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Emergencies at a Glance: Pediatric Emergency Management

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Pediatric Assessment Triangle

The pediatric assessment triangle is a method to quickly assess a pediatric patient. While some of the assessments may be blunted compromised by anesthetics or sedatives, other assessments, such as abnormalities of work of breathing or circulation should be recognized early to maximize interventions and promote positive outcomes.

Appearance focuses on how the child looks. Using the acronym TICLS helps clinicians to remember

the important aspects of the assessment.

References

Remember that anesthetics and sedatives can cause abnormalities in this category.

- T: Tone
  - Normal: intact tone (use muscles appropriately) and startle reflex
  - Abnormal: flaccid muscle tone, no startle reflex
- I: Interactiveness
  - Normal: interact with caregivers and clinicians
  - Abnormal: ignore the environment, do not interact with their surroundings
- C: Consolability
  - Normal: caregiver able to appropriately console
  - Abnormal: caregiver unable to console despite various techniques
- L: Look/gaze
  - Normal: make appropriate eye contact and track staff members through the room
  - Abnormal: unable to track movements, "dolls eyes" (ie, stare straight ahead
- S: Speech/cry
  - Normal: appropriate speech or crying (if at a nonverbal age)
  - Abnormal: lack of crying or speech

Work of breathing refers to abnormal respiratory findings. IT can include abnormal breath sounds (eg, grunting and wheezing indicating a lower airway issue, stridor and snoring indicating an upper airway issue), abnormal positions such as

tripoding, head bobbing, retractions, gasping, and nasal flaring. Children have large heads and large tongues in proportion to the rest of their bodies which can more easily lead to airway obstruction.

Circulation assessments include skin color for central or peripheral mottling, central and peripheral capillary refill, pulses for absence or weakness, blood pressures according to the child's age, and signs of obvious bleeding. Children are dependent on their heart rate to maintain cardiac output which is why CPR for some ages should be started if the heart rate is less than 60 beats per minute.

The pediatric assessment triangle helps clinicians assess the severity of the abnormality. If there are no abnormalities, the child is considered stable and should be closely monitored for any changes.

- Abnormalities in the work of breathing category = respiratory distress
- Abnormalities in both work of breathing and their appearance = respiratory failure
- Abnormality in circulation = shock
- Abnormality in appearance = central nervous system or metabolic abnormality (which can include anesthetics)
- Abnormal findings in all three categories = cardiopulmonary failure

Obtaining an Accurate DOS Weight

or Using a Broselow Tape

Obtaining an accurate weight the DOS is important for accurate medication dosing. During a pediatric emergency, if no recent weight has been obtained, clinicians can use a Broselow tape to assist them determine the weight of a patient based off their height weight-based resuscitative medication doses.

To use the Broselow tape:

- Line up the red "measure from this end" arrow with the top of the head and measure to the child's feet.
- Their heel will line up with a color/section of the Broselow tape which indicates the estimated weight of the patient along with doses recommended for that patient's size.

Normal vital signs vary by the patient's age and clinicians should refer to their facility policies for specific values. If clinicians do not have access to the facility's policy, they can use either of the two formulas to determine a safe systolic blood pressure (SBP) for the patient.

- Normal SBP = 90 + 2 (age in years)
- Hypotensive SBP = anything less than 70 + 2 (age in years)

Endotracheal Tube Sizes by Age

Endotracheal tubes are selected based on the size of the patient.

Pediatric Cardiopulmonary Arrest: Resuscitation Doses, Preparing Medications and Shock Energies

Follow the American Heart Association's pediatric advanced life support (PALS) algorithms[3] for resuscitative medication dosing, which can be found on the Broselow tape or on PALS algorithm guides located on most code carts.

When delivering electricity to pediatric patients, use appropriately sized defibrillator pads. Ensure the pads DO NOT overlap each other; if the pediatric patient is small, consider placing the pads in the anterior and posterior positions to avoid overlapping.

Shock Energy for Defibrillation[3]

◦ First shock = 2 joules/kg

◦ Second shock = 4 joules/kg

◦ Subsequent shocks = >4 joules/kg (maximum 10 joules/kg or adult dose)

References

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2. Pediatric life support: 2020 international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. Circulation. https://www.ahajournals.org/doi/10.1161/CIR.0000000000000894 Accessed June 25th, 2024.
3. American Heart Association. Pediatric Cardiac Arrest Algorithm. https://cpr.heart.org/-/media/CPR-Files/CPR-Guidelines-Files/Algorithms/AlgorithmPALS_CA_200707.pdf.