

Pediatric ED Readiness Applications Workgroup Minutes

May 7, 2026

Workgroup members present:

Dr. Ashley Barrile, PEM fellowship assistant program director

Dr. Anum Ahmad, PEM fellow

Dr. Alicia Rego, PEM fellow

Dr. Michael Naegle, PEM fellow

Dr. Sachin Vasikaran, PEM fellow

Dr. Sandra Horning, Nevada EMSC Committee Chair

The EMSC workgroup committee meeting was called to order at 1400 hours May 7, 2026, in the UNLV PEM fellowship classroom at University Medical Center in Las Vegas, Nevada. One application had been submitted for consideration for Nevada Pediatric Ready Advanced +Trauma Designation from Sunrise Pediatric ED in Las Vegas, Nevada. Copies of the application from Sunrise Pediatric ED were given to each participant including attached documentation materials. The application was reviewed and discussed. The committee unanimously approved the application and recommends that Sunrise Pediatric ED be granted Designation as a Nevada Pediatric Ready Advanced +Trauma Emergency Department. The meeting was adjourned at 1430 hours.

Respectfully submitted,

Sandra W. Horning, MD

Pediatric Respiratory Distress – Wheezing/ Bronchospasm



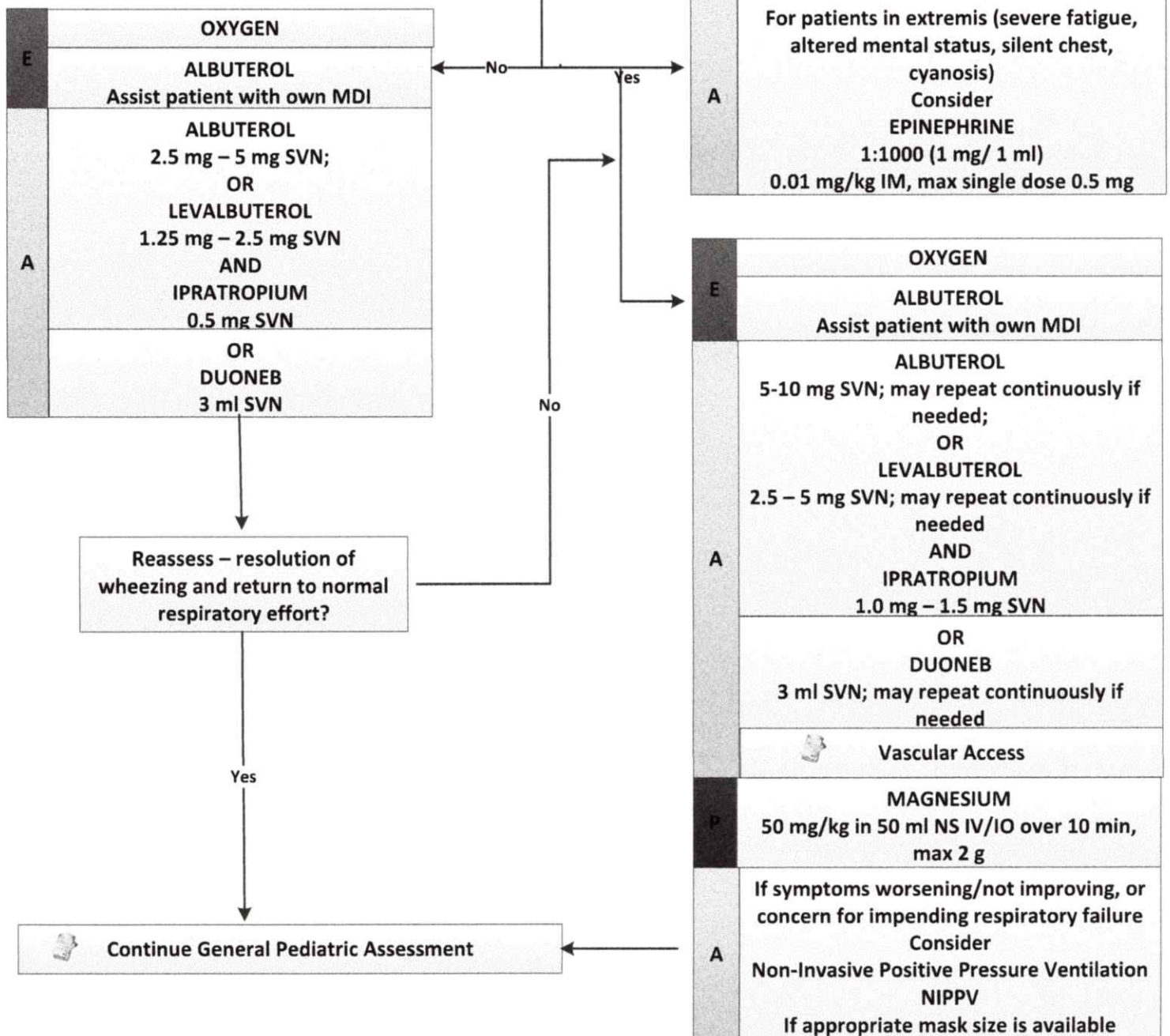
General Pediatric Assessment

Patient in position of comfort



Ventilation Management

Severe respiratory distress?
(Hypoxia, intercostal/subcostal retractions, accessory muscle use, nasal flaring, cyanosis)



History

- Asthma
- Utilization of home treatments (oxygen, nebulizers, MDI)
- Medications
- History of intubation
- History of hospitalization
- Toxic exposure
- Ingestion (toxins, street drugs)

Signs and Symptoms

- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak or cry
- Increased respiratory rate and effort
- Wheezing, rhonchi
- Use of accessory muscles
- Tripod position
- Poor skin signs
- Lethargy, decreased mental status
- Fever, cough
- Tachycardia

Differential

- Asthma
- Anaphylaxis
- Aspiration
- Pleural effusion
- Pneumonia
- Pneumothorax
- Pericardial tamponade (trauma)
- Hyperventilation
- Inhaled toxin
- Ingested toxin
- Cardiac

Pearls

- Although sometimes needed, intubation further narrows airway restriction in severe asthma exacerbation and can precipitate worsened clinical status. Aggressive use of bronchodilators is generally the most important therapy for severe asthma exacerbation.
- Wheezing in children <2 years old is commonly due to bronchiolitis, a self-limited viral illness marked by edema but not smooth muscle contraction/bronchospasm. These patients do not always benefit from bronchodilators, although a trial is appropriate. If bronchiolitis is felt to be likely and there is no response to a trial of bronchodilators, provide oxygen to maintain $\text{SpO}_2 > 94\%$ and consider nasal suctioning with a bulb syringe. Closely monitor for apnea or worsening respiratory distress.
- If non-invasive positive pressure ventilation (NIPPV) is used, inhaled bronchodilators should continue to be given during NIPPV treatment.
- Pulse oximetry and end-tidal waveform capnography should be continuously monitored.
- Pediatric patients compensate differently from adults. In pediatric patients with respiratory distress, bradycardia is likely to represent a peri-arrest state.
- Respiratory failure often precedes cardiac arrest in pediatric patients.

QI Metrics

- Documentation of lung sounds and pulse oximetry
- Repeat assessments
- Response to treatment
- Continuous end-tidal CO_2 monitoring

Here is a 20-minute EMS-focused lecture on **Pediatric Lower Airway Respiratory Distress** designed for paramedics, EMTs, and prehospital providers.

Pediatric Lower Airway Respiratory Distress

EMS Education Program

Duration: 20 minutes

Learning Objectives

At the completion of this lecture, participants will be able to:

1. Recognize signs of lower airway respiratory distress in children.
2. Differentiate respiratory distress from respiratory failure.
3. Identify common lower airway emergencies.
4. Perform a rapid pediatric respiratory assessment.
5. Initiate evidence-based EMS treatment.
6. Recognize when advanced airway management is needed.

Why This Matters

- Respiratory illness is one of the most common pediatric EMS calls.
- Respiratory failure is the leading cause of pediatric cardiac arrest.
- Early recognition and intervention prevent deterioration.
- Children often compensate well until they suddenly decompensate.

Key Point:

Pediatric cardiac arrest is usually a respiratory problem first.

Review of Pediatric Airway Anatomy

Children are not small adults.

Characteristics include:

- Smaller airway diameter
- Larger tongue
- Higher anterior larynx
- More compliant chest wall
- Less pulmonary reserve
- Higher oxygen consumption

Because the airway is smaller:

- A small amount of swelling

- Secretions
- Bronchospasm

can dramatically increase airway resistance.

Lower vs Upper Airway Disease

Upper Airway

Findings:

- Stridor
- Barky cough
- Hoarseness
- Drooling

Examples:

- Croup
- Epiglottitis
- Foreign body

Lower Airway

Findings:

- Wheezing
- Crackles
- Prolonged expiration
- Increased work of breathing

Examples:

- Asthma
- Bronchiolitis
- Pneumonia
- Anaphylaxis with bronchospasm

Today's focus:

Lower Airway Disease

Pediatric Assessment Triangle (PAT)

Use immediately upon arrival.

Appearance

- Alert?
- Interactive?
- Normal muscle tone?

Work of Breathing

- Retractions
- Nasal flaring
- Grunting
- Head bobbing

Circulation

- Skin color
- Pallor
- Cyanosis
- Mottling

The PAT takes less than 30 seconds.

Signs of Respiratory Distress

Early Findings

- Tachypnea
- Wheezing
- Mild retractions
- Anxiety
- Increased work of breathing

Progressive Findings

- Moderate to severe retractions
- Nasal flaring
- Grunting
- Inability to feed or speak normally

Severe Findings

- Altered mental status
- Cyanosis
- Poor air movement
- Fatigue

Respiratory Distress vs Respiratory Failure

Respiratory Distress

Child is still compensating.

