Memorial EMS
Decatur Memorial EMS
Springfield Memorial EMS

# Section 21

# Pediatric Assessment Process

# And Management

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# Pediatric Assessment Process and Management

A patient fifteen (15) years of age and under is considered to be a pediatric patient. Utilization of pediatric treatment guidelines and the extent of care rendered are based on the general impression of the pediatric patient's condition, physical examination findings and the history of the event. Patients 16 years of age or older will treated with adult protocols. The goal of the pediatric patient assessment process is similar to that of the adult patient. However, children are not “little adults”. The causes of catastrophic events, such as cardiac arrest, are most often related to respiratory failure, shock or central nervous system injuries. Early recognition and treatment of the pediatric patient's injuries or illness is important to ensure the best outcome.

Special attention and awareness must be given to the pediatric patient's exceptional ability to compensate for respiratory failure and shock. Vital signs are valuable in the assessment of the pediatric patient but do have significant limitations and can be dangerously misleading. For example, hypotension is a late and often sudden sign of cardiovascular decompensation. Tachycardia (which varies by age group) will persist until cardiac reserve is depleted. Bradycardia is an ominous sign of impending cardiac arrest.

Infants and children are able to maintain their blood pressure by increasing peripheral vascular resistance (shunting) and increasing heart rate. The pediatric patient can be in compensated shock and exhibit a normal blood pressure and skin condition. This increases the importance of the EMS provider understanding of pediatric vital signs and behavior patterns.

The EMS provider must establish a general impression of the pediatric patient. This impression, which is critical, should be done from the doorway of the room. Therefore, the pediatric patient will not be disturbed by a "hands-on" assessment. A simple question to ask yourself is, "How sick is this child?"

Three (3) key areas of importance of a general impression are:

1. Appearance
2. Work of breathing
3. Circulation to skin

The three components are known as the Pediatric Assessment Triangle (PAT) established by the American Academy of Pediatrics (2000).

# Pediatric Assessment Triangle (PAT)

***Appearance***

The appearance of the pediatric patient should be assessed from the doorway. This is the most important aspect to consider when determining how sick or injured the child is. Appearance will give the EMS provider insight on oxygenation, neurological status and ventilation. Remember, the sick child may be alert on the conventional AVPU scale, but still have an abnormal appearance. Children need a more subtle assessment tool so that life-threatening injuries can be identified earlier. A good mnemonic to remember when assessing appearance is "tickles" (TICLS):

| ***Characteristic*** | ***Features to look for:*** |
|---|---|
| Tone | Is he/she moving or resisting examination vigorously? Does he/she have good muscle tone? Or, is he/she limp, listless, or flaccid? |
| Interactiveness | How alert is the child? How readily does a person, object, or sound distract him/ her or draw his/ her attention? Will he/she reach for, grasp and play with a toy or exam instrument such as a penlight or tongue blade? Or, is he/she uninterested in playing or interacting with the caregiver or professional? |
| Consolability | Can he/she be consoled or comforted by the caregiver or by the prehospital profession? Or, is his/her crying or agitated unrelieved by gentle assurance? |
| Look/Gaze | Does he/she fix his/her gaze on a face? Or, is there a ‘nobody home,” glassy-eyed stare? |
| Speech/Cry | Is his/her cry strong and spontaneous, or weak or high-pitched? It the content of speech age-appropriate, or confused or garbled? |

The TICLS Mnemonic (AHA Pediatric Advanced Life Support Manual, 2020 Guidelines)

# Pediatric Assessment Triangle (PAT) {Continued}

***Work of Breathing***

Assessing work of breathing must go beyond the rate and quality of respirations that is used for adult patients. Work of breathing is an accurate indicator of the oxygenation and ventilation status of the pediatric patient. This is another 'hands off' evaluation method in order to avoid disturbing the pediatric patient and causing any more respiratory distress (other than what is already present in the patient).

| ***Characteristic*** | ***Features to look for:*** |
|---|---|
| Abnormal Airway Sounds | Snoring, muffled or hoarse speech; stridor; grunting; wheezing |
| Abnormal Positioning | Sniffing position, tripoding, refusing to lie down |
| Retractions | Supraclavicular, intercostals, or substernal retractions of the chest wall; "head bobbing" in infants |
| Flaring | Flaring of the nares on inspiration |

Characteristics of Work of Breathing (AHA Pediatric Advanced Life Support Manual, 2020 Guidelines)

