CHAPTER 3 ANATOMY & PHYSIOLOGY PART 2 BODY SYSTEMS

The Integumentary System

• The ____________________________________
• The hair
• The ____________________________________

The Skin

• The largest ____________________________________ in the human body.
• Makes up 15% of our total body weight.
• Airtight seal that protects the body from ____________________________________

The Skin

Layers of the skin

• ____________________________________
• ____________________________________
• Subcutaneous tissue

Layers and Major Structures of the Skin

The Hair

• Tactile ____________________________________ organ
• Papilla: vast capillary network that supplies the hair follicle
• Vellus hair: short, fine, and lacks pigment
• ____________________________________ hair: coarser, thicker, has pigmentation
• A transition for terminal to vellus hair causes ____________________________________

The Nails

• Primarily for ____________________________________
• Aging causes nail growth to diminish and nails to become thick and ____________________________________

Hematopoietic System Components

• ____________________________________
• Bone Marrow
• Liver
• ____________________________________
• Kidneys

Components of Blood

• ____________________________________
• Formed elements:
  • Red blood cells
  • White blood cells

Plasma

• Thick, pale yellow fluid that makes up the ____________________________________ part of the blood.
• 90 to 92% ____________________________________

Red Blood Cells (RBCs) (1 of 2)

• Red blood cells, or ____________________________________, contain hemoglobin molecules that transport oxygen.
• Produced in the bone ____________________________________
• RBCs live about 120 days

Red Blood Cells (RBCs) (2 of 2)
• ____________________________________ : the cell volume of RBCs per unit of blood
  • Normal is 40 to 52%
• Red blood cell count is measured in millions per cubic ____________________________
  • Normal is 4.2 to 6.0

13 White Blood Cells (WBCs)
• White blood cells, called ____________________________ or white corpuscles, circulate through the bloodstream and tissues, providing protection from foreign invasion.
• Healthy people have from _________________ to _________________ WBC per microliter of blood
• An infection can cause increase to more than 16,000

14 Platelets
• Platelets, or ____________________________ , are small fragments of large cells called megakaryocytes
• Support ____________________________ of the blood
• Normal range is 150,000 to 450,000 per microliter of blood

15 Hemostasis
• The combined mechanisms that work to prevent or control blood loss. These mechanisms include:
  • Vascular ____________________________
  • Platelet plugs
  • Stable fibrin blood clots (______________________ )
  • ____________________________ : clot formation

16 The Musculoskeletal System

17 Functions of the Skeleton
  Functions of the skeleton include:
  • Gives the body structural form
  • Protects ____________________________ organs
  • Allows for efficient movement
  • Stores ____________________________ and other materials for metabolism
  • Produces red blood cells

18 Bone Structure
• The ____________________________ : hollow shaft in long bones
• The epiphysis: end of a long bone
• The metaphysis: growth zone of a bone that is located between the epiphysis and diaphysis
• The ____________________________ canal: chamber within the diaphysis which contains bone marrow
• The periosteum: tough, outer covering
• ____________________________ : provides articular surfaces

19 Types of Joints
• Synarthroses : immovable
  - skull, between jaw and teeth
• Amphiarthroses: limited movement
• vertebrae, between sacrum and ilium
• Diarthroses (synovial joints): allow relatively free movement
  - ____________________________ Joints
  - ____________________________ Joints
  - ____________________________ Joints

20 Monoaxial Joints
• ____________________________ joints: bending in a single plane
  - elbows, knees, fingers
• ____________________________ Joints: articulation between the 1st cervical vertebrae
and axis of the spine
- allows head to rotate through a wide range of motion

21 Biaxial Joints
- ___________________________ joints: allow gliding movement in 2 directions
  - joints of carpal bones and between the clavicle and sternum
- Ellipsoidal joints: provide a sliding motion in 2 planes
  - between the wrist and metacarpals
- ___________________________ joints: allow for movement in 2 planes at right angles to each other
  - joints at the base of the thumbs

