------------------------------------------|
| <b>Integumentary</b> | Skin, hair, nails, glands         | Protection, temperature regulation, sensation.             |
| <b>Skeletal</b>      | Bones, joints, cartilage          | Support, movement, mineral storage, blood cell production. |
| <b>Muscular</b>      | Skeletal, cardiac, smooth muscles | Body movement, posture, heat production.                   |

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| System           | Primary Organs                                         | Main Functions                                                   |
|------------------|--------------------------------------------------------|------------------------------------------------------------------|
| Nervous          | Brain, spinal cord, peripheral nerves                  | Sensory input, integration, motor output, cognition.             |
| Endocrine        | Glands (pituitary, thyroid, adrenal, etc.)             | Hormone secretion, metabolic regulation.                         |
| Cardiovascular   | Heart, blood vessels                                   | Transport of nutrients, gases, waste; immune defense.            |
| Lymphatic/Immune | Lymph nodes, spleen, thymus                            | Fluid balance, defense against pathogens.                        |
| Respiratory      | Lungs, airways                                         | Gas exchange (O <sub>2</sub> ? CO <sub>2</sub> ).                |
| Digestive        | Mouth, esophagus, stomach, intestines, liver, pancreas | Ingestion, digestion, absorption, waste elimination.             |
| Urinary          | Kidneys, ureters, bladder, urethra                     | Filtration of blood, waste excretion, fluid/electrolyte balance. |
| Reproductive     | Gonads, reproductive tracts                            | Gamete production, hormone secretion, offspring development.     |

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## 4. Anatomical Directional Terms

| Term               | Meaning               | Example                                             |
|--------------------|-----------------------|-----------------------------------------------------|
| Superior (cranial) | Toward the head       | The heart is superior to the stomach.               |
| Inferior (caudal)  | Toward the feet       | The bladder is inferior to the liver.               |
| Anterior (ventral) | Toward the front      | The sternum is anterior to the spine.               |
| Posterior (dorsal) | Toward the back       | The vertebral column is posterior to the esophagus. |
| Medial             | Toward the midline    | The nose is medial to the eyes.                     |
| Lateral            | Away from the midline | The ears are lateral to the nose.                   |
| Proximal           | Near the              |                                                     |