Pediatric patients have their own set of problems that are unique to their population.

- Many problems common in adults do not occur in children.
  - Important to remember that children are not small adults
  - Treatment can be difficult for providers.
Many EMTs have level of discomfort responding to and caring for pediatric patients in distress.
- Pediatric patients differ in how they respond to stressful events.
- With proper training, you will learn the tools necessary to form a baseline assessment and plan of care.
Communication With the Patient and the Family

• You may have more than one patient.
  – Caregiver may need help and support.

• A calm parent contributes to a calm child.
  – An agitated parent means child will act same way.

• Remain calm, efficient, professional, and sensitive.
Body is growing and changing very rapidly during childhood.

- Can create difficulties during assessment if you do not expect them
Anatomy of airway differs from adults.
- Pediatric airway is smaller in diameter and shorter in length.
- Lungs are smaller.
- Heart is higher in child’s chest.
Circulatory System (1 of 3)

- Pulse rates differ from adults.
  - Infants heart can beat 160 beats/min or more.
  - Primary method used to compensate for decreased perfusion
    - Ability of children to constrict blood vessels also helps them compensate for decreased perfusion.
Pathophysiology

- Pediatrics are more dependent on actual cardiac output.
  - Blood being pumped out of heart in 1 minute
  - May be in shock despite normal blood pressure
  - A small amount of blood loss can lead to shock.
Pediatric nervous system is immature, underdeveloped, and not well protected.

- Head-to-body ratio is larger.
- Occipital region of head is larger.
- Subarachnoid space is relatively smaller, leaving less cushioning for brain.
- Brain tissue and cerebral vasculature are fragile and prone to bleeding from shearing forces.
• Pediatric brain requires higher cerebral blood flow, oxygen, and glucose.
  – At risk for secondary brain damage from hypotension and hypoxic events.

• Spinal cord injuries are less common.
  – If injured, it is more likely to be an injury to the ligaments because of rapid neck movements.
• Pathophysiology
  – Altered mental status may result from hypoglycemia, hypoxia, seizure, or ingestion of drugs or alcohol.
  – Parent of caregiver is important resource.
  – Pediatric patient with AMS may appear sleepy, lethargic, combative, unresponsive.
• Abdominal muscles are less developed.
  – Less protection from trauma.
  – Liver, spleen, kidneys are proportionally larger and situated more anteriorly and close to one another.
• Prone to bleeding and injury
• There is a higher risk for multiple organ injury.
• Pathophysiology
  – Signs and symptoms may be vague.
  – Abdominal walls are underdeveloped.
  – May not be able to pinpoint origin of pain
  – Take complaints of abdominal pain seriously.
• Large amount of bleeding may occur within abdominal cavity, without signs of shock.
• Open growth plates allow bones to grow.
  – As a result of growth plates, children’s bones are softer and more flexible, making them prone to stress fracture.

• Bone length discrepancies can occur if injury to growth plate occurs.
  – Immobilize all strains and sprains.
Bones of an infant’s head are flexible and soft.
- Soft spots are located at front and back of head.
  - Referred to as fontanelles
  - Will close at particular stages of development
  - Fontanelles of an infant can be a useful assessment tool.
• Thoracic cage is highly elastic and pliable.
  – Composed of cartilaginous connective tissue
  – Ribs and vital organs are less protected.
• Pathophysiology
  – Muscles and bones grow into adolescence.
  – The younger the child, the more flexible the bone structures.
  • Sprains are uncommon and femur fractures rare.
  – Older children are prone to long bone fractures due to more risks and activity.
Integumentary System (1 of 2)

- Pediatric system differs in a few ways:
  - Thinner skin and less subcutaneous fat
  - Higher ratio of body surface area to body mass leads to larger fluid and heat losses.
  - Composition of skin is thinner and tends to burn more easily and deeply.
• Pathophysiology
  – Thermoregulator system is immature.
    • Makes pediatric population more prone to hypothermic events
    • Lack of ability to shiver to generate heat
    • Children should be kept warm during transport.
    • Without treatment of hypothermic event, patient may lapse into convulsive seizure activity.
• Form a general impression.
  – Use pediatric assessment triangle (PAT).
• 15- to 30-second structured assessment tool
• PAT
  – Does not require equipment
  – Does not require you to touch the patient
  – Three steps:
    • Appearance
    • Work of breathing
    • Circulation
Airway Obstruction

- Children obstruct airway with any object they can fit into their mouth.
- In cases of trauma, teeth may have been dislodged into the airway.

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Airway Obstruction (2 of 8)

- Blood, vomitus, or other secretions can cause severe airway obstruction.
- Infections can cause obstruction.
  - Croup is an infection in the airway below the level of the vocal cords.
    - Usually caused by a virus
  - Epiglottitis is an infection of the soft tissue above the level of the vocal cords.
Airway Obstruction (3 of 8)

Pharynx

Esophagus

Swollen epiglottis

Swollen larynx
• Infection should be considered if child has congestion, fever, drooling, and cold symptoms.

• Obstruction by foreign object may involve upper or lower airway.
  – Signs and symptoms associated with upper airway obstruction include decreased breath sounds and stridor.
Oxygen Delivery Devices (5 of 9)
Altered Mental Status (1 of 2)

- Abnormal neurologic state
  - Understanding developmental changes and listening to caregiver’s opinion are key.
  - AEIOU-TIPPS reflects major causes of AMS.

