



OLD DOMINION EMERGENCY MEDICAL SERVICES ALLIANCE

Pediatric Trauma Emergencies - BLS

SERVING THE CITIZENS, EMS AGENCIES, ACUTE CARE HOSPITALS AND LOCAL GOVERNMENTS IN VIRGINIA PLANNING DISTRICTS 13,14,15 AND 19

7818 E. Parham Road, Suite 911 • Richmond, VA 23294
PHONE: 804-560-3300 • FAX: 804-560-0909 • www.odemsa.vaems.org



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Pediatric Trauma Emergencies - BLS (Abdominal Trauma)

OVERVIEW:

Blunt and penetrating traumas are major causes of morbidity and mortality in the United States. Pediatric abdominal anatomy differs from adults in several unique ways.

There is significantly less protection due to thinner muscle walls and less fat.

Ribs protecting the thoracic abdomen have increased flexibility more easily allowing the ribs to injure the abdominal organs.

Solid organs within the pediatric abdomen have a larger surface area thus a greater area is exposed for potential injury.

The organ attachments are also more elastic, increasing the chances of tearing and shearing injuries.

Lastly, the bladder extends to the umbilicus in the pediatric patient, increasing its chance of injury.

When performing a focused abdominal assessment, be organized, efficient, and thorough.

Initial abdominal examinations only identify injury about 65% of the time; secondary exams are needed when there is a high index of suspicion for abdominal trauma.

A proper abdominal examination involves exposing the entire abdomen from the nipple line to the groin and using a standard examination sequence of inspection, auscultation, percussion, and palpation.



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Student Can demonstrate the following competencies without prompting and can explain the clinical reasoning for each listed below:

1. Demonstrates proper assessment techniques / Physical skills.
 - a. Scene Survey
 - b. HPI – Complete
 - c. Signs and Symptoms
 - d. SAMPLE
 - e. OPQRST
 - f. MOI – NOI
 - i. Blunt
 - ii. Penetrating
 - iii. Speed
 - iv. Restraints
 - v. Protective Equipment
 - vi. LOC
 - vii. Time of Injury occurred
 - g. Need for ALS.
 - h. Pulse Ox
 - i. Primary Assessment
 - i. XABCDE Format
 - j. Life Threat Bleeding
 - i. Assessment
 - ii. Correction
 - k. Airway
 - i. Assessment
 - ii. Correction
 - l. Breathing
 - i. Assessment
 - ii. Correction
 1. Ventilate at a rate of least 30 per min.
 2. Proper volume/Device
 3. Pulse Ox at least 94%

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- m. Circulation
 - i. Assessment
 - ii. Correction
 - n. Disability
 - i. Assessment
 - ii. Correction
 - o. Exposure
 - i. Assessment
 - ii. Correction
 - p. C-Spine Precautions
2. Demonstrates the following skills.
- a. Proper Physical Exam
 - i. Pediatric Assessment Triangle.
 - 1. Across the Room Assessment
 - ii. Head to toe format/Foot to Head
 - iii. All major body parts/systems
 - iv. Vital Signs / Documentation
 - b. Properly able to properly Backboard/C spine with size appropriate equipment
 - c. Frequently assess for Shock
 - d. Impaled Objects
 - e. Evisceration of Abdominal Organs
 - f. Proper CPR skills to current AHA Standards
 - g. Pulse Ox Measurement
 - h. Oxygen/Ventilation based on Assessment.
 - i. Demonstrates the appropriate transport mode and destination.
 - j. Transport as soon as safe to do so to the proper destination.

The above is a very abbreviated summary of the Protocol.

For the complete Protocol, please review the appropriate Protocol as published by ODEMSA.



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Pediatric Trauma Emergencies - BLS (Burns)

OVERVIEW:

Burns are a devastating form of trauma associated with high mortality rates, lengthy rehabilitation, cosmetic disfigurement, and permanent physical disabilities.

Thermal, chemical, electrical, nuclear radiation, or solar sources may cause burns.

Burns can affect more than just the skin. They can affect the body's fluid and chemical balance, temperature regulation, and musculoskeletal, circulatory, and respiratory functions.

Burns are classified by degree:

- 1° **Superficial** - some reddening to skin,
- 2° **Partial-thickness** - has blistering and deep reddening to the skin, and
- 3° **Full-thickness** - causes damage to all skin layers and is either charred/ black or white/ leathery with little or no pain at the site.

The patient's palm equals approximately 1% of their body surface area when determining the area affected.

This is sometimes more helpful than using the “rule of nines” especially with pediatric patients.

