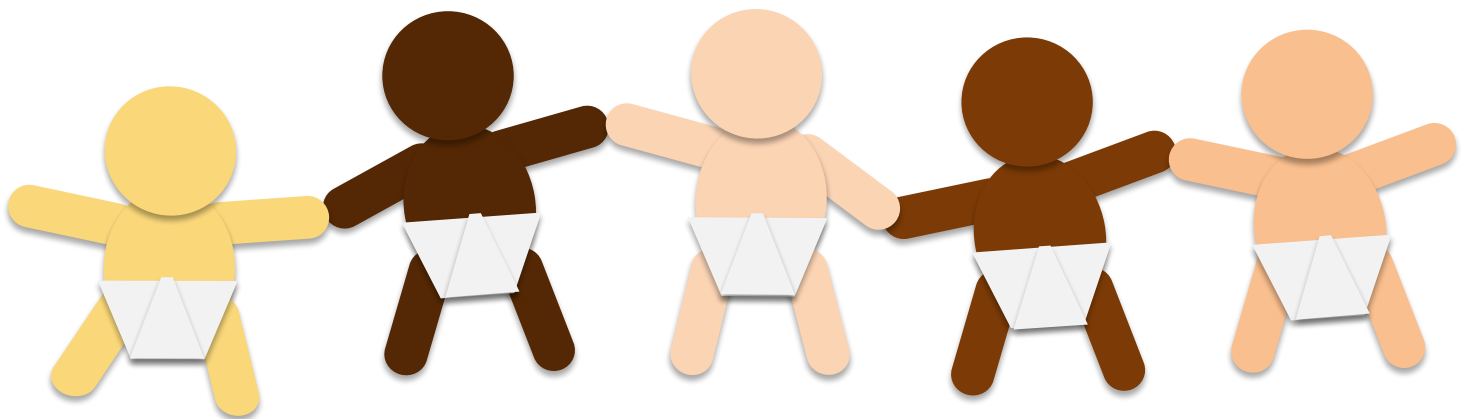


Pediatric Readiness Simbox

A Child With a Wheeze



Emergency Department/Hospitalist/Resident



After this activity, the team will be able to resuscitate a pediatric patient with emphasis on the following objectives:

1. Apply Crisis Resource Management and teamwork in a pediatric resuscitation (with attention to role designation, directed orders, sharing mental model and closed loop communication with team and family members).
2. Prioritize treatment of potential etiologies to guide stabilization or escalation of care for a pediatric patient with status asthmaticus.
3. Determine the appropriate destination for transfer.

Overall Scenario Schema

Prebrief: Use narrated video + **sample script** or your own script

2 mins

Assign or Coach them to allocate roles.
Adapt roles based on the participating team:

Team Leader	Airway	Bedside Survey
Respiratory Tx	Bedside Nurse	Medication Nurse
Parent Liaison	Pharmacy	Recorder

10 mins

Stem: A 9 year-old male is brought to the Emergency Department with respiratory distress.

Your team will focus on the resuscitation of a child with asthma.

Telesim Co-facilitator prompts are indicated in these boxes

15 mins

Debrief: Use the narrated video + **sample script** or pause the video and use your own script

10 mins

Option: re-run scenario

Scenario script:

"You will hear a brief EMS dispatch and then see a two minute countdown clock as you prepare for the arrival of the patient."

[Link to Asthma Video](#)

Video states: "ED this is an ALS Unit 1, coming in with a 9-year-old boy with difficulty breathing after waking up this morning at home. He has a history of asthma but has run out of medications. His oxygen saturation is 94% on a nonrebreather with 100% oxygen. Heart rate is 120 and his blood pressure 110/60. We are working on getting intravascular access. We will arrive in approximately 2 minutes."

2 minute warning

- Team assembles + confirms roles
- Asks for equipment: Broselow tape/ app, monitors, access, temperature, oxygen, breathing (BVM/CPAP), medications
- Dons PPE
- Calls for help

"Patient has arrived."

Time 0

- Team places patient monitors, pulse oximeter, BP cuff, checks temp
- Assesses ABCDEs

Exam: Patient appears to be struggling to breathe with subcostal and intercostal retractions, tachypnea, and nasal flaring. Prolonged expiratory phase, diffuse wheezes bilaterally, poor aeration heard on lung exam. Rest of examination is normal. Patient is alert but in distress. Cannot speak in full sentences.

Step 1

HR	121
BP	117/78
RR	41
Sats	86% RA
Temp	36.5 C

- Team applies oxygen via NRB or moves directly to back-to-back albuterol and ipratropium bromide nebulization
- Calls respiratory therapy (if available)
- Estimates weight from Broselow or if asked: 35 kg
- Obtains SAMPLE history
- Formulates differential diagnosis: Asthma, anaphylaxis, foreign body ingestion

Exam: Patient is coughing and gagging and has one episode of post-tussive emesis. "You are starting albuterol and ipratropium nebulizers right now."

