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UNIT TERMINAL OBJECTIVE

3-2 At the completion of this unit, the EMT-Critical Care Technician student will be able to explain the significance of physical exam findings commonly found in emergency situations.

COGNITIVE OBJECTIVES

At the completion of this unit, the EMT-Critical Care Technician student will be able to:

3-2.1 Define the terms inspection, palpation, percussion, auscultation. (C-1)
3-2.2 Describe the techniques of inspection, palpation, percussion, and auscultation. (C-1)
3-2-3 Review the procedure for taking and significance of vital signs (pulse, respiration, and blood pressure.) (C-2)
3-2.4 Describe the evaluation of mental status. (C-1)
3-2.5 Evaluate the importance of a general survey. (C-3)
3-2.6 Describe the examination of skin and nails. (C-1)
3-2.7 Differentiate normal and abnormal findings of the assessment of the skin. (C-3)
3-2.8 Distinguish the importance of abnormal findings of the assessment of the skin. (C-3)
3-2.9 Describe the normal and abnormal assessment findings of the head (including the scalp, skull, face and skin). (C-1)
3-2.10 Describe the examination of the head (including the scalp, skull, face, and skin). (C-1)
3-2.11 Describe the examination of the eyes. (C-1)
3-2.12 Distinguish between normal and abnormal assessment findings of the eyes. (C-3)
3-2.13 Describe the examination of the ears. (C-1)
3-2.14 Differentiate normal and abnormal assessment findings of the ears. (C-3)
3-2.15 Describe the examination of the nose. (C-1)
3-2.16 Differentiate normal and abnormal assessment findings of the nose. (C-3)
3-2.17 Describe the examination of the mouth and pharynx. (C-1)
3-2.18 Differentiate normal and abnormal assessment findings of the mouth and pharynx. (C-3)
3-2.19 Describe the examination of the neck and cervical spine. (C-1)
3-2.20 Differentiate normal and abnormal assessment findings the neck and cervical spine. (C-3)
3-2.21 Describe the inspection, palpation, percussion, and auscultation of the chest. (C-1)
3-2.22 Describe the examination of the thorax and ventilation. (C-1)
3-2.23 Describe the examination of the anterior and posterior chest. (C-1)
3-2.24 Differentiate the percussion sounds and their characteristics. (C-3)
3-2.25 Differentiate the characteristics of breath sounds. (C-3)
3-2.26 Differentiate normal and abnormal assessment findings of the chest examination. (C-3)
3-2.27 Describe the examination of the arterial pulse including rate, rhythm, and amplitude. (C-1)
3-2.28 Distinguish normal and abnormal findings of arterial pulse. (C-3)
3-2.29 Describe the assessment of jugular venous pressure and pulsations. (C-1)
3-2.30 Distinguish normal and abnormal examination findings of jugular venous pressure and pulsations. (C-3)
3-2.31 Describe the examination of the heart. (C-1)
3-2.32 Differentiate normal and abnormal assessment findings of the heart. (C-3)
3-2.33 Describe the auscultation of the heart. (C-1)
3-2.34 Differentiate the characteristics of normal and abnormal findings associated with the auscultation of the heart. (C-3)
3-2.35 Describe the examination of the abdomen. (C-1)
3-2.36 Differentiate normal and abnormal assessment findings of the abdomen. (C-3)
3-2.37 Describe the examination of the female external genitalia. (C-1)
3-2.38 Differentiate normal and abnormal assessment findings of the female external genitalia. (C-3)
3-2.39 Describe the examination of the male genitalia. (C-1)

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3-2.40 Differentiate normal and abnormal findings of the male genitalia. (C-3)
3-2.41 Describe the examination of the extremities. (C-1)
3-2.42 Differentiate normal and abnormal findings of the extremities. (C-3)
3-2.43 Describe the examination of the peripheral vascular system. (C-1)
3-2.44 Differentiate normal and abnormal findings of the peripheral vascular system. (C-3)
3-2.45 Describe the examination of the nervous system. (C-1)
3-2.46 Differentiate normal and abnormal findings of the nervous system. (C-3)
3-2.47 Discuss the considerations of examination of an infant or child. (C-1)
3-2.48 Describe the general guidelines of recording examination information. (C-1)

AFFECTIVE OBJECTIVES
At the completion of this unit, the EMT-Critical Care Technician student will be able to:

3-2.49 Demonstrate a caring attitude when performing physical examination skills. (A-3)
3-2.50 Discuss the importance of a professional appearance and demeanor when performing physical examination skills. (A-1)
3-2.51 Appreciate the limitations of conducting a physical exam in the out-of-hospital environment. (A-2)

PSYCHOMOTOR OBJECTIVES
At the completion of this unit, the EMT-Critical Care Technician student will be able to:

3-2.52 Demonstrate the examination of skin and nails. (P-2)
3-2.53 Demonstrate the examination of the head and neck. (P-2)
3-2.54 Demonstrate the examination of the eyes. (P-2)
3-2.55 Demonstrate the examination of the ears. (P-2)
3-2.56 Demonstrate the examination of the nose. (P-2)
3-2.57 Demonstrate the examination of the mouth. (P-2)
3-2.58 Demonstrate the examination of the neck. (P-2)
3-2.59 Demonstrate the examination of the thorax and ventilation. (P-2)
3-2.60 Demonstrate the examination of the anterior and posterior chest. (P-2)
3-2.61 Demonstrate auscultation of the chest. (P-2)
3-2.62 Demonstrate percussion of the chest. (P-2)
3-2.63 Demonstrate the examination of the arterial pulse including location, rate, rhythm, and amplitude. (P-2)
3-2.64 Demonstrate the assessment of jugular venous pressure and pulsations. (P-2)
3-2.65 Demonstrate the examination of the heart. (P-2)
3-2.66 Demonstrate the examination of the abdomen. (P-2)
3-2.67 Demonstrate auscultation of the abdomen. (P-2)
3-2.68 Demonstrate the external visual examination of the female external genitalia. (P-2)
3-2.69 Demonstrate the examination of the male genitalia. (P-2)
3-2.70 Demonstrate the examination of the peripheral vascular system. (P-2)
3-2.71 Demonstrate the examination of the extremities. (P-2)
3-2.72 Demonstrate the examination of the nervous system. (P-2)

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DECLARATIVE

I. Physical examination - approach and overview
- A. Examination techniques and equipment
  - 1. Examination techniques
    - a. Inspection
    - b. Palpation
    - c. Percussion
    - d. Auscultation
  - 2. Measurement of vitals
    - a. Pulse
    - b. Respirations
    - c. Blood pressure
  - 3. Height and weight
  - 4. Equipment
    - a. Stethoscope
    - b. Blood pressure cuff
    - c. Cardiac monitor
    - d. Pulse oximetry
    - e. Peak flow meter
    - f. Capnometry
- B. General approach
  - 1. Examine the patient systematically
  - 2. Place special emphasis on areas suggested by the present illness and chief complaint
  - 3. Keep in mind that most patients view a physical exam with apprehension and anxiety - they feel vulnerable and exposed
- C. Overview of a advanced examination
  - 1. The categories of a physical exam should include
    - a. Mental status
    - b. General survey
    - c. Vital signs
    - d. Skin
    - e. HEENT
      - (1) Head
      - (2) Eyes
      - (3) Ears
      - (4) Nose
      - (5) Throat
    - f. Neck
    - g. Chest
    - h. Abdomen
    - i. Posterior body
    - j. Extremities
      - (1) Peripheral vascular
      - (2) Musculoskeletal
    - k. Neurologic exam

II. Mental status
- A. Appearance and behavior

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1. Level of consciousness
    a. Alertness
    b. Response to verbal stimuli
    c. Response to touch or shake of shoulder (tactile)
    d. Response to painful stimuli
    e. Unresponsive
    f. Possible findings
        (1) Normal
        (2) Drowsy
        (3) Obtunded
            (a) Insensitivity to unpleasant or painful stimuli by reduced level of consciousness by an anesthetic or analgesic
        (4) Stuporous
            (a) State of lethargy and unresponsiveness
            (b) Person seems unaware of surroundings
    g. Coma
        (1) State of profound unconsciousness
        (2) Absence of spontaneous eye movements
        (3) No response to verbal or painful stimuli
        (4) Patient can not be aroused by any stimuli
2. Posture and motor behavior
    a. Abnormal posture
        (1) Purposeful
        (2) Non purposeful
    b. Appropriateness of movement
    c. Possible findings
        (1) Normal
        (2) Restlessness
        (3) Agitation
        (4) Bizarre postures
        (5) Immobility
        (6) Involuntary movements
3. Dress, grooming, and personal hygiene
    a. Fastidiousness
    b. Neglect
4. Facial expression
    a. Anxiety
    b. Depression
    c. Elation
    d. Anger
    e. Response to imaginary people or objects
    f. Withdrawal
5. Manner, affect, and relation to person and things