22 Triaxial Joints
- Ball and Socket Joints: permit full motion in a cone of about ____________ degrees and allow a limb to rotate
  - hip and shoulder

23 Types of Joints

24 Joints
- ___________________________ : bending motion that increases the angle
- ___________________________ : bending motion that decreases the angle
- ___________________________ : connects bone to bone
- ___________________________ : connects muscle to bone

25 Structure of a Joint

26 Skeletal Organization
- ___________________________ Skeleton
  - Form the axis of the body
  - Bones of the head, thorax and spine
- ___________________________ Skeleton
  - Consists of the bones of the upper and lower extremities

27 Muscular Tissue and Structure

28 3 Types of Muscle
- ___________________________ : also called voluntary or striated muscle, is found throughout the body
- ___________________________ : only in the heart
- ___________________________ : occasionally called involuntary muscle, is found within the intestines and surrounding blood vessels.

29 The 3 Types of Muscles

30 The Head, Face, and Neck

31 The Head
  The head is made up of three structures that cover the brain:
  - ___________________________
  - Cranium
  - ___________________________

32 The Skull

33 The Meninges and Skull

34 The Face
  Facial bones make up the anterior and inferior structures of the head and include:
  - ___________________________
• Maxilla

The Facial Bones

The Eye (1 of 2)
The eye is made up of the:
• ___________________________ (eye socket)
• ___________________________ humor - clear watery fluid filling the posterior chamber of the eye. It is responsible for giving the eye its spherical shape.
• Retina - light-and-color - sensing tissue lining the posterior chamber of the eye.
• ___________________________—constricts or dilates to change the size of the pupil

The Eye (2 of 2)
• ____________________________: dark opening in the center of the iris
• ____________________________: the “white” of the eye
• Cornea: thin, delicate layer covering the pupil and the iris
• Conjunctiva: mucous membrane that lines the eyelid
• ___________________________ fluid: lubrication liquid

Anatomy of the Eye

The Mouth

The Spine and Thorax

Vertebral Column
• Vertebral column: A hollow skeletal tube made up of 33 irregular bones (vertebrae).
• Cervical spine (__________ vertebrae)
• Thoracic spine (__________ vertebrae)
• Lumbar spine (__________ vertebrae)
• Sacral spine (__________ vertebrae)
• Coccygeal spine (__________ vertebrae)

Divisions of the Vertebral Column

Spinal Meninges
• Consist of the ___________________________ mater, the ___________________________, and ___________________________ mater.
• Cover the entire spinal cord and the peripheral nerve roots as they leave the spinal column.

Structural Protection of the Spinal Cord

The Thorax
• Consists of the ___________________________ skeleton, diaphragm, and associated musculature.
• It is also the location of the ___________________________ , major blood vessels, trachea, bronchi, lungs, and ___________________________.

The Nervous System

The Nervous System
• Central nervous system
• ___________________________ nervous system
  • Somatic nervous system: Transmits sensations
  • Autonomic nervous system
    • ___________________________ nervous system: Fight or Flight
    • ___________________________ nervous system: Feed or Breed
Central Nervous System

Protective structures of the CNS:
- The brain lies within the cranial ________________________________, protected by the skull.
- The spinal cord is housed inside and is protected by the “spinal ________________________________” formed by the vertebrae of the spinal column.

