UNIT TERMINAL OBJECTIVE

5-6 At the completion of this unit, the EMT-Critical Care Technician student will be able to utilize the assessment findings to formulate a field impression and implement the treatment plan for the patient with a neurological emergency.

COGNITIVE OBJECTIVES

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

5-6.1 Discuss the general pathophysiology of non-traumatic neurologic emergencies. (C-1)
5-6.2 Discuss the general assessment findings associated with non-traumatic neurologic emergencies. (C-1)
5-6.3 Identify the need for rapid intervention and transport of the patient with non-traumatic emergencies. (C-1)
5-6.4 Discuss the epidemiology, assessment findings, and management for stroke and intracranial hemorrhage. (C-1).
5-6.5 Discuss the epidemiology, assessment findings, and management for transient ischemic attack. (C-1).
5-6.6 Discuss the epidemiology, assessment findings, and management of epilepsy/seizure. (C-1).
5-6.7 Discuss the epidemiology, assessment findings, and management for non-specific coma or altered level consciousness/ syncope/ weakness/ headache. (C-1).
5-6.8 Develop a patient management plan based on field impression in the patient with neurological emergencies. (C-3)

AFFECTIVE OBJECTIVES

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

5-6.9 Characterize the feelings of a patient who regains consciousness among strangers. (A-2)
5-6.10 Formulate means of conveying empathy to patients whose ability to communicate is limited by their condition. (A-3)

PSYCHOMOTOR OBJECTIVES

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

5-6.11 Perform an appropriate assessment of a patient with a non-traumatic neurological emergency. (P-3)

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DECLARATIVE

I. Introduction

II. General system pathophysiology, assessment, and management
- A. Physiology
  - 1. Alterations in cognitive systems
  - 2. Alterations in cerebral homeostasis
  - 3. Alterations in motor control
  - 4. Central nervous system disorders
    - a. Trauma
    - b. Cerebrovascular disorders
    - c. Tumors
    - d. Infection
    - e. Inflammation
    - f. Degenerative diseases
- B. Assessment findings
  - 1. History
    - a. General health
    - b. Previous medical conditions
    - c. Medications
    - d. Previous experience with complaint
    - e. Time of onset
    - f. Seizure activity
    - **g. Consider cause (A.C.I.O.U.)**
  - 2. Physical
    - a. General appearance
    - b. Level of consciousness
      - (1) Mood
      - (2) Thought
      - (3) Perceptions
      - (4) Judgment
      - (5) Memory and attention
    - c. Speech
    - d. Skin
    - e. Posture and gait
    - f. Vital signs
      - (1) Hypertension
      - (2) Hypotension
      - (3) Heart rate/ fast or slow
      - (4) Ventilation rate/ quality
      - (5) Temperature/ fever
    - g. Head/ neck
      - (1) Facial expression
      - (2) Eyes
        - (a) Position & alignment
        - (b) Pupils
      - (3) Mouth

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(a) Odors on breath
h. Thorax and lungs
(1) Auscultate
i. Cardiovascular
(1) Heart rate
(2) Rhythm
(3) ECG monitoring
j. Nervous
(1) Motor system
(a) Muscle tone
(b) Muscle strength
(c) Coordination
k. Assessment tools
(1) Blood glucose
3. Ongoing assessment
C. Management
1. Airway and ventilatory support
a. Oxygen
b. Positioning
c. Assisted ventilation
d. Suction
e. Advanced airway device
2. Circulatory support
a. Venous access
b. Blood analysis
3. Pharmacological interventions
a. Dextrose 50% **if blood glucose is less than 80 mg/dL**
b. Narcan **if actively seizing**
c. Valium **if narcotic overdose is suspected**
4. Non-pharmacological interventions
a. Positioning
b. Spinal precautions
5. Transport considerations
a. Appropriate mode
b. Appropriate facility
6. Psychological support/ communications strategies

III. Specific injuries/ illnesses
A. Stroke and intracranial hemorrhage
1. Epidemiology
a. Mortality/ morbidity
b. Risk factors
2. Pathophysiology of regional disruption of cerebral blood flow
a. Thrombus
b. Hemorrhage
c. Embolus
3. Assessment findings
a. History

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(1) General health
(2) Previous medical conditions
(3) Medications
(4) Previous experience with complaint
(5) Time of onset
(6) Seizure activity
(7) Headache
(8) Nose bleed
(9) Others

b. Physical
(1) Standard physical exam for the patient with potential neurological event
(2) Glasgow-Coma Scale
(3) Altered mental status
(4) Speech disturbances
i) slurred
ii) garbled
iii) incomprehensible speech
iv) loss of speech
(5) Weakness or paralysis on one side of the body
(6) Weakness, paralysis, or loss of expression on one side of the face

