c. Pierre Robin Syndrome
d. Cleft lip
e. Exposed abdominal contents

C. Assessment
1. Time of delivery
2. Normal/ abnormal vital signs
3. Airway and ventilation
a. Respiratory rate
b. Respiratory effort
4. Circulation
a. Heart rate
(1) Normal
b. Color/ cyanosis
(1) Normal
(2) Central versus peripheral
(3) Mucosal membranes
c. End organ perfusion
(1) Compare strength of central pulses versus peripheral
(2) Capillary refill
5. APGAR
a. **A**ppearance - skin color
(1) Completely pink - 2
(2) Body pink, extremities blue - 1
(3) Blue, pale - 0
b. **P**ulse rate
(1) Above 100 - 2
(2) Below 100 - 1
(3) Absent - 0
c. **G**rimace - irritability
(1) Cries - 2
(2) Grimaces - 1
(3) No response - 0
d. **A**ctivity - muscle tone
(1) Active motion - 2
(2) Some flexion of extremities - 1
(3) Limp - 0
e. **R**espiratory - effort
(1) Strong cry - 2
(2) Slow and irregular - 1
(3) Absent - 0

D. Treatment
1. Prior to delivery, prepare environment and equipment
2. During delivery, suction mouth and nose as head delivers
3. After delivery
a. Airway and ventilation
(1) Drying
(a) Head and face
(b) Body

(2) Warming
  (a) Appropriate techniques
(3) Position
(4) Suction
  (a) Technique
    i) Mouth first, than nares
    ii) Nasal suctioning is a stimulus to breathe
  (b) Equipment
    i) Bulb suction
    ii) Suction catheters
    iii) Meconium aspirator
(5) Stimulation
  (a) Flicking soles of feet
  (b) Stroking back
(6) Blow-by oxygen
  (a) Never withhold oxygen
  (b) Oxygen should be warmed
  (c) Use when
    i) Newborn is cyanotic and
    ii) Heart rate > 100 and
    iii) Adequate respiratory rate and effort
  (d) 5 liters/ minute maximum
    i) Complications due to hypothermia
  (e) Appropriate techniques
(7) Oral airways - rarely used for neonates
  (a) Necessary to keep mouth open for ventilation
  (b) Bilateral choanal atresia
  (c) Pierre Robin Syndrome
(8) Bag-valve-mask
  (a) Mask characteristics
    i) Appropriate size
    ii) Minimize dead-space
  (b) Bag characteristics
    i) Pop-off valve should be disabled
  (c) Use when
    i) Apneic
    ii) Inadequate respiratory rate or effort
    iii) Heart rate less than 100
  (d) Technique
    i) Initial ventilations require higher pressure to expand lungs
(9) Intubation
  (a) Indications
    i) Prolonged positive pressure ventilation
    ii) Bag and mask ventilations ineffective
    iii) Tracheal suctioning required
    iv) Diaphragmatic hernia suspected
  (b) Technique

i) Equipment
a) Suction equipment
b) Laryngoscope
c) Blades-straight
- #1- full term
- #0- preterm
d) Endotracheal tubes
- 2.5 to 4.0 mm ID
e) Shoulder roll
f) Adhesive tape

(c) Confirmation
i) Visualization
a) Tube passing through the cords
- Vocal cord guide should stop at the level of the cords
b) Chest expansion with ventilation
ii) Auscultation
a) Laterally and high on the chest wall
b) Epigastric region
iii) Patient improvement

(d) PEEP

(10) Gastric decompression
(a) Abdominal distention is impeding ventilation
(b) Presence of diaphragmatic hernia

b. Circulation
(1) Vascular access
(a) Indications
i) To administer fluids
ii) To administer medications
(b) Peripheral vein cannulation
(c) Umbilical vein cannulation
(d) Intraosseous cannulation

(2) Chest compression (in addition to assisted ventilation with BVM)
(a) Indications
i) Heart rate less than 60
ii) Heart rate between 60 and 80 and not increasing with adequate oxygenation
(b) Technique
i) Two finger technique
ii) Thumb technique
(c) Rate
i) 120 per minute
(d) Depth
i) 1/2 - 3/4 inches
(e) Compression-to-ventilation ratio
i) 3 compressions to 1 ventilation

c. Pharmacological
(1) Bradycardia

(2) Low blood volume
(3) Respiration depression secondary to narcotics
(4) Metabolic acidosis

d. Non-pharmacological
(1) Temperature control
(2) Positioning

e. Transport consideration
(1) Rapid transportation of the distressed infant
(2) Position newborn on their side to prevent aspiration

f. Psychological support/ communication strategies
(1) Allow healthy newborn to bond with mother if possible

III. Specific situations

A. Meconium stained amniotic fluid

1. Epidemiology

a. Incidence
(1) Approximately 10 - 15% of deliveries
(2) May occur either in utero or intrapartum
(3) Mostly in post-term and small-for-gestational-age newborns

b. Morbidity/ mortality
(1) High mortality
(2) Hypoxemia
(3) Aspiration pneumonia
(4) Pneumothorax
(5) Pulmonary hypertension

c. Risk factors
(1) Fetal distress during labor and delivery
(2) Post-term infants

2. Anatomy and physiology review

3. Pathophysiology

a. Hypoxia or physiologic cause

b. Aspiration of meconium stained amniotic fluid
(1) Airway obstruction
(a) Complete
i) Atelectasis
ii) Right-to-left shunt across the foramen ovale
(b) Incomplete
i) Ball valve type obstruction
ii) Developing pneumothorax

c. Patient deterioration
(1) Hypoxia
(2) Hypercapnia
(3) Acidosis

4. Assessment findings

a. Thin and watery

b. Thick and particulate
(1) Dark green-black amniotic fluid

5. Management considerations for thick or particulate meconium

a. Airway and ventilation
(1) Do not stimulate the infant to breathe
(2) Tracheal suction under direct visualization
(a) End point considerations
i) Airway is clear
ii) Infant breathes on own
iii) Bradycardia
(3) Ventilate with 100% oxygen
b. Circulation
(1) Assure adequate perfusion
c. Pharmacological
(1) If hypotensive, administer fluid challenge
d. Non-pharmacological
(1) Needle decompression may be required
(2) Hypothermia prevention
e. Transport consideration
(1) Identify facility to handle high-risk newborn
f. Psychological support/ communication strategies
(1) Do not discuss "chances of survival" with family
(2) Explain what is being done for the newborn

B. Apnea in the neonate
1. Epidemiology
a. Incidence
(1) Common finding in preterm infants
b. Morbidity/ mortality
(1) If prolonged, can lead to hypoxemia and bradycardia
c. Risk factors
(1) Prematurity
(2) In newborn, prolonged or difficult labor and delivery
(3) Drug exposure
2. Anatomy and physiology review
3. Pathophysiology
a. Usually due to hypoxia or hypothermia
b. May be due to other causes
(1) Narcotics or central nervous system depressant
(2) Airway and respiratory muscle weakness
(3) Oxyhemoglobin dissociation curve shift
(4) Septicemia
(5) Metabolic disorder
(6) Central nervous system disorders
4. Assessment findings
a. Failure to breathe spontaneously after stimulation
b. Respiratory pauses greater than 20 seconds
5. Management considerations
a. Airway and ventilation
(1) Stimulate the baby to breathe
(a) Flicking the soles of the feet
(b) Rubbing the back

(2) Ventilate with BVM
(a) Disable pop-off valve
(b) Subsequent ventilations with minimal pressure to cause chest rise
(3) Suction as needed
(4) Intubation
(a) Indications
i) Heart rate less that 60 with adequate BVM ventilation and chest compressions
ii) Prolonged positive-pressure ventilations
iii) Prolonged apnea
iv) Central cyanosis despite adequate ventilations
(b) Complications
i) Tube dislodgement
ii) Tube occlusion by mucous or meconium
iii) Pneumothorax

b. Circulation
(1) Monitor heart rate continuously
(2) Circulatory access
(a) Umbilical vein cannulation in newborn
(b) Peripheral IV
(c) Intraosseous

c. Pharmacological
(1) Consider narcotic antagonists if narcotic administered within four hours of delivery
(2) NO narcotic antagonist should be utilized if mother is a drug abuser
(3) Consider dextrose (D10) administration if hypoglycemic

d. Non-pharmacological
(1) Hypothermia preventions

e. Transport consideration
(1) Identify facility to handle high-risk newborn

f. Psychological support/ communication strategies
(1) Relatively good outcome if treated early and aggressively
(2) Explain what is being done for the infant

C. Diaphragmatic hernia in the neonate
1. Epidemiology
a. Incidence
(1) Occurs in 1 in 2200 live births
(2) Most commonly (90%) on the left side

b. Morbidity/ mortality
(1) Survival for infant who require mechanical ventilation in the first 18 to 24 hours of life is approximately 50%
(2) If no respiratory distress within the first 24 hours of life survival approaches 100%

c. Risk factors
(1) Bag and mask ventilation can worsen condition

2. Anatomy and physiology review
3. Pathophysiology

a. Abdominal contents are displaced into the thorax
b. Heart may be displaced

4. Assessment findings
   a. Little to severe distress
   b. May have cyanosis unresponsive to ventilations
   c. Scaphoid (flat) abdomen
   d. Bowel sounds heard in chest
   e. Heart sounds displaced to right
5. Management considerations
   a. Airway and ventilation
      (1) Assure adequate oxygen
      (2) Place an orogastric tube and apply low, intermittent suction
      (3) Endotracheal intubation may be necessary
   b. Circulation
      (1) Monitor heart rate continuously
   c. Pharmacological
      (1) None indicated for primary problem
   d. Non-pharmacological
      (1) Surgical repair required
   e. Transport consideration
      (1) Identify facility to handle high-risk newborn
   f. Psychological support/ communication strategies
      (1) Explain what is being done for the infant

D. Bradycardia in the neonate
1. Epidemiology
   a. Incidence
      (1) Most commonly caused by hypoxia
      (2) Increased intracranial pressure
      (3) Hypothyroidism
      (4) Acidosis
   b. Morbidity/ mortality
      (1) Minimal risk if hypoxia is corrected quickly
   c. Risk factors
      (1) Treatment via pharmacological measures alone
      (2) Prolonged suction or airway instrumentation
2. Anatomy and physiology review
3. Pathophysiology
   a. Primarily caused by hypoxia
4. Assessment findings
   a. Assess upper airway for obstruction
      (1) Secretions
      (2) Tongue and soft tissue positioning
      (3) Foreign body
   b. Assess patient for hypoventilation
   c. Palpate umbilical stump or brachial artery
5. Management considerations
   a. Airway and ventilation
      (1) Suction

(2) Positive pressure ventilation with 100% oxygen
(3) Endotracheal intubation

b. Circulation
(1) Heart rate less that 100
(a) BVM ventilation with 100% oxygen and reassess
(2) Heart rate less that 60
(a) Begin chest compressions
(3) Heart rate between 60 and 80 but not responding to assisted ventilations with BVM
(a) Begin chest compressions
(4) Discontinue chest compressions when heart rate reaches 100

c. Pharmacological
(1) Epinephrine

d. Non-pharmacological
(1) Maintain temperature

e. Transport consideration
(1) Identify facility to handle high-risk newborn

f. Psychological support/ communication strategies
(1) Explain what is being done for the infant

E. Premature infants
1. Epidemiology
a. Incidence
(1) Born prior to 37 weeks gestation
(2) Weight ranges from .6-2.2 kg
b. Morbidity/ mortality
(1) Healthy premature infants weighing greater than 1700 g have a survivability and outcome approximately that of full-term infants
(2) Respiratory suppression
(3) Hypothermia risk
(4) Head/ brain injury
(a) Hypoxemia
(b) Change in blood pressure
(c) Intraventricular hemorrhage
(d) Fluctuations in serum osmolarity
c. Risk factors
(1) Mortality decreases weekly with gestation beyond the onset of viability (currently around 23-24 weeks of gestation)
2. Anatomy and physiology review
3. Pathophysiology
a. Retinopathy of prematurity
(1) Result of long term oxygen use
(2) Extreme prematurity
(3) Should not be a factor in short term management
(4) Hypoxemia causes irreparable brain damage
4. Assessment findings
a. Degree of immaturity determines the physical characteristics
b. Generally a large trunk and short extremities
c. Skin is transparent and less wrinkles

d. Less subcutaneous fat

5. Management considerations
   a. Attempt resuscitation if the infant has any sign of life
   b. Airway and ventilation
      (1) Suction
      (2) Assure adequate oxygenation
   c. Circulation
      (1) Chest compressions if indicated
   d. Pharmacological
      (1) Epinephrine
   e. Non-pharmacological
      (1) Maintain body temperature
   f. Transport consideration
      (1) Transport to a facility with special services for low birth weight newborns
   g. Psychological support/ communication strategies
      (1) Explain what is being done for the infant

F. Respiratory distress/ cyanosis in the neonate
   1. Epidemiology
      a. Incidence
         (1) Prematurity is the single most common factor
         (2) Occurs most frequently in infants less than 1200 grams and 30 weeks gestation
         (3) Multiple gestations increase risk
         (4) Prenatal maternal complications increase risk
      b. Morbidity/ mortality
         (1) Premature infants have a immature central respiratory control center
         (2) Easily affected by environmental or metabolic changes
      c. Risk factors
         (1) Associated respiratory diseases/ complications affect oxygenation
   2. Anatomy and physiology review
   3. Pathophysiology
      a. Lung or heart disease
      b. Primary pulmonary hypertension
      c. CNS disorders
      d. Mucous obstruction of nasal passages
      e. Spontaneous pneumothorax
      f. Choanal atresia
      g. Meconium aspiration
      h. Amniotic fluid aspiration
      i. Lung immaturity
      j. Pneumonia
      k. Shock and sepsis
      l. Metabolic acidosis
      m. Diaphragmatic hernia
      n. Can lead to cardiac arrest
   4. Assessment findings
      a. Tachypnea
      b. Paradoxical breathing

c. Periodic breathing
d. Intercostal retractions
e. Nasal flaring
f. Expiratory grunt

5. Management considerations
   a. Airway and ventilation
      (1) Suction
      (2) High concentration oxygen
      (3) BVM
      (4) Consider intubation
   b. Circulation
      (1) Chest compressions if indicated
   c. Pharmacological
      (1) Sodium bicarbonate may be helpful for prolonged resuscitation per medical direction
      (2) D10 administration if hypoglycemic
   d. Non-pharmacological
      (1) Maintain normal body temperature
   e. Transport consideration
   f. Psychological support/ communication strategies
      (1) Explain what is being done for the infant

G. Seizures in the neonate
   1. Epidemiology
      a. Incidence
         (1) Occur in a very small percentage of all newborns
      b. Morbidity/ mortality
         (1) Represent relative medical emergencies as they are usually a sign of an underlying abnormality
      c. Risk factors
         (1) Prolonged and frequent multiple seizures may result in metabolic changes and cardiopulmonary difficulties
   2. Anatomy and physiology review
   3. Pathophysiology
      a. Types of seizures
         (1) Subtle seizure
            (a) Eye deviation, blinking, sucking, swimming movements of the arms, pedaling movements of the legs, apnea
         (2) Tonic seizure
            (a) Tonic extension of the limbs
            (b) Less commonly, flexion of the upper extremities and extension of the lower extremities
            (c) More common in premature infants, especially in those with intraventricular hemorrhage
         (3) Multi focal seizure
            (a) Clonic activity in one extremity
            (b) Randomly migrates to another area of the body
            (c) Occur primarily in full-term infants
         (4) Focal clonic seizure

(a) Clonic localized jerking
(b) Occur in both full-term and premature infants
(5) Myoclonic seizure
(a) Flexion jerks of the upper or lower extremities
(b) May occur singly or in a series of repetitive jerks
b. Causes
(1) Hypoglycemia
(2) Other
(a) Hypoxic-ischemic encephalopathy
(b) Intracranial hemorrhage
(c) Metabolic disturbances
(d) Meningitis or encephalopathy
(e) Developmental abnormalities
(f) Drug withdrawal
4. Assessment findings
a. Decreased level of consciousness
b. Seizure activity
5. Management considerations
a. Airway and ventilation
(1) Maintain oxygen saturation
b. Circulation
c. Pharmacological
(1) Consider D_{10} for hypoglycemia
(2) Consider anticonvulsant
(3) Consider benzodiazepine for status epilepticus
d. Non-pharmacological
(1) Maintain normal body temperature
e. Transport consideration
(1) Identify facility to handle high-risk newborn
f. Psychological support/ communication strategies
(1) Explain what is being done for the infant

H. Fever in the neonate
1. Epidemiology
a. Incidence
(1) Rectal temperature $\geq$ 100.4 F (38.0 degrees C)
(2) Average normal temperature - 99.5 degrees F (37.5 degrees C)
b. Morbidity/ mortality
(1) Limited ability to control body temperature
c. Risk factors
(1) Dehydration may contribute to hyperthermia
2. Anatomy and physiology review
3. Pathophysiology
a. Increased use of glucose to maintain normal body temperature
b. Anaerobic metabolism results due to a lack of glucose
4. Assessment findings
a. Mental status changes (irritability/ somnolence)
b. Decreased intake
c. Caretaker history

d. Feels warm
e. Observe patient for rashes, petechia
f. Term newborns will produce beads of sweat on their brow but not over the rest of their body
g. Premature infants will have no visible sweat

5. Management considerations
   a. Airway and ventilation
      (1) Assure adequate oxygenation and ventilation
   b. Circulation
      (1) Perform chest compressions if indicated
   c. Pharmacological
      (1) Administration of antipyretic agent is questionable in the prehospital setting
   d. Non-pharmacological
   e. Transport consideration
   f. Psychological support/ communication strategies
      (1) Explain what is being done for the infant

I. Hypothermia in the neonate
   1. Epidemiology
      a. Incidence
         (1) Body temperature drops below 35 degrees C
      b. Morbidity/ mortality
         (1) Infants may die of cold exposure at temperatures adults find comfortable
      c. Risk factors
         (1) Four method of heat loss need to be controlled
            (a) Evaporation
            (b) Conduction
            (c) Convection
            (d) Radiation
   2. Anatomy and physiology review
   3. Pathophysiology
      a. Increased surface-to-volume relation makes newborns extremely sensitive to environmental conditions, especially when they are wet after delivery
      b. Can be an indicator of sepsis in the neonate
      c. Increased metabolic demand can cause metabolic acidosis, pulmonary hypertension and hypoxemia
   4. Assessment findings
      a. Pale color
      b. Cool to touch, particular in extremities
      c. Acrocyanosis
      d. Respiratory distress
      e. Apnea
      f. Bradycardia
      g. Central cyanosis
      h. Irritability initially
      i. Lethargy in late stage
      j. Generally do not shiver
   5. Management considerations

a. Airway and ventilation
(1) Assure adequate oxygenation and ventilation
b. Circulation
(1) Perform chest compressions if indicated
c. Pharmacological
(1) D10 if hypoglycemic
(2) Warm IV fluids
d. Non-pharmacological
(1) Environmental conditions should be 24 to 26.5 degrees C
(2) Warm hands prior to touching patient
e. Transport consideration
(1) Identify facility to handle high-risk newborn
f. Psychological support/ communication strategies
(1) Explain what is being done for the infant

J. Hypoglycemia in the neonate
1. Epidemiology
a. Incidence
(1) Blood glucose concentration should be determined on all sick infants
(2) May be due to inadequate glucose intake or increased utilization of glucose
b. Morbidity/ mortality
(1) Persistent low blood glucose levels may have catastrophic effects on the brain
c. Risk factors
(1) Asphyxia, toxemia, smaller twin, CNS hemorrhage, sepsis
2. Anatomy and physiology review
3. Pathophysiology
a. A blood glucose screening test less than 45 mg/dl indicates hypoglycemia
b. Glycogen stores are sufficient to meet glucose requirements for 8 to 12 hours
c. Body releases counter-regulatory hormones including Glucagon, epinephrine, cortisol and growth hormone
d. Hormones may cause symptoms of hyperglycemia that last for several hours
4. Assessment findings
a. Twitching or seizures, limpness, lethargy, eye-rolling, high pitched cry, apnea, irregular respirations and possible cyanosis
5. Management considerations
a. Airway and ventilation
(1) Assure adequate oxygenation and ventilation
b. Circulation
(1) Perform chest compressions if indicated
c. Pharmacological
(1) Administer D10
d. Non-pharmacological
(1) Maintain normal body temperature
e. Transport consideration
(1) Identify facility to handle high-risk newborn
f. Psychological support/ communication strategies
(1) Explain what is being done for the infant

K. Vomiting in the neonate
  1. Epidemiology
    a. Incidence
      (1) Persistent vomiting is a warning sign
      (2) Vomiting mucous, occasionally blood streaked, in the first few hours of life is not uncommon
    b. Morbidity/ mortality
      (1) Vomiting in the first 24 hours of life suggests obstruction in the upper digestive tract or increased intracranial pressure
      (2) Vomitus containing dark blood is usually a sign of a life-threatening illness
    c. Risk factors
      (1) Aspiration of vomitus can cause respiratory insufficiencies or obstruction of the airway
  2. Anatomy and physiology review
  3. Pathophysiology
    a. Vomiting of non-bile-stained fluid
      (1) Anatomic or functional obstruction at or above the first portion of the duodenum
      (2) Gastroesophageal reflux
    b. Vomiting of bile-stained fluid
      (1) Obstruction below the opening of the bile duct
  4. Assessment findings
    a. Distended stomach
    b. Infection
    c. Increased ICP
    d. Drug withdrawal
  5. Management considerations
    a. Airway and ventilation
      (1) Maintain a patent airway
      (2) Suction/ clear vomitus from airway
      (3) Assure adequate oxygenation
    b. Circulation
      (1) Bradycardia may be caused by vagal stimulus
    c. Pharmacological
      (1) Fluid administration may be required
    d. Non-pharmacological
      (1) Provide supportive measures
    e. Transport consideration
      (1) Place infant on side
      (2) Identify facility to handle high-risk newborn
  6. Psychological support/ communication strategies
    a. Explain what is being done for the infant

L. Diarrhea in the neonate
  1. Epidemiology
    a. Incidence
      (1) Normal - five to six stools per day, especially if breast feeding
    b. Morbidity/ mortality

(1) Severe cases can cause dehydration
(2) Bacterial or viral infection may be involved

c. Risk factors
(1) Severe loss can cause electrolyte imbalance

2. Anatomy and physiology review
3. Pathophysiology
a. Gastroenteritis
b. Lactose intolerance
c. Phototherapy
d. Neonatal abstinence syndrome
e. Thyrotoxicosis
f. Cystic fibrosis
4. Assessment findings
a. Loose stools
b. Decreased urinary output
c. Signs of dehydration
5. Management considerations
a. Airway and ventilation
(1) Assure adequate oxygenation
b. Circulation
(1) Perform chest compressions if indicated
c. Pharmacological
(1) Fluid therapy may be indicated
d. Non-pharmacological
(1) BSI procedures
e. Transport consideration
(1) Identify facility to handle high-risk newborn
f. Psychological support/ communication strategies
(1) Explain what is being done for the infant

M. Common birth injuries in the newborn
1. Epidemiology
a. Incidence
(1) Used to denote avoidable and unavoidable mechanical and anoxic trauma incurred by the infant during labor and delivery
(2) Estimated to occur in 2 to 7 of every 1,000 live births
b. Morbidity/ mortality
(1) 5 to 8 of every 100,000 infants die of birth trauma
(2) 25 of every 100,000 die of anoxic injuries
(3) Such injuries account for 2 - 3% of infant deaths
c. Risk factors
(1) Explosive delivery
2. Anatomy and physiology review
3. Pathophysiology
a. Cranial injuries
(1) Molding of the head and overriding of the parietal bones
(2) Erythema, abrasions, ecchymosis and subcutaneous fat necrosis can occur with forceps delivery

(3) Subconjunctival and retinal hemorrhage
(4) Subperiosteal hemorrhage
(5) Fracture of the skull

b. Intracranial hemorrhage
(1) May result from trauma or asphyxia

c. Spine and spinal cord
(1) Strong traction exerted when the spine is hyperextended or pull is lateral

d. Peripheral nerve injury
e. Liver
f. Rupture of the spleen
g. Adrenal hemorrhage
h. Fracture
(1) Clavicle
(2) Extremities

i. Hypoxia-ischemia

4. Assessment findings
a. Diffuse, sometimes ecchymotic, edematous swelling of the soft tissues of the scalp
b. Paralysis below the level of spinal cord injury
c. Paralysis of the upper arm with or without paralysis of the forearm
d. Diaphragmatic paralysis
e. Movement on only one side of the face when the newborn cries
f. Does not move arm freely on side of fractured clavicle
g. Lack of spontaneous movement of the affected extremity
h. Hypoxia
i. Shock

5. Management considerations
a. Airway and ventilation
(1) Assure adequate oxygenation and ventilation

b. Circulation
(1) Perform chest compressions if indicated

c. Pharmacology
(1) Provide if indicated

d. Non-pharmacological
(1) Provide supportive measures

e. Transport consideration
(1) Identify facility to handle high-risk newborn

f. Psychological support/ communication strategies
(1) Explain what is being done for the newborn

IV. Neonatal resuscitation and post resuscitation and stabilization
A. Neonatal cardiac arrest management
1. Epidemiology
a. Incidence
(1) Primarily related to hypoxia

b. Morbidity/ mortality
(1) Outcome is poor if interventions are not initiated quickly
(2) Increased likelihood of brain and organ damage

c. Risk factors
   (1) Intrauterine asphyxia
   (2) Prematurity
   (3) Drugs administered to or taken by the mother
   (4) Congenital neuromuscular diseases
   (5) Congenital malformations
   (6) Intrapartum hypoxemia

2. Anatomy and physiology review
3. Pathophysiology
   a. Primary apnea
   b. Secondary apnea
   c. Bradycardia
   d. Persistent fetal circulation
   e. Pulmonary hypertension
4. Assessment findings
   a. Peripherial cyanosis
   b. Inadequate respiratory effort
   c. Ineffective or absent heart rate
5. Management considerations
   a. Airway and ventilation
      (1) Assure adequate oxygenation and ventilation
         (a) Blow-by oxygenation is required if peripheral cyanosis is present and despite adequate respiratory effort and heart rate greater than 100 beats/ min
         (b) Ventilations are required if respiratory effort is inadequate, ineffective or absent or heart rate is less than 80 beats/ min
         (c) Ventilate at a rate of 40 to 60 breaths per minute
         (d) Administer a tidal volume sufficient to expand the chest
         (e) Intubation required if bag-valve-mask ventilations are ineffective, tracheal suctioning is required or prolonged positive-pressure ventilation is necessary
   b. Chest compressions are indicated if pulse is less than 60 beats/ minute, or between 60 and 80 beats/ minute and not improving despite assisted ventilations with BVM
      (1) Suction airway thoroughly
   c. Circulation
      (1) Perform chest compression
   d. Pharmacological
      (1) Epinephrine
      (2) Normal saline or Ringer's lactate
      (3) Sodium bicarbonate
      (4) Naloxone
      (5) Dextrose (D10)
   e. Non-pharmacological
      (1) Maintain normal body temperature
   f. Transport consideration
      (1) Identify facility to handle high-risk newborn
   g. Psychological support/ communication strategies

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UNIT TERMINAL OBJECTIVE

6-2.1 At the completion of this unit, the paramedic student will be able to integrate pathophysiological principles and assessment findings to formulate a field impression and implement a treatment plan for the pediatric patient.

COGNITIVE OBJECTIVES

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

6-2.2 Discuss the paramedic's role in the reduction of infant and childhood morbidity and mortality from acute illness and injury. (C-1)
6-2.3 Identify methods/ mechanisms that prevent injuries to infants and children. (C-1)
6-2.4 Describe Emergency Medical Services for Children (EMSC). (C-1)
6-2.5 Discuss how an integrated EMSC system can affect patient outcome. (C-2)
6-2.6 Identify key growth and developmental characteristics of infants and children and their implications. (C-2)
6-2.7 Identify key anatomical and physiological characteristics of infants and children and their implications. (C-2)
6-2.8 Describe techniques for successful assessment of infants and children. (C-1)
6-2.9 Describe techniques for successful treatment of infants and children. (C-1)
6-2.10 Identify the common responses of families to acute illness and injury of an infant or child. (C-1)
6-2.11 Describe techniques for successful interaction with families of acutely ill or injured infants and children. (C-1)
6-2.12 Outline differences in adult and childhood anatomy and physiology. (C-3)
6-2.13 Identify "normal" age group related vital signs. (C-1)
6-2.14 Discuss the appropriate equipment utilized to obtain pediatric vital signs. (C-1)
6-2.15 Determine appropriate airway adjuncts for infants and children. (C-1)
6-2.16 Discuss complications of improper utilization of airway adjuncts with infants and children. (C-1)
6-2.17 Discuss appropriate ventilation devices for infants and children. (C-1)
6-2.18 Discuss complications of improper utilization of ventilation devices with infants and children. (C-1)
6-2.19 Discuss appropriate endotracheal intubation equipment for infants and children. (C-1)
6-2.20 Identify complications of improper endotracheal intubation procedure in infants and children. (C-1)
6-2.21 List the indications and methods for gastric decompression for infants and children. (C-1)
6-2.22 Define respiratory distress. (C-1)
6-2.23 Define respiratory failure. (C-1)
6-2.24 Define respiratory arrest. (C-1)
6-2.25 Differentiate between upper airway obstruction and lower airway disease. (C-3)
6-2.26 Describe the general approach to the treatment of children with respiratory distress, failure, or arrest from upper airway obstruction or lower airway disease. (C-3)
6-2.27 Discuss the common causes of hypoperfusion in infants and children. (C-1)
6-2.28 Evaluate the severity of hypoperfusion in infants and children. (C-3)
6-2.29 Identify the major classifications of pediatric cardiac rhythms. (C-1)
6-2.30 Discuss the primary etiologies of cardiopulmonary arrest in infants and children. (C-1)
6-2.31 Discuss age appropriate vascular access sites for infants and children. (C-1)
6-2.32 Discuss the appropriate equipment for vascular access in infants and children. (C-1)
6-2.33 Identify complications of vascular access for infants and children. (C-1)
6-2.34 Describe the primary etiologies of altered level of consciousness in infants and children. (C-1)
6-2.35 Identify common lethal mechanisms of injury in infants and children. (C-1)
6-2.36 Discuss anatomical features of children that predispose or protect them from certain injuries. (C-1)
6-2.37 Describe aspects of infant and children airway management that are affected by potential cervical spine injury. (C-1)

6-2.38 Identify infant and child trauma patients who require spinal immobilization. (C-1)
6-2.39 Discuss fluid management and shock treatment for infant and child trauma patient. (C-1)
6-2.40 Determine when pain management and sedation are appropriate for infants and children. (C-1)
6-2.41 Define child abuse. (C-1)
6-2.42 Define child neglect. (C-1)
6-2.43 Define sudden infant death syndrome (SIDS). (C-1)
6-2.44 Discuss the parent/ caregiver responses to the death of an infant or child. (C-1)
6-2.45 Define children with special health care needs. (C-1)
6-2.46 Define technology assisted children. (C-1)
6-2.47 Discuss basic cardiac life support (CPR) guidelines for infants and children. (C-1)
6-2.48 Identify appropriate parameters for performing infant and child CPR. (C-1)
6-2.49 Integrate advanced life support skills with basic cardiac life support for infants and children. (C-3)
6-2.50 Discuss the indications, dosage, route of administration and special considerations for medication administration in infants and children. (C-1)
6-2.51 Discuss appropriate transport guidelines for infants and children. (C-1)
6-2.52 Discuss appropriate receiving facilities for low and high risk infants and children. (C-1)
6-2.53 Describe the epidemiology, including the incidence, morbidity/ mortality, risk factors and prevention strategies for respiratory distress/ failure in infants and children. (C-1)
6-2.54 Discuss the pathophysiology of respiratory distress/ failure in infants and children. (C-1)
6-2.55 Discuss the assessment findings associated with respiratory distress/ failure in infants and children. (C-1)
6-2.56 Discuss the management/ treatment plan for respiratory distress/ failure in infants and children. (C-1)
6-2.57 Describe the epidemiology, including the incidence, morbidity/ mortality, risk factors and prevention strategies for hypoperfusion in infants and children. (C-1)
6-2.58 Discuss the pathophysiology of hypoperfusion in infants and children. (C-1)
6-2.59 Discuss the assessment findings associated with hypoperfusion in infants and children. (C-1)
6-2.60 Discuss the management/ treatment plan for hypoperfusion in infants and children. (C-1)
6-2.61 Describe the epidemiology, including the incidence, morbidity/ mortality, risk factors and prevention strategies for cardiac dysrhythmias in infants and children. (C-1)
6-2.62 Discuss the pathophysiology of cardiac dysrhythmias in infants and children. (C-1)
6-2.63 Discuss the assessment findings associated with cardiac dysrhythmias in infants and children. (C-1)
6-2.64 Discuss the management/ treatment plan for cardiac dysrhythmias in infants and children. (C-1)
6-2.65 Describe the epidemiology, including the incidence, morbidity/ mortality, risk factors and prevention strategies for neurological emergencies in infants and children. (C-1)
6-2.66 Discuss the pathophysiology of neurological emergencies in infants and children. (C-1)
6-2.67 Discuss the assessment findings associated with neurological emergencies in infants and children. (C-1)
6-2.68 Discuss the management/ treatment plan for neurological emergencies in infants and children. (C-1)
6-2.69 Describe the epidemiology, including the incidence, morbidity/ mortality, risk factors and prevention strategies for trauma in infants and children. (C-1)
6-2.70 Discuss the pathophysiology of trauma in infants and children. (C-1)
6-2.71 Discuss the assessment findings associated with trauma in infants and children. (C-1)
6-2.72 Discuss the management/ treatment plan for trauma in infants and children. (C-1)
6-2.73 Describe the epidemiology, including the incidence, morbidity/ mortality, risk factors and prevention strategies for abuse and neglect in infants and children. (C-1)
6-2.74 Discuss the pathophysiology of abuse and neglect in infants and children. (C-1)
6-2.75 Discuss the assessment findings associated with abuse and neglect in infants and children. (C-1)
6-2.76 Discuss the management/ treatment plan for abuse and neglect in infants and children, including documentation and reporting. (C-1)
6-2.77 Describe the epidemiology, including the incidence, morbidity/ mortality, risk factors and prevention

strategies for SIDS infants. (C-1)

6-2.78 Describe the epidemiology, including the incidence, morbidity/ mortality, risk factors and prevention strategies for children with special health care needs including technology assisted children. (C-1)

6-2.79 Discuss the pathophysiology of children with special health care needs including technology assisted children. (C-1)

6-2.80 Discuss the assessment findings associated for children with special health care needs including technology assisted children. (C-1)

6-2.81 Discuss the management/ treatment plan for children with special health care needs including technology assisted children. (C-1)

6-2.82 Describe the epidemiology, including the incidence, morbidity/ mortality, risk factors and prevention strategies for SIDS infants. (C-1)

6-2.83 Discuss the pathophysiology of SIDS in infants. (C-1)

6-2.84 Discuss the assessment findings associated with SIDS infants. (C-1)

6-2.85 Discuss the management/ treatment plan for SIDS in infants. (C-1)

AFFECTIVE OBJECTIVES

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

6-2.86 Demonstrate and advocate appropriate interactions with the infant/ child that conveys an understanding of their developmental stage. (A-3)

6-2.87 Recognize the emotional dependance of the infant/ child to their parent/ guardian. (A-1)

6-2.88 Recognize the emotional impact of the infant/ child injuries and illnesses on the parent/ guardian. (A-1)

6-2.89 Recognize and appreciate the physical and emotional difficulties associated with separation of the parent/ guardian of a special needs child (A-3)

6-2.90 Demonstrate the ability to provide reassurance, empathy and compassion for the parent/ guardian. (A-1)

PSYCHOMOTOR OBJECTIVES

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

6-2.91 Demonstrate the appropriate approach for treating infants and children. (P-2)

6-2.92 Demonstrate appropriate intervention techniques with families of acutely ill or injured infants and children. (P-2)

6-2.93 Demonstrate an appropriate assessment for different developmental age groups. (P-2)

6-2.94 Demonstrate an appropriate technique for measuring pediatric vital signs. (P-2)

6-2.95 Demonstrate the use of a length-based resuscitation device for determining equipment sizes, drug doses and other pertinent information for a pediatric patient. (P-2)

6-2.96 Demonstrate the appropriate approach for treating infants and children with respiratory distress, failure, and arrest. (P-2)

6-2.97 Demonstrate proper technique for administering blow-by oxygen to infants and children. (P-2)

6-2.98 Demonstrate the proper utilization of a pediatric non-rebreather oxygen mask. (P-2)

6-2.99 Demonstrate proper technique for suctioning of infants and children. (P-2)

6-2.100 Demonstrate appropriate use of airway adjuncts with infants and children. (P-2)

6-2.101 Demonstrate appropriate use of ventilation devices for infants and children. (P-2)

6-2.102 Demonstrate endotracheal intubation procedures in infants and children. (P-2)

6-2.103 Demonstrate appropriate treatment/ management of intubation complications for infants and children. (P-2)

6-2.104 Demonstrate appropriate needle cricothyroidotomy in infants and children. (P-2)

6-2.105 Demonstrate proper placement of a gastric tube in infants and children. (P-2)

6-2.106 Demonstrate an appropriate technique for insertion of peripheral intravenous catheters for infants and children. (P-2)
6-2.107 Demonstrate an appropriate technique for administration of intramuscular, inhalation, subcutaneous, rectal, endotracheal and oral medication for infants and children. (P-2)
6-2.108 Demonstrate an appropriate technique for insertion of an intraosseous line for infants and children. (P-2)
6-2.109 Demonstrate appropriate interventions for infants and children with a partially obstructed airway. (P-2)
6-2.110 Demonstrate age appropriate basic airway clearing maneuvers for infants and children with a completely obstructed airway. (P-2)
6-2.111 Demonstrate proper technique for direct larnyngoscopy and foreign body retrieval in infants and children with a completely obstructed airway. (P-2)
6-2.112 Demonstrate appropriate airway and breathing control maneuvers for infant and child trauma patients. (P-2)
6-2.113 Demonstrate appropriate treatment of infants and children requiring advanced airway and breathing control. (P-2)
6-2.114 Demonstrate appropriate immobilization techniques for infant and child trauma patients. (P-2)
6-2.115 Demonstrate treatment of infants and children with head injuries. (P-2)
6-2.116 Demonstrate appropriate treatment of infants and children with chest injuries. (P-2)
6-2.117 Demonstrate appropriate treatment of infants and children with abdominal injuries. (P-2)
6-2.118 Demonstrate appropriate treatment of infants and children with extremity injuries. (P-2)
6-2.119 Demonstrate appropriate treatment of infants and children with burns. (P-2)
6-2.120 Demonstrate appropriate parent/ caregiver interviewing techniques for infant and child death situations.(P-2)
6-2.121 Demonstrate proper infant CPR. (P-2)
6-2.122 Demonstrate proper child CPR. (P-2)
6-2.123 Demonstrate proper techniques for performing infant and child defibrillation and synchronized cardioversion.(P-2)

