
UNIT TERMINAL OBJECTIVE

- 5-7 At the completion of this unit, the paramedic student will be able to integrate pathophysiological principles and the assessment findings to formulate a field impression and implement a treatment plan for the patient with a renal or urologic problem.

COGNITIVE OBJECTIVES

At the conclusion of this unit, the paramedic student will be able to :

- 5-7.1 Describe the incidence, morbidity, mortality, and risk factors predisposing to urological emergencies. (C-1)
- 5-7.2 Discuss the anatomy and physiology of the organs and structures related to urogenital diseases. (C-1)
- 5-7.3 Define referred pain and visceral pain as it relates to urology. (C-1)
- 5-7.4 Describe the questioning technique and specific questions the paramedic should utilize when gathering a focused history in a patient with abdominal pain. (C-1)
- 5-7.5 Describe the technique for performing a comprehensive physical examination of a patient complaining of abdominal pain. (C-1)
- 5-7.6 Define acute renal failure. (C-1)
- 5-7.7 Discuss the pathophysiology of acute renal failure. (C-1)
- 5-7.8 Recognize the signs and symptoms related to acute renal failure. (C-1)
- 5-7.9 Describe the management for acute renal failure. (C-1)
- 5-7.10 Integrate pathophysiological principles and assessment findings to formulate a field impression and implement a treatment plan for the patient with acute renal failure. (C-3)
- 5-7.11 Define chronic renal failure. (C-1)
- 5-7.12 Discuss the pathophysiology of chronic renal failure. (C-1)
- 5-7.13 Recognize the signs and symptoms related to chronic renal failure. (C-1)
- 5-7.14 Describe the management for chronic renal failure. (C-1)
- 5-7.15 Integrate pathophysiological principles and assessment findings to formulate a field impression and implement a treatment plan for the patient with chronic renal failure. (C-3)
- 5-7.16 Define renal dialysis. (C-1)
- 5-7.17 Discuss the common complication of renal dialysis. (C-1)
- 5-7.18 Define renal calculi. (C-1)
- 5-7.19 Discuss the pathophysiology of renal calculi. (C-1)
- 5-7.20 Recognize the signs and symptoms related to renal calculi. (C-1)
- 5-7.21 Describe the management for renal calculi. (C-1)
- 5-7.22 Integrate pathophysiological principles and assessment findings to formulate a field impression and implement a treatment plan for the patient with renal calculi. (C-3)
- 5-7.23 Define urinary tract infection. (C-1)
- 5-7.24 Discuss the pathophysiology of urinary tract infection. (C-1)
- 5-7.25 Recognize the signs and symptoms related to urinary tract infection. (C-1)
- 5-7.26 Describe the management for a urinary tract infection. (C-1)
- 5-7.27 Integrate pathophysiological principles and assessment findings to formulate a field impression and implement a treatment plan for the patient with a urinary tract infection. (C-3)
- 5-7.28 Apply the epidemiology to develop prevention strategies for urological emergencies. (C-2)
- 5-7.29 Integrate pathophysiological principles to the assessment of a patient with abdominal pain. (C-3)
- 5-7.30 Synthesize assessment findings and patient history information to accurately differentiate between pain of a urogenital emergency and that of other origins. (C-3)
- 5-7.31 Develop, execute, and evaluate a treatment plan based on the field impression made in the assessment. (C-3)

AFFECTIVE OBJECTIVES

None identified for this unit.

PSYCHOMOTOR OBJECTIVES

None identified for this unit.

DECLARATIVE

- I. Introduction
 - A. Epidemiology
 - 1. Incidence
 - 2. Mortality/ morbidity
 - 3. Risk factors
 - 4. Prevention strategies
 - B. Anatomy and physiology review
 - C. Mechanisms of injuries/ illness

- II. General pathophysiology, assessment and management
 - A. Pathophysiology of abdominal pain
 - 1. Bacterial contamination
 - a. Urinary tract infection
 - 2. Types of abdominal pain
 - a. Visceral pain
 - (1) Obstruction of hollow viscera (ureters, urethra, etc.)
 - b. Referred pain
 - B. Assessment findings
 - 1. Scene size-up
 - 2. Initial assessment
 - a. Airway
 - b. Breathing
 - c. Circulation
 - d. Disability
 - e. Chief complaint
 - 3. Focused history
 - a. Onset
 - b. Provoking factors
 - c. Quality
 - d. Region/ radiation
 - e. Severity
 - f. Time
 - g. Previous history of same event
 - h. Nausea / vomiting
 - i. Change in bowel habits/ stool
 - (1) Constipation
 - (2) Diarrhea
 - j. Weight loss
 - k. Last meal
 - l. Chest pain
 - 4. Focused physical examination
 - a. Appearance
 - b. Posture
 - c. Level of consciousness
 - d. Apparent state of health
 - e. Skin color
 - f. Vital signs
 - g. Inspect abdomen

