Chapter 35, Pediatric Emergencies

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1. Introduction to Pediatric Emergencies

- Treating **children** is different from treating **adults**.
- Children vary anatomically, physically, and emotionally from adults.
- Their illnesses and injuries differ based on age and development.
- **pediatrics** is the specialized medical practice for young patients.
- Caring for children can be challenging due to their age and developmental level.
- Children may not be able to describe what is wrong.
- Fear of EMS providers and pain can make assessment difficult.
- Parents or caregivers may be stressed or frightened.

2. Communication and Family Support

- Caring for a child means caring for both the patient and **caregivers**.
- Family members often need emotional support.
- A **calm parent** helps the child remain calm.
- Agitated parents can make a child's care more difficult.
- Remaining calm, efficient, and professional is important.
- For **infants**, the caregiver can hold the baby during assessment.
- For **toddlers**, reassure them with simple words and a calm voice if a parent is unavailable.
- For **preschool-aged** children, communicate simply and directly.
- Do not lie to a preschooler as it harms trust.
- For **school-aged** children, talk to the child, not just the caregiver.
- Give school-aged children simple explanations about pain.
- Ask school-aged children's parents for distraction advice.
- For **adolescents**, allow them to be involved in their own care.
- Allow adolescents to speak openly and ask questions.
- Maintain professional composure when dealing with sensitive issues like sexual abuse.
- After a child's death, support the grieving family.
- Learn and use the child's name.
- Speak to the family at eye level and maintain contact.
- Use the word "dead" or "died" when informing the family.
- Acknowledge the family's feelings.
- Offer to call family members.
- Keep instructions short and simple.
- Ask if family members want to hold the child.
- Wrap the child in a blanket if the family holds them.
- Do not remove tubes or equipment if the family is present.

3. Growth and Development Stages

- Childhood extends from birth to age 18.
- Children's thoughts and behaviors are grouped into five stages.

Stage	Ages	Key Considerations
Infancy	First year	Rapid growth; cannot differentiate strangers from parents; crying is main expression. Relatively larger head predisposes

		to hypothermia. Mobility increases danger. May cry if separated from parents.
Toddler	1 to 3 years	Rapid growth and development; explorers by nature, increasing injuries. Lack of molars increases choking risk. Stranger anxiety; may resist separation from caregiver. Difficulty describing pain; use visual scales.
Preschool Age	3 to 6 years	Rich imagination; fearful about pain; may believe injury is punishment. Can understand directions; describe painful areas. Much history still from caregivers. Modesty developing.
School Age	6 to 12 years	Begin to understand death is final. Assessment more like an adult. Talk to the child; give simple explanations for pain. Understand physical and emotional pain.
Adolescence	13 to 18 years	Physically similar to adults, emotionally still children. Time of experimentation and risk behaviors. Can understand complex concepts; allow involvement in care. Clear understanding of pain.

4. Pediatric Anatomy and Physiology Differences

System	Pediatric Characteristics	Adult Comparison	Source
Respiratory	Smaller airway diameter and length; smaller lungs. Heart opening higher and more anterior. Larger and rounder occiput. Tongue larger relative to mouth size and more anterior. Long, flappy epiglottis. Tracheal cartilage less developed. Upper airway funnel-shaped. Diameter of trachea size of drinking straw. Nose breathers. Oxygen demand twice that of adults. Diaphragm dictates air inspiration. Gastric distension hinders diaphragm movement. Thinner chest walls. Less air exchanged with each breath.	Airway is larger and longer; lungs are larger. Heart opening is lower. Occiput is smaller and flatter. Tongue is smaller relative to mouth size and less anterior. Epiglottis is smaller and less pliable. Tracheal cartilage is more developed and rigid. Upper airway is cylindrical. Trachea is larger. Mouth breathers. Oxygen demand is lower. Other muscles assist in breathing. Gastric distension has less impact on diaphragm.	

		Thicker chest walls. More air exchanged with each breath.	
Circulatory	Normal pulse ranges vary with age. Heart rate 160+ in infants. Compensate for decreased perfusion by constricting skin vessels. Signs of vasoconstriction: pallor, weak distal pulses, delayed cap refill, cool hands/feet.	Heart rate is generally lower and less variable. Compensation mechanisms differ.	
Nervous	Immature, underdeveloped, not well protected. Disproportionately larger head to body ratio. Larger occipital region. Smaller subarachnoid space, less cushioning. Fragile brain tissue and vasculature prone to bleeding. Higher requirement for cerebral blood flow, oxygen, glucose. Higher risk of secondary brain damage from hypotension/hypoxia. SCI less common. Ligament injuries more likely in cervical spine.	Nervous system is mature and well-protected. Head to body ratio is proportionate. Occipital region is smaller. Subarachnoid space is larger, providing more cushioning. Brain tissue and vasculature are more robust. Lower requirement for cerebral blood flow, oxygen, glucose. Lower risk of secondary brain damage. SCI is more common with bony injuries.	
Gastrointestinal	Abdominal muscles less developed, less protection from trauma. Liver, spleen, kidneys proportionately larger and more anterior, prone to bleeding/injury.	Abdominal muscles are more developed, providing greater protection. Liver, spleen, kidneys are proportionately smaller and less anterior, less prone to injury from minimum direct impact.	
Musculoskeletal	Bones are softer; open growth plates allow growth. Growth plates are weak spots, prone to stress fractures. Bone length discrepancies can occur with growth plate injury. Infant skull	Bones are harder; growth plates are closed after adolescence. Bones are less flexible, less prone to stress fractures but more prone	

