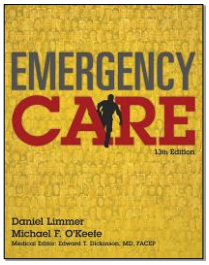
Emergency Care

THIRTEENTH EDITION



CHAPTER 33

Pediatric Emergencies

Pediatric Age Categories

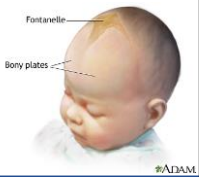
- Newborns and infants
  - Birth to 1 year
- Toddlers
  - 1 to 3 years
- Preschool
  - 3 to 5 years
- School age
  - 6 to 12 years
- Adolescent
  - 13 to 18 years

The Head

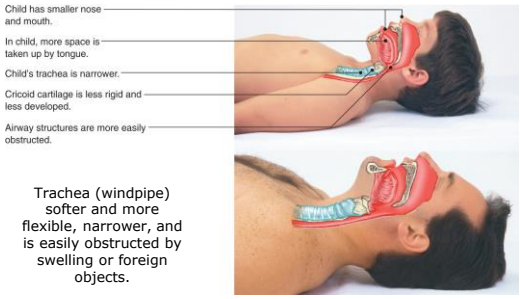
When an infant or young child is supine, the head will tip forward, obstructing the airway.

Head

- Proportionately larger and heavier than an adult's until about age four
- Always suspect injury if serious MOI
- Fontanelles
  - "Soft spots" at the top of infants' heads



Airway and Respiratory System



Trachea (windpipe) softer and more flexible, narrower, and is easily obstructed by swelling or foreign objects.

Airway and Respiratory System

- Chest wall is softer.
  - Diaphragm more involved in breathing
- Thorax shorter and located adjacent to a very full abdominal cavity.
  - Abdominal contents can prevent the diaphragm from dropping far enough to promote increased lung capacities.

continued on next slide

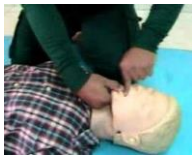
Airway and Respiratory System

- Neonatal ribs are more boxlike.
  - Limited ability to take deeper breaths
- Infants are nose breathers - suction secretions from the nose as needed to help the patient breathe.
- Hyperextension or flexion of the neck may result in airway obstruction.

continued on next slide

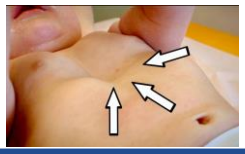
Airway and Respiratory System

- NO "Blind" finger sweeps – if you see an object, retrieve it. If you perform a blind sweep you may wedge the object further into the airway.



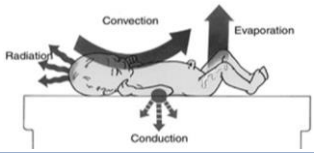
Chest and Abdomen

- Less developed, more elastic.
- Infants and children are abdominal breathers.
- Abdominal organs less protected than in adults



Body Surface

- Larger than adult's in proportion to body mass
- More prone to heat loss through skin
- More vulnerable to hypothermia



Blood Volume

9-pound newborn: Blood volume equals less than a 12-oz (335 mL) can of a soft drink

60-pound child: Blood volume equals about a 2-liter bottle of a soft drink

125-pound adult: Blood volume equals about two 2-liter bottles of a soft drink

Blood loss that might be considered moderate in an adult can be a life-threatening situation for a child.

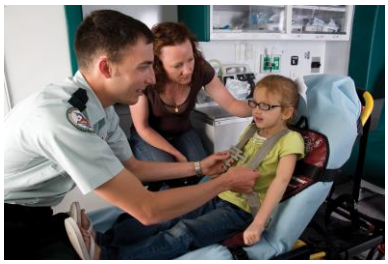
Psychological and Personality Characteristics

- Each age group has its own general characteristics of psychology and personality.
- Some children may cry when they see you since you are a stranger to them.
- Never let the potential of upsetting a child prevent you from delivering appropriate treatment.