Table 32-10  AEIOU-TIPPS

<table>
<thead>
<tr>
<th>A</th>
<th>Alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Epilepsy, endocrine, electrolytes</td>
</tr>
<tr>
<td>I</td>
<td>Insulin</td>
</tr>
<tr>
<td>O</td>
<td>Opiates and other drugs</td>
</tr>
<tr>
<td>U</td>
<td>Uremia</td>
</tr>
<tr>
<td>T</td>
<td>Trauma, temperature</td>
</tr>
<tr>
<td>I</td>
<td>Infection</td>
</tr>
<tr>
<td>P</td>
<td>Psychogenic</td>
</tr>
<tr>
<td>P</td>
<td>Poison</td>
</tr>
<tr>
<td>S</td>
<td>Shock, stroke, space-occupying lesion, subarachnoid hemorrhage</td>
</tr>
</tbody>
</table>

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Seizures (2 of 5)

Table 32-11 Common Causes of Seizures

- Child abuse
- Electrolyte imbalance
- Fever
- Hypoglycemia (low blood glucose level)
- Infection
- Ingestion
- Lack of oxygen
- Medications
- Poisoning
- Seizure disorder
- Recreational drug use
- Head trauma
- Idiopathic (no cause can be found)

• Common causes of seizures
• Inflammation of tissue that covers the spinal cord and brain
  – Caused by infection by bacteria, viruses, fungi, or parasites
  – Left untreated can lead to brain damage or death
Poisoning Emergencies and Management (1 of 5)

• Common among children
  – Can occur by ingesting, inhaling, injecting, or absorbing toxic substances

• Common sources:
  – Alcohol
  – Aspirin and acetaminophen
  – Household cleaning products such as bleach and furniture polish
  – Houseplants
Poisoning Emergencies and Management (2 of 5)

- Common sources (cont’d):
  - Iron
  - Prescription medications of family members
  - Street drugs
  - Vitamins

- Signs and symptoms vary, depending on substance, age, and weight.
• Be alert for signs of abuse.
• After primary assessment, ask caregiver the following:
  – What is the substance involved?
  – Approximately how much was ingested?
  – What time did the incident occur?
  – Any changes in behavior or level of consciousness?
  – Any choking or coughing after the exposure?
Poisoning Emergencies and Management (4 of 5)

• Treatment
  – Perform external decontamination.
    • Remove tablets or fragments from mouth.
    • Wash or brush poison from skin.
  – Assess and maintain ABCs.
  – Give activated charcoal, according to medical control or local protocol.
  – If shock is present, treat and transport.
Activated charcoal

- Not recommended for those who have ingested acid, an alkali, or a petroleum product
- Not recommended for patients who have decreased level of consciousness
- Common trade names are Insta-Char, Actidose, and Liqui-Char.

• Usual dose is 1 g per kilogram of body weight.
Pediatric Trauma Emergencies and Management

- Number one killer of children in the US
  - Quality of care can impact recovery.
  - Infants and toddlers commonly hurt as a result of falls or abuse
  - Older children and adolescents commonly injured in mishaps with automobiles
    - Most significant threat to well-being of a child
    - Gunshot wounds, blunt injuries, and sports also causes
Physical Differences

- Children are smaller than adults.
  - Locations of injuries may be different.
- Children’s bones and soft tissues are less well developed than an adult’s.
  - Force of injury affects structures differently.
- A child’s head is proportionally larger than an adult’s and exerts greater stress on the neck structures during a deceleration injury.
Psychological Differences

- Children are less mature psychologically than adults.
  - Often injured because of underdeveloped judgment and lack of experience
    - Forget to look both ways before crossing street
    - Forget to check depth of water before diving
  - Always assume the child has serious head and neck injuries.
• Important for EMT to understand physical and psychological characteristics of children

• Vehicle collisions
  – Children can dart out in front of motor vehicles without looking.
  – Typically sustain high-energy injuries to the head, spine, abdomen, pelvis, or legs.
• **Sport injuries**
  - Children are often injured in organized sports activities.
  - Head and neck injuries can occur in contact sports such as football, wrestling, ice hockey, field hockey, soccer, or lacrosse.
  - Remember to stabilize cervical spine.
    - Be familiar with protocols for helmet removal.
• JumpSTART triage system
  – Intended for patients younger than 8 years and weighing less than 100 lb
  – Four triage categories
    • Green
    • Yellow
    • Red
    • Black
• JumpSTART triage system (cont’d)
  – Green: minor not in need of immediate treatment
    • Able to walk (except in infants)
  – Yellow: delayed treatment
    • Presence of spontaneous breathing, with peripheral pulse, responsive to painful stimuli
• JumpSTART triage system (cont’d)
  – Red: immediate response
    • Respirations less than 15 or greater than 45 breaths/min, apnea responsive to positioning or rescue breathing, respiratory failure, breathing without a pulse, inappropriate painful response
  – Black: deceased or expectant deceased
    • Apneic without pulse, or apneic and unresponsive to rescue breathing
JumpSTART Pediatric MCI Triage

Able to walk?
- YES: MINOR
- NO: Secondary Triage*

Breathing?
- NO: Position upper airway
  - APNEIC: DECEASED
  - Palpable pulse?
    - NO: DECEASED
    - YES: 5 rescue breaths
      - APNEIC: DECEASED
      - BREATHING: IMMEDIATE

Respiratory rate
- < 15 or > 45: IMMEDIATE
- 15–45
  - Palpable pulse?
    - NO: IMMEDIATE
    - YES: “P” (INAPPROPRIATE), or “U”
      - “A,” “V,” or “P” (APPROPRIATE): DELAYED

* Evaluate infants first in secondary triage

Disaster Management (4 of 4)

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