Meninges

Protective membranes that cover the entire central nervous system.
Three layers of meninges that cushion the brain and spinal cord.
- Dura mater – durable ________________________________ layer
- Arachnoid membrane – web-like ________________________________ layer
- Pia mater – ________________________________ layer directly overlying the central nervous system

The Meninges

The Brain

The brain is divided into six major parts
- ________________________________
- Diencephalon
- Mesencephalon
- Pons
- ________________________________ oblongata
- ________________________________

Cerebrum
- ________________________________ thoughts
- Intellectual functions
- ________________________________

Diencephalon
- ________________________________ and Hypothalamus
- Thalamus
  - Relay and processing centers for ________________________________ information
- Hypothalamus
  - Controls emotions and ________________________________ production

Mesencephalon (Midbrain)
- ________________________________ and auditory data
- Maintenance of ________________________________

Pons
- Relays sensory information to the ________________________________ and thalamus

Medulla Oblongata (Brain Stem)
Regulates:
- ________________________________ System
- ________________________________ System
- Digestive System

Cerebellum
- ________________________________ motor functions
- Posture and ________________________________
- Muscle tone

The Human Brain

Areas of Specialization (1 of 2)
• Speech – located in the __________________________ lobe of the cerebrum
• Vision – located in the __________________________ cortex of the cerebrum
• Personality – located in the __________________________ lobes of the cerebrum

Areas of Specialization (2 of 2)
• Balance and __________________________ – located in the cerebellum
• Sensory – located in the parietal lobes of the cerebrum
• __________________________ – located in the frontal lobes of the cerebrum

The Spinal Cord
• Central nervous system pathway responsible for transmitting sensory input from the body to the brain and for conducting __________________________ impulses from the brain to the body muscles and __________________________.

The Spinal Nerves
• _____________ pairs of nerves that originate along the spinal cord from anterior and posterior nerve roots.

Spinal Cord and Spinal Nerves

Peripheral Nervous System
• Voluntary (___________________________)
• Involuntary (___________________________)
  • Sympathetic
  • Parasympathetic

The Endocrine System

8 Glands of the Endocrine System (1 of 3)
• __________________________ : growth hormones
  • Pituitary Glands
    - Antidiuretic hormone: reabsorption of water
    - __________________________ : contraction of uterus
  • Thyroid Glands: metabolism and lowers calcium levels
  • Parathyroid glands: increases __________________________ levels

8 Glands of the Endocrine System (2 of 3)
• Pancreas
  - __________________________ : allows glucose to enter cells
  - __________________________ : increases glucose levels
• Adrenal Glands
  - Epinephrine: Fight or Flight
  - __________________________ : vasoconstriction
    - Also stimulates glucagon-like effects

8 Glands of the Endocrine System (3 of 3)
• Gonads
  - Ovaries: release estrogen and progesterone
  - Testes: release __________________________
• Pineal Gland
  - Releases __________________________
    - Exact action unknown

The Major Glands of the Endocrine System

The Cardiovascular System

Location of the Heart within the Chest
Heart Tissue Layers (1 of 2)
The heart consists of three tissue layers:
• ____________________________________ – innermost layer, it lines the heart's chambers and is
  bathed in blood.
• ____________________________________ – thick middle layer
  • Physically resemble skeletal muscle, but have electrical properties similar to smooth muscle.
  • Also contain specialized structures that help to rapidly conduct electrical impulses from one muscle
to another, enabling the heart to ________________________________ .

Heart Tissue Layers (2 of 2)
• ____________________________________ – protective sac surrounding the heart. Consists of two
  layers:
  - ____________________________________ (also called epicardium) – Inner layer that is in contact
    with the heart muscle itself.
  - ____________________________________ – outer, fibrous layer

Heart Chambers
The heart contains four chambers.
• The ________________________________ are the two superior chambers that receive
  incoming blood. Chambers are separated by interatrial septum.
• The ________________________________ are the two larger, inferior chambers that pump
  blood out of the heart. Chambers are separated by interventricular septum.

Chambers of the Heart

Heart Valves (1 of 2)
The heart contains two pairs of valves.
• Atrioventricular valves control blood flow between the atria and ventricles.
  • ________________________________ valve – right valve
  • ________________________________ valve – left valve

Heart Valves (2 of 2)
• Semilunar valves regulate blood flow between the ventricles and the arteries into which they empty.
  • ________________________________ valve – left valve, connects the left ventricle to the
    aorta.
  • ________________________________ valve – right valve, connects the right ventricle to the
    pulmonary artery.