DECLARATIVE

1. Introduction
   - A. Epidemiology of EMS incidents involving pediatric patients
   - B. Paramedic role in treating infants and children
     1. Care of the pediatric patient
        - a. Prehospital care (primary transport)
        - b. Interfacility transfer (secondary transport)
     2. Maintain and improve pediatric knowledge and clinical skills
        - a. Continuing education programs
          - (1) Pediatric Advanced Life Support
          - (2) Pediatric Basic Trauma Life Support
          - (3) Advanced Pediatric Life Support
          - (4) Pediatric Emergencies for Paramedics
          - (5) Regional conferences and seminars
        - b. Clinical application
          - (1) Pediatric emergency department
          - (2) Pediatric hospital
          - (3) Pediatric department of a community hospital
          - (4) Pediatrician office
        - c. Textbooks and journals
        - d. Teaching Resource for Instructors of Prehospital Pediatrics (TRIPP)
     3. Reduction of mortality and morbidity
        - a. Educational programs
          - (1) Schools
          - (2) Community
          - (1) Parents
        - b. Prevention
          - (1) Community involvement
          - (2) Safety inspections
        - c. Documentation
          - (1) Prehospital and trauma registries
          - (2) Epidemiological research and surveillance
   - C. Emergency Medical Services for Children (EMSC)
     1. Coordinated national effort to improve the health of pediatric patients who suffer potentially life-threatening illness or injury
     2. Specific areas of pediatric health care concern have been identified
        - a. System approach
        - b. Education

c. Data collection
d. Quality improvement
e. Injury prevention
f. Access
g. Prehospital care
h. Emergency care
i. Definitive care
j. Rehabilitation
k. Finance
l. On-going health care from birth to young adulthood

D. Definitions
1. Newborn
a. First few hours of life (perinatal period)
b. Resuscitation follows Neonatal Advanced Life Support (NALS) guidelines
2. Infant
a. Neonatal period (first 28 days of life) is included
b. First month after birth to approximately 12 months of age
c. Resuscitation follows Pediatric Advanced Life Support (PALS) guidelines
3. Toddler
a. A child between 12 and 36 months of age
4. Preschool
a. A child between three and five years of age
5. School age
a. The child between 6 and 12 years of age
6. Adolescent
a. The period between the end of childhood and adulthood (18 years)
(1) Early (puberty)
(2) Middle (junior high school/ high school age)
(3) Late (high school/ college age)
b. End of childhood is usually defined as the beginning of puberty
(1) Highly child specific
(2) Male child average 13 years
(3) Female child average 11 years

2. Growth and development review
A. Infant

1. Physical development
   a. Neonate (first month of life)
      (1) Weight
      (2) Crying
         (a) Typical causes
         (b) Persistent crying may indicate physiologic distress
      (3) Movements
      (4) Sleep
   b. Infant (2-12 months)
      (1) Weight
      (2) Crying
         (a) Gradually decreases throughout infancy
         (b) Persistent crying may indicated physiological distress
      (3) Movements
         (a) Young infant
         (b) Older infant
      (4) Sleep
2. Cognitive development
   a. Neonate (first month of life)
   b. Infant (2-12 months)
      (1) Young infant
      (2) Older infant
3. Emotional development
   a. Neonate (first month of life)
   b. Infant (2-12 months)
4. Paramedic implications
   a. Keep the patient warm and dry
   b. Handle patient gently, supporting head and neck
   c. Speak quietly
   d. Involve caregivers in treatment whenever possible
   1. Persistent crying, irritability, or inability to console or arouse patient may indicate physiologic distress
   e. Foreign body airway obstruction risk begins at approximately 6 months and increases

B. Toddler
   1. Physical development
      a. Weight
      b. Movements
   2. Cognitive development
   3. Emotional development

4. Paramedic implications
    a. Keep the patient warm
    b. Handle patient gently
    c. Speak quietly and use simple words
    d. Distract patient with interesting objects (toy) during exam
    e. Avoid procedures on the dominant hand/ arm
    f. Involve caregivers in treatment whenever possible
    g. Try not to separate child from the caregiver
    h. Allow child to hold transitional objects (blanket, stuffed animal, etc.)
    2. Persistent irritability, and inability to console or arouse patient may indicate physiologic distress
    i. Foreign body airway obstruction continues to be a risk

C. Preschool
1. Physical development
    a. Weight
    b. Movements
2. Cognitive development
3. Emotional development
4. Paramedic implications
    a. Keep the patient warm
    b. Handle patient gently
    c. Speak quietly in clear and unambiguous language; avoid baby talk
    d. Offer the patient treatment choices if possible
    e. Involve caregivers in treatment whenever possible
    3. Persistent irritability, or inability to arouse patient may indicate physiologic distress
    f. Foreign body airway obstruction risk continues
    g. Respect patient modesty
    h. Avoid frightening or misleading comments

D. School age
1. Physical development
    a. Weight
    b. Movement
2. Cognitive development
3. Emotional development
4. Paramedic implications
    a. Keep the patient warm
    b. Speak in clear and unambiguous language

c. Be honest about procedures inducing pain
d. Involve the patient in treatment whenever possible
4. Persistent irritability, or inability to arouse patient may indicate physiologic distress
e. Respect patient modesty
f. Reassure patient of body integrity
g. Address preoccupations about death when appropriate

E. Adolescent
1. Physical development
2. Cognitive development
3. Emotional development
4. Paramedic implications
a. Explain things clearly and honestly
b. Involve the patient in treatment whenever possible
c. Respect patient modesty
d. Address patient concerns of body integrity/ disfigurement
e. Deal with patient tactfully and fairly
f. Vital signs approach adult values
g. Consider the possibility of substance abuse, endangerment of self or others

3. Anatomy and physiology review
A. Head
1. Proportionally larger size
2. Larger occipital region
3. Fontanelles open in infancy
4. Face is small in comparison to size of head
5. Paramedic implications
a. Higher proportion of blunt trauma involves the head
b. Different airway positioning techniques
(1) Place thin layer of padding under back of seriously injured child < 3 years of age to obtain neutral position
(2) Place folded sheet under occiput of medically ill child > 3 years of age to obtain sniffing position
c. Examine fontanelle in infants

(1) Bulging fontanelle suggests increased intracranial pressure
(2) Sunken fontanelle suggests dehydration

B. Airway
1. Narrower at all levels
2. Infants are obligate nasal breathers
3. Jaw is proportionally smaller in young children
4. Larynx is higher (C 3-4) and more anterior
5. Cricoid ring is the narrowest part of the airway in young children
6. Tracheal cartilage softer
7. Trachea smaller in both length and diameter
8. Epiglottis
   a. Omega shaped in infants
   b. Extends at a 45 degree angle into airway
   c. Epiglottic folds have softer cartilage, therefore are more floppy, especially in infants
9. Paramedic implications
   a. Keep nares clear in infants < 6 months of age
   b. Narrower upper airways are more easily obstructed
      (1) Flexion or hyperextension
      (2) Particulate matter
      (3) Soft tissue swelling (injury, inflamation)
   c. Differences in intubation technique
      (1) Gentler touch
      (2) Straight blade
      (3) Lift epiglottis
      (4) Uncuffed tube
      (5) Precise placement

C. Chest and lungs
1. Ribs are positioned horizontally
2. Ribs are more pliable and offer less protection to organs
3. Chest muscles immature and fatigue easily
4. Lung tissue is more fragile
5. Mediastinum is more mobile
6. Thin chest wall allows for easily transmitted breath sounds
7. Paramedic implications
   a. Infants and children are diaphragmatic breathers
   b. Infants and children are prone to gastric distention
   c. Rib fractures are less frequent but not uncommon

in child abuse and trauma
d. Greater energy transmitted to underlying organs following trauma, therefore, significant internal injury can be present without external signs
e. Pulmonary contusions are more common in major trauma
f. Lungs prone to pneumothorax following barotrauma
g. Mediastinum has greater shift with tension pneumothorax
h. Easy to miss a pneumothorax or misplaced intubation due to transmitted breath sounds

D. Abdomen
1. Immature abdominal muscles offer less protection
2. Abdominal organs are closer togther
3. Liver and spleen proportionally larger and more vascular
4. Paramedic implications
a. Liver and spleen more frequently injured
b. Multiple organ injuries more common

E. Extremities
1. Bones are softer and more porous until adolescence
2. Injuries to growth plate may disrupt bone growth
3. Paramedic implications
a. Immobilize any "sprain" or "strain" as it is likely a fracture
b. Avoid piercing growth plate during intraosseous needle insertion

F. Skin and body surface area (BSA)
1. Thinner and more elastic
2. Thermal exposure results in deeper burn
3. Less subcutaneous fat
4. Larger surface area to body mass
5. Paramedic implications
a. More easily and deeply burned
b. Larger losses of fluid and heat

G. Respiratory system
1. Tidal volume proportionally similar to that of adolescents and adults
2. Metabolic oxygen requirements of infants and children are approximately double those of adolescents and adults
3. Proportionally smaller functional residual capacity therefore proportionally smaller oxygen reserves

4. Paramedic implications
    a. Hypoxia develops rapidly because of increased oxygen requirements and decreased oxygen reserves

H. Cardiovascular system
1. Cardiac output is rate dependent in infants and small children
2. Vigorous but limited cardiovascular reserves
3. Bradycardia is a response to hypoxia
4. Can maintain blood pressure longer than an adult
5. Circulating blood volume is proportionally larger than in an adult
6. Absolute blood volume is smaller than in an adult
7. Paramedic implications
    a. Smaller absolute volume of fluid/ blood loss needed to cause shock
    b. Larger proportional volume of fluid/ blood loss needed to cause shock
    c. Hypotension is a late sign of shock
    d. A child may be in shock despite normal blood pressure
    e. Shock assessment is based upon clinical signs of tissue perfusion
    f. Carefully assess for shock if tachycardia is present
    g. Monitor carefully for development of hypotension

I. Nervous system
1. Develops throughout childhood
2. Developing neural tissue is more fragile
3. Brain and spinal cord are less well protected by skull and spinal column
4. Paramedic implications
    a. Brain injuries are more devastating in young children
    b. Greater force transmitted to underlying brain of young children
    c. Spinal cord injury can occur without spinal column injury

J. Metabolic differences
1. Infants and children have a limited glycogen and glucose stores
2. Significant volume loss can result from vomiting and diarrhea
3. Prone to hypothermia due to increased body surface

area
4. Newborns and neonates are unable to shiver to maintain body temperature
5. Paramedic implications
   a. Keep child warm during treatment and transport
   b. Cover the head to minimize heat loss

4. Assessment
   A. General considerations
      1. Many components of the initial patient evaluation can be done by observing the patient
      1. Utilize the parent/ guardian to assist in making the infant or child more comfortable as appropriate
      2. Interacting with parents and family
         a. Normal responses to acute illness and injury
         b. Parent/ guardian and child interaction
         c. Intervention techniques
   B. Physical exam
      1. Scene survey
         a. Observe the scene for hazards or potential hazards
         b. Observe the scene for mechanism of injury/ illness
            (1) Ingestion
               (a) Pills, medicine bottles, household chemicals, etc.
            (2) Child abuse
               (a) Injury and history do not coincide, bruises not where they should be for mechanism of injury, etc.
            (3) Position patient found
         c. Observe the parent/ guardian/ caregiver interaction with the child
            (1) Do they act appropriately
            (2) Is parent/ guardian/ caregiver concerned
            (3) Is parent/ guardian/ caregiver angry
            (4) Is parent/ guardian/ caregiver indifferent
      2. Initial assessment
         a. General impression
            (1) General impression of environment
            (2) General impression of parent/ guardian and child interaction
            (3) General impression of the patient/ Pediatric

Assessment Triangle
(a) A structure for assessing the pediatric patient
(b) Focuses on the most valuable information for pediatric patients
(c) Used to ascertain if any life-threatening condition exists
(d) Components
i) Appearance
a) Mental status
b) Muscle tone
ii) Work of breathing
a) Respiratory rate
b) Respiratory effort
iii) Circulation
a) Skin signs
b) Skin color

(4) Initial triage decisions
(1) Urgent - proceed with rapid ABC assessment, treatment and transport
(e) Non urgent - proceed with focused history, detailed physical exam after initial assessment

b. Vital functions
(1) Determine level of consciousness
(a) AVPU scale
i) Alert
ii) Responds to verbal stimuli
iii) Responds to painful stimuli
iv) Unresponsive
(b) Modified Glasgow Coma Scale
(c) Signs of inadequate oxygenation

(2) Airway
(a) Determine patency

(3) Breathing
(a) Adequate chest rise and fall
(b) Use of accessory muscles
(c) Nasal flaring
(d) Tachypnea
(e) Bradypnea
(f) Irregular breathing pattern
(g) Head bobbing
(h) Grunting

(i) Absent breath sounds
(j) Abnormal sounds
(4) Circulation
(a) Pulse
i) Central
ii) Peripheral
iii) Quality of pulse
(b) Blood pressure
i) Measuring blood pressure is not necessary in children < 3 years of age
(c) Skin color
(d) Active hemorrhage
(5) Vital signs
(a) Infant
(b) Toddler
(c) Preschool
(d) School aged
(e) Adolescent

3. Transition phase
2. Utilized to allow the infant or child to become familiar with you and your equipment
c. Use of transition phase depends on the seriousness of the patient's condition
d. For the conscious, non-acutely ill child
e. For the unconscious, acutely ill child do not perform the transition phase but proceed directly to the treatment and transport

4. Focused history
a. Approach
(1) For infant, toddler, and preschool age patient, obtain from parent/ guardian
(2) For school age and adolescent patient, most information may be obtained from the patient
(3) For older adolescent patient question the patient in private regarding sexual activity, pregnancy, illicit drug and alcohol use
b. Content
(1) Chief complaint
(a) Nature of illness/ injury
(b) How long has the patient been sick/ injured

(c) Presence of fever
(d) Effects on behavior
(e) Bowel/ urine habits
(f) Vomiting/ diarrhea
(g) Frequency of urination

(2) Past medical history
(a) Infant or child under the care of a physician
(b) Chronic illnesses
(c) Medications
(d) Allergies

5. Detailed physical exam
a. Examine all body regions
(1) Head-to-toe in older child
(2) Toe-to-head in younger child
b. Some or all of the following may be appropriate, depending on the situation
(1) Pupils
(2) Capillary refill
(a) Normal - two seconds or less
(b) Valuable to assess on patients less than six years of age
(c) Less reliable in cold environment
(d) Blanch nailbed, base of the thumb, sole of the feet
(3) Hydration
(a) Skin turgor
(b) Sunken or flat fontanelle in an infant
(c) Presence of tears and saliva
(4) Pulse oximetry
(1) Should be utilized on any moderately injured or ill infant or child
(d) Hypothermia and shock can alter reading
(5) Cardiac monitor

6. On-going exam - continually monitor the following
a. Respiratory effort
b. Color
c. Mental status
d. Pulse oximetry
e. Vital signs
f. Patient temperature

C. General management
1. Airway management in pediatric patients

a. Basic airway management
   (1) Manual positioning
      (a) Allow medical patients to assume position of comfort
      (b) Support under the torso for trauma patients less than 3 year old
      (2) Occipital elevation for supine medical patients 3 years of age or older
   (2) Foreign body airway obstruction - basic clearing methods
      (a) Infants
         i) Back blows
         ii) Chest thrusts
      (b) Children
         i) Abdominal thrusts
   (3) Suction
      (a) Avoid hypoxia
      (b) Avoid upper airway stimulation
      (c) Decrease suction negative pressure (≤100 mm/Hg) in infants
   (4) Oxygenation
      (a) Non-rebreather mask
      (b) Blow-by oxygen if mask is not tolerated
      (3) Utilize the parent or guardian to deliver oxygen if patient condition warrants
      (c) Maintain proper head position
   (5) Oropharyngeal airway
      (a) Sizing
      (b) Preferred method of insertion uses the tongue blade to depress the tongue and jaw
   (6) Nasopharyngeal airway
      (a) Sizing
      (b) No major differences in sizing or use compared to adults
   (7) Ventilation
      (a) Bag size
      (b) Proper mask fit
      (c) Proper mask position and seal (E-C clamp)
      (d) Ventilate at age appropriate rate (squeeze-release-release)

(e) Obtain chest rise with each breath
(f) Allow adequate time for exhalation
(g) Assess BVM ventilation
(4) Apply cricoid pressure to minimize gastric inflation and passive regurgitation

b. Advanced airway management
(1) Foreign body airway obstruction - advanced clearing methods
(a) Direct laryngoscopy with Magill forceps
(b) Attempt intubation around foreign body
(c) Consider needle cricothyroidotomy per medical direction only as a last resort if complete upper airway obstruction is present
(2) Endotracheal intubation in pediatric patients
(a) Laryngoscope and appropriate size blade
i) Length based resuscitation tape to determine size
ii) Straight blade is preferred
(b) Appropriate size endotracheal tube and stylette
i) Sizing methods
1) Length based resuscitation tape
c) Numerical formulas
d) Anatomical clues
ii) Stylette placement
(c) Technique for pediatric intubation
(d) Depth of insertion
(e) Endotracheal tube securing device
(3) Needle cricothyroidotomy in pediatric patients

2. Circulation
a. Vascular access
(1) Intraosseous access in children < 6 years of age in cardiac arrest or if intravenous access fails
b. Fluid resuscitation
(1) 20 ml/kg of lactated ringer's or normal saline bolus as needed

3. Pharmacological

a. Rapid sequence intubation per medical direction

4. Non-pharmacological
   a. C-spine immobilization for traumatic cause
5. Transport considerations
   a. Appropriate mode
      (1) Transport should not be delayed to perform procedures that can be done en route
      (2) Proper BLS care must be performed prior to any ALS interventions
   b. Appropriate facility
      (1) The availability of a receiving hospital with expertise in pediatric care may improve the patient's outcome
6. Psychological support/ communication strategies
   a. Utilize the parent/ guardian to assist in making the infant or child more comfortable
   b. Encourage parents to help calm the child during painful procedures
   c. Infants, toddlers, preschool and school aged patients do not like to be separated from parent/ guardian
   d. Infants and children have a natural fear of strangers; for stable patients, allow them to become accustomed to you before your hands-on assessment
   e. Give some control of what is going to happen to the patient (which arm to have their IV)
   f. When possible and practical, physically position your face at the same level as the patient's face to facilitate communication and minimize fear
   g. Use age-appropriate vocabulary
   h. Keep patient warm
   i. Allow child to take their favorite toy/ blanket if possible
   j. Permit the child to express their feelings (e.g., fear, pain, crying,)
   3. Let the child know that certain physical actions (e.g., hitting, biting, spitting) are not permitted

5. Specific pathophysiology, assessment and management
   A. Respiratory compromise
      1. Introduction

a. Epidemiology
   (1) Incidence
   (2) Morbidity/ mortality
   (3) Risk factors
   (4) Prevention strategies
b. Categories of respiratory compromise
   (1) Upper airway obstruction
   (2) Lower airway disease

2. Pathophysiology
   a. Respiratory illnesses cause respiratory compromise in airway/ lung
      (1) Severity of respiratory compromise depends on extent of respiratory illness
      (3) Approach to treatment depends on severity of respiratory compromise
   b. Severity
      (1) Respiratory distress
         (a) Increased work of breathing
         (b) Carbon dioxide tension in the blood initially decreases, then increases as condition deteriorates
         (c) If uncorrected, respiratory distress leads to respiratory failure
      (2) Respiratory failure
         (a) Inadequate ventilation or oxygenation
         (1) Respiratory and circulatory systems are unable to exchange enough oxygen and carbon dioxide
         (b) Carbon dioxide tension in the blood increases, leading to respiratory acidosis
         (c) Very ominous condition; patient is on the verge of respiratory arrest
      (3) Respiratory arrest
         (a) Cessation of breathing
         (b) Failure to intervene will result in cardiopulmonary arrest
         (c) Good outcomes can be expected with early intervention that prevents cardiopulmonary arrest
   c. Assessment
      (1) Chief Complaint
      (2) History

(3) Physical findings
  (a) Signs and symptoms of respiratory distress
    i) Normal mental status => irritability or anxiety
    ii) Tachypnea
    iii) Retractions
    iv) Nasal flaring
    v) Good muscle tone
    vi) Tachycardia
    vii) Head bobbing
    viii) Grunting
    ix) Cyanosis which improves with supplemental oxygen
  (b) Signs and symptoms of respiratory failure
    i) Irritability or anxiety ==> lethargy
    ii) Marked tachypnea ==> bradypnea
    iii) Marked retractions ==> agonal respirations
    iv) Poor muscle tone
    v) Marked tachycardia ==> bradycardia
    vi) Central cyanosis
  (c) Signs and symptoms of respiratory arrest
    i) Obtunded ==> coma
    ii) Bradypnea ==> apnea
    iii) Absent chest wall motion
    iv) Limp muscle tone
    v) Bradycardia ==> asystole
    vi) Profound cyanosis
(4) On-going assessment - improvement indicated by
  (a) Improvement in color
  (b) Improvement in oxygen saturation
  (c) Increased pulse rate
  (d) Increased level of consciousness

d. Management
  (1) Graded approach to treatment
  (2) Consider separating parent and child
  (3) Airway
    (a) Manage upper airway obstructions as

needed
(b) Insert airway adjunct if needed
(4) Ventilation and oxygenation
(a) Respiratory distress/ early respiratory failure
i) Administer high flow oxygen
(b) Late respiratory failure/ respiratory arrest
i) BVM - ventilate patient with 100% oxygen via age- appropriate sized bag
ii) ETT - intubate patient if positive pressure ventilation does not rapidly improve patient condition
iii) Consider gastric decompression if abdominal distention is impeding ventilation
iv) Consider needle decompression per medical direction if tension pneumothorax is present
v) Consider cricothyroidotomy per medical direction only as a last resort if complete upper airway obstruction is present
(5) Circulation
(6) Supportive care
(7) Transport considerations
(a) Appropriate mode
(b) Appropriate facility
(8) Psychological support/ communication strategies

3. Upper airway obstruction
a. Croup
(1) Epidemiology
(a) Incidence
1) Very common in infants and children (6 months to 4 years of age)
(b) Risk factors
(c) Prevention strategies
(2) Pathophysiology
(2) An inflammatory process of the upper respiratory tract involving the

subglottic region
(d) Main cause is viral infection of the upper airway
(e) Another form is spasmodic croup
v) Occurs mostly in the middle of the night
vi) Usually without prior upper respiratory infection

(3) Assessment
(a) Signs and symptoms of respiratory distress or failure, depending on severity, plus
i) Appears sick
ii) Stridor
iii) Barking (seal or dog-like) or brassy cough
iv) Hoarseness
v) Fever (+/-)
(b) History
i) Usually with history of upper respiratory infection in classic croup (1-2 days)
ii) Rarely progresses to respiratory failure

(4) Management
(a) Airway and ventilation
i) Humidified or nebulized oxygen
ii) Cool mist oxygen at 4-6 L/min
(b) Circulation
(c) Pharmacological
(d) Non-pharmacological
i) Keep child in position of comfort
(e) Transport considerations
(f) Psychological support/ communication strategies
i) Do not agitate the patient (no IVs, blood pressure, etc.)
1) Keep the parent/ guardian/ caregiver with the infant or child if appropriate

b. Foreign body aspiration
(1) Epidemiology
(a) Incidence

i) Usually occurs in toddlers and pre-schoolers (1 to 4 years of age, but can occur at any age)
ii) Common
(b) Risk factors
(c) Prevention strategies
(2) Pathophysiology
(a) Partial or complete blockage of the upper airway by a foreign body
(b) Objects are usually food (hard candy, nuts, seeds, hot dog) or small objects (coins, balloons)
(c) If no interventions or if interventions are unsuccessful, respiratory arrest followed by cardiopulmonary arrest will ensue
(3) Assessment
(a) Partial obstruction
i) Signs and symptoms of respiratory distress or failure, depending on severity, plus
a) Appears irritable or anxious, but not toxic
b) Inspiratory stridor
c) Muffled or hoarse voice
d) Drooling
e) Pain in throat
ii) History
1) Usually a history of choking if observed by adult
(b) Complete obstruction
i) Signs and symptoms of respiratory failure or arrest, depending on severity, plus
e) Appears agitated or lethargic
f) No or minimal air movement
ii) History
a) History often lacking
b) Inability to ventilate despite proper airway positioning
(4) Management
(a) Airway and ventilation

i) Partial obstruction
   a) Place patient in sitting position
   b) Deliver oxygen by non-rebreather mask or blow-by
   c) DO NOT ATTEMPT TO LOOK IN MOUTH
   d) Interventions other than oxygen and transport may precipitate complete obstruction
ii) Complete obstruction
   a) Open airway and attempt to visualize the obstruction
   b) Sweep visible obstructions with your finger (do NOT perform blind finger sweeps)
   c) Perform BLS FBAO maneuvers
   d) Attempt BVM ventilations
   e) Perform laryngoscopy if BVM is unsuccessful
   f) Remove object if possible with pediatric Magill forceps
   g) Intubate if possible
   h) Continue BLS FBAO maneuvers if ALS is unsuccessful
   i) Consider needle cricothyroidotomy per medical direction only as a last resort

(b) Circulation
(c) Pharmacological
(d) Transport considerations
   i) Notify hospital of patient status
   ii) Transport expeditiously
(e) Psychological support/ communication strategies
   i) Do not agitate patient
      a) No IVs or medications
      b) Do not look in patient's mouth
   ii) Keep caregiver with child, if appropriate

c. Bacterial tracheitis
  (1) Epidemiology
    (a) Incidence
      2) Usually occurs in infants and toddlers (1-5 years old), but can occur in older children
      3) Very uncommon
    (b) Risk factors
    (c) Prevention strategies
  (2) Pathophysiology
    (3) Bacterial infection of the upper airway, subglottic trachea, usually following viral croup
  (3) Assessment
    (c) Signs and symptoms - respiratory distress or failure depending on severity, plus
      i) Appears agitated, sick
      ii) High-grade fever
      iii) Inspiratory and expiratory stridor
      iv) Coughing up pus/ mucous
      v) Hoarse voice
      vi) Pain in throat
    (d) History
      i) Usually a history of croup in the preceding few days
    (e) May progress to respiratory failure or arrest
  (4) Management
    (a) Assure airway and ventilation
    (b) Administer oxygen by non-rebreather or blow-by
    (c) Complete obstruction or respiratory failure/ arrest
      i) BVM ventilation
      ii) May require high pressure to adequately ventilate
      iii) Intubate patient
      iv) Suction endotracheal tube to reduce pus or mucous
    (d) Circulation
    (e) Pharmacological
    (f) Transport considerations

i) Place patient in sitting position
ii) Notify hospital of patient status as early as possible
iii) Transport quickly

(g) Psychological support/ communication strategies
1) DO NOT AGITATE THE PATIENT - no IVs, no BP, do not look in patient's mouth
iv) Keep caregiver with child if appropriate

d. Epiglottitis
(1) Epidemiology
(a) Incidence
i) Usually occurs in pre-school and school-age children (3-7 years of age) but can occur at any age
ii) Extremely uncommon due to the H. flu vaccine
(b) Risk factors
(c) Prevention strategies
(2) Pathophysiology
(4) Rapidly forming cellulitis of the epiglottis and its surrounding structures
(d) Bacterial infection, usually Hemophilus influenza type B
(e) Can be a true life-threatening emergency
(3) Assessment
(a) Signs and symptoms of respiratory distress or failure depending on severity, plus
i) Appears agitated, sick
ii) Stridor
iii) Muffled voice
iv) Drooling
v) Sore throat
vi) Pain on swallowing
vii) High fever
(b) History
i) Usually no previous history but a rapid onset of symptoms (6-8

hours)
(c) Can quickly progress to respiratory arrest
(4) Management
(a) Airway and ventilation
i) NEVER ATTEMPT TO VISUALIZE THE AIRWAY IF THE PATIENT IS AWAKE
ii) Allow the parent to administer oxygen
iii) If airway becomes obstructed, two rescuer ventilation with BVM is almost always effective
iv) If BVM is not effective, attempt intubation with stylet in place
v) Intubation should not be attempted in settings with short transport times
vi) Performing chest compression upon glottic visualization during intubation may produce a bubble at the tracheal opening
vii) Consider needle cricothyroidotomy per medical direction as a last resort if complete upper airway obstruction is present
(b) Circulation
(c) Pharmacological
(d) Transport considerations
i) Allow patient to assume position of comfort
ii) Notify hospital of patient status early
1) Transport to the hospital without delay, keeping child warm
(e) Psychological support/ communication strategies
i) DO NOT AGITATE THE PATIENT - no IVs, BP, do not look in patient's mouth
ii) Keep the caregiver with the child if appropriate

4. Lower airway disease
a. Asthma

(1) Epidemiology
  (a) Incidence
    i) Usually occurs in children older than 2 years of age
    ii) Very common
  (b) Risk factors
    i) Typically in child with known history of asthma
    2) Triggered by upper respiratory infections, allergies, changes in temperature, physical exercise and emotional response
    3) Children that experience prolonged asthma attacks tire easily; watch for signs of respiratory failure
  (c) Prevention strategies
(2) Pathophysiology
  (a) Bronchospasm
  (b) Excessive mucous production
  (c) Inflammation of the small airways
(3) Assessment
  (5) Signs and symptoms - respiratory distress or failure depending on severity, plus
    i) Appears anxious
    ii) Wheezes
    iii) Prolonged expiratory phase
    iv) A silent chest means danger
  (d) History
    i) Usually follows exposure to known trigger
  (e) Bronchiolitis and asthma may present very similarly
(4) Management
  (a) Airway and ventilation
    i) Administer oxygen by tolerated method
    ii) BVM ventilations for respiratory failure/ arrest (progressive lethargy, poor muscle tone, shallow respiratory effort)
    iii) Endotracheal intubation for respiratory failure/ arrest with

prolonged BVM ventilations, or inadequate response to BVM ventilations
(b) Circulation
(c) Pharmacological
i) Albuterol nebulizer
ii) Subcutaneous epinephrine 1:1000 - only with severe respiratory distress or failure
iii) Medications can be repeated if no effect
(d) Transport considerations
i) Allow patient to assume position of comfort
(e) Psychological support/ communication strategies
i) Keep caregiver with child if appropriate

b. Bronchiolitis
(1) Epidemiology
(a) Incidence
i) Usually occurs in children less than 2 years of age
ii) Very common
(b) Risk factors
i) Usually occurs in winter months
(c) Prevention strategies
(2) Pathophysiology
(6) An inflammatory process of the lower respiratory tract including the terminal airways
(7) Main cause is respiratory syncytial virus infection of the lower airway
(3) Assessment
(a) Signs and symptoms - respiratory distress or failure depending on severity, plus
i) Appears anxious
ii) Wheezing
iii) Rales (diffuse)
(b) History
i) Usually a history of upper respiratory infection symptoms

(c) Bronchiolitis and asthma may present very similarly

(4) Management

(a) Airway and ventilation

i) Administer oxygen by tolerated method

ii) BVM ventilations for respiratory failure/ arrest (progressive lethargy, poor muscle tone, shallow respiratory effort)

iii) Endotracheal intubation for respiratory failure/ arrest with prolonged BVM ventilations, or inadequate response to BVM ventilations

(b) Circulation

(c) Pharmacological

i) Albuterol nebulizer

(d) Transport considerations

i) Allow patient to assume position of comfort

(e) Psychological support/ communication strategies

i) Keep caregiver with child if appropriate

c. Pneumonia

(1) Epidemiology

(a) Incidence

1) Usually occurs in infants, toddlers and pre-schoolers (1-5 years of age), but can occur at any age

ii) Common

(b) Risk factors

(c) Prevention strategies

(2) Pathophysiology

(a) Infection of the lower airway and lung

(b) May be caused by bacteria or virus

(3) Assessment

(a) Signs and symptoms - respiratory distress or failure depending on the severity, plus

i) Appears anxious

ii) Decreased breath sounds
iii) Rales
iv) Rhonchi (localized or diffuse)
v) Pain in the chest
vi) Fever
(b) History
i) Usually a history of lower respiratory infectious symptoms
(4) Management
(a) Airway and ventilation
i) Administer oxygen by tolerated method
ii) BVM ventilations for respiratory failure/ arrest (progressive lethargy, poor muscle tone, shallow respiratory effort)
iii) Endotracheal intubation for respiratory failure, prolonged BVM ventilations, or inadequate response to BVM ventilations
(b) Circulation
(c) Pharmacological
(d) Transport considerations
i) Allow patient to assume position of comfort
(e) Psychological support/ communication strategies
i) Keep caregiver with child if appropriate

d. Foreign body lower airway obstruction
(1) Epidemiology
(a) Incidence
i) Usually occurs in toddlers and preschool age children (1-4 years of age), but can occur at any age
ii) Uncommon
(b) Risk factors
(c) Prevention strategies
(2) Pathophysiology
(a) Foreign body in the lower airway or lung
(b) Objects are usually food (nuts, seeds, etc.) or small objects

(3) Assessment
(a) Signs and symptoms - respiratory distress of failure depending on the severity, plus
i) Appears anxious
ii) Decreased breath sounds
iii) Rales
iv) Rhonchi (localized or diffuse)
v) Pain in the chest
(b) History
i) May be a history of choking if witnessed by an adult
(4) Management
(a) Airway and ventilation
i) Administer oxygen by tolerated method
2) BVM ventilations for respiratory failure/ arrest (progressive lethargy, poor muscle tone, shallow respiratory effort)
3) Endotracheal intubation for respiratory failure/ arrest with prolonged BVM ventilations, or inadequate response to BVM ventilations
4) Do not attempt to retrieve foreign body as it is beyond the reach of Magill forceps
(b) Circulation
(c) Transport considerations
i) Allow patient to assume position of comfort
(d) Psychological support/ communication strategies
i) Keep caregiver with child if appropriate

B. Shock
1. Introduction
a. Epidemiology
(1) Incidence
(2) Morbidity/ mortality
(3) Risk factors
(4) Prevention strategies

b. Categories of shock
    (1) Non-cardiogenic
    (2) Cardiogenic

2. Pathophysiology
    a. An abnormal condition characterized by inadequate delivery of oxygen and metabolic substrates to meet the metabolic demands of tissues
    b. Severity
        (1) Compensated (early)
            (8) Patient's blood pressure is normal although signs of inadequate tissue perfusion are present
            (e) Reversible
        (2) Decompensated (late)
            (a) Hypotension and signs of inadequate organ perfusion are present
            (b) Often irreversible
    c. Assessment
        (1) Chief complaint
        (2) History
        (3) Physical findings
            (a) Signs and symptoms of compensated shock
                i) Irritability or anxiety
                ii) Tachycardia
                iii) Tachypnea
                iv) Weak peripheral pulses, full central pulses
                v) Delayed capillary refill
                vi) Cool, pale extremities
                vii) Systolic blood pressure within normal limits
                viii) Decreased urinary output
            (b) Signs and symptoms of decompensated shock
                i) Lethargy or coma
                ii) Marked tachycardia or bradycardia
                iii) Marked tachypnea or bradypnea
                iv) Absent peripheral pulses, weak central pulses
                v) Markedly delayed capillary refill
                vi) Cool, pale, dusky, mottled extremities

vii) Hypotension
viii) Markedly decreased urinary output

d. Management
(1) Graded approach to treatment
(2) Consider separating parent and child
(3) Airway
(a) Trauma - immobilize c-spine
(4) Ventilation and oxygenation
(a) Compensated shock
i) Oxygen
(b) Decompensated shock
i) BVM - consider ventilating patient with 100% oxygen via appropriate-sized bag
ii) ETT - consider intubating patient if positive pressure ventilation does not rapidly improve patient's condition
(5) Circulation
(a) Compensated shock
i) Oxygen
(b) Decompensated shock
i) Non-cardiogenic
a) Fluid
ii) Cardiogenic
a) No fluid
b) Dysrhythmia management as indicated
(6) Supportive care
(7) Transport considerations
(a) Appropriate mode
(b) Appropriate facility
(8) Psychological support/ communication strategies

3. Noncardiogenic
a. Hypovolemia
(1) Epidemiology
(a) Common
(2) Pathophysiology
(a) Intravascular volume depletion
i) Severe dehydration
a) Vomiting

b) Diarrhea
ii) Blood loss
a) Trauma
b) Other, e.g., GI bleed
(3) Assessment
(a) Signs and symptoms of compensated or decompensated shock depending on severity, plus
i) Blood loss
a) External hemorrhage
b) Major trauma
ii) Dehydration
a) Poor skin turgor
b) Decreased saliva and or tears
c) Sunken fontanelle (infants)
(b) History
(4) Management
(a) Airway and ventilation
i) Oxygen
ii) Trauma - immobilize c-spine
(b) Circulation
i) Compensated shock
a) Oxygen
ii) Decompensated shock
a) Oxygen
b) Vascular access
1) 20 ml/kg of lactated ringers or NS bolus as needed
(c) Supportive care
(d) Transport considerations
(e) Psychological support/ communication strategies

b. Distributive
(1) Epidemiology
(a) Uncommon
(2) Etiology
(a) Septic
(b) Neurogenic
(c) Anaphylactic
(3) Pathophysiology
(a) Peripheral pooling due to loss of vasomotor tone
(4) Assessment

(9) Signs and symptoms of compensated or decompensated shock depending on severity, plus
i) Septic
a) Early - warm skin
b) Late - cool skin
ii) Neurogenic
a) Warm skin
b) Bradycardia
iii) Anaphylactic
a) Allergic rash
b) Airway swelling
(b) History
(5) Management
(a) Airway and ventilation
i) Oxygen
ii) Trauma - immobilize c-spine
(b) Circulation
i) Compensated shock
a) Oxygen
ii) Decompensated shock
a) Oxygen
b) Vascular access
1) 20 ml/kg of lactated ringers or NS bolus as needed
c) Anaphylactic - secure airway
(c) Supportive care
(d) Transport considerations
(e) Psychological support/ communication strategies

4. Cardiogenic
a. Cardiomyopathy
(1) Epidemiology
(a) Infection
(b) Congenital abnormalities
(2) Pathophysiology
(a) Mechanical pump failure
(b) Usually biventricular
(3) Assessment
(a) Signs and symptoms of compensated or decompensated shock, depending on severity, plus
i) Rales

ii) Jugular venous distention
iii) Hepatomegaly
iv) Peripheral edema
(b) History
(4) Management
(a) Airway and ventilation
i) Oxygen
(b) Circulation
i) Compensated shock
a) Oxygen
ii) Decompensated shock
a) Oxygen
b) Vascular access
c) Restrict fluid
d) Consider diuretic
e) Consider vasopressor
(c) Supportive care
(d) Transport considerations
(e) Psychological support/ communication strategies

b. Dysrhythmias
(1) Epidemiology
(a) Bradydysrhythmias - common
(b) Supraventricular tachydysrhythmias - uncommon
(c) Ventricular tachydysrhythmias - very uncommon
(2) Pathophysiology
(a) Electrical pump failure
(10) Results in cardiogenic shock or cardiopulmonary arrest depending on type
(3) Assessment
(11) Signs and symptoms of cardiogenic shock (compensated or decompensated) or cardiopulmonary arrest, depending on type
(b) History
(4) Management
(a) Specific to each type