Signs:

- Increased respiratory effort
- Normal mental status
- Adequate air movement

Respiratory Failure

Child is no longer compensating.

Signs:

- Altered mental status
- Exhaustion
- Cyanosis
- Bradycardia
- Weak respiratory effort
- Silent chest

A silent chest in an asthmatic child is a pre-arrest sign.

Common Lower Airway Emergencies

Asthma

Most common lower airway emergency.

Pathophysiology:

- Bronchospasm

- Airway inflammation
- Mucous production

Findings:

- Wheezing
- Prolonged expiratory phase
- Retractions
- Decreased air movement

Asthma Severity

Mild

- Speaking normally
- Mild wheezing
- Normal mental status

Moderate

- Retractions
- Difficulty speaking
- Increased work of breathing

Severe

- Unable to speak
- Silent chest
- Altered mental status

Requires immediate intervention.

Asthma EMS Treatment

Oxygen

Administer as needed to maintain:

$\text{SpO}_2 > 94\%$

Albuterol

Nebulized:

- 2.5 mg (<20 kg)
- 5 mg (>20 kg)

May repeat continuously if needed.

Ipratropium

Add for moderate to severe exacerbations.

Dose: 0.5 mg nebulized

Epinephrine

Consider for severe asthma.

IM:

0.01 mg/kg of 1 mg/mL

Maximum:

0.5 mg

Bronchiolitis

Most commonly caused by RSV.

Usually affects:

Children less than 2 years old.

Pathophysiology:

- Small airway inflammation
- Mucous plugging
- Air trapping

Bronchiolitis Findings

- Tachypnea
- Wheezing
- Crackles
- Retractions
- Poor feeding

May appear similar to asthma.

Bronchiolitis EMS Treatment

Supportive care only.

Focus on:

- Airway positioning
- Suctioning
- Oxygen
- CPAP if protocol allows

Albuterol often provides minimal benefit.

Do not delay transport.

Pneumonia

Can be viral or bacterial.

Findings:

- Fever
- Tachypnea
- Crackles
- Increased work of breathing
- Hypoxia

Children may present with:

- Abdominal pain
- Vomiting
- Lethargy

instead of respiratory complaints.

Pneumonia EMS Treatment

- Oxygen

- Position of comfort
 - Monitor respiratory effort
 - Consider sepsis if ill appearing
- Rapid transport.

Anaphylaxis with Bronchospasm

May mimic severe asthma.

Look for:

- Hives
- Facial swelling
- Vomiting
- Hypotension
- Wheezing

Anaphylaxis Treatment

Epinephrine First

IM 1 mg/mL:

0.01 mg/kg

Maximum:

0.5 mg

Do not delay epinephrine.

Albuterol is secondary treatment.

CPAP in Pediatric Patients

May be considered for:

- Severe asthma
- Bronchiolitis
- Pulmonary edema

Benefits:

- Improves oxygenation
- Reduces work of breathing
- Helps avoid intubation

Monitor closely for deterioration.

When to Assist Ventilations

Provide BVM ventilation when:

- Poor respiratory effort
- Inadequate chest rise
- Altered mental status
- Progressive exhaustion
- Apnea

Use:

- Two-person technique
- Appropriate mask size

- Gentle ventilations
- Avoid hyperventilation.

Indicators of Impending Arrest

Red Flags:

- ✓ Altered mental status
- ✓ Silent chest
- ✓ Cyanosis
- ✓ Bradycardia
- ✓ Exhaustion
- ✓ Poor respiratory effort
- ✓ Weak cry
- ✓ Diminished air movement

These children need immediate aggressive intervention.

EMS Pearls

1. Respiratory failure causes most pediatric arrests.
2. Use the Pediatric Assessment Triangle early.
3. Treat respiratory distress before failure develops.
4. A silent chest is a pre-arrest finding.

5. Epinephrine is lifesaving in severe asthma and anaphylaxis.
6. Suctioning is often the most important treatment in bronchiolitis.
7. Watch mental status closely—it often predicts deterioration before vital signs.

Case Study

Dispatch: 4-year-old male with difficulty breathing.

Assessment:

- Sitting upright
- Severe retractions
- Audible wheezing
- RR 48
- SpO₂ 89%
- Unable to speak full sentences

Questions:

1. Respiratory distress or failure?
2. What is your first treatment?
3. When would epinephrine be indicated?
4. What findings would suggest impending arrest?

Answer:

Severe respiratory distress from asthma. Administer oxygen, albuterol, ipratropium, consider IM epinephrine, and prepare for assisted ventilation if deterioration occurs.

Take-Home Message

**Children usually deteriorate from respiratory distress
→ respiratory failure → cardiac arrest.**

Recognize early signs, treat aggressively, and intervene before compensation is lost. Early EMS care saves lives.

EMS Simulation: Pediatric Lower Airway Respiratory Distress

Title

Severe Asthma Exacerbation in a School-Aged Child

Target Audience

EMTs, Advanced EMTs, Paramedics

Duration

15–20 minutes

Learning Objectives

By completion of this scenario, participants will:

1. Perform a Pediatric Assessment Triangle (PAT).
2. Recognize moderate-to-severe lower airway respiratory distress.
3. Differentiate respiratory distress from respiratory failure.
4. Administer appropriate bronchodilator therapy.
5. Recognize indications for IM epinephrine.
6. Prepare for respiratory failure and assisted ventilations.

7. Communicate effectively with the child and caregiver.

Scenario Overview

Dispatch:

“7-year-old male with difficulty breathing.”

Location:

Private residence

Weather:

Normal

Scene Safety:

No hazards

Participants:

- EMS crew
- Parent (role player)
- Child patient (manikin or actor)

Initial Presentation

The patient is seated upright on a couch.

He appears anxious and is speaking in short phrases.

Mother states:

“He has asthma and has been getting worse all afternoon.”

The child is leaning forward and using accessory muscles.

Pediatric Assessment Triangle

Appearance:

- Alert
- Anxious
- Responds appropriately

Work of Breathing:

- Moderate-to-severe retractions
- Nasal flaring
- Audible wheezing

Circulation:

- Pink
- Slightly pale
- No cyanosis

PAT Impression:

Respiratory Distress

Initial Assessment

Age:

7 years

Weight:

25 kg

Airway:

Patent

Breathing:

- RR 42
- Diffuse expiratory wheezing
- Prolonged expiratory phase
- Moderate intercostal and suprasternal retractions

Circulation:

- HR 148
- BP 108/68
- Strong pulses

SpO₂:

90% on room air

Temperature:

37.1°C

Blood Glucose:

112 mg/dL

Parent Information

History of asthma.

Uses albuterol inhaler.

Two nebulizer treatments given at home.

No improvement.

No fever.

No allergies.

No recent trauma.

No choking episode.

Expected EMS Actions

Participants should:

- Perform PAT
- Obtain vital signs
- Apply cardiac monitor
- Apply pulse oximetry
- Administer oxygen
- Position for comfort
- Recognize severe asthma exacerbation
- Administer bronchodilator therapy

IF CHILD IS IN EXTREMIS PER PROTOCOL CONSIDER:

Epinephrine 1:1000 (1 mg/1 ml)

0.01 mg/kg IM max single dose 0.5 mg

CRITICAL INTERVENTION #1

Albuterol Nebulizer

Dose:

5-10 mg SVN may repeat continuously if needed AND

Ipratropium 1.0 to 1.5 mg SVN

Expected Response:

After 3–5 minutes:

RR decreases to 38

SpO₂ improves to 93%

Wheezing remains significant

Retractions persist

Expected Response:

Mild improvement in air movement

Continued respiratory distress

Scenario Progression

If Appropriate Treatment Given

Patient remains alert.

Still working hard to breathe.

RR 36

HR 140

SpO₂ 94% on oxygen

Wheezing continues.

Child can speak only 3–4 words at a time.

Facilitator Prompt:

“What additional medication should be considered?”

Expected Answer: magnesium

CRITICAL INTERVENTION #2

Magnesium

50 mg/kg in 50 ml NS IV/IO over 10 min Max dose 2 grams

Positive Outcome

If Magnesium Administered

Within 5–10 minutes:

RR 28

HR 130

SpO₂ 97%

Retractions improve

Patient speaks complete sentences

Air movement improves

Wheezing decreases

Patient reports:

“I can breathe better.”

Failure-to-Treat Progression

If Albuterol, Ipratropium, and Magnesium Are Delayed

Patient deteriorates.

Updated Assessment:

RR 20 and slowing

Minimal wheezing

Very poor air movement

SpO₂ 84%

HR 70

Mental status deteriorates

Becomes lethargic

Respiratory Failure Findings

- Altered mental status

- Silent chest
- Bradycardia
- Cyanosis
- Weak respiratory effort

Expected EMS Actions:

- BVM ventilation
- High-flow oxygen
- Prepare advanced airway management per local protocol
- Rapid transport

Scenario End Point

Successful Outcome:

Patient receives oxygen, albuterol, ipratropium, and magnesium.

Demonstrates clinical improvement.

Transport initiated.

OR

Failure Outcome:

Respiratory distress progresses to respiratory failure due to delayed recognition and treatment.

Debriefing Questions

1. What findings indicated lower airway disease?
2. What findings suggested severe asthma?
3. Why is a “silent chest” concerning?
4. When should epinephrine be administered?
5. How can respiratory distress be distinguished from respiratory failure?
6. What changes in mental status are concerning?
7. What was the earliest clue that this child was deteriorating?