Blood Flow Through the Heart
1. Vena Cava
2. Right ________________________________
3. Tricuspid valve
4. ________________________________ Ventricle
5. Pulmonic Valve
6. Pulmonary Artery
7. ________________________________
8. Pulmonary Vein
9. Left Atrium
10. Mitral Valve
11. ________________________________ Ventricle
12. Aortic Valve
13. ________________________________
14. Body

Blood Flow Through the Heart

Coronary Circulation
The coronary circulation provides blood flow to the ____________________________ itself.

It gets blood directly from the ____________________________ and is the very first organ to receive oxygenated blood.

**Coronary Circulation**

**Cardiac Physiology**

**Cardiac Cycle**

- ____________________________ Cycle - The period of time from the end of one cardiac contractions to the end of the next.
- ____________________________ - The period of time when the myocardium is relaxed and cardiac filling and coronary perfusion occur.
- ____________________________ - The period of the cardiac cycle when the myocardium is contracting.

**Role of Electrolytes**

- Cardiac function, both electrical and mechanical, depends heavily on electrolyte balance.
- Electrolytes affecting cardiac function include:
  - ____________________________ (Na+)
  - Calcium (Ca++)
  - ____________________________ (K+)
  - Chloride (Cl-)
  - ____________________________ (Mg ++)

**Cardiac Conductive System**

Properties of the conduction system

- ____________________________ - ability of the cells to respond to an electrical stimulus.
- Conductivity - ability of the cells to propagate the electrical impulse from one cell to another.
- ____________________________ - pacemaker cells' capability of self-depolarization.
- ____________________________ - ability of muscle cells to contract, or shorten.

**Anatomy of the Peripheral Circulation**

**Peripheral Circulation**

- The peripheral circulation transports oxygenated blood from the heart to the tissues and subsequently transports deoxygenated blood back to the ____________________________.

**Arterial System**

- Carries oxygenated blood ____________________________ from the heart; functions under high pressure.
- Exception: the pulmonary ____________________________ carries unoxygenated blood

**Venous System**

- Transports blood from the peripheral tissues back to the heart. Functions under ____________________________ pressure with the aid of surrounding muscles and one-way ____________________________ within the veins.
- Carries unoxygenated blood
- Exception is the ____________________________ Vein

**The Physiology of Perfusion**

**Perfusion**

- The supplying of ____________________________ and nutrients to the body tissues as a result of the constant passage of blood through the ____________________________.

**Hypoperfusion**

- Inadequate ____________________________ of the body tissues, resulting in an inadequate supply of oxygen and nutrients to the body tissues. Also called
Components of the Circulatory System (1 of 2)

- The pump
- The fluid
- The container

Any problem with any of these components can lead to inadequate perfusion.

Components of the Circulatory System (2 of 2)

The Pump

- The ___________________________ is the pump of the cardiovascular system.
- Receives blood from the venous system, pumps it to the lungs for oxygenation, and then pumps it to the ___________________________ tissues.

Stroke Volume

- The ____________________________________ ejected by the heart in one contraction.

Factors affecting stroke volume:

- ___________________________—amount of blood delivered to the heart during diastole.
- Cardiac ___________________________ force—the strength of contraction of the heart.
- ___________________________—the resistance against which the ventricle must contract.

Starling’s Law of the Heart states that the greater the ___________________________ of cardiac muscle, up to a certain point, the greater the force of cardiac contraction.

Contractile Force

- Contractile force is affected by circulating two hormones called catecholamines.