Think About It

- What techniques would you utilize when attempting to assess a crying infant?

Interacting with the Pediatric Patient



During transport, the child must be appropriately restrained.

Interacting with the Pediatric Patient

- Identify yourself.
- Let child know that someone has called or will call his parents.
- If no life-threatening problems, continue at a calm pace during the evaluation process.
- Let child have a nearby toy.
- Kneel at child's eye level.

continued on next slide

Interacting with the Pediatric Patient

- Smile. 
- Touch or hold child's hand or foot.
- Do not use equipment without first explaining what you will do with it.
- Stop occasionally to find out if child understands.
- Never lie to the child.
- Let child see your face.

The Adolescent Patient

- Should be able to tell you exactly what happened and how they feel
- May not be completely communicative or cooperative if in front of parents or peers
  - Sensitive to the opinions of their peers
  - May be intimidated by authority
- Often embarrassed, worried about changes in body

continued on next slide

The Adolescent Patient

- Do not delay evaluation and care because you or the patient may be embarrassed.
- When possible, have the exam conducted by or in the presence of an EMT of the same sex as the patient.

The Adolescent Patient

Treat the adolescent with respect.

Supporting the Parents or Other Care Providers

Supporting the Parents or Other Care Providers

- Possible reactions to child's illness/injury
  - Denial, shock, crying, screaming, anger, self-blame, guilt
- May interfere with care of child
- Not all children live in a traditional nuclear family.
- Ask to help by holding/comforting child and giving medical history.

Supporting the Parents or Other Care Providers

If at all possible, let a young child sit in the parent's lap during assessment and care.

Caring and Empathy Video

Click on the screenshot to view a video on the subject of caring and empathy for patient and family.

Back to Directory

Assessing the Pediatric Patient

Pediatric Assessment Triangle (PAT)

- Two viewpoints
  - "From the doorway"
  - Remainder of primary assessment done next to patient

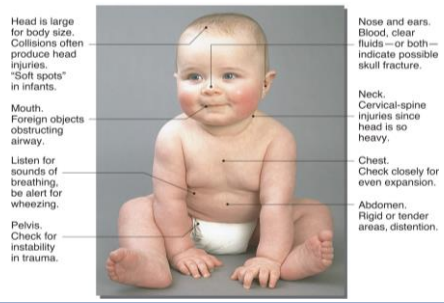
Scene Size-Up and Safety—Pediatric

- Determine if scene is safe.
  - Rare risk from violence or abusive behavior, sometimes directed toward child
- Use Standard Precautions.
- Evaluate scene for clues of accidental poisoning if applicable.

Primary Assessment—Pediatric

- General impression observations:
  - Mental status
  - Interaction with environment or others
  - Emotional state
  - Response to you
  - Tone and body position
  - Work of breathing
  - Quality of cry or speech
  - Skin color

Forming a General Impression

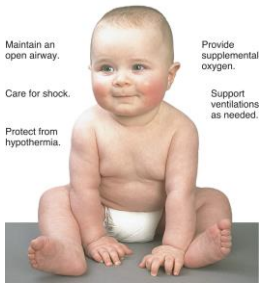


Primary Assessment—Pediatric

- Assessing mental status
  - Alert
  - Verbal
  - Painful
  - Gently tap unresponsive infant or child

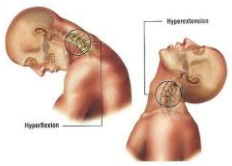
continued on next slide

Primary Assessment



Primary Assessment—Airway

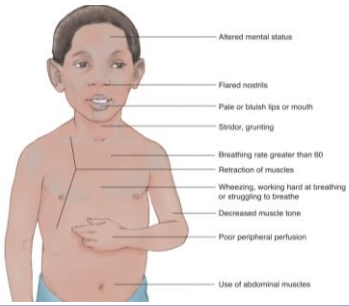
- Assessing airway
  - Consider whether airway is open or endangered.
  - Be careful to not hyperextend child's neck.