B. Speech and language
1. Assess
    a. Quantity
    b. Rate
    c. Loudness
    d. Fluency

e. Possible findings
(1) Aphasia
(2) Dysphonia
(3) Dysarthria
(4) Changes with mood disorders

C. Mood
1. Assess
a. Stability of abnormal mood
b. Risk of suicide
c. Possible findings
(1) Happiness
(2) Elation
(3) Depression
(4) Anxiety
(5) Anger
(6) Indifference

D. Orientation
1. Assess
a. Time
b. Place
c. Person
d. Possible findings
(1) Disorientation
e. Assess remote memory (i.e., birthdays)
f. Assess recent memory (i.e., events of the day)

III. General survey
A. Level of consciousness
1. AVPU
B. Signs of distress
1. Assess for signs of distress
2. Examples (not inclusive)
a. Cardiorespiratory insufficiency
(1) Labored breathing
(2) Wheezing
(3) Cough
b. Pain
(1) Wincing
(2) Sweating
(3) Protectiveness of a painful part
c. Anxiety
(1) Anxious face
(2) Fidgety movement
(3) Cold moist palms
C. Apparent state of health
1. Acutely or chronically ill
2. Frail
3. Feeble
4. Robust

5. Vigorous

D. Skin color and obvious lesions
1. Pallor
2. Cyanosis
3. Jaundice
4. Rashes
5. Bruises - ecchymosis
6. Scars
7. Discoloration

E. Weight
1. Emaciated
2. Obese
3. Recent history of weight gain or loss

F. Posture, gait, and motor activity
1. Preferred posture
   a. Tripodal
   b. Paralysis
   c. Limpness
   d. Ataxia
   e. Restless or quiet
   f. Involuntary motor activity
   g. Ease of walking
      (1) Balance
      (2) Limp
      (3) Discomfort
      (4) Fear of falling
      (5) Abnormal motor pattern

G. Dress, grooming, and personal hygiene
1. How is the patient dressed
   a. Appropriate for temperature and weather
   b. Clean

H. Odors of breath
1. May indicate underlying conditions
   a. Alcohol/ alcoholic beverage
   b. Acetone
   c. Putrid
   d. Other

I. Facial expression
1. Observe expression
2. At rest, during conversation, and during the examination

J. Vital signs
1. Blood pressure
2. Respirations
3. Pulse
4. Temperature

K. Additional assessment techniques
1. Pulse oximetry
2. Blood glucose monitor
3. Cardiac monitor

IV. Anatomical regions
- A. Skin
  - 1. Techniques of exam
    - a. Inspect and palpate the skin
      - (1) Note the following characteristics
        - (a) Color
          - i) The red color of oxyhemoglobin and pallor due to lack of oxygen are best seen where the epidermis is thinnest
          - ii) The fingernails and lips and the mucous membranes of the mouth and palpebral conjunctiva
          - iii) In dark skinned persons, the palms and the soles may also be useful
        - (b) Moisture
        - (c) Temperature
        - (d) Texture
        - (e) Mobility and turgor
        - (f) Lesions
    - b. Inspect the fingernails
      - (1) Note their color
  - 2. Abnormalities
    - a. Color
    - b. Temperature
    - c. Condition
- B. Head, ears, eyes, nose, and throat
  - 1. Techniques of examination
    - a. Head
      - (1) The scalp
        - (a) Inspect and palpate for evidence of trauma
      - (2) Skull
        - (a) Inspect and palpate, note any tenderness or deformities
      - (3) Face
        - (a) Note the facial expression and contours
        - (b) Observe for asymmetry, involuntary movements, and edema
        - (c) Inspect and palpate, note any tenderness or deformities
      - (4) Skin
        - (a) Note color, temperature, and condition
    - b. Eyes
      - (1) Position and alignment
        - (a) Stand in front of the patient and survey the patient's eyes
        - (b) Assess for conjugate gaze
      - (2) Eyelids
        - (a) Inspect the eyelids for any evidence of trauma
      - (3) Conjunctiva and sclera
        - (a) Inspect for discoloration
      - (4) Pupils
        - (a) Inspect the size, shape, and symmetry of the pupils
        - (b) Test the pupillary reactions to light
          - i) Look for
            - a) Direct reaction