- ___________________________—

- ___________________________

Cardiac Output

- Cardiac output is the amount of blood pumped by the heart in one

- ___________________________ volume x Heart rate = Cardiac output

Blood Pressure

- Peripheral vascular resistance is the ___________________________ against which the heart must pump.
- Blood _________________ =
  - Cardiac Output x Peripheral Vascular Resistance

The Fluid

- Blood ___________________________ than water.
- Consists of ___________________________ and the formed elements.
  -Red cells, white cells, platelets
- Transports oxygen, carbon dioxide, nutrients, hormones, metabolic waste products, and heat.
- An adequate amount is needed for perfusion, and must be adequate to _________________ the container.

The Container (1 of 2)

- Blood ___________________________ serve as the container of the cardiovascular system.
- Under control of the ___________________________ nervous system they can adjust their size and selectively reroute blood through microcirculation.

- ___________________________ is comprised of the small vessels: arterioles, capillaries, and venules.
The Container (2 of 2)

• Capillaries have a ________________________________ between the arteriole and capillary called the pre-capillary sphincter.
• The pre-capillary sphincter responds to local tissue demands such as acidosis and hypoxia, and opens as more ________________________________ is needed.

Blood Flow Regulation

• Peripheral ________________________________ resistance.
• ________________________________ within the system.

Post-Capillary Sphincter

• At the end of the capillary between the capillary and ________________________________ is the post-capillary sphincter.
• The post-capillary sphincter opens when blood needs to be ________________________________ into the venous system.

The Fick Principle (1 of 2)

The movement and utilization of oxygen in the body is dependent upon the following conditions:
• Adequate concentration of ________________________________ oxygen.
• Appropriate movement of oxygen across the alveolar/capillary membrane into the ________________________________ bloodstream.

The Fick Principle (2 of 2)

• Adequate number of ________________________________ blood cells to carry the oxygen.
• Proper tissue perfusion.
• Efficient ________________________________ of oxygen at the tissue level.

Anatomy of the Respiratory System

The respiratory system provides a ________________________________ for oxygen to enter the body and for carbon dioxide to exit the body.

Upper Airway

• ________________________________ cavity
• Oral cavity
• ________________________________

Oral Cavity

• ________________________________
• Hard palate
• Soft palate
• ________________________________ Gums
• ________________________________

Pharynx

• ________________________________ Oropharynx
• ________________________________

Larynx

• ________________________________ cartilage
• Cricoid cartilage
• Glottic opening: lip-like opening between the vocal cords
• ________________________________ cords: regulate passage of air
• Cricothyroid cartilage
• ________________________________ membrane
Anatomy of the Upper Airway

Internal Anatomy of the Upper Airway

Lower Airway Anatomy
• ____________________________________
• Bronchi
• Alveoli
• ____________________________________

Anatomy of the Lower Airway

Anatomy of the Alveoli

Anatomy of the Pediatric Airway

Physiology of the Respiratory System

Respiration vs. Ventilation
• ____________________________________ is the exchange of gases between a living organism and its environment.
• ____________________________________ is the mechanical process that moves air into and out of the lungs.

Diffusion of Gases Across an Alveolar Membrane

Pulmonary ventilation depends upon ____________________________________ changes within the thoracic cavity.

Pulmonary Circulation

Measuring Oxygen and Carbon Dioxide Levels
• ____________________________________ pressure is the pressure exerted by each component of a gas mixture.
• Partial pressure of a gas is its percentage of the mixture's total pressure.
• Pressure is measured in "__________________________________ "
• Torr and ____________________________________ are the same measures of pressure

Normal Arterial Partial Pressures
Oxygen (\( \text{PaO}_2 \)) = 100 torr (average = ____________ – ____________ ).
Carbon dioxide (\( \text{PaCO}_2 \)) = 40 torr (average = ____________ – ____________ ).

Diffusion
• Movement of a gas from an area of ____________________________________ concentration to an area of ____________________________________ concentration.
• Diffusion transfers gases between the ____________________________________ and the blood and between the blood and peripheral tissues.