	bones flexible, soft spots (fontanelles). Fontanelles used for assessment (ICP, dehydration). Thoracic cage highly elastic/pliable (cartilage). Ribs/organs less protected by muscle/fat.	to complete fractures. Thoracic cage is more rigid (bone). Ribs/organs are more protected by muscle/fat.	
Integumentary	Skin thinner with less subcutaneous fat. Burns more deeply and easily with less exposure. Higher body surface area to body mass ratio leads to greater fluid and heat loss.	Skin is thicker with more subcutaneous fat. Burns are generally less severe for the same exposure. Lower body surface area to body mass ratio leads to less fluid and heat loss.	

5. Patient Assessment Techniques

- Assessment begins at dispatch.
- Mentally prepare for approaching and treating a child.
- Plan for pediatric scene size-up and equipment.
- Gather information from dispatch like age, gender, location, MOI/NOI, and chief complaint.
- Note the patient's position.
- Complete an environmental assessment for safety threats.
- Use the **pediatric assessment triangle (pat)** to determine if the patient is sick.
- The PAT takes less than 30 seconds to perform.
- It requires no equipment.
- The three elements of the PAT are **Appearance, work of breathing, and Circulation**.
- **Appearance** assesses muscle tone and mental status.
  - Look at level of consciousness, interactiveness, and muscle tone.
  - The mnemonic **TICKLES** (Tone, Interactiveness, Consolability, Look or gaze, Speech or cry) helps determine if a patient is sick.
- **work of breathing** looks for signs of increased effort.
  - Signs include abnormal airway noise, accessory muscle use, retractions, head bobbing, nasal flaring, tachypnea, and tripod position.
  - The body tries to compensate for oxygenation and ventilation problems.
- **Circulation to the skin** assesses perfusion.
  - Pallor (pale skin) is seen in compensated shock, anemia, or hypoxia.
  - Mottling is another sign of poor perfusion.
  - Cyanosis indicates decreased blood oxygen.

- From the PAT, decide if the patient is **stable or unstable**.
- If unstable, assess **ABCs**, treat life threats, and transport immediately.
- If stable, continue with the assessment process.
- Perform necessary interventions and discuss transport options.
- Perform a **hands-on assessment** following **X-ABCs**.
  - **X** is for exsanguination (life-threatening bleeding).
  - **A** is Airway: ensure it is open and clear. Position in the neutral sniffing position.
  - **B** is Breathing: Look, listen, and feel. Feel for chest rise and fall. Belly breathing is adequate in infants.
  - **C** is Circulation: Determine pulse, bleeding, or shock. Palpate brachial or femoral pulse in infants, carotid in older children. Assess skin temp and moisture, estimate cap refill.
  - **D** is Disability: Use AVPU or pediatric GCS to assess level of consciousness. Check pupil response and symmetrical movement.
  - **E** is Exposure: Remove clothing to observe face, chest wall, and skin. Keep infants and young children warm to prevent hypothermia.

6. Transport Decisions and Considerations

- If the pediatric patient is stable, obtain history and perform a secondary assessment at the scene.
- Transport and provide additional treatment as needed.
- **Rapid transport** is indicated for specific conditions:
  - Significant mechanism of injury.
  - History of or capable of serious illness.
  - Physical abnormality noted during primary assessment.
  - Potentially serious anatomical abnormality or significant pain.
  - Abnormal level of consciousness or altered mental status.
  - Any signs or symptoms of shock.
- Consider the type of problem, benefits of advanced life support, local protocols, and your comfort level.
- Transport time to the hospital is also a factor.
- If the patient's condition is urgent, transport immediately to the closest facility.
- Special facilities (trauma centers, children's hospitals) provide complete care.
- The most appropriate facility is not always the closest.
- Ask if you can deliver the patient to the most appropriate facility without risk or delay.
- If not, transport to the closest facility.
- Patients less than 40 pounds not requiring spinal immobilization should be transported in a **car seat**.
- Mount the car seat to the stretcher following manufacturer instructions.