Teaching Pearls

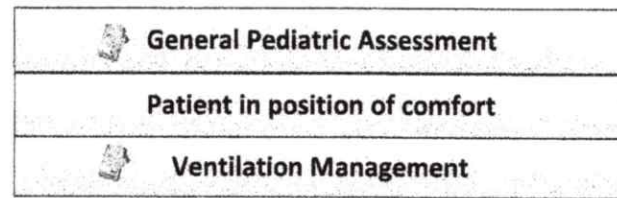
- Wheezing plus retractions equals significant lower airway obstruction.
- Children compensate well until they suddenly decompensate.
- A silent chest is a pre-arrest finding.
- Bradycardia in a hypoxic child is an ominous sign.
- Epinephrine is appropriate for severe asthma with significant respiratory distress.
- Early aggressive treatment prevents respiratory failure.
- Continuous reassessment is essential during pediatric respiratory emergencies.

Key Take-Home Message

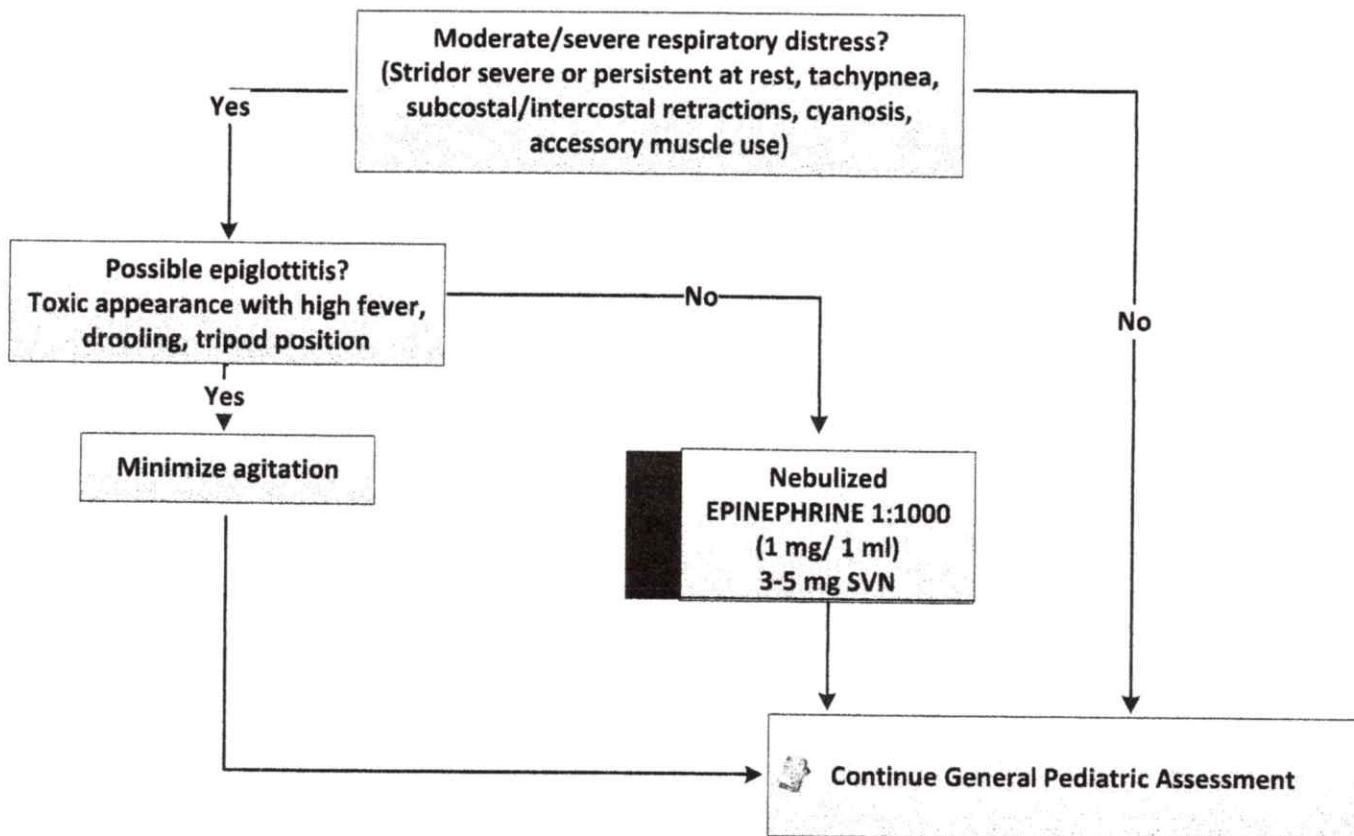
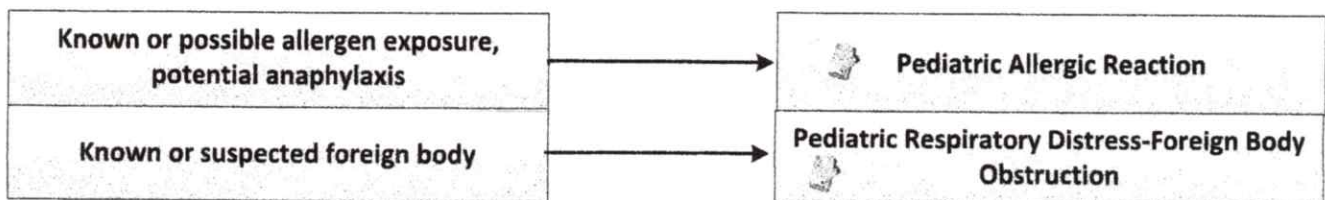
Respiratory distress → Respiratory failure → Cardiac Arrest

Recognize distress early, treat aggressively, and intervene before compensation is lost.

Pediatric Respiratory Distress – Stridor/Croup/Upper Airway



Consider alternate etiologies



History

- Asthma
- Utilization of home treatments (oxygen, nebulizers, MDI)
- Medications
- History of intubation
- History of hospitalization
- Toxic exposure
- Ingestion (toxins, street drugs)

Signs and Symptoms

- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi
- Use of accessory muscles
- Tripod position
- Poor skin signs
- Lethargy, decreased mental status
- Fever, cough
- Tachycardia

Differential

- Asthma
- Anaphylaxis
- Aspiration
- Foreign body airway obstruction
- Pleural effusion
- Pneumonia
- Pneumothorax
- Pericardial tamponade (trauma)
- Hyperventilation
- Inhaled toxin
- Ingested toxin
- Cardiac

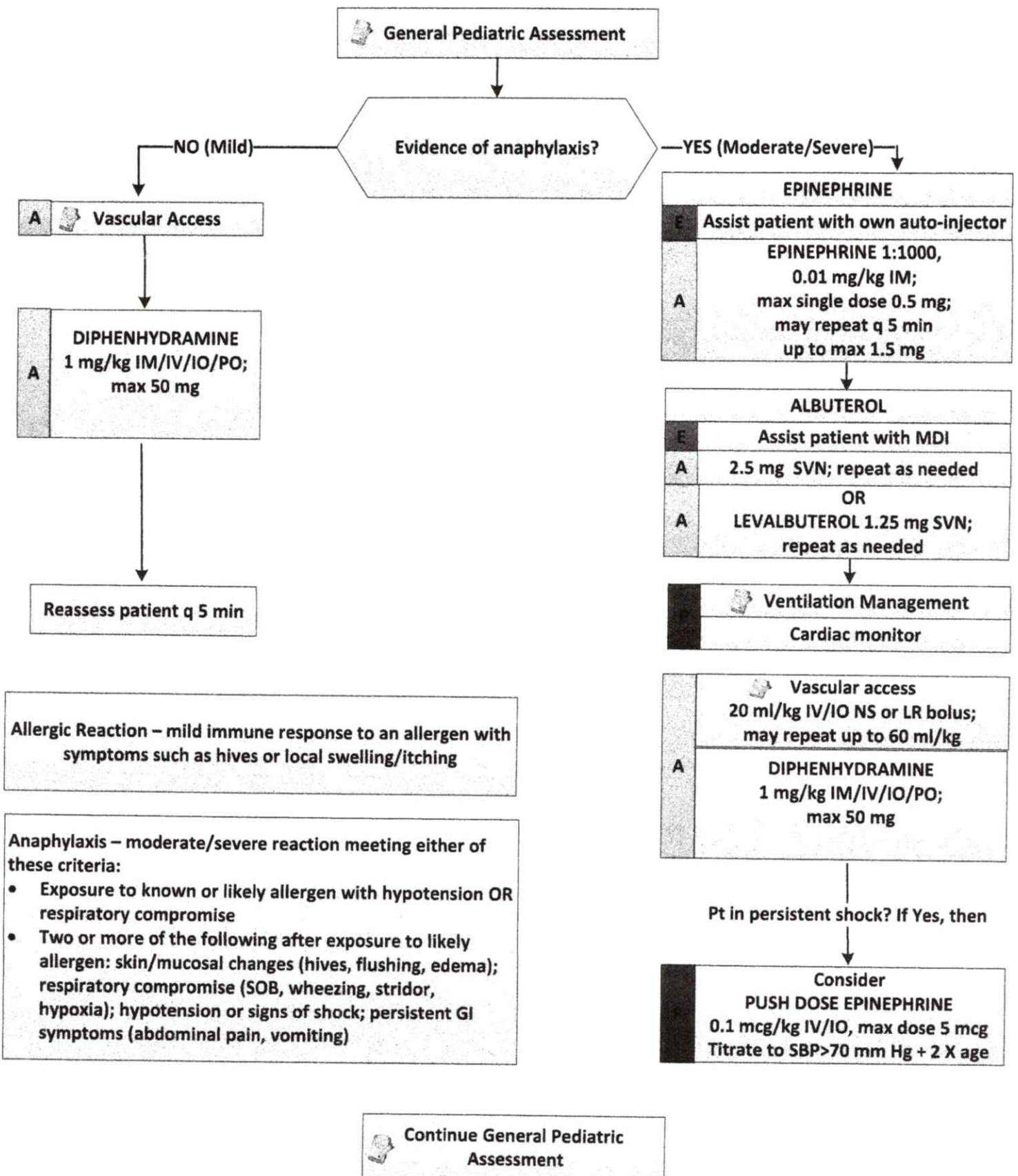
Pearls

- Signs and symptoms of croup include: stridor, barking cough, may have respiratory infection (fever, congestion, sore throat)
- Epiglottitis is a rare cause of stridor in children due to vaccination against *Haemophilus influenzae* type b (Hib). Maintain a high index of suspicion, especially in unvaccinated children.
- Avoid intubation attempts if epiglottitis is suspected. Most patients can be adequately ventilated with a BVM. Manipulating the airway with intubation attempts can be fatal.
- Pediatric patients compensate differently from adults. In pediatric patients with respiratory distress, bradycardia is likely to represent a peri-arrest state.
- Respiratory failure often precedes cardiac arrest in pediatric patients.

