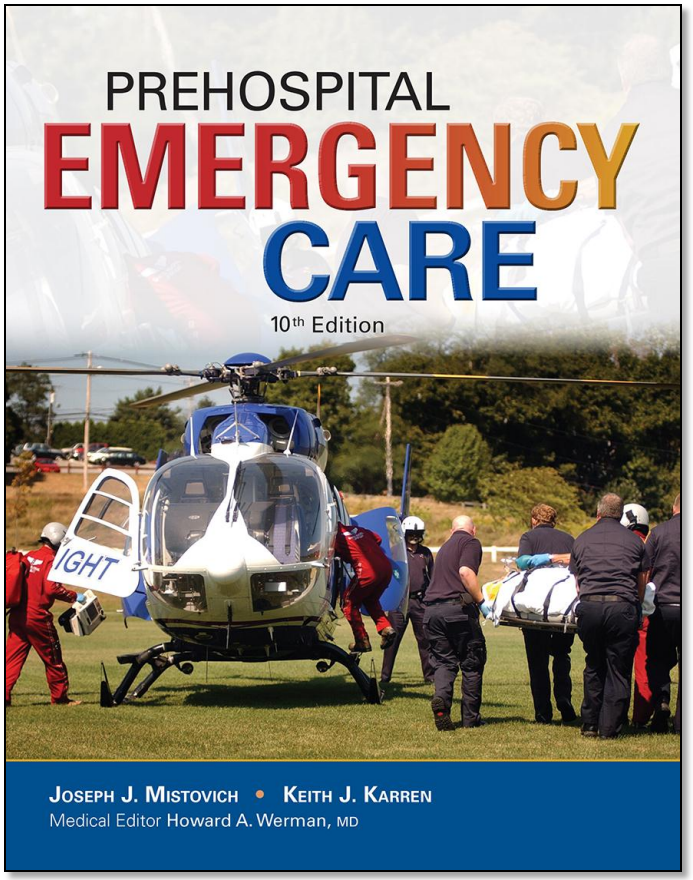
PREHOSPITAL EMERGENCY CARE

TENTH EDITION



CHAPTER 38

Part I
Pediatrics

Learning Readiness

- EMS Education Standards, text p. 1024

Learning Readiness Objectives

- Please refer to pages 1024 and 1025 of your text to view the objectives for this chapter.

Learning Readiness Key Terms

- Please refer to page 1025 of your text to view the key terms for this chapter.

Setting the Stage

- Overview of Lesson Topics
  - Dealing with Caregivers
  - Dealing with the Child
  - Assessment-Based Approach to Pediatric Emergencies
  - Airway and Respiratory Problems

Case Study Introduction

EMTs Julian Ballard and Tammy Pell are responding to a call for a two-year-old with difficulty breathing. En route, the EMTs talk about their approach to the patient, and possible causes to look for.

Case Study

- What criteria should Julian and Tammy use to develop a general impression of the patient's condition?
- What questions should they ask of the parents?
- What are some special considerations in the assessment of a two-year-old child?

Introduction

- Trauma is the leading cause of fatal injuries in children under the age of 14.
- Of medical problems, respiratory problems are the most serious.

Introduction

- Assessment of a child is somewhat different, but the basic treatment goals are the same.
- Emergency care focuses on managing airway, ventilation, oxygenation, and circulation.

Dealing with Caregivers

- Caregivers may be upset, cry, blame themselves, or be angry.
- Listen carefully and remain nonjudgmental.
- Let caregivers verbalize their emotions.
- Be supportive.

continued on next slide

Dealing with Caregivers

- Display competence and confidence.
- Inform the patient and caregivers what you are doing.
- Involve the caregivers so that they are participants in the child's care.

Dealing with the Child

- Each age group has specific emotional and physical characteristics that affect assessment and treatment.
- Pain is difficult to assess in most age groups.

continued on next slide

Dealing with the Child

- Neonates
  - Birth to one month
  - Subset of infants
- Infants
  - One month to one year
  - Infants older than 6 months often cry if separated from their caregiver.
  - Assess from toe to head.

continued on next slide

Up to 6 months of age, babies are usually not afraid to let the EMT handle them.

continued on next slide

Dealing with the Child

- Toddlers
  - 1 to 3 years
  - Do not like to be touched
  - Do not like to be separated from caregivers
  - Do not like having clothing removed
  - Do not like an oxygen mask on the face
  - Do not like needles

continued on next slide

Toddlers do not like to be separated from their caregiver.

continued on next slide

Dealing with the Child

- Toddlers
  - Think of your exam as an intrusion; respect the child's space.

continued on next slide

Dealing with the Child

- Preschoolers
  - 3 to 6 years of age
  - Use concrete thinking and literal interpretation.
  - Vivid imagination
  - May believe illness or injury is a punishment.

continued on next slide

Dealing with the Child

- Preschoolers
  - Fear loss of bodily integrity
  - Aware of death; fear pain, blood, and permanent injury
  - Explain what you are doing in terms the child understands.

continued on next slide

Dealing with the Child

- School-age
  - 6 to 12 years
  - More cooperative, better understanding of the body
  - Honesty is key
  - Explain what you are doing.

continued on next slide

School-age children like to be informed about what is going on.

continued on next slide

Dealing with the Child

- Adolescents
  - Abstract thinking is developing
  - Feelings of invincibility
  - Establish trust
  - Respect privacy
  - Anticipate fears and provide reassurance.

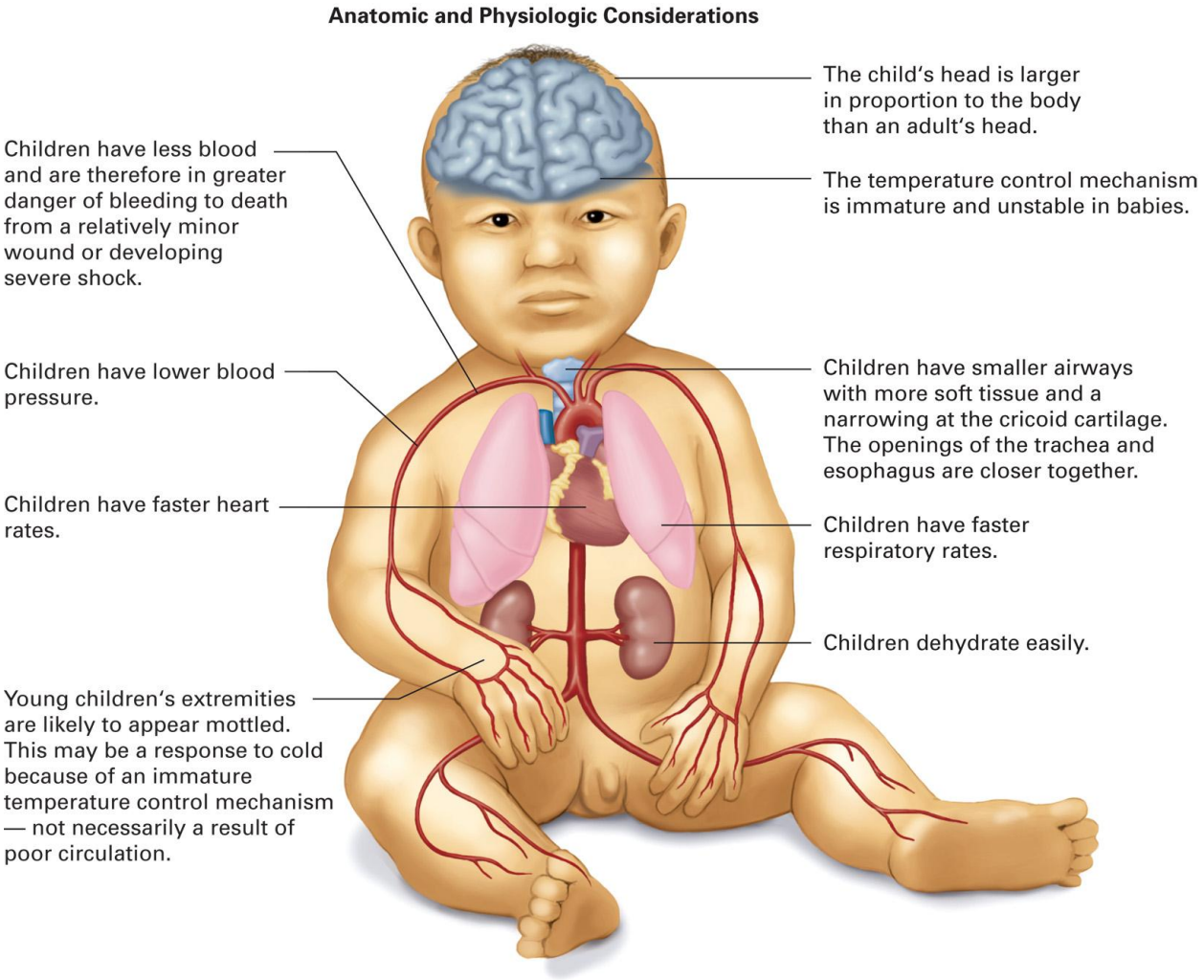
continued on next slide

Dealing with the Child

- Anatomical and physiological differences

continued on next slide

Anatomical and physiological considerations in the infant and child.