- Patients younger than two must be transported **rear-facing** due to immature neck muscles.
- For pediatric patients requiring spinal immobilization, use a long backboard or suitable device.
- Pediatric patients in cardiopulmonary arrest should be on a device that secures to the stretcher.
- Do **not** use the pediatric car seat for patients in cardiac arrest.
- The goal is to secure and protect the patient during transport.

7. History Taking in Pediatric Patients

- The approach to history taking depends on the child's **age**.
- For infants, toddlers, and preschool-aged children, obtain history from the **parent or caregiver**.
- For adolescents, most information comes from the patient.
- Ask adolescents about sexual activity, pregnancy, drugs, or alcohol in private.
- Question about the immediate illness or injury based on the chief complaint.
- When interviewing the caregiver or child about the chief complaint, obtain:
  - Mechanism of injury or nature of illness.
  - How long the patient has been sick or injured.
  - Key events leading to the illness or injury.
  - Presence of fever.
  - Effects on the child's behavior and activity level.
  - Recent eating, drinking, and urine output.
  - Change in bowel or bladder habits.
  - Presence of vomiting, diarrhea, abdominal pain, or rashes.
- Obtain the caregiver's name and phone number if they cannot go to the hospital.
- Use the **SAMPLE** history, adapting questions to the patient's age and developmental stage.
- The process for obtaining **OPQRST** is the same as for adults.
- OPQRST questions should also be based on the patient's age and developmental stage.

8. Secondary Assessment and Physical Exam

- A secondary assessment of the entire body is used when there is potential for hidden illness or injuries.
- It helps identify problems not obvious during the primary assessment.
- Use the **DCAP-BTLS** mnemonic for the secondary assessment.
- A focused assessment is performed on patients without life-threatening conditions.

- For infants, toddlers, and preschool-aged children without life threats, assess from the **feet to the head**.
- For school-aged children and adolescents, use the **head-to-toe** approach like adults.
- During the physical exam, examine specific areas:
  - **Head**: assess for bruising, DCAP-BTLS, and fontanelles in infants.
  - **Nose**: clear nasal congestion as it can cause respiratory distress.
  - **Ears**: look for drainage indicating skull fracture.
  - **Mouth**: check for bleeding or airway obstruction. Note breath smell for possible diabetes.
  - **Neck**: look for tracheal deviation.
  - **Chest**: assess for DCAP-BTLS, listen and feel. Check clavicles.
  - **Back**: look for DCAP-BTLS.
  - **Abdomen**: inspect for distension, palpate for guarding, pain, tenderness. Look for seat belt abrasions or bruising.
  - **Extremities**: check pms (Pulse, Motor, Sensation), look for symmetry, and range of motion.

9. Vital Signs Assessment

- Vital signs assess circulatory status but have limitations in pediatric patients.
- Normal heart rates vary with age.
- Blood pressure is usually not assessed in children younger than three.
- Assessment of the **skin** is a better indicator of circulatory status.
- Use appropriately sized equipment.
- Use a blood pressure cuff covering two-thirds of the upper arm.
- Systolic blood pressure for children 1-10 years old can be estimated as (Child's age in years x 2) + 70.
- Respiratory rates can be difficult to interpret.
- Count respirations for at least 30 seconds and double it.
- In infants and children younger than three, evaluate respirations by assessing abdominal rise and fall.
- Assess pulse rate by counting for at least a minute.
- Note pulse quality and regularity.
- Normal vital signs vary with age.

Vital Sign	Infants (0-1 yr)	Toddlers (1-3 yrs)	Preschool (3-6 yrs)	School-Age (6-12 yrs)	Adolescent (13-18 yrs)	Source

Respiratory Rate	30-60	24-40	22-34	18-30	12-26	
Pulse Rate (bpm)	100-160	90-150	80-140	70-120	60-100	
Systolic BP (mmHg)	Not typically assessed	(Age x 2) + 70 est.	(Age x 2) + 70 est.	(Age x 2) + 70 est.	90-140	

- Assess vital signs in the order: **Respirations, Pulse, Blood Pressure** last.
- Compare pupil size.
- Pulse oximetry measures oxygen saturation.
- Reassess vital signs every 15 minutes if stable, every 5 minutes if unstable.
- Continually monitor respiratory effort, skin, and level of consciousness.
- Parents or caregivers can assist by calming the child.
- Communicate and document all information for emergency department personnel.

