

Chapter 1

An Introduction to Anatomy and Physiology

PowerPoint® Lecture Slides prepared by Jason LaPres Lone Star College - North Harris

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Structure and Function

- Anatomy
 - Describes the structures of the body
 - What they are made of
 - Where they are located
 - Associated structures
- Physiology
 - Is the study of
 - Functions of anatomical structures
 - Individual and cooperative functions

Anatomy and Physiology Integrated

- Anatomy
 - Gross anatomy, or macroscopic anatomy, examines large, visible structures
 - Surface anatomy: exterior features
 - Regional anatomy: body areas
 - Systemic anatomy: groups of organs working together
 - Developmental anatomy: from conception to death
 - Clinical anatomy: medical specialties

Anatomy and Physiology Integrated

- Anatomy
 - Microscopic anatomy examines cells and molecules
 - Cytology: study of cells and their structures
 - cyt- = cell
 - Histology: study of tissues and their structures

Anatomy and Physiology Integrated

- Physiology
 - Cell physiology: processes within and between cells
 - Special physiology: functions of specific organs
 - Systemic physiology: functions of an organ system
 - Pathological physiology: effects of diseases

Levels of Organization

The Chemical (or Molecular) Level

- Atoms are the smallest chemical units
- Molecules are a group of atoms working together

The Cellular Level

 Cells are a group of atoms, molecules, and organelles working together

The Tissue Level

Tissues are a group of similar cells working together

The Organ Level

 An organ is a group of different tissues working together

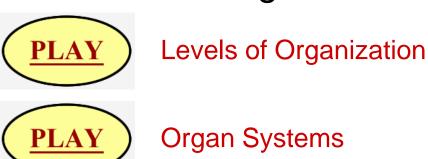
Levels of Organization

The Organ System Level

- Organ systems are a group of organs working together
- Humans have 11 organ systems

The Organism Level

A human is an organism



Anatomical Terminology

- Superficial Anatomy
 - Anatomical position: hands at sides, palms forward
 - Supine: lying down, face up
 - Prone: lying down, face down

Anatomical Terminology

- Superficial Anatomy
 - Anatomical Landmarks
 - References to palpable structures
 - Anatomical Regions
 - Body regions
 - Abdominopelvic quadrants
 - Abdominopelvic regions
 - Anatomical Directions
 - Reference terms based on subject

Anatomical Terminology

- Sectional Anatomy
 - Planes and sections
 - Plane: a three-dimensional axis
 - Section: a slice parallel to a plane
 - Used to visualize internal organization and structure
 - Important in radiological techniques
 - MRI
 - PET
 - CT

- Body cavities have two essential functions
 - Protect organs from accidental shocks
 - Permit changes in size and shape of internal organs
- Ventral body cavity (coelom)
 - Divided by the diaphragm:
 - Thoracic cavity
 - Abdominopelvic cavity

The Thoracic Cavity

- Separated into regions
 - Right and left pleural cavities
 - contain right and left lungs

Mediastinum

- upper portion filled with blood vessels, trachea, esophagus, and thymus
- lower portion contains pericardial cavity
 - » the heart is located within the pericardial cavity

- The Abdominopelvic Cavity
 - Peritoneal cavity chamber within abdominopelvic cavity
 - Parietal peritoneum lines the internal body wall
 - Visceral peritoneum covers the organs

The Abdominopelvic Cavity

- Abdominal cavity superior portion
 - Diaphragm to top of pelvic bones
 - Contains digestive organs
 - Retroperitoneal space
 - Area posterior to peritoneum and anterior to muscular body wall
 - Contains pancreas, kidneys, ureters, and parts of the digestive tract

- The Abdominopelvic Cavity
 - Pelvic cavity inferior portion
 - Within pelvic bones
 - Contains reproductive organs, rectum, and bladder