Scald injuries are more common in younger children while flame injuries are more common in older children and account for the most fatalities.

Smoke inhalation is the most common cause of death in the first hour after a burn injury.

Children who have burn injuries are at a greater risk than adults for shock and hypothermia because of their proportionately large body surface.



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1. Demonstrates proper assessment techniques / Physical skills.
 - a. Scene Survey
 - b. HPI – Complete
 - c. Signs and Symptoms
 - d. SAMPLE
 - e. OPQRST
 - f. MOI – NOI
 - i. Blunt
 - ii. Penetrating
 - iii. Speed
 - iv. Restraints/Seatbelts/Car seat
 - v. Protective Equipment
 - vi. LOC
 - vii. Time of Injury occurred
 - g. Need for ALS.
 - h. Pulse Ox
 - i. Primary Assessment
 - i. XABCDE Format
 - j. Life Threat Bleeding
 - i. Assessment
 - ii. Correction
 - k. Airway
 - i. Assessment
 - ii. Correction
 - l. Breathing
 - i. Assessment
 - ii. Correction
 1. Ventilate at a rate of least 30 per min.
 2. Proper volume/Device
 3. Pulse Ox at least 94%

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 - i. Assessment
 - ii. Correction
- n. Disability
 - i. Assessment
 - ii. Correction
- o. Exposure
 - i. Assessment
 - ii. Correction
- p. C-Spine Precautions
- q. Types of Burns
 - i. Thermal
 - 1. Stop the burning process.
 - ii. Chemical
 - 1. Dry Chemicals
 - a. Brush off the substance
 - b. Rinse with copious amounts of water for 20 minutes
 - 2. Liquid Chemicals
 - a. Flush area with copious amounts of water for 20 minutes
 - iii. Electrical
 - 1. Ensure Electricity/Energy is turned off.
 - a. Remove from the source.
 - 2. Treat based on an assessment of injuries.
 - iv. Radiation /Nuclear Materials
 - 1. Remove from the source.
 - 2. Treat based on an assessment of injuries.
- r. Remove constricting clothing/Jewelry.
- s. Bandage Dry Sterile Dressing
 - i. Burn Sheet
- 2. Demonstrates the following skills.
 - a. Proper Physical Exam
 - i. Pediatric Assessment Triangle.
 - 1. Across the Room Assessment

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- ii. Head to toe format/Foot to Head
- iii. All major body parts/systems
 - 1. Critical Burns
- iv. Vital Signs / Documentation
- b. Properly able to properly Backboard/C spine with size appropriate equipment
- c. Frequently assess for Shock
- d. Pulse Ox Measurement
- e. Oxygen/Ventilation based on Assessment.
- f. Demonstrates the appropriate transport mode and destination.
- g. Transport as soon as safe to do so to the proper destination.

The above is a very abbreviated summary of the Protocol.

For the complete Protocol, please review the appropriate Protocol as published by ODEMSA.



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Pediatric Trauma Emergencies - BLS (Electrical Injuries)

OVERVIEW:

Most electrical injuries are caused by generated electricity, such as that encountered in power lines and household outlets.

Relative to the external damage caused by electrical injuries, internal damage is often more severe and can include damage to muscles, blood vessels, organs, and nerves.

Damaged muscle releases myoglobin and potassium, which can precipitate in the kidneys and cause acute renal failure.

Electrical current as low as 20 mA can cause respiratory arrest and as little as 50 mA can cause ventricular fibrillation.

Although long-bone fractures and spinal injuries can occur due to falls after electrocution, they can additionally occur due to severe tetanic muscle spasms with high amplitude electrocutions.

Before treating any patient with an electrical injury, ensure your personal safety.

Do not touch the patient, if the patient is still in contact with the electrical source.



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Student Can demonstrate the following competencies without prompting and can explain the clinical reasoning for each listed below:

1. Demonstrates proper assessment techniques / Physical skills.
 - a. Scene Survey
 - b. HPI – Complete
 - c. Signs and Symptoms
 - d. SAMPLE
 - e. OPQRST
 - f. MOI – NOI
 - i. Blunt
 - ii. Penetrating
 - iii. Speed
 - iv. Restraints/Seatbelts/Car seat
 - v. Protective Equipment
 - vi. LOC
 - vii. Time of Injury occurred
 - g. Need for ALS.
 - h. Pulse Ox
 - i. Primary Assessment
 - i. XABCDE Format
 - j. Life Threat Bleeding
 - i. Assessment
 - ii. Correction
 - k. Airway
 - i. Assessment
 - ii. Correction
 - l. Breathing
 - i. Assessment
 - ii. Correction
 1. Ventilate at a rate of least 30 per min.
 2. Proper volume/Device
 3. Pulse Ox at least 94%