QI Metrics

- Documentation of lung sounds and pulse oximetry
- Repeat assessments
- Response to treatment
- Appropriate differentiation between croup/stridor and lower airway bronchospasm
- Continuous end-tidal CO₂ monitoring

Pediatric Allergic Reaction



History

- Onset and location
- Insect sting or bite
- Food allergy/exposure
- Medication allergy/exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

Signs and Symptoms

- Itching or hives
- Coughing/wheezing or respiratory distress
- Throat or chest constriction
- Difficulty swallowing
- Hypotension/shock
- Edema
- Nausea/vomiting

Differential

- Urticarial (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration/airway obstruction
- Asthma/COPD
- CHF
- Scorpion Envenomation

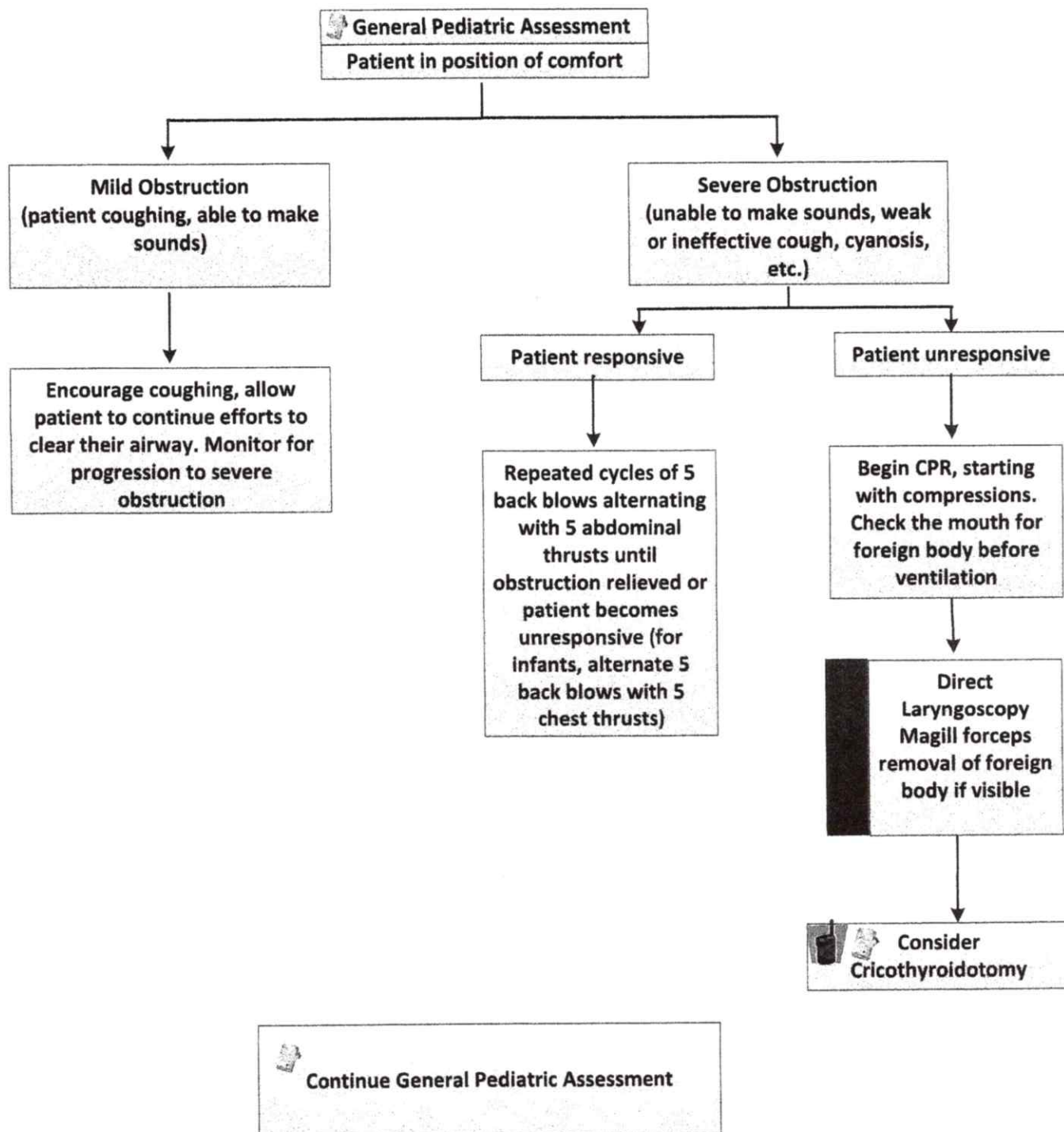
Pearls

- Recommended exam: Mental status, skin, heart, lung
- Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.
- Epinephrine is a first-line drug that should be administered immediately in acute anaphylaxis. IM Epinephrine (1:1000) should be administered before or during attempts at IV or IO access.
- Remove trigger if still present (stinger, food, etc)
- Never give Epinephrine 1:1000 (IM concentration) through IV/IO route

QI Metrics

- Epinephrine given appropriately.
- Airway assessment documented.

Pediatric Respiratory Distress-Foreign Body Obstruction



History

- Asthma
- Home treatment (oxygen, nebulizers, MDI)
- Medication
- History of intubation
- History of hospitalization
- Toxic exposure
- Ingestion (toxins, street drugs)

Signs and Symptoms

- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi
- Use of accessory muscles
- Tripod position
- Poor skin signs
- Lethargy, decreased mental status
- Fever, cough
- Tachycardia

Differential

- Asthma
- Anaphylaxis
- Aspiration
- Foreign body obstruction
- Pleural effusion
- Pneumonia
- Pneumothorax
- Pericardial tamponade (trauma)
- Hyperventilation
- Inhaled toxin
- Ingested toxin
- Cardiac

Pearls

- Avoid blind finger sweeps
- SLAT Technique – Simultaneous Laryngoscopy and Abdominal Thrusts – when the foreign body is visible on laryngoscopy but cannot be grabbed by forceps, it may be reasonable to have a second clinician apply abdominal thrusts (chest thrusts in infants) to temporarily dislodge the foreign body so it can be grasped with forceps by the clinician performing laryngoscopy
- Pediatric patients compensate differently from adults. In pediatric patients with respiratory distress, bradycardia is likely to represent a peri-arrest state.
- Respiratory failure often precedes cardiac arrest in pediatric patients

QI Metrics

- Repeat assessments
- Response to treatment
- Continuous end-tidal CO₂ monitoring

Pediatric Upper Airway Respiratory Distress for EMS

20-Minute EMS Education Lecture

Learning Objectives

By the end of this lecture, participants will be able to:

1. Recognize signs of pediatric upper airway respiratory distress.
2. Differentiate upper airway from lower airway disease.
3. Identify common causes of upper airway obstruction.
4. Perform appropriate assessment using the Pediatric Assessment Triangle (PAT).
5. Implement evidence-based prehospital management.
6. Recognize when advanced airway intervention is needed.

Why This Matters

Airway compromise is one of the leading causes of pediatric cardiac arrest.

Children have:

- Smaller airways
- Larger tongues

- More anterior larynx
- Increased oxygen consumption
- Less respiratory reserve

A small amount of swelling can dramatically reduce airflow.

Remember:

A child who is tiring is far more dangerous than a child who is working hard to breathe.

Pediatric Airway Anatomy

Key Differences

Pediatric Airway	Adult Airway
Larger tongue	Smaller tongue
Narrowest at cricoid	Narrowest at vocal cords
More anterior larynx	Less anterior
Shorter trachea	Longer trachea
Easily obstructed	Less susceptible

Poiseuille's Law

Airway resistance is inversely proportional to airway radius.

A 1 mm circumferential swelling:

- Adult airway → minimal effect
- Infant airway → >60% reduction in diameter

Upper vs Lower Airway Disease

Upper Airway

Sounds

- Stridor
- Hoarse voice
- Barking cough
- Muffled voice

Findings

- Retractions
- Head bobbing
- Tripod positioning

Diseases

- Croup
- Epiglottitis
- Anaphylaxis
- Foreign body obstruction

Lower Airway

Sounds

- Wheezing
- Prolonged expiratory phase

Diseases

- Asthma
- Bronchiolitis

Pediatric Assessment Triangle (PAT)

Appearance

Evaluate:

- Tone
- Interactiveness
- Consolability
- Look/Gaze
- Speech/Cry

Abnormal appearance suggests impending respiratory failure.

Work of Breathing

Look for:

- Stridor

- Nasal flaring
- Retractions
- Accessory muscle use
- Head bobbing

Circulation

Assess:

- Pallor
- Cyanosis
- Mottling

Late findings indicate severe illness.