C. Dysrhythmias
1. Tachydysrhythmias
a. Supraventricular tachycardia

(1) Epidemiology
  (a) Incidence
    i) Usually in infants with no prior history
  (b) Risk factors
  (c) Prevention strategies
(2) Pathophysiology
  (12) Stable (compensated shock) - patient will usually remain stable during transport with oxygen
  (d) Unstable (decompensated shock) - PATIENT REQUIRES IMMEDIATE TREATMENT
  (e) Children may be able to sustain increased rates for a while, but after several hours, they will decompensate
(3) Assessment
  (a) Signs and symptoms - compensated or decompensated shock, depending on severity, plus
    i) Narrow complex tachycardia with rates of greater than 220 beats per minute (too fast to count)
    ii) Poor feeding
    iii) Hypotension
  (b) History
(4) Management
  (a) Stable - supportive care
  (b) Unstable
    i) Airway and ventilation
      a) Oxygen
    ii) Circulation
    iii) Pharmacological
      a) Consider adenosine
    iv) Non-pharmacological
      a) Synchronized cardioversion
    v) Transport considerations
    vi) Psychological support/ communication strategies

b. Ventricular tachycardia with a pulse
(1) Epidemiology
  (a) Incidence
  (b) Risk factors
  (c) Prevention strategies

(2) Pathophysiology
(13) Stable (compensated shock) - patient will usually not tolerate for long periods of time
(d) Unstable (decompensated shock) - PATIENT REQUIRES IMMEDIATE TREATMENT
(e) Most VT with a pulse is secondary to structural heart disease and responds poorly to lidocaine
(3) Assessment
(a) Signs and symptoms - signs of compensated or decompensated shock, depending on severity, plus
i) Rapid, wide complex tachycardia
ii) Poor feeding
iii) Hypotension
(b) History
(4) Management
(a) Stable - supportive care
(b) Unstable
i) Airway and ventilation
a) Administer high flow oxygen
ii) Circulation
iii) Pharmacological
a) Consider lidocaine
iv) Non-pharmacological
a) Synchronized cardioversion
v) Transport considerations
vi) Psychological support/ communication strategies

2. Bradydysrhythmias
a. Epidemiology
(1) Incidence - most common dysrhythmia in children
(2) Risk factors
(3) Prevention strategies
b. Pathophysiology
(1) Usually develops as a result of hypoxia
(2) May develop due to vagal stimulation (rare)
c. Assessment
(1) Signs and symptoms - compensated or decompensated shock, depending on severity, plus

(a) Bradycardia
(b) Slow, narrow complex heart rhythm, QRS duration may be normal or prolonged
(2) History
d. Management
(1) Stable - supportive care
(2) Unstable
(a) Airway and ventilation
i) Ventilate patient with 100% oxygen via BVM
ii) Intubate patient if poor response to BVM ventilations
(b) Circulation
i) Perform chest compressions if oxygen does not increase heart rate
(c) Pharmacological
i) Medications can be given down the endotracheal tube
ii) Administer epinephrine
iii) Administer atropine for vagally induced bradycardia
(d) Non-pharmacological
(e) Transport considerations
(f) Psychological support/ communication strategies
2. Absent rhythm
a. Asystole
(1) Epidemiology
(a) Incidence - may be the initial cardiac arrest rhythm
(b) Risk factors
(c) Prevention strategies
(2) Pathophysiology
(a) Bradycardias may degenerate into asystole
(b) High mortality rate
(3) Assessment
(a) Signs and symptoms
i) Pulseless
ii) Apneic
iii) Cardiac monitor indicating no electrical activity

(b) History
(4) Management
(a) Confirm in two leads
(b) Airway and ventilation
i) Ventilate the patient with 100% oxygen via BVM
ii) Intubate patient if poor response to BVM ventilations
(c) Circulation
i) Perform chest compressions
(d) Pharmacological
i) Medications can be given down the endotracheal tube
ii) Administer epinephrine
(e) Non-pharmacological
(f) Transport considerations
(g) Psychological support/ communication strategies

b. Ventricular fibrillation/ pulseless ventricular tachycardia
(1) Epidemiology
(a) Incidence - rare
(b) Risk factors
(c) Prevention strategies
(2) Pathophysiology
(a) Possibly due to electrocution and drug overdoses
(b) High mortality rate
(3) Assessment
(a) Signs and symptoms
i) Pulseless
ii) Apneic
1) Cardiac monitor indicating no organized electrical activity or rapid wide complex tachycardia
(b) History
(4) Management
(a) Unmonitored - perform basic life support
(b) Monitored - defibrillate up to three consecutive shocks
(c) Airway and ventilation
i) Ventilate the patient with 100%

oxygen via BVM
ii) Intubate patient if poor response to BVM ventilations
(d) Circulation
i) Perform chest compressions
(e) Pharmacological
i) Medications can be given down the endotracheal tube
ii) Administer epinephrine
iii) Administer lidocaine
iv) Administer bretylium
2) After administration of a medication, allow it to circulate for one minute before repeat defibrillation
(f) Non-pharmacological
(g) Transport considerations
(h) Psychological support/ communication strategies

c. Pulseless electrical activity
(1) Epidemiology
(a) Incidence - look for a treatable cause
(b) Risk factors
(c) Prevention strategies
(2) Pathophysiology
(a) Pneumothorax
(b) Cardiac tamponade
(c) Hypovolemia
(d) Hypoxia
(e) Acidosis
(f) Hypothermia
(g) Hypoglycemia
(3) Assessment
(a) Signs and symptoms
i) Pulseless
ii) Apneic
iii) Cardiac monitor indicating organized electrical activity
(b) History
(4) Management
(a) Resuscitation should be directed toward relieving cause
(b) Airway and ventilation

i) Ventilate the patient with 100% oxygen
ii) Intubate patient
(c) Circulation
i) Perform chest compressions
(d) Pharmacological
i) Medications can be given down the endotracheal tube
ii) Administer epinephrine
(e) Non-pharmacological
(f) Transport considerations
(g) Psychological support/ communication strategies

D. Seizure
1. Epidemiology
a. Incidence
b. Morbidity/ mortality
c. Risk factors
d. Prevention strategies
2. Pathophysiology
a. Types
(1) Generalized
(2) Focal
2. See neonatal section for a more specific listing of signs and symptoms
3. Assessment
a. Signs and symptoms
(1) Generalized
(a) Sudden jerking of both sides of the body followed by tenseness and relaxation of the body
(1) Loss of consciousness
(2) Focal
(1) Sudden jerking of a part of the body (arm, leg)
(2) Lip smacking
(3) Eye blinking
(4) Staring
(5) Confusion
(6) Lethargy
b. History
4. Management
a. Airway and ventilation

(1) Maintain patent airway
(2) Administer high-flow oxygen

b. Circulation
c. Pharmacological
(1) Consider dextrose if hypogylcemic
(3) Consider benzodiazepine if active seizures are present; anticipate need for ventilatory support
d. Non-pharmacological
(1) Protect patient from further injury
(2) Protect head and cervical spine if injury has occurred
e. Transport considerations
f. Psychological support/ communication strategies

E. Hypoglycemia
1. Epidemiology
a. Incidence
b. Morbidity/ mortality
c. Incidence
d. Risk factors
e. Prevention strategies
2. Pathophysiology
a. Children have limited glucose storage
b. In severe cases, if not treated promptly, can cause brain damage
3. Assessment
a. Signs and symptoms
(1) Mild
(a) Hunger
(b) Weakness
(c) Tachypnea
(d) Tachycardia
(2) Moderate
(a) Sweating
(b) Tremors
(c) Irritability
(d) Vomiting
(e) Mood swings
(f) Blurred vision
(g) Stomach ache
(h) Headache
(i) Dizziness
(3) Severe

(a) Decreased level of consciousness
(b) Seizure
b. Measure blood glucose
c. History
4. Management
a. Airway and ventilation
b. Circulation
c. Pharmacological
(1) Administer Dextrose per medical direction
(4) Administer Glucagon IM if IV access is not possible per medical direction
(2) Repeat blood glucose test 10-15 minutes after dextrose infusion
d. Non-pharmacological
e. Transport considerations
f. Psychological support communication strategies

F. Hyperglycemia
1. Epidemiology
a. Morbidity/ mortality
b. Incidence
c. Risk factors
d. Prevention strategies
2. Pathophysiology
a. Hyperglycemia leads to dehydration and ketoacidosis
3. Assessment
a. Signs and symptoms
(1) Early
(a) Increased thirst
(b) Increased urination
(c) Weight loss
(2) Late (dehydration and early ketoacidosis)
(a) Weakness
(b) Abdominal pain
(c) Generalized aches
(d) Loss of appetite
(e) Nausea
(f) Vomiting
(g) Signs of dehydration except decreased urinary output
(h) Fruity breath odor
(i) Tachypnea
(j) Hyperventilation

(k) Tachycardia
(3) If untreated, progresses to
(a) Coma
(b) Deep and slow respirations (Kussmaul)
(c) Signs of severe dehydration
b. Measure blood glucose
c. History
4. Management
a. Airway and ventilation
b. Circulation
c. Pharmacological
(5) Consider lactated ringers or NS if signs of dehydration are present per medical direction
d. Non-pharmacological
e. Transport considerations
f. Psychological support communication strategies
2. Infection
1. Epidemiology
a. Incidence
b. Morbidity/ mortality
c. Risk factors
d. Prevention strategies
2. Pathophysiology
a. Depends upon the type of infectious organism and extent of infection
3. Assessment
a. Signs and symptoms vary depending upon the infection and the time since the patient was exposed
(3) Fever
(4) Chills
(5) Tachycardia
(6) Cough
(7) Sore throat
(8) Nasal congestion
(9) Malaise
(10) Tachypnea
(11) Cool or clammy skin
(12) Petechia
(13) Respiratory distress
(14) Poor feeding
(15) Vomiting

(16) Diarrhea
(17) Dehydration
(18) Hypoperfusion
(19) Purpura
(20) Seizures
(21) Severe headache
(22) Irritability
(23) Stiff neck
(24) Bulging fontanelle (infant)

b. History

4. Management

a. Body substance isolation precautions must be strictly adhered to due to the unknown etiology of the infection

b. Airway and ventilation

(1) Administer high-flow oxygen
(2) Provide ventilatory support if indicated

c. Circulation

d. Pharmacological

(1) Administer lactated ringers or NS if signs of decompensated shock are present per medical direction
(2) Administer benzodiazepine per medical direction if active seizure is present

e. Non-pharmacological

f. Transport considerations

g. Psychological support communication strategies

G. Poisoning and toxic exposure

1. Epidemiology

a. Incidence

(1) Children account for the majority of poisoning events

b. Morbidity/ mortality

(1) Major cause of preventable death in children under five years of age

c. Risk factors

d. Prevention strategies

2. Pathophysiology

a. Depends upon the type of poison or toxin and the extent of exposure

3. Common substances of pediatric poisonings

a. Alcohol, barbiturates, sedatives

b. Amphetamines, cocaine, hallucinogens

c. Anticholinergic
d. Aspirin
e. Corrosives
f. Digitalis, beta-blockers
g. Hydrocarbons
h. Narcotics
i. Organic solvents (inhaled)
j. Organophosphate

4. Assessment
   1. Signs and symptoms - vary depending upon both the poisoning/ toxic substance and the time since the child was exposed
      (1) Respiratory system depression
      (2) Circulatory system depression
      (3) Central nervous system stimulation or depression
      (4) Mind-altering ability
      (5) Gastrointestinal system irritation
   k. History

5. Management
   a. Airway and ventilation
   b. Circulation
   c. Pharmacological
      (1) Contact poison control center or medical direction to obtain directions for specific treatment
   d. Non-pharmacological
      (1) Take pills, substances, containers to the hospital
   e. Transport considerations
   f. Psychological support communication strategies

6. Pediatric trauma
   A. Pathophysiology
      1. Blunt
         a. Thinner body wall allows forces to be readily transmitted to body contents
         b. Predominant cause of injury in children
      2. Penetrating
         a. Becoming an increasing problem in adolescents
         b. Higher incidence in the inner city (mostly intentional), but significant incidence in other areas (mostly unintentional)

B. Mechanism of injury
   1. Fall
      a. Single most common cause of injury in children
      b. Serious injury or death resulting from truly accidental falls is relatively uncommon unless from a significant height
      c. Prevention strategies
   2. Motor vehicle crash
      a. Leading cause of permanent brain injury and new cases of epilepsy
      b. Leading cause of death and serious injury in children
      c. Prevention strategies
   3. Pedestrian vehicle crash
      a. Particularly lethal form of trauma in children
      b. Initial injury due to impact with vehicle (extremity/ trunk)
      c. Child is thrown from force of impact causing additional injury (head/ spine) upon impact with other objects (ground, another vehicle, light standard, etc.)
      d. Prevention strategies
   4. Near-drowning
      a. Third leading cause of injury or death in children between birth and 4 years of age
      b. Causes approximately 2000 deaths annually
      c. Severe, permanent brain damage occurs in 5-20% of hospitalized children for near drowning
      d. Prevention strategies
   5. Penetrating injuries
      a. Risk of death from firearm injuries increase with age
      b. Stab wounds and firearm injuries account for approximately 10-15% of all pediatric trauma admissions
      c. Visual inspection of external injuries can not evaluate the extent of internal involvement
      d. Prevention strategies
   6. Burns
      a. The leading cause of accidental death in the home for children under the age of 14 years
      b. Burn survival is a function of burn size and concomitant injuries

1. Modified "rule of nines" is utilized to determine percentage of surface area involved
c. Prevention strategies

7. Physical abuse
a. Has been classified into four categories - physical abuse, sexual abuse, emotional abuse and child neglect
b. Social phenomena such as increased poverty, domestic disturbance, younger aged parents, substance abuse, and community violence have been attributed to increase of abuse
c. Document all pertinent findings, treatments and interventions
d. Prevention strategies

C. Special considerations
1. Airway control
a. Maintain in-line stabilization in neutral, not sniffing position
b. Administer 100% oxygen to all trauma patients
c. Patent airway must be maintained via suctioning and jaw thrust
d. Be prepared to assist ineffective respirations
e. Intubation should be performed when the airway remains inadequate
f. Gastric tube should be placed after intubation
g. Needle cricothyroidotomy is rarely indicated for traumatic upper airway obstruction

2. Immobilization
a. Indications for stabilization and immobilization of cervical spine
b. Utilize appropriate sized pediatric immobilization equipment
(1) Rigid cervical collar
(2) Towel/ blanket roll
(3) Child safety seat
(4) Pediatric immobilization device
(5) Vest-type/ short wooden backboard
(6) Long backboard
(7) Straps, cravats
(8) Tape
(9) Padding

2. Maintain supine neutral in-line position for infants, toddlers, and pre-schoolers by placing

padding from the shoulders to the hips

3. Fluid management
   a. Management of the airway and breathing take priority over management of circulation because circulatory compromise is less common in children than adults
   b. Vascular access
      (1) Large-bore intravenous catheter should be inserted into a large peripheral vein
      (2) Do not delay transport to gain access
      (3) Intraosseous access in children < 6 years of age if intravenous access fails
      (4) Initial fluid bolus of 20 ml/kg of an lactated ringers or NS
      (5) Reassess vital signs and rebolus with 20 ml/kg if no improvement
      (6) If improvement does not occur after the second bolus, there is likely to be significant blood loss and the need for rapid surgical intervention
4. Traumatic brain injury
   a. Early recognition and aggressive management can reduce mortality and morbidity
   b. Severity
      (1) Mild - GCS is 13 to 15
      (2) Moderate - GCS is 9 to 12
      (3) Severe - GCS is less than or equal to 8
   c. Signs of increased intracranial pressure
      (1) Elevated blood pressure
      (2) Bradycardia
      (1) Rapid deep respirations (Kussmaul) progressing to slow, deep respirations alternating with rapid deep respirations (Cheyne-Stokes)
      (3) Bulging fontanelle (infant)
   d. Signs of herniation
      (1) Asymmetrical pupils
      (2) Posturing
   e. Specific management
      (1) Administer high concentration of oxygen for mild to moderate head injuries (GCS 9-15)
      (2) Intubate and ventilate at normal breathing rate with 100% oxygen for severe head

injuries (GCS 3-8)
(a) Use of lidocaine may blunt rise in ICP (controversial)
(b) Consider RSI per medical direction
(3) Indications for hyperventilation
(a) Asymmetric pupils
(b) Active seizures
(c) Neurologic posturing

D. Specific injuries
1. Head and neck injury
a. Larger relative mass of the head and lack of neck muscle strength provides increased momentum in acceleration-deceleration injuries and a greater stress to the cervical spine region
b. Fulcrum of cervical mobility in the younger child is at the C2-C3 level
c. 60% to 70% of pediatric fractures occur in C1 or C2
d. Head injury is the most common cause of death in pediatric trauma victim
e. Diffuse injuries are common in children, focal injuries are rare
f. Soft tissues, skull and brain are more compliant in children than in adults
3. Due to open fontanelles and sutures, infants up to an average age of 16 months may be more tolerant to an increase of intracranial pressure and can have delayed signs
g. Subdural bleeds in a infant can produce hypotension (extremely rare)
h. Significant blood loss can occur through scalp lacerations and should be controlled immediately
i. The Modified Glasgow Coma scale should be utilized for infants and young children
2. Chest injury
a. Chest injuries in children under 14 years of age are usually the result of blunt trauma
b. Due to the compliance of the chest wall, severe intrathoracic injury can be present without signs of external injury
c. Tension pneumothorax is poorly tolerated and is an immediate threat to life
d. Flail segment is an uncommon injury in children;

when noted without a significant mechanism of injury, suspect child abuse

e. Many children with cardiac tamponade will have no physical signs of tamponade other then hypotension

3. Abdominal injury
   a. Musculature is minimal and poorly protects the viscera
   b. Organs most commonly injured are liver, kidney and spleen
   c. Onset of symptoms may be rapid or gradual
   d. Due to the small size of the abdomen, be certain to palpate only one quadrant at a time
   4. Any child who is hemodynamically unstable without evidence of obvious source of blood loss should be considered as having an abdominal injury until proven otherwise
4. Extremity
   a. Relatively more common in children than adults
   b. Growth plate injuries are common
   c. Compartment syndrome is an emergency in children
   d. Any sites of active bleeding must be controlled
   e. Splinting should be performed to prevent further injury and blood loss
   f. PASG may be useful in unstable pelvic fractures with hypotension
5. Burns
   a. Thermal burns in children
   b. Chemical burns in children
   c. Electrical burns in children
   d. Management priorities
      (1) Prompt management of the airway is required as swelling can develop rapidly
      (2) If intubation is required, an endotracheal tube up to two sizes smaller than what would normally be used may be required
      (3) Thermally burned children are very susceptible to hypothermia; maintain normal body temperature
      (4) Suspect musculoskeletal injuries in electrical burn patients and perform spine immobilization techniques

7. Sudden Infant Death Syndrome (SIDS)
   A. Epidemiology
      1. Incidence
      2. Morbidity/ mortality
      3. Risk factors
         a. Occurs most frequently in the fall and winter months
         b. Minor illness (cold or upper respiratory infection) within two weeks prior to the death
         c. Premature and low birth-weight infants
         d. Infants of young mothers
         e. Infants of mothers who did not receive prenatal care
         f. Infants of mothers who used cocaine, methadone or heroin during pregnancy
      4. Prevention strategies
   B. Pathophysiology
      1. Sudden and unexpected death of a seemingly healthy infant, which remains unexplained even after a thorough postmortem examination
      2. No prior symptoms of life-threatening illness
      3. Death usually occurs during sleep
      4. No definitive answer at this time
      5. A small percentage is abuse related
      6. Many victims of SIDS appear to have suffered from long-term underventilation of the lungs, possibly due to poor control of breathing during sleep; prone positioning may be a factor
      7. Abnormalities in the brainstem
   C. Assessment
      1. Signs and symptoms
         a. No external signs of injury
         b. Lividity
         c. Frothy blood-tinged drainage from nose/ mouth
         d. Rigor mortis
         e. Evidence that the baby was very active just prior to the death (i.e. rumpled bed clothes, unusual position or location in the bed)
      2. History
   D. Management
      1. Airway and ventilation
      2. Circulation
      3. Pharmacological

4. Non-pharmacological
5. Transport considerations
6. Psychological support/ communication strategies
    a. Initiate CPR unless the infant is obviously dead (unquestionably dead to a lay person)
    b. Perform ALS as indicated
    c. Be prepared for the range of possible family emotional reactions
    d. Parents/ caregiver should be allowed to accompany their baby in the ambulance
    e. Explain that certain information is required regarding the infant's health is necessary to determine the care to be given
    f. Utilize the baby's name
    g. Questions should be phrased so blame is not implied
    h. Debriefing
    i. Resources for SIDS families

8. Child abuse and neglect
    A. Epidemiology
        1. Second leading cause of death in infants less than 6 months of age
        2. Between 2000 and 5000 children die each year due to abuse and neglect
    B. Age considerations
        1. Under 18 years of age
        2. Physically or mentally handicapped person under 21 years of age
    C. Abuse or neglect perpetrators
        1. Parent, legal guardian, foster parent
        2. Person, institution, agency or program having custody of the child
        3. Person serving as a caretaker, i.e. babysitter
    D. Abuse
        1. Types
            a. Physical
            b. Emotional
            c. Sexual
        2. Abuse indicators
            a. Historical
            b. Psychosocial
            c. Signs of physical abuse

d. Signs of emotional abuse
(1) Physical indicators
(2) Behavioral indicators
e. Signs of sexual abuse

E. Neglect
1. Types
a. Physical
b. Emotional
2. Neglect indicators
a. Behavioral
b. Physical

F. Paramedic role in treating abuse and neglect
1. Assess the injuries/ neglect and render appropriate care
2. Look at the environment for condition and cleanliness
3. Look for evidence of anything out of the ordinary
4. Look and listen to caregiver/ family members
5. Assess whether the explanation fits the injury
6. Document all findings thoroughly
7. Report suspicion
a. Mandated reporter
b. Immunity from liability

G. Resources for abuse and neglect
1. State, regional and local child protection agency
2. Hospital social service department

9. Infants and children with special needs
A. This can include many different types of children
1. Premature babies
2. Lung disease
3. Heart diseases
4. Neurological diseases
5. Chronic diseases
6. Altered functions from birth

B. Often these children will be at home, technologically dependent
1. Tracheostomy tube
a. Types
b. Complications
(1) Obstruction
(2) Bleeding
(3) Air leak
(4) Dislodged

(5) Infection
c. Treatment
(1) Maintain an open airway
(2) Suction
(3) Maintain position of comfort
(4) Intubation
(a) Intubate orally in the absence of upper airway obstruction
(b) Intubate via the stoma if there is an upper airway obstruction
(5) Transport
2. Home artificial ventilators
a. Types
(1) Parents are usually familiar with the operation
b. Treatment
(1) Assure airway
(2) Artificially ventilate with oxygen
(3) Transport
3. Central venous lines
a. Intravenous lines that are placed near the heart for long term use
b. Complications
(1) Cracked line
(2) Infection
(3) Clots
(4) Bleeding
(5) Air embolism
c. Treatment
(1) If cracked line, clamp between crack and patient
(1) If altered mental status following cracked line, position on left side with head down
(2) If bleeding, apply pressure
d. Transport
4. Gastrostomy tubes and gastric feeding
a. Tubes placed directly into stomach for feeding
b. Come in many shapes
c. Patients usually cannot be fed by mouth
d. Be alert for breathing problems
e. Treatment
(1) Assure adequate airway

(2) Administer 100% oxygen
(3) Suction if needed
(4) Consider hypoglycemia in diabetic patient who cannot be fed

f. Transport
(1) Sitting
(2) Lying on right side, head elevated

5. Shunts
a. Device running from the brain to abdomen to drain excess cerebral spinal fluid
(1) Will find a reservoir on the side of the skull
(2) Change in mental status
(3) Prone to respiratory arrest

b. Treatment
(1) Manage airway
(2) Assure adequate artificial ventilation

c. Transport
(1) Keep head elevated if possible

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UNIT TERMINAL OBJECTIVE

6-3 At the completion of this unit, the paramedic student will be able to integrate the pathophysiological principles and the assessment findings to formulate and implement a treatment plan for the geriatric patient.

COGNITIVE OBJECTIVES

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

6-3.1 Discuss population demographics demonstrating the rise in elderly population in the U.S. (C-1)
6-3.2 Discuss society's view of aging and the social, financial, and ethical issues facing the elderly. (C-1)
6-3.3 Assess the various living environments of elderly patients. (C-3)
6-3.4 Describe the local resources available to assist the elderly and create strategies to refer at risk patients to appropriate community services. (C-3)
6-3.5 Discuss issues facing society concerning the elderly. (C-1)
6-3.6 Discuss common emotional and psychological reactions to aging to include causes and manifestations. (C-1)
6-3.7 Apply the pathophysiology of multi-system failure to the assessment and management of medical conditions in the elderly patient. (C-2)
6-3.8 Discuss the problems with mobility in the elderly and develop strategies to prevent falls. (C-1)
6-3.9 Discuss the implications of problems with sensation to communication and patient assessment. (C-2)
6-3.10 Discuss the problems with continence and elimination and develop communication strategies to provide psychological support. (C-3)
6-3.11 Discuss factors that may complicate the assessment of the elderly patient. (C-1)
6-3.12 Describe principles that should be employed when assessing and communicating with the elderly. (C-1)
6-3.13 Compare the assessment of a young patient with that of an elderly patient. (C-3)
6-3.14 Discuss common complaints of elderly patients. (C-1)
6-3.15 Compare the pharmacokinetics of an elderly patient to that of a young adult. (C-2)6-3.
6-3.16 Discuss the impact of polypharmacy and medication non-compliance on patient assessment and management. (C-1)
6-3.17 Discuss drug distribution, metabolism, and excretion in the elderly patient. (C-1)
6-3.18 Discuss medication issues of the elderly including polypharmacy, dosing errors and increased drug sensitivity. (C-1)
6-3.19 Discuss the use and effects of commonly prescribed drugs for the elderly patient. (C-1)
6-3.20 Discuss the normal and abnormal changes with age of the pulmonary system. (C-1)
6-3.21 Describe the epidemiology of pulmonary diseases in the elderly, including incidence, morbidity/ mortality, risk factors, and prevention strategies for patients with pneumonia, chronic obstructive pulmonary diseases and pulmonary embolism. (C-1)
6-3.22 Compare and contrast the pathophysiology of pulmonary diseases in the elderly with that of a younger adult, including pneumonia, chronic obstructive pulmonary diseases, and pulmonary embolism. (C-3)
6-3.23 Discuss the assessment of the elderly patient with pulmonary complaints, including pneumonia, chronic obstructive pulmonary diseases, and pulmonary embolism. (C-1)
6-3.24 Identify the need for intervention and transport of the elderly patient with pulmonary complaints. (C-1)
6-3.25 Develop a treatment and management plan of the elderly patient with pulmonary complaints, including pneumonia, chronic obstructive pulmonary diseases, and pulmonary embolism. (C-3)
6-3.26 Discuss the normal and abnormal cardiovascular system changes with age. (C-1)
6-3.27 Describe the epidemiology for cardiovascular diseases in the elderly, including incidence, morbidity/ mortality, risk factors, and prevention strategies for patients with myocardial infarction, heart failure, dysrhythmias, aneurism, and hypertension. (C-1)
6-3.28 Compare and contrast the pathophysiology of cardiovascular diseases in the elderly with that of a younger

adult, including myocardial infarction, heart failure, dysrhythmias, aneurism, and hypertension. (C-3)

6-3.29 Discuss the assessment of the elderly patient with complaints related to the cardiovascular system, including myocardial infarction, heart failure, dysrhythmias, aneurism, and hypertension. (C-1)

6-3.30 Identify the need for intervention and transportation of the elderly patient with cardiovascular complaints. (C-1)

6-3.31 Develop a treatment and management plan of the elderly patient with cardiovascular complaints, including myocardial infarction, heart failure, dysrhythmias, aneurism and hypertension. (C-3)

6-3.32 Discuss the normal and abnormal changes with age of the nervous system. (C-1)

6-3.33 Describe the epidemiology for nervous system diseases in the elderly, including incidence, morbidity/ mortality, risk factors, and prevention strategies for patients with cerebral vascular disease, delirium, dementia, Alzheimer's disease and Parkinson's disease. (C-1)

6-3.34 Compare and contrast the pathophysiology of nervous system diseases in the elderly with that of a younger adult, including cerebral vascular disease, delirium, dementia, Alzheimer's disease and Parkinson's disease. (C-3)

6-3.35 Discuss the assessment of the elderly patient with complaints related to the nervous system, including cerebral vascular disease, delirium, dementia, Alzheimer's disease and Parkinson's disease. (C-1)

6-3.36 Identify the need for intervention and transportation of the patient with complaints related to the nervous system. (C-1)

6-3.37 Develop a treatment and management plan of the elderly patient with complaints related to the nervous system, including cerebral vascular disease, delirium, dementia, Alzheimer's disease and Parkinson's disease. (C-3)

6-3.38 Discuss the normal and abnormal changes of the endocrine system with age. (C-1)

6-3.39 Describe the epidemiology for endocrine diseases in the elderly, including incidence, morbidity/ mortality, risk factors, and prevention strategies for patients with diabetes and thyroid diseases. (C-1)

6-3.40 Compare and contrast the pathophysiology of diabetes and thyroid diseases in the elderly with that of a younger adult. (C-3)

6-3.41 Discuss the assessment of the elderly patient with complaints related to the endocrine system, including diabetes and thyroid diseases. (C-1)

6-3.42 Identify the need for intervention and transportation of the patient with endocrine problems. (C-1)

6-3.43 Develop a treatment and management plan of the elderly patient with endocrine problems, including diabetes and thyroid diseases. (C-3)

6-3.44 Discuss the normal and abnormal changes of the gastrointestinal system with age. (C-1)

6-3.45 Discuss the assessment of the elderly patient with complaints related to the gastrointestinal system. (C-1)

6-3.46 Identify the need for intervention and transportation of the patient with gastrointestinal complaints. (C-1)

6-3.47 Develop and execute a treatment and management plan of the elderly patient with gastrointestinal problems. (C-3)

6-3.48 Discuss the assessment and management of an elderly patient with GI hemorrhage and bowel obstruction. (C-1)

6-3.49 Compare and contrast the pathophysiology of GI hemorrhage and bowel obstruction in the elderly with that of a young adult. (C-3)

6-3.50 Discuss the normal and abnormal changes with age related to toxicology. (C-1)

6-3.51 Discuss the assessment of the elderly patient with complaints related to toxicology. (C-1)

6-3.52 Identify the need for intervention and transportation of the patient with toxicological problems. (C-1)

6-3.53 Develop and execute a treatment and management plan of the elderly patient with toxicological problems. (C-3)

6-3.54 Describe the epidemiology in the elderly, including the incidence, morbidity/ mortality, risk factors, and prevention strategies, for patients with drug toxicity. (C-1)

6-3.55 Compare and contrast the pathophysiology of drug toxicity in the elderly with that of a younger adult. (C-3)

6-3.56 Discuss the assessment findings common in elderly patients with drug toxicity. (C-1)
6-3.57 Discuss the management/ considerations when treating an elderly patient with drug toxicity. (C-1)
6-3.58 Describe the epidemiology for drug and alcohol abuse in the elderly, including incidence, morbidity/ mortality, risk factors, and prevention strategies. (C-1)
6-3.59 Compare and contrast the pathophysiology of drug and alcohol abuse in the elderly with that of a younger adult. (C-3)
6-3.60 Discuss the assessment findings common in elderly patients with drug and alcohol abuse. (C-1)
6-3.61 Discuss the management/ considerations when treating an elderly patient with drug and alcohol abuse. (C-1)
6-3.62 Discuss the normal and abnormal changes of thermoregulation with age. (C-1)
6-3.63 Discuss the assessment of the elderly patient with complaints related to thermoregulation. (C-1)
6-3.64 Identify the need for intervention and transportation of the patient with environmental considerations. (C-1)
6-3.65 Develop and execute a treatment and management plan of the elderly patient with environmental considerations. (C-3)
6-3.66 Compare and contrast the pathophysiology of hypothermia and hyperthermia in the elderly with that of a younger adult. (C-3)
6-3.67 Discuss the assessment findings and management plan for elderly patients with hypothermia and hyperthermia. (C-1)
6-3.68 Discuss the normal and abnormal psychiatric changes of age. (C-1)
6-3.69 Describe the epidemiology of depression and suicide in the elderly, including incidence, morbidity/ mortality, risk factors, and prevention strategies. (C-1)
6-3.70 Compare and contrast the psychiatry of depression and suicide in the elderly with that of a younger adult. (C-3)
6-3.71 Discuss the assessment of the elderly patient with psychiatric complaints, including depression and suicide. (C-1)
6-3.72 Identify the need for intervention and transport of the elderly psychiatric patient. (C-1)
6-3.73 Develop a treatment and management plan of the elderly psychiatric patient, including depression and suicide. (C-3)
6-3.74 Discuss the normal and abnormal changes of the integumentary system with age. (C-1)
6-3.75 Describe the epidemiology for pressure ulcers in the elderly, including incidence, morbidity/ mortality, risk factors, and prevention strategies. (C-1)
6-3.76 Compare and contrast the pathophysiology of pressure ulcers in the elderly with that of a younger adult. (C-3)
6-3.77 Discuss the assessment of the elderly patient with complaints related to the integumentary system, including pressure ulcers. (C-1)
6-3.78 Identify the need for intervention and transportation of the patient with complaints related to the integumentary system. (C-1)
6-3.79 Develop a treatment and management plan of the elderly patient with complaints related to the integumentary system, including pressure ulcers. (C-3)
6-3.80 Discuss the normal and abnormal changes of the musculoskeletal system with age. (C-1)
6-3.81 Describe the epidemiology for osteoarthritis and osteoporosis, including incidence, morbidity/ mortality, risk factors, and prevention strategies. (C-1)
6-3.82 Compare and contrast the pathophysiology of osteoarthritis and osteoporosis with that of a younger adult. (C-3)
6-3.83 Discuss the assessment of the elderly patient with complaints related to the musculoskeletal system, including osteoarthritis and osteoporosis. (C-1)
6-3.84 Identify the need for intervention and transportation of the patient with musculoskeletal complaints. (C-1)
6-3.85 Develop a treatment and management plan of the elderly patient with musculoskeletal complaints,

including osteoarthritis and osteoporosis. (C-3)

6-3.86 Describe the epidemiology for trauma in the elderly, including incidence, morbidity/ mortality, risk factors, and prevention strategies for patients with orthopedic injuries, burns and head injuries. (C-1)

6-3.87 Compare and contrast the pathophysiology of trauma in the elderly with that of a younger adult, including orthopedic injuries, burns and head injuries. (C-3)

6-3.88 Discuss the assessment findings common in elderly patients with traumatic injuries, including orthopedic injuries, burns and head injuries. (C-1)

6-3.89 Discuss the management/ considerations when treating an elderly patient with traumatic injuries, including orthopedic injuries, burns and head injuries. (C-1)

6-3.90 Identify the need for intervention and transport of the elderly patient with trauma. (C-1)

AFFECTIVE OBJECTIVES

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

6-3.91 Demonstrate and advocate appropriate interactions with the elderly that conveys respect for their position in life. (A-3)

6-3.92 Recognize the emotional need for independence in the elderly while simultaneously attending to their apparent acute dependence. (A-1)

6-3.93 Recognize and appreciate the many impediments to physical and emotional well being in the elderly. (A-2)

6-3.94 Recognize and appreciate the physical and emotional difficulties associated with being a caretaker of an impaired elderly person, particularly the patient with Alzheimer's disease. (A-3)

PSYCHOMOTOR OBJECTIVES

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

6-3.95 Demonstrate the ability to assess a geriatric patient. (P-2)

6-3.96 Demonstrate the ability to adjust their assessment to a geriatric patient. (P-3)

DECLARATIVE

I. Introduction
- A. Special population with special and varying needs
- B. Epidemiology/ demographics
  - 1. Prevalence/ "graying of America"
- C. Societal issues
  - 1. Society's view of aging
  - 2. Social issues
    - a. Isolation
    - b. Marital status
  - 3. Living environments
    - a. Independent living
      - (1) Spousal/ family support
      - (2) Visiting nursing
    - b. Dependent living
      - (1) Live in nursing care
      - (2) Assisted living environments
      - (3) Nursing homes
  - 4. Financial aspects
  - 5. Ethics
    - a. Advanced directives
- D. Referral resources
  - 1. Private
    - a. National
    - b. State
    - c. Local
  - 2. Governmental
    - a. National
    - b. State
    - c. Local

II. Pathophysiology, assessment and management
- A. Pathophysiology
  - 1. Multi-system failure
    - a. Concomitant disease process
    - b. Non specific complaints
    - c. Decreased ability to detect changes
  - 2. Pharmacology in the elderly
    - a. Age related pharmacokinetics
      - (1) Older adults are more sensitive to drugs
      - (2) Experience prolonged drug effects
      - (3) Have more adverse reactions
    - b. Polypharmacy
      - (1) Many chronic illnesses
      - (2) Interactions with over the counter medication
    - c. Compliance
      - (1) Multiple dosage regimens

(2) Difficult reading/ hearing/ understanding directions

3. Problems with mobility and falls
   a. Physical effects of decreased mobility
      (1) Poor nutrition
      (2) Difficulty with elimination
      (3) Circulation
      (4) Skin integrity
      (5) Predisposes patients to falls and injury
   b. Psychological effect of decreased mobility
      (1) Loss of independence
      (2) Loss of confidence
      (3) Feeling "old"
   c. Risk factors for falls
      (1) History of falls
      (2) Dizziness, weakness, impaired vision
      (3) Altered gait
      (4) CNS problems/ decreased mental status
      (5) Medications
   d. Prevention strategies
      (1) Use of assistive devices
      (2) Environmental modifications
         (a) Remove scatter rugs and secure loose carpeting
         (b) Remove items that may cause tripping
         (c) Provide/ use railings
         (d) Adequate lighting
         (e) Unclutter the environment
         (f) Arrange furniture for walking ease
         (g) Use non slip decals in the tub
         (h) Provide handrails on tubs, showers, and commodes
4. Problems with sensations
   a. Problems with seeing
      (1) Pathophysiology
         (a) Visual changes begin at age 40 and increase gradually
         (b) Effects
            i) Reading
            ii) Depth perception
            iii) Loss of independence
            iv) Limitations
            v) Poor accommodation
            vi) Altered color perception
            vii) Sensitivity to light and glare
            viii) Decreased visual acuity
      (2) Cataracts
         (a) Lens becomes hardened and opaque
         (b) Patient may have
            i) Blurred vision
            ii) Double vision
            iii) Spots

iv) Ghost images
(c) May require surgery if it affects lifestyles
(3) Glaucoma
(a) Increased intraoccular pressure
(b) Damage to optic nerve
(c) May progress to permanent loss of peripheral and central vision
(d) Oral medications and eye drops may relieve the pressure
b. Problems with hearing
(1) Not all elderly patient have hearing loss
(2) Overall hearing decreases
(3) Ability to perceive speech
(4) Tinnitus
(5) Meniere's disease
(6) Hearing loss
(a) Impairs the ability to communicate
(b) Hearing aids may not restore hearing to normal
c. Problems with speech
(1) Word retrieval
(2) Decreased fluency of speech
(3) Slowed rate of speech
(4) Change in voice quality
d. Pain perception
e. Assessment findings specific to the elderly patient
f. Management implications for the elderly patient
(1) Alterations for sensory deficits
5. Problems with continence and elimination
a. Incontinence
(1) Definition
(2) Incontinence is never normal
(3) Urinary or bowel
(4) Mild to total incontinence
(5) Extremely embarrassing
(6) Can lead to
(a) Skin irritation
(b) Skin breakdown
(c) Urinary tract infection
(7) Pathophysiology
(a) Continence requires
i) Anatomically correct GI/ GU tract
ii) Competent sphincter mechanism
iii) Cognitive and physical function
iv) Motivation
(b) Effects of age
i) Decrease in bladder capacity
ii) Involuntary bladder contractions
iii) Decreased ability to postpone voiding
iv) Medications may effect bladder/ bowel control
(8) Management implications

