

INTRODUCTION TO ANATOMY
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OVERVIEW OF ANATOMY

- Anatomical terminology from ancient Greek and Latin
- Branches of anatomy
 - Gross anatomy
 - Microscopic anatomy
 - Cytology
 - Histology
 - Developmental anatomy
 - Embryology
 - Comparative anatomy
- Hierarchy of structural organization from simplest to most complex
- Scale uses metric system

STRUCTURAL ORGANIZATION FROM SIMPLEST TO MOST COMPLEX

- Chemical
- Cellular
- Tissue – group of cells similar in structure and function
- Organ – two or more tissue types performing specific function
- Organ system – group of organs acting together to perform specific function
- Human organism

ORGAN SYSTEMS

- Integumentary
- Skeletal
- Muscular
- Nervous
- Endocrine
- Cardiovascular
- Lymphatic/immune
- Respiratory
- Digestive
- Urinary
- Reproductive

BRANCHES OF ANATOMY

- Gross anatomy
- Microscopic anatomy
 - Cytology
 - Histology
- Developmental anatomy
 - Embryology
- Comparative anatomy

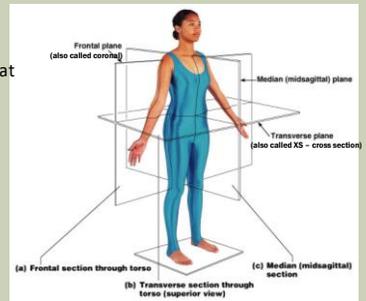
GROSS ANATOMY

- The anatomical position (see right)
- Directional and regional terms
 - Anterior
 - Posterior
 - Superior
 - Inferior
 - Medial
 - Lateral
 - Proximal
 - Distal
 - Superficial
 - Deep
 - Cephalic
 - Vertebral
 - Thoracic
 - Appendicular
 - Brachial
 - Lumbar
- Body planes and sections
- Anatomical variability
- The human body plan



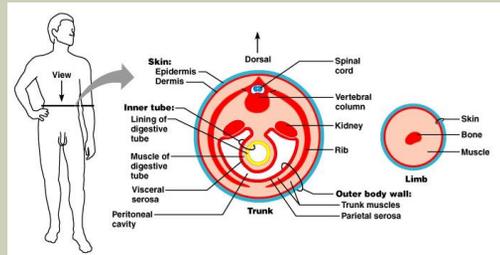
BODY PLANES AND SECTIONS

- Cut into sections along a flat surface called a plane



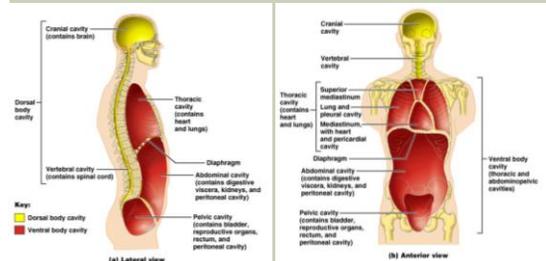
THE HUMAN BODY PLAN

- Humans are vertebrates and share basic features
 - Tube-within-a-tube
 - Bilateral symmetry
 - Dorsal hollow nerve cord
 - Notochord and vertebrae
 - Segmentation
 - Pharyngeal pouches

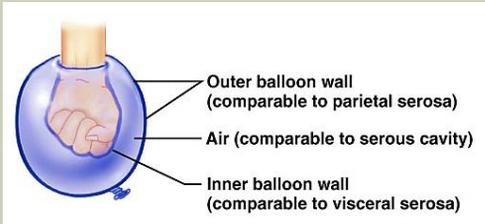


BODY CAVITIES & MEMBRANES

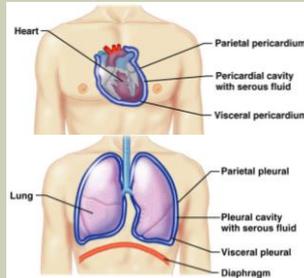
- Dorsal cavity divided into cranial and vertebral
- Ventral cavity containing viscera (visceral organs) divided into two main cavities
 - Thoracic cavity
 - 2 lateral pleural cavities
 - Central mediastinum containing pericardial cavity
 - Abdominopelvic cavity
 - Abdominal cavity
 - Pelvic cavity
- Serous cavities are slit-like spaces lined by serous membranes (serosa):
 - Parietal serosa forms the outer wall of the cavity
 - Visceral serosa covers the visceral organ
- Other smaller cavities: in head, between joints