Primary Assessment—Breathing

- Assessing breathing
  - Chest expansion
  - Work of breathing
  - Sounds of breathing
  - Breathing rate
  - Color

Signs of Distress



Primary Assessment—Circulation

- Assessing circulation
  - Warm, pink, and dry skin
  - Normal pulse
  - Check for and control any blood loss.
  - Check capillary refill for those under 5.

Primary Assessment—Priorities

- Identifying priority patients
  - A patient who:
    - Gives a poor general impression
    - Is unresponsive or listless
    - Does not recognize the parent or primary caregiver
    - Is not comforted when held by a parent but becomes calm and quiet when set down

continued on next slide

Primary Assessment—Priorities

- Priority Patients (continued)
  - Has a compromised airway
  - Is in respiratory arrest or has inadequate breathing or respiratory distress
  - Has a possibility of shock
  - Has uncontrolled bleeding or has experienced significant blood loss before EMS arrival.

Secondary Assessment—Pediatric

- Ask simple questions that cannot be answered with "Yes" or "No."
- Perform a physical exam for a medical patient and a rapid trauma assessment for a trauma patient.
  - Explain all steps to child.
- Take and record vital signs.

Secondary Assessment: Pediatric

Take blood pressure in patients older than three years of age.

Physical Exam—Pediatric

- Start with toes/trunk and work way toward head.
- If no injuries, patient should be held in parent's lap.
- Protect child's modesty.
- Explain why each piece of clothing must be removed.

Head

- Do not apply pressure to fontanelles.
- Meningitis and head trauma can cause bulging of fontanelle.
- Collisions can often produce head injuries.

Nose and Ears

- Look for blood and clear fluids coming from the nose and ears.
  - Suspect skull fractures if either is present.
- Mucus or clot obstructions will make it hard for children to breathe.

Neck

- Vulnerable to spinal cord injuries
- Children have proportionately larger and heavier heads.
- Muscles and bone structures are less developed.
- May be sore, stiff, or swollen

Airway

- Maintain neutral position for infants
- Neutral-plus position for children.
- If no suspicion of spinal injury, place a flat, folded towel under patient's shoulders to align for better airway.

Chest

- Be alert for wheezes and other noises.
- Check for symmetry.
- Check for bruising.
- Check for paradoxical motion and retraction.

Abdomen and Pelvis

- Note if rigid.
- Check for tender areas and distension.
- Abdominal injury may impede movement of the diaphragm.
- Check for stability of pelvic girdle.

Extremities

- Capillary refill
- Distal pulse
- Pulses
- Motor
- Sensory

Reassessment—Pediatric

- Reassess mental status.
- Reassess ABC's
- Reassess circulation (pulse, skin, temp)
- Reassess vital signs
  - 5 minutes for unstable
  - 15 minutes for stable
- Evaluate treatment provided

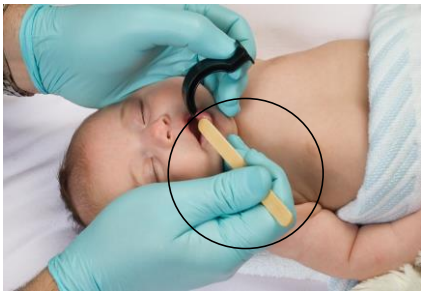
continued on next slide

Special Concerns in Pediatric Care

Maintaining an Open Airway

- Align and open airway.
- Use head-tilt, chin-lift if no trauma.
  - Use jaw-thrust with spinal immobilization if trauma is suspected.
- Suction.
- Check blockage of airway by tongue.