(a) Some cases of incontinence are managed surgically
(b) Absorptive devices are commonly used for fecal and urinary incontinence
(c) Indwelling catheters are less common and often cause infection
(d) Self esteem and social issues appreciation

b. Elimination
(1) Causes of difficultly in urination
(a) Enlargement of the prostate in men
(b) Urinary tract infections
(c) Acute or chronic renal failure
(2) Causes of difficulty in bowel elimination
(a) Diverticular disease
(b) Constipation
(c) Colorectal cancer

B. Assessment of the elderly patient
1. Patience is of utmost importance
2. General health assessment
a. Social history
b. Living situation
c. Social support system
d. Activity level
e. Medication history
(1) Prescription medications
(2) Non-prescription medications
f. Nutrition
(1) Overall health is greatly affected by nutrition
(2) Malnutrition causes dehydration and hypoglycemia
(3) Lowered sensory stimulation of eating
(4) Decreased internal cues of hunger and thirst
(5) Caloric requirements deceases with age
(6) Eating may be complicated by
(a) Breathing
(b) Abdominal pain
(c) Nausea/ vomiting
(d) Poor dental care
(e) Health problems
(f) Medications
(g) Alcohol/ drugs
g. Sleep and rest
h. Environmental assessment
(1) Ability for self care
3. Geriatric assessment
a. Factors complicating assessment
(1) Multiple diseases/ complaints
(2) Absent classical symptoms
(3) Failure to relate symptoms
(4) Sensory alterations
(5) Polypharmacy

(6) Other
b. Assessment communication methods
(1) Always introduce yourself
(2) Speak slowly, distinctly, and respectfully
(3) Speak to the patient first rather than family or bystanders
(4) Speak face to face, at eye level with eye contact
(5) Locate hearing aid or eyeglasses if needed
(6) Turn on lights
(7) Verbal and nonverbal communication of concern and empathy
(8) Use polite, respectful terms
(9) Preserve dignity
(10) Always explain before you do
c. History
(1) Common medical complaints
(2) Environment assessment
d. Physical exam
(1) Mental status assessment

C. Management considerations for the elderly
1. Airway and ventilation
2. Circulation
3. Pharmacological
4. Non-pharmacological
5. Transport considerations
a. Gentle handling
b. Extra padding
6. Psychological support/ communication strategies
a. Communication strategies
(1) Encourage the patient to express their feelings
(2) Acknowledge nonverbal massages
(3) Avoid questions which are judgmental
(4) Confirm what the patient says
(5) Take responsibility for communication breakdowns
b. Incontinence
(1) Do not make a big deal about incontinence
(2) Maintain patient dignity
(3) Reassurance that it is a treatable problem
(4) Usually does NOT require surgical intervention

III. System pathophysiology, assessment and management
A. Pulmonary changes in the elderly
1. Normal and abnormal changes with age
a. Kyphosis may affect pulmonary function
b. Decreased lung function due to
(1) Chronic exposure to pollutants
(2) Decreased respiratory muscle tone
(3) Changes in alveolar/ capillary exchange
(4) Respiratory center changes
2. Assessment findings specific to the elderly

a. Most common pulmonary diseases in the elderly
   (1) Pneumonia
   (2) Pulmonary embolism
   (3) Obstructive airway diseases

3. Management implications for the elderly
   a. Airway and ventilation
   b. Circulation
   c. Pharmacological/ non-pharmacological
   d. Transport considerations
   e. Psychological support/ communications strategies

4. Specific illnesses
   a. Pneumonia in the elderly
      (1) Epidemiology in the elderly
         (a) Incidence in the elderly
            i) Usually bacterial
            ii) Aspiration pneumonia due to difficult swallowing
            iii) Viral
            iv) High incidence due to
               a) Decreased immune response
               b) Reduced pulmonary function
               c) Increased gram-negative pharyngeal colonization
         (b) Morbidity/ mortality in the elderly
            i) Leading cause of death in the elderly
            ii) Often fatal in frail adults
            iii) Concomitant chronic diseases
         (c) Risk factors
            i) Institutional environments
            ii) Chronic diseases
            iii) Immune compromise
         (d) Prevention strategies
            i) Prophylaxis treatment with antibiotics
      (2) Assessment findings specific for the elderly patient
         (a) Fever
         (b) Cough
         (c) Shortness of breath
         (d) Often presents with mental status alterations
         (e) May be afebrile
         (f) Tachypnea
      (3) Management considerations for the elderly patient
         (a) Manage life-threats
         (b) Maintain oxygenation
         (c) Must be transported for diagnosis
         (d) High rate of hospital admission
   b. Chronic obstructive pulmonary disease in the elderly
      (1) Epidemiology in the elderly
         (a) Incidence in the elderly
            i) Combined bronchitis and emphysema in patients with a

long history of smoking
(b) Morbidity/ mortality in the elderly
i) Diminished efficiency of breathing reduced tolerance
(c) Risk factors
i) Cigarette smoking
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(a) Obtain history of prior intubation or steroid therapy
(b) Wheezing and prolonged expiratory phase
(c) Breath sounds are unreliable
(3) Management considerations for the elderly patient
c. Pulmonary embolism in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
(b) Morbidity/ mortality in the elderly
i) Therapy is effective
ii) Mortality is high due to difficulty in diagnosis
(c) Risk factors
i) Deep vine thrombosis
ii) Venous stasis from immobility
iii) Tumor
iv) Surgery
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(a) Dyspnea
(b) Pleuritic chest pain
(c) Cough
(d) Tachypnea
(3) Management considerations for the elderly patient
(a) Airway and ventilation
i) Lysing the thrombus
ii) Anticoagulation after confirming no GI bleeding
(b) Circulation
(c) Pharmacological/ non-pharmacological
(d) Transport consideration
(e) Psychological support/ communication strategies

B. Cardiology in the elderly
1. Normal and abnormal changes with age
a. Arteries become increasingly rigid
b. Decreased peripheral resistance
c. Reduced blood flow to all organs
d. Increased blood pressure
e. Widened pulse pressure
f. Heart muscle stiffens
g. Increased incidence of postural hypotension
h. Increased atherosclerosis throughout the body
2. Assessment findings specific to the elderly
a. History

(1) Cardiovascular fitness
(2) Changes in exercise tolerance
(3) Recent diet history
(4) Medications
(5) Smoking
(6) Breathing difficulty, especially at night
(7) Palpitations, flutter, skipped beats

b. Physical exam
(1) The heart increases in size
(2) Hypertension and orthostatic hypotension
(3) Dependent edema
(4) Consider checking the blood pressure in both arms
(5) Check pulses in all extremities routinely
(6) Check for carotid bruits
(7) Check for dehydration

3. Management implications for the elderly
a. Airway and ventilation
b. Circulation
c. Pharmacological/ non-pharmacological
(1) Use caution to avoid medication interaction
(2) Proper dosing is very important due to
(a) Less lean body mass
(b) Low fluid reserve
(c) Slow metabolism
(d) Decreased renal and hepatic function
d. Transport consideration
e. Psychological support/ communication strategies

4. Specific illnesses
a. Myocardial infarction in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
(b) Morbidity/ mortality in the elderly
i) Mortality doubles after 70 years old
ii) Much greater complication rate
(c) Risk factors
i) Physical exertion
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(a) Chest pain is less common in the elderly
(b) Much greater incidence of silent MI
(c) Dyspnea is the most common sign in patients over 85
(d) Any nonspecific complaints of upper trunk discomfort
(3) Management considerations for the elderly patient
b. Heart failure in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
i) More frequent in older adults
ii) Large incidence of non cardiac causes

(b) Morbidity/ mortality in the elderly
(c) Risk factors
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(a) First symptom of left failure is often fatigue
(b) Two pillow orthopnea
(c) Dyspnea on exertion
(d) Dry, hacking cough progressing to productive cough
(e) Dependent edema due to right failure
(f) Nocturia
(g) Anorexia, hepatomegaly, ascites
(3) Management considerations for the elderly patient

c. Dysrhythmias in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
i) The most common cause is hypertensive heart disease
ii) PVCs are present in most adults over 80
iii) Can be caused by anything that decreases myocardial blood flow
iv) May be caused by electrolyte aberrancies
v) Atrial fibrillation is the most common dysrhythmia
(b) Morbidity/ mortality in the elderly
i) Serious due to the decreased tolerance due to less CO
ii) Can lead to falls from cerebral hypoperfusion
iii) Can lead to TIAs and CHF
(c) Risk factors
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(3) Management considerations for the elderly patient

d. Aneurysm in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
(b) Morbidity/ mortality in the elderly
(c) Risk factors
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(3) Management considerations for the elderly patient

e. Hypertension in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
i) Increases with atherosclerosis
(b) Morbidity/ mortality in the elderly
i) BP greater than 160/95 doubles mortality in men
ii) Can lead to kidney loss
iii) Can lead to blindness
(c) Risk factors
i) Age
ii) Diabetes

iii) Obesity
(d) Prevention strategies
i) Medication compliance
ii) Dietary sodium reduction
iii) Exercise
iv) Smoking cessation
(2) Assessment findings specific for the elderly patient
(a) Often presents as memory loss
i) Epistaxis
ii) Slow tremors
iii) Nausea and vomiting
(3) Management considerations for the elderly patient

C. Neurology in the elderly
1. Normal and abnormal changes with age
a. Cognition requires perceptual organs and the brain
b. Cognitive function is not affected by the normal aging process
c. Slight changes in the following are normal
(1) Difficulty with recent memory
(2) Psychomotor slowing
(3) Forgetfulness
(4) Decrease in reaction time
2. Assessment findings specific to the elderly
a. Best if conducted over time
b. Ask family or caretakers for information to determine the progression
c. Focus on the patient's
(1) Perceptions
(2) Thinking processes
(3) Communication
d. Provide an environment with minimal distractions
e. Mental status/ cognitive functioning exam
(1) Be calm, unhurried
(2) Ask clear, direct questions
(3) Give the patient time to respond
(4) Establish normal patterns of behavior and changes in behavior
(5) Include ability to perform activities of daily living
(6) Look for patters of behavior over time
(7) Assess the patient's mood and affective or emotional state
f. Assess for
(1) Weakness
(2) Chronic fatigue
(3) Changes in sleep patterns
(4) Syncope, or near syncope
3. Management implications for the elderly
a. Airway and ventilation
b. Circulation
c. Pharmacological/ non-pharmacological
d. Transport consideration
e. Psychological support/ communication strategies

(1) Care for the patient with respect and dignity

4. Specific illnesses
   a. Cerebral vascular disease
      (1) Epidemiology in the elderly
         (a) Incidence
         (b) Morbidity/ mortality
            i) Expected course of disease
            ii) Complications
         (c) Risk factors
         (d) Prevention strategies
      (2) Pathophysiology
         (a) Cerebral vascular accident
         (b) Transient ischemic attack
      (3) Assessment
      (4) Management
   b. Delirium
      (1) Epidemiology in the elderly
         (a) Incidence
         (b) Morbidity/ mortality
            i) Expected course of disease
               a) Potentially reversible, if caught early
               b) Can progress into chronic mental disfunction
            ii) Complications
         (c) Risk factors
         (d) Prevention strategies
      (2) Pathophysiology
         (a) Organic brain dysfunction
         (b) Possible causes
            i) Tumor
            ii) Metabolic disorders
            iii) Fever
            iv) Drug reaction
            v) Alcohol intoxication/ withdrawal
      (3) Assessment findings specific for the elderly patient
         (a) Acute onset of anxiety
         (b) Unable to focus
         (c) Unable to think logically or maintain attention
         (d) Memory is intact
      (4) Management considerations for the elderly patient
   c. Dementia
      (1) Epidemiology
         (a) Incidence
            i) Increases with age
            ii) Half of nursing home patients have some form of dementia
         (b) Morbidity/ mortality
            i) Generally considered irreversible
            ii) Expected course of disease

iii) Complications
a) Patient becomes dependent on others
(c) Risk factors
(d) Prevention strategies
(2) Pathophysiology in the elderly
(a) Many causes
i) Strokes
ii) Genetic or viral factors
iii) Alzheimer's
(b) Progressive loss of cognitive function
(3) Assessment
(a) Progressive disorientation
(b) Shortened attention span
(c) Aphasia, nonsense talking
(d) Hallucinations
(e) Caretaker exhaustion
(4) Management implications
(a) Severely limits ability to communicate
d. Alzheimer's disease
(1) Epidemiology
(a) Incidence
(b) Morbidity/ mortality
i) Expected course of disease
ii) Complications
(c) Risk factors
(d) Prevention strategies
(2) Pathophysiology
(3) Assessment
(4) Management implications
e. Parkinson's disease
(1) Epidemiology
(a) Incidence
(b) Morbidity/ mortality
i) Expected course of disease
ii) Complications
(c) Risk factors
(d) Prevention strategies
(2) Pathophysiology
(3) Assessment
(4) Management implications

D. Endocrinology in the elderly
1. Normal and abnormal changes with age
2. Assessment findings specific to the elderly
3. Management implications for the elderly
a. Airway and ventilation
b. Circulation
c. Pharmacological/ non-pharmacological
d. Transport considerations

e. Psychological support/ communications strategies
4. Specific illnesses
a. Diabetes in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
i) Approximately 20% of older adults have diabetes
ii) Almost 40% have some impaired glucose tolerance
iii) Most commonly type II
(b) Morbidity/ mortality in the elderly
(c) Risk factors
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(a) Test for neuropathy
(b) Test visual acuity
(3) Management considerations for the elderly patient
b. Thyroid diseases in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
(b) Morbidity/ mortality in the elderly
(c) Risk factors
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(3) Management considerations for the elderly patient

E. Gastroenterology in the elderly
1. Epidemiology
2. Assessment findings
a. Look for indication of malnutrition
b. Hiatal hernia
3. Management implications
a. Airway and ventilation
b. Circulation
c. Pharmacological/ non-pharmacological
d. Transport consideration
e. Psychological support/ communication strategies
4. Specific illnesses
a. GI hemorrhage in the elderly
(1) Increased risk in the elderly
b. Bowel obstruction in the elderly

F. Toxicology in the elderly
1. Pathophysiology/ pharmacokinetics
a. Decreased kidney function alters elimination
b. Increased likelihood of CNS side effects
c. Altered GI absorption
d. Decreased liver blood flow alters metabolism and excretion
2. Specific
a. Lidocaine toxicity in the elderly
(1) Epidemiology in the elderly
(2) Assessment findings in the elderly

(3) Management implications for the elderly

b. Beta-blockers in the elderly
   (1) Epidemiology in the elderly
   (2) Assessment findings in the elderly
   (3) Management implications for the elderly

c. Antihypertensives in the elderly
   (1) Epidemiology in the elderly
   (2) Assessment findings in the elderly
   (3) Management implications for the elderly

d. Diuretics in the elderly
   (1) Epidemiology in the elderly
   (2) Assessment findings in the elderly
   (3) Management implications for the elderly

e. Digitalis in the elderly
   (1) Epidemiology in the elderly
   (2) Assessment findings in the elderly
   (3) Management implications for the elderly

f. Psychotropics in the elderly
   (1) Epidemiology in the elderly
   (2) Assessment findings in the elderly
   (3) Management implications for the elderly

g. Antidepressants in the elderly
   (1) Epidemiology in the elderly
   (2) Assessment findings in the elderly
   (3) Management implications for the elderly

h. Substance abuse in the elderly
   (1) Epidemiology in the elderly
   (2) Assessment findings in the elderly
   (3) Management implications for the elderly

i. Alcohol abuse in the elderly
   (1) Epidemiology
      (a) Common problem
      (b) History of alcoholism
      (c) Severe stress is a risk factor
   (2) Assessment findings
      (a) Often very subtle signs
      (b) Small amounts of alcohol can cause intoxications
      (c) Mood swings, denial, and hostility
      (d) Question family and friends
      (e) Confusion
      (f) History of falls
      (g) Anorexia
      (h) Insomnia
   (3) Management implications
      (a) Requires identification and referral

j. Drug abuse in the elderly
   (1) Epidemiology
      (a) Very common problem in the elderly

(b) Risk factors
i) Vision and memory changes
ii) Polypharmacy
iii) Nutritional deficits
(2) Assessment findings
(a) Memory changes
(b) Drowsy
(c) Decreased vision/ hearing
(d) Orthostatic hypotension
(e) Poor dexterity
(3) Management implications
(a) Requires identification and referral

G. Environmental considerations in the elderly
1. Normal and abnormal changes with age
2. Assessment findings specific to the elderly
3. Management implications for the elderly
a. Airway and ventilation
b. Circulation
c. Pharmacological/ non-pharmacological
d. Transport considerations
e. Psychological support/ communications strategies
4. Specific illnesses
a. Hypothermia in the elderly
b. Hyperthermia in the elderly

H. Behavioral/ psychiatric disorders in the elderly
1. Normal and abnormal changes with age
2. Assessment findings specific to the elderly
3. Management implications for the elderly
a. Airway and ventilation
b. Circulation
c. Pharmacological/ non-pharmacological
d. Transport considerations
e. Psychological support/ communications strategies
4. Specific situations
a. Depression in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
(b) Morbidity/ mortality in the elderly
(c) Risk factors
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(3) Management considerations for the elderly patient
b. Suicide in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
(b) Morbidity/ mortality in the elderly
(c) Risk factors
(d) Prevention strategies

(2) Assessment findings specific for the elderly patient
(3) Management considerations for the elderly patient

I. Integumentary changes with age
1. Normal and abnormal changes with age
a. Epidermal cellular turnover decreases
b. Slower healing
c. Increased risk of secondary infection
d. Increased risk of skin tumors, fungal or viral infections
e. Skin decreases in thickness, increasing susceptibility to tears
f. Hair becomes finer and thinner
2. Assessment findings specific to the elderly
3. Management implications for the elderly
a. Airway and ventilation
b. Circulation
c. Pharmacological/ non-pharmacological
d. Transport considerations
e. Psychological support/ communications strategies
4. Specific illnesses
a. Pressure ulcers in the elderly
(1) Result from tissue hypoxia
(2) Usually over bony areas
(3) Common in immobile patients
(4) Possibility increases with
(a) Altered sensory perception
(b) Skin exposure to moisture
(c) Decreased activity
(d) Decreased mobility
(e) Poor nutrition
(f) Friction or shear

J. Musculoskeletal changes with age
1. Normal and abnormal changes with age
2. Assessment findings specific to the elderly
a. Bone fractures with mild trauma
3. Management implications for the elderly
a. Airway and ventilation
b. Circulation
c. Pharmacological/ non-pharmacological
d. Transport considerations
e. Psychological support/ communications strategies
4. Specific illnesses
a. Osteoarthritis in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
(b) Morbidity/ mortality in the elderly
(c) Risk factors
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(3) Management considerations for the elderly patient

b. Osteoporosis in the elderly
(1) Epidemiology in the elderly
(a) Incidence in the elderly
(b) Morbidity/ mortality in the elderly
(c) Risk factors
(d) Prevention strategies
(2) Assessment findings specific for the elderly patient
(3) Management considerations for the elderly patient

K. Trauma in the elderly
1. Pathophysiology
a. Osteoporosis and muscle weakness increases likelihood of fractures
b. Reduced cardiac reserve decreases the ability to compensate for blood loss
c. Decreased respiratory function increases likelihood of adult respiratory distress syndrome (ARDS)
d. Impaired renal function decreases the ability to adapt to fluid shifts
2. Epidemiology
a. Fifth leading cause of death
b. Mortality rates markedly increased
c. Post injury disability more common
3. Assessment findings
a. Mechanism of injury
(1) Falls
(2) Motor vehicle crashes
(3) Burns
(4) Assault/ abuse
(5) Other - syncope, MI, etc. may be underlying cause of trauma
b. Initial level of consciousness very important
c. Blood pressure that is normal, may be hypovolemic
d. Fractures can be occult due to diminished pain perception
e. Observe scene for clues of abuse
(1) Physical abuse
(2) Active and passive neglect
(3) Psychological abuse
(4) Financial abuse
(5) Self abuse
(6) Reporting
4. Management
a. Airway and ventilation
(1) Dentures may need to be removed
(2) Oxygen is very important due to vascular disease
b. Circulation
(1) Fluid administration should be closely monitored for signs/ symptoms of pulmonary edema
c. Other
(1) Prevent hypothermia by keeping patient warm
(2) ECG monitoring is indicated due to increased cardiac disease
d. Transportation consideration
(1) Appropriate mode

(2) Appropriate facilities

e. Psychological support/ communications strategies

5. Specific injuries

a. Orthopedic injuries

(1) Hip fracture is the most common acute orthopedic condition

(2) Elderly are susceptible to stress fractures of femur, pelvis, tibia

(3) Packaging should include bulk, and padding to fill in areas

(4) Kyphosis may require extra padding under the shoulders to maintain alignment

b. Burns

(1) Increased risk of significant mortality and morbidity due to pre-existing disease

(2) Skin changes result in increased burn depth

(3) Altered nutrition decreases defense against infection

(4) Fluid important to prevent renal tubular damage

(5) Assess hydration in initial hours after burn injury by BP, pulse, and urine output (at least 50-60 cc/ hr)

c. Head injury

(1) More serious in the elderly

(2) Brain shrinkage allows brain to move

(3) Subdural hematoma may develop more slowly, sometimes over days or weeks

UNIT TERMINAL OBJECTIVE

6-4 At the completion of this unit, the paramedic student will be able to integrate the assessment findings to formulate a field impression and implement a treatment plan for the patient who has sustained abuse or assault.

COGNITIVE OBJECTIVES

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

6-4.1 Discuss the incidence of abuse and assault. (C-1)
6-4.2 Describe the categories of abuse. (C-1)
6-4.3 Discuss examples of spouse abuse. (C-1)
6-4.4 Discuss examples of elder abuse. (C-1)
6-4.5 Discuss examples of child abuse. (C-1)
6-4.6 Discuss examples of sexual assault. (C-1)
6-4.7 Describe the characteristics associated with the profile of the typical abuser of a spouse. (C-1)
6-4.8 Describe the characteristics associated with the profile of the typical abuser of the elder. (C-1)
6-4.9 Describe the characteristics associated with the profile of the typical abuser of children. (C-1)
6-4.10 Describe the characteristics associated with the profile of the typical assailant of sexual assault. (C-1)
6-4.11 Identify the profile of the "at-risk" spouse. (C-1)
6-4.12 Identify the profile of the "at-risk" elder. (C-1)
6-4.13 Identify the profile of the "at-risk" child. (C-1)
6-4.14 Discuss the assessment and management of the abused patient. (C-1)
6-4.15 Discuss the legal aspects associated with abuse situations. (C-1)
6-4.16 Identify community resources that are able to assist victims of abuse and assault. (C-1)
6-4.17 Discuss the documentation associated with abused and assaulted patient. (C-1)

AFFECTIVE OBJECTIVES

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

6-4.18 Demonstrate sensitivity to the abused patient. (A-1)
6-4.19 Value the behavior of the abused patient. (A-2)
6-4.20 Attend to the emotional state of the abused patient. (A-1)
6-4.21 Recognize the value of non-verbal communication with the abused patient. (A-1)
6-4.22 Attend to the needs for reassurance, empathy and compassion with the abused patient. (A-1)
6-4.23 Listen to the concerns expressed by the abused patient. (A-1)
6-4.24 Listen and value the concerns expressed by the sexually assaulted patient. (A-2)

PSYCHOMOTOR OBJECTIVES

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

6-4.25 Demonstrate the ability to assess a spouse, elder or child abused patient. (P-1)
6-4.26 Demonstrate the ability to assess a sexually assaulted patient. (P-1)

DECLARATIVE

I. Introduction
  A. Epidemiology
    1. Incidence
      a. Abuse of spouse, elderly relatives, and children is greater than most estimate
      b. Only 10% of women report battering incidents
      c. Over 1 million children suffer from abuse or neglect
    2. Mortality/ morbidity
      a. Victims may die as a result of the abuse or assault
      b. Victims may suffer mental or physical injuries
    3. Risk factors
      a. Men and women who beat one another also most likely beat their children
      b. Children of abusive and unloving homes are more likely to become spouse or child batterers and later, abusers of their elderly parents
    4. Prevention strategies
      a. Early detection
      b. Social services support
      c. Altering life styles

II. The battered spouse
  A. Epidemiology
    1. Incidence
      a. Not a new phenomenon
      b. The act itself can be traced to early history
  B. Battered women
    1. Overview
      a. Women generally report incident only as a last resort
      b. Reasons for not reporting
        (1) Fear
          (a) For her self
          (b) For her children
        (2) Believes behavior will change
        (3) Lack of financial support
          (a) No money
          (b) No one to turn to
          (c) No knowledge of where to go
        (4) Believes she is the cause of the violent behavior
        (5) Believes that it is part of the marriage and must endure in order to keep the family together
      c. Characteristics of wife-battering
        (1) The beatings do not stop
        (2) Beatings become more severe and more frequent
        (3) Beatings occur without provocation whatsoever
        (4) At some point will turn violence toward the children
      d. Characteristics of spouse abusers
        (1) They have low self esteem and are not happy about themselves
        (2) For the most part their violence was learned from their parents

(3) Some believe they are demonstrating discipline
(4) They do not like being out of "control"
(5) Fail to see any alternatives and do not know what else to do
(6) Both parties do not know how to back down from conflict
(7) He/ she may feel powerless to change
(8) The use of alcohol seems to be a factor
(9) Mental illness occurs in less than 10% of abusers
(10) Abuse does occur in all socio-economic groups, however most abusers are in the lower socio-economic groups
(11) The abuser goes into sudden rages
(12) Abusers feel insecure and jealous
(13) The abuser can appear charming and loving after the incident of battering
(14) The abuser may have money difficulties, problems holding a job and possible legal issues

e. Ten "risk factors" for domestic violence (as taken from "Domestic Violence: Cracking the Code of Silence")
(1) Male is unemployed
(2) Male uses illegal drugs at least once a year
(3) Partners have different religious backgrounds
(4) Family income is below poverty line
(5) Partners are unmarried
(6) Either partner is violent toward children at home
(7) Male did not graduate from high school
(8) Male has a blue-collar job, if employed
(9) Male is between 18-30
(10) Male saw father hit mother

C. Battered men
1. Overview
a. Battering is not limited to women
b. Men also rarely report incident
c. Humiliation suffered by a woman is multiplied for a man
d. Men feel as trapped as women do
e. Same psychological and emotional effects
(1) Guilt
(2) Loss of self-control
(3) Loss of control
f. Society is less empathetic toward men
g. Even fewer resources exist for men

D. Homosexual relationships
1. Overview
a. Spouse battering occurs in homosexual relationship as well
b. Homosexuals are conditioned the same as heterosexuals

E. Identifying the battered patient
1. Difficult to do because the description of the injuries may be incorrect, inaccurate and protective of the attacker
2. May not seek care for bruises or lacerations
3. May avoid eye contact and be hesitant or evasive about the details of the injuries
4. Clues about the situation

a. "Things haven't been going well lately"
b. "There have been problems at home"

F. Approaching the battered patient
1. Direct questioning is best
2. Ask if the difficulties led to the physical harm
3. Convey your awareness that the injuries may be due to their spouse
a. May feel a sense of relief that someone else is aware
4. Once the subject has been introduced, show a willingness to discuss it
a. Remember the following key points for the discussion
(1) Non-judgmental attitude
(a) Avoid judgmental statements
i) "Oh, how awful"
ii) Avoid "why" questions
a) "Why don't you leave"
(2) Supportive attitude
(a) Listen attentively
(b) Support and encourage
(3) Return of control
(a) Help them to gain control over their life
(b) Have them identify what they want for themselves and their children
(4) Community resources
(a) Community resources vary widely
(b) Become knowledgeable of the community resources
b. Safety precautions
(1) Encourage the patient to take precautions as needed
(2) What is the quick way out
(a) Where they can go
(b) Whom they can call

G. Legal considerations
1. It is a crime to beat another person
2. Assault is a misdemeanor or a felony
a. Depends on amount of injury inflicted and devices used
3. Attacker may be arrested
a. May be released within hours on their own recognizance
b. The patient must be aware of this

H. Victim-witness assistance programs
1. State and federal funded programs are available
2. Need to become aware of services available in your area

III. The abused elder
A. Overview
1. Prevalent medical and social problem
2. Factors contributing to the problem
a. Increased life expectancy
b. Physical and mental impairment
c. Decreased productivity
d. Increased dependence with greater longevity

e. Limited resources for care of the elderly
f. Economic factors
g. Stress of the middle-aged caretaker responsible for two generations

3. Two types of elder abuse
   a. Domestic
      (1) The National Aging Resource Center on Elder Abuse gives the following percentages as to who are the perpetrators of elder abuse in domestic settings
         (a) Adult children 32.5%
         (b) Grandchildren 4.2%
         (c) Spouse 14.4%
         (d) Sibling 2.5%
         (e) Other relatives 12.5%
         (f) Friend/ neighbor 7.5%
         (g) All others 18.2%
         (h) Unknown 2.0%
      (2) Four major theories of causes of domestic elder abuse
         (a) The care giver is stressed-care; giver is ill-equipped to give care (this may be due to personal problems and/ or lack of knowledge of how to do the job)
         (b) Impairment of dependent elders - elders in poor health are morelikely to be abused than those in good health
         (c) Cycle of violence = tension/ crisis/ calm/ repeat cycle
         (d) Personal problems of abusers - abusers of the elderly tend to have more personal problems than do non-abusers
   b. Institutional abuse-perpetrators of institutional abuse usually are persons who have legal or contractual obligation to provide care to elders (e.g., paid caretakers, staff, professionals)
4. Characteristics of elder abuse
   a. More likely to suffer from physical or mental impairment
   b. Abusers are most often the children of the abused person
   c. Elders are most often repeatedly abused by family members
   d. Abused elders do not seek help
5. Forms of abuse
   a. Physical abuse or neglect
   b. Psychological abuse
   c. Violation of individual rights
      (1) Victim of theft
      (2) Loss of freedom of choice

IV. The abused child
   A. Overview
      1. Various forms of abuse or neglect
      2. Results in physical or emotional impairment
      3. Involves the mistreatment of children
         a. Occur from infancy to 18 years of age
         b. Involves caretakers
            (1) Parents

(2) Foster parents
(3) Stepparents
(4) Babysitters

4. Neglect
   a. Failure to provide physical care
      (1) Nutrition
      (2) Shelter
      (3) Clothing
   b. Failure to provide emotional care
      (1) Indifference
      (2) Disregard
   c. Importance of identifying the abused child
      (1) Tends to be repetitive
      (2) Repeated calls to the patient's home

B. Characteristics of abusers
   1. Overview
      a. Not related to social class, income or level of education
      b. Rigorous discipline accounts for the cyclical nature of abuse
      c. History of severe physical punishment
      d. The abuser was beaten as a child
      e. Abuser would prefer to use other forms of discipline, the stress makes them regress to the earliest patterns
   2. Signs of a pre-abuse state
      a. Sometimes the abusive adult will actively seek help
      b. The following pattern may be observed
         (1) Several calls in a 24 hour period
         (2) Frequent calls for inconsequential symptoms
         (3) Parent begins to demonstrate behavior of being unable to handle the impending crisis
   3. Characteristics of the child abuser
      a. Immature behavior and is preoccupied with him/ herself
      b. Has little perception of how a child could feel, physically or emotionally
      c. Is critical of the child
      d. Seldom touches or looks at the child
      e. Is unconcerned about the child's injury, treatment, or prognosis
      f. Gives no indication of feeling guilt or remorse
         (1) May blame the child for the injury
      g. Is more concerned about themselves

C. Characteristics of the abused child
   1. Overview
      a. The child's behavior offers important clues
         (1) This behavior is age related
            (a) Child under 6 years is excessively passive
            (b) The child over 6 years is aggressive
      b. Child doesn't mind, at any age, if their parent leaves the room
   2. Behavior of the abused child
      a. Cries hopelessly during treatment or cries very little in general
      b. Does not look at parents for assurance

c. May avoid parents
d. Is wary of physical contact
e. Is apprehensive
f. Appears constantly on the alert for danger
g. May constantly seek favors, food, or things

3. Accidental versus intentional injury
   a. Children very commonly get injured
   b. Not all children with injuries are abused
   c. If the story by the child is volunteered without hesitation and matched that of the parent, child abuse is very unlikely
   d. Distinguishing between an intentional injury and an authentic accident is a challenge

D. Physical examination
   1. Overview
      a. The examination is best done with another colleague
      b. The recording of information must be objective
      c. Assumptions and personal perceptions must not be included
      d. The report must be terse and legible
      e. The exam should be performed with kindness and gentleness
   2. Common types of soft tissue injuries
      a. Overview
         (1) Soft tissue injuries are the injuries found most frequently in early abuse and may present in a variety of forms
      b. Multiple bruises and ecchymoses
         (1) Look for presence of defense wounds
         (2) Look for injuries on multiple planes of the body
      c. Patterned injuries
         (1) Bites
         (2) Burns
      d. Scalds
         (1) A common form of abuse
         (2) Young and old are particularly susceptible
   3. Fractures
      a. Overview
         (1) Second most common injury
      b. Types of fractures
         (1) Twisting injuries
         (2) Jerking injuries
         (3) Rib fractures
         (4) Multiple fractures
   4. Head injuries
      a. Overview
         (1) Produce the highest mortality
         (2) Result in greater amount of permanent disability
         (3) Progression of injuries appears to be from the trunk and extremities towards the head
      b. Types of injuries
         (1) Scalp wounds

(2) Skull fractures
(3) Subdural or subgaleal hematomas
(4) Repeated concussions

5. Abdominal injuries
   a. Overview
      (1) A small number of injuries, but serious
   b. Types of injuries
      (1) Causes rupture of liver, injuries to intestine and mesentery

V. Sexual assault
   A. Overview
      1. Incidence
         a. Increases annually
         b. Sexual assault is the more frequently committed offense than abuse
         c. Victims of abuse and assault may die from their injuries
         d. Victims may sustain mental or physical injury
         e. Victims range from 9 months to 90 years of age
         f. Women alone in isolated areas
   B. Legal aspect of sexual assault
      1. What constitutes rape
         a. Each state has different interpretation of sexual assault
         b. Generally, sexual assault refers to sexual contact, whether genital, oral or manual
         c. Rape is defined as penile penetration of the genitalia (however slight) without consent of the victim
         d. Rape is a felony crime, based on proof that a crime has occurred
      2. Considerations for providing care for a patient who has been sexually assaulted
         a. Take steps to preserve any evidence
         b. The patient should not urinate, defecate, douche, bathe
         c. The patient should not in any way remove evidence from the part of the body that was subjected to sexual contact
         d. Notify law enforcement as soon as possible
         e. Remember there will be a "chain of evidence"
         f. Be aware of local and state requirements for caring for these patients
   C. Characteristics of sexual assault
      1. Overview
         a. Anyone can be a victim
         b. Victims are from 9 months to 90 years of age
         c. Frequently victims know their assailant
   D. Psychosocial aspect of care
      1. Initial contact with the patient
         a. Non-judgmental attitude
         b. Supportive attitude
         c. Empathetic, sensitive comments
         d. Considerate gestures
            (1) Covering them
            (2) Moving from public view
      2. Acceptance of behavior
         a. Each patient responds differently

b. Anger is especially difficult for most to accept

3. Privacy
   a. Avoid further exposure and embarrassment
   b. If possible have same sex partner provide care to the patient
4. Returning control
   a. Patient must regain as much control of their life as possible
   b. Ask open ended questions
      (1) Would you like to sit on a seat or ride on the stretcher
      (2) Would you like us to contact someone

E. The child victim
   1. Overview
      a. Children who are assaulted usually have frequent contact with their assailant
      b. In a trusted person's home
      c. Usually involves a male assailant and a female victim
      d. Male victims involved in heterosexual relationships are unlikely to report incident
      e. Many children are fondled or physically explored without intercourse
      f. Often the child conceals the sexual activity out of fear
   2. Assessment considerations
      a. Symptoms may include behavior or physical manifestations
         (1) Nightmares
         (2) Restlessness
         (3) Withdrawal tendencies
         (4) Hostility
         (5) Phobias related to the offender
         (6) Regression (i.e. bed wetting)
         (7) Truancy
      b. Emotional impact
         (1) Adult will create the impression on the child
         (2) Children will perceive the importance and ramifications of sexual assault through the behavior of the adults around them
   3. Legal considerations
      a. If sexual assault is confirmed or suspected, any law that applies must be followed
      b. In some states minors may seek and be treated for sexual assault without parental consent

UNIT TERMINAL OBJECTIVE

6-5 At the completion of this unit the paramedic student will be able to integrate pathophysiological and psychosocial principles to adapt the assessment and treatment plan for diverse patients and those who face physical, mental, social and financial challenges.