Factors Affecting Oxygen Concentrations in the Blood
• Decreased ____________________________________ concentration.
• Inadequate alveolar ventilation.
• Decreased diffusion across the pulmonary membrane when diffusion distance increases or the pulmonary ____________________________________ changes.
• Ventilation/perfusion mismatch occurs when a portion of the ____________________________________ collapses.

Factors Affecting Carbon Dioxide Concentrations in the Blood (1 of 2)
• Hyperventilation ____________________________________ CO\(_2\) levels due to increased respiratory rates or deeper respiration.
• Respiratory depression, airway obstruction, respiratory muscle impairment, ____________________________________ diseases
Factors Affecting Carbon Dioxide Concentrations in the Blood (2 of 2)

CO₂ elimination results from decreased alveolar ventilation caused by:
- Respiratory depression
- Airway obstruction
- Respiratory impairment
- Respiratory diseases

Regulation of Respiration

Respiratory Rate
- \( \text{Respiratory rate} \); however, can be voluntarily controlled.
- Chemical and physical mechanisms provide involuntary to correct any breathing irregularities.

Nervous Impulses from the Respiratory Center
- Main respiratory center is the medulla.
- \( \text{Nervous impulses} \) within medulla initiate impulses that produce respiration.
- \( \text{Nervous impulses} \) center in the pons assumes respiratory control if the medulla fails to initiate impulses.
- \( \text{Nervous impulses} \) center in the pons controls expiration.

Stretch Receptors
- The \( \text{Breuer reflex} \) prevents over-expansion of the lungs.

Chemoreceptors
- Located in \( \text{Chemoreceptors} \) bodies, arch of the aorta, and medulla.
- Stimulated by decreased \( \text{PaO}_2 \), \( \text{PaCO}_2 \), and decreased \( \text{pH} \).
- \( \text{Chemoreceptors} \) fluid (CSF) \( \text{pH} \) is primary control of respiratory center.

Respiratory Drives
- \( \text{Respiratory drive} \) is a profound stimulus of respiration in a normal individual who breathes on the Respiratory Drive.
- The stimulus is the level of carbon dioxide in the arterial blood
- The \( \text{Respiratory drive} \) increases respiratory stimulation in people with chronic respiratory disease.
- The stimulus is the level of oxygen in the arterial blood

Normal Respiratory Rates

<table>
<thead>
<tr>
<th>AGE</th>
<th>RATE</th>
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<tbody>
<tr>
<td>Adult</td>
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<tr>
<td>Child</td>
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<tr>
<td>Infants</td>
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Respiratory Rate Factors

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>EFFECT</th>
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<tbody>
<tr>
<td>Fever</td>
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<tr>
<td>Emotion</td>
<td>Increases</td>
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<tr>
<td>Pain</td>
<td>Increases</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Increases</td>
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<tr>
<td>Acidosis</td>
<td></td>
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<tr>
<td>Stimulant Drug</td>
<td>Increases</td>
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<tr>
<td>Depressant Drug</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>Decreases</td>
</tr>
</tbody>
</table>
Total Lung Capacity (TLC)
- __________________________ lung capacity
- Average adult male TLC—__________ liters

Tidal Volume (VT)
- Average volume of gas inhaled or exhaled in __________________________ respiratory cycle.
- Average adult male:
  \[ V_T = \text{__________} \text{ ml (5-7ml/kg)} \]

Dead Space Volume (VD)
- Amount of gases in tidal volume that remains in the airway __________________________ for gas exchange.
- Approximately _____________ ml in adult male.

