Chapter 5 - Medical Terminology and Anatomy and Physiology

OBJECTIVES

5.1 Define key terms introduced in this chapter. Slides 12, 20, 31, 41, 48, 65–73
5.2 Describe the importance of the proper use of medical terminology. Slides 12, 16–17
5.3 Apply definitions of common prefixes, suffixes, and roots to determine the meaning of medical terms. Slides 12–16

continued

OBJECTIVES

5.4 Recognize the meaning of acronyms and abbreviations commonly used in EMS. Slide 16
5.5 Give examples of when it is better to use a common or lay term to describe something than it is to use a medical term. Slide 17

continued
5.6 Use anatomical terms of position and direction to describe the location of body structures and position of the body. Slides 22–29

5.7 Utilize topographical anatomical landmarks as points of reference. Slide 24

5.8 Describe the structures and functions of each of the following body systems: musculoskeletal, respiratory, cardiovascular, nervous, digestive, integumentary, endocrine, renal, and male and female reproductive. Slides 31–73

5.9 Given a series of models or diagrams, label the anatomical structures of each of the following body systems: skeletal, respiratory, cardiovascular, nervous, skin, endocrine, renal/urinary, and male and female reproductive. Slides 32–38, 41, 49–52, 65–66, 69–70, 72–73
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OBJECTIVES

5.10 Describe differences in the respiratory anatomy of children as compared to adults. Slides 47
5.11 Apply understanding of anatomy and physiology to explain the function of the life support chain. Slide 20

MULTIMEDIA

• Slide 17 Medical Term Components Video
• Slide 18 Terms Involved With Medical Specialties Video

CORE CONCEPTS

• Medical terminology and how terms are constructed
• Directional terms
• Positional terms
• The structure and function of major body systems
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Topics

• Medical Terminology
• Anatomy and Physiology
• Anatomical Terms
• Body Systems

Medical Terminology

Components of Medical Terms

• Words made from parts
  – Root: pnea, arthr
  – Root with combining form: therm-o + meter = thermometer
  – Prefix: dys-pnea, tachy-pnea
  – Suffix: arthr-itis, hemophil-iac
• Compounds of two or more words:
  smallpox
Word Component Example

tachy (fast) | cardia (heart)
\[\rightarrow\]
tachycardia (fast heart rate)

Word Component Example

hemo (blood) | thorax (chest)
\[\rightarrow\]
hemothorax (blood in chest cavity)

Word Component Example

cardio (heart) | ology (study of) | ist (specialist)
\[\rightarrow\]
cardiologist (doctor specializing in cardiac care)

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Acronyms and Abbreviations

• Acronym: abbreviation made up of initials that can be pronounced as a word
  – CPAP (see-pap): Continuous Positive Airway Pressure

• Abbreviation: letters or symbols used in place of words or phrases
  – DNR: Do Not Resuscitate
Anatomy and Physiology

• Anatomy—study of body structure
• Physiology—study of body function

Anatomical Terms
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Anatomical Position

- Facing forward, hands at sides, palms facing forward

Anatomical Planes

Abdominal Quadrants

- Horizontal and vertical lines through navel
- Right upper quadrant (RUQ)
- Left upper quadrant (LUQ)
- Right lower quadrant (RLQ)
- Left lower quadrant (LLQ)
Positional Terms—Fowler/Semi-Fowler Position

Positional Terms—Trendelenburg Position

Body Systems
Musculoskeletal System

- Gives body shape
- Protects body organs
- Allows for movement

Skeletal System

- Extends into all parts of the body
- Consists of skull and spine, ribs and sternum, shoulders and upper extremities, pelvis and lower extremities

Skull

- Cranial
- Zygomatic bone (cheekbone)
- Maxilla
- Mandible (jaw)
- Orbit
- Nasal bone
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Muscle

- Voluntary (skeletal)
- Involuntary (smooth)
- Cardiac

Respiratory System

- Brings in oxygen via inhalation
- Excretes carbon dioxide via exhalation

Respiratory Physiology

- Inhalation (active process)
  - Diaphragm and intercostal muscles contract; diaphragm moves downward
  - Negative pressure pulls air into lungs
- Exhalation (passive process)
  - Diaphragm and intercostal muscles relax
  - Positive pressure pushes air out of lungs
Inhalation