Oropharyngeal Airway



Nasopharyngeal Airway

Can a nasal airway be inserted in pediatric patients? - YES

Clearing an Airway Obstruction

- Identify type.
  - Partial obstruction
    - Place patient in position of comfort.
    - Offer high-flow oxygen.
    - Transport.
  - Complete obstruction
    - Perform airway clearance techniques.

Clearing an Airway Obstruction

For a severe airway obstruction in an infant, alternate back blows with chest thrusts.

Providing Supplemental Oxygen

- High-concentration oxygen should be administered to children in respiratory distress, those with inadequate respirations, or those in possible shock.
- Young children are often afraid of an oxygen mask.
  - Push oxygen tubing through a paper cup.
  - Nonrebreather mask preferable

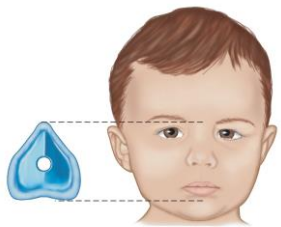
Providing Supplemental Oxygen and Ventilations

You can deliver oxygen to an infant using the blow-by method.

Providing Ventilations

- Guidelines
  - 1 breath over 1 second
  - Avoid ventilating too hard or too fast
  - If ventilation is not successful in raising the patient's chest, perform procedures for clearing an obstructed airway. Then try to ventilate again.

Providing Supplemental Oxygen and Ventilations

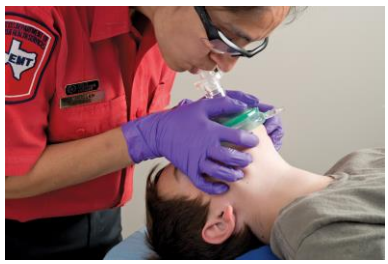


Correct placement of a properly sized mask is necessary to ensure a good mask seal. This shows correct placement of the mask.

Providing Ventilations

- Guidelines
  - Can a flow-restricted, oxygen-powered ventilation devices be used on infants and children?

Providing Supplemental Oxygen and Ventilations

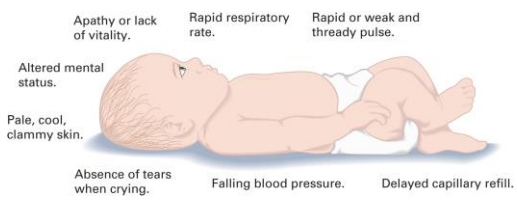


Ventilation of a child using a pocket face mask.

Caring for Shock

- Common causes of shock in infants and children
  - Diarrhea and/or vomiting
  - Infection
  - Trauma (esp. abdominal injuries)
  - Blood loss
  - Allergic reactions
  - Poisoning
  - Cardiac events (rare)

Signs and Symptoms of Shock in Pediatric Patients



Signs of shock in an infant or child.

Caring for Shock

- Ensure an open airway.
- Manage severe external hemorrhage if present.
- Provide high-concentration oxygen.
- Lay patient flat.
- Keep patient warm.
- Transport immediately.

Protecting against Hypothermia

- Cover patient's head and body.
- Keep the patient compartment warm.
- Avoid rough handling.
- Consult medical control about active rewarming of patient.

Think About It

- How do you balance the need to examine a hypothermic patient with the need to keep the patient covered to maintain warmth?

Pediatric Medical Emergencies

Respiratory Disorders

- Likeliest cause of cardiac arrest in a child, other than trauma
- Distinguish whether probable cause is upper or lower airway problem.
- Care for upper airway obstruction not indicated for lower airway disorder
- Critical to be alert for early signs of respiratory failure

Difficulty Breathing

- Number of diseases or disorders ranging from less serious (a cold) to serious (epiglottitis)
- The role of the EMT is to recognize signs of early respiratory distress and treat it before it advances to a life-threatening stage.