Step 2

HR	140
BP	119/79
RR	42
Sats	86%
ETCO2	33

- Team recognizes and verbalizes illness state: patient in respiratory failure due to status asthmaticus
- Asks RN for access (IV/IO)
- Orders parenteral steroids (Methylprednisolone or dexamethasone)
- Discusses obtaining blood gas and other labs if needed
- Discusses obtaining chest x-ray

SAMPLE history

Signs/Symptoms: 9-year-old male with 3 days of cough and congestion; He woke up this morning with difficulty breathing. No fevers.

Allergies/Medications: Seasonal allergies/Albuterol PRN. No food allergies.

Birth/ Medical history: History of eczema and asthma. Three previous admissions and once the ICU, never intubated. Family history remarkable for asthma in his father and 8-year-old sister. Vaccinations are up to date.

Last meal: Cereal and milk for breakfast 1 hour ago, but vomited once afterwards.

Events: Preceding URI symptoms, younger brother with URI symptoms, +sick contacts at home.

Exam: IV access successfully placed, labs are sent if they have been ordered. CXR is pending (if requested).

"The patient's oxygen saturation is improving, but he still has significant subcostal retractions and nasal flaring. "

Step 3

HR	111
BP	110/60
RR	42
Sats	98%
ETCO2	37

- Team notes improvement in oxygen saturation but persistent work of breathing.
- Orders IV Magnesium Sulfate and 20 mL/kg bolus of NS
- Starts continuous albuterol via nebulization
- Considers systemic b-agonist (IM Epinephrine or SQ/IV Terbutaline), IV Aminophylline
- Asks nurse for STAT POC glucose

Exam: Coughing persistently. Worsening retractions but not moving air very well. End inspiratory squeak, silent expiration and worsening retractions and tracheal tugging.

Fluid bolus in, if ordered. If POC glucose is requested: 100.

"The patient seems to be working harder to breathe and his BP is lower."

Step 4

HR	130
BP	70/40
RR	41
Sats	96%
ETCO2	38

- Team escalates treatment per local protocol (eg terbutaline)
- Notes lower blood pressure and orders second NS bolus.
- Initiates non-invasive ventilation (NIV) such as BiPAP or CPAP with circuit connector to nebulized continuous albuterol, with respiratory therapy

"The patient seems to like the BPAP - He appears breathing more comfortably. 2nd NS bolus in, CRT now 2 seconds and BP is improving. Patient is a bit more alert."

Wrap up

HR	119
BP	109/60
RR	42
Sats	99%
ETCO2	38

- Team reevaluates ABCDEs
- States differentials and further workup plan
- Handoffs the patient to the transfer / PICU team
- Formulates respiratory & fluid management plan for transport
- Updates family and answers their questions

"The PICU team is here. Can you please give them a status update on what's going on with this patient?"

After team performs handoff, state "This concludes the simulation" and move to debrief.

TASK		DONE CORRECTLY	NOT DONE CORRECTLY	NOT DONE
Team-centered care	Verbally assemble the necessary staff, equipment, and resources to care for an ill pediatric patient.			
	Demonstrate effective teamwork and communication (i.e. designate leader/roles, directed orders, closed-loop communication, sharing mental model).			
	Demonstrate appropriate PPE.			
Family-centered care	Obtain an appropriate history from the family member (SAMPLE).			
	Address family concerns, update on care (translate medical aspects of care in plain language).			
	Involve social work for parental support early.			
Medical knowledge	Verbalize the initial management of an acutely ill pediatric patient (airway, breathing, circulation).			
	Verbalize the first line diagnostic tests of a patient in respiratory distress.			
	Verbalize the first line therapeutic intervention of a patient in status asthmaticus.			
	Performs appropriate escalation of care of a patient in status asthmaticus who is not improving.			
Communication	Demonstrate handoff of care at the end of the case.			

This page provides possible questions to elicit teaching points during the debrief. These questions are not meant to replace your team's discussion, but can help to steer the debriefing session.

PERFORM A SYSTEMATIC PRIMARY ASSESSMENT/ REASSESSMENT OF A CHILD IN RESPIRATORY DISTRESS

How does your team perform a systematic assessment of an ill pediatric patient?

- PAT Pediatric Assessment Triangle
- Appearance TICLS: tone, interactivity, consolability, look/gaze, speech/cry
- Work of breathing: Important to undress to visualize WOB
- Circulation/capillary refill: Where and how is this assessed in the pediatric patient?

Airway Breathing Circulation Caveats: Consider pediatric anatomical differences - ABC vs CAB (in adult patient)

SAMPLE mnemonic: signs/symptoms, allergies, medications, last meal, events preceding

DEMONSTRATE A STEPWISE APPROACH TO INTERVENTION IN A CHILD WITH ASTHMA



Explain your stepwise approach to intervention after the primary assessment.

