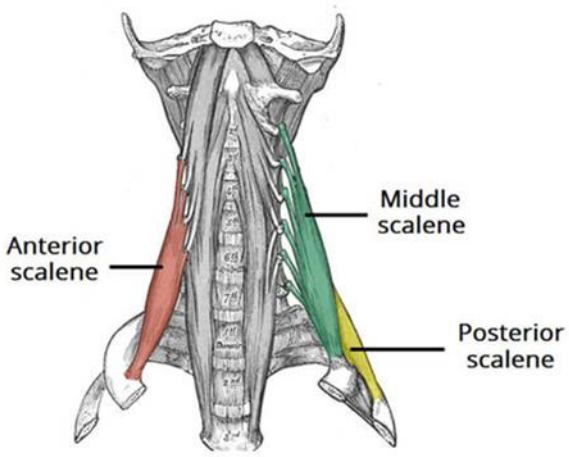
Pediatric Respiratory Assessment Measure (PRAM)

	0	1	2	3
Suprasternal Retractions	Absent		Present	
Scalene Muscle Contraction	Absent		Present	
Air Entry	Normal	Decreased at base	Diffusely decreased	Absent/minimal
Wheezing	Absent	Expiratory only	Inspiratory and expiratory	Audible without a stethoscope/air entry absent or minimal
Oxygen Saturation	≥95% RA And no O2	92-94% RA And no O2	<92% RA 0r on O2	

Total Score _____



SCALENE MUSCLES

Pediatric Asthma Pathway (ED)

ED Phase 1a: Initial Assessment (within 30 min of arrival)

There is no role for routine CXR or blood gas

PRAM 1-3	PRAM 4-7	PRAM 8-12
Albuterol + ipratropium (max 3 doses back to back) Consider: - Corticosteroid	Albuterol +ipratropium (max 3 doses back to back) Corticosteroid	Albuterol + ipratropium (3 doses back to back) Continuous or q1H albuterol Corticosteroid Magnesium Consider: - Terbutaline - Epinephrine - BiPAP/ HFNC

ED Phase 1b: Reassessment Hourly x 2h minimum

PRAM 1-3	PRAM 4-7 Admit to Floor*		PRAM 8-12 Admit to PICU
	O2 sat >92% on Room Air	**O2 sat <92% on Room Air**	
Discharge with albuterol Consider: - Corticosteroid	Albuterol q2H Corticosteroid Consider: - Magnesium	Administer O2 Corticosteroid Albuterol q2H Consider: - Continuous or q1H albuterol - Magnesium - BiPAP - PICU consult	Continuous or q1H albuterol Corticosteroid Magnesium Consider: - Terbutaline - Epinephrine - BiPAP/ HFNC Refer to PICU pathway

If patient is on **continuous albuterol or q1H treatment**, admit patient to **PICU**.
If Albuterol at **q2H, admit to floor** for further management.
Consider BI Short Stay Unit for admissions anticipate to last <48h.

***If patient is a floor patient boarded in ED, use floor pathway**
***If patient is admitted to observation status in ED, use ED Obs pathway**

ED Discharge Checklist

- Nebulizer/MDI frequency doable at home
- Consider step-up therapy
- Prescriptions
- Recommended appointments and contact numbers (PMD, Pulmonology/Chest Clinic if needed)
- Place asthma action plan in AVS: .pedsasthmaplaneng or .pedsasthmaplanspan
- Consider completing asthma MAF
- Consider referral to AIRnyc for home-based asthma education, skill building, and environmental assessment: 718-577-2794; www.air-nyc.org Use MSH password carecoordination to complete referral.
- Tobacco smoke exposure: Refer to NY State Quitline 1-800-697-8487; www.nysmokefree.com

Include: Patients treated for asthma in ED, ≥2 years of age

Exclude: children <2 years, bronchiolitis, pneumonia, ***chronic*** lung disease, airway anomalies, history of arrhythmias or heart disease, immune disorder, sickle cell disease

Medication Dosing

Albuterol:
<15kg: 4 puffs MDI or 2.5 mg nebulized
15-25kg: 6 puffs MDI or 5mg nebulized
≥25 kg: 8 puffs MDI or 7.5 mg nebulized

