

## The Bruce Anatomy Notes<sup>1</sup>

1. Anterior: Front part of the body.
  2. Posterior: Back
  3. Midline: A line drawn through the nose & umbilicus.
  4. Midclavicular line: Middle of the Clavicle parallel to the midline.
  5. Midaxillary: The middle of the armpit, parallel to the midline.
- Directional Terms
1. Right: Patients Right
  2. Left: Patients Left
  3. Superior: Closer to the head, higher.
  4. Inferior: Farther from the head, lower.
  5. Lateral: toward the outside.
  6. Medial: Toward the inside/middle.
  7. Proximal: Closer to the midline(in an extremity, closer to the trunk)
  8. Distal: Farther from the midline( in an extremity, further from the trunk)
  9. Superficial: Closer to or on the skin.
  10. Deep: Further inside the body and away from the skin.
  11. Ventral: Belly side of the body. Anterior surface of the body. Ex: Toward the superficial abdomen.
  12. Dorsal: Toward the spine, Posterior part of the body. Including the back of the hand.
  13. Palmar: Front region of the hand.
  14. Plantar: The bottom of the foot.
  15. Apices ( Apex ): On top of something, like a structure.
  16. Bilateral: A body part that appears on both sides of the midline.
  17. Extension: Straightening of a joint. Ex: Straightening of a arm or leg.
  18. Flexion: Bending of a joint, ( Bending the arm or leg ).
  19. Abduction: Motion away from the body.
  20. Adduction: Motion toward the body.

- The Skeletal System

1. Gives form to the body.
2. Protects our vital organs.
3. Consists of 206 bones.
4. Allows movement/non-movement.
5. Bones of the Skull:
  - i. Nasal Bones: 2 Nasal Bones
  - ii. Maxillae: Upper Jaw Bone.
  - iii. Mandible: Lower Jaw Bone.
  - iv. Zygomatic: 2 Cheek Bones.
  - v. Middle and inferior nasal concha: Bones inside the cartilage part of the nose.
  - vi. Temporal: Bone behind the ear.
  - vii. Frontal: Forehead part of the bone. Also includes the orbit (eye socket). Which is made up of the maxilla and the zygoma.
  - viii. Parietal: Located between the temporal regions and the occiput lie.
  - ix. Occipital: Bottom back part of the skull.

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6. The Vertebrae:
    - a. Cervical Spine: Has 7 Vertebrae, which lie in the neck. The skull rests on the cervical vertebrae ( the atlas ).
    - b. Thoracic: Has 12 vertebrae. 1 pair of ribs is attached to each thoracic vertebrae.
    - c. Lumbar: Has 5 Vertebrae
    - d. Sacrum: Has 5 Sacral vertebrae. Is joined to the iliac bones of the pelvis.
    - e. Coccyx: Has 4 Vertebrae also fused together to form the coccyx or tailbone.
  7. The Thorax:
    - a. Contains the heart, lungs, esophagus, and great vessels ( the aorta and 2 venae cavae.
    - b. Formed by the 12 thoracic vertebrae and their 12 ribs.
  8. Sternum: ( breastbone ) at the base of the neck.
  9. Ribs:
    - a. Upper 5 ribs: Connect to the sternum through a short bridge of cartilage.
    - b. 6-10: insert into the costal arch
    - c. 11<sup>th</sup> & 12<sup>th</sup>: floating ribs.
  10. The kidneys and pancreas are called retroperitoneal organs they lie behind the abdominal cavity.
  11. The Functions of the musculoskeletal System
    - a. Gives the body shape.
    - b. Protects the internal shape.
    - c. 600 muscles
    - d. Contains Smooth and Cardiac Muscles
  12. Types of Muscle:
    - a. Diaphragm:
      - i. Both voluntarily/involuntarily muscles.
      - ii. Dome-shaped muscle
      - iii. Divides thorax abdominal
      - iv. Contracts during inhalation
      - v. Relaxes during exhalation
  13. Exchange of O<sub>2</sub> and CO<sub>2</sub>:
    - a. O<sub>2</sub> rich is delivered to aveoli w/inspiration
    - b. O<sub>2</sub> diffuses into the blood.
    - c. Doesn't use all inhaled O<sub>2</sub>
  14. Control of Breathing:
    - a. Brain-stem controls breathing: Increase breathing rate if the CO<sub>2</sub> level in blood becomes to high.
    - b. Hypoxic Drive is a back-up system. In which activates when O<sub>2</sub> levels decrease to stimulate breathing.
  15. Recognizing Inadequate Breathing:
    - a. Irregular rythym
    - b. Labored breathing
    - c. Muscle retraction
- 

1. Thanks Bruce!

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- d. Pale and blue skin ( Cyanotic )
- e. Cool / clammy skin
- f. Faster resp. rate
  - i. Respiratory
  - ii. Rate
  - iii. Rythym
  - iv. Quality

16. Agonal Respiration: Breathing after the heart has stopped. ( Gasping )

17. Major Arteries and Veins:

1. Aorta: Principal Artery leaving the left side of the heart. It carries freshly O<sub>2</sub> blood to the body.
2. Pulmonary: Begins @ the R side of the heart and carries O<sub>2</sub> poor blood to the lungs.
3. Carotid: The major artery that supplies blood to the head and brain. The carotid arteries are located on both sides of the neck.
4. Femoral: This artery supplies blood to the lower extremities. It is palpable in the groin. And then divides @ the level of the knee and supplies blood to the legs.
5. Brachial: A major vessel in the upper extremity that supplies blood to the arms.
6. Radial: Major artery in the forearm & is palpable @ the wrist on the thumb side.
7. Superior Vena Cava: Carries blood returning from the head, shoulders, & upper extremities.
8. Inferior Vena Cava: Blood from the abdomen, pelvis, and lower extremities pass through this way.