b) Consensual reaction

c. Ears
(1) The auricle
(a) Inspect each auricle and surrounding tissue for deformities, drainage, tenderness, and erythema
(2) Mastoid
(a) Discoloration
(b) Tenderness

d. Nose
(1) Inspect the anterior and inferior surface of the nose
(a) Asymmetry
(b) Deformity
(c) Foreign bodies
(2) Palpate for tenderness

e. Mouth and pharynx
(1) Inspect the lips, observe color, moisture, or cracking
(2) Note the color of the gums
(3) Inspect the teeth
(4) Inspect the tongue

f. Neck
(1) Inspect the neck, noting its symmetry and any masses or scars
(2) Inspect and palpate the trachea for any deviation
(3) Inspect for jugular venous distention
(4) The cervical spine
(a) Inspection
(b) Palpation
i) Tenderness
ii) Deformities
(c) Nuchal rigidity

C. Chest
1. Techniques of examination

a. General approach
(1) Proceed in an orderly fashion
(a) Inspect
(b) Palpate
(c) Percuss
(d) Auscultate
(e) Compare side to side
(2) Try to visualize the underlying lobes of the lungs

b. Examination of the thorax and ventilation
(1) Observe rate, rhythm, depth, and effort of breathing
(2) Check for cyanosis
(3) Listen to the patient's breathing
(4) Observe the shape of the chest

c. Examination of the anterior and posterior chest
(1) Inspect
(a) Any deformities or asymmetry
i) Barrel chest
ii) Traumatic flail chest

iii) Open wounds
iv) Other evidence of trauma
(b) Abnormal retractions
(c) Impairment of respiratory movement
(2) Palpate
(a) Any tenderness
(b) Assessment of observed abnormalities
(c) Further assessment of respiratory expansion
(3) Percuss in symmetrical locations noting
(a) Any area of abnormal percussion
i) Dullness
ii) Resonance
iii) Hyperresonance
(4) Auscultate breath sounds
(a) Normal
i) Vesicular
ii) Bronchiovesicular
iii) Bronchial
iv) Tracheal
(b) Added sounds (adventitious lung sounds)
i) Discontinuous sounds (crackles)
a) Fine crackles
b) Course crackles
ii) Continuous sounds
a) Wheezes
b) Rhonchi
(c) Diminished or absent
i) Effusion
ii) Consolidation

D. Cardiovascular system
1. Techniques of examination
a. Arterial pulse
(1) Heart rate
(2) Rhythm
(3) Amplitude
(4) Abnormal findings
b. Blood pressure
c. Jugular venous pressure and pulsation
(1) Abnormal findings
d. Heart
(1) Inspection and palpation of the chest
(2) Auscultation-Listen for the heart tones
(a) Locate the point of maximum impulse (PMI) and assess apical pulse
(b) Listen for distant or muffled heart tones

E. Abdomen
1. Techniques of examination
a. General approach
(1) Place the patient in a supine position

(2) Before palpation ask the patient to point out any areas of pain - examine these areas last
(3) Approach slowly and avoid quick, unexpected movements
(4) Distract the patient as needed with conversation
(5) Proceed in an orderly manner
(a) Inspection
(b) Palpation

b. Inspection of the abdomen, including the flanks, noting
(1) Skin
(a) Scars
(b) Rashes and lesions
(c) Discoloration
(d) Ascites
(2) The contour of the abdomen
(a) Bulges
i) Flat
ii) Rounded
iii) Protuberant
iv) Scaphoid
v) Bulges at the flanks
vi) Hernias
(b) Symmetry
(3) Pulsations
(4) Ascites

c. Palpation
(1) Muscle guarding
(2) Rigidity
(3) Large masses
(4) Tenderness

F. Female genitalia
1. Techniques of examination
a. General approach
(1) This may be awkward or uncomfortable for the patient and the provider
(2) Male examiners are customarily attended by female assistants
(3) Female examiners may choose to work alone

b. Examination
(1) Inspect the external genitalia
(2) Note any
(a) Inflammation
(b) Discharge and bleeding
(c) Swelling