Common Causes of Upper Airway Distress

Croup

Age

6 months–3 years

Cause

Usually viral

Common pathogens:

- Parainfluenza

- RSV
- Influenza

Findings

Classic triad:

- Barking cough
- Hoarseness
- Inspiratory stridor

Usually worse at night.

EMS Treatment of Croup

Mild

- Keep child calm
- Oxygen if needed

Moderate-Severe

Nebulized Epinephrine

1 mg/1 mL concentration

Dose:

3-5 mg SVN

Nebulized via oxygen-driven nebulizer

Epiglottitis

Medical Emergency

Historically:

- Haemophilus influenzae type B
- Now uncommon due to vaccination.

Findings

Classic “3 D’s”

- Drooling
- Dysphagia
- Distress

Additional findings:

- Tripod position
- High fever
- Muffled “hot potato” voice
- Stridor

Critical EMS Pearl

DO NOT:

- Force airway examination
- Place tongue depressor in mouth
- Agitate child

May cause complete obstruction.

EMS Management

- Keep child with caregiver
- Allow position of comfort
- Blow-by oxygen
- Rapid transport

Prepare for sudden airway loss.

Bacterial Tracheitis

Usually follows viral illness

Findings:

- Fever
- Toxic appearance
- Thick secretions
- Stridor
- Poor response to epinephrine

Requires definitive airway management.

Anaphylaxis

Upper Airway Findings

- Stridor

- Hoarseness
- Facial swelling
- Tongue swelling
- Drooling

May progress rapidly.

EMS Treatment

IM Epinephrine

1 mg/mL concentration

Dose:

0.01 mg/kg IM

Maximum single dose

0.5 mg

May repeat q 5 min up to max 1.5 mg

Additional Therapies

- Oxygen
- IV access
- Fluid bolus if shock present
- Albuterol if wheezing
- Diphenhydramine

Foreign Body Airway Obstruction

High Risk Ages

6 months–4 years

Common Objects

- Peanuts
- Grapes
- Hot dogs
- Coins
- Small toys

Findings

Sudden onset:

- Choking episode
- Stridor
- Drooling
- Unilateral breath sounds
- Persistent cough

Complete Obstruction

Infant (<1 year)

- 5 back blows
- 5 chest thrusts

Repeat until relieved or unconscious

Child (>1 year)

5 BACK BLOWS

5 ABDOMINAL THRUSTS

Continue until object expelled or patient becomes unconscious.

Retropharyngeal Abscess

Usually:

- Age <6 years
- Fever
- Neck stiffness
- Difficulty swallowing
- Muffled voice
- Stridor

Treat supportively and transport rapidly.

Signs of Impending Respiratory Failure

Early

- Tachypnea
- Retractions
- Stridor

- Agitation

Late

- Altered mental status
- Poor respiratory effort
- Cyanosis
- Bradycardia
- Silent airway

When to Consider Advanced Airway Management

Indications:

- Respiratory arrest
- Severe altered mental status
- Inability to maintain airway
- Severe hypoxia despite treatment

Airway Management Pearls

Do

- ✓ Keep child calm
- ✓ Allow caregiver presence
- ✓ Use blow-by oxygen
- ✓ Treat the underlying cause

✓ Monitor closely

Don't

✗ Agitate child unnecessarily

✗ Force supine positioning

✗ Separate child from caregiver

✗ Delay transport

✗ Attempt unnecessary airway exams

Case Study

Dispatch

2-year-old male with difficulty breathing.

Arrival

- Sitting upright on mother's lap
- Barking cough
- Inspiratory stridor
- RR 40
- SpO₂ 94%

Questions

1. Most likely diagnosis?
 - Croup

2. Initial treatment?
 - Keep calm
 - Oxygen as tolerated
 - Nebulized epinephrine
3. What finding suggests worsening?
 - Decreased responsiveness
 - Fatigue
 - Cyanosis

Key Take-Home Points

Remember:

1. Stridor = upper airway obstruction until proven otherwise.
2. Keep children calm; agitation worsens obstruction.
3. Croup is the most common cause of pediatric upper airway distress.
4. Epiglottitis is rare but life-threatening.
5. IM epinephrine is the treatment of choice for anaphylaxis.
6. Recognize impending respiratory failure early.
7. A tiring child is an airway emergency.

Final EMS Pearl

“The loud child with stridor is concerning. The quiet child with stridor is terrifying.”

A decrease in work of breathing in a child with upper airway obstruction may signal exhaustion and impending respiratory arrest.

Below are three EMS pediatric simulation scenarios designed for a 15–20 minute simulation with structured debriefing points.

Simulation #1: Pediatric Croup

Learning Objectives

- Recognize upper airway respiratory distress.
- Differentiate croup from lower airway disease.
- Demonstrate appropriate treatment of moderate-to-severe croup.
- Avoid interventions that increase agitation.

Dispatch

“2-year-old male, difficulty breathing.”

Scene

Private residence. Child is sitting upright in mother’s lap.

Initial Presentation

Mother reports:

- Runny nose for 2 days
- Woke up tonight with a “seal-like” cough
- Breathing seems worse

Pediatric Assessment Triangle

Appearance

- Alert
- Clinging to mother
- Crying when approached

Work of Breathing

- Inspiratory stridor at rest
- Suprasternal retractions
- Barking cough

Circulation

- Pink skin

Vital Signs

Vital Sign	Value
HR	150
RR	38
BP	92/60
SpO ₂	94% RA
Temp	38.2°C

Expected Actions

- Perform PAT
- Minimize agitation
- Allow parent to hold child

- Apply blow-by oxygen if needed
- Recognize moderate-to-severe croup
- Administer nebulized epinephrine:
 - 1 mg/1 ml 3-5 mg SVN
- Transport with continuous monitoring

Scenario Progression

If Appropriate Care Given

After nebulized epinephrine:

- HR 140
- RR 30
- SpO₂ 97%
- Stridor improves
- Retractions decrease

If Child Is Agitated

- Stridor worsens
- Increased retractions
- SpO₂ falls to 89%

Debriefing Points

- Stridor indicates upper airway obstruction.
- Keeping children calm is a treatment.
- Croup typically presents with barking cough and stridor.
- Epinephrine treats airway edema rapidly.

Simulation #2: Pediatric Foreign Body Airway Obstruction

Learning Objectives

- Recognize airway foreign body obstruction.
- Differentiate partial vs complete obstruction.
- Perform age-appropriate airway maneuvers.
- Recognize deterioration requiring CPR.

Dispatch

“18-month-old choking.”

Scene

Family barbecue.

Initial Report

Grandmother states:

“He was eating a hot dog and suddenly started choking.”

Pediatric Assessment Triangle

Appearance

- Awake
- Panicked

Work of Breathing

- Severe distress

Circulation

- Pale

Initial Findings

- Weak cough
- Audible stridor
- Drooling
- Unable to speak

Vital Signs

Vital Sign	Value
HR	165
RR	42
SpO ₂	88%

Expected Actions

- Rapid airway assessment
- Recognize severe obstruction
- Encourage coughing if effective
- Prepare for worsening obstruction

Scenario Progression

Phase 2

Object shifts.

Child becomes:

- Silent
- No effective cough
- Cyanotic

Expected Treatment

Because patient is <1 year? No.

Patient is 18 months old.

Perform:

- 5 back blows alternating with 5 abdominal thrusts

Continue until:

- Object expelled
OR
- Child becomes unconscious

If Patient Becomes Unresponsive

Expected actions:

- Begin CPR
- Airway inspection during ventilations
- Continue obstruction algorithm

Successful Outcome

Hot dog fragment expelled.

New Vitals

Vital Sign	Value
HR	130
RR	28
SpO ₂	98%

Debriefing Points

- Sudden onset strongly suggests foreign body.
- Do not perform blind finger sweeps.
- Distinguish partial from complete obstruction.
- Early recognition prevents cardiac arrest.

Simulation #3: Pediatric Anaphylaxis

Learning Objectives

- Recognize pediatric anaphylaxis.
- Identify airway involvement.
- Administer IM epinephrine rapidly.
- Manage shock and respiratory compromise.

Dispatch

“7-year-old having allergic reaction.”

Scene

Birthday party.

History

Child has known peanut allergy.

Mother reports:

“He accidentally ate a cookie with peanuts.”

Symptoms started 5 minutes ago.

Pediatric Assessment Triangle

Appearance

- Anxious
- Frightened

Work of Breathing

- Stridor
- Hoarse voice
- Mild wheezing

Circulation

- Flushed skin

Physical Exam

- Facial swelling
- Lip swelling
- Diffuse urticaria

- Drooling

Vital Signs

Vital Sign
HR
RR
BP
SpO ₂

Expected Actions

- Recognize anaphylaxis
- High-flow oxygen
- Immediate IM epinephrine

Medication

Epinephrine 1 mg/mL

Dose:

0.01 mg/kg IM

Maximum single dose 0.5 mg. May repeat q 5 min up to max 1.5 mg

Additional Care

- Cardiac monitor
- Albuterol if wheezing
- IV access
- Normal saline bolus 20 mL/kg
- Diphenhydramine
- Rapid transport

Scenario Progression

If Epinephrine Delayed

Patient develops:

- Increased stridor
- Severe hypotension
- Decreased responsiveness

If Epinephrine Given Promptly

Within several minutes:

Vital Sign	
HR	
RR	
BP	
SpO ₂	

Debriefing Points

- Epinephrine is the first-line treatment.
- Antihistamines do not treat airway edema or shock.
- Airway swelling can progress rapidly.
- Delayed epinephrine is associated with worse outcomes.