- Focus on the vital signs and your clinical exam findings (mental and hydration status, respiratory, cardiovascular exams).
- Suction, increase oxygen and positive pressure supplementation, consider early trial of high flow nasal cannula (escalate further PRN).
- After any intervention, remember to reassess the patient to note any positive/negative changes based on your intervention.

What medications will help this patient?

- For asthma, the initial treatment is inhaled bronchodilators, which is tailored to the severity of the asthma exacerbation. For patients with moderate to severe exacerbation, give three to four doses of an inhaled bronchodilator in the first hour of treatment until there is good response. Several meta-analyses have shown that nebulized albuterol (0.15 mg/kg per dose, maximum 5 mg) and MDI with device spacer are clinically equivalent. Current recommendations of ED dosages of albuterol for acute asthma are for 2 to 4 puffs of albuterol for young children, 4 to 6 puffs for older children, and 4 to 8 puffs for adolescents and adults.

Side effects of albuterol includes- tachycardia, tachyarrhythmias (rare), CNS stimulation, hypokalemia (especially in patients receiving high-dose continuous albuterol for more than 6 to 8 hours)

- Asthma is an inflammatory disease. Bronchodilators control only the symptoms, not the underlying disease. Thus, give systemic steroids immediately to severely ill patients with acute asthma, preferably at the start of their ED treatment.
- Both oral and IV corticosteroids are equally effective, even among severely ill patients. Reserve IV route for patients unable tolerate oral medicine (i.e. vomiting, severe respiratory distress) and those admitted to PICU.
- IV magnesium sulfate (50-75 mg/kg, maximum 2 g, intravenously over 20 to 30 minutes) produces bronchodilation via direct effect on smooth muscle because of calcium antagonism, may results in greater clinical improvement and improved pulmonary function and Sao2 in children with severe exacerbations.

This page provides possible questions to elicit teaching points during the debrief. These questions are not meant to replace your team's discussion, but can help to steer the debriefing session.

DESCRIBE THE
NEED FOR AND
STEPS FOR
MECHANICAL
VENTILATION



The evidence for heliox (mixture of helium and oxygen, usually in a ratio of 60% to 70% He/30% to 40% O₂) effectiveness in status asthmaticus is mixed.

Indications for endotracheal intubation and mechanical ventilation in acute asthma exacerbation:

- Failure of maximal pharmacologic therapy
- Hypoxemia unrelieved by O₂ therapy
- Hypercarbia with rising Pco₂
- Deteriorating mental status
- Respiratory fatigue
- Respiratory arrest

Medications used with intubation:

- Use rapid sequence induction, including sedation and neuromuscular blockade for intubation in patient in refractory status asthmaticus.
- IV Ketamine is a good choice as a sedating agent because of its intrinsic bronchodilation properties.
- Add an anticholinergic agent such as atropine or glycopyrrolate to decrease airway secretions.
- Avoid medications, including opiates (morphine, meperidine) and muscle relaxants (curare, atracurium) which may potentiate histamine release and worsen bronchospasm.

Common complications of mechanical ventilation include:

- Air leak due to barotrauma (pneumomediastinum, pneumothorax)
- Hypotension which can occur shortly after endotracheal intubation, due to a combination of hypovolemia and decreased venous return to the heart owing to positive intrapleural pressure.

PEDIATRIC ASTHMA CLINICAL TREATMENT ALGORITHM

CHILDREN ≥ 2 Y/O WITH KNOWN RAD OR Hx CONSISTENT WITH RAD AND RECURRENT WHEEZING

AGE

2-3

INITIAL EVALUATION PAS 1

1. Time Zero: provide supplemental oxygen to keep O₂ saturations ≥90%
2. Calculate Pediatric Asthma Score
3. Notify MD/DO/APP for score > 4

2-3 yrs	1 pt	2 pt	3 pt	ALBUTEROL (WEIGHT BASED DOSING)			
RR	≤ 30	31-39	≥40	Wt (kg)	Single dose 0.083%	MDI + spacer	Large Volume Neb
O ₂ Requirement	≥93% RA	89-92% RA	≤ 88% on RA or on any oxygen	5-10	2.5 mg (0.5ml)	4	7.5 mg/hr
Auscultation	Normal BS to end exp wheezes only	Exp wheezes	Insp and exp wheezes to diminished BS	10-20	3.75 mg (0.75ml)	6	11.25 mg/hr
Retractions	None or intercostal	Intercostal & substernal	Intercostal, substernal and supraclavicular	Ref: Becker AB, Nelson NA, Simons FE. The pulmonary index. Assessment of a clinical score for asthma. Am J Dis Child. 1984 Jun;138(6):574-6. Gorelick M, Scribano PV, Stevens MW, Schultz T, Shults J. Predicting need for hospitalization in acute pediatric asthma. Pediatr Emerg Care. 2008 Nov;24(11):735-44.			