2. Abnormal findings

G. Male genitalia
1. Techniques of examination
a. General approach
(1) This may be awkward or uncomfortable for the patient and the provider
(2) Female examiners are customarily attended by male assistants
(3) Male examiners may choose to work alone

b. Examination

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(1) Inspect the external genitalia
(2) Note any
(a) Inflammation
(b) Discharge and bleeding
(c) Swelling
(d) Hematomas

2. Abnormal findings

H. Extremities
1. Techniques of examination
a. General approach
(1) Direct your attention to function as well as structure
(2) Assess general appearance, bodily proportions and ease of movement
(3) Note particularly
(a) Limitation in the range of motion
(b) Unusual Increase in the mobility of a joint
(4) In general note
(a) Signs of inflammation
i) Swelling
ii) Tenderness
iii) Increased heat
iv) Redness
v) Decreased function
(b) Crepitus
(c) Deformities
(d) Muscular strength
(e) Symmetry
(f) Atrophy
(g) Pain
(h) Tenderness
(i) Peripheral pulses
(j) Motor function
(k) Sensory function

I. Peripheral vascular system
1. Techniques of examination
a. The arms
(1) Inspection from fingertips to shoulders noting
(a) Size
(b) Symmetry
(c) Swelling
(d) Color of the skin and nail beds
(e) Texture of the skin
(2) Palpation
(a) If you suspect arterial insufficiency, feel for the brachial pulse
(b) Compare amplitude of pulses
b. Legs
(1) Patient should be lying down
(2) Successful examination cannot be completed with socks or stockings on
(3) Inspect from the groin and buttocks to the feet
(a) Size

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(b) Symmetry
(c) Swelling
(d) Rashes
(e) Scars
(f) Ulcers
(g) Color and texture of the skin
(4) Palpate the pulses in order to assess arterial circulation
(a) Femoral pulse
(b) Popliteal pulse
(c) Dorsalis pedis pulse
(d) Posterior tibial pulse
(e) Note the temperature of the feet and legs
(f) Look for edema
(g) Check for pitting edema
i) Press firmly but gently with your thumb for at least 5 seconds
a) Over the dorsum of each foot
b) Behind each medial malleolus
c) Over the shins
(h) Assess and compare amplitude in all extremities
2. Abnormal findings
J. Spine
1. Techniques of examination
a. Inspection
(1) Evidence of trauma
(a) Obvious deformity
(b) Ecchymosis
b. Palpation
(1) Palpate the spinous process with your thumb
(a) Identify tenderness
(2) Palpate in the area of the costovertebral angle
(a) Identify tenderness
2. Abnormal findings
K. Nervous system
1. Techniques of examination
a. General approach
(1) Are right and left-sided findings symmetrical
(2) Is this a peripheral or central nervous system problem
(3) Detail of an appropriate neurological exam varies greatly
(4) Components of the neurological exam may be completed during other assessments
(5) It may be best to organize your findings into three categories
(a) Mental status and speech
(b) Motor system
(c) Sensory system
b. The motor system
(1) Body position
(a) Observe the position during movement and at rest
(2) Involuntary movements

(a) Watch for involuntary movements
(b) Note
i) Quality
ii) Rate
iii) Rhythm
iv) Amplitude
(c) Note relation to
i) Posture
ii) Activity
iii) Fatigue
iv) Emotion
(3) Muscle tone
(a) Feel the resistance to passive stretch
(4) Muscle strength
(a) Ask the patient to move actively against your resistance
i) No muscular contraction detected
ii) A barely detectable flicker or trace of contraction
iii) Active movement of the body part with gravity eliminated
iv) Active movement against gravity
v) Active movement against gravity and some resistance
vi) Active movement against full resistance without evident fatigue - this is normal muscle tone
(b) Test flexion
(c) Test extension
(d) Test the grip
(e) Test finger abduction
(f) Test dorsiflexion
(g) Test plantar flexion
(5) Coordination
(a) Rapid alternating movements
c. Sensory system
(1) General approach
(a) Compare symmetrical areas on the two sides of the body
(b) When testing pain, temperature, and touch, compare distal and proximal areas
(2) Pain
(3) Light touch

V. Physical examination of infants and children
A. Approach to the patient
B. Techniques of examination

VI. Recording examination findings

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