10. Respiratory Emergencies

- Respiratory emergencies are the leading cause of cardiopulmonary arrest in children.
- Failure to recognize and treat declining respiratory status leads to death.
- **Respiratory distress** means the child is working harder to breathe.
- If untreated, respiratory distress will progress to **respiratory failure**.
- Early signs of respiratory distress include behavioral changes like combativeness, restlessness, and anxiety.
- Signs of increased work of breathing include nasal flaring, abnormal breath sounds, accessory muscle use, and tripod position.
- As respiratory failure progresses, breathing efforts decrease.
- Chest rise lessens with inspiration.
- The body has used up energy stores.
- Behavioral changes occur, leading to altered consciousness.
- Patients may have periods of apnea.
- The heart rate slows due to hypoxic heart muscles.
- Respiratory failure does not always indicate airway obstruction.
- Other causes include trauma, nervous system problems, dehydration, or metabolic disturbances.
- A child's condition can worsen from distress to failure quickly.
- Treatment for respiratory distress includes **supplemental oxygen**.
- Assist ventilation with a bag valve mask (BVM) and 100% oxygen if needed.

- Allow the patient to remain in a comfortable position.

11. Specific Respiratory Conditions

- **Asthma**: smaller airway passages are inflamed and swell, producing mucus.
  - It is a true emergency if not treated promptly.
  - Causes include infection, exercise, cold air, smoke, and emotional stress.
  - Signs are wheezing, cyanosis, respiratory arrest, or tripod position.
  - Treatment: allow position of comfort, administer supplemental oxygen, administer albuterol (with or without ipratropium) via MDI or nebulizer. Contact ALS and assist ventilations if needed.
- **Pneumonia**: an infection of the lungs, often secondary to a pre-existing infection.
  - Can also result from chemical ingestion, lung injury, or submersion.
  - Children with immunodeficiency are at increased risk.
  - Signs: rapid breathing, grunting or wheezing sounds, nasal flaring, tachypnea, hypothermia or fever, diminished breath sounds or crackles.
  - Treatment is supportive: administer supplemental oxygen and bronchodilator if wheezing.
  - Diagnosis is confirmed at the hospital.
- **Croup**: infection of the airway below the vocal cords, usually viral.
  - Typically seen in children 6 months to 3 years.
  - Easily passed between children.
  - Starts with cold symptoms, cough, and low-grade fever.
  - Hallmark signs: stridor and a seal bark cough.
  - Responds well to oxygen or humidified oxygen.
  - Bronchodilators are not indicated and can worsen the condition.
- **Epiglottitis**: infection of soft tissue above vocal cords, usually bacterial.
  - Incidence decreased with vaccination.
  - Epiglottis can swell significantly.
  - Children look ill, report sore throat, high fever.
  - Often in tripod position and drooling.
- **Bronchiolitis**: viral infection (often RSV) causing inflammation of bronchioles.
  - Highly contagious.
  - More common in premature infants.
  - Results in copious secretions requiring suctioning.
  - Occurs in the first two years, more common in males.
  - Bronchioles inflame, swell, and fill with mucus.
  - Airways easily blocked.
  - Look for signs of dehydration, shortness of breath, fever.

    - Treatment: allow position of comfort, administer humidified oxygen, consider ALS backup.
- **Pertussis (Whooping Cough)**: bacterial disease spread by respiratory droplets.
    - Less common due to vaccinations.
    - Starts like a common cold (sneezing, runny nose).
    - Progresses to severe coughing with a distinctive whoop sound on inspiration.
    - Infants may develop pneumonia or respiratory failure.
    - Treatment: keep airway open, transport. Follow standard precautions (mask, eye protection).

12. Airway Adjuncts and Oxygen Delivery

- Airway adjuncts help maintain the airway or assist ventilation.
- These include OPAs, NPAs, bite blocks, and BVM devices.
- **Oral Pharyngeal Airway (OPA)**: keeps tongue from blocking airway, makes suctioning easier.
    - Use in unconscious patients in possible respiratory failure.
    - Do not use in conscious patients, those with a gag reflex, or who ingested caustic/petroleum products.
- **Nasal Pharyngeal Airway (NPA)**: usually well tolerated, less likely to cause vomiting.
    - Used in responsive patients with possible respiratory failure.
    - Rarely used in infants younger than one year.
    - Do not use in patients with nasal obstruction or head trauma.
- Potential problems with airway adjuncts:
    - Small diameter airway can obstruct with mucus, blood, vomit.
    - Airway too long can stimulate vagal nerve (slow heart rate) or enter esophagus (gastric distension).
    - Can cause laryngeal spasm and vomiting if inserted into responsive patient.
    - NPA should not be used with facial trauma due to bleeding risk.
- Oxygen delivery devices:
    - **Blow-by technique**: provides >21% oxygen at 6 L/min. Not as effective as mask/cannula, but better than none.
    - **Nasal cannula**: provides 24-44% oxygen at 1-6 L/min. Some children prefer it.
    - **Non-rebreather mask**: delivers up to 95% oxygen at 10-15 L/min. Patient exhales CO2 without rebreathing it.
    - **Bag-Valve Mask (BVM)**: provides nearly 100% oxygen at 10-15 L/min.
- Non-rebreather, nasal cannula, or simple face mask are for patients with **adequate respirations**.
- Patients with respirations fewer than 12 or more than 60, altered consciousness, or inadequate tidal volume need **assisted ventilations with a BVM**.