Time	SCORE 1 MILD: PAS < 6	MODERATE: PAS 7-9	SEVERE: PAS 10-12
0-60 min	<p>Albuterol MDI + spacer 4-8 puffs</p> <ul style="list-style-type: none"> administer 4 puffs & auscultate if no change, administer 2 more puffs continue til BS improve or 8 puffs total <p>Dexamethasone PO 0.6mg/kg (max 12 mg)</p>	<p>Albuterol MDI + spacer 4-10 puffs</p> <p>OR</p> <p>Large volume albuterol 0.5mg/kg/hr (max 20mg) + ipratropium (0.5-1 mg)</p> <p>Dexamethasone PO 0.6mg/kg (max 12mg)</p>	<p>Large volume albuterol 0.5mg/kg/hr (max 20mg) + ipratropium (0.5-1 mg)</p> <p>Dexamethasone PO 0.6mg/kg (max 12mg) OR Methylprednisolone IV 1mg/kg (max 60mg)</p> <p>Magnesium sulfate IV 50 mg/kg (max 2g)</p> <p>If anaphylaxis Consider Epinephrine (1:1,000) IM 0.01 mg/kg</p>
<p>PAS 2: REASSESS & SCORE END OF 1st HOUR</p>			
60-120 min	<p>Monitor AT LEAST 2 HOURS if initial PAS 7-9 DISCHARGE IF PAS < 6</p> <ul style="list-style-type: none"> Asthma education Follow up within 48-72 hrs 	<p>Repeat Large Volume Albuterol + Consider Magnesium sulfate 50 mg/kg IV (max 2g)</p>	<p>Repeat Large Volume Albuterol + Consider NS bolus 20 ml/kg HeliOx/Terbutaline SC High flow nasal cannula</p>
<p>PAS 3 REASSESS & SCORE END OF 2nd HOUR</p>			
		<p>MODERATE: PAS 7-9</p>	<p>SEVERE: PAS 10-12</p>

Remember to order scheduled nebs for patients boarding in the department.

PAS < 7 Admit to General Peds
PAS 7-9 Admit PIMC

Admit to PICU

PEDIATRIC ASTHMA CLINICAL TREATMENT ALGORITHM

CHILDREN ≥ 2 Y/O WITH KNOWN RAD OR Hx CONSISTENT WITH RAD AND RECURRENT WHEEZING

AGE

4-5

INITIAL EVALUATION PAS 1

1. Time Zero: provide supplemental oxygen to keep O₂ saturations ≥90%
2. Calculate Pediatric Asthma Score
3. Notify MD/DO/APP for score > 3 (ONE POINT EACH)

4-5 yrs	1 pt	2 pt	3 pt	ALBUTEROL (WEIGHT BASED DOSING)			
RR	≤ 28	29-35	≥36	Wt (kg)	Single dose 0.083%	MDI + spacer	Large Volume Neb
O ₂ Requirement	≥93% RA	89-92% RA	≤ 88% on RA or on any oxygen	10-20	3.75 mg (0.75ml)	6	11.25 mg/hr
Auscultation	Normal BS to end exp wheezes only	Exp wheezes	Insp and exp wheezes to diminished BS	>20	5 mg (1ml)	8	15 mg/hr
Retractions	None or intercostal	Intercostal & substernal	Intercostal, substernal and supraclavicular	<small>Ref: Becker AB, Nelson NA, Simons FE. The pulmonary index. Assessment of a clinical score for asthma. Am J Dis Child. 1984 Jun;138(6):574-6. Gorelick M, Scribano PV, Stevens MW, Schultz T, Shults J. Predicting need for hospitalization in acute pediatric asthma. Pediatr Emerg Care. 2008 Nov;24(11):735-44.</small>			

Time	SCORE 1 MILD: PAS < 6	MODERATE: PAS 7-9	SEVERE: PAS 10-12
0-60 min	<p>Albuterol MDI + spacer 4-8 puffs</p> <ul style="list-style-type: none"> ☐ administer 4 puffs & auscultate ☐ if no change, administer 2 more puffs ☐ continue til BS improve or 8 puffs total <p>Dexamethasone PO 0.6mg/kg (max 12 mg)</p>	<p>Albuterol MDI + spacer 4-10 puffs</p> <p>OR</p> <p>Large volume albuterol 0.5mg/kg/hr (max 20mg) + ipratropium (0.5-1 mg)</p> <p>Dexamethasone PO 0.6mg/kg (max 12mg)</p>	<p>Large volume albuterol 0.5mg/kg/hr (max 20mg) + ipratropium (0.5-1 mg)</p> <p>Dexamethasone PO 0.6mg/kg (max 12mg) OR Methylprednisolone IV 1mg/kg (max 60mg)</p> <p>Magnesium sulfate IV 50 mg/kg (max 2g)</p> <p>If anaphylaxis Consider Epinephrine (1:1,000) IM 0.01 mg/kg</p>
<p>PAS 2: REASSESS & SCORE END OF 1st HOUR</p>			
60-120 min	<p>Monitor AT LEAST 2 HOURS if initial PAS 7-9</p> <p>DISCHARGE IF PAS < 6</p> <ul style="list-style-type: none"> ☐ Asthma education ☐ Follow up within 48-72 hrs 	<p>Repeat Large Volume Albuterol +</p> <p>Consider Magnesium sulfate 50 mg/kg IV (max 2g)</p>	<p>Repeat Large Volume Albuterol +</p> <p>Consider NS bolus 20 ml/kg HeliOx/Terbutaline High flow nasal cannula</p>
<p>PAS 3 REASSESS & SCORE END OF 2nd HOUR</p>			
		<p>MODERATE: PAS 7-9</p>	<p>SEVERE: PAS 10-12</p>