continued on next slide

TABLE 38-1 **Estimated Pediatric Heart Rate, Respiratory Rate, Systolic Blood Pressure and Diastolic Blood Pressure Based on Age**

Age	Heart Rate	Respiratory Rate	Systolic Blood Pressure	Diastolic Blood Pressure
Newborn to 1 year	140 bpm	40/minute		
1 year to 4 years	120 bpm	30/minute		
4 years to 12 years	100 bpm	20/minute		
>12 years	80 bpm	15/minute		
Newborn to 1 month			60 mmHg	
1 month to 1 year			70 mmHg	
1 year to 10 years			Median normal: **80** mmHg + (2 × years in age) Lower limit of normal: **70** mmHg + (2 × years in age) Higher limit of normal: **90** mmHg + (2 × years in age)	2/3 the systolic blood pressure
>10 years			90 mmHg	

continued on next slide

Dealing with the Child

- Airway
  - Infants have a proportionally large tongue.
  - A newborn's trachea is 4 to 5 mm in diameter.
  - The trachea is more pliable.
  - Pressure on the soft tissue under the chin can obstruct the airway.

continued on next slide

Dealing with the Child

- Airway
  - Newborns are obligate nasal breathers.
  - The smallest part of the airway is at the level of the cricoid cartilage.
  - The epiglottis is positioned higher in the airway

continued on next slide

Dealing with the Child

- Head
  - The head is proportionally larger.
  - The head and neck are more prone to injury.
  - Place padding beneath the shoulders during immobilization of the spine.

continued on next slide

(a) When a child is supine, the head tilts forward. (b) Pad behind the shoulders to maintain airway alignment.

(a)

(b)

continued on next slide

Dealing with the Child

- Head
  - Infants less than 6–7 months old cannot support their heads.
  - Avoid handling the fontanelles.
  - The fontanelles may be sunken (dehydration) or bulging (increased intracranial pressure).

continued on next slide

Dealing with the Child

- Chest and lungs
  - Ribs are more pliable
  - Ribs are more horizontal
  - Lung tissue is more fragile
  - Minimal chest rise with normal breathing
  - Chest muscles are underdeveloped

continued on next slide

Dealing with the Child

- Respiratory system
  - Breathing is inadequate at rates ≥60.
  - Children younger than 5 years old have a breathing rate twice that of adults.

continued on next slide

Dealing with the Child

- Cardiovascular system
  - The heart rate increases from fear, fever, anxiety, hypoxia, activity, and hypovolemia.
  - Bradycardia is a late response to hypoxia in infants and children, but an early response in newborns.
  - The circulating blood volume is smaller.

continued on next slide

Dealing with the Child

- Cardiovascular system
  - Hypotension does not develop until more than 30% of the blood volume is lost.
  - Limited ability to increase the strength of cardiac contraction

continued on next slide

Dealing with the Child

- Abdomen
  - Musculature is less well developed.
  - Liver and spleen are less well-protected by the ribs.

continued on next slide

Dealing with the Child

- Extremities
  - Bones can fracture by bending and splintering (greenstick fractures).
  - Motor development occurs from head to toe.

continued on next slide

Dealing with the Child

- Metabolic rate
  - The metabolic rate is faster, requiring rapid consumption of oxygen and glucose.
  - Risk of developing hypoglycemia

continued on next slide

Dealing with the Child

- Skin and body surface area
  - The large skin surface increases the risk of hypothermia.
  - The skin is thinner and more delicate.

Assessment-Based Approach

- Scene size-up
  - Look for clues to the nature of the problem.
  - Assess the need for additional resources.
  - Determine scene safety.

continued on next slide

Assessment-Based Approach

- Primary assessment
  - Form a general impression using the Pediatric Assessment Triangle.
  - Assess the level of consciousness.
  - Assess the airway.
  - Assess breathing.
  - Assess circulation.
  - Determine priority.

continued on next slide

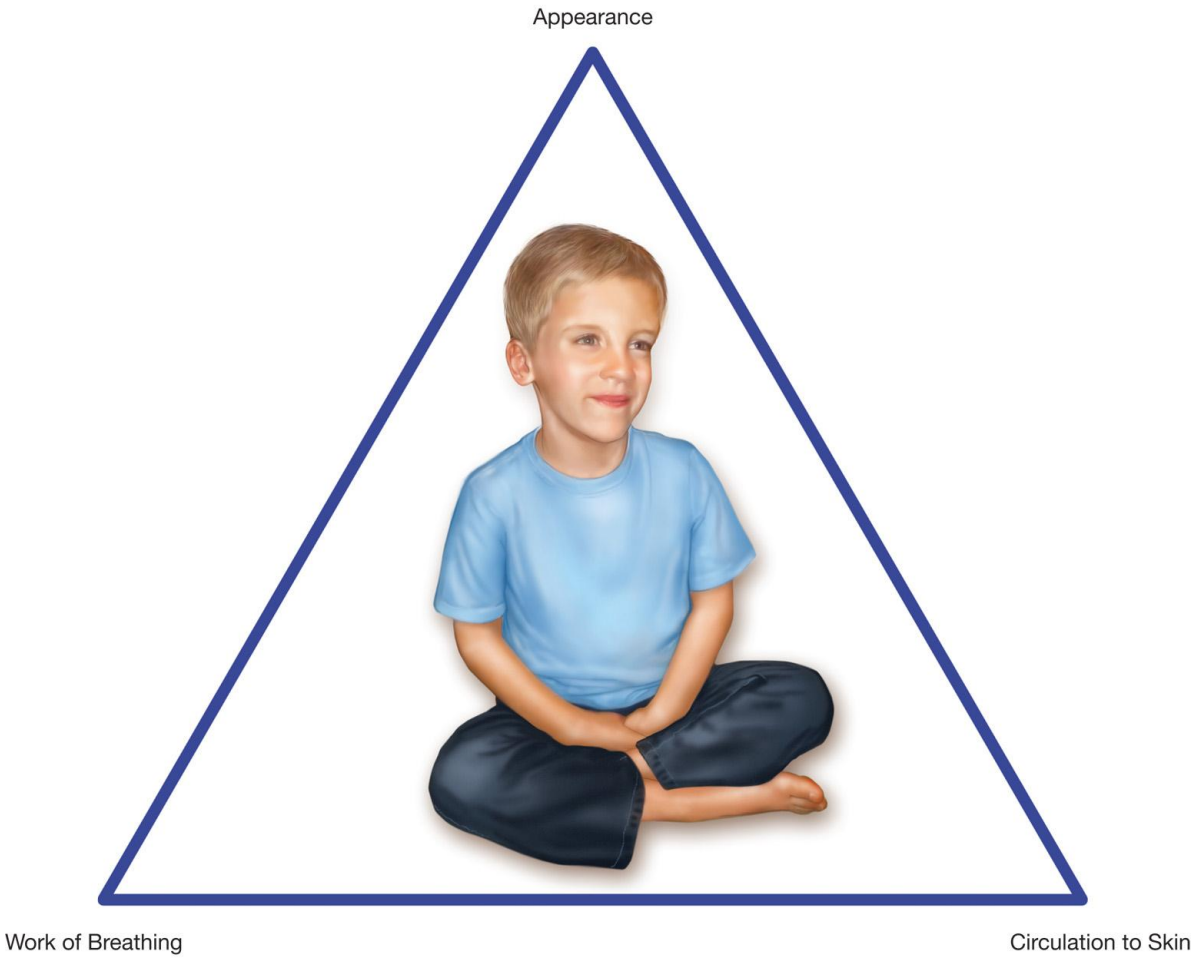
TABLE 38-2 Primary Assessment "From the Doorway"

PAT (Pediatric Assessment Triangle: American Academy of Pediatrics)	PALS (Pediatric Advanced Life Support, American Heart Association)
Appearance	Consciousness
Work of Breathing	Breathing
Circulation to Skin	Color

continued on next slide

To form a general impression of the pediatric patient “from the doorway,” both PAT and PALS offer similar guidance. Before approaching the child, gain an impression of three factors: (1) appearance/consciousness, (2) breathing effort/sounds, and (3) circulation/color.