continued on next slide

Difficulty Breathing

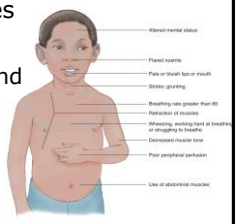
- Differentiating upper airway problems from lower airway disorders
  - **Upper** airway disorder
    - Affects mouth, throat, larynx
    - Foreign body obstructions, trauma, swelling from burns and infections
    - Commonly identified by difficulty breathing, stridor, or difficulty speaking

Difficulty Breathing

- Differentiating upper airway problems from lower airway disorders
  - **Lower** airway disorder
    - Affects large and small bronchiole tubes, and alveoli
    - Asthma, pneumonia, other respiratory infections
    - Commonly identified by difficulty breathing, wheezing lung sounds

Signs of Distress

- Nasal flaring
- Retractions
- Use of abdominal muscles
- Stridor
  - High-pitched, harsh sound
- Audible wheeze
- Grunting



Signs of Distress

- Breathing rate greater than 60 breaths/min
- Altered mental status
- Slowing or irregular respiratory rate
- Cyanosis
- Decreased muscle tone
- Poor peripheral perfusion
- Decreased heart rate

Respiratory Diseases

- **Croup**
  - Mild fever and some hoarseness (daytime)
  - Loud "seal-bark" cough
  - Difficulty breathing
  - Signs of respiratory breathing
  - Restlessness
  - Paleness with cyanosis

Respiratory Diseases

- **Epiglottitis**
  - Sudden onset of high fever
  - Painful swallowing
    - Child often drools.
  - Tripod position
  - Patient sits very still.
  - Appears more ill than with croup

Other Pediatric Disorders

- Patient care for a child with a fever
  - Remove child's clothing.
  - Cover in towel soaked in tepid water, if local protocols permit.
  - Monitor for shivering.
  - Follow protocols for water or ice chips.

continued on next slide

Other Pediatric Disorders

- Patient care for a child with a fever
  - Transport if patient suffered a seizure.
  - Do not submerge patient in cold water.
  - Do not use rubbing alcohol to cool patient.

Other Pediatric Disorders

- Patient care for a child with **meningitis**
  - Monitor ABCs and vital signs.
  - Provide high-concentration oxygen by nonrebreather mask.
  - Ventilate with BVM or pocket mask if necessary.
  - Provide CPR.
  - Be alert for seizures.
  - Transport immediately.

Other Pediatric Disorders

- Patient care for a child with **diarrhea and vomiting**
  - Maintain open airway.
  - Provide oxygen.
  - Contact medical control if signs of shock are present.
  - If protocols allow, offer the child sips of clear liquids and chipped ice
  - Immediate transport

Other Pediatric Disorders

- Patient care for a child experiencing a **seizure**
  - Maintain open airway (*not* oral).
  - Position on side if no spinal injury.
  - Be alert for vomiting.
  - Provide oxygen.
  - Transport.
  - Monitor for inadequate breathing and/or altered mental status.

Other Pediatric Disorders

- Assessment of a child with an **altered mental status**
  - Be alert for mechanism of injury.
  - Be alert for signs of shock.
  - Look for evidence of poisoning.
  - Attempt to get history of diabetes and seizure disorder.

Other Pediatric Disorders

- Patient care for a **poisoning**
  - Contact medical direction or poison control center.
  - Consider activated charcoal, if protocol allows.
  - Provide oxygen.
  - Transport.
  - Continue to monitor responsiveness.

Other Pediatric Disorders

- Patient care for a **poisoning**
  - Care for unresponsive patient
    - Ensure open airway
    - Provide oxygen
    - Be prepared to provide artificial ventilation
    - Transport
    - Contact medical direction or poison control center
    - Rule out trauma

Other Pediatric Disorders

- Patient care for a **drowning** patient
  - Provide artificial ventilation or CPR.
  - Protect airway.
  - Consider spinal immobilization.
  - Protect against hypothermia.
  - Treat any trauma.
  - Transport.