SEROSA



NAMING OF SEROUS MEMBRANES (SEROSA) WITH 2 ADJECTIVES:

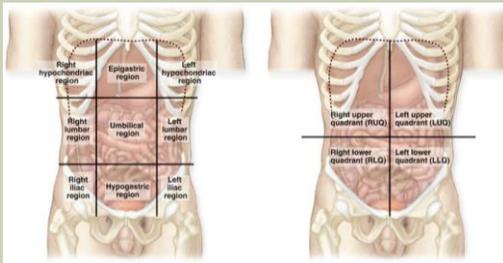


- Parietal serosa forms the outer wall of the cavity
- Visceral serosa covers the visceral organ
- **Pericardial:** heart
- **Pleural:** lungs
- **Peritoneal:** abdominal

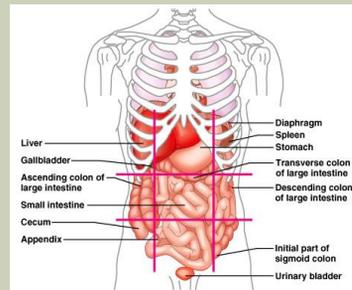
The 2nd adjective can become a noun: pericardium, pleura, peritoneum

9 ABDOMINAL REGIONS; 4 QUADRANTS

- The important regions:

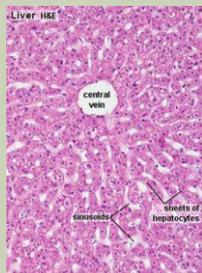


WHAT'S UNDERNEATH...



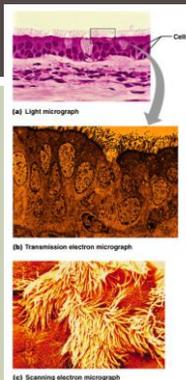
HISTOLOGY

- Microscopic examination of the fine structure of organs, tissues and cells
- Tissues are prepared by fixation (preserved) and then cut into thin sections
- Artifacts (distortions; not real)

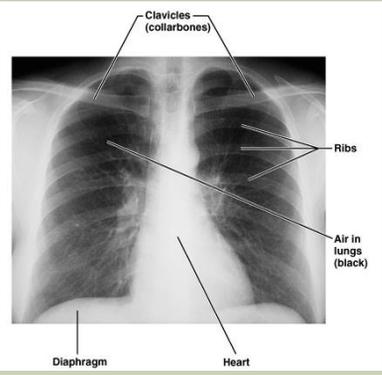


CILIATED EPITHELIUM

- (a) 300x
- (b) 1700x
- (c) 2600x

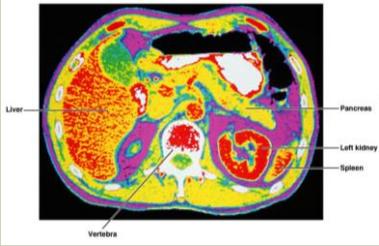


- X-ray**
 - Electromagnetic rays; denser tissues block more and are whiter (photographically they're negatives)

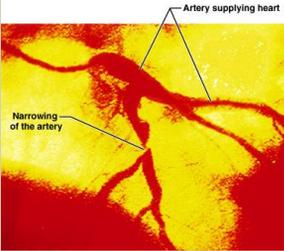



- CT – Computed Tomography**
 - a form of x-ray
 - provides a different form of imaging known as cross-sectional imaging.