# Pediatric Assessment Triangle (PAT) {Continued}

***Circulation to Skin***

A rapid circulatory assessment is needed to determine the perfusion status of the pediatric patient. The key is to assess the core perfusion status of the child. Assessing the skin and mucous membranes can do this. Circulation to the skin reflects the overall status of core circulation.

| ***Characteristic*** | ***Features to look for:*** |
|---|---|
| Pallor | White or pale skin/ mucous membrane coloration from inadequate blood flow |
| Mottling | Patchy skin discoloration due to vasoconstriction/vasodilatation |
| Cyanosis | Bluish discoloration of skin and mucous membranes |

Characteristics of Circulation to Skin (AHA Pediatric Advanced Life Support Manual, 2020 Guidelines)

# Pediatric Assessment Triangle (PAT) {Continued}

***Putting it all Together***

The goal of pediatric patient care is to identify patients in shock or at risk of shock, initiating care that will directly assist maintaining the patient's perfusion and safely transporting the patient to an emergency department or trauma center in a timely manner. The benefit of remaining on scene to establish specific treatments versus prompt transport to a definitive care facility should be a consideration of each patient contact. Requesting advanced assistance is another important resource that EMT & A-EMT/EMT-I providers should consider

***Notes on Pediatric Shock:***

| *Mechanism* | *Medical* | *Traumatic* |
|---|---|---|
| Hypovolemia | Blood Loss-Internal Bleeding<br>Fluid Loss-Dehydration | Blood Loss-Trauma<br>Fluid Loss-Burns |
| Cardiogenic (Pump Failure) | Respiratory Failure<br>Airway Obstruction<br>Dysrhythmia | Chest Trauma<br>Pneumothorax<br>Pericardial Tamponade |
| Cyanosis | Sepsis<br>Anaphylaxis<br>Chemical/ Poisoning<br>Endocrine Dysfunction | Spinal Cord Injury (Neurogenic) |

# Pediatric Age Definitions

***Neonate (0-1 Month):***

- Utilization of APGAR Scoring is helpful in assessing the neonate patient.

***Infant (1-12 Months):***

- Approach the infant slowly and calmly. Fast motion and loud noises may startle or agitate the infant.
- Use warm hands and assessment tools.
- Avoid doing anything potentially painful or distressing until after the assessment is completed.
- Have the caregiver assist in care -this is less threatening to the infant.
- Children over six (6) months of age are usually best examined in the arms of a parent. "Stranger anxiety" may be present and could eliminate other assessment options.
- If needed, calm the infant with a pacifier, blanket or favorite toy.

***Toddler (1-3 Years):***

- Approach the toddler slowly. Keep physical contact at a minimum until he/she feels familiar with you.
- Perform the assessment at the level of the toddler by sitting or squatting next to them and allow the toddler to remain in the caregiver's lap whenever possible.
- Assessment should be toe to head. This is less threatening to the toddler.
- Give limited choices such as "Do you want me to listen to your chest or feel your wrist first?"
- Use simple, concrete terms and continually reassure the toddler.
- Do not expect the toddler to sit still and cooperate-be flexible.

***Preschooler (3-5 Years):***

- A preschool aged child is a “magical thinker.” Concrete concepts must be described in short, simple terms.
- A preschooler is often very cooperative during the assessment process and may be able to provide a history.

# Pediatric Age Definitions

## Pediatric Age Definitions {Continued}

***Preschooler (3-5 Years) {Continued}:***

- Questions should be simple and direct.
- Allow the child to handle equipment.
- Use distractions.
- Do not lie to the child. If the procedure is going to hurt, tell them.
- Set limits on behavior (i.e. “You can cry and scream, but not bite or kick.”)
- Focus on one thing at a time.
- Play games with immobilizing preschoolers to distract him/her and prevent them from squirming.

***School Age (5-13 Years):***

- The school aged child is usually cooperative and can be the primary source for the patient history.
- Explain all procedures simply and completely and respect the patient's modesty.
- Substance abuse issues may be present in this age group and should be considered during the care of altered level of consciousness cases.
- Children at this age are afraid of losing control, so let him/her be involved in the care. However, do not negotiate patient care unless the child really has a choice.
- Reassure the child that being ill or injured is not a punishment and praise them for cooperating.

***Adolescent (13-16 Years):***

- The adolescent is more of an adult than a child and should be treated as such. Depending on the nature of the problem, an accurate history may not be possible with parents observing. It may be necessary to separate the parent and child during the assessment.
- Regardless of who is present, respect the patient's modesty. Avoid exposing the adolescent unnecessarily.
- Explain what you are doing and why you are doing it.
- Show respect- speak to the adolescent directly. Do not turn to the caregiver for the initial information.