- BVM is indicated for patients with respirations too slow or too fast, unresponsive, or not responding purposefully to pain.
- Two-person BVM is similar to one-person, but one holds the mask and the other ventilates. It is usually more effective for maintaining a tight seal.

13. Cardiopulmonary Arrest and Shock

- Cardiopulmonary arrest in children is most often associated with respiratory arrest.
- Children are affected differently by decreasing oxygen than adults.
- Focus on effective **CPR**, early use of an **AED**, and **transport**.
- **Shock** develops when the circulatory system cannot deliver enough blood to vital organs.
- It results in organ failure and cardiopulmonary arrest.
- **Compensated shock** is the early stage where the body compensates.
- **Decompensated shock** is the later stage where blood pressure falls.
- Common causes of shock in children: traumatic injury, dehydration, severe infection, neurologic injury, anaphylaxis, heart disease, tension pneumothorax, blood around the heart.
- Children respond to fluid loss differently than adults.
- They may increase heart rate and respirations, show pale or blue skin.
- Signs of shock in children: **tachycardia, poor capillary refill** (>2 seconds), **mental status change**.
- Begin treating shock by assessing **ABCs** and intervening.
- If obvious life-threatening external hemorrhage, the order is **CAB** (Circulation, Airway, Breathing).
- If cardiac arrest is suspected, the order is also **CAB** for chest compressions.
- Children in shock often have increased respirations but blood pressure falls only in severe shock.
- Limit management to simple interventions.
- Ensure airway is open, prepare for artificial ventilation, control bleeding.
- Give supplemental oxygen by mask or blow-by.
- Keep the patient warm.
- Provide **rapid transport** to the nearest appropriate facility.
- Contact ALS backup as needed.

14. Anaphylaxis and Bleeding Disorders

- **Anaphylaxis**: a life-threatening allergic reaction involving multiple body systems.
  - Characterized by airway swelling and blood vessel dilation.
  - Common causes: insect stings, medications, food.

    - Signs and symptoms: hypoperfusion, stridor, wheezing, increased work of breathing, restlessness, agitation, sense of impending doom, hives.
    - Treatment: keep the patient calm, administer oxygen, assist parent with prescribed Epi auto-injector. Provide rapid transport.
- **Hemophilia**: a congenital condition where the patient lacks normal clotting factors.
    - Mostly hereditary and severe.
    - Predominantly in males.
    - Bleeding may occur spontaneously.
    - All injuries become serious due to blood loss as blood does not clot.
    - Transport immediately.
    - Do not delay applying tourniquets for life-threatening hemorrhage.

15. Neurologic Emergencies

- Use the **AEIOU-TIPS** mnemonic for major causes of altered mental status.
- Understand normal developmental and age-related changes in behavior.
- Listen carefully to the caregiver's opinion.
- Signs and symptoms of altered mental status vary from confusion to coma.
- Management focuses on **ABCs**.
- **Seizures**: disorganized electrical activity in the brain.
    - Subtle in infants (sucking, bicycling movements).
    - More obvious in older children (repetitive muscle contractions, unresponsiveness).
    - Common causes are listed on a slide.
    - After a seizure, muscles relax, becoming flaccid.
    - Breathing is labored during the post-ictal state.
    - The post-ictal state is over when the child regains normal consciousness.
    - **Status epilepticus** is seizures every few minutes without regaining consciousness or lasting over 30 minutes.
    - Recurring or prolonged seizures are potentially life-threatening.
    - If seizing or unconscious, protect the patient from harm and call for ALS.
    - Management: Protect the **airway** (top priority). Place in recovery position if vomiting, have suction ready. Provide 100% oxygen (non-rebreather or blow-by). Begin BVM ventilations if no improvement. Monitor breathing and consciousness. Transport to appropriate facility.
- **Meningitis**: inflammation of the tissues covering the spinal cord and brain.
    - Recognizing it in children is important.
    - Risk factors: males, newborns, compromised immune systems, history of brain/spinal cord/back surgery, head trauma, shunts/pins/foreign bodies in brain/spinal cord.
    - Signs and symptoms vary by age.

- Common symptoms in all ages: fever, altered level of consciousness.
- Seizure may be the first sign.
- Infants <2-3 months may have apnea, cyanosis, fever, high-pitched cry, hypothermia.
- Meningeal irritation causes pain with movement, often a stiff neck.
- Infant sign: increasing irritability and bulging fontanelle without crying.
- Bacterial meningitis can have rapid onset, leading to shock and death.
- Bacterial meningitis signs: small, pinpoint cherry red spots or larger purple-black rash.
- Suspected meningitis patients are considered contagious.
- Follow standard precautions. Follow up on diagnosis for possible antibiotics if exposed.
- Treatment: give oxygen, assist ventilations if needed. Reassess vital signs frequently. Transport to the highest level of service.