Instructor Summary

Key Diagnoses

Scenario	Initial Assessment
#1	Viral Croup
#2	Foreign Body Airway Obstruction
#3	Anaphylaxis

Critical Actions

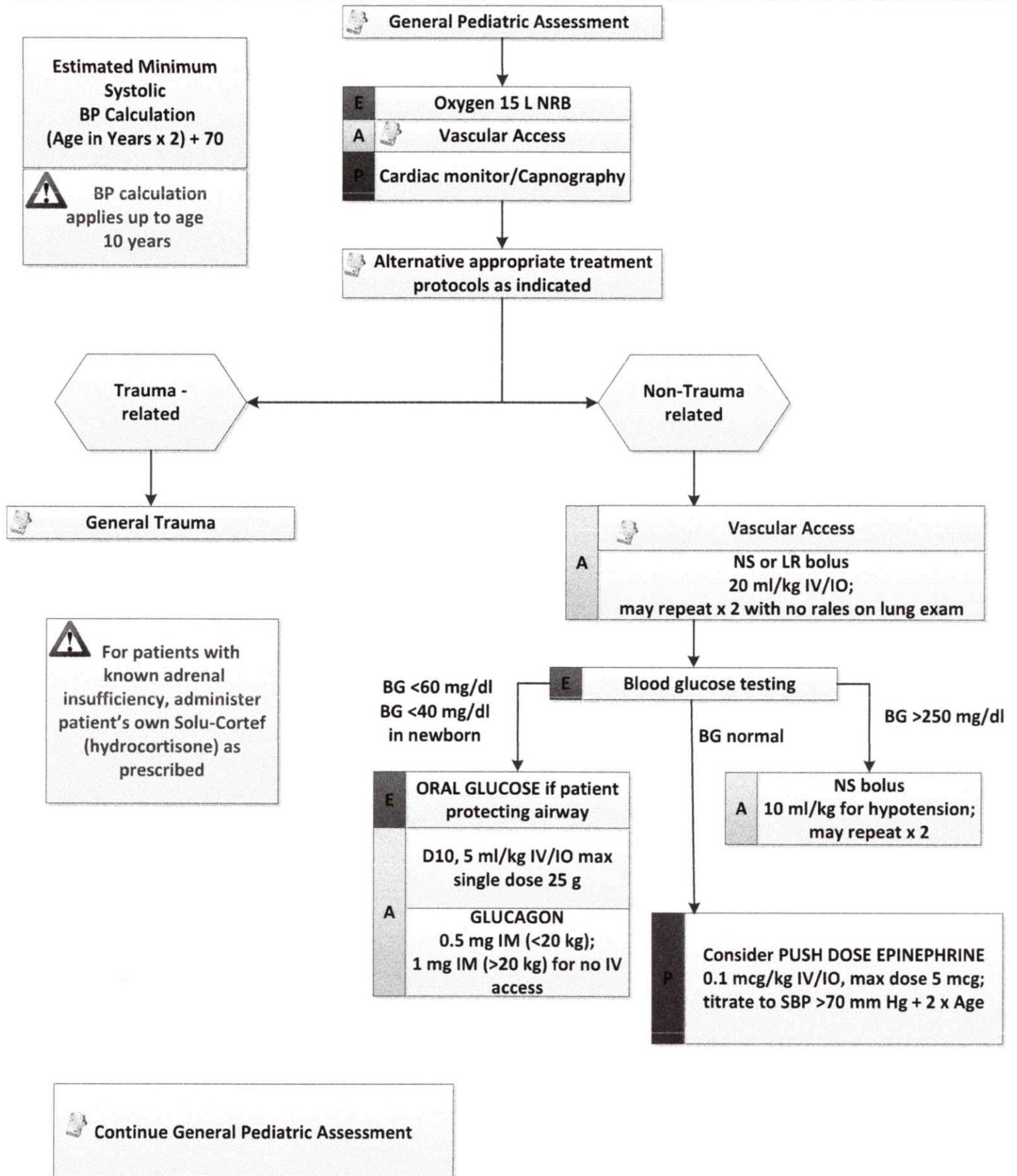
Scenario	Critical Actions
Croup	Nebulized epinephrine and minimizing agitation

Foreign Body	Age-appropriate obstruction maneuvers
Anaphylaxis	Immediate IM epinephrine

Universal Teaching Point

The pediatric patient with upper airway obstruction often worsens when agitated. Keeping the child calm and treating early are among the most important interventions EMS can provide.

Pediatric Shock



History

- Blood loss-vaginal bleeding, ectopic, GI bleeding or AAA
- Fluid loss-vomiting, diarrhea, fever
- Infection
- Cardiac tamponade
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

Signs and Symptoms

- Restlessness, confusion
- Weakness, dizziness
- Weak rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

Differential

- Hypovolemic shock
- Cardiogenic shock
- Septic shock
- Neurogenic shock
- Anaphylactic shock
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolism
- Tension pneumothorax
- Medication effect or overdose
- Vasovagal

For patients with known adrenal insufficiency, administer patient's own Solu-Cortef (hydrocortisone) as prescribed.

Causes of Adrenal Insufficiency:

Addison's Disease

Congenital Adrenal Hyperplasia

Long term administration of steroids

Others

Pearls

- Recommended exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro.
- Hypotension can be defined as a systolic <Estimated Minimum Systolic. This is not always reliable and should be interpreted in context and patient's typical BP, if known. Shock may present with a normal BP initially.
- Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.
- Consider all possible causes of shock and treat per appropriate protocol.

Hypovolemic shock

- Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding

Cardiogenic shock

- Heart failure, MI, cardiomyopathy, myocardial contusion, toxins

Distributive shock

- Sepsis, anaphylaxis, neurogenic, toxins

Obstructive shock

- Pericardial tamponade, pulmonary embolus, tension pneumothorax

Below is a 20-minute EMS-focused lecture designed for paramedics and EMTs. It emphasizes early recognition, pediatric physiology, and prehospital management.

Pediatric Shock Recognition for EMS

20-Minute Educational Session

Learning Objectives

By the end of this lecture, participants will be able to:

1. Define shock in pediatric patients.
2. Recognize the early and late signs of shock.
3. Differentiate the major types of pediatric shock.
4. Utilize the Pediatric Assessment Triangle (PAT) to rapidly identify shock.
5. Initiate appropriate prehospital management.

Introduction (2 Minutes)

Shock is one of the leading causes of preventable pediatric death.

Unlike adults, children can maintain their blood pressure until they are near cardiovascular collapse. EMS providers who wait for hypotension to develop may miss the opportunity to intervene early.

Key Point

Hypotension is a late and ominous sign in children.

The goal of EMS is to recognize shock before blood pressure falls.

What is Shock? (2 Minutes)

Shock occurs when oxygen delivery to tissues is insufficient to meet metabolic demands.

This leads to:

- Cellular dysfunction
- Anaerobic metabolism
- Lactic acidosis
- Organ failure
- Death if untreated

Formula to Remember

Oxygen Delivery = Cardiac Output $\times$ Oxygen Content

Cardiac Output = Heart Rate $\times$ Stroke Volume

Children have limited ability to increase stroke volume.

Therefore:

Children compensate primarily by increasing heart rate.

Pediatric Assessment Triangle (PAT)

(3 Minutes)

The PAT allows EMS providers to identify critically ill children in seconds.

Appearance

Reflects brain perfusion and oxygenation.

Normal:

- Alert
- Interactive
- Appropriate tone

Abnormal:

- Lethargy
- Irritability
- Decreased responsiveness
- Poor muscle tone

Work of Breathing

May indicate a compensatory response to shock.

Findings:

- Tachypnea
- Retractions
- Nasal flaring

- Grunting

Circulation to Skin

Normal:

- Pink skin

Abnormal:

- Pallor
- Mottling
- Cyanosis

PAT Findings Suggestive of Shock

- Altered appearance
- Tachypnea
- Pale or mottled skin

Why Children Compensate So Well (2 Minutes)

Children maintain blood pressure through:

- Tachycardia
- Vasoconstriction
- Increased systemic vascular resistance

This compensation can persist until approximately 25–30% of blood volume is lost.

Important Concept

A child may appear relatively stable and suddenly deteriorate.

Do not be reassured by a normal blood pressure.

Early Signs of Pediatric Shock (3 Minutes)

Tachycardia

Usually the first sign.

Always consider:

- Fever
- Pain
- Anxiety

But persistent tachycardia should raise concern for shock.

Delayed Capillary Refill

Normal:

- Less than 2 seconds

Abnormal:

- Greater than 2 seconds

Cool Extremities

Indicates peripheral vasoconstriction.

Weak Peripheral Pulses

Peripheral pulses become weaker before central pulses.

Tachypnea

Often develops as compensation for metabolic acidosis.

Decreased Urine Output

May not be evident in the field but is an important sign.

Late Signs of Pediatric Shock (2 Minutes)

These findings indicate decompensated shock.

Hypotension

Remember:

Hypotension = Late Shock

EMS should never wait for hypotension to identify shock.

Altered Mental Status

- Confusion
- Lethargy
- Unresponsiveness

Weak Central Pulses

Cyanosis

Bradycardia

In children, bradycardia often indicates severe hypoxia or impending cardiac arrest.

Key Point

Bradycardia in a sick child is a pre-arrest sign.

Types of Pediatric Shock (4 Minutes)

1. Hypovolemic Shock

Most common pediatric shock.