COGNITIVE OBJECTIVES

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

6-5.1 Describe the various etiologies and types of hearing impairments. (C-1)
6-5.2 Recognize the patient with a hearing impairment. (C-1)
6-5.3 Anticipate accommodations that may be needed in order to properly manage the patient with a hearing impairment. (C-3)
6-5.4 Describe the various etiologies of visual impairments. (C-1)
6-5.5 Recognize the patient with a visual impairment. (C-1)
6-5.6 Anticipate accommodations that may be needed in order to properly manage the patient with a visual impairment. (C-3)
6-5.7 Describe the various etiologies and types of speech impairments. (C-1)
6-5.8 Recognize the patient with a speech impairment. (C-1)
6-5.9 Anticipate accommodations that may be needed in order to properly manage the patient with a speech impairment. (C-3)
6-5.10 Describe the various etiologies of obesity. (C-1)
6-5.11 Anticipate accommodations that may be needed it order to properly manage the patient with obesity. (C-3)
6-5.12 Describe paraplegia/ quadriplegia. (C-1)
6-5.13 Anticipate accommodations that may be needed in order to properly manage the patient with paraplegia/ quadriplegia. (C-3)
6-5.14 Define mental illness. (C-1)
6-5.15 Describe the various etiologies of mental illness. (C-1)
6-5.16 Recognize the presenting signs of the various mental illnesses. (C-1)
6-5.17 Anticipate accommodations that may be needed in order to properly manage the patient with a mental illness. (C-3)
6-5.18 Define the term developmentally disabled. (C-1)
6-5.19 Recognize the patient with a developmental disability. (C-1)
6-5.20 Anticipate accommodations that may be needed in order to properly manage the patient with a developmental disability. (C-3)
6-5.21 Describe Down's syndrome. (C-1)
6-5.22 Recognize the patient with Down's syndrome. (C-1)
6-5.23 Anticipate accommodations that may be needed in order to properly manage the patient with Down's syndrome. (C-3)
6-5.24 Describe the various etiologies of emotional impairment. (C-1)
6-5.25 Recognize the patient with an emotional impairment. (C-1)
6-5.26 Anticipate accommodations that may be needed in order to properly manage the patient with an emotional impairment. (C-3)
6-5.27 Define emotional/ mental impairment (EMI). (C-1)
6-5.28 Recognize the patient with an emotional or mental impairment. (C-1)
6-5.29 Anticipate accommodations that may be needed in order to properly manage patients with an emotional or mental impairment. (C-3)
6-5.30 Describe the following diseases/ illnesses: (C-1)
a. Arthritis

b. Cancer
c. Cerebral palsy
d. Cystic fibrosis
e. Multiple sclerosis
f. Muscular dystrophy
g. Myasthenia gravis
h. Poliomyelitis
i. Spina bifida
j. Patients with a previous head injury

6-5.31 Identify the possible presenting sign(s) for the following diseases/ illnesses: (C-1)

a. Arthritis
2. Cancer
3. Cerebral palsy
4. Cystic fibrosis
5. Multiple sclerosis
6. Muscular dystrophy
7. Myasthenia gravis
8. Poliomyelitis
9. Spina bifida
10. Patients with a previous head injury

6-5.32 Anticipate accommodations that may be needed in order to properly manage the following patients: (C-3)

1. Arthritis
2. Cancer
3. Cerebral palsy
4. Cystic fibrosis
5. Multiple sclerosis
6. Muscular dystrophy
7. Myasthenia gravis
8. Poliomyelitis
9. Spina bifida
10. Patients with a previous head injury

6-5.33 Define cultural diversity. (C-1)

6-5.34 Recognize a patient who is culturally diverse. (C-1)

6-5.35 Anticipate accommodations that may be needed in order to properly manage a patient who is culturally diverse. (C-3)

6-5.36 Identify a patient that is terminally ill. (C-1)

6-5.37 Anticipate accommodations that may be needed in order to properly manage a patient who is terminally ill. (C-3)

6-5.38 Identify a patient with a communicable disease. (C-1)

6-5.39 Recognize the presenting signs of a patient with a communicable disease. (C-1)

6-5.40 Anticipate accommodations that may be needed in order to properly manage a patient with a communicable disease. (C-3)

6-5.41 Recognize sign(s) of financial impairments. (C-1)
6-5.42 Anticipate accommodations that may be needed in order to properly manage the patient with a financial impairment. (C-3)

AFFECTIVE OBJECTIVES
None identified for this unit.

PSYCHOMOTOR OBJECTIVES
None identified for this unit.

DECLARATIVE

I. Introduction
   A. Different types of "challenged" patients

II. Physical challenges
   A. Hearing impairments
      1. Types
         a. Conductive deafness
         b. Sensorineural deafness
      2. Etiologies
         a. Conductive deafness (curable)
            (1) Infection
            (2) Injury
            (3) Earwax
         b. Sensorineural deafness (many incurable)
            (1) Congenital
            (2) Birth injury
            (3) Disease
            (4) Medication-induced
            (5) Viral infection
            (6) Tumor
            (7) Prolonged exposure to loud noise
            (8) Aging
      3. Recognition
         a. Hearing aids
         b. Poor diction
         c. Inability to respond to verbal communication in the absence of direct eye contact
      4. Accommodations that may be necessary
         a. Retrieve hearing aid
         b. Paper/ pen
            (1) Many patients with a hearing impairment use American Sign Language (ASL)
            (2) Different syntax than English
         c. Do not shout
            (1) 80% of hearing loss is related to the loss of high-pitched sounds
            (2) Use low-pitched sounds directly into ear canal
         d. Do not exaggerate lip movement
         e. Interpreter
            (1) Notify receiving facility as early as

possible
f. Use of an "amplified" listener (e.g., ear microphone)
g. Use of picture that illustrate basic needs/ procedures

B. Visual impairments
1. Etiologies
a. Injury
b. Disease
c. Degeneration of eyeball, optic nerve or nerve pathways
d. Congenital
e. Infection (C.M.V.)
2. Recognition
a. May be difficult
3. Accommodations that may be necessary
a. Retrieve visual aids
b. Describe everything that you're going to do
c. Provide sensory information
d. If ambulatory, guide by leading, not by pushing
e. Allow leader dogs to accompany patient

C. Speech impairments
1. Types
a. Language disorders
b. Articulation disorders
c. Voice production disorders
d. Fluency disorders
2. Etiologies
a. Language disorders
(1) Stroke
(2) Head injury
(3) Brian tumor
(4) Delayed development
(5) Hearing loss
(6) Lack of stimulation
(7) Emotional disturbance
b. Articulation disorders
(1) From damage to nerve pathways passing from brain to muscles in larynx, mouth or lips
(2) Delayed development from hearing problems, slow maturation of nervous system
c. Voice production disorders

(1) Disorder affecting closure of vocal cords
(2) Hormonal or psychiatric disturbance
(3) Severe hearing loss

d. Fluency disorders
(1) Not fully understood

3. Recognition
a. Language disorders (aphasia)
(1) Slowness to understand speech
(2) Slow growth in vocabulary and sentence structure

b. Articulation disorders (dysarthria)
(1) Speech can be slurred, indistinct, slow, or nasal

c. Voice production disorders
(1) Hoarseness
(2) Harshness
(3) Inappropriate pitch
(4) Abnormal nasal resonance

d. Fluency disorders
(1) Stuttering

4. Accommodations that may be necessary
a. Allow patient time to respond to questions
b. Provide aids when available

D. Obesity
1. Etiologies
a. Caloric intake exceeds calories burned
b. Low basal metabolic rate
c. Genetic predisposition

2. Accommodations that may be necessary
a. Obtaining medical history
(1) Often extensive medical history

b. Assessment
(1) Use appropriately sized diagnostic devices

c. Management
(1) Maintain professionalism

d. Transport
(1) May require additional assistance

E. Patients with paraplegia/ quadriplegia
1. Description
a. Paraplegia
(1) Weakness or paralysis of both legs

b. Quadriplegia
(1) Paralysis of all four extremities and the

trunk
2.2 Accommodations that may be necessary
a. Assessment
(1) May require airway management
(a) Patients with halo traction device
(2) Observe for ostomies
(a) Trachea
(b) Bladder
(c) Colon
(3) Priapism may be present
b. Transport
(1) May require additional assistance/ equipment
F. Other physically challenged patients

III. Mental challenges
A. Mental illness
1. Description
a. Any form of psychiatric disorder
2. Etiologies
a. Psychoses
(1) Caused by complex biochemical brain disease
b. Neuroses
(1) Disease related to personality
3. Recognition
a. Behavior may be unaffected
b. May present with signs and symptoms consistent with illness
4. Accommodations that may be necessary
a. Obtaining history
(1) Don't be afraid to ask about
(a) History of mental illness
(b) Prescribed medications
(c) Whether patient is taking medications as prescribed
(d) Concomitant ingestion of alcohol, other drugs
b. Assessment
(1) Be sure to solicit permission before beginning
c. Management
(1) Treat as you would any patient that does not have a mental illness, unless call is related specifically to the mental illness; patients

with mental illness also experience myocardial infarctions, hypoglycemic episodes, and dislocated shoulders

B. Developmental disabilities
  1. Description/ etiologies
    a. Impaired/ insufficient development of the brain, causing an inability to learn at the usual rate
  2. Recognition
    a. History
  3. Accommodations that may be necessary
    a. Obtaining history
    b. Assessment
    c. Management
    d. Transport
  4. Down's syndrome
    a. Description/ etiologies
      (1) A chromosomal abnormality resulting in mild to severe mental retardation, and a characteristic physical appearance
    b. Recognition (typical)
      (1) Eyes slope up at outer corners; folds of skin on either side of nose cover the inner corners of eye
      (2) Small face and features
      (3) Large and protruding tongue
      (4) Flattening on back of the head
      (5) Hands short and broad
    c. Accommodations that may be necessary
      (1) Obtaining history, consider
        (a) Approximately 25% have a heart defect at birth
        (b) IQ varies from 30-80
      (2) Assessment
      (3) Management
      (4) Transport

C. Emotional impairments
  1. Description/ etiologies
    a. Neurasthenia
    b. Anxiety neurosis
    c. Compulsion neurosis
    d. Hysteria
  2. Recognition
    a. History

3. Accommodations that may be necessary
    a. Obtaining history
    b. Assessment
    c. Management
    d. Transport

D. Emotional/ mental impairments (EMI)
1. Description/ etiologies
2. Recognition
    a. History
3. Accommodations that may be necessary
    a. Obtaining history
    b. Assessment
    c. Management
    d. Transport

IV. Pathological challenges
A. Arthritis
1. Description
    a. Inflammation of a joint; characterized by pain, stiffness, swelling, redness
2. Types/ etiologies
3. Accommodations that may be necessary
    a. Assessment
        (1) Decreased range of motion/ mobility may limit physical exam
        (2) Be sure to solicit current medications before considering the administration of medications
    b. Management/ transport
        (1) Limited ability to be mobile
        (2) Make equipment fit patient, not vice-versa; pad all voids

B. Cancer (malignant tumor)
1. Description/ etiologies
    a. Various; dependent on primary site
2. Recognition
    a. Various; dependent on primary site
3. Accommodations that may be necessary
    a. Obtaining history
    b. Assessment
        (1) Look for transdermal pain medication on skin
    c. Management
        (1) Mediport access
    d. Transport

C. Cerebral palsy
  1. Description
    a. Nonprogressive disorders of movement and posture
  2. Types
    a. Spastic paralysis
      (1) Abnormal stiffness and contraction of groups of muscles
    b. Athetosis
      (1) Involuntary, writhing movements
    c. Ataxia
      (1) Loss of coordination and balance
  3. Etiologies
    a. Most occur before birth
    b. Prepartum
      (1) Cerebral hypoxia
      (2) Maternal infection
      (3) Kernicterus
    c. Postpartum
      (1) Encephalitis
      (2) Meningitis
      (3) Head injury
  4. Recognition
    a. Spastic
      (1) Muscles of one or more extremities are permanently contracted
    b. Athetoid
      (1) Involuntary writhing movement
    c. Quadriplegia
    d. Mental retardation in about 75% of all people with CP
    e. Many people with athetoid and diplegic cerebral palsy are highly intelligent
  5. Accommodations that may be necessary
    a. Transport
      (1) May require additional resources to facilitate transport
      (2) May need suctioning, due to increased oral secretions
      (3) If contractures are present, pad appropriately; do not force extremities to move

D. Cystic fibrosis (Mucoviscidosis)
  1. Description

a. An inherited metabolic disease of the lungs and digestive system, manifesting itself in childhood

2. Etiology
   a. A defective, recessive gene
3. Recognition
   a. History
   b. Patient may be oxygen-dependent
   c. Salty taste on skin
   d. Productive cough
4. Accommodations that may be necessary
   a. Management
      (1) May require respiratory support, suctioning, oxygen

E. Multiple sclerosis
1. Description
   a. A progressive autoimmune disease of the CNS, whereby scattered patches of myelin in the brain and spinal cord are destroyed
2. Etiologies
   a. Unknown
3. Recognition
   a. If brain is affected
      (1) Fatigue
      (2) Vertigo
      (3) Clumsiness
      (4) Muscle weakness
      (5) Slurred speech
      (6) Ataxia
      (7) Blurred or double vision
      (8) Numbness, weakness or pain in the face
   b. If spinal cord is affected
      (1) Tingling, numbness, or feeling of constriction in any part of the body
      (2) Extremities may feel heavy and become weak
      (3) Spasticity may be present
4. Accommodations that may be necessary
   a. Assessment
      (1) Recognize characteristic presentations
      (2) May be accompanied by
         (a) Painful muscle spasms
         (b) UTI
         (c) Constipation
         (d) Skin ulcerations

(e) Changes of mood, from euphoria to depression

b. Management
(1) Possible respiratory support

c. Transport
(1) Patient should not be expected to ambulate

F. Muscular dystrophy
1. Description
a. An inherited muscle disorder of unknown cause in which there is slow but progressive degeneration of muscle fibers
2. Recognition
a. History
b. Little or no movement of muscle groups
3. Accommodations that may be necessary
a. Management
(1) Possible respiratory support
b. Transport
(1) Patient should not be expected to ambulate

G. Poliomyelitis
1. Description/ etiologies
a. Caused by a virus, which usually results in a mild illness
b. In more serious cases, it attacks the CNS; may result in paralysis or death
2. Recognition
a. History
b. Patients with severe polio may present with paralysis (including respiratory)
3. Accommodations that may be necessary
a. Management
(1) If lower extremities are paralyzed, patient may require catheterization
(2) If respiratory paralysis, patient may require tracheostomy
b. Transport
(1) Patient should not be expected to ambulate

H. Patients with previous head injuries
1. Recognition
a. Physical appearance may be uncharacteristic
b. Speech and mobility may be affected
c. Short term memory loss
2. Accommodations that may be necessary

a. Obtaining history
b. Assessment
c. Management
d. Transport

I. Spina bifida
1. Description
a. A congenital defect in which part of one or more vertebrae fails to develop, leaving a portion of the spinal cord exposed
2. Etiology
a. Unknown
3. Recognition
a. History
4. Accommodations that may be necessary
a. Management/ transport
(1) Patient should not be expected to ambulate, although most can

J. Myasthenia gravis
1. Description
a. A disorder in which muscles become weak and tire easily
b. Eyes, face, throat, and extremity muscles most commonly affected
2. Etiology
a. Autoimmune disorder of unknown etiology
3. Recognition
a. Drooping eyelids, double vision
b. Difficulty speaking
c. Chewing, swallowing may be difficult
d. Movement of extremities may be difficult
e. Respiratory muscles may be weakened
4. Accommodations that may be necessary
a. Assessment/ management
(1) History
(2) Accommodations vary, based upon presentation

V. Culturally diverse patients
A. Variables
1. Ethnicity, religion, gender, homelessness, etc. may dictate various accepted medical practices

a. May conflict with learned medical practice of the paramedic
2. Patients who speak a language other than English have unique challenges
B. Recognition
C. Accommodations that may be necessary
1. Assessment/ management/ transport
a. Be sure to obtain permission to treat when possible
b. Attempt to recruit an interpreter, or consider translator device (e.g. AT&T language line) for non-English speaking patients; notify receiving facility as soon as possible if an interpreter will be needed

VI. Terminally ill patients
A. Variables
B. Accommodations
1. Obtaining history
a. Advance directives, DNR
2. Assessment
a. Pain assessment (transdermal delivery of pain medications) - quantify and qualify
b. Management
c. Transport

VII. Patients with communicable diseases
A. Review of etiologies
B. Accommodations
1. Obtaining history
2. Assessment
3. Management
a. Precautions will depend upon modes of transmission
4. Transport

VIII. Financial challenges
A. Description
1. May be apprehensive about seeking medical care
B. Accommodations
1. Management
2. Transport

UNIT TERMINAL OBJECTIVE

6-6 At the completion of this unit, the paramedic student will be able to integrate the pathophysiological principles and the assessment findings to formulate a field impression and implement a treatment plan for the acute deterioration of a chronic care patient.

COGNITIVE OBJECTIVES

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

6-6.1 Compare and contrast the primary objectives of the ALS professional and the home care professional. (C-3)
6-6.2 Identify the importance of home health care medicine as related to the ALS level of care. (C-1)
6-6.3 Differentiate between the role of EMS provider and the role of the home care provider. (C-3)
6-6.4 Compare and contrast the primary objectives of acute care, home care and hospice care. (C-3)
6-6.5 Summarize the types of home health care available in your area and the services provided. (C-3)
6-6.6 Discuss the aspects of home care that result in enhanced quality of care for a given patient. (C-1)
6-6.7 Discuss the aspects of home care that have a potential to become a detriment to the quality of care for a given patient. (C-1)
6-6.8 List complications commonly seen in the home care patients which result in their hospitalization. (C-1)
6-6.9 Compare the cost, mortality and quality of care for a given patient in the hospital versus the home care setting. (C-3)
6-6.10 Discuss the significance of palliative care programs as related to a patient in a home health care setting. (C-1)
6-6.11 Define hospice care, comfort care and DNR/ DNAR as they relate to local practice, law and policy. (C-1)
6-6.12 List the stages of the grief process and relate them to an individual in hospice care. (C-1)
6-6.13 List pathologies and complications typical to home care patients. (C-1)
6-6.14 Given a home care scenario, predict complications requiring ALS intervention. (C-3)
6-6.15 Given a series of home care scenarios, determine which patients should receive follow-up home care and which should be transported to an emergency care facility. (C-3)
6-6.16 Describe airway maintenance devices typically found in the home care environment. (C-1)
6-6.17 Describe devices that provide or enhance alveolar ventilation in the home care setting. (C-1)
6-6.18 List modes of artificial ventilation and an out-of-hospital situation where each might be employed. (C-1)
6-6.19 List vascular access devices found in the home care setting. (C-1)
6-6.20 Recognize standard central venous access devices utilized in home health care. (C-1)
6-6.21 Describe the basic universal characteristics of central venous catheters. (C-1)
6-6.22 Describe the basic universal characteristics of implantable injection devices. (C-1)
6-6.23 List devices found in the home care setting that are used to empty, irrigate or deliver nutrition or medication to the GI/ GU tract. (C-1)
6-6.24 Describe complications of assessing each of the airway, vascular access, and GI/ GU devices described above. (C-1)
6-6.25 Given a series of scenarios, demonstrate the appropriate ALS interventions. (C-3)
6-6.26 Given a series of scenarios, demonstrate interaction and support with the family members/ support persons for a patient who has died. (C-3)
6-6.27 Describe common complications with central venous access and implantable drug administration ports in the out-of-hospital setting. (C-1)
6-6.28 Describe the indications and contraindications for urinary catheter insertion in an out-of-hospital setting. (C-1)
6-6.29 Identify the proper anatomy for placement of urinary catheters in males or females. (C-2)
6-6.30 Identify failure of GI/ GU devices found in the home care setting. (C-2)
6-6.31 Identify failure of ventilatory devices found in the home care setting. (C-2)

6-6.32 Identify failure of vascular access devices found in the home care setting. (C-2)
6-6.33 Identify failure of drains. (C-2)
6-6.34 Differentiate between home care and acute care as preferable situations for a given patient scenario. (C-3)
6-6.35 Discuss the relationship between local home care treatment protocols/ SOPs and local EMS Protocols/ SOPs. (C-3)
6-6.36 Discuss differences in individuals ability to accept and cope with their own impending death. (C-3)
6-6.37 Discuss the rights of the terminally ill. (C-1)

AFFECTIVE OBJECTIVES
At the completion of this unit, the paramedic student will be able to:

6-6.38 Value the role of the home-care professional and understand their role in patient care along the life-span continuum. (A-2)
6-6.39 Value the patient's desire to remain in the home setting. (A-2)
6-6.40 Value the patient's desire to accept or deny hospice care. (A-2)
6-6.41 Value the uses of long term venous access in the home health setting, including but not limited to: (A-2)
a. Chemotherapy
b. Home pain management
c. Nutrition therapy
d. Congestive heart therapy
e. Antibiotic therapy

PSYCHOMOTOR OBJECTIVES
At the completion of this unit, the paramedic student will be able to:

6-6.42 Observe for an infected or otherwise complicated venous access point. (P-1)
6-6.43 Demonstrate proper tracheotomy care. (P-1)
6-6.44 Demonstrate the insertion of a new inner cannula and/ or the use of an endotracheal tube to temporarily maintain an airway in a tracheostomy patient. (P-1)
6-6.45 Demonstrate proper technique for drawing blood from a central venous line. (P-1)
6-6.46 Demonstrate the method of accessing vascular access devices found in the home health care setting. (P-1)

DECLARATIVE

I. Introduction
  A. Epidemiology of home care
    1. Patients receiving home care
      a. Supportive statistics
    2. ALS responses to home care patients
      a. Role of the ALS provider
      b. Role of the home care provider
      c. Supportive statistics
      d. Typical responses
        (1) Respiratory failure
        (2) Cardiac decompensation
        (3) Septic complications
        (4) Equipment malfunction
        (5) Other medical pathologies exacerbated in the home care setting
    3. Medical devices commonly found in the home care setting
      a. Supportive statistics
        (1) National (number of trach patients, home ventilator patients, etc.)
        (2) Local
      b. Examples of home care problems requiring intervention by a home health practitioner of physician
        (1) Chemotherapy
        (2) Pain management
        (3) Hospice care
        (4) Others
      c. Examples of home care problems requiring acute intervention
        (1) Inadequate respiratory support
        (2) Acute respiratory events
        (3) Acute cardiac events
        (4) Acute sepsis
        (5) GI/ GU crisis
    4. Injury control and prevention in the home care setting
      a. Haddon's matrix
      b. Performance versus task demand
      c. Infection control in the home care setting
  B. Types of home care patients
    1. Airway pathologies
      a. Inadequate pulmonary toilet
      b. Inadequate alveolar ventilation
      c. Inadequate alveolar oxygenation
    2. Circulatory pathologies
      a. Alterations in peripheral circulation
    3. GI/ GU pathologies
      a. Ostomies
      b. Catheters

c. Home dialysis
4. Infections
   a. Cellulitis
   b. Sepsis
5. Wound care
   a. Surgical wound closure
   b. Decubitus wounds
   c. Drains
6. Hospice care
7. Maternal/ child care
   a. Apnea monitors
   b. The new parent
8. Progressive dementia in the patient at home
9. Psychosocial support of the home care family
10. Chronic pain management
11. Home chemotherapy
12. The transplant candidate

II. General system pathophysiology, assessment and management
   A. Assessment
      1. Scene size-up
         a. Body substance isolation
            (1) Infectious waste issues in the home care environment
         b. Scene safety
            (1) Pets
            (2) Firearms and other home protection devices
            (3) Home hazards
         c. Milieu
            (1) Ability to maintain a healthy environment
            (2) Adequate nutritional support available
            (3) Adequate basic needs (heat, electricity, etc.)
      2. Initial assessment
      3. Focused history and physical examination
         a. Critical findings
            (1) Rapid assessment and transport
            (2) Detailed assessment
            (3) On-going assessment
         b. Non-critical findings
            (1) Focused history and physical examination
               (a) Medication interactions in home care
               (b) Using the available home health history
               (c) Accessing the home health history
               (d) Compliance issues
               (e) Assessing dementia
            (2) Other intervention and transport considerations
               (a) Notification of family or caretakers

(b) Securing the home

4. On-going assessment
5. Comprehensive assessment
   a. Inspection
   b. Palpation
   c. Auscultation
6. Differential diagnosis and continued management

B. Management/ treatment plan
   1. Replacing home health treatment modalities with ALS modalities
      a. Airway and ventilatory support
      b. Circulatory support
      c. Pharmacological intervention
      d. Non-pharmacologic interventions
      e. Transport considerations
         (1) Home care follow-up
         (2) Referral to other public service agencies
         (3) Notification of family medical doctor or home health agencies

III. Specific acute home health situations
   A. Inadequate respiratory support
      1. Supportive statistics
         a. Home oxygen
         b. COPD patients
         c. Home ventilation patients
      2. Review of specific anatomy and physiology
         a. Respiratory anatomy and physiology as it relates to
            (1) CPAP
            (2) Positive pressure ventilation
      3. Review pathophysiology
         a. Increased risk of airway infections in the respiratory compromised patient
         b. Progression of chronic respiratory diseases
         c. Chronic pathologies requiring home respiratory support
            (1) COPD
            (2) Bronchopulmonary dysplasia
            (3) Patients awaiting lung transplant
            (4) Cystic fibrosis
            (5) Sleep apnea
         d. Increased respiratory demand making current support inadequate
            (1) Respiratory infections
            (2) Other factors affecting respiratory demand
         e. Increased secretions
         f. Obstructed or malfunctioning airway devices
         g. Improper application of medical device
      4. Medical therapy found in the home setting
         a. Home oxygen therapy
            (1) Oxygen concentrators

(2) Oxygen in cylinders
(3) Liquid oxygen systems
b. CPAP
(1) Mask CPAP
(2) Nasal CPAP
(3) BiPAP
c. Artificial airways
(1) Tracheotomies
d. Home ventilation
(1) Volume ventilators
(2) Pressure ventilators
(3) Negative pressure ventilation devices (poncho ventilators)
5. Assessment findings
a. Work of breathing
b. Tidal volume
c. Peak flow
d. Oxygen saturation
e. Breath sounds
6. Management
a. Improving airway patency
(1) Repositioning airway devices
(2) Removing secretions from airway devices
(3) Replacing a home airway device with an ALS device
(a) ET tube replacing trach tube
b. Improving ventilation
(1) Removing from a home care device and using positive pressure ventilation
(2) Adjusting home care devices fit or settings to improve ventilations
c. Improving oxygenation
(1) Replacing oxygen delivery devices
(2) Changing the flow rate of oxygen delivery devices
d. Transport considerations
e. Psychological support/ communication strategies
(1) Communication with the intubated patient
(2) Communication using a "talking trach"

B. Acute cardiovascular and vascular access
1. Epidemiology
a. Supportive statistics
(1) Types and numbers of central venous access devices found in the home
(2) Types and numbers of dialysis patients found in the home
2. Review of specific anatomy and physiology
a. Cardiovascular anatomy and physiology as it relates to
(1) Central venous access
(2) Dialysis shunts
(3) Peripheral circulation
(4) Cardiovascular decompensation

3. Review pathophysiology
   a. Cardiomyopathy
   b. Post MI cardiac insufficiency
   c. Anticoagulation associated with percutaneous or implanted devices
   d. Embolus formation associated with indwelling devices, stasis and inactivity
   e. Air embolus associated with central venous access devices
   f. Obstructed or malfunctioning vascular access devices
   g. Infected access site
   h. Obstructed dialysis shunts
4. Medical therapy found in the home setting
   a. Vascular access devices
      (1) Surgically implanted medication delivery devices (Mediports, etc.)
      (2) Peripheral vascular access devices (PICC, Intracath, etc.)
      (3) Central vascular access devices (Hickman, Groshon, etc.)
   b. Dialysis shunts
   c. Hemodynamic support
   d. Anticoagulant therapy
5. Assessment findings
   a. Infection
   b. Hemodynamic compromise
   c. Hemorrhage
   d. Embolus
      (1) Air
      (2) Thrombus
      (3) Plastic or catheter tip
   e. Stable versus unstable angina

C. GI/ GU crisis
1. Epidemiology
   a. Supportive statistics referencing numbers of devices in the out-of-hospital setting
      (1) Urinary catheters or urostomies
      (2) Benign prostetic hypertrophy
      (3) Indwelling nutritional support device (peg tube, G-tube)
      (4) Colostomies
      (5) NG tubes
2. Review of specific anatomy and physiology
   a. GI/ GU anatomy and physiology as it relates to
      (1) Urinary tract infections and urosepsis
      (2) Bowel obstruction
      (3) Aspiration of gastric contents
3. Review pathophysiology
   a. Urosepsis
   b. Urinary retention
   c. Aspiration of gastric contents secondary to
      (1) Non-patent gastric tube
      (2) Improper nutritional support via feeding tube
      (3) Patient positioning with the above devices

d. Bowel obstruction in the patient with gastric devices
e. Obstructed or malfunctioning gastric devices

4. Medical therapy found in the home setting
   a. Urinary tract
      (1) External urinary catheters
      (2) Indwelling urinary catheters
      (3) Suprapubic catheters
      (4) Urostomy
   b. Gastric emptying or feeding
      (1) NG tubes
      (2) Feeding tubes
      (3) Peg tubes, J tubes, etc.
      (4) Colostomy
5. Assessment findings
   a. Abdominal pain
   b. Distention
   c. Bowel sounds
   d. Palpation of bladder
   e. Color/ character/ amount of urine
6. Management
   a. Aspiration
   b. Urinary retention
      (1) Hypotension
      (2) Catheterization
   c. Bowel obstruction
   d. Dysfunctional device
   e. Transport considerations
      (1) Positioning
      (2) Positioning of devices for proper drainage and prevention of reflux

D. Acute infections
1. Epidemiology
   a. Supportive statistics
      (1) Mortality rates from sepsis and severe peripheral infections
      (2) Increased rate of infections in the elderly, chronically ill and homebound
      (3) Decreased ability to perceive pain or perform self-care in many homebound populations
2. Review of specific anatomy and physiology
   a. Immune system
   b. Normal wound healing
3. Review pathophysiology
   a. Increased risk of airway infections in the immunocompromised patient
   b. Poor peripheral perfusion results in decreased healing and increased peripheral infections
   c. Sedentary existence leads to skin breakdown and peripheral infections
   d. Percutaneous and implanted medical devices increase risk for infections and sepsis

e. Patients discharged to home with open wounds and incisions
f. Chronic diseases may further impair healing
g. Poor nutrition, hygiene or ability to care for self impact infection rates
h. Abscesses
i. Cellulitis

4. Medical therapy found in the home setting
   a. Open wounds
      (1) Dressings
      (2) Wound packing
      (3) Drainage
   b. Drains found in wounds
      (1) Penrose drains
      (2) Jackson-Pratt drains
      (3) Others
   c. Wound closure techniques
      (1) Sutures
      (2) Wires
      (3) Staples
      (4) Others
5. Assessment findings
   a. Signs of healthy wound healing
   b. Signs of superficial infections
   c. Signs of major infections
   d. Signs of sepsis
6. Management
   a. Sterile dressing (redressing) after wound evaluation
   b. Transport considerations
   c. Psychological support/ communication strategies

E. Maternal/ child
1. Epidemiology
   a. Supportive statistics
      (1) Birth rates and average length of hospitalization
      (2) Rates for post partum bleeding
      (3) Rates for infant septicemia
2. Review of specific anatomy and physiology
   a. Childbirth and post partum changes
   b. Newborn pathophysiology as it relates to
      (1) Thermoregulation
      (2) Respiratory drive
      (3) Immune response
3. Review pathophysiology
   a. Infantile apnea
      (1) Review apnea monitoring
   b. Septicemia in the newborn
   c. Other newborn pathophysiologies
   d. Post partum hemorrhage

e. Post partum depression
f. Other post partum pathophysiologies
(1) Sepsis
(2) Pulmonary embolus

4. Assessment findings
a. Signs of sepsis
b. Failure to thrive
c. The well-baby exam
d. Post partum assessment

5. Management
a. Transport considerations
b. Psychological support/ communication strategies

F. Hospice/ comfort care

1. Epidemiology
a. Supportive statistics
(1) Hospice care statistics

2. Review of specific terms
a. Palliative care
b. Comfort care
c. Hospice care
d. DNR/ DNAR
e. Durable power of attorney

3. Review material
a. The grief response
b. Local DNR or related legislation
c. Medical direction considerations

4. Medical therapy found in the home setting
a. Pain control in the terminal patient
(1) Therapy for overmedication

5. Management
a. Transport considerations
b. Psychological support/ communication strategies

UNIT TERMINAL OBJECTIVE

7-1 At the completion of this unit, the paramedic student will be able to integrate the principles of assessment based management to perform an appropriate assessment and implement the management plan for patients with common complaints.

COGNITIVE OBJECTIVES

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

7-1.1 Explain how effective assessment is critical to clinical decision making. (C-1)
7-1.2 Explain how the paramedic's attitude affects assessment and decision making. (C-1)
7-1.3 Explain how uncooperative patients affect assessment and decision making. (C-1)
7-1.4 Explain strategies to prevent labeling and tunnel vision. (C-1)
7-1.5 Develop strategies to decrease environmental distractions. (C-1)
7-1.6 Describe how manpower considerations and staffing configurations affect assessment and decision making. (C-1)
7-1.7 Synthesize concepts of scene management and choreography to simulated emergency calls. (C-3)
7-1.8 Explain the roles of the team leader and the patient care person. (C-1)
7-1.9 List and explain the rationale for carrying the essential patient care items. (C-3)
7-1.10 When given a simulated call, list the appropriate equipment to be taken to the patient. (C-2)
7-1.11 Explain the general approach to the emergency patient. (C-1)
7-1.12 Explain the general approach, patient assessment, differentials, and management priorities for patients with the following problems: (C-3)
- a. Chest pain
- b. Medical and traumatic cardiac arrest
- c. Acute abdominal pain
- d. GI bleed
- e. Altered mental status
- f. Dyspnea
- g. Syncope
- h. Seizures
- I. Environmental or thermal problem
- j. Hazardous material or toxic exposure
- k. Trauma or multi trauma patients
- l. Allergic reactions
- m. Behavioral problems
- n. Obstetric or gynecological problems
- o. Pediatric patients

7-1.13 Describe how to effectively communicate patient information face to face, over the telephone, by radio, and in writing. (C-1)

AFFECTIVE OBJECTIVES

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

7-1.14 Appreciate the use of scenarios to develop high level clinical decision making skills. (A-2)
7-1.15 Defend the importance of considering differentials in patient care. (A-3)
7-1.16 Advocate and practice the process of complete patient assessment on all patients. (A-3)

7-1.17 Value the importance of presenting the patient accurately and clearly. (A-2)

PSYCHOMOTOR OBJECTIVES
At the completion of this unit, the paramedic student will be able to:

7-1.18 While serving as team leader, choreograph the EMS response team, perform a patient assessment, provide local/ regionally appropriate treatment, present cases verbally and in writing given a moulaged and programed simulated patient. (P-3)

7-1.19 While serving as team leader, assess a programmed patient or mannequin, consider differentials, make decisions relative to interventions and transportation, provide the interventions, patient packaging and transportation, work as a team and practice various roles for the following common emergencies: (P-3)

a. Chest pain
b. Cardiac Arrest
    1. Traumatic arrest
    2. Medical arrest
c. Acute abdominal pain
d. GI bleed
e. Altered mental status
f. Dyspnea
g. Syncope
h. Seizure
i. Thermal/ environmental problem
j. Hazardous materials/ toxicology
k. Trauma
    1. Isolated extremity fracture (tibia/ fibula or radius/ ulna)
    2. Femur fracture
    3. Shoulder dislocation
    4. Clavicular fracture or A-C separation
    5. Minor wound (no sutures required, sutures required, high risk wounds, with tendon and/ or nerve injury)
    6. Spine injury (no neurologic deficit, with neurologic deficit)
    7. Multiple trauma-blunt
    8. Penetrating trauma
    9. Impaled object
    10. Elderly fall
    11. Athletic injury
    12. Head injury (concussion, subdural/ epidural)
l. Allergic reactions/ bites/ envenomation
    1. Local allergic reaction
    2. Systemic allergic reaction
    3. Envenomation
m. Behavioral
    1. Mood disorders
    2. Schizophrenic and delusional disorders
    3. Suicidal
n. Obstetrics/ gynecology

1. Vaginal bleeding
2. Childbirth (normal and abnormal)

o. Pediatric
1. Respiratory distress
2. Fever
3. Seizures

DECLARATIVE

I. Effective Assessment
- A. Assessment is the foundation of care
  1. Can't treat or report anything that isn't found
  2. Must gather, evaluate and synthesize the information
  3. Make the right decisions
  4. Take appropriate action
- B. Accurate information is critical to decision making
  1. The history
     a. Often 80% of a medical diagnosis is based on history
     b. Knowledge of disease and suspicion affect quality of the history acquired
     c. Is focused toward the complaint and associated problems
  2. The physical examination
     a. Often overlooked or done in a cursory manner
     b. Effectiveness compromised by some field situations
     c. Focused toward systems associated with complaint
  3. Pattern recognition
     a. Gathered information compared to knowledge base
     b. Pattern is or isn't recognized
     c. Greater the knowledge base and assessment information, better the chances of accurate assessment and decisions
  4. Assessment/ field impression
     a. Field impression
        (1) Pattern recognition
        (2) Gut instinct based on experience
     b. Formulation of plan of action
        (1) Patients condition
        (2) The environment
  5. BLS/ ALS treatment driven by
     a. Protocols
        (1) Must have right impression to know which one to use
     b. Judgment
        (1) Know when and how to apply protocols
        (2) Know when to deviate from protocols
- C. Factors affecting assessment and decision making
  1. Paramedic attitude - need to be non-judgmental
     a. May "short circuit" information gathering
     b. Lead to insufficient information to recognize patterns
     c. GIGO = garbage in - garbage out
     d. Patients depend on us for medical assessment/ management not determination of social standing or "likability"
  2. Uncooperative patients
     a. Perception of intoxication
     b. In all uncooperative, restless, belligerent patients consider the following as possible causes

(1) Hypoxia
(2) Hypovolemia
(3) Hypoglycemia
(4) Head injury/ concussion

3. Obvious but distracting injuries
   a. Can divert attention from more serious problems
4. Tunnel vision/ labeling
   a. "Labels" applied by responders sometimes set an inappropriate tone, distract and cause biased assessment
      (1) "Just another drunk"
      (2) "Frequent flyer"
      (3) Etc.
   b. Tunnel vision causes distraction
      (1) Locking on, making a field impression too early
      (2) "Gut instinct" sometimes causes a rush to judgment too early
5. The environment
   a. Scene chaos
   b. Violent/ dangerous situations
   c. Crowds of bystanders
   d. Crowds of responders
   e. Noise levels
6. Patient compliance
   a. Patient confidence in rescuers
   b. Cultural and ethnic barriers
7. Manpower considerations
   a. Single paramedic
      (1) Sequential information gathering
      (2) Sequential treatment
   b. Two paramedics
      (1) Simultaneous information gathering
      (2) Simultaneous treatment
   c. Multiple responders
      (1) History by "committee"
         (a) Disorganized acquision of history

D. Assessment/ management choreography
   1. Number of responders often makes coherent assessment challenging
      a. Multiple tier responders
      b. Too many people attempting to acquire history
      c. Worse if responders at same level without clear direction
   2. Members of the team need to have a preplan for determining roles
      a. Predesignated roles assigned to team members
      b. Roles should be rotated among team members
      c. Paramedics working alone must assume all ALS roles
      d. Multiple paramedics need to have a plan
   3. One example is a 2 paramedic preplan with "team leader" and "patient care" paramedic designated

a. Plan is not cast in concrete as field situations are dynamic
b. Regular partners may develop their "own plan" and flow
(1) Having a universally understood plan allows for others to participate
c. Having a some basic "game plan" is important to prevent chaos

4. Team leader
a. Usually who ever will accompany patient thru to definitive care
b. Establishes contact and a dialogue with the patient
c. Obtains the history
d. Performs the physical examination
e. Presents the patient, gives verbal report over the radio or at definitive care
f. Does the documentation
g. Tries to maintain the overall patient perspective and
(1) Designating tasks
(2) Coordinating transportation
h. During resuscitative phase of initial assessment designates and actively participates in critical interventions
i. Multiple casualty situations acts as initial EMS command
j. During ACLS
(1) Reads ECG
(2) Talks on radio and gives drug orders
(3) Controls the drug box
(4) Keeps notes on drug administrations/ effects