Continuous albuterol via nebulizer:
<20 kg: 10 mg/hr
≥20 kg: 15 mg/hr

Ipratropium bromide:
500 mcg nebulized

Dexamethasone (oral/IM):
0.6 mg/kg (max 16mg)
*2 days of dexamethasone is equivalent to 5 days of prednisone/prednisolone

Prednisone or Prednisolone (oral):
1st dose: 2 mg/kg/day (max dose 60 mg/day) followed by 1-2 mg/kg/day for 3-5 days

Methylprednisolone (IV):
First dose: 2 mg/kg (max- 60mg) followed by 1 mg/kg IV q6h (max 125 mg/day)

Indications for IV/IM steroids:
Inability to tolerate PO or concern for inadequate GI absorption.

Adjunct Therapies

Magnesium sulfate (IV):
50-75 mg/kg (max 2g) over 20 minutes

Terbutaline (SQ):
<12y: 0.005-0.01 mg/kg/dose (max 0.4 mg/dose) q20 min x 3 doses
>12y: 0.25 mg/dose q20 min x 3 doses (max total dose 0.75mg)

Terbutaline (IV):
Bolus: 2-10mcg/kg over 10 min (if >50kg, max 5mcg/kg), followed by Continuous 0.08-0.4mcg/kg/ min
May titrate every 30 min

Epinephrine:
(1:1000 = 1 mg/ml): 0.01 mg/kg (max 0.4 mg) given SQ or IM q10-20min

Pediatric Asthma Pathway (ED Observation)

Observation Admission Criteria:
ED Arrival after 7PM. PRAM 4-7 after ED Phase 1a
Exclusion: O2 Requirement or clinically unlikely to improve by next morning

Phase 2: Albuterol q2h

Reassessment q2h

PRAM 1-3:	PRAM 4-7:	PRAM 8-12:
After one treatment in this phase, move to Phase 3 Continue corticosteroid Assess O2, wean as able	Continue albuterol q2h Continue corticosteroid Assess O2, wean as able	Escalation Pathway Admit

Phase 3: Albuterol q3H

Reassessment q3h

PRAM 1-3:	PRAM 4-7:	PRAM 8-12:
After one treatment in this phase, move to Phase 4 Continue corticosteroid Assess O2, wean as able Consider Discharge	Continue albuterol q3h Continue corticosteroid Assess O2, wean as able Consider Admission if on ED Observation >9:00 AM	Step back to prior phase Escalation Pathway Admit

Phase 4: Albuterol q4H

Reassessment q4h

PRAM 1-3:	PRAM 4-7:	PRAM 8-12:
Discharge after one treatment	Continue albuterol q4h Continue corticosteroid Assess O2, wean as able Consider Admission if on ED Observation >9:00 AM	Step back to prior phase Escalation Pathway Admit

Discharge Checklist

- Nebulizer/MDI frequency doable at home
- Consider step-up therapy
- Prescribed medications
- Place asthma action plan in AVS: .pedsasthmaplaneng or .pedsasthmaplanspan
- Asthma MAF
- Appointment with PMD and Pulmonology/Chest Clinic (if needed) and contact numbers
- Consider referral to AIRnyc for home-based asthma education, skill building, and environmental assessment: 718-577-2794; www.air-nyc.org Use MSH password carecoordination to complete referral.
- Tobacco smoke exposure: Refer to NY State Quitline 1-800-697-8487; www.nysmokefree.com

Include: Patients treated for asthma in the ED, ≥2 years of age

Exclude: children <2 years, bronchiolitis, pneumonia, chronic lung disease, airway anomalies, history of arrhythmias or heart disease, immune disorder, sickle cell disease

Medication Dosing

Albuterol:
<15kg: 4 puffs MDI or 2.5 mg nebulized
15-25kg: 6 puffs MDI or 5mg nebulized
≥25 kg: 8 puffs MDI or 7.5 mg nebulized

Ipratropium bromide:
500 mcg nebulized

Dexamethasone (oral/IM):
0.6 mg/kg (max 16 mg)
*2 days of dexamethasone is equivalent to 5 days of prednisone/prednisolone

Prednisone or Prednisolone (oral):
1st dose: 2 mg/kg/day (max dose 60 mg/day) followed by 1-2 mg/kg/day for 3-5 days

Methylprednisolone (IV):
First dose: 2 mg/kg (max- 60mg) followed by 1 mg/kg IV q6h (max 125 mg/day)