16. Gastrointestinal Emergencies

- Never take a complaint of **abdominal pain** lightly.
- Significant bleeding can occur internally without outward signs of shock.
- Monitor for signs and symptoms of shock.
- Gastrointestinal complaints are common in children.
- Common causes: ingestion of certain foods or substances.
- Symptoms: abdominal discomfort, nausea, vomiting, and diarrhea.
- Vomiting and diarrhea can cause **dehydration**.
- If appendicitis is suspected, promptly transport to the hospital.
- Obtain history from the caregiver, especially regarding:
  - Number of wet diapers.
  - Tolerance of liquids.
  - Frequency of diarrhea.
  - Presence of tears when crying.

17. Poisoning Emergencies

- Poisonings are common in children.
- Occur via ingestion, inhalation, injection, or absorption.
- Common sources: alcohol, aspirin, cosmetics, cleaning products (bleach), plants, iron, prescription/illicit drugs, vitamins.
- Signs and symptoms vary widely based on substance, age, and weight.
- Child can appear normal initially or be confused, sleepy, or unconscious.
- Some substances are lethal with just one pill in a small child.

- Infants can be poisoned by siblings, parents, or caregivers; be alert for **abuse**.
- May be exposed in settings where harmful substances are smoked.
- After primary assessment, ask the patient or caregiver:
  - What substance was involved?.
  - Approximately how much and how long ago?.
  - Any changes in behavior or consciousness?.
  - Any choking or coughing after exposure?.
- Contact medical control for assistance in identifying poisons and treatment.
- Perform external decontamination.
- Assess ABCs and monitor breathing.
- Provide oxygen and ventilations if necessary.
- If signs of shock, position supine, keep warm, and transport.
- May give activated charcoal per medical control or protocol.

18. Dehydration and Fever Emergencies

- **Dehydration**: fluid loss is greater than intake.
  - Most common causes: vomiting and diarrhea.
  - If untreated, can lead to shock and death.
  - Infants and children are at greater risk due to smaller fluid reserves.
  - Life-threatening dehydration can occur in hours in infants.
  - Signs of mild dehydration: dry lips, decreased saliva, few wet diapers.
  - Signs of moderate dehydration: sunken eyes, sleepiness, irritability, loose skin, sunken fontanelles.
  - Signs of severe dehydration: mottled, cool, clammy skin, delayed cap refill, increased respirations.
  - Management: Assess ABCs. ALS backup is necessary for severe dehydration.
  - Transport all patients with moderate or severe dehydration.
- **Fever**: increase in body temperature, usually from infection.
  - Temperatures 100.4°F or higher are abnormal.
  - Rarely life-threatening alone, but fever with a rash can indicate serious conditions like meningitis.
  - Common causes: infection, status epilepticus, cancer, drug ingestion (aspirin), arthritis, systemic lupus, high environmental temperatures.
  - Result of increased heat generation and decreased heat loss.
  - Accurate body temp is important.
  - Rectal temperature is most accurate for infants and toddlers.
  - Signs may include respiratory distress, shock, stiff neck, rash, hot skin, flushed cheeks, seizures, bulging fontanelles (infants).
  - Assess for other signs/symptoms.

    - Provide rapid transport and management.
    - Follow standard precautions if communicable disease suspected.
- **Febrile seizures**: common in children 6 months to 6 years, caused by fever alone.
    - Typically occur on the first day of a febrile illness.
    - Characterized by generalized tonic-clonic seizure activity.
    - Usually last fewer than 15 minutes with little or no post-ictal state.
    - May indicate a more serious problem like meningitis.
    - Management: Assess ABCs, provide cooling measures.
    - All patients with febrile seizures need to be seen at the hospital.

19. Drowning Emergencies

- Drowning is the second most common cause of unintentional death in children 1-4 years.
- Children can drown in pools, lakes, bathtubs, puddles, or buckets.
- Older adolescents drown while swimming or boating; alcohol can be a factor.
- The primary result is **lack of oxygen**.
- Lack of oxygen affects heart, lungs, and brain even in minutes.
- Submersion in icy water can cause hypothermia.
- Diving increases the risk of neck and spinal cord injuries.
- Signs and symptoms vary by submersion time.
- Symptoms: coughing, choking, difficulty breathing, altered mental status, seizure, unresponsiveness.
- Management: request ALS, assess and manage ABCs. Administer oxygen or BVM. If trauma suspected, apply cervical collar and backboard.