5. Patient care person(s)
a. Provides scene cover (watches the team leader's back)
b. Gathers scene information, talks to relatives, bystanders etc.
c. Obtains vital signs
d. Performs skills, interventions as requested by team leader
(1) Attach monitoring leads
(2) Oxygen administration
(3) Venous access
(4) Medication administration
(a) Obtains transportation equipment
e. Multiple casualty situations acts as triage group leader
f. During ACLS
(1) Administers drugs
(2) Monitors tube placement
(3) Monitors BCLS

II. The right "stuff"
A. The right stuff means carrying the right equipment to the patient's side
1. Paramedics need to be prepared for the worst
2. For some patients, assessment and management is simultaneous
3. Not having the right equipment compromises care and causes pandemonium
B. Having the right stuff is like backpacking
1. Have the essential items
2. Downsized to facilitate rapid movement

3. Minimum weight and bulk

C. Essential equipment carried to every patient
   1. Paramedic management of the ABCDE
   2. Cardiac monitoring and defibrillation

D. Essential items
   1. Airway control
      a. Oral airways
      b. Nasal airways
      c. Suction (electric or manual)
      d. Rigid Yankauer and flexible suction catheters
      e. Laryngoscope and blades
      f. Endotracheal tubes, stylettes, syringes, tape
   2. Breathing
      a. Mouth powered ventilation devices (pocket mask)
      b. Manual ventilation bag-valve-mask
      c. Spare masks
      d. Oxygen tank and regulator
      e. Oxygen masks, cannulas and extension tubing
      f. Occlusive dressings
      g. Large bore IV catheter for thoracic decompression
   3. Circulation
      a. Dressings
      b. Bandages and tape
      c. Infection control supplies-gloves, eye shields
      d. Sphygmomanometer, stethoscope
      e. Note pad and pen or pencil
   4. Disability and Dysrhythmia
      a. Rigid collars
      b. Flashlight
      c. Cardiac monitor/ defibrillator
   5. Exposure
      a. Scissors
      b. Space blanket or something to cover the patient
   6. Note pad and pen or pencil
   7. The essential items need to be brought to every patient

E. Optional " take in " equipment
   1. Drug therapy and venous access supplies need to be portable too
      a. May not need to go in for every patient contact
      b. How supplies are carried often depends on how the system is designed
         (1) Paramedic ambulances
         (2) Paramedics in non-transporting vehicles
   2. What is carried to the patient depends on local protocols
      a. Standing order flexibility
      b. Number of paramedic responders
      c. Difficulty in accessing patients
   3. Venous access is required to administer most emergency drugs

a. Venous access supplies should be carried with drug box
b. Drug box should contain drugs allowed in the formulary

III. General approach to the patient
A. Calm orderly demeanor is essential
1. Look the part
2. Act the part
3. "Bedside" manner is important
4. Patients may not be able to rate medical performance
a. They can rate people skills and service
B. Have a "preplan" to prevent confusion and improve accuracy of the assessment
1. One team member does the talking to the patient
a. Active concerned dialogue
b. Listen
2. Take notes when acquiring the history
a. Helps prevent asking the same question repeatedly
C. Carry in all of the essential equipment
1. Ready to provide resuscitative care
2. Minimizes pandemonium
D. Use the initial scene size-up to gather clues and help formulate an impression
1. Especially useful in trauma situations
a. Hazards
b. MOI
c. Number of patients
2. Avoid tunnel vision
E. The initial assessment sets the tone for the patient encounter
1. Resuscitative approach
a. Immediate intervention is necessary
b. Patient has a life threatening problem such as
(1) Cardiac/ respiratory arrest
(2) Respiratory distress/ failure
(3) Unstable dysrhythmias
(4) Seizures
(5) Coma/ altered mental status
(6) Shock/ hypotension
(7) Major trauma
(8) Possible "C" spine injury
c. Begin to take resuscitative action
(1) Acquire more history and details post immediate resuscitation
2. Contemplative approach
a. Immediate intervention not necessary
b. Generally history and physical; then interventions if required
3. Immediate evacuation to the ambulance may be required if
a. Patient needs lifesaving interventions that can't be provided by the paramedic
b. Scene is too unstable/ or unsafe
c. Scene is too chaotic to allow for rational assessment

F. To find something, one must suspect it
   1. During initial assessment one must actively look for life-threatening problems
   2. Must be systematic
   3. Rapidly determine the chief complaint
   4. Assess the degree of distress
   5. Obtain baseline vital signs early
   6. Focused on the relevant history and physical findings

G. The greater the knowledge about what is being looked for the more productive the line of questioning will be

H. Experience assists in developing the ability of "multi-tasking" or being able to ask questions and do something while listening to the answer
   1. Until experienced, ask questions and just listen
   2. Have partner perform necessary tasks
   3. Important clues are lost by not listening

I. The patient's ability to describe symptoms and paramedic's ability to listen has a great effect on the assessment
   1. Pain severity does not correlate well with life-threat potential
   2. Location of pain and it's source also do not always correlate well; especially if it is visceral

J. Paramedics role is to rapidly assess and treat for the worst case scenario

IV. Presenting the patient

A. Effective communication and transfer of patient information is vital to both out-of-hospital and hospital care
   1. Patient presentation is often a weak link in care in spite of the frequency of use
   2. Paramedics may actually use BLS/ ALS interventions on few patients, but patient presentation and information exchange occurs with every patient encounter
   3. Presentation will routinely be done
      a. Face to face
      b. Over the telephone
      c. Over the radio
      d. In writing

B. Effective presentation and communications skills are essential to establish trust and credibility
   1. Good assessment and presentation go hand in hand
      a. Can't report anything that isn't found
      b. Can't treat things that are not found
   2. Good presentations suggest effective patient assessment and care
      a. Poor presentation, suggests poor assessment and care to the listener
   3. Other health care providers are disinterested in listening to rambling, disjointed presentations covering inconsequential information while omitting vital information
      a. Most health care providers are used to listening to either the SOAP format or some close variation of it

C. Poor presentation can also compromise patient care
   1. As physician extenders, paramedics must contact supervising physicians for orders at some level
   2. Patient's needs and status must be communicated effectively

D. Effective presentations

1. Are very concise, usually lasting less than one minute
2. Are usually free of extensive medical jargon
3. Follow the same basic information pattern
4. Generally follow the SOAP format or some close variation of it
5. Includes pertinent findings and pertinent negatives
   a. Expected findings that are absent (ie. a patient with dyspnea who's chest is clear to auscultation)

E. Start with the end in mind; know what discrete areas of information will be asked for and be sure to acquire the right information
   1. Until experienced and the format is committed to memory, use a pre-printed card or sheet to organize information and take notes during the work-up
   2. Use the form to organize thoughts and assessment findings before making the presentation
   3. With time the flow will become second nature

F. Discrete areas of an ideal presentation
   1. Patient identification, age, sex and degree of distress
   2. Chief complaint
      a. Why they called
   3. Present illness/ injury
      a. Pertinent details about the present problem
      b. Pertinent negatives
   4. Past medical history
      a. Allergies, medications and pertinent medical history
   5. Physical findings
      a. Vital signs
      b. Pertinent positive findings
      c. Pertinent negative findings
   6. Assessment
      a. Paramedic impression
   7. Plan
      a. What has been done
      b. Orders requested

G. The key to developing proficiency is repetition and understanding the format
   1. Use a small pre-printed form; eventually you will depend on the form less and less
   2. Practice presenting on simulated and real patients
   3. Listen to other's radio reports

V. Review of common complaints

A. In order to develop as an entry level practitioner at the paramedic level, scenario based practice and review needs to be conducted for complaints commonly encountered in the field

B. The goal of practice sessions should be to
   1. Choreograph the EMS response team
   2. Practice assessment and decision making on cases they are likely to be encountered out-of-hospital
   3. Provide interventions based on their assessment and modalities in local/ regional treatment protocols

4. Practice presenting cases verbally and in writing

C. Laboratory based simulations should require the paramedic student to
   1. Assess a programmed patient or mannequin
   2. Make decisions relative to interventions and transportation
   3. Provide the interventions, patient packaging and transportation
   4. Work as a team and practice various roles

D. Simulations should include the following patient presentations
   1. Chest pain
      a. Scenarios
         (1) Stable with no dysrhythmias
         (2) Stable bradycardia
         (3) Unstable bradycardia (hypotension/ chest pain)
         (4) Stable supraventricular tachycardia
         (5) Unstable supraventricular tachycardia
         (6) Stable ventricular tachycardia
         (7) Unstable ventricular tachycardia
         (8) Ventricular ectopy
         (9) Cardiogenic shock/ hypotension
      b. Must demonstrate the ability to identify/ differentiate between
         (1) AMI
         (2) Unstable angina
         (3) Aortic aneurism
         (4) Pulmonary embolism
         (5) Pneumothorax
         (6) Esophageal rupture
   2. Cardiac arrest
      a. Scenarios
         (1) Trauma arrest
         (2) Medical arrest
         (3) Ventricular fibrillation
         (4) Ventricular tachycardia
         (5) Asystole
         (6) Pulseless electrical activity
         (7) Termination of resuscitation
         (8) No resuscitation indicated
      b. Must demonstrate the ability to identify/ differentiate between
         (1) Blunt trauma with tension pneumothorax
         (2) Electrocution
         (3) Drowning
         (4) Hypothermia
   3. Abdominal pain
      a. Scenarios
         (1) Acute abdominal pain
         (2) Chronic abdominal pain
      b. Must demonstrate the ability to identify/ differentiate between
         (1) Acute myocardial infarction

(2) Aortic aneurism
(3) Renal colic
(4) Ruptured ectopic pregnancy
(5) Cholecystitis
(6) Appendicitis
(7) Hernia/ intestinal obstruction

4. GI Bleeding
   a. Must demonstrate the ability to identify/ differentiate between
      (1) Upper GI bleeding
      (2) Lower GI bleeding
5. Altered mental status
   a. Must demonstrate the ability to identify/ differentiate between
      (1) Alcohol overdose
      (2) Drug ingestion/ overdose
      (3) Idiopathic seizure disorder
      (4) Hypoglycemia
      (5) Hyperglycemia
      (6) Stroke
      (7) Transient ischemic attack
      (8) Head injury
6. Dyspnea
   a. Must demonstrate the ability to identify/ differentiate between
      (1) Emphysema/ chronic bronchitis
      (2) Asthma/ acute bronchospasm
      (3) Acute pulmonary edema/ left heart failure
      (4) Acute myocardial infarction
      (5) Foreign body obstruction
      (6) Pneumonia
      (7) Pulmonary embolism
      (8) Spontaneous pneumothorax
      (9) Hyperventilation syndrome/ carpo-pedal spasm
      (10) Smoke/ toxic inhalation
7. Syncope
   a. Must demonstrate the ability to identify/ differentiate between
      (1) Cardiac related
         (a) Bradycardia/ heart block
         (b) Paroxysmal supraventricular tachycardia
         (c) Ventricular tachycardia
      (2) Vascular/ volume causes
         (a) Medication induced
         (b) Hypovolemia
         (c) Carotid sinus stimulation
         (d) Orthostatic
         (e) Vaso-vagal
      (3) Metabolic
         (a) Hypoglycemic

(b) Hyperventilation
(4) Neurologic
(a) TIA
(b) Seizure

8. Seizure
   a. Must demonstrate the ability to differentiate between
      (1) Idiopathic
      (2) Fever
      (3) Neoplasms
      (4) Infection
      (5) Metabolic
         (a) Hypoxia
         (b) Hypoglycemia
         (c) Thyrotoxicosis
         (d) Hypocalcemia
      (6) Drug intoxication
      (7) Drug withdrawal
      (8) Head trauma
      (9) Eclampsia
      (10) Cerebral degenerative diseases
9. Thermal/ environmental
   a. Scenarios
      (1) Hypothermia
      (2) Hyperthermia
      (3) Superficial/ deep frostbite
      (4) Thermal burns
      (5) Smoke inhalation
      (6) Near drowning
10. Hazardous materials/ toxicology
   a. Scenarios
      (1) Accidental toxic ingestion
      (2) Toxic inhalation
      (3) Chemical burn/ contact dermatitis
      (4) Chemicals in the eyes
      (5) Overdose/ street drugs
11. Trauma
   a. Scenarios
      (1) Isolated extremity fracture (tibia/ fibula or radius/ ulna)
      (2) Femur fracture (hip, mid-shaft, supra-condylar)
      (3) Shoulder dislocation
      (4) Clavicular fracture or A-C separation
      (5) Minor wounds
      (6) Spinal injuries
      (7) Multiple trauma - blunt
      (8) Penetrating trauma
      (9) Impaled object

(10) Elderly fall
(11) Athletic injury
(12) Head injury

b. Must demonstrate the ability to identify/ differentiate between
(1) Minor wound - no sutures required
(2) Minor wound - sutures required
(3) High risk wounds
(4) Wound with tendon and/ or nerve injury
(5) Spine injury - no neurologic deficit
(6) Spine injury - neurologic deficit
(7) Concussion
(8) Subdural/ epidural hematoma

12. Allergic reactions/ bites/ envenomation
a. Scenarios
(1) Bee sting
(2) Pit viper envenomation
(3) Spider/ scorpion
(4) Human bite
b. Must demonstrate the ability to identify/ differentiate between
(1) Local allergic reaction
(2) Systemic allergic reaction

13. Behavioral
a. Scenarios
(1) Mood disorders - depression, bi-polar (manic-depression)
(2) Schizophrenic and delusional disorders
(3) Suicidal

14. Obstetrics/ gynecology
a. Scenarios
(1) Vaginal bleeding
(2) Childbirth (normal and abnormal)
b. Must demonstrate the ability to identify
(1) Ectopic pregnancy

15. Pediatric
a. Scenarios
(1) Respiratory distress/ failure/ arrest
(2) Shock
(3) Cardiopulmonary failure/ arrest
(4) Major trauma
(5) Fever
(6) Seizures
b. Must demonstrate the ability to identify/ differentiate between
(1) Respiratory distress/ failure/ arrest
(2) Upper airway obstruction/ lower airway disease
(3) Cardiogenic/ non-cardiogenic shock
(4) Major/ minor trauma

UNIT TERMINAL OBJECTIVE

8-1 At the completion of this unit, the paramedic will understand standards and guidelines that help ensure safe and effective ground and air medical transport.

COGNITIVE OBJECTIVES

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

8-1.1 Identify current local and state standards which influence ambulance design, equipment requirements and staffing of ambulances. (C-1)
8-1.2 Discuss the importance of completing an ambulance equipment/ supply checklist. (C-1)
8-1.3 Discuss the factors to be considered when determining ambulance stationing within a community. (C-1)
8-1.4 Describe the advantages and disadvantages of air medical transport. (C-1)
8-1.5 Identify the conditions/ situations in which air medical transport should be considered. (C-1)

AFFECTIVE OBJECTIVES

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

8-1.6 Assess personal practices relative to ambulance operations which may affect the safety of the crew, the patient and bystanders. (A-3)
8-1.7 Serve as a role model for others relative to the operation of ambulances. (A-3)
8-1.8 Value the need to serve as the patient advocate to ensure appropriate patient transportation via ground or air. (A-2)

PSYCHOMOTOR OBJECTIVES

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

8-1.9 Demonstrate how to place a patient in, and remove a patient from, an ambulance. (P-1)

DECLARATIVE

I. Ambulance operations
  A. Ambulance standards
    1. Influence ambulance design, equipment, and staffing
      a. State statutes/ administrative rules
        (1) KKK specifications
        (2) Air ambulance standards
        (3) Operational staffing standards
        (4) Operational driver standards
        (5) Operational driving standards
        (6) Operational equipment standards
        (7) City/ county/ district ordinance standards
  B. Checking ambulances
    1. Completing an ambulance equipment/ supply checklist is important
      a. Safety
      b. Patient care
      c. Risk management issues
      d. Scheduled medications
  C. Ambulance stationing
    1. Peak load staffing (cyclic patterns)
      a. Geographical demands
      b. Standards of reliability
      c. Patient demand
      d. Traffic congestion
      e. Deployment strategies
  D. Safe ambulance operation
    1. Factors in safe driving
    2. Using escorts
    3. Adverse environmental conditions
    4. Use of lights and sirens
    5. Proceeding through intersections
    6. Parking at an emergency scene
    7. Operate with "due regard for the safety of all others"
    8. Safely placing a patient in and removing a patient from an ambulance

II. Utilizing air medical transport
  A. Types
    1. Rotorcraft
    2. Fixed wing
  B. Advantages
    1. Specialized care
      a. Skills, supplies, equipment
    2. Rapid transport
    3. Access to remote areas
    4. Helicopter hospital helipads

C. Disadvantages
   1. Weather/ environmental
   2. Altitude limitations
   3. Airspeed limitations
   4. Aircraft cabin size
   5. Terrain
   6. Cost

D. Activation
   1. Local and state guidelines exist for air medical activation
      a. State statutes
      b. Administrative rules
      c. City/ county/ district ordinance standards

E. Indications for patient transport
   1. Medical
   2. Trauma
   3. Search and rescue

F. Patient transfer
   1. Interacting with flight personnel
   2. Patient preparation
   3. Scene safety
      a. Securing loose objects
      b. Approaching the aircraft

UNIT TERMINAL OBJECTIVE

8-2 At the completion of this unit, the paramedic student will be able to integrate the principles of general incident management and multiple casualty incident (MCI) management techniques in order to function effectively at major incidents.

COGNITIVE OBJECTIVES

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

8-2.1 Explain the need for the incident management system (IMS)/ incident command system (ICS) in managing emergency medical services incidents. (C-1)
8-2.2 Define the term multiple casualty incident (MCI). (C-1)
8-2.3 Define the term disaster management. (C-1)
8-2.4 Describe essential elements of scene size-up when arriving at a potential MCI. (C-1)
8-2.5 Describe the role of the paramedics and EMS systems in planning for MCIs and disasters. (C-1)
8-2.6 Define the following types of incidents and how they affect medical management: (C-1)
- a. Open or uncontained incident
- b. Closed or contained incident

8-2.7 Describe the functional components of the incident management system in terms of the following: (C-1)
1. Command
2. Finance
3. Logistics
4. Operations
5. Planning

8-2.8 Differentiate between singular and unified command and when each is most applicable. (C-3)
8-2.9 Describe the role of command. (C-1)
8-2.10 Describe the need for transfer of command and procedures for transferring it. (C-1)
8-2.11 Differentiate between command procedures used at small, medium and large scale medical incidents. (C-1)
8-2.12 Explain the local/ regional threshold for establishing command and implementation of the incident management system including threshold MCI declaration. (C-1)
8-2.13 List and describe the functions of the following groups and leaders in ICS as it pertains to EMS incidents: (C-1)
- a. Safety
- b. Logistics
- c. Rehabilitation (rehab)
- d. Staging
- e. Treatment
- f. Triage
- g. Transportation
- h. Extrication/ rescue
- I Disposition of deceased (morgue)
- j. Communications

8-2.14 Describe the methods and rationale for identifying specific functions and leaders for these

functions in ICS. (C-1)

8-2.15 Describe the role of both command posts and emergency operations centers in MCI and disaster management. (C-1)

8-2.16 Describe the role of the physician at multiple casualty incidents. (C-1)

8-2.17 Define triage and describe the principles of triage. (C-1)

8-2.18 Describe the START (simple triage and rapid treatment) method of initial triage. (C-1)

8-2.19 Given a list of 20 patients with various multiple injuries, determine the appropriate triage priority with 90% accuracy. (C-3)

8-2.20 Given color coded tags and numerical priorities, assign the following terms to each: (C-1)

a. Immediate
b. Delayed
c. Hold
d. Deceased

8-2.21 Define primary and secondary triage. (C-1)

8-2.22 Describe when primary and secondary triage techniques should be implemented. (C-1)

8-2.23 Describe the need for and techniques used in tracking patients during multiple casualty incidents. (C-1)

8-2.24 Describe techniques used to allocate patients to hospitals and track them. (C-1)

8-2.25 Describe modifications of telecommunications procedures during multiple casualty incidents. (C-1)

8-2.26 List and describe the essential equipment to provide logistical support to MCI operations to include: (C-1)

a. Airway, respiratory and hemorrhage control
b. Burn management
c. Patient packaging/ immobilization

8-2.27 List the physical and psychological signs of critical incident stress. (C-1)

8-2.28 Describe the role of critical incident stress management sessions in MCIs. (C-1)

8-2.29 Describe the role of the following exercises in preparation for MCIs: (C-1)

a. Table top exercises
b. Small and large MCI drills

AFFECTIVE OBJECTIVES

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

8-2.30 Understand the rationale for initiating incident command even at a small MCI event. (A-1)

8-2.31 Explain the rationale for having efficient and effective communications as part of an incident command/ management system. (A-1)

8-2.32 Explain why common problems of an MCI can have an adverse effect on an entire incident. (A-1)

8-2.33 Explain the organizational benefits for having standard operating procedures (SOPs) for using

the incident management system or incident command system. (A-1)

PSYCHOMOTOR OBJECTIVES

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

8-2.34 Demonstrate the use of local/ regional triage tagging system used for primary and secondary triage. (P-1)
8-2.35 Given a simulated tabletop multiple casualty incident, with 5-10 patients: (P-1)
- a. Establish unified or singular command
- b. Conduct a scene assessment
- c. Determine scene objectives
- d. Formulate an incident plan
- e. Request appropriate resources
- f. Determine need for ICS expansion and groups
- g. Coordinate communications and groups leaders
- h. Coordinate outside agencies

8-2.36 Demonstrate effective initial scene assessment and update (progress) reports. (P-1)
8-2.37 Given a classroom simulation of a MCI with 5-10 patients, fulfill the role of triage group leader. (P-3)
8-2.38 Given a classroom simulation of a MCI with 5-10 patients, fulfill the role of treatment group leader. (P-3)
8-2.39 Given a classroom simulation of a MCI with 5-10 patients, fulfill the role of transportation group leader. (P-3)

DECLARATIVE

I. Introduction
- A. Need for incident command system
  1. Used at small "everyday" incidents
  2. Expands/ contracts as incident evolves
  3. Provides a clear system of command/ control
  4. Overcomes jurisdictions and geographic boundaries
- B. The FEMA incident management or command system
  1. National standard for incident management
  2. Used by public and by private sectors
  3. Flexible system
  4. Used for routine and large scale emergencies
- C. Incident command system elements
  1. Define span of control
  2. Define multiple casualty incident
  3. Define incident management system (IMS)/ incident command system (ICS)

4. Define disaster management
5. Uniform terminology
6. Geographic and functional components
7. Define an open or uncontained incident
8. Define a closed or contained incident
9. Major functional areas are C-FLOP
    a. C command
    b. F finance
    c. L logistics
    d. O operations
    e. P planning
10. Discuss importance of communications
11. Define triage
12. Define transfer of command
13. Define sectorization
14. Discuss benefits of using standard operating procedures (SOPs) for ICS
15. Identify laws or regulations that relate to the incident command system

D. Need for preplanning
    1. Periodic review of plan and updating as needed
    2. Participation in local/ regional planning

E. Drills and critiques
    1. Need to practice the plan
        a. Drills
        b. Table top exercises
    2. Critiques
        a. Drills and exercises
        b. Actual MCIs and incidents where IMS or ICS model is used

II. Basic elements of the incident command system (C-FLOP)

A. Command
    1. Responsible for all functions unless delegated
        a. Oversees incident needs
        b. Establishes objectives/ priorities
        c. Develops action plan
        d. Coordinates with other agencies/ officials
        e. Identifies appropriate command structure for operation size
        f. Approves, orders and releases resources
    2. Established at all incidents
        a. Identify appropriate command structure for size of incident
    3. Singular command

a. Single commander responsible for entire operation
b. Works well for incidents with limited jurisdictions or responsibilities
c. Ideal for short duration limited incidents
d. Unrealistic in many localities
(1) Overlapping responsibilities
(2) Overlapping jurisdictions
(3) Incident evolution

4. Unified command
a. EMS-police-fire command personnel unify
b. As incident evolves, right agency leads at the right time
c. Identification and accessing appropriate agency(ies) or specialized organization, as needed, to complement command (e.g. health department, public works, building department, American Red Cross, Salvation Army, etc.)
d. Stimulates cooperation
e. Provides for balanced decision making
f. Selection of sector leaders and functions
g. "Span of control" (supervisor/ worker ratio)
(1) 1 to 6 ratio
(2) Maintaining unity/ command structure
h. Determines need for public information officer and liaison with media

B. Finance
1. Accounting and administration of the incident
2. Staff support function
a. Monitors costs, provides for careful accounting
b. Seldom used on small scale incidents
c. Essential as incident grows in magnitude and costs
d. Not a component used in routine daily incidents
e. Finance section responsible for
(1) Time accounting
(2) Procurement
(3) Paying claims
(4) Estimating costs

C. Logistics
1. Procurement and stockpiling of equipment and supplies
2. Staff support function
a. Support the logistical needs of the incident
b. Logistics appropriate to incident size/ duration
c. Seldom used at routine daily incidents
d. Logistics section responsible for

(1) Supplies/ equipment
(2) Facilities
(3) Food
(4) Communications support
(5) Medical support for workers

D. Operations
1. Carries out the action functions and commands direction
2. Line or actual operational responsibility
3. Major functional area in all operations
a. Carries out tactical objectives
b. Directs the front end activities
c. Participates in planning
d. Modifies action plan
e. Maintains discipline
f. Accounts for personnel
4. EMS operation areas fall under this section

E. Planning
1. Staff function to provide past, present and future information about the incident
2. Resource and situation status on a real time basis

III. Role and functions of command in managing major medical incidents
A. Establishing command
1. Local threshold as to when command is established
2. Low threshold encourages frequent practice (> 2 patients)
3. Identify which group/ sector functions or major functional areas need to be implemented for the size and scope of incident
4. Unification of EMS command with fire and police
5. Tactical worksheet used to focus command on SOP
6. Bib or other ID to easily identify command
7. Assumption of a command position and arrival report

B. Scene assessment
1. First unit on the scene should make a quick and rapid assessment of the situation
a. Windshield assessment
b. What is observed as you enter the area (incident scene)
2. Precise and complete assessment should be done as soon as safety and time permit
a. Type of incident and potential duration
b. Entrapment or special rescue resources needed
c. Number of patients in each triage category
d. Additional resources needed

3. Continually updated scene assessment

C. Communications
   1. Command established over radio with communication center/ emergency operations center (EOC)
   2. Radio traffic can be very distracting
   3. In larger incidents communications aide is used

D. Obtaining resources
   1. Additional units requested according to the situation
   2. Communications center should have written SOP on mutual aid
   3. Assignment of units consistent with the situation
   4. Additional support services requested as needed for victims, for food, shelter and clothing

E. Strategic deployment of resources
   1. Command issues instructions as to deployment
   2. Personnel stay with vehicle until given instructions
   3. Staging slows resource deployment and premature commitment
   4. Staging techniques
      a. Lining vehicles up at scene to facilitate egress
      b. Staging off of the limited access highway
      c. Formal staging area with staging officer assigned
   5. Resources deployed more effectively

F. Strategic development of resources
   1. "Tool box" theory
      a. Identification of resources ("tools") specific to an incident, utilizing only needed resources
      b. Issue instruction for deployment of resources

G. Transferring command
   1. Procedures established for transferring command
   2. Command remains in that position until relieved according to SOP
   3. Limitation of transferring command

H. Terminating command
   1. Procedures established for de-escalation and relief of units
   2. Procedures for terminating command and the ICS structure

I. Command procedures at various size events
   1. Small
   2. Medium
   3. Large

J. Common problems at a multiple casualty incident
   1. Failure to adequately provide widespread notification of the event
   2. Lack of rapid "initial" stabilization of all patients

3. Failure to move, collect and to organize patients rapidly at a treatment area
4. Failure to provide proper triage
5. Overly time consuming care employed
6. Premature transportation of patients
7. Improper use of personnel in field
8. Lack of proper distribution of patients to medical facilities
9. Lack of recognizable EMS command in the field
10. Lack of proper preplanning and lack of adequate training of all personnel [Alex M. Butman, "Responding to the MCI: A Guide for EMS Personnel", © 1982]

IV. Group or sector functions
- A. Safety officer
  1. Staff role to monitor safety of workers at incident
  2. Authority to stop unsafe procedures or institute safety procedures
  3. Necessary at large scale incidents
- B. Logistics
  1. Provides essential equipment and medical supplies
  2. Generally established and pre-positioned during the pre-MCI/ planning phase
  3. Supports the operational needs of the incident
- C. Rehabilitation
  1. Locates and sets up the rehabilitation area
  2. Rehabilitation area set up
     a. In safe area with thermal control
     b. Away from exhaust fumes and crowds
  3. Monitors personnel and assures proper rest and hydration
  4. Work with logistics to assure proper hydration and personnel monitoring supplies
- D. Staging
  1. Locates and sets up sufficient area to stage equipment/ personnel
     a. Lining vehicles up to facilitate egress
  2. Formal staging area with staging officer assigned
  3. Assures apparatus is parked to allow egress when deployed
  4. Confers with command about additional resources needed
  5. Releases resources for deployment when ordered by command
  6. Ensures personnel stay with vehicle until deployed
  7. Supervises personnel within sector
  8. Tracks unit arrival and deployment from staging
  9. Prevents premature commitment of resources
- E. Treatment
  1. Locates and sets up the treatment area according to the situation

2. Generally away from immediate action area
3. Provides for treatment areas for priority 1,2,3 patients
4. Provides for secondary triage of patients as they arrive in treatment
5. Assures patients receive adequate care in each sub-area
6. Communicates/ coordinates with command, triage and transportation
7. Moves patients to transportation appropriately
8. Supervises personnel within the group

F. Triage
1. Works at the incident or action site
2. Assures initial primary triage is conducted to minimize re-triage
3. Determines site treatment needs and assures initial triage/ treatment
4. Organizes resources to deliver patients to the treatment area
5. Responsible for supervising safety and treatment of entrapped patients

G. Transportation
1. Establishes ambulance staging and landing zones if necessary
2. Determines availability of receiving facilities and treatment capabilities
3. Coordinates transportation and distribution of patients to appropriate receiving facilities
4. Tracks patients leaving the site and maintains tracking log with
   a. Patient ID
   b. Unit transporting
   c. Destination facility

H. Extrication/ rescue
1. Determines type of equipment and resources needed
2. Identifies the need for specialized equipment and personnel with unique expertise
3. Assures special safety equipment is available to all personnel (e.g. SCBA, protective clothing, etc.)
4. Supervises personnel within group
5. Ensures that support materials (e.g. gasoline, electricity, compressed air, etc.) for extrication equipment and materials are readily available
6. Works with treatment personnel with extended extrication or special rescue situations
7. Coordinates with safety officer, staging, and triage

I. Disposition of deceased
1. Works with medical examiner, coroner, law enforcement and other appropriate agencies to coordinate disposition of deceased (attempt to leave deceased victims in location found, if possible, until a decision and plan for disposition can be determined)
2. Assists in establishing an appropriate and secure area for a morgue, if needed

3. Monitors personnel for signs of stress

J. Communications
   1. Modification of communications techniques
      a. Calm communications (helps sets an orderly tone)
      b. Avoid use of radio codes/ signals
      c. Plain English and terminology is used
      d. Need for a common radio channel between command, sectors (groups), divisions
      e. Radio traffic should be minimized
      f. Face-to-face communication is encouraged to limit radio traffic
   2. Importance of communications at an MCI
   3. Communication requirements of command post and emergency operations center

V. On-scene physicians in multiple casualty incident management
   A. Triage function
      1. Increased ability to make difficult triage decisions
      2. Use at treatment area to make secondary triage decisions
      3. Emergency surgery to facilitate extrication
   B. Treatment capabilities
      1. On-scene ability to perform specialized invasive procedures
      2. More accurate assessment and direction of specific treatments
   C. Medical direction
      1. On-scene medical direction of paramedics

VI. Principles and techniques of triage
   A. Primary versus secondary triage
      1. Primary triage used at site to rapidly categorize patients condition for treatment
         a. Document location of patient and transport needs
         b. Triage tape or labels used
         c. Focus on speed to sort patients quickly
      2. Secondary triage used at treatment area
         a. Retriage of patients
         b. Usually accomplished at the treatment area
         c. Paper tags usually used
         d. Not always necessary especially at small incidents
   B. START technique of primary triage
      1. Developed at Hoag Memorial Hospital, Newport Beach, CA
      2. Stands for "simple triage and rapid treatment"
      3. Rapidly allows sorting of patients
      4. Accurate with practice

5. Focuses on
   a. Ability to walk
   b. Respiratory effort
   c. Pulses/ perfusion
   d. Neurologic status

C. START technique
1. Walking wounded verbally directed to a designated location
2. Initial triage effort is directed to non-walking patients
3. Only treatment effort directed to correction of airway and severe bleeding
4. Respiratory effort assessed
   a. No respirations — Priority-0 (P-0)
   b. Above 30 — Priority-1 (P-1)
   c. Below 30 — Go to next assessment
5. Perfusion assessed
   a. Absence of radial pulse — Priority-1 (P-1)
   b. Radial pulse — Go to next assessment
6. Neurologic assessed
   a. Unresponsive — Priority-1 (P-1)
   b. Altered LOC — Priority-2 (P-2)
   c. Alert — Priority-3 (P-3)
7. Walking wounded need to be carefully triaged

D. Triage tagging/ labeling
1. International agreement on color coding and priorities
   a. Immediate — Red — Priority-1 (P-1)
   b. Delayed — Yellow — Priority-2 (P-2)
   c. Hold — Green — Priority-3 (P-3)
   d. Deceased — Black — Priority-0 (P-0)
2. Many variations of tags, tape and labels available
3. Purpose of tagging
   a. Identify the priority of the patient
   b. Prevent re-triage of the same patient
   c. Serve as a tracking system during treatment/ transport
4. Tags/ labels should be
   a. Easy to use
   b. Rapidly identify priority
   c. Allow for easy tracking
   d. Allow for some documentation
   e. Prevent patients from re-triaging themselves
5. Should be used routinely so their use becomes familiar

E. Tracking systems for patients

1. Destination log must be maintained by the transportation officer
2. Log and tagging system must be integrated in order to track patients
3. Either name or triage label ID# should be used
4. Tracking log is similar to a shipping manifest with
    a. Patient identification
    b. Unit transporting
    c. Priority
    d. Destination

F. Transportation of patients
1. Method of transportation driven by triage priority and situation
2. Ambulance (s) are the typical method of transportation
3. Buses should be considered for transporting large numbers of P-3s
4. Air ambulances are often used for transport of critical patients

VII. Critical incident stress and MCIs
A. Critical incident stress in personnel exposed to major events
B. Critical incident stress debriefing should be part of post-incident SOP
C. Access to defusing during the MCI
D. Role of debriefing for an MCI
E. Access to debriefing

UNIT TERMINAL OBJECTIVE

8-3 At the completion of this unit, the paramedic student will be able to integrate the principles of rescue awareness and operations to safely rescue a patient from water, hazardous atmospheres, trenches, highways, and hazardous terrain.

COGNITIVE OBJECTIVES

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

8-3.1 Define the term rescue. (C-1)
8-3.2 Explain the medical and mechanical aspects of rescue situations. (C-1)
8-3.3 Explain the role of the paramedic in delivering care at the site of the injury, continuing through the rescue process and to definitive care. (C-1)
8-3.4 Describe the phases of a rescue operation. (C-1)
8-3.5 List and describe the types of personal protective equipment needed to safely operate in the rescue environment to include: (C-1)
- a. Head protection
- b. Eye protection
- c. Hand protection
- d. Personal flotation devices
- e. Thermal protection/ layering systems
- f. High visibility clothing
- g. Specialized footwear

8-3.6 Explain the differences in risk between moving water and flat water rescue. (C-1)
8-3.7 Explain the effects of immersion hypothermia on the ability to survive sudden immersion and self rescue. (C-1)
8-3.8 Explain the phenomenon of the cold protective response in cold water drowning situations. (C-1)
8-3.9 Identify the risks associated with low head dams and the rescue complexities they pose. (C-1)
8-3.10 Given a picture of moving water, identify and explain the following features and hazards associated with: (C-2)
- a. Hydraulics
- b. Strainers
- c. Dams/ hydro-electric sites

8-3.11 Explain why water entry or go techniques are methods of last resort. (C-1)
8-3.12 Explain the rescue techniques associated with reach-throw-row-go. (C-1)
8-3.13 Given a list of rescue scenarios, identify the victim survivability profile and which are rescue versus body recovery situations. (C-1)
8-3.14 Explain the self rescue position if unexpectedly immersed in moving water. (C-1)
8-3.15 Given a series of pictures identify which would be considered "confined spaces" and potentially oxygen deficient. (C-3)
8-3.16 Identify the hazards associated with confined spaces and risks posed to potential rescuers to include: (C-1)
- a. Oxygen deficiency
- b. Chemical/ toxic exposure/ explosion
- c. Engulfment
- d. Machinery entrapment
- e. Electricity

8-3.17 Identify components necessary to ensure site safety prior to confined space rescue attempts. (C-1)
8-3.18 Identify the poisonous gases commonly found in confined spaces to include: (C-1)

a. Hydrogen sulfide (H_2S)
b. Carbon dioxide ($C0_2$)
c. Carbon monoxide (CO)
d. Low/ high oxygen concentrations ($Fi0_2$)
e. Methane (CH_4)
f. Ammonia (NH_3)
g. Nitrogen dioxide (NO_2)

8-3.19 Explain the hazard of cave-in during trench rescue operations. (C-1)
8-3.20 Describe the effects of traffic flow on the highway rescue incident including limited access superhighways and regular access highways. (C-1)
8-3.21 List and describe the following techniques to reduce scene risk at highway incidents: (C-1)
a. Apparatus placement
b. Headlights and emergency vehicle lighting
c. Cones, flares
d. Reflective and high visibility clothing
8-3.22 List and describe the hazards associated with the following auto/ truck components: (C-1)
a. Energy absorbing bumpers
b. Air bag/ supplemental restraint systems
c. Catalytic converters and conventional fuel systems
d. Stored energy
e. Alternate fuel systems
8-3.23 Given a diagram of a passenger auto, identify the following structures: (C-1)
a. A, B, C, D posts
b. Fire wall
c. Unibody versus frame designs
8-3.24 Describe methods for emergency stabilization using rope, cribbing, jacks, spare tire, and come-a-longs for vehicles found on their: (C-1)
a. Wheels
b. Side
c. Roof
d. Inclines
8-3.25 Describe the electrical hazards commonly found at highway incidents (above and below ground). (C-1)
8-3.26 Explain the difference between tempered and safety glass, identify its locations on a vehicle and how to break it safely. (C-3)
8-3.27 Explain typical door anatomy and methods to access through stuck doors. (C-1)
8-3.28 Explain SRS or "air bag" systems and methods to neutralize them. (C-1)
8-3.29 Define the following terms: (C-1)
a. Low angle
b. High angle
c. Belay
d. Rappel
e. Scrambling
f. Hasty rope slide
8-3.30 Describe the procedure for stokes litter packaging for low angle evacuations. (C-1)
8-3.31 Explain the procedures for low angle litter evacuation to include: (C-1)
a. Anchoring
b. Litter/ rope attachment
c. Lowering and raising procedures

8-3.32 Explain techniques to be used in non-technical litter carries over rough terrain. (C-1)
8-3.33 Explain non-technical high angle rescue procedures using aerial apparatus. (C-1)
8-3.34 Develop specific skill in emergency stabilization of vehicles and access procedures and an awareness of specific extrication strategies. (C-1)
8-3.35 Explain assessment procedures and modifications necessary when caring for entrapped patients. (C-1)
8-3.36 List the equipment necessary for an "off road" medical pack. (C-1)
8-3.37 Explain specific methods of improvisation for assessment, spinal immobilization and extremity splinting. (C-1)
8-3.38 Explain the indications, contraindications and methods of pain control for entrapped patients. (C-1)
8-3.39 Explain the need for and techniques of thermal control for entrapped patients. (C-1)
8-3.40 Explain the pathophysiology of "crush trauma" syndrome. (C-1)
8-3.41 Develop an understanding of the medical issues involved in providing care for a patient in a rescue environment. (C-1)
8-3.42 Develop proficiency in patient packaging and evacuation techniques that pertain to hazardous or rescue environments. (C-1)
8-3.43 Explain the different types of "stokes" or basket stretchers and the advantages and disadvantages associated with each. (C-1)

AFFECTIVE OBJECTIVES
None identified for this unit.