Adjunct Therapies

Magnesium sulfate (IV):
50-75 mg/kg (max 2g) over 20 minutes

Terbutaline (SQ):
<12y: 0.005-0.01 mg/kg/dose (max 0.4 mg/dose) q20 min x 3 doses
>12y: 0.25 mg/dose q20 min x 3 doses (max total dose 0.75mg)

Terbutaline (IV):
Bolus: 2-10mcg/kg over 10 min (if >50kg, max 5mcg/kg), followed by Continuous 0.08-0.4mcg/kg/ min
May titrate every 30 min

Epinephrine:
(1:1000 = 1 mg/ml): 0.01 mg/kg (max 0.4 mg) given SQ or IM q10-20min

Escalation Pathway

- Consider Adjunct Therapies
- Albuterol + Ipratropium
- Reassess after interventions
- If PRAM still >/= 8 admit to PICU
- If PRAM <8, nebs q2 h+ = admit to floor or consider transfer to BI Short Stay if admission likely < 48 hours.

Pediatric Asthma Pathway (Inpatient Floor)

Admission checklist:
History (ED visits, hospitalization, ICU, intubated, corticosteroid use in past year, atopy, family history)
Triggers (tobacco smoke exposure, weather, illness, exercise, animals)
Use orderset "Pediatric Asthma Admission MSH IP"
Order IP Consult to Pediatric Environmental Medicine and Public Health

Phase 2: Albuterol q2h

Reassessment q2h

PRAM 8-12:	PRAM 4-7:	PRAM 1-3:
Refer to escalation pathway	Continue albuterol q2h Continue corticosteroid Assess O2, wean as able	After one treatment in this phase, move to Phase 3 Continue corticosteroid Assess O2, wean as able

Phase 3: Albuterol q3h

Reassessment q3h

PRAM 8-12:	PRAM 4-7:	PRAM 1-3:
Step back to prior phase Consider escalation pathway	Continue albuterol q3h Continue corticosteroid Assess O2, wean as able	After one treatment in this phase, move to Phase 4 Continue corticosteroid Assess O2, wean as able

Phase 4: Albuterol q4H

Reassessment q4h

PRAM 8-12:	PRAM 4-7:	PRAM 1-3:
Step back to prior phase Consider escalation pathway	Continue albuterol q4h Continue corticosteroid Assess O2, wean as able	Discharge after one treatment

Discharge Checklist

- Nebulizer/MDI frequency doable at home
- Education by Asthma Social work
- Consider step-up therapy
- Delivery of prescribed medications
- Place asthma action plan in AVS: .pedsasthmaplaneng or .pedsasthmaplanspan
- Asthma MAF
- Appointment with PMD and Pulmonology/Chest Clinic if needed, with contact numbers
- Consider referral to AIRnyc for home-based asthma education, skill building, and environmental assessment: 718-577-2794; www.air-nyc.org Use MSH password carecoordination to complete referral.
- Tobacco smoke exposure: Refer to NY State Quitline 1-800-697-8487; www.nysmokefree.com

Include: Patients treated for asthma on the floor, ≥2 years of age

Exclude: children <2 years, bronchiolitis, pneumonia, chronic lung disease, airway anomalies, history of arrhythmias or heart disease, immune disorder, sickle cell disease

Medication Dosing

Albuterol:
<15kg: 4 puffs MDI or 2.5 mg nebulized
15-25kg: 6 puffs MDI or 5mg nebulized
≥25 kg: 8 puffs MDI or 7.5 mg nebulized

Ipratropium bromide:
500 mcg nebulized

Dexamethasone (oral/IM):
0.6 mg/kg (max 16 mg)
*2 days of dexamethasone is equivalent to 5 days of prednisone/prednisolone

Prednisone or Prednisolone (oral):
1st dose: 2 mg/kg/day (max dose 60 mg/day) followed by 1-2 mg/kg/day for 3-5 days

Methylprednisolone (IV):
First dose: 2 mg/kg (max- 60mg) followed by 1 mg/kg IV q6h (max 125 mg/day)

Indications for IV/IM steroids:
Inability to tolerate PO or concern for inadequate GI absorption.