20. Pediatric Trauma Emergencies

- Unintentional injuries are the number one killer of children.
- Quality of care after injury greatly impacts recovery chances.
- Children's muscles and bones are still growing.
- Adolescents are prone to extremity fractures.
- Femur fractures are rare but cause major blood loss.
- Children's bones and soft tissues are less developed, affecting how force impacts them.
- Child's head is proportionately larger, exerting more stress on neck during deceleration injury.
- Children are often injured due to underdeveloped judgment and lack of experience.
- Always assume serious neck or head injuries in vehicle collisions.
- Injury area depends on child's height and bumper position.

- Sports injuries are common; immobilize the cervical spine for sports-related injuries.
- **Head injuries** are common due to head-to-body ratio.
  - Infant skull is softer and thinner, increasing brain tissue injury risk.
  - Scalp and facial vessels bleed easily, causing significant blood loss.
  - Nausea and vomiting are common signs.
  - Immobilization is necessary for possible head or spine injury after trauma.
  - Immobilization can be difficult due to body proportions.
- **Chest injuries** are often due to blunt rather than penetrating trauma.
  - Flexible chest can cause flail chest without external signs.
  - Significant internal chest injuries may be present.
- **Abdominal injuries** are common.
  - Monitor for shock.
  - Prevent hypothermia by keeping warm with blankets.
  - If low pulse, ventilate and monitor during transport.
  - Monitor all children with abdominal injuries for shock.
- **Burns** are generally more serious than in adults.
  - Higher surface area to mass ratio increases shock risk, hypothermia risk, and airway problems.
  - Common causes: hot substances (scalding water, stove), caustic substances (cleaners, paint thinners).
  - Older children burned by flames.
  - Infection is common; use sterile techniques.
  - Consider **abuse** in any burn situation and report suspicions.
  - Severity: minor (partial thickness <10%), moderate (partial thickness 10-20%), severe (full thickness any %; partial thickness >20%; any burn to hands, feet, face, airway, genitalia).
  - Management is the same as adults.
- **Extremity injuries**: bones are immature with active growth centers (growth plates).
  - Growth plates are potential weak spots.
  - Incomplete or greenstick fractures can occur.
  - Management is generally the same as adults.

21. Pain Management

- The first step is recognizing that the patient is in **pain**.
- Use visual clues and the **Wong-Baker FACES Pain Scale** as some children use non-verbal or limited vocabulary.
- Pain interventions are limited:
  - Positioning.
  - Ice packs.

    - Extremity evaluation.
- These interventions decrease pain and swelling.
- Kindness and emotional support are important tools.

22. Disaster Management (Jumpstart Triage)

- Use the **Jumpstart triage system** instead of START triage for pediatric patients.
- Intended for patients younger than 8 or appearing to weigh less than 100 pounds.
- Four triage categories, designated by colors:
    - **Green**: Minor, not an immediate need for treatment. Able to walk (except infants).
    - **Yellow**: Delayed, spontaneous breathing, peripheral pulses, responsive to painful stimuli.
    - **Red**: Immediate, apnea and respiratory failure, breathing but without a pulse, inappropriate response to painful stimuli.
    - **Black**: Apnea without a pulse, or apnea and unresponsive to rescue breathing.

23. Child Abuse and Neglect

- **Child abuse**: improper or excessive action that harms a child or infant.
- Includes physical abuse, sexual abuse, neglect, and emotional abuse.
- Over half a million child abuse victims annually.
- Many suffer life-threatening conditions or die.
- You **must report suspected child abuse**.
- Abuse is likely to reoccur, potentially causing permanent injury or death.
- Abuse occurs in every socio-economic status.
- Be aware of the surroundings and document findings objectively.
- You may testify in abuse cases, making accurate records essential.
- Ask yourself questions to identify potential abuse:
    - Is the injury typical for the child's developmental level?.
    - Is the reported mechanism of injury consistent?.
    - Is the parent or caregiver behaving appropriately?.
    - Is there evidence of drinking or drug abuse at the scene?.
    - Was there a delay in seeking help?.
    - Is there a good relationship between caregiver and child?.
    - Does the child have multiple injuries in different healing stages?.
    - Does the child have unusual marks (cigarettes, heating, branding)?.
    - Does the child have several types of injuries?.
    - Are there burns on hands/feet with a glove distribution?.
    - Unexpected decreased level of consciousness?.
    - Is the child clean and appropriate weight?.