- h. Auscultate abdomen
- i. Percuss abdomen
- j. Palpate abdomen
- k. Female abdominal exam
- l. Male abdominal exam
- 5. Assessment tools
 - a. Hematocrit
- C. Management/ treatment plan
 - 1. Airway and ventilatory support
 - a. Maintain an open airway
 - b. High flow oxygen
 - 2. Circulatory support
 - a. Electrocardiogram
 - b. Monitor blood pressure
 - 3. Pharmacological interventions
 - a. Consider initiating intravenous line
 - b. Avoid intervention which mask signs and symptoms
 - 4. Non-pharmacological interventions
 - a. Nothing by mouth
 - b. Monitor LOC
 - c. Monitor vital signs
 - d. Position of comfort
 - 5. Transport consideration
 - a. Persistent pain for greater than six hours requires transport
 - b. Gentle but rapid transport
 - 6. Psychological support
 - a. All actions reflect a calm, caring, competent attitude
 - b. Keep patient and significant others informed of your actions
- III. Specific injuries/ illness
 - A. Acute renal failure
 - 1. Epidemiology
 - a. Incidence
 - b. Mortality/ morbidity
 - (1) Overall mortality 50%
 - c. Risk factors
 - (1) Prerenal
 - (2) Postrenal
 - (3) Renal
 - d. Prevention strategies
 - (1) Protection of cardiovascular function and volume
 - (2) Reduce exposure to nephrotoxic drugs
 - e. Anatomy and physiology review
 - f. Pathophysiology
 - (1) Function of the nephron and glomerular filtration rate
 - (2) Retention of nitrogenous waste products and electrolytes
 - (3) Aberrations in glucose reabsorption
 - (4) Disorders of renal hypoperfusion
 - (a) Hypovolemia
 - (b) Low cardiac output

- (c) Increased renal systemic vascular resistance ratio
 - (d) Diseases of renal parenchyma
 - i) Renovascular obstruction
 - ii) Glomerular renal microvasculature
 - iii) Acute tubular necrosis
 - iv) Interstitial nephritis
 - (e) Acute obstruction of the urinary tract
 - i) Ureter
 - ii) Bladder neck
 - iii) Urethra
 - (f) Hyperkalemia
 - (g) Metabolic acidosis
2. Assessment findings
- a. History
 - (1) Oliguria/ anuria
 - (2) Edema
 - (3) Acidosis
 - b. Physical
 - (1) Altered level of consciousness
 - (2) Skin
 - (a) Pale
 - (b) Cool
 - (c) Moist
 - (3) Cardiovascular
 - (a) Hypotension
 - (b) Tachycardia
 - (c) ECG findings
 - (4) Inspect abdomen
 - (a) Scars
 - (b) Ecchymosis
 - (c) Contour
 - i) Bulges
 - ii) Symmetry
 - (5) Auscultate
 - (6) Palpate
 - c. Assessment tools
 - (1) Hematocrit
 - (2) Urinalysis
3. Management
- a. Airway and ventilatory support
 - (1) High flow oxygen
 - b. Circulatory support
 - (1) Positioning
 - (2) Consider fluid bolus or resuscitation
 - (3) Consider fluid lavage
 - c. Psychological support
 - d. Transport consideration
- B. Chronic renal failure
- 1. Epidemiology
 - a. Incidence

- b. Mortality/ morbidity
 - c. Risk factors
 - (1) Diabetes mellitus
 - (2) Hypertension
 - d. Prevention strategies
 - e. Anatomy and physiology review
 - f. Pathophysiology
 - (1) Reduction of renal mass
 - (2) Reduction of nephron mass
 - (3) Glucose intolerance
 - (4) Electrolyte imbalance
 - (5) Anemia
2. Assessment findings
- a. History
 - (1) Anorexia
 - (2) Nausea
 - (3) Vomiting
 - (4) Anxiety
 - (5) Seizure activity
 - b. Physical
 - (1) Altered level of consciousness
 - (a) Delirium
 - (2) Skin
 - (a) Pale
 - (b) Cool
 - (c) Moist
 - (d) Jaundice
 - (e) Uremic frost
 - (3) Cardiovascular
 - (a) Hypotension
 - (b) Tachycardia
 - (c) ECG findings
 - (d) Pericarditis rub
 - (e) Edema
 - (4) Lungs
 - (a) Pulmonary edema
 - (5) Neurological
 - (a) Seizure
 - (b) Muscle twitching
 - (6) Inspect abdomen
 - (a) Scars
 - (b) Ecchymosis
 - (c) Contour
 - (d) Bulges
 - (7) Symmetry
 - (8) Auscultate
 - (9) Percuss
 - (10) Palpate
 - c. Assessment tools
 - (1) Hematocrit