Causes:

- Gastroenteritis
- Vomiting
- Diarrhea
- Hemorrhage
- Burns

Findings:

- Tachycardia
- Delayed capillary refill
- Dry mucous membranes

- Poor skin turgor
- Weak pulses

Treatment:

- IV or IO access
- Isotonic fluid bolus

2. Distributive Shock

Septic Shock

Early:

- Warm extremities
- Bounding pulses
- Flash capillary refill

Late:

- Cool extremities
- Weak pulses
- Hypotension

Anaphylactic Shock

Findings:

- Urticaria
- Facial swelling
- Wheezing
- Hypotension

Treatment:

- IM epinephrine
- Oxygen
- Fluid resuscitation

3. Cardiogenic Shock

Causes:

- Congenital heart disease
- Myocarditis
- Dysrhythmias

Findings:

- Tachycardia
- Hepatomegaly
- Pulmonary edema
- Poor perfusion

Treatment:

- Oxygen
- Careful fluid administration
- Rapid transport

4. Obstructive Shock

Causes:

- Tension pneumothorax
- Cardiac tamponade

Findings:

- Severe respiratory distress
- Poor perfusion
- Weak pulses

Treatment:

- Correct the obstruction
- Rapid transport

EMS Management Priorities (2 Minutes)

Airway

Maintain airway patency.

Breathing

Provide oxygen as needed.

Support ventilation if indicated.

Circulation

Obtain:

- IV access
- IO access if necessary

Fluid Resuscitation

Suspected hypovolemic or septic shock:

20 mL/kg isotonic crystalloid

Examples:

- Normal saline
- Lactated Ringer's

Reassess after every bolus.

Frequent Reassessment

Evaluate:

- Mental status
- Heart rate
- Respiratory rate
- Pulse quality
- Capillary refill

Case Scenario (2 Minutes)

EMS responds for a 3-year-old with vomiting and diarrhea for two days.

Vital Signs:

- HR 170
- RR 38
- BP 94/58
- SpO₂ 99%

Exam:

- Pale
- Delayed capillary refill of 4 seconds
- Dry mucous membranes
- Weak peripheral pulses

Question:

Is this shock?

Answer:

Yes.

Despite a normal blood pressure, this child has compensated hypovolemic shock.

Management:

- High-flow oxygen as needed
- IV/IO access
- 20 mL/kg isotonic fluid bolus
- Continuous reassessment
- Rapid transport

Key Take-Home Points

1. Shock is inadequate tissue perfusion.
2. Children compensate with tachycardia and vasoconstriction.
3. Hypotension is a late finding.
4. The Pediatric Assessment Triangle helps identify shock rapidly.

5. Persistent tachycardia should always raise concern.
6. Look for delayed capillary refill, weak pulses, and altered mental status.
7. Reassess after every intervention.
8. Early recognition saves lives.

Remember

“A normal blood pressure does not rule out pediatric shock.”

This lecture fits a 20-minute EMS presentation and can easily be expanded with local protocol references, pediatric vital-sign charts, and simulation scenarios.

EMS Pediatric Shock Simulation Scenario

Title: The Child with Vomiting and Diarrhea: Recognition of Compensated Shock

Audience: EMTs, AEMTs, Paramedics

Duration: 10–15 minute scenario, 15–20 minute debrief

Learning Objectives

1. Recognize compensated pediatric shock.
2. Perform a Pediatric Assessment Triangle (PAT).
3. Identify tachycardia as an early sign of shock.
4. Understand that normal blood pressure does not rule out shock.
5. Initiate fluid resuscitation and reassess.

Dispatch Information

"3-year-old child, sick."

Mother reports vomiting and diarrhea for 2 days and decreased activity.

Initial PAT

Appearance: Lethargic, minimal eye contact, weak cry.

Work of Breathing: Mild tachypnea.

Circulation to Skin: Pale, mottled extremities.

Impression: Shock.

Initial Assessment

Weight: 15 kg

HR 170, RR 38, BP 94/58, SpO₂ 99%, Temp 38.0°C

Cap refill 4 seconds, weak radial pulses, dry mucous membranes, cool extremities.

Expected Critical Actions

- Perform PAT
- Recognize compensated shock
- Obtain vital signs
- Establish IV/IO access
- Administer 20 mL/kg isotonic crystalloid (300 mL)
- Transport and reassess frequently

If Appropriate Care Is Provided

HR 140, RR 30, BP 96/60, cap refill 2 seconds, improved mental status and skin color.

If Shock Is Missed

HR 185, RR 44, BP 72/38, difficult to arouse, cap refill 6 seconds, weak central pulses, cool mottled skin.

Debriefing Questions

- What clues suggested shock?
- Why was the blood pressure misleading?
- How did the PAT help identify critical illness?
- What intervention likely made the biggest difference?
- What should be reassessed after fluids?

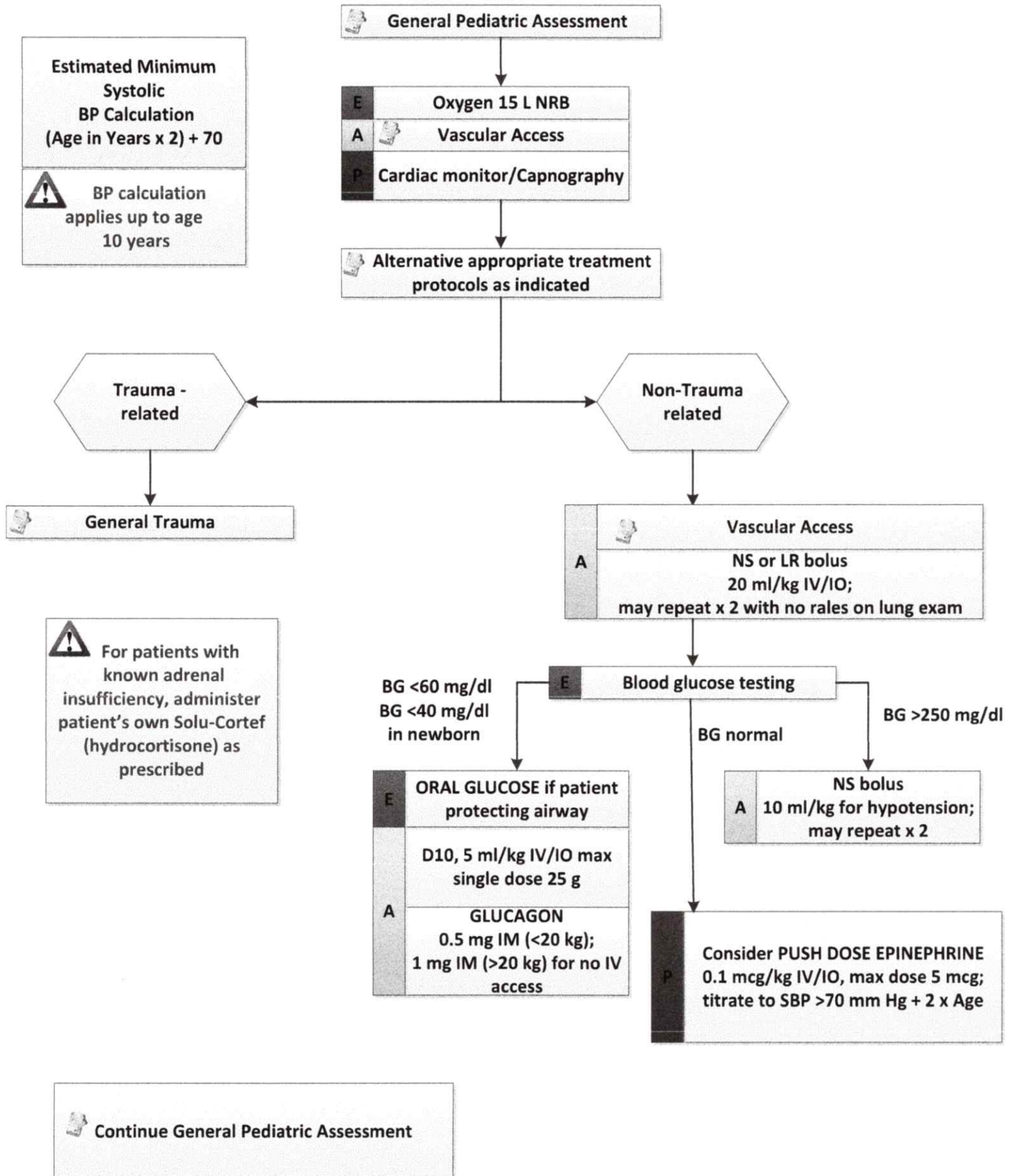
Key Teaching Pearls

1. Tachycardia is shock until proven otherwise.
2. Normal blood pressure does not exclude shock.
3. PAT identifies shock before monitors do.
4. Capillary refill and pulse quality are critical assessment tools.
5. Early recognition and treatment prevent cardiac arrest.

Instructor Take-Home Message

A child with tachycardia, delayed capillary refill, weak pulses, and abnormal appearance is in shock until proven otherwise.

Pediatric Shock



History

- Blood loss-vaginal bleeding, ectopic, GI bleeding or AAA
- Fluid loss-vomiting, diarrhea, fever
- Infection
- Cardiac tamponade
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

Signs and Symptoms

- Restlessness, confusion
- Weakness, dizziness
- Weak rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

Differential

- Hypovolemic shock
- Cardiogenic shock
- Septic shock
- Neurogenic shock
- Anaphylactic shock
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolism
- Tension pneumothorax
- Medication effect or overdose
- Vasovagal

For patients with known adrenal insufficiency, administer patient's own Solu-Cortef (hydrocortisone) as prescribed.

Causes of Adrenal Insufficiency:

Addison's Disease

Congenital Adrenal Hyperplasia

Long term administration of steroids

Others

Pearls

- Recommended exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro.
- Hypotension can be defined as a systolic <Estimated Minimum Systolic. This is not always reliable and should be interpreted in context and patient's typical BP, if known. Shock may present with a normal BP initially.
- Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.
- Consider all possible causes of shock and treat per appropriate protocol.