Exhalation

Ventilation and Respiration

- Ventilation: movement of gases to and from alveoli
- Respiration: exchange of gases between cells and bloodstream

continued
Ventilation and Respiration

- Oxygenated blood travels from lungs to heart, then is pumped to rest of the body
- At capillary level, oxygen ($O_2$) is exchanged with cells for waste carbon dioxide ($CO_2$)
- Deoxygenated blood returns to the heart, then to lungs to exchange waste $CO_2$ for $O_2$

Pediatric Differences: Respiratory System

- Child has smaller nose and mouth
- Nasal cavities are narrow
- Septum is more developed
- Airway structures are more wash developed

Cardiovascular System

- Heart
- Blood
- Circulatory system
Circulation of the Blood

Composition of the Blood

• Plasma
  – More than half of blood’s volume
• Red blood cells
  – RBCs, erythrocytes, red corpuscles
• White blood cells
  – WBCs, leukocytes, white corpuscles
• Platelets
  – Help with clotting

Pulse

• Wave of blood flowing down an artery when the left ventricle contracts
• Can be felt when an artery is near the surface of the skin and over a bone
Peripheral and Central Pulses

- Peripheral (outer parts of body)
  - Radial
  - Brachial
  - Posterior tibial
  - Dorsalis pedis
- Central (core of body)
  - Carotid
  - Femoral

Central Pulses

- Pulses near the center or core of the body
- Carotid
- Femoral
- Carotid pulse should be used to determine pulselessness rather than a peripheral pulse

Carotid Pulse
Brachial Pulse

Radial Pulse

Femoral Pulse
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Dorsalis Pedis Pulse

Blood Pressure

- Pressure inside arteries
- Systolic (upper reading)—arterial pressure when left ventricle contracts
- Diastolic (lower reading)—pressure when left ventricle refills

Perfusion

- Adequate circulation of blood and exchange of oxygen and waste products
- Hypoperfusion (shock): when flow becomes inadequate
Think About It

• How is the function of the respiratory system related to the function of the circulatory system?

Central Nervous System

• Brain
• Spinal cord

Peripheral Nervous System

• Sensory
  – Messages from body to brain
• Motor
  – Messages from brain to body
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Digestive System

Integumentary System—Functions

Integumentary System—Layers
Endocrine System

Renal System
- Helps body regulate fluid levels, chemicals, and pH levels
- Kidneys
- Bladder
- Ureters
- Urethra

Male Reproductive System
Chapter Review

- Medicine has a language of its own. You will frequently communicate with medical professionals who speak this language.
- Medical terms generally consist of a root with a prefix and/or suffix.
Chapter Review

• Your knowledge of the anatomy, or structure, and the functions, or physiology, of the body will be important in allowing you to assess your patient and communicate your findings with other EMS personnel and hospital staff accurately and efficiently.

Chapter Review

• Major body systems with which you should be familiar are musculoskeletal, respiratory, cardiovascular, nervous, digestive, integumentary, endocrine, renal, and reproductive.

Remember

• Medical terminology is the language of health care. Roots, prefixes, and suffixes can lend clues to the meaning of many terms.
• Understanding anatomy and physiology is like reviewing the owner’s manual for the body.
Remember

• Anatomical terminology brings precision and accuracy to descriptions.
• Understanding an overview and the basic function of body systems will improve both assessment and treatment of patients.

Questions to Consider

• Is my use of medical terms accurate and descriptive?
• Can I identify critical organs and structures that reside in an area where a patient has a complaint or traumatic injury?

Critical Thinking

• You respond to a teenage boy who has taken a hard fall from his dirt bike. He has a deep gash on the outside of his left arm halfway between shoulder and elbow and another on the inside of his right arm just above the wrist. His left leg is bent at a funny angle about halfway between hip and knee.
Critical Thinking

• When you cut away his pants leg, you see a bone sticking out of a wound on the front side. How will you describe your patient’s injuries over the radio to the hospital staff?

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