Adjunct Therapies

Magnesium sulfate (IV):
50-75 mg/kg (max 2g) over 20 minutes

Escalation Pathway

- Albuterol + Ipratropium: 3 doses q20mins over 1 hour
- Reassess after interventions
- If PRAM still >/= 8 call RRT
- Consider Magnesium if accepted to PICU

Pediatric Asthma Pathway (PICU)*

Admission checklist:
History (ED visits, hospitalization, ICU, intubated, corticosteroid use in past year, atopy, family history)
Triggers (tobacco smoke exposure, weather, illness, exercise, animals)
Use orderset "Pediatric ICU Asthma Admission MSH IP"
Order IP Consult to Pediatric Environmental Medicine and Public Health

Continuous Albuterol
O2
Consider noninvasive ventilation
Continue/ Initiate Methylprednisolone
Consider repeating Magnesium

Reassessment q30 min x 2 then q1h

PRAM 1-5:	PRAM 6-7:	PRAM 8-12:
Enter weaning pathway Oral corticosteroid Assess O2, wean as able	Continue continuous Albuterol Continue IV corticosteroid Assess O2, wean as able If score significantly improved, consider: - Weaning pathway - Oral steroid	Continue continuous albuterol Continue IV corticosteroid Consider: - Terbutaline - Noninvasive ventilation - Mechanical ventilation
Weaning Pathway	**Reassessment q1h**	**Reassessment q1h If PRAM > 10 reassessment q15-30min**

Weaning Pathway

Reassessment q1h**

PRAM 1-5:	PRAM 6-7:	PRAM 8-12:
Discontinue noninvasive ventilation Wean Terbutaline Continue continuous albuterol Continue corticosteroid Assess O2, wean as able//	Consider: - Weaning noninvasive ventilation support - Weaning Terbutaline Continue continuous albuterol Continue corticosteroid Assess O2, wean as able	Exit weaning pathway Return to Severe pathway above

Reassessment q1h**

PRAM 1-5:	PRAM 6-7:	PRAM 8-12:
Wean terbutaline off Stop continuous Albuterol Start albuterol q2h Oral corticosteroid Assess O2, wean as able	If off noninvasive ventilation AND terbutaline: Stop continuous albuterol Start albuterol q2h Oral corticosteroid Assess O2, wean as able	Exit weaning pathway Return to Severe pathway above

Reassessment q1h x 2h minimum

PRAM 1-5:	PRAM 6-7:	PRAM 8-12:
Assess O2, wean as able Transfer to floor	Assess O2, wean as able Consider transfer to floor	Exit weaning pathway Return to Severe pathway

Medication Dosing

Continuous Albuterol (via nebulizer):
<20kg: 10mg/hr
≥20kg: 15mg/hr

Methylprednisolone:
First dose: 2 mg/kg (max 60 mg) followed by 1mg/kg IV q6h (max 125 mg/day)

Magnesium sulfate (IV):
IV: 50-75mg/kg (max 2g) over 20 min

Terbutaline (SQ):
<12y: 0.005-0.01 mg/kg/dose (max 0.4 mg/dose) q20 min x 3 doses
>12y: 0.25 mg/dose q20 min x 3 doses (max total dose 0.75mg)

Terbutaline (IV):
Bolus: 2-10mcg/kg over 10 min (if >50kg, max 5mcg/kg), followed by Continuous 0.08-0.4mcg/kg/ min
Titrate to effect

Epinephrine:
(1:1000 = 1 mg/ml): 0.01 mg/kg (max 0.4 mg) given SQ or IM q10-20min

Weaning Medications

Continuous Albuterol:
Wean to 10 mg/hr for 2 hrs then stop if PRAM ≤5 and use intermittent albuterol

Albuterol dosing:
<15kg: 4 puffs MDI or 2.5 mg nebulized
15-25kg: 6 puffs MDI or 5mg nebulized
≥25 kg: 8 puffs MDI or 7.5 mg nebulized

Methylprednisolone:
IV: 1 mg/kg q6hrs
Switch to Prednisone/Prednisolone if off assisted ventilation and on PO

Prednisone or Prednisolone (oral):
1st dose: 2 mg/kg/day (max dose 60 mg/day) Subsequently: 1-2 mg/kg/day for 3-5 days

Terbutaline:
Wean by 50% q1hr x 2 then turn off

***If patient is floor patient boarded in PICU, use floor pathway**

****These steps may be repeated**