Pediatric Assessment Triangle Elements



continued on next slide

Assessment-Based Approach

- PAT: Appearance
  - Tone
  - Interactivity and irritability
  - Consolability
  - Look or gaze
  - Speech or cry

continued on next slide

Assessment-Based Approach

- PAT: Work of Breathing
  - Abnormal sounds
  - Abnormal posture or position
  - Retractions
  - Nasal flaring
  - Head bobbing

continued on next slide

Assessment-Based Approach

- PAT: Circulation to Skin
  - Pallor—skin and mucous membranes
  - Mottling
  - Cyanosis
  - Petechiae

continued on next slide

Assessment-Based Approach

- A well vs. sick child
  - Does the patient:
    - Display normal behavior for his age?
    - Move about spontaneously, or does he seem lethargic?
    - Appear attentive and recognize the parents or caregivers?

continued on next slide

Assessment-Based Approach

- A well vs. sick child
  - Does the patient:
    - Maintain any eye contact?
    - Seem easily consoled by the parents or caregiver?
    - Respond to the parent or caregiver calling him?

continued on next slide

Assessment-Based Approach

- Conditions presenting with an abnormal PAT finding:
  - Respiratory distress
  - Respiratory failure
  - Compensated shock
  - Decompensated shock
  - Poor brain perfusion or brain injury
  - Cardiopulmonary failure

continued on next slide

Assessment-Based Approach

- Pediatric Advanced Life Support (PALS) initial impression
  - Consciousness
  - Breathing
  - Color

continued on next slide

Assessment-Based Approach

- PALS initial impression
  - If breathing is adequate, proceed to the primary assessment.
  - If the patient is unresponsive and breathing is absent or gasping, begin positive pressure ventilation at 12 to 20/minute, and assess the pulse.

continued on next slide

Assessment-Based Approach

- PALS initial impression
  - If there is no pulse, begin chest compressions.
  - If there is a pulse but signs of poor perfusion are present and the heart rate is <60, begin chest compressions
  - If the pulse is >60/minute, proceed to the primary assessment

continued on next slide

Click on the item that is NOT a component that is assessed using the Pediatric Assessment Triangle (PAT).

A. Muscle tone

B. Blood pressure

C. Breathing

D. Skin color

continued on next slide

Assessment-Based Approach

- Level of consciousness
  - Use the AVPU approach

continued on next slide

TABLE 38-5 The Pediatric Glasgow Coma Scale

	>1 Year	<1 Year	
Eye opening	4 Spontaneous	Spontaneous	
	3 To verbal command	To shout	
	2 To pain	To pain	
	1 No response	No response	
	>1 Year	**<1 Year**	
Best motor response	6 Obeys		
	5 Localizes pain	Localizes pain	
	4 Flexion-withdrawal	Flexion-withdrawal	
	3 Flexion-abnormal (decorticate rigidity)	Flexion-abnormal (decorticate rigidity)	
	2 Extension (decerebrate rigidity)	Extension (decerebrate rigidity)	
	1 No response	No response	
	5 Years	**2–5 Years**	**0–23 Months**
Best verbal response	5 Oriented and converses	Appropriate words and phrases	Smiles, coos, cries appropriately
	4 Disoriented and converses	Inappropriate words	Cries
	3 Inappropriate words	Cries and/or screams	Inappropriate crying and/or screaming
	2 Incomprehensible sounds	Grunts	Grunts
	1 No response	No response	No response

continued on next slide

Assessment-Based Approach

- Airway assessment
  - Hypoxia and death may occur from an obstructed airway.
  - Keep in mind pediatric anatomical and physiological differences.

continued on next slide

Ensure an open airway. Listen for abnormal sounds that may indicate a need for suctioning.

continued on next slide

Assessment-Based Approach

- Breathing assessment
  - Count respirations for 30 to 60 seconds.
  - Assess tidal volume.
  - If the rate or tidal volume are inadequate, begin positive pressure ventilation with supplemental oxygen.

continued on next slide

Assess breathing. Listen for noisy breathing. Assess for diminished breathing.

continued on next slide

Assessment-Based Approach

- Rapid breathing
  - Normal breathing rates are 25–30/minute in an infant and 15–30/minute in a child.
  - Check for signs of hypoxia and respiratory distress.

continued on next slide

Assessment-Based Approach

- Possible causes of rapid breathing
  - Hypoxia
  - Head injury
  - Lung infection
  - Fever

continued on next slide

Assessment-Based Approach

- Possible causes of rapid breathing
  - Diabetes
  - Aspirin overdose, poisoning
  - Stress, fear, pain
  - Shock

continued on next slide

Assessment-Based Approach

- Noisy breathing
  - Auscultate both midaxillary areas

continued on next slide

Assessment-Based Approach

- Sounds that characterize certain problems:
  - Coughing, gagging, gasping
    - Aspiration of a foreign body or body secretions, creating a partial blockage of the airway

continued on next slide

Assessment-Based Approach

- Sounds that characterize certain problems:
  - Crackles
    - Fluid in the alveoli
  - Wheezing
    - Narrowed bronchioles

continued on next slide

Assessment-Based Approach

- Sounds that characterize certain problems:
  - Stridor
    - Severe upper airway obstruction
  - Diminished breathing
    - Part of the lung is not inflating

