### Chapter 4: Body Systems

- Identify five body cavities and the major organs in each
- Identify eight body systems and the major structures in each
- Describe the primary functions of each of the eight systems
- Give one example of how the systems work together
- Describe a condition within each body system that would require emergency care

### Introduction

- Understanding the body's systems and how they interact and depend on each other will help you give appropriate care to an injured or ill person.

### Anatomical Terms

- Anatomical position is the basis for all medical terms that refer to the body.
  - The person stands with the body erect and arms down at the sides, palms facing forward.
- Break into groups and review anterior/posterior, superior/inferior, frontal or coronal plane, sagittal or lateral plane, transverse or axial plane, medial/lateral, proximal/distal, superficial/deep, internal/external and right/left.
Anatomical Terms

Positions
- Supine position refers to the person lying face-up on his or her back.
- Prone position refers to the person lying face-down on his or her stomach.
- Right and left lateral recumbent position refers to the person lying on his or her right or left side.
- Fowler’s position refers to the person lying on his or her back with the upper body elevated at a 45° to 60° angle.

Body Cavities

- A body cavity is a space in the body containing organs, such as the heart, lungs and liver.
- Five major cavities:
  - Cranial
  - Spinal
  - Thoracic
  - Abdominal
  - Pelvic

Body Systems

- The body is made up of billions of microscopic cells, the basic units of all living tissue.
- Similar cells form tissues.
- An organ is a collection of similar tissues acting together to perform a specific body function.
Body Systems (continued)

- A body system is a group of organs and other structures that adapt to perform specific body functions.
- For the body to work properly, all of the following body systems must work well together:
  - Respiratory
  - Circulatory
  - Nervous
  - Musculoskeletal
  - Integumentary
  - Endocrine
  - Digestive
  - Genitourinary

Musculoskeletal System

- If an injury occurs that breaks a bone, what can happen?
  - Fracture
  - Dislocation
  - Subluxation
  - Strains
  - Sprains
  - Actions?
Respiratory System

If an airway obstruction blockage does not permit air to reach the lungs and prevents oxygen from being circulated to the vital organs, what can happen?

Respiratory System

- Respiratory Distress
  - Conscious or Unconscious
  - Anxious
  - Lips and nails cyanotic
- Hyperventilation
- Respiratory arrest
- Action?

<table>
<thead>
<tr>
<th>TABLE 4.3: Pediatric Considerations in the Respiratory System</th>
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<tbody>
<tr>
<td><strong>ANATOMICAL DIFFERENCES IN CHILDREN AND INFANTS AS COMPARED WITH ADULTS</strong></td>
</tr>
<tr>
<td>Structure are smaller.</td>
</tr>
<tr>
<td>Primarily breathe through nose (especially infants).</td>
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<tr>
<td>Tongue takes up proportionately more space in the pharynx.</td>
</tr>
<tr>
<td>Presence of “breathy breath.”</td>
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<tr>
<td>Face shape and nose are flatter.</td>
</tr>
<tr>
<td>Tissue is narrower, softer and more flexible.</td>
</tr>
<tr>
<td>More mucus secretions.</td>
</tr>
<tr>
<td>Use abdominal muscles to breathe.</td>
</tr>
<tr>
<td>Chest wall is softer.</td>
</tr>
<tr>
<td>More flexible ribcage.</td>
</tr>
<tr>
<td>Breathe faster.</td>
</tr>
</tbody>
</table>
If a heart attack damages the heart and diminishes or prevents the delivery of oxygenated blood to the vital organs, what can happen?

Pulmonary Circulation
- Get O₂ from the lungs

Systemic Circulation
- Distribute O₂ to tissues

Caused by blood clot, severe bleeding, failure of the heart
- Cardiac arrest
  - Angina, respiratory distress, referred pain, sweating
- Actions?
Nervous System

- If a significant injury to the brain occurs, what can happen?

Nervous System

- Unconscious
- Conscious
  - Loss of function
    - Speech
    - Senses
    - Motor
- Voluntary/Autonomic
- Actions?

Integumentary System

- If a significant injury occurs to the skin, what can happen?
**Integumentary System**

- **Burns**
  - Extreme temps
- **Cuts, Scrapes**
  - Increase chance of infection

**Endocrine System**

If a problem develops with the endocrine system, what can happen?

- Controls many regulatory functions.
- **Diabetic emergency**
  - Feeling weak or ill
  - Altered level of consciousness
  - Abnormal pulse
  - Irregular breathing
Digestive System

- If a significant injury occurs to a part of the digestive system, what can happen?

- **Abdominal trauma**
  - Rigid abdominal area
  - Pain
  - Bruising
  - Protruding organs

- **Illness**
  - Vomiting (blood)
  - Dehydration

Genitourinary System

- If an injury occurs to the pelvic area, damaging a part of the genitourinary system, what can happen?
Genitourinary System

- Renal trauma
  - Internal bleeding
  - Blood in urine
- Ruptured bladder
- Injuries to genitalia
  - Rarely life-threatening
  - But cause much distress

Interrelationships Among Body Systems

- Each body system plays a vital role in survival.
- Body systems work together.
- The condition that results from the progressive failure of body systems is called shock.
  - The inability of the circulatory system to provide adequate O\textsubscript{2} to all parts of the body, especially vital organs

Table 4-1

Closing

- Each body system plays a vital role in survival. The body systems work together to help the body maintain a constant healthy state.

Questions?