4. Management
a. Airway and ventilatory support
(1) Oxygen
(2) Positioning
(3) **Be prepared to** Assist ventilations
(4) Suction
(5) Advanced airway device **as needed**

b. Circulatory support
(1) Venous access
(2) Blood analysis

c. Pharmacological interventions
(1) Dextrose **if blood glucose is less than 80 mg/dL**
(2) Valium **if actively seizing**
(3) Narcan **if narcotic overdose is suspected**

d. Non-pharmacological interventions
(1) Positioning
(2) Spinal precautions

e. Transport considerations
(1) Appropriate mode **(Time is Brain)**
(2) Appropriate facility **(Consider Stroke Center if available)**

f. Psychological support/ communications strategies

B. Transient ischemic attack (TIA)
1. Epidemiology
a. Mortality/ morbidity
b. Risk factors

2. Pathophysiology
a. Transient neurological deficits
b. Partial disruptions of blood flow

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3. Assessment findings
   a. History
      (1) General health
      (2) Previous medical conditions
      (3) Medications
      (4) Previous experience with complaint
      (5) Time of onset
      (6) Seizures
      (7) Headache
      (8) Nosebleed
   b. Physical
      (1) Standard physical exam for the patient with potential neurological event
      (2) Glasgow-Coma Scale
      (3) Altered mental status
      (4) Speech disturbances
         i) slurred
         ii) garbled
         iii) incomprehensible speech
         iv) loss of speech
      (5) Weakness or paralysis on one side of the body
      (6) Weakness, paralysis, or loss of expression on one side of the face
4. Management **(Treat as Stroke patient)**
   a. Airway and ventilatory support
      (1) Oxygen
      (2) Positioning
      (3) Assisted ventilation
      (4) Suction
      (5) Advanced airway device
   b. Circulatory support
      (1) Venous access
      (2) Blood analysis
   c. Pharmacological interventions
      (1) Dextrose **if blood glucose is less than 80 mg/dL**
      (2) Valium **if actively seizing**
      (3) Narcan **if narcotic overdose is suspected**
   d. Non-pharmacological interventions
      (1) Positioning
      (2) Spinal precautions
   e. Transport considerations
      (1) Appropriate mode
      (2) Appropriate facility
   f. Psychological support/ communications strategies

C. Epilepsy/ seizures
1. Epidemiology
   a. Mortality/ morbidity
   b. Risk factors
2. Pathophysiology
   a. Unexpected electrical discharge of neurons in brain

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b. Types
   (1) Generalized
      (a) Grand mal (tonic-clonic)
      (b) Tonic
      (c) Clonic
      (d) Petit mal
   (2) Partial
      (a) Simple partial
      (b) Complex partial
   (3) Status epilepticus
c. Causes other than epilepsy
   (1) Idiopathic
   (2) Fever
   (3) Neoplasms
   (4) Infection
   (5) Metabolic
   (6) Drug intoxication
   (7) Drug withdrawal
   (8) Head trauma
   (9) Eclampsia
   (10) Cerebral degenerative diseases

3. Assessment findings
   a. History
      (1) General health
      (2) Previous medical conditions
      (3) Medications
      (4) Previous seizures
      (5) Time of onset
      (6) Seizure activity
         (a) Duration
         (b) Number of events
         (c) Consciousness between
   b. Physical
      (1) Standard physical exam for the patient with potential neurological event
      (2) Pertinent findings
         (a) Tongue laceration(s)
         (b) Head
            i) Hemorrhage
            ii) Wounds
         (c) GI/ GU
            i) Incontinence of bladder
            ii) Incontinence of bowel

4. Management
   a. Airway and ventilatory support
      (1) Oxygen
      (2) Positioning
      (3) Assisted ventilation
      (4) Suction

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(5) Advanced airway device
b. Circulatory support
(1) Venous access
(2) Blood analysis
c. Pharmacological interventions
(1) Dextrose
(2) Valium
(3) Narcan
d. Non-pharmacological interventions
(1) Protection from injury
(2) Positioning
(3) Spinal precautions
e. Transport considerations
(1) Appropriate mode
(2) Appropriate facility
f. Psychological support/ communications strategies

D. Non-specific coma or altered level of consciousness/ syncope/ weakness/ headache
1. Pathophysiology
a. Define coma
b. Define syncope
c. Headache
d. Describe potential causes
2. Assessment findings
a. Standard history and physical focused neurological exam
3. Management
a. Airway and ventilatory support
(1) Oxygen
(2) Positioning
(3) Assisted ventilation
(4) Suction
(5) Advanced airway device
b. Circulatory support
(1) Venous access
(2) Blood analysis
c. Pharmacological interventions
(1) Dextrose **if blood glucose is less than 80 mg/dL**
(2) Valium **if actively seizing**
(3) Narcan **if narcotic overdose is suspected**
d. Non-pharmacological interventions
(1) Protection from injury
(2) Positioning
(3) Spinal precautions
e. Transport considerations
(1) Appropriate mode
(2) Appropriate facility
f. Psychological support/ communications strategies

IV. Integration

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A. Develop management strategies, based on the chief complaint or problem, for the following patient presentations
   1. Coma/ decreased level of consciousness
   2. Stroke
   3. Seizure

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