Inspiratory Reserve Volume (IRV)
- The amount of air that can be maximally __________________________ after normal inspiration

Expiratory Reserve Volume (ERV)
- The amount of air that can be maximally __________________________ after a normal expiration

Residual Volume (RV)
- The amount of air __________________________ in the lungs at the end of maximal expiration

Functional Residual Capacity (FRC)
- The volume of gas that remains in the lungs at the end of __________________________ expiration

Forced Expiratory Volume (FEV)
- The amount of air that can be maximally __________________________ after maximum inspiration

The Abdomen

Abdominal Cavity
- Bound superiorly by the __________________________ and inferiorly by the pelvis
- The abdominal cavity is divided into three spaces:
  - __________________________ space
  - Retroperitoneal space
  - __________________________ space

Peritoneal Space
- Division of the abdominal cavity containing those organs or portions of organs covered by the __________________________
- Peritoneum: fine fibrous tissue surrounding the __________________________ of most of the abdominal cavity and covering most of the small bowel and some of the abdominal organs

Retroperitoneal Space
- Division of the abdominal cavity containing those organs __________________________ to the peritoneal lining

Pelvic Space
- Division of the abdominal cavity containing those __________________________ located within the pelvis

Abdominal Quadrants
- Right Upper Quadrant (RUQ)
The Digestive System

The digestive system includes the digestive tract and the __________________________ organs of digestion.

The Digestive Tract

• Internal passageway that begins at the mouth and ends at the anus; also called __________________________ canal.

Accessory Organs of Digestion

• Detoxifies blood, regulates fluids in blood
• Stores bile to use for digestion of fatty foods
• Produces insulin and glucagon

The Spleen

• Actually part of the __________________________ system.
• Performs some immunological functions and also stores a large volume of blood.
• Though well protected in its location, it is the most __________________________ abdominal organ.

The Urinary System

Four Major Structures

• Kidneys: Produces urine and performs other functions related to the urinary system.
• __________________________ : 2 ducts that carries urine from kidney to urinary bladder.
• Urinary bladder: The muscular organ that stores urine before its elimination from the body.
• __________________________ : The duct that carries urine from the urinary bladder out of the body.

Anatomy of the Urinary System, Posterior View

Nephron

• A microscopic structure within the kidney that produces __________________________.

The Reproductive System

Female Reproductive System

• The most important female reproductive organs are located within the pelvic cavity and are essential to reproduction.
  • __________________________
  • Fallopian Tubes
  • __________________________
  • Vagina

The Menstrual Cycle
The Menstrual Cycle
• Prepares the uterus to receive a fertilized egg
• ___________________________ – the onset of menses, usually occurring between ages 10 and 14.
• Four phases:
  • -Proliferative phase
  • - ___________________________ phase
  • -Ischemic phase
  • - ___________________________ phase
• Generally occurs every 28 days on average

Proliferative Phase
• First __________ weeks of the cycle
• Dominated by ___________________________
• Causes the endometrium to thicken and become engorged with blood
• At approximately day 14, an ___________________________ is released (ovulation)

Secretory Phase
• The stage immediately surrounding ___________________________
• If egg is not fertilized, estrogen level ___________________________ sharply

Ischemic Phase
• If fertilization does not occur, vascular changes cause the ___________________________ to become pale and small blood vessels

Menstrual Phase
• ___________________________ endometrium is shed
• Menstruation occurs
  - Discharge of blood, mucus, and cellular debris
• Average blood loss is __________ml
• Menstrual flow usually lasts from __________ to __________ days

Menopause
• The cessation of menses and ovarian function resulting from decreased secretion of ___________________________.
• Menstrual periods generally continue to occur until a woman is __________ to __________.

The Pregnant Uterus
• Pregnancy raises the circulatory volume by about __________% 
• ___________________________ cardiac rate by about 15bpm
• Increases cardiac output by 40%
• Size and weight of fetus may compress the ___________________________ producing supine hypotension syndrome
• Mother's body will sacrifice life of fetus to preserve itself

The Male Reproductive System
• ___________________________ : produce hormones and sperm
  - Contained in the scrotum
• ___________________________ : small sac in which sperm cells are stored
• Vasa Deferens: duct that carries sperm to the urethra
• ___________________________ gland: surrounds the male urinary bladder neck
• Penis