# Assessment of the Pediatric Patient

1. Scene Size-Up
   - Note anything suspicious at the scene (e.g. medications, household chemicals, other ill family members, etc.).
   - Assess for any discrepancies between the history and the patient presentation (e.g. infant fell on hard floor but there is carpet throughout the house).
2. General Approach to the Stable/Conscious Pediatric Patient
   - Utilize the PAT (Pediatric Assessment Triangle) to gain a general impression of the child.
   - Assessments and interventions must be tailored to each child in terms of age, size and development.
   - Smile, if appropriate to the situation.
   - Keep voice at an even, quiet tone - do not yell.
   - Speak slowly. Use simple, age-appropriate terms.
   - Keep small children with their caregiver(s) whenever possible and complete assessment while the caregiver is holding the child.
   - Kneel down to the level of the child if possible.
   - Be cautious in the use of touch. In the stable child, make as many observations as possible before touching (and potentially upsetting) the child.
   - Adolescents may need to be interviewed without their caregivers present if accurate information is to be obtained regarding drug use, alcohol use, LMP, sexual activity or child abuse.
   - Observe general appearance and determine if behavior is age appropriate.
   - Observe for respiratory distress or extreme pain.
   - Look at the position of the child.
   - What is the level of consciousness?
   - Muscle tone: good vs. limp.
   - Movement: spontaneous, purposeful or symmetrical.
   - Color: pink, pale, flushed, cyanotic or mottled.
   - Obvious injuries: bleeding, bruising, gross deformities, etc.
   - Determine weight - ask patient, caregiver(s) or use Broselow tape.
   - If utilizing Broselow tape or such devise, assess child to validate that child meets the average size benchmark used.

# Assessment of the Pediatric Patient

## Assessment of the Pediatric Patient {Continued}

3. Initial Assessment

   Airway access/maintenance with c-spine control

   - Maintain with assistance: positioning
   - Maintain with adjuncts: oral airway, nasal airway
   - Listen for any audible airway noises (e.g. stridor, snoring, gurgling, wheezing)
   - Patency: suction secretions as necessary

   Breathing

   - Rate & rhythm of respirations - compare to normal rate for age and situation
   - Chest expansion - symmetrical?
   - Breath sounds - compare both sides and listen for sounds (present, absent, normal, abnormal)
   - Positioning - sniffing position, tripod position
   - Work of breathing- retractions, nasal flaring, accessory muscle use, head bobbing, grunting

   Circulation

   - Heart rate - compare to normal rate for age and situation
   - Central pulses (e.g. brachial, carotid, femoral)- strong, weak or absent
   - Distal/Peripheral pulses (e.g. radial, pedal)- present/absent, thready, weak or strong
   - Color- pink, pale, flushed, cyanotic, mottled
   - Skin temperature - hot, warm, cool, or cold
   - Blood pressure- use appropriately sized cuff and compare to normal for the age of the child
   - Hydration status - observe anterior fontanel in infants, mucous membranes, skin turgor, crying tears, urine output, history to determine

# Assessment of the Pediatric Patient {Continued}

Disability- Brief Neurological Examination:

- Assess responsiveness- APGAR or TICLS
- Assess pupils
- Assess for transient numbness/tingling
- Disability- Brief Neurological Examination:

Expose and Examine:

- Expose the patient as appropriate based on age and severity of illness.
- Immediately after assessment complete work to prevent heat loss and keep the child from becoming hypothermic.

4. Rapid Assessment vs. Focused History & Physical Assessment
   - Tailor assessment to the needs and age of the patient.
   - Rapidly examine areas specific to the chief complaint.
   - Responsive medical patients: Perform focused assessment based on chief complaint. A full review of systems may not be necessary. If the chief complaint is vague, examine all systems and proceed to detailed exam.
   - Unresponsive medical patients: Perform rapid assessment (i.e., ABCs & a quick head-to-toe exam). Render emergency care based on signs & symptoms, initial impression and standard operating procedures.
   - Proceed to detailed exam.
   - Trauma patients with NO significant mechanism of injury: Focused assessment is based on specific injury site.
   - Trauma patients with significant mechanism of injury: Perform rapid assessment of all body systems and then proceed to detailed exam.