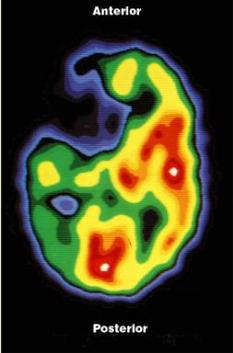
- Ultrasound**
 - High frequency sound waves, like sonar

- DSA – Digital Subtraction Angiography**
 - A type of fluoroscopy technique used in interventional radiology to clearly visualize blood vessels in a bony or dense soft tissue environment.



- PET scan – Positron Emission Tomography**
 - A nuclear medicine, functional imaging technique that is used to observe metabolic processes in the body



■ MRI – Magnetic Resonance Imaging

- A test that uses a magnetic field and pulses of radio wave energy to make pictures of organs and structures inside the body



TERMINOLOGY

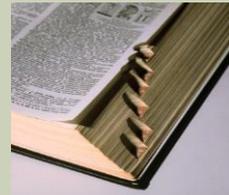
- Study and memorize the Greek and Latin prefixes and suffixes:

<http://www.technion.ac.il/~medicine/Students/latin&Greekprefixes.html>

Many medical terms are built from Greek and Latin prefixes. Knowing the common words enables one to quickly comprehend and understand many long, complicated terms.

- Find definitions and memorize terms:

Anterior	Superficial
Posterior	Deep
Superior	Cephalic
Inferior	Vertebral
Medial	Thoracic
Lateral	Appendicular
Proximal	Brachial
Distal	Lumbar



Acro- extremity. Acrophobia is a fear of heights.
 Adeno- gland. Adenoid is a lymph gland found in the nasopharynx.
 Alba- white. Albinism is the white appearance of skin lacking melanin.
 Algia- pain. Neuroalgia is a pain following the course of a nerve.
 Angi- vessel. Angioplasty is the repair of a blood vessel.
 Arthro- joint. Arthritis is the inflammation of skeletal joints.
 Auto- self. Autolysis is the destruction of body cells by bodily enzymes.
 Bio- living. Biology is the study of living organisms.
 Blast- germ, bud. Osteoblast is the germ of a bone cell.
 Blephar- eyelid. A blepharoplasty is eyelid surgery.
 Brachi- arm. The brachialis muscle moves the arm.
 Broncho- trachea, windpipe. Bronchitis is the inflammation of the respiratory system.
 Bucc- cheek. The buccinator muscle is in the cheek.
 Capit- head. De-capitate means "Off With the Head!"
 Carcin- cancer. A carcinogen is a substance which triggers cancer formation.
 Cardia- heart. Cardiologist is a heart specialist.
 Cephal- head. Cephalon is another term for the brain. (see capit-)
 Cerebro- brain. Cerebrospinal fluid (CSF) is fluid circulating within the brain and spinal cord.
 Chole- bile, gall. Cholecystectomy is removal of the gallbladder.
 Chondro- cartilage. A chondrocyte is a cartilage cell.

Chroma- color. Chromosomes are so named because they took color easily when dye is added to a cell.

Cili- eyelash. Supercilia are eyebrows -- the hairs above the eyelashes.

Corpus- body. Corpus albicans is the white body inside an ovary.

Corona Crown. Coronary arteries supply blood to the heart muscle run along the heart, encircling it like a crown. The coronary ligaments of the liver (which encircle the liver like a crown), the coronal suture and the corona of the glans penis, all structures which encircle something (like a crown).

Cost- rib. Costal cartilages attach ribs to the sternum.

Cut- skin. Cutaneous tissue is skin tissue.

Cysti- sac, bladder.

Cyto- cell. Cytology is the study of cells.

Dactyl- digits. Polydactylism is the presence of more fingers than is normal.

Derma- skin. Dermatologists are skin specialists.

Dura- tough, hard. Dura mater is the tough covering around the brain and spinal cord.

Entero- intestine. Enteritis is inflammation of the intestines.