Other Pediatric Disorders

- Sudden infant death syndrome **(SIDS)**
  - No accepted reason exists for why these babies die.
  - Treat as any patient in cardiac or respiratory arrest.
  - Resuscitate unless there is rigor mortis.
  - Give emotional support for parents.

Pediatric Trauma Emergencies

Injury Patterns

- During motor vehicle collisions
  - Unrestrained
    - Head and neck
  - Restrained
    - Abdominal
    - Lower spinal

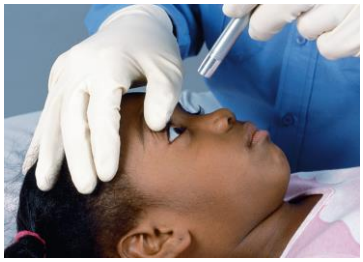
Injury Patterns

- When struck by vehicle
  - Head injury
  - Abdominal injury, possible internal bleeding
  - Lower extremity injury, possible fractured femur

Examine Head

1. Examine the head. Look for bruising or blood or clear fluid draining from the nose or ears. Palpate gently for soft or spongy areas, skull irregularities, or crepitus (feeling of grinding bone fragments). Check the fontanelles in infants.

Examine Eyes



2. Check the eyes. The pupils should be equal in size and reactive to light.

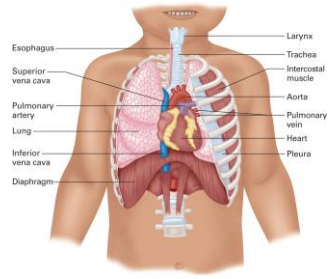
Examine Neck

3. Examine the neck. Check for the position of the trachea, swollen neck veins, stiffness, tenderness, or crepitus.

Examine Chest

4. Examine the chest. Check for bruising, equal chest rise and fall, and crepitus. Watch for signs of breathing difficulty.

Contents of Thorax



While examining the chest, be aware of the contents of the thorax.

Auscultate for Breath Sounds

5. Auscultate for breath sounds over all lung fields.

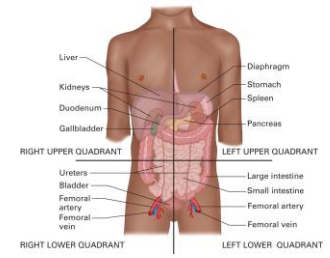
Injury Patterns

- Abdomen
  - Watch for diaphragm in breathing.
  - Can be a site of hidden injuries
  - Distention may interfere with artificial ventilation.
    - Watch for vomiting

Examine Abdomen

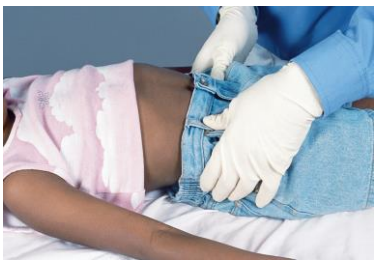
6. Examine the abdomen. Check for bruising, tenderness, or guarding. Look for swelling that may indicate swallowed air.

Abdominal Quadrants



Divide the abdomen into quadrants, and examine each one while remembering which organs are located in each quadrant.

Examine Pelvis

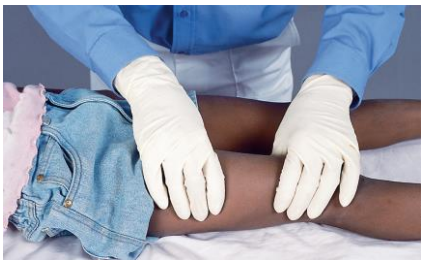


7. Examine the pelvis for tenderness, swelling, bruising, or crepitus. If the patient complains of pain, injury, or other problems in the genital area, assess for bruising, swelling, or tenderness in that area.