- 3. Management
 - (2) Urinalysis
 - a. Airway and ventilatory support
 - (1) High flow oxygen
 - b. Circulatory support
 - (1) Positioning
 - (2) Consider fluid bolus or resuscitation
 - (3) Consider fluid lavage
 - c. Pharmacological
 - (1) Vasopressor
 - d. Non-pharmacological
 - (1) Renal dialysis
 - (a) Definition
 - i) Process of diffusing blood across a semi-permeable membrane to remove substances that normally the kidney would eliminate
 - ii) May restore electrolyte and acid base imbalances
 - (b) Complications
 - i) Vascular-access related - most common
 - a) Bleeding from dialysis puncture site
 - b) Thrill in access has been lost
 - c) Infection
 - ii) Non-vascular access related
 - a) Hypotension
 - b) Shortness of breath
 - c) Chest pain
 - d) Neurologic abnormalities
 - e. Psychological support
 - f. Transport considerations
 - (1) Appropriate mode
 - (2) Appropriate facility
- C. Renal calculi
 - 1. Epidemiology
 - a. Incidence
 - b. Mortality/ morbidity
 - c. Risk factors
 - (1) Absent sensory/ motor impulses
 - (2) Medications
 - (a) Anesthetics
 - (b) Opiates
 - (c) Psychotropic
 - (3) Postoperative
 - d. Prevention strategies
 - e. Anatomy and physiology review
 - f. Pathophysiology
 - (1) Urinary stones
 - (a) Calcium salts
 - (b) Uric acid
 - (c) Cystine
 - (d) Struvite

2. Assessment findings
 - a. History
 - (1) Quality of pain
 - (2) Onset of pain
 - (3) Location of pain
 - (4) Dysuria
 - (5) Hematuria
 - (6) Nocturia
 - (7) Frequent urination
 - (8) History of same condition
 - b. Physical
 - (1) Restless
 - (2) Skin
 - (a) Pale
 - (b) Cool
 - (c) Moist
 - (3) Vital signs
 - (a) Vary considerably
 - (4) Abdominal exam
 - (a) Inspect
 - i) Contour
 - a) Bulges
 - b) Symmetry
 - (b) Auscultate
 - (c) Palpate
3. Management
 - a. Airway and ventilatory support
 - b. Circulatory support
 - (1) Positioning
 - c. Pharmacological
 - (1) Consider pain management
 - d. Non-pharmacological
 - (1) Pain management
 - e. Transport considerations
 - (1) Appropriate mode
 - (2) Appropriate facility
- D. Urinary tract infection
 1. Epidemiology
 - a. Incidence
 - b. Mortality/ morbidity
 - c. Risk factors
 - (1) Nerve disruption
 - (2) Diabetes
 - d. Prevention strategies
 - e. Anatomy and physiology review
 - f. Pathophysiology
 - (1) Lower tract infection
 - (a) Urethritis
 - (b) Cystitis
 - (c) Prostatitis

- (2) Upper tract infection
 - (a) Pyelonephritis
 - (b) Intrarenal and perinephric abscesses
 - (3) Pathogenic microorganisms
2. Assessment findings
- a. History
 - (1) Quality of pain
 - (2) Onset of pain
 - (3) Location of pain
 - (4) Dysuria
 - (5) Urgency to urinate
 - (6) Strong urine odor
 - (7) History of same condition
 - b. Physical
 - (1) Restless
 - (2) Skin
 - (a) Pale
 - (b) Cool
 - (c) Moist
 - (d) Warm
 - (3) Fever
 - (4) Vital signs
 - (a) Vary considerably
 - (5) Abdominal exam
 - (a) Inspect
 - i) Contour
 - a) Bulges
 - b) Symmetry
 - (b) Auscultate
 - (c) Palpate
3. Management
- a. Airway and ventilatory support
 - b. Circulatory support
 - (1) Positioning
 - c. Pharmacological
 - (1) Consider pain management
 - d. Non-pharmacological
 - (1) Pain management
 - e. Transport considerations
 - (1) Appropriate mode
 - (2) Appropriate facility

IV. Integration