Hypovolemic shock

- Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding

Cardiogenic shock

- Heart failure, MI, cardiomyopathy, myocardial contusion, toxins

Distributive shock

- Sepsis, anaphylaxis, neurogenic, toxins

Obstructive shock

- Pericardial tamponade, pulmonary embolus, tension pneumothorax

Here's a 20-minute EMS-focused lecture designed for paramedics, EMTs, and prehospital providers. It emphasizes recognition, assessment, and early treatment of pediatric sepsis.

Pediatric Sepsis Recognition and Management for EMS

Learning Objectives

By the end of this lecture, participants will be able to:

1. Define pediatric sepsis and septic shock.
2. Recognize early and late signs of pediatric sepsis.
3. Apply the Pediatric Assessment Triangle (PAT) to identify critical illness.
4. Differentiate compensated from decompensated shock.
5. Initiate evidence-based prehospital management.
6. Communicate effectively with receiving facilities.

Case Introduction

Dispatch:

4-year-old female, fever and lethargy.

Upon arrival:

- Temperature: 39.8°C (103.6°F)

- HR: 170
- RR: 38
- BP: 92/58
- Cap refill: 4 seconds
- Skin cool and mottled
- Parents report decreased urine output and poor intake.

Question:

Is this just a fever—or something more serious?

Why EMS Matters

Sepsis is a leading cause of pediatric morbidity and mortality worldwide.

Children can:

- Compensate extremely well
- Deteriorate rapidly
- Progress from compensated shock to cardiac arrest quickly

Early recognition and treatment significantly improve outcomes.

EMS often provides:

- First medical assessment
- First fluid resuscitation
- First sepsis alert

What is Sepsis?

Current Definition

Sepsis = Life-threatening organ dysfunction caused by a dysregulated response to infection.

For EMS purposes:

Think:

Infection + signs of poor perfusion or organ dysfunction.

Common Causes of Pediatric Sepsis

Neonates

- Group B Streptococcus
- E. coli
- Listeria

Infants and Children

- Pneumonia
- Influenza
- RSV
- Urinary tract infection
- Meningitis
- Skin and soft tissue infection

High-Risk Patients

- Immunocompromised
- Cancer patients
- Sickle cell disease
- Technology dependent children
- Recent surgery
- Chronic medical conditions

Pediatric Assessment Triangle (PAT)

The PAT can identify a sick child in seconds.

Appearance

Assess:

- Tone
- Interactiveness
- Consolability
- Look/gaze
- Speech/cry

Abnormal findings:

- Lethargy
- Irritability
- Poor responsiveness

Work of Breathing

Assess:

- Retractions
- Nasal flaring
- Grunting
- Abnormal positioning

Remember:

Septic children frequently develop tachypnea before hypotension.

Circulation to Skin

Assess:

- Pallor
- Mottling
- Cyanosis

Abnormal circulation may be the earliest clue to sepsis.

Pediatric Shock

Shock occurs when oxygen delivery fails to meet metabolic demand.

Children usually maintain blood pressure until late.

Important EMS Rule

Hypotension is a late and ominous finding.

Do not wait for low blood pressure to diagnose shock.

Compensated Septic Shock

Findings

- Tachycardia
- Tachypnea
- Delayed cap refill
- Cool extremities
- Decreased urine output
- Irritability
- Fever or hypothermia

Blood pressure may still be normal.

This is the ideal time for EMS intervention.

Decompensated Septic Shock

Findings

- Altered mental status
- Weak pulses
- Hypotension
- Mottling
- Cyanosis
- Severe lethargy

These patients may be minutes from cardiac arrest.

Vital Sign Clues

Tachycardia

Most sensitive sign of pediatric shock.

Consider sepsis when persistent tachycardia exists despite:

- Fever treatment
- Comfort measures

Tachypnea

Often appears before hypotension.

Altered Mental Status

Never ignore:

- Decreased interaction
- Excessive sleepiness
- Failure to recognize caregivers

Red Flags for EMS

Consider sepsis when infection is present with:

- ✓ Altered mental status
- ✓ Delayed capillary refill

- ✓ Mottled skin
- ✓ Weak peripheral pulses
- ✓ Persistent tachycardia
- ✓ Respiratory distress
- ✓ Decreased urine output
- ✓ High-risk medical history

EMS Assessment

Airway

Assess:

- Patency
- Protective reflexes
- Need for positioning

Prepare for deterioration.

Breathing

Provide oxygen if:

- Respiratory distress
- Hypoxia
- Signs of shock

Target:

$\text{SpO}_2 > 94\%$

Monitor closely.

Circulation

Evaluate:

- Heart rate
- Pulse quality
- Skin signs
- Cap refill
- Blood pressure
- Mental status

Obtain glucose early.

Prehospital Management

Oxygen

Provide as needed.

Methods:

- Nasal cannula
- Non-rebreather
- BVM if necessary

Avoid delaying transport.

IV or IO Access

Establish:

- IV if possible
- IO if critically ill and IV unsuccessful

Do not spend excessive time attempting IV access.

Fluid Resuscitation

Initial Bolus

20 mL/kg isotonic crystalloid

Examples:

- Normal saline
- Lactated Ringer's

Reassess after each bolus.

Reassessment After Fluids

Evaluate:

- Mental status
- Heart rate
- Cap refill
- Pulse quality
- Blood pressure

- Work of breathing

Ask:

“Is the child improving?”

If not, additional fluid may be needed per protocol.

Watch for Fluid Overload

Signs include:

- New rales
- Increased work of breathing
- Hepatomegaly
- Worsening oxygenation

Repeated reassessment is essential.

Glucose Matters

Hypoglycemia can mimic sepsis.

Check glucose early.

Treat per protocol if abnormal.

Remember:

Children have limited glycogen stores.

Antibiotics

Typically not given prehospital.

EMS role:

- Recognize sepsis
- Notify receiving hospital
- Enable rapid antibiotic administration after arrival

Every hour of delay matters.

Sepsis Alert

Consider notifying the receiving facility when sepsis is suspected.

Report:

- Suspected infection source
- Vital signs
- Mental status
- Cap refill
- Fluids administered
- Response to treatment

This allows hospital sepsis teams to prepare.

Pediatric Sepsis Pearls

Pearl #1

Children compensate longer than adults.

Pearl #2

Hypotension is late.

Pearl #3

Tachycardia is often the earliest sign.

Pearl #4

Mental status changes are critical clues.

Pearl #5

Early fluids and rapid transport save lives.

Case Resolution

4-year-old female:

- Fever
- Tachycardia
- Delayed cap refill
- Mottled skin
- Lethargy

Assessment:

Compensated septic shock

Treatment:

- Oxygen

- IV access
- 20 mL/kg fluid bolus
- Glucose check
- Sepsis alert
- Rapid transport

Hospital diagnosis:

Pneumococcal pneumonia with sepsis.

Child admitted to PICU and recovered.

Key Take-Home Points

1. Think sepsis in any ill child with infection and abnormal perfusion.
2. Use the Pediatric Assessment Triangle immediately.
3. Tachycardia and delayed cap refill are early warning signs.
4. Hypotension is a late finding.
5. Obtain IV/IO access early.
6. Give isotonic fluid boluses and reassess frequently.
7. Communicate suspicion of sepsis early to the receiving facility.

Remember: Early recognition by EMS can be the difference between recovery and cardiac arrest.

EMS Pediatric Sepsis Simulation

Scenario Title: The Quietly Sick Child

Target Audience: EMTs, Advanced EMTs, Paramedics

Duration: Scenario 15–20 minutes, Debrief 20 minutes

Learning Objectives

1. Recognize pediatric sepsis using the Pediatric Assessment Triangle (PAT).
2. Identify compensated septic shock.
3. Obtain rapid vascular access.
4. Administer appropriate fluid resuscitation.
5. Reassess after interventions.
6. Communicate a pediatric sepsis alert to the receiving facility.

Dispatch Information

"Medic 4 respond to a private residence for a 3-year-old female who is lethargic and has a fever."

Scene Description

Mother is holding the child on a couch. Child appears sleepy and ill. Mother states: "She's usually running around everywhere. Today she barely wants to open her eyes."

Patient Information

Emma, age 3 years, weight 15 kg. Previously healthy. Fever for 48 hours, cough, decreased appetite, one episode of vomiting.

Initial PAT

Appearance: less interactive, slow response.
Work of Breathing: mild tachypnea.
Circulation: pale with mild mottling.

Initial Vital Signs

HR 168, RR 38, BP 96/58, SpO2 96%, Temp 39.5°C, cap refill 4 sec, glucose 96 mg/dL, GCS 14.

Expected Learner Actions

Perform PAT, obtain vital signs, recognize compensated shock, suspect sepsis, obtain IV/IO access, begin fluid resuscitation, reassess, transport, and notify hospital.

Critical Decision Point #1

If treatment is delayed: HR 180, RR 42, BP 82/48, cap refill 5 sec, worsening mental status.

Critical Decision Point #2

Administer 20 mL/kg normal saline. For 15 kg child = 300 mL bolus.

Expected Improvement

HR 145, RR 32, BP 98/60, cap refill 2–3 sec, improved mental status.

Hospital Notification

Provide pediatric sepsis alert including suspected source, vital signs, treatment provided, and ETA.

Debriefing Points

Discuss recognition of sepsis, compensated shock, abnormal PAT findings, fluid resuscitation, reassessment, teamwork, and communication.

Key Take-Home Points

Children may remain normotensive despite shock. Tachycardia, delayed cap refill, altered mental status, and poor perfusion are early clues. Early EMS recognition and treatment save lives.