continued on next slide

Assessment-Based Approach

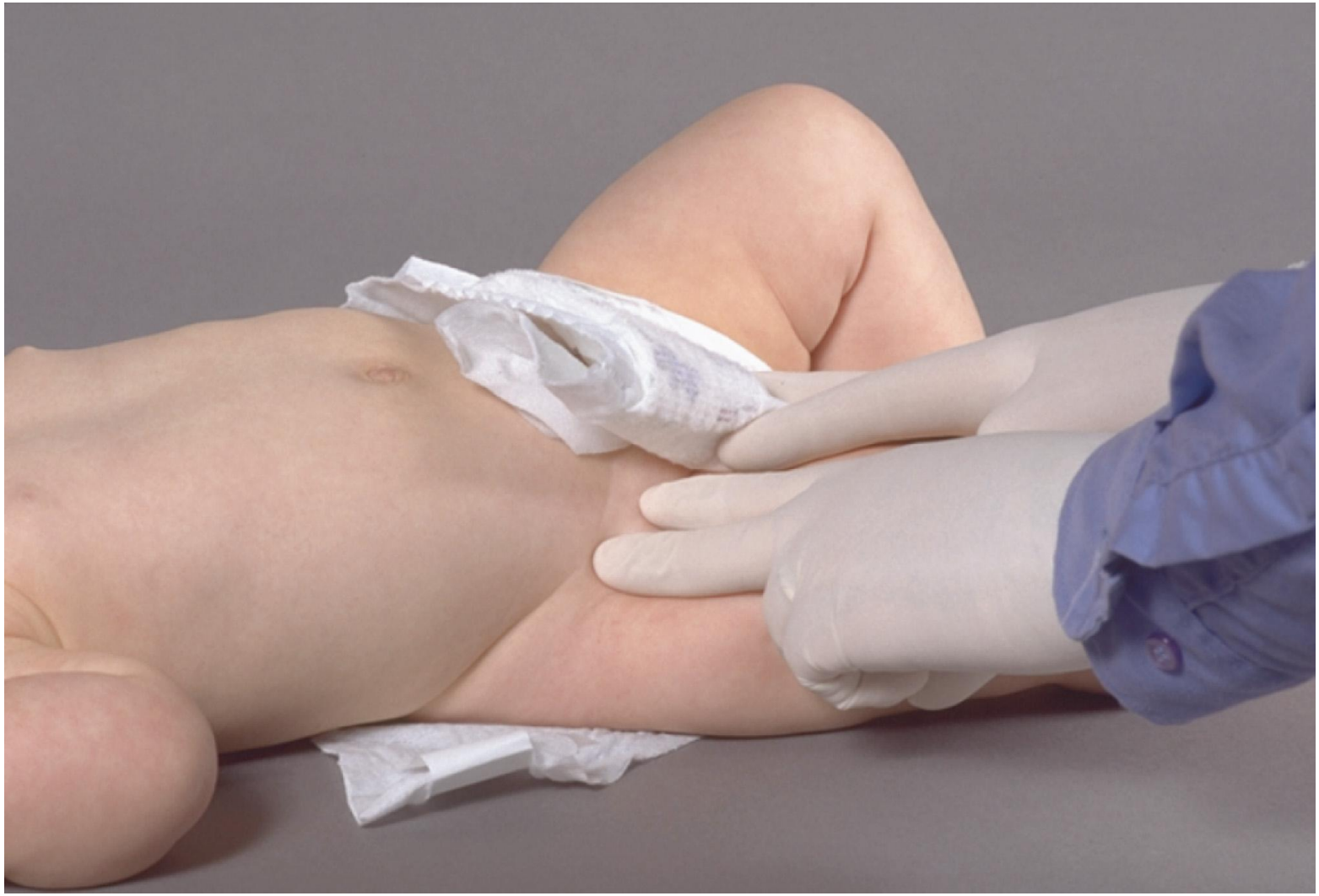
- Circulatory assessment
  - Assess the pulse.
  - Capillary refill is reliable in children.
  - Also assess blood pressure, urine output, and mental status to check for hypoperfusion.

continued on next slide

Assess the strength of the peripheral pulse. In an infant, check the brachial pulse.

continued on next slide

Assess the strength of the central pulse. In an infant, check the femoral pulse. Locate this pulse by identifying the midpoint of an imaginary line extending from the anterior superior iliac spine to the symphysis pubis, then moving your fingertip about one to two finger breadths inferior.



continued on next slide

In a child, check the radial pulse.

continued on next slide

To assess the strength of the central pulse in an older child, check the carotid pulse. Compare the strength of the central pulse to the previously determined strength of the peripheral pulse.

continued on next slide

Press the top of the patient's hand or foot.

continued on next slide

Release and note how long before normal color returns.

continued on next slide

Assessment-Based Approach

- Priority determination
  - Consider scene size-up, PAT, and primary assessment information.
  - Priority patients
    - Respiratory distress
    - Respiratory failure
    - Respiratory arrest
    - Poor perfusion

continued on next slide

Assessment-Based Approach

- Secondary assessment
  - For trauma, perform the assessment first, then the history and baseline vital signs.
  - For a responsive patient with a medical problem, a focused assessment may be performed.
  - For younger patients, use a toe-to-head approach.

continued on next slide

Assessment-Based Approach

- Special considerations in the physical exam

continued on next slide

TABLE 38-4 Ten Tips for Examining Infants and Children

When examining an infant or child . . .

1. If possible, have only one EMT deal with the infant or child. This reduces the fear the patient may experience by being assessed by two unknown individuals.
2. Get down to the child's eye level. Towering above an infant or child will only increase his fear and anxiety. Sit down next to the child whenever possible.
3. With children under school age, start the assessment with your hands and save stethoscopes, blood pressure cuffs, and scissors until you have developed some trust with the child. Keep the most painful parts of the examination for the end.
4. Speak in a calm, quiet voice and maintain eye contact as much as possible. Even infants will respond to a calm voice, and an apparently unresponsive child may actually hear much of what you say.
5. Never become impatient or lose your temper. This will just ignite the patient's temper. Switch off with a partner or take a brief time-out for yourself, if you need to.
6. Avoid questions that require "yes" or "no" answers. Given the choice, a child will almost always say "no" when asked if you can do something to him. Instead, ask questions in this format: "Would you like your mother to take off your shirt, or may I do it?" Giving the child a choice also empowers him in what may be a very scary situation.
7. Involve the caregivers (or a familiar person) as much as possible during care and transport. If the child sees his caretaker respecting and trusting you, he is much more likely to do the same.
8. Be honest. For instance, you might say, "It will hurt when I touch you here, but it will only last a moment. If you feel like crying, it's okay." Children can tolerate some pain if they are prepared for it and are given adequate support.
9. Ask children for their help and assure them that they are doing a good job. Have toys, stickers, or other "rewards" to console and encourage a child.
10. Be gentle. Use all appropriate measures to reduce the amount of pain that a child must endure. If you must restrain a child, be sure that it is absolutely necessary. Use only the minimum degree of restraint to be safe and allow you to provide good care. As a general rule, "humane" (soft) restraints are much better than "mechanical" ones.

continued on next slide

Assessment-Based Approach

- When using pulse oximetry, also consider the patient's overall presentation.
- Administer supplemental oxygen to maintain an SpO_2 greater than or equal to 94%.
- Recognize limitations of pulse oximetry in shock and hypothermia, and with movement.

continued on next slide

Assessment-Based Approach

- An alternative means of assessing the heart rate is to auscultate with a stethoscope.
- Compare peripheral and central pulses.
- Take a blood pressure in patients older than 3 years old, using appropriately sized equipment.

continued on next slide

Assessment-Based Approach

- Considerations in the history
  - Watch the child's interaction with the caregiver.
  - If there are no life threats, take time to establish trust.
  - Use a calm voice and include the child in the conversation.
  - Place yourself at the child's eye level.

continued on next slide

Assessment-Based Approach

- Considerations in the history
  - Avoid rapid-fire "yes" and "no" questions.
  - Avoid words that increase anxiety.
  - Keep the child with the parent.
  - For small children, examine from toe to head.

continued on next slide

Assessment-Based Approach

- Considerations in the history
  - Do not explain things too far in advance.
  - Let the child handle equipment such as stethoscopes and penlights before using them in the assessment.

continued on next slide

Assessment-Based Approach

- Reassessment
  - Monitor the mental status, airway, breathing, and circulation.
  - Remember that compensatory mechanisms fail rapidly and without warning.
  - Assess and record the vital signs and check interventions.

Case Study

Julian and Tammy arrive to find a two-year-old boy being held by his father. The child seems listless and tired. He is slightly pale, and his respirations are rapid with nasal flaring and retractions.

The child has been sick with a cough, runny nose, and fever for about 12 hours, and his breathing has worsened substantially over the past hour.

continued on next slide

Case Study

The child's skin is warm and dry. Julian auscultates the breath sounds, and hears crackles in the right lung. Tammy reports an SpO_2 of 92%.

continued on next slide

Case Study

- What additional assessment information do the EMTs need?
- What interventions are needed, and how should they be carried out in this patient?

Airway and Respiratory Problems

- The leading cause of cardiac arrest in pediatric patients is respiratory failure.
- Failure to assess, establish, and maintain the airway, ventilatory, or oxygenation status will defeat any other treatment.

continued on next slide

Airway and Respiratory Problems

- Compensatory mechanisms function well until total exhaustion occurs, leading to rapid respiratory deterioration and cardiac arrest.