18. Components of Blood:

1. Plasma: Sticky, yellow fluid that carries the blood cells and nutrients. Also transports cellular waste material to the organs of execution. Carries the compounds needed to form a blood clot.
2. RBC: Iron containing blood. Also called erythrocytes ( give color to the blood and carries O<sub>2</sub> ). Make up about 45% of blood.
3. WBC: ( Leukocytes ) body's immune defense against the fight of infection.
4. Platelets: Tiny-disk shaped element in which are essential in the initial formation of a blood clot. To stop bleeding.

19. Systole: LV ( Left Ventricle ) contracts.

20. Diastole: LV relaxes.

21. Perfusion: Circulation of blood w/in an organ/tissue. \*\*If inadequate, the patient will go into shock.

22. The Nervous System:

1. Somatic NVS: That regulates activities over which there is voluntary control, ( walking, talking and writing ).
2. Autonomic NVS: controls many body functions, involuntary controls. ( Digestion, dilation and constriction of blood vessels, sweating, etc.)
3. Central NVS: is made up of the brain and the spinal cord. Most nerve cells ( the nucleus and the cell body ) lie w/in the CNVS.
4. Peripheral NVS: is composed of 31 pairs of PNS called spinal nerves & 12 pairs called cranial nerves.

23. The Skin:

- Protects the body from the environment.
- Regulates body temperature.
- Transmit information about the environment to the brain. ( heat & cold )
  - i. Epidermis: is composed of several layer of cells. Also most common is your dead skin. Under the epidermis lays the germinal layer. This helps produce more skin.
  - ii. Dermis: Deeper part of the skin. Under this type of skin lays the sweat glands, sebaceous glands, hair follicles, blood vessels, and nerve endings.
  - iii. Subcutaneous tissue: Its main component is fat. This fat insulates us from the cold.

24. Endocrine System:

- Complex message and control system.
- Made up of 7 glands.
- Release hormones
  - Adrenal: (Kidneys) Regulate salt, sugar and sexual func. Hormones that it produces is Adrenaline (Epinephrine), and others.
  - Ovary: (Female Pelvis) Regulate sexual function, characteristics and reproduction. Hormone: Estrogen
  - Pancreas: (Retroperitoneal Space) Regulates glucose metabolism and others. Hormone: Insulin
  - Parathyroid: (Neck {behind & beside the thyroid} 3-5 Glands) Regulate Serum Calcium. Hormone : Parathyroid
  - Pituitary: (Base of Skull) Regulates all other endocrine glands. Hormones: Multiple, very important hormones.
  - Testes: (Male Scrotum) Regulates sexual functions, characteristics, and reproduction. Hormones: Testosterone
  - Thyroid: (Neck over the Larynx) Regulates metabolism. Hormones: Thyroxine

25. Digestive System: The processing of food that nourishes the individual cells of the body.

- Mouth: Consists of the lips, cheeks, gums, teeth and tongue.
- Salivary Glands: 2 located under the tongue, one on each side of the lower jaw and one inside each cheek. The gland produces nearly 1.5L of saliva daily. Saliva is 98% H<sub>2</sub>O.
- Oropharynx: Is a tubular structure about 5” long that extends vertically from the back of the neck to the esophagus and trachea.
- Esophagus: 10” long, It is a closeable tube that extends from the end of the pharynx to the stomach and lies just anterior to the spinal column in the chest.
- Stomach: Is a hollow organ located in the L upper quadrant of the abdominal cavity, protected by lower L ribs. It produces approx. 1.5L of gastric juice daily for this process.
- Pancreas: A flat solid organ, lies below & behind the liver & stomach & behind the peritoneum. Secretes nearly 2L of pancreatic juice daily. The juice contains many enzymes that aid in the digestion of fat, starch and protein.

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- Liver: large, solid organ that takes up most of the area immediately beneath the diaphragm in the R upper quadrant and also extends into the upper L quadrant. Approx. 25% of the cardiac output of blood (1.5L) passes through here daily.
  - Bile Ducts: Serves as a reservoir & concentrating organ for bile produced in the liver. Together, the bile ducts & gallbladder form the biliary system.
  - Small Intestine: the major hollow organ of the abdomen. Composed of the duodenum, jejunum, and the ileum.
  - Large Intestine: Major hollow organ, consists of the cecum, the colon, and the rectum. About 5' long.
  - Appendix: Is a tube 3" – 4" long that opens into the cecum (the first part of the large intestine) in the R lower quadrant of the abdomen.
  - Rectum: Large, hollow organ that is adapted to store quantities of feces until is expelled.
26. The Urinary System: Controls the discharge of certain waste materials filtered from the blood by the kidneys.
- Our urine is formed in both of the kidneys, goes down the ureters, into the bladder for storage. Until time for urinating.