# Assessment of the Pediatric Patient {Continued}

5. Detailed Assessment
   - SAMPLE history - acquire/incorporate into physical exam.
   - Vital signs (i.e. pulse, BP, respirations, skin condition, capnography, pulse ox)
   - Assessment performed (usually en route) to detect non-life-threatening conditions and to provide care for those conditions or injuries
6. Ongoing Assessment

   • To effectively maintain awareness of changes in the patient's condition, repeated assessments are essential and should be performed at least every 5 minutes on the unstable patient and at least every 15 minutes on the stable patient.

## Critical Thinking Elements

- Remember: Pediatric patients have extraordinary ability to compensate and may show normal vital signs even though they are in shock.

# Assessment of the Pediatric Patient {Continued}

| Normal Pediatric Vital Sign Ranges | | | |
|---|---|---|---|
| | Heart Rate | Respiratory Rate | Minimum Blood Pressure |
| Infant | 100-160 bpm | 30-60 rpm | > 60mmHg systolic |
| Toddler | 90-150 bpm | 24-40 rpm | > 70mmHg systolic |
| Preschooler | 80-140 bpm | 22-34 rpm | > 75mmHg systolic |
| School Age | 70-120 bpm | 18-30rpm | > 80mmHg systolic |
| Adolescent | 60-100 bpm | 12-16 rpm | > 90mmHg systolic |

# Routine Pediatric Care Protocol

## EMR Care

1. Open and/or maintain an open airway. Have suction equipment readily available to suction nose and mouth as needed.
2. Protect the child from environmental exposure. Give special consideration to the warmth of the infant (i.e. cover the head to prevent heat loss).
3. Reassure the patient and caregiver(s). Speak softly and calmly, maintaining conversation and explanation of exam and treatment. Use age-appropriate communication techniques.
4. Patient positioning will be based on assessment, patient condition, age, development and safety. Both the patient and caregiver should have the appropriate safety restraint devices, seat belts in place for transport.
5. Administer **oxygen**, preferably 10-15 L/min via non-rebreather mask (either on the child's face or holding the mask close to the face). If the patient does not tolerate a mask, then administer 4-6 L/min by nasal cannula.
6. Ensure that transport agency has been activated for further care and transport. Provide responding units with pertinent patient information.
7. Monitor the patient's level of consciousness, vital signs, etc. for any acute changes.

PEARLS: If a pediatric patient is found to have complex pre-existing medical conditions or are medical device dependent (i.e. the STARS program), please refer to the patient's care plan. Contact Medical Control as soon as reasonable.

# Routine Pediatric Care Protocol {Continued}

## EMT Care

1. EMT Care includes the components of EMR Care.
2. Attach **pulse oximeter** and obtain analysis, if indicated.
3. Apply **Waveform Capnography** (if equipped).
4. Initiate Paramedic intercept, if indicated (or A-EMT/EMT-I intercept if Paramedic is unavailable).
5. Simultaneously with above, perform physical exam/assessment, obtain baseline vital signs and obtain patient history.
6. Establish on-line Medical Control as indicated.
7. Continue to reassess patient en route to the hospital.
8. Transport should be initiated at the earliest possible opportunity.

## A-EMT/EMT-I Care

1. A-EMT/EMT-I Care includes all of the components of EMT Care.
2. Attach cardiac monitor and print rhythm strip for documentation, if indicated.
3. If indicated, **establish IV access**. No more than one (1) attempt should be made on scene. Keep IV access saline locked unless infusing intravenous fluid boluses or weight-based medications. Dependent upon patient condition, consider initiating IV access when enroute.

## Paramedic Care

1. Paramedic Care includes all of the components of A-EMT/EMT-I Care.

## Critical Thinking Elements

- When determining the extent of care needed to stabilize the pediatric patient, the EMS provider should take into consideration the patient's presentation, chief complaint, risk of shock and proximity to the receiving facility.
- IV access in pediatric patients is difficult and may complicate the situation. Indications and benefits vs. patient disturbance and complications should be considered.
- If the patient exhibits signs of shock, administer fluid bolus at 20mL/kg over 2 minutes.
- If the pediatric patient is in emergent need of fluids and/or medications (i.e. cardiac arrest, trauma, decompensated shock or severe bums) and peripheral IV access is unobtainable, proceed with intraosseous infusion.
- Saline locks may be used as a drug administration route if fluid replacement is not indicated.
- IV access should not significantly delay initiation of transportation or be attempted on scene with a trauma patient meeting load-and-go criteria.