Remember to order scheduled nebs for patients boarding in the department.

PAS < 7 Admit to General Peds
PAS 7-9 Admit PIMC

PAS 10-12
Admit to PICU

PEDIATRIC ASTHMA CLINICAL TREATMENT ALGORITHM

CHILDREN ≥ 2 Y/O WITH KNOWN RAD OR Hx CONSISTENT WITH RAD AND RECURRENT WHEEZING

AGE
6-12

INITIAL EVALUATION PAS 1

1. Time Zero: provide supplemental oxygen to keep O₂ saturations ≥90%
2. Calculate Pediatric Asthma Score
3. Notify MD/DO/APP for score > 4

6-12 yrs	1 pt	2 pt	3 pt	ALBUTEROL (WEIGHT BASED DOSING)			
RR	≤ 22	23-30	≥31	Wt (kg)	Single dose 0.083%	MDI + spacer	Large Volume Neb
O ₂ Requirement	≥93% RA	89-92% RA	≤ 88% on RA or on any oxygen	10-20	3.75 mg (0.75ml)	6	11.25 mg/hr
Auscultation	Normal BS to end exp wheezes only	Exp wheezes	Insp and exp wheezes to diminished BS	>20	5 mg (1ml)	8	15 mg/hr
Retractions	None or intercostal	Intercostal & substernal	Intercostal, substernal and supraclavicular	<small>Ref: Becker AB, Nelson NA, Simons FE. The pulmonary index. Assessment of a clinical score for asthma. Am J Dis Child. 1984 Jun;138(6):574-6. Gorelick M, Scribano PV, Stevens MW, Schultz T, Shults J. Predicting need for hospitalization in acute pediatric asthma. Pediatr Emerg Care. 2008 Nov;24(11):735-44.</small>			

Time	SCORE 1 MILD: PAS < 6	MODERATE: PAS 7-9	SEVERE: PAS 10-12
0-60 min	<p>Albuterol MDI + spacer 4-8 puffs</p> <ul style="list-style-type: none"> ❑ administer 4 puffs & auscultate ❑ if no change, administer 2 more puffs ❑ continue til BS improve or 8 puffs total <p>Dexamethasone PO 0.6mg/kg (max 12 mg)</p>	<p>Albuterol MDI + spacer 4-10 puffs</p> <p>OR</p> <p>Large volume albuterol 0.5mg/kg/hr (max 20mg) + ipratropium (0.5-1 mg)</p> <p>Dexamethasone PO 0.6mg/kg (max 12mg)</p>	<p>Large volume albuterol 0.5mg/kg/hr (max 20mg) + ipratropium (0.5-1 mg)</p> <p>Dexamethasone PO 0.6mg/kg (max 12mg) OR Methylprednisolone IV 1mg/kg (max 60mg)</p> <p>Magnesium sulfate IV 50 mg/kg (max 2g)</p> <p>If anaphylaxis Consider Epinephrine (1:1,000) IM 0.01 mg/kg</p>
<p>PAS 2: REASSESS AND SCORE END OF 1st HOUR</p>		<p>Repeat Large Volume Albuterol + Consider Magnesium sulfate 50 mg/kg IV (max 2g)</p>	<p>Repeat Large Volume Albuterol + Consider NS bolus 20 ml/kg HeliOx/Terbutaline High flow nasal cannula</p>
60-120 min	<p>Monitor AT LEAST 2 HOURS if initial PAS 7-9</p> <p>DISCHARGE IF PAS < 6</p> <ul style="list-style-type: none"> ❑ Asthma education ❑ Follow up within 48-72 hrs 	<p>PAS 3 REASSESS & SCORE END OF 2nd HOUR</p>	<p>MODERATE: PAS 7-9</p>
<p>Remember to order scheduled nebs for patients boarding in the department.</p>		<p>PAS < 7 Admit to General Peds PAS 7-9 Admit PIMC</p>	<p>PAS 10-12 Admit to PICU</p>