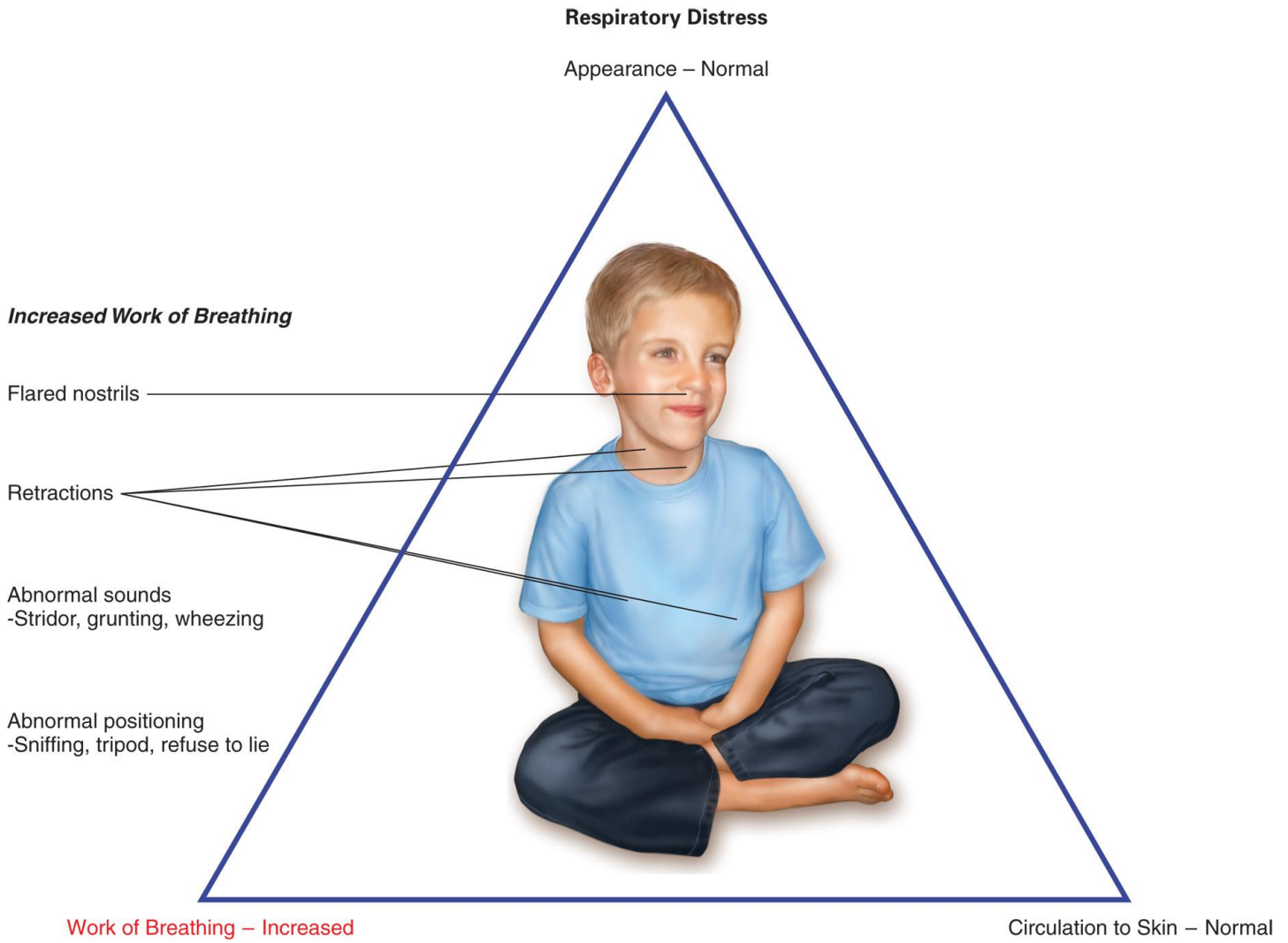
continued on next slide

Airway and Respiratory Problems

- Early respiratory distress
  - Adequate depth and rate of respiration
  - Work of breathing is increased.
  - The patient can progress to respiratory failure and respiratory arrest.
  - Provide oxygen and transport.

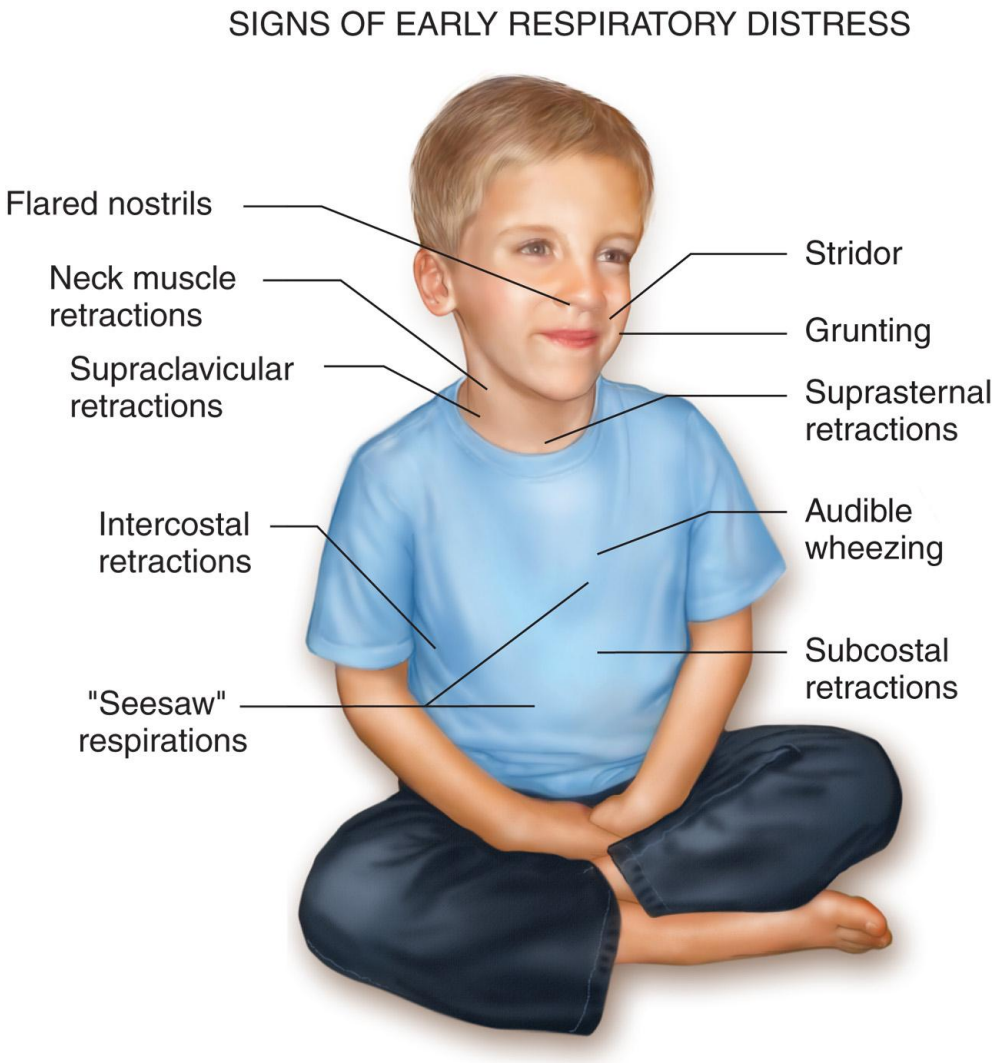
continued on next slide

Findings for a child in respiratory distress.



continued on next slide

Signs of early respiratory distress.



continued on next slide

If signs of early respiratory distress are present, provide oxygen and prompt transport to the hospital.