Examine Arms

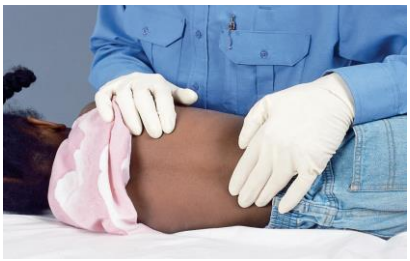
8. Examine the extremities. Evaluate pulses, sensation, and warmth. Look for unequal movement.

Examine Legs



9. If you have immobilized an extremity, check the patient's capillary refill, peripheral pulses, and sensory status (if age appropriate), and compare them with the other arm or leg.

Examine Back and Spine



10. Examine the back. Assess for tenderness, bruising, and crepitus. If the child requires immobilization, the back can be checked while the child is being log-rolled onto the spine board.

Immobilizing Child With KED

Other Pediatric Devices

Burns

- Identify candidates for transportation to burn centers.
- Cover burn with nonadherent sterile dressing.
- Ensure open airway.
- Suction as needed.
- Immobilize spine.
- Transport immediately.

Child Abuse and Neglect

Child Abuse and Neglect

- Types of child abuse often in combination
  - Psychological (emotional) abuse
  - Neglect
    - Serious legal question as to what constitutes neglect
  - Physical abuse
  - Sexual abuse

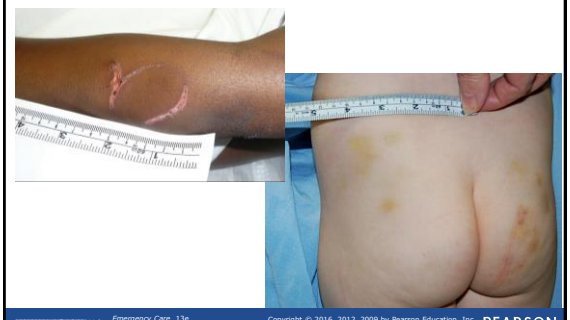
Physical and Sexual Abuse

- Almost every imaginable kind of injury and maltreatment
- Often called "battered" children
- Ranges from adults exposing themselves to forcing sexual intercourse or torture on children
- Cases in which abuse was only emotional or minor in nature are less reported.

Patient Assessment

- Signs of possible physical abuse
  - Slap marks, bruises, abrasions, lacerations, incisions
  - Broken bones
  - Head injuries
  - Abdominal injuries
  - Bite marks
  - Burn marks
  - Indications of shaking an infant

Child Abuse



Patient Assessment

- Signs of possible physical abuse
  - Obvious signs of sexual assault
  - Any unexplained genital injury
  - Seminal fluid on body or clothes or other discharges associated with sexually transmitted diseases
  - If the child tells you he was sexually assaulted

Patient Assessment

- Possible indications for an adult being an abuser
  - Inappropriate concern about child
  - Trouble controlling anger
  - Seems to be on a brink of an emotional explosion
  - Appears to be in deep depression
  - Indications of alcohol or drug abuse
  - Suicidal thoughts

Patient Care

- Dress and provide other appropriate care.
- Preserve evidence.
  - Discourage child from going to the bathroom.
  - Give nothing to patient by mouth.
  - Do not have child wash or change clothes.
- Transport.

Role of the EMT in Cases of Suspected Abuse or Neglect

- Gather information from adults without expression of disbelief or judgment.
- Talk with child separately.
- Plainly and clearly report to medical staff any finding or suspicion regarding physical or sexual abuse.
- Use terms *suspected* and *possible* even when talking to partner, hospital staff, police, and superiors.

Think About It

- What should be your concern if a parent in a possible child abuse case reveals suicidal ideas?

