

Introduction to Human Physiology

Key Terms

Anatomy is the science of body structures and the relationships among structures.

Physiology is the science of body functions.

The human body consists of six levels of structural organization: chemical, cellular, tissue, organ, system, and organismal levels.

Cells are the basic structural and functional living units of an organism and the smallest living units in the human body.

Tissues are groups of cells and the materials surrounding them that work together to perform a particular function.

Organs are composed of two or more different types of tissues; they have specific functions and usually have recognizable shapes.

Systems consist of related organs that have a common function.

An **organism** is any living individual.

Homeostasis is a condition of equilibrium in the body's internal environment produced by the interplay of all the body's regulatory processes.

Body fluids are dilute, watery solutions. **Intracellular fluid** is inside cells, and **extracellular fluid** is outside cells.

Interstitial fluid is the ECF that fills spaces between tissue cells, whereas plasma is the ECF within blood vessels.

The components of a feedback system are (1) receptors that monitor changes in a controlled condition and send input to (2) a control center that sets the value at which a controlled condition should be maintained, evaluates the input it receives from receptors, and generates output commands when they are needed, and (3) effectors that receive output from the control center and produce a response (effect) that alters the controlled condition.

If a response reverses the original stimulus, the system is operating by **negative feedback**.

If a response enhances the original stimulus, the system is operating by **positive feedback**.

Body Systems

There are eleven systems of the human organism:

- The integumentary system**
- The skeletal system**
- The muscular system**
- The nervous system**
- The endocrine system**
- The cardiovascular system**
- The lymphatic and immune system**
- The respiratory system**
- The digestive system**
- The urinary system**
- The reproductive system**

Anatomical Planes & Directional Terms

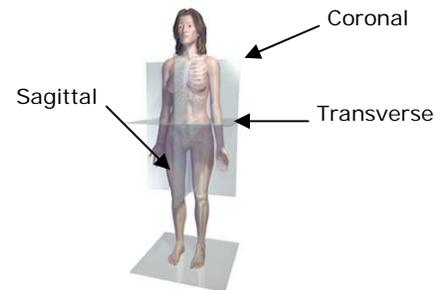
Descriptions of any region of the body assume the body is in **the anatomical position**, in which the subject stands erect facing the observer, with the head level and the eyes facing directly forward. The feet are flat on the floor and directed forward, and the arms are at the sides, with the palms turned forward.

A body lying face down is **prone**, whereas a body lying face up is **supine**.

Coronal Plane- separates the body into front and back halves.

Sagittal Plane- separates the body into left and right halves.

Transverse Plane- separates the body into superior and inferior halves.



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Body Cavities

Spaces in the body that help protect, separate, and support internal organs are called **body cavities**.

The **dorsal** and **ventral cavities** are the two principal body cavities.

The **dorsal cavity** is subdivided into the cranial cavity, which contains the brain, and the vertebral canal, which contains the spinal cord. The **meninges** are protective tissues that line the dorsal cavity.

The **ventral body cavity** is subdivided by the diaphragm into a superior thoracic cavity and an inferior abdominopelvic cavity.

The **viscera** are organs within the ventral body cavity.

The **thoracic cavity** is subdivided into three smaller cavities: a **pericardial cavity**, which contains the heart, and two **pleural cavities**, which contain the lungs.

The central portion of the thoracic cavity is the **mediastinum**. It contains all thoracic viscera except the lungs.

The **abdominopelvic cavity** is divided into a superior abdominal & an inferior pelvic cavity.

Viscera of the abdominal cavity include the stomach, spleen, liver, gallbladder, pancreas, small intestine, and most of the large intestine.

Viscera of the pelvic cavity include the urinary bladder, portions of the large intestine, and internal organs of the reproductive system.

Serosus membranes line the walls of the thoracic and abdominal cavities and cover the organs. They include the **pleura**, associated with the lungs; the **pericardium**, associated with the heart; and the **peritoneum**, associated with the abdominal cavity.

How to Use This Cheat Sheet: These are the keys related this topic. Try to read through it carefully twice then recite it out on a blank sheet of paper. Review it again before the exams.