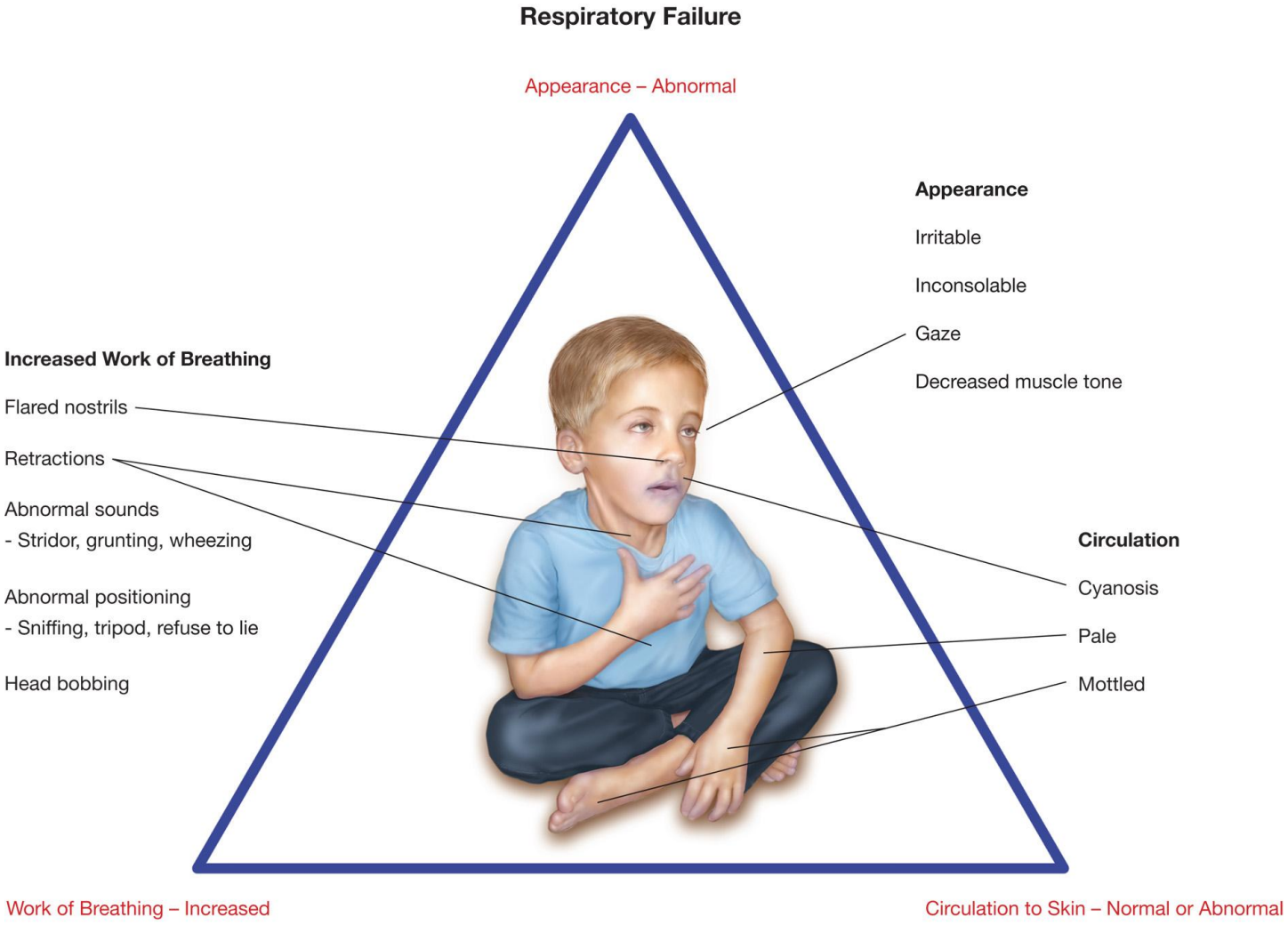
continued on next slide

Airway and Respiratory Problems

- Decompensated respiratory failure
  - Patient cannot compensate and is unable to maintain adequate breathing.
  - Either the respiratory rate or the tidal volume is inadequate.
  - The patient requires immediate intervention.

continued on next slide

Findings for a child in decompensated respiratory failure.



continued on next slide

Airway and Respiratory Problems

- In addition to signs of respiratory distress, patients in respiratory failure may have:
  - Respiratory rate >60
  - Cyanosis
  - Decreased muscle tone
  - Severe use of accessory muscles

continued on next slide

Airway and Respiratory Problems

- In addition to signs of respiratory distress, patients in respiratory failure may have:
  - Poor peripheral perfusion
  - Altered mental status
  - Grunting
  - Head bobbing

continued on next slide

Airway and Respiratory Problems

- For patients in decompensated respiratory failure, provide positive pressure ventilation with supplemental oxygen and transport.

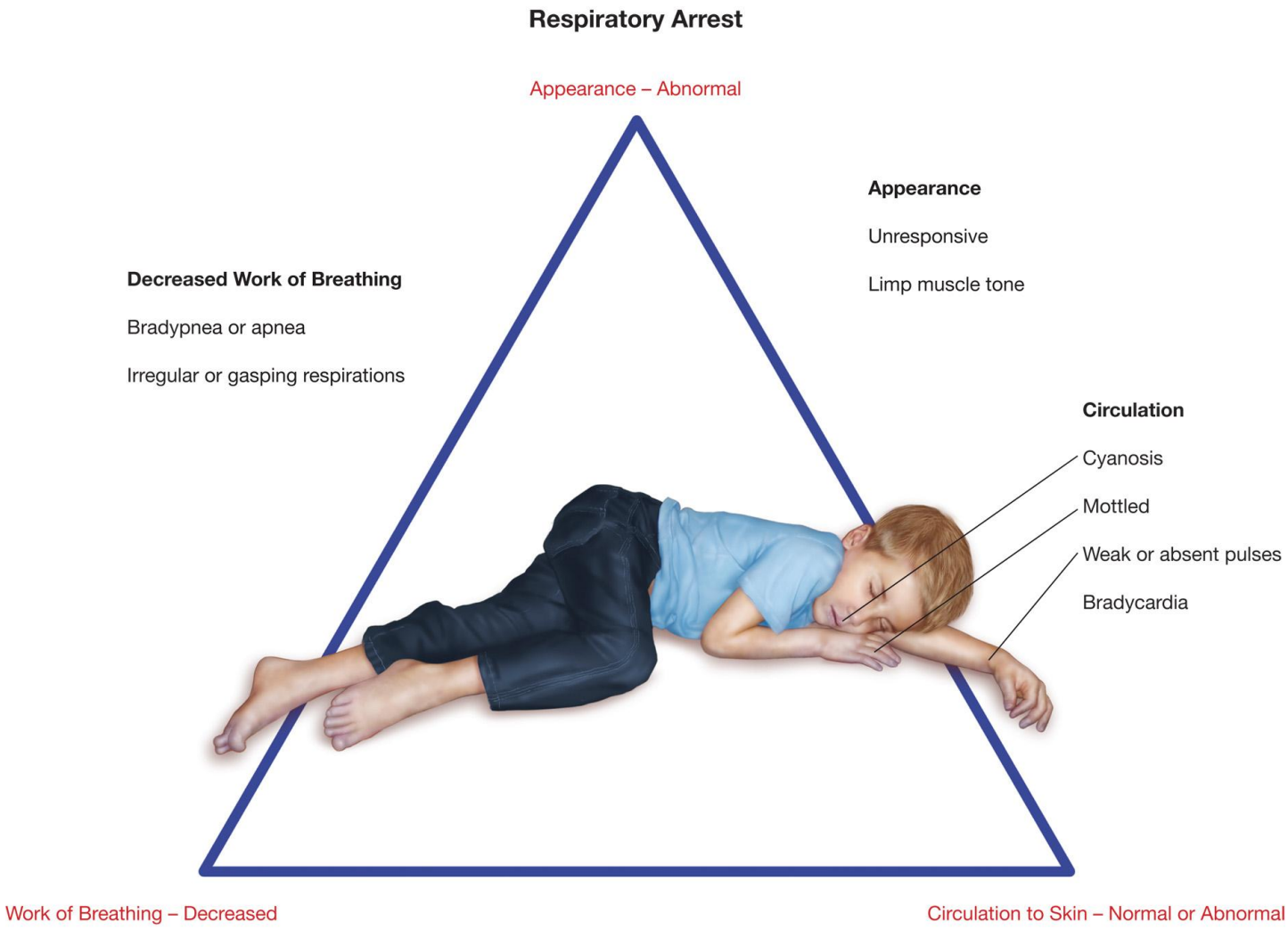
continued on next slide

Airway and Respiratory Problems

- Respiratory arrest
  - Respiratory rate <10
  - Irregular or gasping respirations
  - Limp muscle tone
  - Unresponsiveness
  - Slower than normal or absent heart rate
  - Weak or absent peripheral pulses
  - Hypotension

continued on next slide

Findings for a child in imminent respiratory arrest.