Infants and Children With Special Challenges

Infants and Children With Special Challenges

- Common challenges
  - Premature infants with lung disease
  - Infants and children with heart disease
  - Infants and children with neurological disease
  - Children with chronic disease or altered function from birth

Tracheostomy Tubes

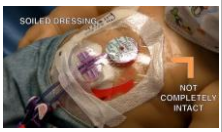
- Potential complications
  - Obstruction
  - Bleeding from or around tube
  - Air leaking around tube
  - Infection
  - Dislodged tube

Home Artificial Ventilators

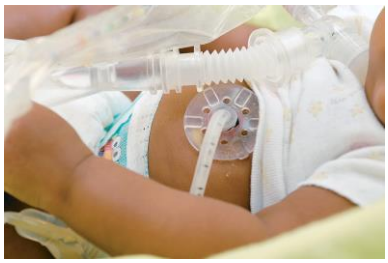
- Maintain open airway
- Artificially ventilate with pocket mask or BVM with oxygen
- Transport

Central Intravenous Lines

- Possible complications
  - Infection
  - Bleeding
  - Clotting-off of the line
  - Cracked line
- Emergency care
  - Apply pressure if there is bleeding.
  - Transport the patient.



Gastrostomy Tubes and Gastric Feeding



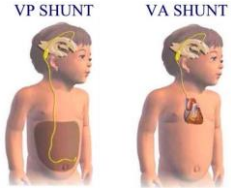
Children who have complicated medical problems are often dependent on various technologies, such as the gastric feeding tube implanted in this baby's stomach.

Gastrostomy Tubes and Gastric Feeding

- Be alert for altered mental status.
- Ensure open airway.
- Suction airway as needed.
- Provide oxygen if needed.
- Transport sitting or on right side with head elevated.

Shunts

- Maintain open airway.
- Ventilate with pocket mask or BVM and high-concentration oxygen.
- Transport patient.



The EMT and Pediatric Emergencies

The EMT and Pediatric Emergencies

- Psychiatric effects on EMT
  - Pediatric calls are among the most *stressful*.
  - May identify patient with *own children*
  - May be *anxious* about dealing with children
  - Most serious stresses over very sick, injured, or abused child, or child who *dies* during or after emergency care

The EMT and Pediatric Emergencies

- Dealing with stress
  - Communicating with and treating children can be learned.
  - Care mostly consists of applying knowledge of adult patients and adjusting for children.
  - Talk with other EMTs.
  - Talk with your service's counselor.

Chapter Review

Chapter Review

- The assessment, treatment, anatomically, and psychosocial aspects are much different than adults.
- As an EMT, you must learn these differences to enable you to better serve this special population.

continued on next slide

Remember

- Caregiver interaction sets the tone for scene management. Be professional with a calm demeanor.
- Pediatric assessment triangle allows rapid assessment of severity of injury or illness by reviewing appearance, work of breathing, and skin.

continued on next slide

Remember

- Proper pediatric assessment takes into account differences in anatomy and psychosocial development.
- Airway and breathing maintenance, shock care, and prevention of hypothermia are universal points of importance in pediatric care.

continued on next slide

Remember

- Shock is subtle in children. Learn to recognize the signs of compensation.
- Recognize respiratory failure in children, and differentiate upper and lower airway disorders.

continued on next slide

Remember

- Different anatomy leads to slightly different patterns of traumatic injury in pediatric patients. Use your knowledge of pediatric A&P to enhance assessment and treatment.
- Be alert for findings of potential abuse. Treat medical issues first, then document and report.

continued on next slide

Remember

- Many children have special health care needs. Most caregivers are trained to handle emergencies and can be important resources for assessment. Be prepared for unusual circumstances.
- Critical incident stress management is essential to an EMT's well-being plan.

Questions to Consider

- How do you plan to approach your first pediatric call?
- How do you determine appropriate mental status for a child?
- Given certain situations, how would you involve the parent or caregiver in treatment?

Critical Thinking

- You are called to a home for a 3-year-old child who has been running a low-grade fever all day and now is drooling. As you enter the child's bedroom, you hear what you think is a seal-like bark.

continued on next slide

Critical Thinking

- What do you suspect is wrong with this patient? How will you and your partner treat this patient and handle the situation?