    - Any rectal or vaginal bleeding?.
    - What is the condition of the home (clean, dirty, warm, cold, food)?.
- The mnemonic **CHILD ABUSE** helps remember points to look for.
    - **C**hild abuse (the mnemonic itself).
    - **H**istory inconsistencies.
    - **I**njuries: multiple types or stages.
    - **L**ack of concern from caregiver.
    - **D**elay in seeking care.
- **Bruises**: note color and location; suspicious on back, buttocks, face (usually inflicted).
- **Burns**: suspicious on penis, testicles, vagina, buttocks (usually inflicted). Burns encircling hand or foot (glove distribution) are suspicious. Suspect abuse with cigarette burns or grid pattern burns.
- **Fractures**: humerus or femur fractures without major trauma are suspicious. Falls out of bed usually don't cause fractures. Maintain suspicion for femur or complete fracture in infants/young children.
- **Shaken baby syndrome**: life-threatening head trauma from shaking or head impact. Bleeding in head, cervical spine damage from shaking.
- **Neglect**: refusal or failure to provide necessities. Neglected children are often dirty, thin, developmentally delayed.
- Behavioral indicators: withdrawn, fearful, or hostile children. Be concerned if a child avoids discussing injury cause. Alert for conflicting stories or lack of caregiver concern.
- Abuser can be parent, caregiver, relative, or friend.
- EMTs in all states must report suspected abuse. Most states have special forms.
- Supervisors are generally forbidden from interfering with reporting.
- Law enforcement and child protective services determine if abuse occurred.
- **Sexual abuse**: victims can be any age or gender. Maintain a high index of suspicion.
- Assessment limited to determining dressing needs for injuries (bruises, fractures). Do not examine genitalia unless bleeding is evident.
- Do not allow child or EMT to wash, urinate, or defecate.
- Ensure same-gender EMT or police officer stays with the child.
- Maintain professional composure.
- Obtain as much information as possible.
- Transport all child victims; sexual abuse is a crime.

24. Sudden Unexpected Infant Death Syndrome (SUIDS/SIDS)

- **Sudden unexpected infant death (SUID)**: sudden death where cause is unknown until investigation.
- One cause of SUID is **Sudden infant death syndrome (SIDS)**, death unexplained by another cause.
- About 3,500 infants die of SIDS annually.

- Recommendations to reduce SIDS risk: place baby on their back in a crib free of bumpers, blankets, toys.
- Have baby sleep in the same room, but not the same bed.
- Breastfeeding and pacifier use are associated with lower risk.
- SIDS risk factors (impossible to predict): mother <20, mothers who smoke, use alcohol or drugs, low birth weight.
- SIDS can occur at any time of day.
- EMT tasks in SIDS cases: scene assessment, patient assessment/management, communication/support for family.
- Patient assessment for a SIDS victim: blue, pale, not breathing, unresponsive.
- Other potential causes to consider: infection, child abuse, airway obstruction, meningitis, accidental poisoning, hypoglycemia, metabolic defects.
- Begin assessment with **XABCs**. Provide interventions as needed.
- If signs of postmortem changes are present (depending on time passed), call medical control.
- If no postmortem changes, begin **CPR immediately**.
- Note any marks or bruises on the child before procedures.
- Document any interventions not done prior to your arrival.
- Scene assessment: inspect the environment, noting conditions where found.
- Concentrate on signs of illness (medications, humidifiers, thermometers), house condition, hygiene, family interaction, and where infant was discovered.
- Communication and support for the family after death: a devastating event evoking strong emotions in healthcare providers.
- Follow or allow the family to express grief. Offer empathy and understanding.
- Family may want resuscitation attempts conflicting with protocols.
- Introduce yourself, ask date of birth and history.
- Do not speculate on the cause of death.
- Ask if they want to hold the child and say goodbye.
- Helpful interventions: use child's name, speak at eye level, maintain contact.
- Use "dead" or "died", not euphemisms.
- Acknowledge feelings, offer to call family.
- Keep instructions short and basic. Ask each family member individually if they want to hold the child.
- Wrap the child in a blanket and stay with them.
- Each culture expresses grief differently. Some require intervention.
- Most caregivers feel responsible for the death.
- Some EMS systems arrange home visits for closure, requiring special training.
- Child's death is stressful for providers. Take time off, talk to colleagues. Be alert for PTSD signs in self/others, consider professional help.

25. Apparent Life-Threatening Events (ALTES)

- Infants found not breathing, cyanotic, or unresponsive may resume breathing/color with stimulation.
- This is an **Apparent Life-Threatening Event (ALTE)**.
- Characteristics: cyanosis, apnea, distinct change in muscle tone, choking, or gagging.
- After the event, the child may appear healthy with no signs of illness or distress.
- Management: strict attention to **airway management**.
- Assess the infant's history.
- Allow caregivers to ride in the back.
- Physicians will determine the cause of this brief, unexplained event.
- Signs and symptoms include brief color changes (pale or cyanosis), choking, absent/low/irregular breathing, abnormal muscle tone, decreased consciousness, no abnormality on assessment.
- Transport is required for evaluation.