PEDIATRIC ASTHMA CLINICAL TREATMENT ALGORITHM

CHILDREN ≥ 2 Y/O WITH KNOWN RAD OR Hx CONSISTENT WITH RAD AND RECURRENT WHEEZING

AGE
> 12

INITIAL EVALUATION PAS 1

1. Time Zero: provide supplemental oxygen to keep O₂ saturations ≥90%
2. Calculate Pediatric Asthma Score
3. Notify MD/DO/APP for score > 4

>12 yrs	1 pt	2 pt	3 pt	ALBUTEROL (WEIGHT BASED DOSING)			
RR	≤ 20	21-27	≥28	Wt (kg)	Single dose 0.083%	MDI + spacer	Large Volume Neb
O ₂ Requirement	≥93% RA	89-92% RA	≤ 88% on RA or on any oxygen	>20	5 mg (1ml)	8 puffs	15-20 mg/hr
Auscultation	Normal BS to end exp wheezes only	Exp wheezes	Insp and exp wheezes to diminished BS				
Retractions	None or intercostal	Intercostal & substernal	Intercostal, substernal and supraclavicular	<small>Ref: Becker AB, Nelson NA, Simons FE. The pulmonary index. Assessment of a clinical score for asthma. Am J Dis Child. 1984 Jun;138(6):574-6. Gorelick M, Scribano PV, Stevens MW, Schultz T, Shults J. Predicting need for hospitalization in acute pediatric asthma. Pediatr Emerg Care. 2008 Nov;24(11):735-44.</small>			

Time	SCORE 1 MILD: PAS < 6	MODERATE: PAS 7-9	SEVERE: PAS 10-12
0-60 min	<p>Albuterol MDI + spacer 4-8 puffs</p> <ul style="list-style-type: none"> administer 4 puffs & auscultate if no change, administer 2 more puffs continue til BS improve or 8 puffs total <p>Dexamethasone PO 0.6mg/kg (max 12 mg)</p>	<p>Albuterol MDI + spacer 4-10 puffs</p> <p>OR</p> <p>Large volume albuterol 0.5mg/kg/hr (max 20mg) + ipratropium (0.5-1 mg)</p> <p>Dexamethasone PO 0.6mg/kg (max 12mg)</p>	<p>Large volume albuterol 0.5mg/kg/hr (max 20mg) + ipratropium (0.5-1 mg)</p> <p>Dexamethasone PO 0.6mg/kg (max 12mg) OR Methylprednisolone IV 1mg/kg (max 60mg)</p> <p>Magnesium sulfate IV 50 mg/kg (max 2g)</p> <p>If anaphylaxis Consider Epinephrine (1:1,000) IM 0.01 mg/kg</p>
<p>PAS 2: REASSESS AND SCORE END OF 1st HOUR</p>		<p>Repeat Large Volume Albuterol + Consider Magnesium sulfate 50 mg/kg IV (max 2g)</p>	<p>Repeat Large Volume Albuterol + Consider NS bolus 20 ml/kg HeliOx/Terbutaline High flow nasal cannula</p>
60-120 min	<p>Monitor AT LEAST 2 HOURS if initial PAS 7-9</p> <p>DISCHARGE IF PAS < 6</p> <ul style="list-style-type: none"> Asthma education Follow up within 48-72 hrs 	<p>PAS 3 REASSESS & SCORE END OF 2nd HOUR</p>	<p>MODERATE: PAS 7-9</p>

Remember to order scheduled nebs for patients boarding in the department.

PAS < 7 Admit to General Peds
PAS 7-9 Admit PIMC

PAS 10-12
Admit to PICU

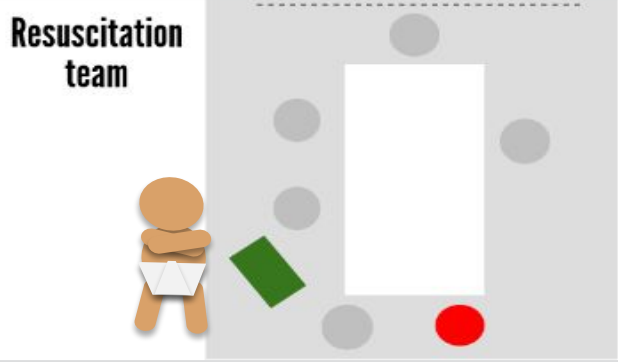
Medications and dosing for acute asthma exacerbation