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 - i. Assessment
 - ii. Correction
 - n. Disability
 - i. Assessment
 - ii. Correction
 - o. Exposure
 - i. Assessment
 - ii. Correction
 - p. C-Spine Precautions
 - q. Types of Burns
 - i. Thermal
 - 1. Stop the burning process.
 - ii. Electrical
 - 1. Ensure Electricity/Energy is turned off.
 - a. Remove from the source.
 - 2. Treat based on an assessment of injuries.
 - 3. 12 lead EKG
 - r. Remove constricting clothing/Jewelry.
 - s. Bandage Dry Sterile Dressing
 - i. Burn Sheet
2. Demonstrates the following skills.
- a. Proper Physical Exam
 - i. Pediatric Assessment Triangle.
 - 1. Across the Room Assessment
 - ii. Head to toe format/Foot to Head
 - iii. All major body parts/systems
 - 1. Critical Burns
 - iv. Vital Signs / Documentation
 - b. Properly able to properly Backboard/C spine with size appropriate equipment
 - c. Frequently assess for Shock
 - d. Pulse Ox Measurement
 - e. Oxygen/Ventilation based on Assessment.

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- f. Demonstrates the appropriate transport mode and destination.
- g. Transport as soon as safe to do so to the proper destination.

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Pediatric Trauma Emergencies - BLS (Head Injury)

OVERVIEW:

Brain injury and its accompanying pathologic processes continue to be a leading cause of mortality associated with trauma.

Whether the injury is due to a blunt or penetrating mechanism, bleeding or swelling of the brain and surrounding tissue may lead to an increase in pressure within the cranial cavity, known as intracranial pressure (ICP).

If the pressure within the skull is not controlled, neurologic changes may produce signs and symptoms ranging from headache to coma with loss of protective reflexes.

Blunt force trauma may result in scalp injury, skull fracture, and meningeal and brain tissue injury.

Penetrating trauma may produce focal or diffuse injury, depending on the velocity of the penetrating object.

Although the pre-hospital provider cannot reverse the brain tissue damage from the initial/primary brain injury that has already occurred, they can play a major role in preventing or limiting the processes that exacerbate and lead to a secondary brain injury.

The pre-hospital provider's goal is to focus on reversing any hypoxia, hypotension, hypercarbia, acidosis, or increasing intracranial pressure.



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1. Demonstrates proper assessment techniques / Physical skills.
 - a. Scene Survey
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 - c. Signs and Symptoms
 - d. SAMPLE
 - e. OPQRST
 - f. MOI – NOI
 - i. Blunt
 - ii. Penetrating
 - iii. Speed
 - iv. Restraints/Seatbelts/Car seat
 - v. Protective Equipment
 - vi. LOC
 - vii. Time of Injury occurred
 - g. Need for ALS.
 - h. Pulse Ox
 - i. Primary Assessment
 - i. XABCDE Format
 - j. Life Threat Bleeding
 - i. Assessment
 - ii. Correction
 - k. Airway
 - i. Assessment
 - ii. Correction
 - l. Breathing
 - i. Assessment
 - ii. Correction
 1. Ventilate at a rate of least 30 per min.
 2. Proper volume/Device
 3. Pulse Ox at least 94%

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 - ii. Correction
 - n. Disability
 - i. Assessment
 - ii. Correction
 - o. Exposure
 - i. Assessment
 - ii. Correction
 - p. C-Spine Precautions
 - q. Obtain Blood Glucose
2. Demonstrates the following skills.
- a. Proper Physical Exam
 - i. Pediatric Assessment Triangle.
 - 1. Across the Room Assessment
 - ii. Head to toe format/Foot to Head
 - iii. All major body parts/systems
 - 1. Critical Burns
 - iv. Vital Signs / Documentation
 - b. Properly able to properly Backboard/C spine with size appropriate equipment
 - i. Proper Head/Neck Immobilization
 - ii. Proper method to secure Patient to the Backboard
 - iii. Proper method to secure Back boarded Patient to Stretcher.
 - c. Frequently assess for Shock
 - i. If Shock is noted Refer to the Pediatric Shock Protocol
 - d. Properly Calculate Age-appropriate GCS
 - e. Pulse Ox Measurement
 - f. Oxygen/Ventilation based on Assessment.
 - g. Demonstrates the appropriate transport mode and destination.
 - h. Transport as soon as safe to do so to the proper destination.

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