continued on next slide

Airway and Respiratory Problems

- For respiratory arrest, provide positive pressure ventilation with supplemental oxygen and transport immediately.

continued on next slide

Airway and Respiratory Problems

- Partial airway obstruction
  - If the airflow is adequate, allow the patient to assume a comfortable upright position.
  - Administer oxygen.
  - Encourage the patient to cough.
  - Do not agitate the patient.
  - Transport immediately.

continued on next slide

Airway and Respiratory Problems

- Partial airway obstruction
  - Signs and symptoms
    - May be alert with good peripheral perfusion.
    - Skin may be normal or slightly pale.
    - Stridor

continued on next slide

Airway and Respiratory Problems

- Partial airway obstruction
  - Signs and symptoms
    - Intercostal, supraclavicular, or subcostal retractions
    - Crowing or other noisy respirations
    - Crying
    - Forceful cough may be present.

continued on next slide

Airway and Respiratory Problems

- Complete airway obstruction
  - Requires use of procedures for relieving airway obstruction.

continued on next slide

Airway and Respiratory Problems

- Signs of complete airway obstruction
  - No crying or talking
  - Ineffective or absent cough
  - Altered mental status, including possible loss of responsiveness
  - Cyanosis probable

continued on next slide

Airway and Respiratory Problems

- Emergency medical care
  - Establish and maintain a patent airway.
    - If no cervical spine injury is suspected, use a head-tilt, chin-lift maneuver.
      - Extend the head only enough to ensure a patent airway.
      - Do not apply pressure to the soft tissue under the chin.
    - If spine injury is suspected, use a jaw-thrust maneuver.

continued on next slide

Head-tilt, chin-lift maneuver in an infant. Avoid overextension.

continued on next slide

Head-tilt, chin-lift maneuver in a child.

continued on next slide

Jaw-thrust maneuver in an infant.

continued on next slide

Jaw-thrust maneuver in a child.

continued on next slide

Airway and Respiratory Problems

- Emergency medical care
  - Suction secretions, vomitus, or blood.
  - Limit suctioning to 3 to 5 seconds.
  - Use appropriately sized equipment.

continued on next slide

Airway and Respiratory Problems

- Emergency medical care
  - If positive pressure ventilation is needed, insert an oropharyngeal airway if the patient does not have a gag reflex.
  - In general, avoid the use of nasopharyngeal airways in pediatric patients.

continued on next slide

A variety of oropharyngeal airways.

continued on next slide

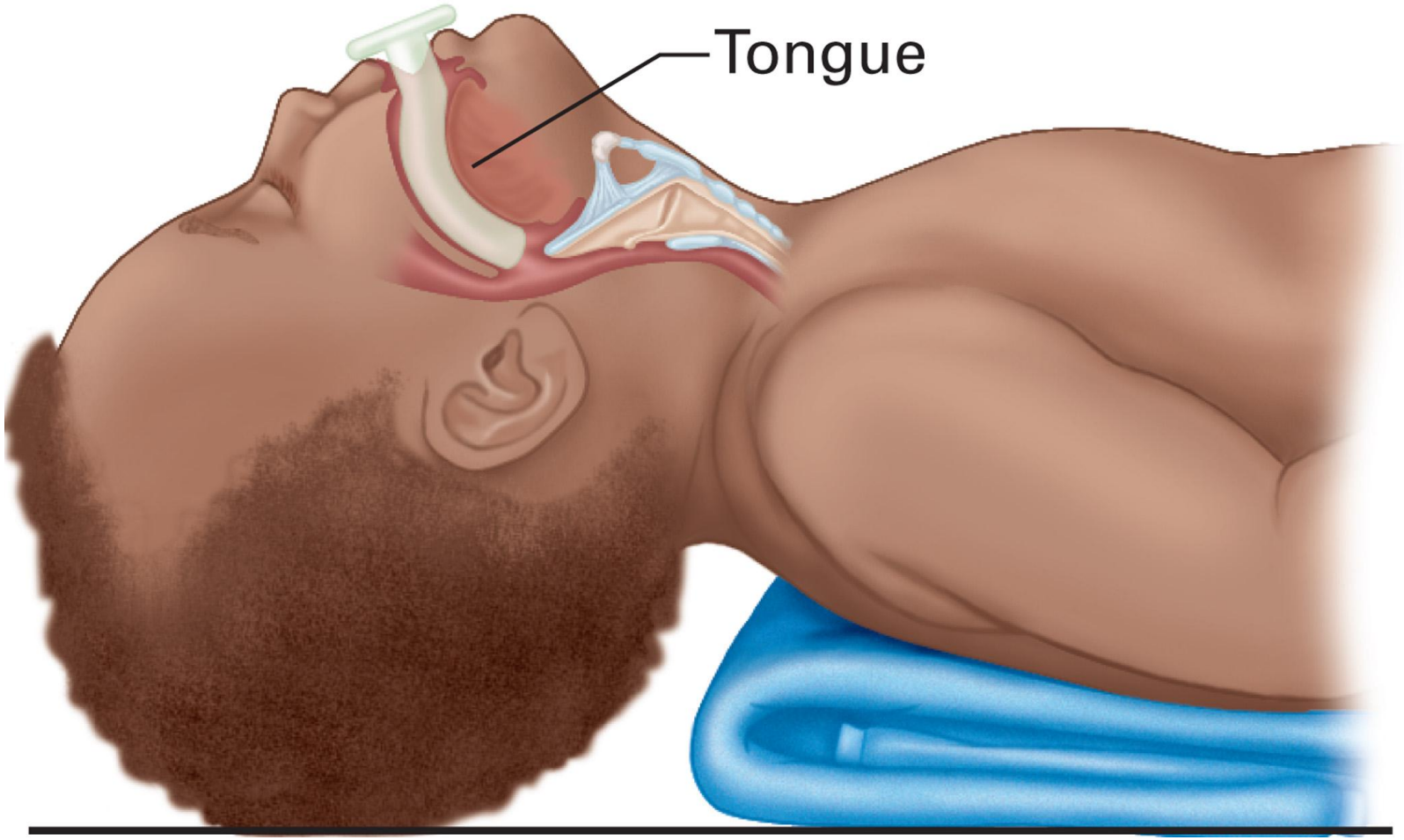
Sizing an oropharyngeal airway.

continued on next slide

Inserting an oropharyngeal airway, using a tongue depressor for insertion in a pediatric patient.

continued on next slide

An oropharyngeal airway in place.