AGENT	DOSE	EFFECTS/COMMENTS	ADVERSE EFFECTS (SHORT TERM)
Oxygen	21-100%	Titrated to keep SpO ₂ >90%	
Methylprednisolone	0.5-1 mg/kg/dose IV q 6 hrs	<i>Anti-inflammatory</i>	Hyperglycemia, hypertension, dyspepsia/peptic ulcer, increased appetite
Prednisone/Prednisolone	2 mg/kg/day PO x5 days	<i>Anti-inflammatory</i> Max dose 60 mg/dose	Hyperglycemia, hypertension, dyspepsia/peptic ulcer, increased appetite
Dexamethasone	0.6 mg/kg PO x1-2 days	<i>Anti-inflammatory</i> Max dose 16 mg	Hyperglycemia, hypertension, dyspepsia/peptic ulcer, increased appetite
Albuterol	Intermittent: 2.5-5.0 mg in 4 mL saline Continuous: 10-30 mg/hr	<i>Short acting bronchodilator</i>	Tachycardia, tremor, hypokalemia, headache, dizziness
Ipratropium	Under 6 yrs old: 0.75 mg 6 yrs and older: 1.5 mg	<i>Anticholinergic</i> Given over first hour of ED management	Tachycardia, blurred vision, headache, dizziness, dry mouth
Magnesium	25-75 mg/kg IV	<i>Smooth muscle relaxant</i> Max dose 2 grams Infuse over 20 min	Flushing, hypotension, nausea (related to rapidity of infusion)
Epinephrine	0.01 mg/kg of 1:1000 SQ/IM	<i>Alpha and beta agonist</i>	Tachycardia, nausea, tremor
Aminophylline	Load: 6-7 mg/kg IV Infusion: 0.6-1.2 mg/kg/hr IV	<i>Phosphodiesterase inhibitor</i> Titrate to serum level of 10-20 mg /dL Infuse over 20 min	Tachycardia, tremor, seizures, nausea, vomiting, agitation, arrhythmias, hypotension, seizures
Terbutaline	Load: 10 mcg/kg IV Infusion: 0.5-10 IV mcg/kg/min Subcutaneous: 0.1 mcg/kg/dose SQ q20 min x 3 doses	<i>Beta-2 agonist</i> Infuse over 20 min	Tachycardia, tremor, hypokalemia, hypotension, hyperglycemia
Ketamine	Load: 1-2 mg/kg IV Infusion: 0.5-2 mg/kg/hr IV	<i>Bronchodilator</i>	Laryngospasm, bronchorrhea, increased intraocular, hypertension, hypotension, myocardial depression

Source: [ALiEM ReSCu Peds: Case 14, Status Asthmaticus](#)

PRINCIPLES OF TEAMWORK IN HEALTHCARE

CRISIS RESOURCE MANAGEMENT: CRM, Closed loop Communication and the Shared Mental Model



CRM was established by the airline industry and popularized by high risk anesthesia teams in the 1990s. It highlights the purpose of defining clear roles for all team members for accountability. When used by all team members, closed loop communication reduces errors and improves safety through:

- Addressing team members by name when assigning tasks
- Giving verbal confirmation when tasks are acknowledged or completed

Sharing a mental model allows team-members to anticipate the plan for patient care and which equipment or medications might be needed.

COMPONENTS OF EFFECTIVE TEAMS: TEAMSTEPS IN A NUTSHELL

COMMUNICATION	LEADING TEAMS	SITUATION MONITORING	MUTUAL SUPPORT
<p>SBAR</p> <p>Situation Background Assessment Recommendation</p>	<p>BRIEF</p> <p>Planning, setting the tone</p>	<p>STEP</p> <p>Status of pt Team Members Environment Progress toward goal</p>	<p>TASK ASSISTANCE</p> <p>Awareness of team workload</p>
<p>CALL OUT</p> <p>Sharing critical information with the team</p>	<p>Huddle</p> <p>Ad-hoc planning or updates</p>	<p>"I'M SAFE"</p> <p><i>Tool for self evaluation</i></p> <p>Illness Medication</p>	<p>FEEDBACK</p> <p>Providing information for purpose of team improvement</p>
<p>CHECK BACK</p> <p>Loop Closure**</p>	<p>DEBRIEF</p> <p>Exchange of information to inform team of performance and effectiveness</p>	<p>Stress Alcohol/Drugs Fatigue Eating + Elimination</p>	<p>ADVOCACY & ASSERTION</p> <p>Advocating for patient in case of a disagreement with decision maker</p>
<p>HANDOFF</p> <p>I PASS the BATON</p> <p>Introduction</p> <p>Patient Assessment Situation Safety Concern</p> <p>Background Actions Timing Ownership Next</p>			<p>2 CHALLENGE RULE</p> <p>Information conflict regarding patient safety</p>
<p>Cognitive Aid @DrM_Kou</p>			<p>DESC Script</p> <p><i>Tool for personal conflict*</i></p> <p><u>D</u>escribe situation <u>E</u>xpress concern <u>S</u>uggest alternative <u>S</u>tate <u>C</u>onsensus</p>
<p>LINK TO AHRQ RESOURCES</p> <p>https://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/modules/implement/teamworknotes.html</p>			<p>CUS STATEMENT</p> <p>I'm <u>c</u>oncerned I'm <u>u</u>ncomfortable This is a <u>s</u>afety issue</p>
			<p>COLLABORATION</p> <p>Working toward a common mission</p>