PSYCHOMOTOR OBJECTIVES
At the completion of this lesson, the paramedic student should be able to:

8-3.44 Using cribbing, ropes, lifting devices, spare tires, chains, and hand winches, demonstrate the following stabilization procedures: (P-1)
- a. Stabilization on all four wheels
- b. Stabilization on its side
- c. Stabilization on its roof
- d. Stabilization on an incline/ embankments

8-3.45 Using basic hand tools demonstrate the following: (P-1)
- a. Access through a stuck door
- b. Access through safety and tempered glass
- c. Access through the trunk
- d. Access through the floor
- e. Roof removal
- f. Dash displacement/ roll-up
- g. Steering wheel/ column displacement
- h. Access through the roof

8-3.46 Demonstrate methods of "stokes" packaging for patients being: (P-1)
- a. Vertically lifted (high angle)
- b. Horizontally lifted (low angle)
- c. Carried over rough terrain

8-3.47 Demonstrate methods of packaging for patients being vertically lifted without stokes litter stretcher packaging. (P-1)
8-3.48 Demonstrate the following litter carrying techniques: (P-1)
- a. Stretcher lift straps
- b. "Leap frogging"

c. Passing litters over and around obstructions

8-3.49 Demonstrate litter securing techniques for patients being evacuated by aerial apparatus. (P-1)

8-3.50 Demonstrate in-water spinal immobilization techniques. (P-1)

8-3.51 Demonstrate donning and properly adjusting a PFD. (P-1)

8-3.52 Demonstrate use of a throw bag. (P-1)

DECLARATIVE

I. Role of the paramedic in rescue operations
- A. Definition of rescue according to Webster - the act of delivery from danger or imprisonment
  1. Humans who are traumatized or stranded need rescue
  2. No patient - no rescue
  3. Rescue is a patient driven event
- B. Rescue involves both medical and mechanical skills with the correct amount of each applied at the appropriate time
  1. Patients must be accessed and assessed for treatment needs
  2. Patient treatment must begin at the site
  3. Patient must be released from entrapment or imprisonment
  4. Medical care must continue throughout the incident
  5. There is no army in the world that does not train and deploy medical people into combat
  6. Medical and mechanical skills must be carefully balanced to ensure that patients obtain effective treatment and timely extraction
  7. Must have a well coordinated effort between medical care and specialized rescue effort
  8. Rescue effort must be driven by the patient's medical and physical needs
- C. Role of the paramedic in rescue operations
  1. Have proper training and PPE to allow access and the provision of treatment at the site and continuing throughout the incident
  2. As first responders to many incidents
     a. Understand hazards associated with various environments
     b. Know when it is safe/ unsafe to gain access or attempt rescue
     c. Have skills to effect a rescue when safe and necessary
     d. Understand the rescue process and when certain techniques are indicated or contraindicated
  3. Be skilled in specialized patient packaging techniques to allow safe extraction and medical care
- D. Phases of a rescue operation
  1. Arrival and size-up
     a. Responders must understand the environment and risks
     b. Establish command and conduct a scene assessment
     c. Determine the number of patients and triage as necessary
     d. Determine if situation is a search, rescue or body recovery
     e. Risk versus benefit analysis
     f. Request additional resources
     g. ICS used as a command/ control mechanism
     h. Make a realistic "time" estimate in accessing and evacuating
  2. Hazard control
     a. Control as many of the hazards as possible
     b. Manage, reduce and minimize the risks from the uncontrollable hazards
     c. Make the scene as safe as possible
     d. Ensure all personnel are in PPE appropriate for the situation
  3. Gain access to the patient
     a. Determine the best method to gain access to the patient
     b. Deploy personnel to the patient
     c. Stabilize the physical location of the patient

4. Medical treatment
   a. Medical treatment provided appropriate to the situation
5. Disentanglement
   a. Release from physical entrapment
   b. Methods must be driven by patient's needs
   c. Risk versus benefit assessment
   d. Could involve use of specialized equipment and techniques
6. Patient packaging
   a. Patient packaged to ensure their medical needs are addressed
   b. Physically secure to prevent additional injury
7. Transportation
   a. Often as simple as carrying the patient to an ambulance
   b. Could involve air evacuation
   c. Could involve specialized operations

II. Rescuer personal protective equipment (PPE)
   A. Rescuer protection
      1. The same PPE is not appropriate in all situations
         a. PPE must be appropriate for/ to the situation encountered
         b. PPE may not prevent exposure to infectious disease but it does minimize risk
         c. Most PPE is not specifically designed for EMS workers
      2. EMS PPE historically has been adapted from other fields
         a. EMS does not have a national uniform trauma reporting system to identify potential work related exposures
         b. Risk management and PPE design needs to be driven by data
   B. Head/ eye/ hearing/ hand/ foot protection
      1. Adequate head protection depends on the environment
         a. Compact firefighter's helmet meeting NFPA standards adequate for most vehicle/ structural applications
         b. Climbing helmet used for many confined space and technical rescue applications
         c. Padded rafting/ kayaking helmet for water rescue
         d. Must meet safety standards for the appropriate application
      2. Eye protection
         a. Face shield on most fire helmets is inadequate
         b. ANSI approved safety glasses/ goggles with side shields is best
      3. Hearing protection
         a. For high noise areas
         b. Ear plugs or ear muffs
      4. Hand protection
         a. Gloves to protect the hands
         b. Must allow for adequate dexterity
         c. Protection from cuts/ puncture
      5. Foot protection
         a. Ankle support to limit range of motion
         b. Tread to provide traction and prevent slips
         c. Insulated in some environments
         d. Steel toe/ shank required to meet some safety requirements
   C. Flame/ flash protection

1. Nomex/ PBI/ flame retardant cotton designed to provide limited flash protection
   a. Turnout clothing
   b. Jump-suits/ flyers coveralls
2. Does not provide complete protection from puncture or cuts
3. Thermal protection from turnout clothing increases heat stress
4. Should be used when danger from fire exists

D. Personal flotation devices (PFD)
1. Meet Coast Guard standards for flotation
2. Must be used when operating on or around the water
3. Type III preferred for most rescue work
   a. Should have whistle and strobe light attached
   b. Knife for cutting should be attached

E. Visibility
1. Reflective trim should be on all outer-wear
2. Orange clothing or safety vests should be used when in highway operations

F. Extended, remote or wilderness protection
1. Additional/ different PPE must be considered for bad weather conditions not normally encountered (cold, rain, snow, wind)
2. Personal drinking water
3. Personal snacks for a few hours
4. Possible shelter needs

III. Surface water rescue
A. Moving water and common hazards
1. Hydraulics of moving water change with many variables
   a. Water depth
   b. Velocity
   c. Obstructions to flow
2. Force of moving water is very deceptive
3. Rescue using "go" techniques requires special skills
4. Rescuer perception
   a. People are drawn to moving water for recreation
   b. Many underestimate the power of the water
   c. Unaware rescuers also underestimate the power of the water
   d. Fail to understand the hazards involved
5. "Drowning machines"- recirculating currents
   a. Water moving over a uniform obstruction to flow
   b. Most commonly found on "low head" dams
   c. Commonly found on many rivers
   d. Innocuous in appearance
   e. Victims caught in the recirculating flow of the current
   f. Escape very difficult
   g. Same hydraulic can be created by many other obstructions
   h. Hazardous rescue
6. Strainers
   a. Water moving through obstructions in flood or river
      (1) Trees
      (2) Grating/ wire mesh

b. Current may move victim into strainer
c. Force of water against victim makes escape difficult
d. Hazardous rescue

7. Foot/ extremity pin
   a. Unsafe to walk in fast moving water over knee depth
   b. If extremity becomes trapped force of water forces victim under the surface
   c. Extremity must be extricated the same way it went in
   d. Hazardous rescue
8. Dams, hydroelectric intakes
   a. Height of dam no indication of the degree of hazard
   b. Intakes can act as strainers
   c. Most dams create recirculating currents
   d. Hazardous rescue

B. Flat water (slow moving or still water)
   1. Most people who drown never planned on being in the water
      a. PFDs routinely worn and fastened properly when on or around the water save lives
      b. Having the PFD available but unworn is not enough
   2. Alcohol consumption is a contributory factor to many flat water boating incidents
      a. Alcohol alters mental ability and reason
   3. Water temperature and hypothermia can quickly incapacitate and lead to drowning
      a. Routine use of PFDs decreases the likelihood of drowning

C. Water temperature
   1. Immersion in cold water can rapidly lead to hypothermia
      a. Any water temperature less than 98 degrees will cause hypothermia
      b. Cannot maintain body heat in water less than 92 degrees
      c. Colder water causes a faster rate of heat loss
      d. Water causes heat loss 25 times faster than air
      e. A 15-20 minute immersion in 35 degree water is likely to kill
   2. Hypothermic patients rapidly lose the ability for self rescue
      a. Sudden immersion in cold water may trigger laryngospasm
      b. Hypothermic victims are unable to follow directions
      c. Hypothermia makes it difficult for a victim to grab anything
      d. Hypothermia increases the likelihood of drowning
      e. Victims become incapacitated and unable to help themselves
   3. Water temperature varies widely with seasons and run off
      a. Even on warm days water temperature can be very low
   4. PFDs lessen heat loss and energy required for flotation
      a. If sudden immersion occurs assume HELP position
      b. If multiple people are in the water huddle to decrease heat loss

D. Cold protective response
   1. Increases the chances of a cold water drowning victim's survival
      a. Documented saves from cold immersion of up to 45 minutes
      b. Colder water seems to increase chances of survival
      c. How long is the head above water during the cooling process
   2. Protective physiologic response
      a. Face immersion causes parasympathetic stimulation
      b. Heart rate decreases/ bradycardia

c. Peripheral vasoconstriction and blood shunted to the core
d. Blood pressure drop

3. Survivability profile affected by
   a. Age
   b. Posture
   c. Lung volume
   d. Water temperature
4. You are never cold and dead - only warm and dead
   a. Hypothermic patients should be presumed salvageable
   b. A patient must be re-warmed before an accurate assessment can be made
5. Rescue versus body recovery
   a. Length of time submerged
   b. Any known or suspected trauma
   c. Age and physical condition
   d. Water temperature and environmental conditions
   e. Time until rescue or removal

E. Scenario options for water rescue training
   1. Rescue safety - equipment
      a. Properly fitting personal flotation device (USGA approved)
      b. Helmet - for head protection
      c. Knife - for entanglement protection
      d. Whistle - for location if in trouble
      e. Thermal protection
   2. Rescuer safety - training
      a. Confined water situations - pool, stock tank
      b. Flat water situations - lakes, ponds, marsh
      c. Moving water - rivers, streams, creeks
      d. Fast water - spring runoffs, mountain streams
      e. Floods and debris flows
      f. Heavy surf - ocean, Great Lakes
      g. Man made barriers - dams, piers, weirs
   3. Victim safety - equipment
      a. Flotation for victim
      b. Immobilization equipment
      c. Extrication equipment
      d. Thermal protection equipment
      e. Resuscitation equipment
      f. Transportation equipment
   4. Victim safety - training
      a. Victim recognition skills
      b. In-water patient management skills
      c. Airway management skills
      d. In-water immobilization skills
      e. Extrication from water skills
      f. In-water thermal loss skills
      g. Resuscitation skills - in-water, land and boat
   5. Factors determining - rescue or recovery
      a. Number of victims

b. Number of trained and equipped rescuers
c. Environmental conditions present and expected
d. Age of victims
e. Length of submersion of victims
f. Known trauma to victims
g. Temperature and speed of water

6. Location of submerged victims - witness interviews
   a. Separate witnesses and have them return to where they were during the incident
   b. Have each witness locate an object across water to form a line
   c. Use the point of convergence of lines to locate last seen point
   d. Use last seen point as "datum" point to begin search
   e. Search in area where last seen point is center and radius out is equal to depth of water
7. In-water spinal immobilization
   a. Head-splint technique (rescuer PFD inhibits other techniques)
   b. Approach victim from the side
   c. Move victim's arms over their head
   d. Hold victim's head in place by using victim's arms as a "splint"
   e. If victim is face-down, perform steps 1-4, then rotate victim toward rescuer to face-up position
   f. Assure open airway
   g. Maintain position until C-collar is applied
8. C-collar application
   a. Second rescuer determine collar size
   b. Second rescuer holds open collar under victim's neck
   c. Primary rescuer maintains immobilization and patent airway
   d. Second rescuer brings collar up to back of victim's neck, primary rescuer allows second rescuer to bring collar around victim's neck and throat while second rescuer maintains airway
   e. Second rescuer secures fastener on collar while primary rescuer maintains airway
   f. Second rescuer secures victim's hands at waist of victim
9. Back boarding and extrication of victim
   a. Submerge board under victim at their waist
   b. Never lift the victim to the board, allow the board to float up to the victim (if board does not float, lift it gently to the victim)
   c. Secure victim with straps, cravats or other devices
   d. Move victim to extrication point at shore or boat
   e. Always extricate victim head first, so that body weight will not compress possible spinal trauma
   f. Avoid extrication of victim through surf - board could capsize
   g. Maintain airway management during extrication
10. Overview of rescue techniques
   a. Never underestimate the power of moving water
      (1) Moving water is very deceptive
      (2) Do not enter without highly specialized training
   b. The water rescue model is reach-throw-row-go
   c. As a first responder, a shore based rescue attempt (either by talking the victim into self-rescue, reaching or throwing) are the methods of choice

(1) Either boat based or go techniques require specialized training

d. Even with shore based rescue techniques a PFD must be worn
   (1) Reach with a pole or long rescue device
   (2) Throw a floatation device
   (3) Become proficient with a water throw bag

e. Self rescue if fallen into flat or moving water
   (1) Cover mouth/ nose during entry
   (2) Protect your head and keep face out of the water
   (3) If flat water assume the HELP position
   (4) In moving water do not attempt to stand up
   (5) Float on back with feet downstream and head pointed towards the nearest shore at 45 degree angle

IV. Hazardous atmospheres

A. Oxygen deficient environments/ confined spaces (CFR 1910.146)
   1. Defined as a space with limited access/ egress not designed for human occupancy or habitation
   2. Has a limited or restricted means for entry or exit and is not designed for continuous employee occupancy
      a. Tanks
      b. Vessels
      c. Silos
      d. Storage bins
      e. Vaults
      f. Pits
   3. NIOSH estimates that 60% of the fatalities associated with confined spaces are people attempting a rescue of someone
   4. Examples of confined spaces
      a. Grain bins and silos
      b. Wells and cisterns
      c. Storage tanks
      d. Manholes, pumping stations
      e. Drainage culverts
      f. Underground vaults

B. Hazards associated with confined spaces
   1. Oxygen deficient atmospheres
      a. Oxygen deficient atmospheres are not a visible problem
      b. Rescuers often presume an atmosphere is safe
      c. Be aware that increased oxygen content can give atmospheric monitoring meters a false reading
   2. Chemical/ toxic exposure/ explosion
      a. Toxicity of chemicals and the displacement of oxygen
      b. Explosion is a hazard in some environments
   3. Engulfement
      a. Grain, coal or substances that can bury a person
      b. Dusts can also create an explosion hazard
   4. Machinery entrapment
      a. Spaces often have auger/ screws which can entrap

5. Electricity
   a. Motors and materials management equipment have power
   b. Risk of stored energy
   c. Physiology of oxygen deficiency
6. Structural concerns
   a. I beams inside space
   b. Not all spaces are cylindrical - L, T and X shaped spaces compound extrication pathway

C. Emergencies in confined spaces
1. OSHA requires a permit process before workers may enter a confined space
   a. Area must be made safe or workers must don PPE
   b. Retrieval devices must be in place
   c. Environmental monitoring of the site before entry
2. Non-permitted sites are likely locations for emergencies
   a. No atmospheric monitoring is done
   b. Entrants are likely to encounter oxygen deficienct atmosphere
3. Types of emergencies
   a. Falls
   b. Medical emergencies
   c. Oxygen deficiency/ asphyxia
   d. Explosion
   e. Entrapment
4. Types of gases found in confined spaces
   a. Hydrogen sulfide (H_2S)
   b. Carbon dioxide (CO_2)
   c. Carbon monoxide (CO)
   d. Low/ high oxygen concentrations
   e. Methane (CH_4)
   f. Ammonia (NH_3)
   g. Nitrogen dioxide (NO_2)

D. Safe entry for rescue requires specialized training
1. Safe entry cannot be made without the following
   a. Atmospheric monitoring to determine
      (1) Oxygen concentration
      (2) Hydrogen sulfide level
      (3) Explosive limits
      (4) Flammable atmosphere
      (5) Toxic air contaminants
   b. Lock out/ tag outfox all power
   c. Blank out of all flow into the site
   d. Dissipation of stored energy
   e. Area is ventilated
2. No rescuers are allowed to make entry until a rescue team has made the area safe
3. Access to confined spaces is often limited making access and extraction difficult
   a. SCBA use is usually dangerous
      (1) Limited air supply
      (2) Removal of SCBA to make some entries
   b. Supplied air breathing apparatus is preferred

c. Rescuer lowering and retrieval system is in place
d. Limited space makes extraction difficult

4. Arriving EMS personnel should
a. Establish a safe perimeter
b. Not allow any additional entry to the space
c. Assist in attempting remote retrieval
d. Determine from permit/ entry supervisor what type of work is being done
e. Determine from entry supervisor how many workers are inside

E. Rescue from trenches/ cave ins

1. Most trench collapses occur in trenches less than 12' deep and 6' wide
a. Weight of soils - 1 cubic foot = 100 pounds
b. 2 feet of soil on the chest or back = 700-1000 pounds
c. Being buried rapidly leads to asphyxia

2. Reasons for cave in/ collapse
a. Federal law requires either shoring or trench box for excavations deeper than 5'
b. Contractors forsake safety due to increased costs
c. Lip of one or both sides of trench caves in
d. Wall shears way and falls in
e. Spoil pile too close to edge causing collapse

3. Factors contributing to collapse
a. Previously disturbed soil
b. Intersecting trenches
c. Ground vibrations
d. Dirt (spoil) pile too close to edge of trench
e. Water seepage

4. Initial response
a. If collapse has occurred causing burial, secondary collapse is likely to occur
b. Secure the scene, establish command, and secure a perimeter
c. Call for a team specializing in trench rescue
d. Do not allow entry into the trench or cave in area
e. Safe access only when proper shoring is in place

V. Highway operations

A. Hazards in highway operations

1. Traffic flow is the largest hazard associated with EMS highway operations
a. Response to limited access highways
b. Response to unlimited access highways
c. Risk of apparatus and rescuers being struck
d. Back-up impedes flow to and from scene
e. EMS must work closely with law enforcement

2. Traffic hazard reduction techniques
a. Staging of unnecessary apparatus off highway
(1) Essential on limited access highways
(2) Use staging area away from scene
b. Place apparatus in position to protect scene
(1) Attempt minimal reduction to traffic flow
(2) Have a safe ambulance loading area
c. Use only essential warning lights

(1) Too many lights distract/ confuse/ blind drivers
(2) Turn off headlights
(3) Consider use of amber scene lighting

d. Use traffic cones/ flares to redirect traffic
(1) Create a safe zone
(2) Move traffic away from workers
(3) Caution on use of flares and their proximity to scene
(a) Allow flares to burn out
(b) Do not extinguish once ignited

e. All rescuers should be in high visibility clothing
(1) Orange highway vests
(2) High visibility clothing
(3) Reflective trim

3. Other scene hazards
a. Fuel/ fire hazards
(1) Fuel spilled on the highway increases fire risk
(2) Catalytic converters can ignite spilled fuel

b. Alternate fuel systems
(1) Natural gas in high pressure cylinders
(2) Electrical power and storage cells

c. Sharp metal and glass
(1) Cut and puncture hazard to patients and rescuers

d. Electrical power
(1) Downed power lines and contact with underground electrical feeds

e. Energy absorbing bumpers
(1) When exposed to fire can explode
(2) When "loaded" can spring out causing rescuer trauma

f. Air bags/ supplemental restraint systems(SRS)
(1) Can deploy during rescue operations
(2) Must be deactivated prior to mechanical extrication

g. Vehicles carrying hazardous cargoes
(1) Most hazardous substances travel by road
(2) Be suspicious with crashes involving commercial vehicles
(3) Look for UN numbers and placarding

h. Vehicles in unstable positions
(1) On side
(2) On roof
(3) On incline or unstable area/ terrain
(4) Weather conditions
(5) On-site spills/ leaks

B. Auto anatomy
1. Roof and roof support posts
a. "A "post
b. "B" post
c. "C" post
d. "D" post
e. Cutting the supports interrupts the unibody construction

2. Fire wall

a. Separates engine and occupant compartment
b. Frequently collapses onto occupants legs during high speed head on collisions

3. Engine compartment and power train
   a. Battery usually in the engine compartment
4. Under-carriage and unibody versus frame construction
   a. Roof posts, floor, firewall, trunk support integral to unibody
   b. Most cars are of unibody construction
   c. Light trucks are usually of frame construction
5. Safety versus tempered glass
   a. Safety glass usually in windshield
      (1) Glass-plastic laminate-glass
      (2) Designed to stay intact when shattered/ broken
      (3) Fractures into long shards
   b. Tempered glass
      (1) Glass with high tensile strength
      (2) Does NOT stay intact when shattered/ broken
      (3) Fractures into small pieces when broken
6. Doors
   a. Reinforcing bar in most car doors
   b. Bar designed to protect occupant in side impact collisions
   c. Case hardened steel "Nader" pin designed to prevent car door from opening during collisions
   d. If Nader pin/ latch engaged difficult to pry door open
   e. Latch must be disengaged first
7. Deactivation of the SRS
   a. Power removal
   b. Power dissipation

C. Rescue strategies
1. Initial size-up, hazard control
   a. Establish command
   b. Scene size-up
   c. Call appropriate back-up
   d. Control the hazards
   e. Locate and triage patients
2. Assess degree of entrapment and fastest means of extraction
   a. Try all of the doors
   b. Considerations for door removal
   c. Considerations for roof removal
   d. Considerations for dash roll-up maneuver
   e. Considerations for door removal and making a new door
3. Inner circle/ outer circle rescue concept

VI. Hazardous terrain
A. Types of hazardous terrain
1. Steep slope or "low angle" terrain
   a. Slope capable of being walked on without using hands
   b. Footing may be difficult
   c. Difficult to carry a litter even with multiple people

d. Rope used to counteract gravity during litter carry
e. Consequence of error likely to be a fall and tumble

2. Vertical or "high angle" terrain
   a. Cliff, building side or terrain so steep hands must be used for balance when scaling it
   b. Total dependence on rope or aerial apparatus for litter movement
   c. Consequence of error likely to be fatal
3. Flat terrain with obstructions
   a. Rocks, scree, creeks etc.

B. Patient access in hazardous terrain
1. Specialized training and equipment required for the high angle environment
   a. Rappelling and retrieval of personnel (ascending or raising) once rappelled in
   b. Belaying
   c. High angle litter evacuation
   d. Use of ladders
   e. Serious consequence of errors
   f. High degree of training required for access and evacuation
2. Low angle environment
   a. Access often gained by walking or scrambling
   b. Rope sometimes used as a hand line to assist with balance
   c. Less severe consequence of error
   d. High degree of training required for low angle rope evacuation of litter
   e. Hasty rope slide to assist with balance and footing on rough terrain

C. Patient packaging
1. Basket stretcher is the standard for rough terrain evacuation
   a. Rigid frame for patient protection
   b. Easy to carry with adequate personnel
   c. Standard EMS patient handling device
   d. Alternative spinal immobilizers can be used in them (KED, OSS)
   e. Can be used as a spinal immobilizer by itself as a last resort
2. Wire mesh stokes baskets
   a. Generally strongest of baskets
   b. Better air/ water flow through the basket
   c. Inexpensive
   d. With flotation, better for water rescue
   e. Older "military style" will not accept backboard
3. Plastic basket stretchers
   a. Generally weaker than steel baskets
   b. Provide better patient protection
   c. Plastic bottom with steel frame is best
4. Most basket stretchers are not equipped with adequate restraints
   a. All require additional strapping or lacing for rough terrain evacuation/ extraction
   b. Plastic litter shield for patient protection
   c. High angle restraint
      (1) Harness applied to patient
      (2) Leg stirrups applied
      (3) Lifters applied to prevent movement
      (4) Tail of 1 litter line to patient's harness

(5) Helmet or litter shield on patient
(6) Fluids (IV or PO)
(7) Accessibility for BP, suction, distal perfusion assessment
(8) Padding is crucial
(9) Patient heating/ cooling system
(10) Airway clearing system via gravity "tip line"

d. Low angle restraint
(1) Same restraint as for high angle

e. Flat rough terrain
(1) Lacing or securing to prevent movement

D. Patient movement
1. Non-technical/ non-rope evacuation is usually faster
2. Flat rough terrain
a. Litter carrying procedures
b. Leapfrogging
c. Adequate numbers of bearers
d. Load lifting straps to assist with carry
3. Low angle/ high angle evacuation
a. Secure anchors
b. Rope lowering systems
c. Rope hauling systems
d. Specialized knowledge and skill required for use
4. Use of aerial apparatus
a. Tower-ladder or bucket trucks
(1) Litter belay during movement to bucket
(2) Attachment of litter to bucket
b. Aerial ladders
(1) Upper sections not wide enough to slot litter
(2) Litter must be belayed if being slid down ladder
c. Ladder or aerial apparatus should not be used as a crane to move a litter

E. Use of helicopters in hazardous terrain rescue
1. Difference in mission, crew and capabilities of medical versus rescue and military helicopters
2. Need for constant reassessment of risk of rescue technique involving a helicopter
3. Need for non-aircrew-member rescue training, specific to helicopter rescue techniques
a. Know general safety around helicopters
b. Be familiar with these uses of helicopters for rescue - the advantages, disadvantages, hazards and local restrictions for each of these
(1) Boarding, deboarding, riding
(2) One-skids, hovers, toe-ins
(3) Short hauls or sling loads (personnel and equipment)
(4) Cable hoists

VII. Vehicle rescue
A. Practice initial stabilization of vehicles using cribbing, lifting devices, spare tires, 2 ton come-a-long on (be certain all fluids are drained)
1. Wheels
2. Roof

3. Side
4. Embankments

B. Gain access using hand tools through
1. Non-deformed door
2. Deformed door
3. Safety and tempered glass
4. Trunk
5. Floor

C. Package and extricate simulated patients
1. Rapid extraction of patients using long spine boards
2. Vertical extrication of patients from vehicles using spineboards

D. Observe the following procedures being accomplished using heavy hydraulic equipment
1. Door removal
2. Roof removal
3. Making of a "third door"
4. Dashboard/ firewall "roll-up"

VIII. Assessment procedures

A. Environmental issues affecting assessment
1. Weather/ temperature extremes
   a. Difficulty in completely exposing patients for full assessment and treatment
   b. Physical examination compromised
   c. Patients susceptible to hypo/ hyperthermia
   d. Rescuer mobility restricted due to clothing/ PPE
2. Access to patient may be limited
   a. Parts may not be accessible for examination
   b. Cramped space
   c. Limited lighting
3. Typical street equipment may not be transportable to patient
   a. Boxes and street "packaging" of equipment
   b. Downsizing of initial assessment/ management equipment
4. Patient may be entrapped for an extended period of time
5. Rescuer PPE essential but cumbersome
   a. PPE must be used
   b. Some must be removed to perform skills
   c. Reapply as soon as possible

B. Specific assessment/ management considerations
1. Equipment considerations
   a. Must be downsized and capable of being brought to patient
   b. Capable of being carried hands free
   c. Have lighting to facilitate assessment/ treatment in dark
   d. Have the following
      (1) Airway control
         (a) OPA/ NPA
         (b) Manual suction
         (c) Intubation
      (2) Breathing
         (a) Thoracic decompression

(b) Small oxygen tank/ regulator
(c) Masks/ cannulas
(d) Pocket mask/ BVM

(3) Circulation
(a) Bandages/ dressings
(b) Triangular bandages
(c) Occlusive dressings
(d) IV administration
(e) BP cuff and stethoscope

(4) Disability
(a) Extrication collars

(5) Expose
(a) Scissors

(6) Miscellaneous
(a) Headlamp/ flashlight
(b) Space blanket
(c) SAM splint
(d) PPE (leather gloves/ latex gloves/ eye shields)

2. Exposure of patients
a. Cover patient and assure thermal protection
b. During extrication place hard protection (spine board)
c. Prevent glass shards from contacting patient

3. ALS skills only if really necessary (good BLS skills are mandatory)
a. More wires and tubing complicate the extraction process
b. Definitive airway control and volume may be essential
c. Continuous oxygenation

4. Patient monitoring
a. In high noise areas take BP by palpation
b. Pulse oximetry compact and helpful
c. ECG cumbersome during extrication
d. Continue talking to patient
e. Explain what is being done and answer questions

5. Improvisation
a. Upper extremity fractures tied to torso
b. Lower extremity fractures tied to uninjured leg
c. SAM splints very useful

C. Pain control
1. Non-pharmacological management
a. Splinting
b. Distraction - talking to the patient and asking questions
c. Scratching or creating sensory stimuli when doing painful procedure

2. Pharmacologic agents
a. Pain control with isolated extremity trauma
b. Pain control with multiple trauma

D. Crush and compartment syndromes secondary to entrapment
1. Compartment syndromes can be caused by crushing mechanisms
a. Increased pressure in the muscle compartment enclosed by fascia
b. Pressure increase causes ischemic muscle damage

c. Tissue necrosis and nerve injury can occur

2. Crush syndrome
   a. Compressive forces crush and cause prolonged hypoxia
   b. Prolonged compression 4-6 hours or longer
   c. May appear stable with compressive forces in place
   d. Compressive force removed - part is reperfused
   e. Vascular volume lost into the tissue
   f. Myoglobin, lactic acid and other toxins released into circulation
   g. Rapid decompensation may occur

E. Patient packaging
   1. Stokes basket orientation and practice with
      a. Types of basket stretchers and their uses
      b. Patient comfort and packaging
      c. Patient immobilization and restraint
   2. Other patient devices for rough terrain and practice with
      a. SKED
      b. Half-spine devices
   3. High angle-non-technical evacuation using aerial apparatus
   4. Low angle-non-technical evacuation using manpower
   5. Handing a litter over terrain
   6. Litter carry over rough terrain and practice the following
      a. Litter carry sequence with six people
      b. Use of litter lifting or load slings
      c. Passing litter over uneven terrain
   7. It is required that the EMS response team fully understands the capability of the rescue response team thereby circumventing any "turf" issues

UNIT TERMINAL OBJECTIVE

8-4 At the completion of this unit, the paramedic student will be able to evaluate hazardous materials emergencies, call for appropriate resources, and work in the cold zone.

COGNITIVE OBJECTIVES

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

8-4.1 Explain the role of the paramedic/ EMS responder in terms of the following: (C-1)
- a. Incident size-up
- 2. Assessment of toxicologic risk
- 3. Appropriate decontamination methods
- 4. Treatment of semi-decontaminated patients
- 5. Transportation of semi-decontaminated patients

8-4.2 Size-up a hazardous materials (haz-mat) incident and determine the following: (C-1)
- a. Potential hazards to the rescuers, public and environment
- 2. Potential risk of primary contamination to patients
- 3. Potential risk of secondary contamination to rescuers

8-4.3 Identify resources for substance identification, decontamination and treatment information including the following: (C-1)
- a. Poison control center
- 2. Medical control
- 3. Material safety data sheets (MSDS)
- 4. Reference textbooks
- 5. Computer databases (CAMEO)
- 6. CHEMTREC
- 7. Technical specialists
- 8. Agency for toxic substances and disease registry

8-4.4 Explain the following terms/ concepts: (C-1)
- 1. Primary contamination risk
- 2. Secondary contamination risk

8-4.5 List and describe the following routes of exposure: (C-1)
- a. Topical
- 2. Respiratory
- 3. Gastrointestinal
- 4. Parenteral

8-4.6 Explain the following toxicologic principles: (C-1)
- 1. Acute and delayed toxicity
- 2. Route of exposure
- 3. Local versus systemic effects
- 4. Dose response
- 5. Synergistic effects

8-4.7 Explain how the substance and route of contamination alters

triage and decontamination methods. (C-1)

8-4.8 Explain the limitations of field decontamination procedures. (C-1)

8-4.9 Explain the use and limitations of personal protective equipment (PPE) in hazardous material situations. (C-1)

8-4.10 List and explain the common signs, symptoms and treatment for the following substances: (C-1)

1. Corrosives (acids/ alkalis)
2. Pulmonary irritants (ammonia/ chlorine)
3. Pesticides (carbamates/ organophosphates)
4. Chemical asphyxiants (cyanide/ carbon monoxide)
5. Hydrocarbon solvents (xylene, methlyene chloride)

8-4.11 Explain the potential risk associated with invasive procedures performed on contaminated patients. (C-1)

8-4.12 Given a contaminated patient determine the level of decontamination necessary and : (C-1)

a. Level of rescuer PPE
2. Decontamination methods
3. Treatment
4. Transportation and patient isolation techniques

8-4.13 Identify local facilities and resources capable of treating patients exposed to hazardous materials. (C-1)

8-4.14 Determine the hazards present to the patient and paramedic given an incident involving hazardous materials. (C-2)

8-4.15 Define the following and explain their importance to the risk assessment process: (C-1)

1. Boiling point
2. Flammable/ explosive limits
3. Flash point
4. Ignition temperature
5. Specific gravity
6. Vapor density
7. Vapor pressure
8. Water solubility
9. Alpha radiation
10. Beta radiation
11. Gamma radiation

8-4.16 Define the toxicologic terms and their use in the risk assessment process: (C-1)

1. Threshold limit value (TLV)
2. Lethal concentration and doses (LD)
3. Parts per million/ billion (ppm/ ppb)
4. Immediately dangerous to life and health (IDLH)

5. Permissible exposure limit (PEL)
6. Short term exposure limit (TLV-STEL)
7. Ceiling level (TLV-C)

8-4.17 Given a specific hazardous material be able to do the following: (C-1)
1. Research the appropriate information about it's physical and chemical characteristics and hazards
2. Suggest the appropriate medical response
3. Determine risk of secondary contamination

8-4.18 Determine the factors which determine where and when to treat a patient to include: (C-1)
1. Substance toxicity
2. Patient condition
3. Availability of decontamination

8-4.19 Determine the appropriate level of PPE to include: (C-1)
a. Types, application, use and limitations
2. Use of chemical compatibility chart

8-4.20 Explain decontamination procedures when functioning in the following modes: (C-1)
a. Critical patient rapid two step decontamination process
2. Non-critical patient eight step decontamination process

8-4.21 Explain specific decontamination procedures. (C-1)

8-4.22 Explain the four most common decontamination solutions used to include: (C-1)
a. Water
2. Water and tincture of green soap
3. Isopropyl alcohol
4. Vegetable oil

8-4.23 Identify the areas of the body difficult to decontaminate to include: (C-1)
1. Scalp/ hair
2. Ears/ ear canals/ nostrils
3. Axilla
4. Finger nails
5. Navel
6. Groin/ buttocks/ genitalia
7. Behind knees
8. Between toes, toe nails

8-4.24 Explain the medical monitoring procedures of hazardous material team members to be used both pre and post entry, to include: (C-1)
1. Vital signs
2. Body weight

3. General health
4. Neurologic status
5. ECG

8-4.25 Explain the factors which influence the heat stress of hazardous material team personnel to include: (C-1)
1. Hydration
2. Physical fitness
3. Ambient temperature
4. Activity
5. Level of PPE
6. Duration of activity

8-4.26 Explain the documentation necessary for Haz-Mat medical monitoring and rehabilitation operations. (C-1)
1. The substance
2. The toxicity and danger of secondary contamination
3. Appropriate PPE and suit breakthrough time
4. Appropriate level of decontamination
5. Appropriate antidote and medical treatment
6. Transportation method

8-4.27 Given a simulated hazardous substance, use reference material to determine the appropriate actions. (C-3)

8-4.28 Integrate the principles and practices of hazardous materials response in an effective manner to prevent and limit contamination, morbidity, and mortality

AFFECTIVE OBJECTIVES

None identified for this unit.