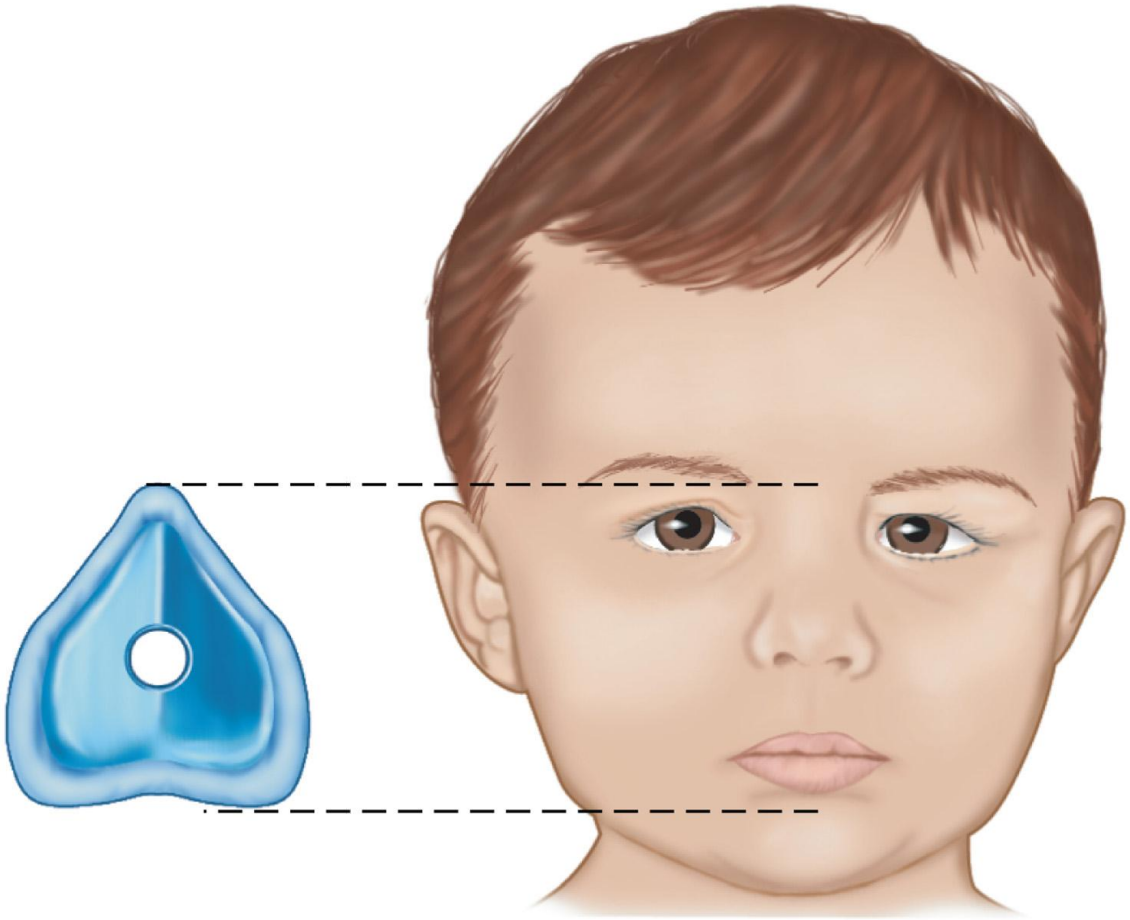
continued on next slide

Airway and Respiratory Problems

- Emergency medical care
  - Initiate positive pressure ventilation for respiratory failure or respiratory arrest.
  - Attach supplemental oxygen.
  - Use an appropriately sized bag-valve-mask.

continued on next slide

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



continued on next slide

Correct placement of a properly sized mask is necessary to ensure a good mask seal. The mask placed on a child.

continued on next slide

Ensure a good mask seal by using proper hand placement. For a one-handed technique, place the middle, ring, and little finger of your nondominant hand along the jaw in an “E” or “3”shape. (Avoid pressing the soft tissues under the chin, which may cause airway occlusion.) Place the thumb and index finger on the mask in a “C” shape, thumb over the bridge of the nose and index finger over the anterior jaw.

continued on next slide

Ensure a good mask seal by using proper hand placement. For a two-handed technique, position yourself behind the patient's head and apply the same "E-C" or "3-C" position as described for the one-handed technique, but with the two hands on opposite sides of the mask.

continued on next slide

Airway and Respiratory Problems

- Emergency medical care
  - Positive pressure ventilation
  - Ventilate 20 to 25 times per minute.
  - Squeeze the bag slowly and evenly.

continued on next slide

Airway and Respiratory Problems

- Emergency medical care
  - Oxygen therapy
    - If the patient is breathing adequately, administer oxygen to maintain an SpO_2 greater than or equal to 94%.
    - If the patient cannot tolerate a cannula or mask, try the blow-by method.

continued on next slide

To administer oxygen a nonrebreather mask is appropriate for a child.

continued on next slide

To administer oxygen the blow-by method, using oxygen tubing and a paper cup, is appropriate for an infant or for a child who will not tolerate a mask.

continued on next slide

Airway and Respiratory Problems

- Emergency medical care
  - Position the patient
    - Patients with respiratory distress often prefer to sit in the caregiver's lap.
    - Position unresponsive patients in lateral recumbent position.
    - If the patient requires ventilation, place him supine.
    - Immobilize patients with suspected spine injury.

continued on next slide

Airway and Respiratory Problems

- Emergency medical care
  - Foreign body airway obstruction
    - Suspect foreign body airway obstruction if there is high resistance to airflow with positive pressure ventilation.
    - Attempt to reposition the airway, first.

continued on next slide

Airway and Respiratory Problems

- Emergency medical care
  - Foreign body airway obstruction
    - If a foreign body, and not airway infection, is suspected, take actions to clear the airway.

continued on next slide

Airway and Respiratory Problems

- Mild foreign body airway obstruction
  - Do not intervene.
  - Allow the patient to continue to cough.
  - Provide supplemental oxygen.
  - Monitor for worsening obstruction.

continued on next slide

Airway and Respiratory Problems

- Severe foreign body airway obstruction
  - Infant
    - Place the infant prone on your forearm.
    - Deliver 5 back blows.
    - Transfer the patient to a supine position on your other forearm; deliver 5 chest thrusts.
    - Repeat until the obstruction is relieved, the patient is unresponsive, or you arrive at the medical facility.

continued on next slide

Position the infant to deliver back slaps.

continued on next slide

Use the finger sweep only when the foreign body is visible.

continued on next slide

Airway and Respiratory Problems

- Foreign body airway obstruction
  - Unresponsive infant
    - Open the airway, using a head-tilt, chin-lift maneuver.
    - Open the mouth and look for the foreign body. If it is seen in the oropharynx, attempt to remove it; do not perform blind finger sweeps.

continued on next slide

Airway and Respiratory Problems

- Foreign body airway obstruction
  - Unresponsive infant
    - Provide two ventilations over a 1-second period
    - Perform 30 chest compressions

continued on next slide

Position the infant to deliver chest thrusts.

continued on next slide

Airway and Respiratory Problems

- Foreign body airway obstruction
  - Unresponsive infant
    - Look in the mouth for the obstruction. If it can be seen, attempt to remove it.
    - Provide two ventilations and 30 compressions.

continued on next slide

Airway and Respiratory Problems

- Foreign body airway obstruction
  - Unresponsive infant
    - Continue the sequence until the foreign body is removed.
    - If the foreign body cannot be visualized and removed, continue chest compressions and ventilations.

continued on next slide

Airway and Respiratory Problems

- Severe foreign body airway obstruction
  - Child
    - Place the thumb side of one clenched fist midway between the navel and the xiphoid process.
    - Wrap the other hand over the clenched hand.

continued on next slide

Airway and Respiratory Problems

- Severe foreign body airway obstruction
  - Child
    - Deliver five abdominal thrusts inward and upward.
    - Repeat until the object is dislodged, you arrive at the medical facility, or the patient becomes unresponsive.

continued on next slide

Abdominal thrusts on a choking but responsive child.

continued on next slide

Airway and Respiratory Problems

- Foreign body airway obstruction
  - Unresponsive child
    - Open the airway, using a head-tilt, chin-lift maneuver.
    - Open the mouth and look for the foreign body. If the foreign body is seen in the oropharynx, attempt to remove it.
    - Provide two ventilations over a 1-second period.
    - Provide 30 chest compressions.

continued on next slide

Chest compressions on a child who is unresponsive. For an older child, place one hand on top of the other.

continued on next slide

Airway and Respiratory Problems

- Foreign body airway obstruction
  - Unresponsive child
    - Look in the mouth for the obstruction. If it can be seen in the oropharynx, attempt to remove it.
    - Provide two ventilations and 30 compressions.

continued on next slide

Airway and Respiratory Problems

- Foreign body airway obstruction
  - Unresponsive child
    - Continue until the foreign body is removed.
    - If the foreign body cannot be visualized and removed, continue compressions and ventilations.

Case Study Conclusion

Tammy hands the patient's father the oxygen tubing, with oxygen flowing, and instructs him to hold it near the patient's face. Julian allows the father to continue to hold the patient as they complete vital signs.

The patient's respirations are 40 per minute, and he has a heart rate of 120 per minute.

continued on next slide

Case Study Conclusion

The EMTs place the child in his car seat and secure the car seat in the ambulance, so they can transport the patient and his father to the emergency department.

En route, Julian constantly monitor's the patient's mental status and respirations.

Lesson Summary

- Each age group has specific emotional and physical characteristics that affect assessment and care.
- Use the Pediatric Assessment Triangle or PALS initial impression to form a general impression of whether the child is sick or well.

continued on next slide

Lesson Summary

- Respiratory failure is the most common cause of cardiac arrest in pediatric patients.
- It is critical to recognize signs of respiratory distress and respiratory failure and to intervene immediately.