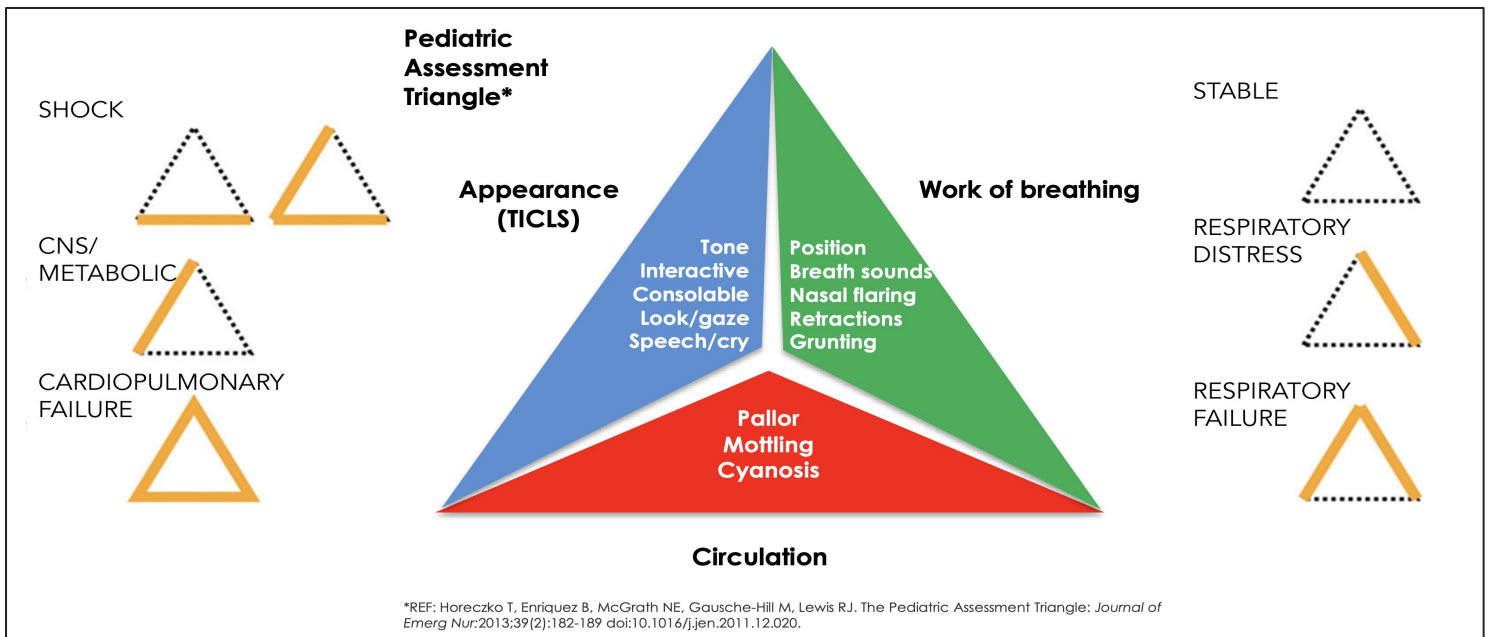
Pediatric Vital Signs/Weight by Age

Age	Weight (kg)	Pulse	Resp	Systolic BP*
Newborn	3	100-180	30-60	60-70
6 mos	7	100-160	30-60	70-80
1 yr	10	100-140	24-40	72-107
2	12	80-130	24-40	74-110
3	15	80-130	24-40	76-113
4	16	80-120	22-34	78-115
5	18	80-120	22-34	80-116
6	20	70-110	18-30	82-117
8	25	70-110	18-30	86-120
10	35	60-100	16-24	90-123
12-15+	40-55	60-100	16-24	90-135

*BP in children is a late and unreliable indicator of shock



Using the Pediatric Assessment Triangle (PAT)



Pediatric Mental Status Assessment: response to stimuli



OVERVIEW

[Guidelines from the National Asthma Education and Prevention Program](#)

VIDEOS, BLOGS & PODCASTS

[Children's Hospital of Philadelphia PEM Podcast: Severe Asthma](#)

[Grudge match: Dexamethasone versus prednisolone in acute asthma: PEM Currents](#)

[PEM Blog Why We Do What We Do: Treatments for Severe Asthma](#)

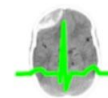
[Ventilation strategies for the critically ill asthmatic](#)

ALGORITHMS

[Asthma Clinical Pathway/Algorithm by Children's Hospital of Philadelphia](#)

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Please complete the facilitator and participant surveys by clicking on the links
or scanning the QR codes below:

Facilitator Survey



Participant Survey



Posted: April 2023

Updated: Jan 2024

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