PSYCHOMOTOR OBJECTIVES

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

8-4.29 Demonstrate the donning and doffing of appropriate PPE. (P-1)

8-4.30 Set up and demonstrate an emergency two step decontamination process. (P-1)

8-4.31 Set up and demonstrate an eight step decontamination process. (P-1)

DECLARATIVE

I. Role of paramedic in hazardous materials response
  A. Incident size-up
    1. Recognition that incident involves hazardous materials
      a. Transportation incidents
      b. Highway crashes
      c. Storage of materials
      d. Manufacturing operations
      e. Acts of terrorism
    2. Use of the following to identify the substance
      a. Department of Transportation (DOT) emergency response guide
      b. United Nations (UN) numbers
      c. National Fire Protection Agency (NFPA) 704 placard system
      d. DOT placards
      e. Shipping papers
      f. Material safety data sheets (MSDS)
    3. Immediate need for evacuation or other action
    4. Immediate action with ambulatory patients
    5. Determine zones
      a. Hot zone - dangerous area
      b. Warm zone - entry/ decontamination point
      c. Cold zone - safe area
  B. Assessment of toxicologic risk
    1. Determine type of chemical
    2. Actions of chemical
    3. Potential for secondary contamination
    4. Out-of-hospital medical treatment
  C. Appropriate decontamination methods
    1. Techniques to decontaminate patients
    2. Recognition that no patient is completely decontaminated
  D. Treatment of semi-decontaminated patients
    1. Appropriate use of PPE
  E. Transportation of semi-decontaminated patients
    1. Methods to prevent vehicle contamination
  F. NFPA levels of response
    1. All personnel who may arrive first must be trained to an awareness level
    2. Paramedics who may transport "semi-decontaminated patients" be trained to the NFPA 473 "Level-1"
    3. Paramedics who may have to rapidly "decon" and assist in

the decontamination corridor be trained to the 473 "Level-2"

G. Monitoring of hazardous materials personnel

II. Hazardous materials size-up
  A. High degree of awareness
    1. Vehicle crashes
      a. Commercial vehicles
      b. Pest control vehicles
      c. Tankers
      d. Cars with alternative fuels
      e. Tractor-trailers
    2. Transportation
      a. Railroads
      b. Pipelines
    3. Storage
      a. Tanks/ storage vessels
      b. Warehouses
      c. Hardware/ agricultural stores
      d. Agriculture
    4. Manufacturing operations
      a. Chemical plants
      b. All manufacturing operations
    5. Terrorism
      a. Workplace
      b. Shopping
      c. Other public environments
  B. Recognition of hazard
    1. Placarding of vehicles
      a. Required by law
      b. Some vehicles not placarded
      c. Placarding in emergency response guide
    2. UN/ DOT placard classifications
      a. Explosives
      b. Gasses
      c. Flammable liquids
      d. Flammable solids
      e. Oxidizers and organic peroxides
      f. Poisonous and etiologic agents
      g. Radioactive materials
      h. Corrosives
      i. Miscellaneous hazardous materials
    3. Recognition of UN numbers

4. NFPA 704 System for fixed facilities
    a. Blue = health hazard
    b. Red = fire hazard
    c. Yellow = reactivity hazard

C. Identification of substances
1. The "crux" of dealing with a hazardous material
2. Often difficult-especially with unknown substances
3. Material safety data sheets (MSDS)
    a. Detailed substance information
4. Shipping papers
    a. Substance ID
5. DOT Emergency Response Guide
    a. UN numbers
    b. Names of substances
    c. Emergency action guide
    d. Placard facsimiles
    e. Evacuation/ isolation information
6. Poison control centers
    a. Detailed toxicology information
    b. Decontamination methods
    c. Treatment
7. CAMEO computer database
    a. Information
    b. Computer modeling
8. CHEMTREC
    a. 24 hour toll free hotline
    b. Product and emergency action information
9. Other reference sources
    a. Textbooks
    b. Handbooks
    c. Technical specialists
10. Monitors and testing for unknown materials
    a. Air monitoring equipment
    b. Gas monitoring equipment
    c. Ph testing
    d. Chemical testing
    e. Colormetric tube testing

D. Hazardous material zones
1. Hot zone
    a. Contamination actually present
    b. Site of incident
    c. Entry with high level PPE
    d. Entry limited

2. Warm zone
   a. Buffer zone outside of hot zone
   b. Where decontamination corridor is located
   c. Corridor has "hot" and "cold" end
3. Cold zone
   a. Safe area
   b. Staging for personnel and equipment
   c. Where medical monitoring occurs
   d. One end of corridor

E. Specific terminology for medical hazardous materials operations
   1. Boiling point
   2. Flammable/ explosive limits
   3. Flash point
   4. Ignition temperature
   5. Specific gravity
   6. Vapor density
   7. Vapor pressure
   8. Water solubility
   9. Alpha radiation
   10. Beta radiation
   11. Gamma radiation

F. Specific toxicologic terms and their use in the risk assessment process
   1. Threshold limit value (TLV)
   2. Lethal concentration and doses (LD)
   3. Parts per million/ billion (ppm/ ppb)
   4. Immediately dangerous to life and health (IDLH)
   5. Permissible exposure limit (PEL)
   6. Short term exposure limit (TLV-STEL)
   7. Ceiling level (TLV-C)

III. Contamination and toxicology review

A. Types of contamination
   1. Primary contamination
      a. Exposure to substance
      b. Only harmful to individual
      c. Little chance of exposure to others
   2. Secondary contamination
      a. Exposure to substance
      b. Substance easily transferred
      c. Touching patient results in contamination
      d. Key concept in hazardous materials medical

operations
e. Gas exposure rarely results in secondary contamination
f. Liquid and particulate matter more likely to result in secondary contamination

B. How poisons are absorbed
1. Topical absorption
a. Skin and mucous membranes
b. Not all skin absorbs at same rate
c. Not all poisons easily absorbed
2. Respiratory inhalation
a. Absorption through bronchial tree
b. Oxygen deficient atmospheres
3. Gastrointestinal ingestion
a. Ingestion of substances
b. Factors affecting absorption
4. Parenteral injection
a. Injection
b. Wound entry
c. Invasive medical procedures

C. Cycle of poison actions
1. Absorption
a. Time to delivery into blood stream
2. Distribution
a. Distribution to target organs
b. Poison or drug binds to tissues/ molecules
c. Actions
d. Deposits
3. Biotransformation
a. Liver
4. Elimination
a. GI
b. Kidney
c. Respiratory

D. Poison actions
1. Acute toxicity
a. Immediate effect from substance
2. Delayed toxicity
a. No immediate effect
b. Symptoms later appear
c. Delayed pathology or disease
3. Local effects
a. Effect immediate site

b. Burn model
c. Progression of effects like burn
d. Topical or respiratory
e. Skin irritation - acute bronchospasm

4. Systemic effects
a. Cardiovascular
b. Neurologic
c. Hepatic
d. Renal

5. Dose response
a. Physiologic response to dosage
b. How much to get an effect
c. Essential concept for decontamination

6. Synergistic effects
a. Combinations may react synergistically
b. Standard pharmacologic approach
c. Standard treatment can result in synergy
d. Medical control/ poison control reference

E. Treatment for commonly encountered hazardous materials

1. Corrosives (acids/ alkalis)
a. Typical exposures
b. Actions
c. Decontamination methods
d. Treatment
e. Transportation precautions

2. Pulmonary irritants (ammonia/ chlorine)
a. Typical exposures
b. Actions
c. Decontamination methods
d. Treatment
e. Transportation precautions

3. Pesticides (carbamates/ organophosphates)
a. Typical exposures
b. Actions
c. Decontamination methods
d. Treatment
e. Transportation precautions

4. Chemical asphyxiants (cyanide/ CO)
a. Typical exposures
b. Actions
c. Decontamination methods
d. Treatment
e. Transportation precautions

5. Hydrocarbon solvents (xylene/ methlyene chloride)
   a. Typical exposures
   b. Actions
   c. Decontamination methods
   d. Treatment
   e. Transportation precautions
6. Considerations for performing invasive procedures
   a. Risk versus benefit
   b. Patient need

IV. Decontamination approaches
   A. Purpose of decontamination
      1. Reduce the patient's dosage of material
      2. Decrease threat of secondary contamination
      3. Reduce risk of rescuer injury
   B. Environmental considerations
      1. Major consideration If there are no life-threats
         a. Prevent run off of material
      2. If there are life-threats, patient comes first
         a. Environmental considerations last
   C. Methods of decontamination
      1. Dilution
         a. Lavage with water
         b. Water is universal decontamination solution
         c. Dilution decreases dose and action
         d. Reduction of topical absorption
      2. Absorption
         a. Use of pads to "blot" up the material
         b. Towels to dry the patient after lavage
         c. Usually a secondary method to lavage
         d. Common for environmental clean up
      3. Neutralization
         a. Almost never used in patient decontamination
         b. Hazard of exothermic reactions
         c. Time to determine neutralizing substance
         d. Lavage usually dilutes and removes faster
         e. More practical with equipment, etc.
      4. Disposal/ isolation
         a. Removal of clothing
         b. Removal of substances which contain substances
   D. Decontamination decision making
      1. Field considerations
         a. Flight of walking contaminated to rescuers -"fast

break" event - action required now
b. Conscious, contaminated people will "self rescue" by walking out of hot zone
c. Immediate decontamination often not avoidable
d. Speed of hazardous material team response
(1) Patients often can't wait that long
(2) Patients become impatient and leave
e. EMS gross decontamination and treatment
(1) All EMS needs gross decontamination capability
(2) EMS preparedness for quick decontamination
(3) Need for rapid EMS PPE
(4) Need quick transport isolation methods

2. "Fast break" incident decision making
a. Critical patient - unknown/ life-threatening material
(1) Decontamination and treatment simultaneous
(2) Remove clothing
(3) Treat life-threatening problems
(4) Lavage - water universal decontamination solution
(5) Contain/ isolate patient
(6) Transport
b. Non-critical - unknown/ life-threatening material
(1) More contemplative approach
(2) Decontamination and treatment simultaneous
(3) Remove clothing
(4) Treat life-threatening problems
(5) Lavage - water universal decontamination solution
(6) Contain/ isolate patient
(7) Transport
c. Non-critical - substance known
(1) Slower approach
(2) Environmental/ privacy considerations
(3) More thorough decontamination
(4) Clothing removal
(5) Thorough lavage/ wash
(6) Drying/ reclothing PRN
(7) Medical monitoring
(8) Patient isolation PRN
(9) Transport

3. Longer duration event decision making
a. Patients in hot zone - non-ambulatory

(1) No rescue attempted
(2) Wait for hazardous material team
(3) Team will set up decontamination corridor

b. Team will not make entry until
(1) Medical monitoring of entry team
(2) Decontamination corridor established

c. Longer duration event
(1) Often 60 minutes for team deployment
(2) Set up time

d. Better opportunity for thorough decontamination
e. Better PPE
f. Less chance of secondary contamination
g. Better environmental protection

4. When in doubt - better grossly decontaminated and alive than perfectly decontaminated and dead
a. Deal with patient emergencies first
b. Have some type of chemical PPE

E. Decontamination methods
1. Decontamination and PPE is ideally driven by the substance encountered
a. Sometimes unknown
2. Decontamination solutions
a. Do not attempt to neutralize
b. Lavage with copious amounts of water
c. Water is the universal solution
d. Tincture of green soap used to improve wash
e. Isopropyl alcohol is used for some isocyanates
f. Vegetable oil is used for some water reactive substances
3. Remove the clothing
a. Also remove rings and jewelry
b. Shoes and socks
c. Cut off clothing PRN
4. Thorough wash and rinse
a. Allow fluid to drain away
b. Don't allow them to stay in the run-off
5. Rewash and rinse
a. Careful attention to difficult areas
b. Difficult decontamination areas
(1) Scalp/ hair
(2) Ears/ ear canals/ nostrils
(3) Axilla
(4) Finger nails

(5) Navel
(6) Groin/ buttocks/ genitalia
(7) Behind knees
(8) Between toes, toe nails
c. Post "field decontamination" all patients should be presumed to still have some degree of contamination
d. They must be handled accordingly
6. Rapid decontamination
a. Two step process described
b. For fast breaking event
7. Decontamination corridor - eight step process
a. Entry point at hot end
b. Tool drop and outer glove removal
c. Surface contamination removed
d. SCBA doffed
e. Protective equipment doffed
f. Clothing doffed
g. Thorough wash/ dry
h. Medical evaluation

V. Rescuer personal protective equipment/ transport protection
A. Levels of hazardous materials personal protection
1. Level "A" protection
a. Highest level of personal protection
b. High degree of chemical break through time
c. Encapsulated suit
(1) Covers everything including SCBA
d. Impermeable
e. Sealed
f. Typically used by hazardous material team for entry into hot zone
2. Level "B" protection
a. Level of protection typically worn by decontamination team
(1) Decontamination wears one level below entry
b. Usually non-encapsulating protection
(1) SCBA worn outside suit
(2) Easier entry and SCBA bottle changes
c. Much easier to work in
d. High degree of repellence
3. Level "C" protection
a. Non-permeable clothing
b. Eye and hand protection

c. Foot covering
d. Used during transport of patients with potential of secondary contamination
4. Level "D" protection
a. Firefighter turnout clothing
B. Determining appropriate PPE
1. Ideally the chemical is known
2. A permeability chart is consulted to determine "breakthrough" time
3. Double or triple gloves are used or chemical resistant gloves
4. Nitrile gloves have a high resistance to chemicals
5. If situation is emergent
a. Take maximal barrier precautions
b. Full turnouts or Tyvek suit/ gowns
c. Use HEPA filters and eye protection
d. Double or triple glove
e. Remove leather shoes, use rubber boots
6. Ideally at least level "B" protection should be used
7. Ideally use disposable protection
C. Transportation of semi-decontaminated patients
1. Use as much disposable equipment as possible
a. Reduces decontamination later
2. Practicality of lining an ambulance interior with plastic
a. Impractical
b. Time consuming
c. If airborne contaminants can permeate cabinets it is unsafe for the driver to operate the ambulance
d. Better to isolate the patient
3. Patient isolation
a. Stretcher decontamination pool
b. Continue decontamination and contain run-off
c. Plastic can be used to cover pool
d. Fits on stretcher
4. Transport to facilities predetermined to handle hazardous materials

VI. Medical monitoring and rehabilitation
A. Entry team/ decontamination team readiness prior to entry
1. Assessment of vital signs and documentation
2. Team members should have normal values on file
3. Documentation flow sheet must be started
a. Blood pressure

b. Pulse
c. Respiratory rate
d. Temperature
e. Body weight
f. ECG
g. Mental/ neurologic status

4. Rescuer PPE can cause considerable heat stress
5. Prehydration prior to entry
   a. 8-16 ounces of water or sport drink

B. After exit personnel should return to the medical sector for "rehab"
1. Re-assessment of vital signs and documentation
2. Documentation flow sheet must be started
   a. Blood pressure
   b. Pulse
   c. Respiratory rate
   d. Temperature
   e. Body weight
   f. ECG
   g. Mental/ neurologic status
3. Re-hydration at exit
   a. 8-16 ounces of water or sport drink
4. Use weight to estimate fluid losses
   a. Medical control/ protocol determination
      (1) PO fluids
      (2) IV Fluids
5. No re-entry until
   a. Vitals back to normal
      (1) Non-tachycardic
      (2) Alert
      (3) Normotensive
      (4) Body weight within percentage of normal

C. Heat stress factors
1. Prehydration of member
2. Degree of physical fitness
3. Ambient air temperature
4. Degree of activity and duration
5. Rescue PPE
   a. Suits protect but prevent cooling
   b. There is no way to lose heat by
      (1) Evaporation
      (2) Conduction
      (3) Convection

(4) Radiation
c. Like being in a sauna

VII. Practice the following
A. Donning and doffing level B and C PPE
B. Set up a rapid 2 step decontamination process
C. Set up 3 step decontamination process
D. Give a simulated chemical determine PPE and decontamination methods
E. Pre-entry medical monitoring and documentation
F. Exit medical monitoring and documentation
G. Preparing a patient and ambulance for transport

UNIT TERMINAL OBJECTIVE

8-5 At the completion of this unit, the paramedic student will have an awareness of the human hazard of crime and violence and the safe operation at crime scenes and other emergencies.

COGNITIVE OBJECTIVES

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

8-5.1 Explain how EMS providers are often mistaken for the police. (C-1)
8-5.2 Explain specific techniques for risk reduction when approaching the following types of routine EMS scenes: (C-1)
- a. Highway encounters
- b. Violent street incidents
- c. Residences and "dark houses"

8-5.3 Describe warning signs of potentially violent situations. (C-1)
8-5.4 Explain emergency evasive techniques for potentially violent situations, including: (C-1)
- a. Threats of physical violence.
- b. Firearms encounters
- c. Edged weapon encounters

8-5.5 Explain EMS considerations for the following types of violent or potentially violent situations: (C-1)
- a. Gangs and gang violence
- b. Hostage/ sniper situations
- c. Clandestine drug labs
- d. Domestic violence
- e. Emotionally disturbed people
- f. Hostage/ sniper situations

8-5.6 Explain the following techniques: (C-1)
- a. Field "contact and cover" procedures during assessment and care
- b. Evasive tactics
- c. Concealment techniques

8-5.7 Describe police evidence considerations and techniques to assist in evidence preservation. (C-1)

AFFECTIVE OBJECTIVES

None identified for this unit.

PSYCHOMOTOR OBJECTIVES

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

8-5.8 Demonstrate the following techniques: (P-1)
- a. Field "contact and cover" procedures during assessment and care
- b. Evasive tactics
- c. Concealment techniques

DECLARATIVE

I. Hazard awareness control and avoidance
  A. Determining the need
    1. Increasing violence
      a. Street violence (assault, robbery, etc.)
      b. Threat groups
      c. Domestic violence
      d. Drugs and drug users
    2. EMS providers on the street
      a. Violent crimes require EMS response
      b. EMS may arrive before police
    3. Local issues of concern
  B. Approach to the scene
    1. Approach is part of scene size-up
      a. Key point - identify and respond to dangers before they threaten
      b. Safety concerns begin with dispatch information
      c. Use available resources before arrival
        (1) Computer aided dispatch (CAD) information
        (2) You or your partner's prior calls at this location or area
        (3) Information from other crews and rigs
      d. Retreat from the scene if the scene cannot be made safe; there is no such thing as dead hero!
      e. Know local protocols
      f. Begin observation several blocks before the scene
      g. Use red lights and siren appropriate for the call
        (1) Urban scene - excess use could draw a crowd
        (2) Highway scene - lights required for safety
        (3) Joint law enforcement agency/ EMS response posturs
          (a) EMS code 3 but law enforcement agency code 1
          (b) Need for inter-agency cooperation and understanding
      h. Remember non-violent dangers such as hazardous materials, power lines, dangerous pets, etc.
      i. Scene safety considerations must continue throughout the call
        (1) Violence can resume
        (2) Crowds gather or turn violent
        (3) Additional persons can enter the scene
        (4) Violence may occur even with police present
        (5) EMS personnel may be mistaken for police
          (a) Uniform colors
          (b) Badges
          (c) Exiting a vehicle with lights and sirens
          (d) This could cause aggression toward you as an authority figure
        (6) Others could expect you to intervene in violent situations
        (7) Remember to include an "escape and strategic escape plan" in your protocols
    2. Known violent scenes
      a. Stage safe distance from the scene until police advise scene "secure"

(1) Out of sight of the scene
(2) If you can be seen, people will come to you
(3) Entering an unsafe scene adds another potential victim
(4) You may be injured or killed
(5) You may become a hostage (hostage negotiations techniques)
(6) You may be another patient in a scene which is already an MCI

C. Specific dangerous scenes
1. Approach to residences
a. Everyday response - all calls require a certain level of caution
(1) Even calls that appear "routine" require size-up
(2) Begin assessment of scene even before exiting your vehicle
b. Warning signs of danger - residential calls
(1) Past history of problems or violence
(2) Known drug or gang area
(3) Loud noises or items breaking
(4) Seeing or hearing fighting
(5) Intoxication or drug use
(6) Evidence of dangerous pets (droppings, barking, signs)
(7) Unusual silence or darkened residence
c. Approach - choose tactics that match threat or situation
(1) If actual danger is present - retreat and call for police
(2) Do not broadcast approach with lights/ sirens
(3) Foot approach using unconventional path (i.e. not sidewalk)
(4) Do not backlight yourself (getting between rig and residence)
(5) Stand to the side of door opposite hinges (doorknob side)
(6) Listen for signs of danger before announcing presence
2. Highway encounters
a. Danger from vehicular traffic
(1) Vehicle positioning to protect scene (fire truck in back - ambulance close to patient)
(2) Wear reflective clothing (be aware there is some controversy about use of this clothing)
(3) Stay out of traffic flow
(4) Beware of speeding and/ or intoxicated drivers
b. Danger from violence - application
(1) Disabled vehicles
(2) "Man slumped over wheel" calls
(3) Motor vehicle crashes
(4) Occupants may be
(a) Intoxicated/ drugged
(b) Wanted or fleeing felons
(c) Armed
(d) Violent/ abusive from altered mental status etiology
(e) Warning signs of danger
(f) Suspicious movements within vehicle
i) Grabbing or hiding items
ii) Arguing or fighting between passengers
iii) Lack of activity where activity is likely

(5) Signs of alcohol or drug use
(6) Open or unlatched trunks
(a) May occasionally hide people

c. Approach to vehicles
(1) One person approach
(2) Drive remains in ambulance which is elevated and provides greater visibility
(3) If nighttime, use ambulance lights to illuminate vehicle
(4) Notify dispatch of situation, location, license plate number and state
(5) Approach passenger side of vehicle
(a) Protection from vehicular traffic
(b) Not usually expected - police approach to driver's side
(6) Do not walk between ambulance and other vehicle
(a) Ambulance lights cause backlighting
(b) Could be injured if vehicle backs up
(c) For EMT to approach passenger side of vehicle, walk around rear of ambulance then to passenger side of vehicle
(7) Posts (a, b, c) provide best ballistic protection
(8) Observe rear seat; do not move forward of "c" post unless there are no threats in the back seat
(a) Observe front seat from behind "b" post
(b) Move forward only after assuring safety
(9) Retreat at the first sign of violence or problem

3. Violent street incidents
a. Murder, assault, robbery
(1) Involve dangerous weapons
(2) Perpetrators may be on-scene or return to scene
(3) Even patients may be violent toward EMS
b. Dangerous crowds and bystanders
(1) Crowds may quickly become large and volatile
(2) Violence directed against everything/ everyone in it's path
(3) EMS status not immunity from violence
c. Warning signs of danger - street scenes
(1) Voices become louder
(2) Pushing, shoving
(3) Hostilities toward any other persons at scene (perpetrator, police, victim, etc.)
(4) Rapid increase in crowd size
(5) Inability of law enforcement to control crowds
d. Safety actions - crowds
(1) Constantly monitor crowd
(2) Retreat from scene if necessary
(3) Take patient with you if possible and safe to do so
(a) Prevents return to scene later
(b) May require limited or tactical assessment of the patient at the scene

D. Violent groups and situations
1. Street gang awareness

a. Threat groups
   (1) Crips
   (2) Bloods
   (3) Latin Kings (Almighty Latin King Nation)
   (4) Hell's Angels
   (5) Outlaws
   (6) Pagans
   (7) Banditos
   (8) Other gangs
   (9) Local variations
   (10) Drug distribution groups

b. Gang characteristics
   (1) Clothing
      (a) Unique clothing - specific to group
      (b) Identifies affiliation and rank within group
      (c) Defiguring or disrespecting gang colors may provoke violence from member
   (2) Graffiti
      (a) Identifies gang presence
      (b) Marks gang territory

c. Safety issues in gang areas
   (1) Potential for violence
   (2) We appear to look like law enforcement and, therefore, we must be extremely cautious

2. Clandestine drug labs

a. Identification
   (1) Chemical odors
   (2) Chemistry equipment
      (a) Glassware
      (b) Chemical containers
      (c) Heating mantles, burners
   (3) Suspicious persons, activities, deliveries
   (4) Area fits the needs for a clan lab
      (a) Privacy
      (b) Utilities
      (c) Ventilation
   (5) Types of drug labs
      (a) Synthesis - creates drugs from chemical precursors (LSD, methamphetamine)
      (b) Conversion - change drug forms (cocaine HCl to base form)
      (c) Other types (i.e. tableting, extraction)

b. Hazards
   (1) Toxic inhalation
   (2) Fire and explosion
   (3) Booby traps
   (4) Armed or otherwise violent occupants
   (5) Actions if lab identified
      (a) Leave area immediately

(b) Notify law enforcement
(c) Initiate ICS and hazardous materials procedures
(d) Local hazardous materials teams/ fire service
(e) Police/ Drug Enforcement Administration
(f) Chemist/ chemistry specialists
(g) EMS concerns
i) Area evacuation?
ii) Do not touch anything
iii) Never stop any reaction or alter equipment

3. Domestic violence (refer to the abuse and assault unit)
a. Definition
(1) Violence between persons in a domestic relationship
(2) May be spousal, boy/ girlfriend, same-sex relationships
(3) Victims may be male or female
(4) Violence may be physical, emotional, sexual, verbal, economic
b. Indications
(1) Apparent fear of household member
(2) Different or conflicting accounts by parties at the scene
(3) One party preventing another from speaking
(4) Patient reluctant to speak
(5) Injuries do not match reported mechanism of injury
(6) Unusual or unsanitary living conditions or hygiene
c. EMS actions
(1) Treat the patient
(2) Do not be judgmental about the situation
(3) Provide phone number for domestic violence hot line or shelter
(4) Notify authorities
(a) If consistent with policy/ regulations
(b) Mandatory reporting may be required
(c) Notify ED staff of your concerns

II. Tactical considerations for safety and patient care
A. Tactics for safety
1. Avoidance is always preferable to confrontation
a. Observation
b. Knowledge of warning signs
c. Knowledge of proper tactical response
(1) To avoid danger
(2) To deal with danger when you can't avoid
d. Staging - dispatcher learns of danger and advises not to approach scene until danger is handled by appropriate authorities
2. Tactical retreat
a. Leaving the scene when danger is observed
(1) Violence or indicators of violence displayed
(2) Immediate, decisive actions required
(3) Retreat in a calm, safe manner
(4) Be aware of the danger which is now behind you
(5) Retreat may be on foot or via vehicle (there is nothing in your ambulance

that is worth your life!)
(6) Choose mode and route of retreat that provides least exposure to danger

b. How far to retreat
(1) Must protect you from any potential danger
(2) Must be out of immediate line of sight
(3) Must be protected from gunfire (cover)
(4) Must be far enough away to react if danger re-approaches

3. Retreat - other considerations
a. Notify other responding units and agencies of danger
(1) EMS agency's SOP
(a) Code RED
(b) Other
(2) Law enforcement agency's reaction/ response
(a) Their SOPs
(b) Inter-agency agreement
(3) Document your observations of danger
(4) Document your response to danger
(a) Who was notified of danger
(b) Your actions
(c) Time left/ time returned to scene
(5) Documentation is key to reducing liability
(6) Retreat for appropriate circumstances is not abandonment

4. Cover and concealment
a. Concealment
(1) Hides your body
(2) Offers no ballistic protection
(3) Examples
(a) Bushes
(b) Wallboard
(c) Vehicle door

b. Cover
(1) Hides your body
(2) Offers ballistic protection
(3) Examples
(a) Large trees
(b) Telephone pole
(c) Vehicle engine block

c. Application
(1) Be aware of your surroundings
(2) Cover/ concealment should be integrated in retreat from danger
(3) Cover/ concealment should be used when "pinned down"
(4) Cover/ concealment must be used properly
(a) Place as much of your body as possible behind cover
(b) Constantly look to improve your protection and location
(5) Be conscious of reflective clothing that may make you stand out

5. Distraction and evasive tactics
a. Use of equipment
(1) Wedge stretcher in doorway to block aggressor

(2) Throw equipment to trip or slow aggressor
b. Evasion
(1) Use unconventional path while retreating
(2) Anticipate moves of aggressor
6. Contact/ cover tactics
a. Specific evasive techniques for
(1) Threats of physical violence
(2) Firearms encounters
(3) Edged weapons encounters
b. Providers have preassigned roles
(1) "Contact" provider
(a) Initiates and provides direct patient care
(b) Performs patient assessment
(c) Handles most interpersonal scene contact
(2) "Cover" provider
(a) In tactical context, main function to "cover" or observe scene for danger while "contact" provider takes care of patient
(b) Generally avoids patient care duties that would prevent observation of the scene
(c) In small crews "cover" provider likely to have other functions (equipment, etc.)
c. Communication between providers
(1) Warning signals
(a) Crews should develop methods of alerting other providers to danger without alerting aggressors
(b) Verbal and non-verbal signals needed
(2) Involve dispatch in danger signal process
(a) Code RED

B. Tactical patient care
1. Body armor
a. Also known as "bullet-proof vests"
b. Offers protection from
(1) Most handgun bullets
(2) Most knives
(3) Reduction of blunt trauma (i.e. steering wheel in MVC)
c. Does not offer protection
(1) High velocity (rifle) bullets
(2) Thin or dual-edged weapons (ice pick)
(3) When not worn
(4) Reduced protection when wet
d. Wearer may feel false sense of security
(1) Never do anything you wouldn't do without body armor
(2) Body armor doesn't cover all of your body
(3) Cavitation even with body armor may be severe (but without penetration)
2. Tactical EMS
a. Providing EMS in violent or tactically "hot" zone
(1) Requires special training and authorization
(2) Body armor and tactical uniform

(3) Compact, functional equipment in small cases
(4) May require risks not taken in standard EMS situations

b. Patient care differences
(1) Extraction of patient from the area safely is a major concern
(2) Frequent care of trauma patients
(3) Care may be modified to meet tactical considerations
(4) Medical and transport interventions must be coordinated with incident commander
(5) Move patient to tactically cold zone for complete patient care and transportation
(6) Use of metal clipboard or chemical agent as a defensive tool

c. Local protocols, standing orders, and medical control issues

d. Joint law enforcement agency/ EMS operation
(1) Law enforcement agency/ SWAT team member
(a) CONTOMS
(b) SWAT-Medic
(c) EMT-T

III. EMS at crime scenes

A. Crime scenes

1. Definition
a. A location where any part of a criminal act occurred
b. A location where evidence relating to a crime may be found

2. Evidence
a. Prints
(1) Fingerprints
(a) Ridge characteristics left behind on a surface with oils and moisture from skin
(b) Unique - no two people have identical fingerprints
(2) Footprints

b. Blood and body fluids
(1) DNA and ABO blood typing
(2) Blood spatter evidence

c. Particulate evidence
(1) Hairs
(2) Carpet and clothing fibers

d. EMS provider's observations of the scene
(1) Patient (victim) position
(2) Patient's injuries
(3) Conditions at the scene
(a) Lights
(b) Curtains
(c) Signs of forced entry
(4) Statements of persons at the scene
(5) Statements of the patient/ victim
(6) Dying declarations

3. Preserving evidence
a. Patient care is the ultimate priority (you may be restricted to only one team

member entrance)
b. Evidence protection is performed while caring for the patient (carry in only necessary equipment)
c. Evidence preservation techniques
(1) Be observant
(2) Touch only what is required for patient care
(3) If necessary to touch something, remember it and tell police
(4) Wear latex gloves
(a) Infection control
(b) Prevents you leaving your fingerprints
(c) Will not prevent you from smudging other fingerprints
(5) Report pertinent observations

4. Documentation
a. Note observations objectively, not subjectively
(1) Put patient's or bystanders' words in quotes
(2) Patient care records are legal documents
(3) Avoid opinions not relevant to patient care
(4) Patient care records will be used in court
b. Mandatory reporting (refer to unit dealing with abuse and assault)
(1) EMS providers may be required to report certain types of crimes (your protocols, state laws and ethical versus legal considerations)
(2) Child abuse and geriatric/ elder abuse/ neglect
(3) Domestic violence
(4) Certain violent crimes (i.e. rape, gunshot, etc.)
(5) Follow local policies and regulations regarding confidentiality

The following goals must be successfully accomplished within the context of the learning environment. Clinical experiences should occur after the student has demonstrated competence in skills and knowledge in the didactic and laboratory components of the course. Items in **bold** are essentials and must be completed. Items in *italics* are recommendations to achieve the essential and should be performed on actual patients in a clinical setting. Recommendations are not the only way to achieve the essential. If the program is unable to achieve the recommendations on live patients, alternative learning experiences (simulations, programed patient scenarios, etc.) can be developed. If alternatives to live patient contact are used, the program should increases in the number of times the skill must be performed to demonstrate competence.

These recommendations are based on survey data from Paramedic Program Directors and expert opinion. Programs are encouraged to adjust these recommendations based on thorough program evaluation. For example, if the program finds that graduates perform poorly in airway management skills, they should increase the number of intubations and ventilations required for graduation and monitor the results.

PSYCHOMOTOR SKILLS

The student must demonstrate the ability to safely administer medications.
The student should safely, and while performing all steps of each procedure, properly administer medications at least 15 times to live patients.

The student must demonstrate the ability to safely perform endotracheal intubation.
The student should safely, and while performing all steps of each procedure, successfully intubate at least 5 live patients.

The student must demonstrate the ability to safely gain venous access in all age group patients.
The student should safely, and while performing all steps of each procedure, successfully access the venous circulation at least 25 times on live patients of various age groups.

The student must demonstrate the ability to effectively ventilate unintubated patients of all age groups.
The student should effectively, and while performing all steps of each procedure, ventilate at least 20 live patients of various age groups.

AGES

The student must demonstrate the ability to perform a comprehensive assessment on pediatric patients.
The student should perform a comprehensive patient assessment on at least 30 (including newborns, infants, toddlers, and school age) pediatric patients.

The student must demonstrate the ability to perform a compressive assessment on adult patients.
The student should perform a comprehensive patient assessment on at least 50 adult patients.

The student must demonstrate the ability to perform a comprehensive assessment on geriatric patients.
The student should perform a comprehensive patient assessment on at least 30 geriatric patients.

PATHOLOGIES

The student must demonstrate the ability to perform a comprehensive assessment on obstetric patients.

The student should perform a comprehensive patient assessment on at least 10 obstetric patients.

The student must demonstrate the ability to perform a comprehensive assessment on trauma patients.

The student should perform a comprehensive patient assessment on at least 40 trauma patients.

The student must demonstrate the ability to perform a comprehensive assessment on psychiatric patients.

The student should perform a comprehensive patient assessment on at least 20 psychiatric patients.

COMPLAINTS

The student must demonstrate the ability to perform a comprehensive assessment, formulate and implement a treatment plan for patients with chest pain.

The student should perform a comprehensive patient assessment, formulate and implement a treatment plan on at least 30 patients with chest pain.

The student must demonstrate the ability to perform a comprehensive assessment, formulate and implement a treatment plan for patients with dyspnea/respiratory distress.

The student should perform a comprehensive patient assessment, formulate and implement a treatment plan on at least 20 adult patients with dyspnea/respiratory distress.

The student should perform a comprehensive patient assessment, formulate and implement a treatment plan on at least 8 pediatric patients (including infants, toddlers, and school age) with dyspnea/respiratory distress.

The student must demonstrate the ability to perform a comprehensive assessment, formulate and implement a treatment plan for patients with syncope.

The student should perform a comprehensive patient assessment, formulate and implement a treatment plan on at least 10 patients with syncope.

The student must demonstrate the ability to perform a comprehensive assessment, formulate and implement a treatment plan for patients with abdominal complaints.

The student should perform a comprehensive patient assessment, formulate and implement a treatment plan on at least 20 patients with abdominal complains (for example: abdominal pain, nausea/vomiting, GI bleeding, gynecological complaint, etc.)

The student must demonstrate the ability to perform a comprehensive assessment, formulate and implement a treatment plan for patients with altered mental status.

The student should perform a comprehensive patient assessment, formulate and implement a treatment plan on at least 20 patients with altered mental status.

TEAM LEADER SKILLS

The student must demonstrate the ability to serve as a team leader in variety of prehospital emergency situations.

The student should serve as the team leader for at least 50 prehospital emergency responses.

NOTE: Webpage reflecting hyperlink to 1998 incorporated materials (see p. 4).

≡ MENU

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EDUCATION

Supporting a nationwide systems approach to EMS education

EMS is a critical component of the nation's healthcare system. Indeed, regardless of where they live, work or travel, people across the United States rely on a sufficient, stable and well-trained workforce of EMS providers for help in everyday emergencies, large-scale incidents and natural disasters alike.

To this end, NHTSA's Office of EMS works collaboratively with its Federal partners to support workforce research and develop resources designed specifically for EMS caregivers. We help coordinate and promote a unified vision for a system of EMS education, publish National EMS Education Standards and a National Standard Curriculum and champion EMS workforce health and safety, among other essential activities.

Resources

EMS Education Agenda for the Future +

National EMS Education Standards and Instructional Guidelines +

National EMS Scope of Practice Model +

EMS Core Content +

Additional & Archived Resources +

1996 EMD Program Implementation and Administration: NSC

This resource contains support materials for the National Standard Curriculum Emergency Medical Dispatch (EMD) Program, 1996. Included are an EMD Manager's Guide, EMD Instructor's Guide, and an EMD Trainee's Guide. (This is provided for historical value)

2002 Supplemental Airway Modules for the 1994 EMT-Basic: NSC

This 2002 document provided supplemental information to assist the EMT-Basic instructor in the presentation of airway management, oxygenation and ventilation concepts.

Instructor's Course Guide for National Standard Curriculum: EMT - Intermediate, 2001, Refresher Curriculum

This site contains an instructor's course guide for the 2001 EMT-Intermediate Refresher Curriculum. (It is provided for historical value)

National Guidelines for Educating EMS Instructors, 2002

This instructor preparation curriculum was designed to aid EMS educators in effectively teaching adult learners who populate the EMS classroom.

National Guidelines: Paramedic, EMT - Continuing Education

This document presents national guidelines for both EMT-Intermediate and EMT-Paramedic continuing education and competency assurance.

National Standard Curriculum - Emergency Vehicle Operator's Course (Ambulance)

This document contains information to help instructors of the Emergency Vehicle Operator Course (Ambulance) present the materials effectively. (This is provided for historical value)

National Standard Curriculum - Emergency Vehicle Operator's Course (Ambulance) Participant Manual

The Emergency Vehicle Operator Course (Ambulance) curriculum provides participants the knowledge and skill practice necessary for individuals to learn how to safely operate all types of ambulances. (This is provided for historical value)

National Standard Curriculum: EMT - Ambulance, 1984

This document contains instructor lesson plans for the EMT level in 1984. (This is provided for historical value, but is replaced by the EMS Education Standards)

National Standard Curriculum: EMT - Basic, 1994

This instructor's course guide was designed to assist the course coordinator, instructors, and others in planning, managing and teaching the Emergency Medical Technician-Basic: National Standard Curriculum. (This is provided for historical value, but is replaced by the EMS Education Standards)

National Standard Curriculum: EMT - Basic REFRESHER, 1996

These 1996 Instructor Lesson Plans were designed to provide the technically competent instructor with the educational materials needed to conduct EMT refresher training programs.

National Standard Curriculum: EMT-Intermediate, 1985

This document contains instructor lesson plans for the EMT-I level in 1985. (It is provided for historical value)

National Standard Curriculum: EMT - Intermediate Comparison Document, 1999

This document lists the cognitive, affective and psychomotor objectives found in the 1999 EMT-I that were not in the 1985 EMT-I. The document was designed to help program managers and instructors meet the 1999 standard. (It is provided for historical value)

National Standard Curriculum: EMT - Intermediate Course Guide and Instructor Modules, 1998

This is the 1998 release of the EMT-I National Standard Curriculum. It contains the Course Guide and Instructor Modules and was designed to support instructors in teaching the EMT-I course. (It is provided for historical value)

National Standard Curriculum: First Responder, 1995

This 1995 document was the instructor's course guide and lessons for the National Standard Curriculum First Responder level. (Newer information is in the EMS Education Standards.)

National Standard Curriculum: First Responder - REFRESHER, 1996

This 1996 document was the National Standard Curriculum for the First Responder Refresher Course.

National Standard Curriculum: Paremedic, 1998

This document contains materials for the EMT-Paramedic National Standard Curriculum in 1998. (It is provided for historical value)

National Standard Curriculum: Paramedic - Comparison Document

This document lists the cognitive, affective and psychomotor objectives found in the 1998 EMT-P that are not in the 1985 EMT-P. (It is provided for historical value)

National Standard Curriculum: Paramedic - Instructor's Lesson Plans, 1985

This document contains instructor lesson plans for the EMT-Paramedic level in 1985. (It is provided for historical value)

National Standard Curriculum: Paramedic - REFRESHER, 2001

This site contains an instructor's guide for the 2001 EMT-Paramedic: NSC, Refresher Curriculum. (It is provided for historical value)

Related Content

Projects

- EMS Agenda 2050

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- Reducing Workforce Injuries and Illness
- Writing the Next Agenda
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