Erythro- red. Erythrocytes are red blood cells.

Galacto- milk. Galactose-Milk Sugar; Galactosemia is the lack of ability to digest one of milk's sugars.

Gastro- stomach, belly. Gastric juices are produced in the stomach.

Glosso- tongue. Hypoglossal means "below the tongue".
 Glyco- sugar. Glycosuria is sugar in the urine.
 Glosso- tongue. Hypoglossal means "below the tongue".
 Glyco- sugar. Glycosuria is sugar in the urine.
 Hema- blood. Hemoglobin is a large molecule of the red blood cell.
 Hepato- liver. The hepatic vein drains blood away from the liver.
 Hyster- uterus. Hysterectomy is the removal of the uterus.
 Ileo- ileum. Part of the small intestine.
 Ilio- ilium. Part of the hip bone.
 Lachry- tears. Lacrimal glands secrete tears.
 Leuko- white. Leukocytes are white cells of the blood. (see alba-)
 Lingua- tongue. Sublingual glands are beneath the tongue. (see glosso-)
 Lipo- fat. Liposuction is the removal of fat by suction tube.
 Lith- stone. Shock wave lithotripsy is a treatment for breaking up kidney stones.
 Lumbo- lower back. Lumbar vertebrae are located in the lower back.
 Macul- spot, blotch. The macula lutea is a spot on the retina of an eyeball.
 Mamm- breast. Mammogram is a picture of a breast, usually a female breast.
 Mast- breast. Aren't we showing our obsession with breasts?
 Meningo- membrane. Meninges are the coverings of the brain and spinal cord.
 Metro- uterus. Endometrium is the inner lining of the uterus. (see hystero-)

Morpho- shape. Endomorphs are people whose physical shape extends to the limits of human dimension.

Myelo- spinal cord. Poliomyelitis is inflammation of the grey matter of the spinal cord.

Myo- muscle. Myo-cardiac infarction is a problem with the heart muscle.

Necro- death. Necrosis is death of cell tissue.

Nephro- kidney. Nephrons are the functional units of a kidney.

Neuro- nerve. Neurons are individual nerve cells.

Oculo- eye. An oculist supplies eyeglasses.

Odont- tooth. Orthodontics refers to repair of teeth.

Onco- tumour. Oncology is not doctors wearing pagers; it is the study of cancerous tumors.

Ophthalm- eye. Ophthalmology is the study of eye and its diseases.

Oro- mouth. The oral cavity is the other name for the mouth.

Orchido- testicle. Orchidectomy is removal of a testicle.

Osse-, Osteo- bone. Osteoporosis is porosity of bone.

Oto- ear. Otosclerosis is the formation of bone in the ear. Otomycosis-fungal infection in ear

Patho- disease. Pathogens are agents which cause disease.

Peps- digestion. Pepsin is an enzyme found in the digestive system.

Phago- eat. Phagocytes are cells (cyto-) which eat foreign material.

Philo- love, to have an affinity for. Hydrophilic molecules are attracted to water (hydro-)

Phleb- vein. Phlebitis is inflammation of the veins.

Phren- diaphragm. Phrenic refers to a diaphragm.
Pneumo- lung. Pneumonia is a disease of the lungs.
Pulmo- lung. Are lungs related to breasts?
Pyo- pus. Pyuria is pus in the urine.
Ren- kidney. Renal artery supplies blood to the kidney.
Rhin- nose. Rhinoplasty is a nose job
Scler- hard. Atherosclerosis is hardening of the arteries. (see dura-)
Stasis- stand still. Homeostasis is the process of maintaining constant conditions within the body.
Thromb- clot, lump. Thrombosis refers to a clot in the heart or blood vessel.
Trich- hair. Trichosis is a disease of the hair.
Vas- vessel, duct. Vas deferens is the vessel which carries sperm from the epididymus.
Viscer- organ. Visceral refers to organs.
Zoo- animal. Zoology refers to the study of animals.