# Clinical Guideline

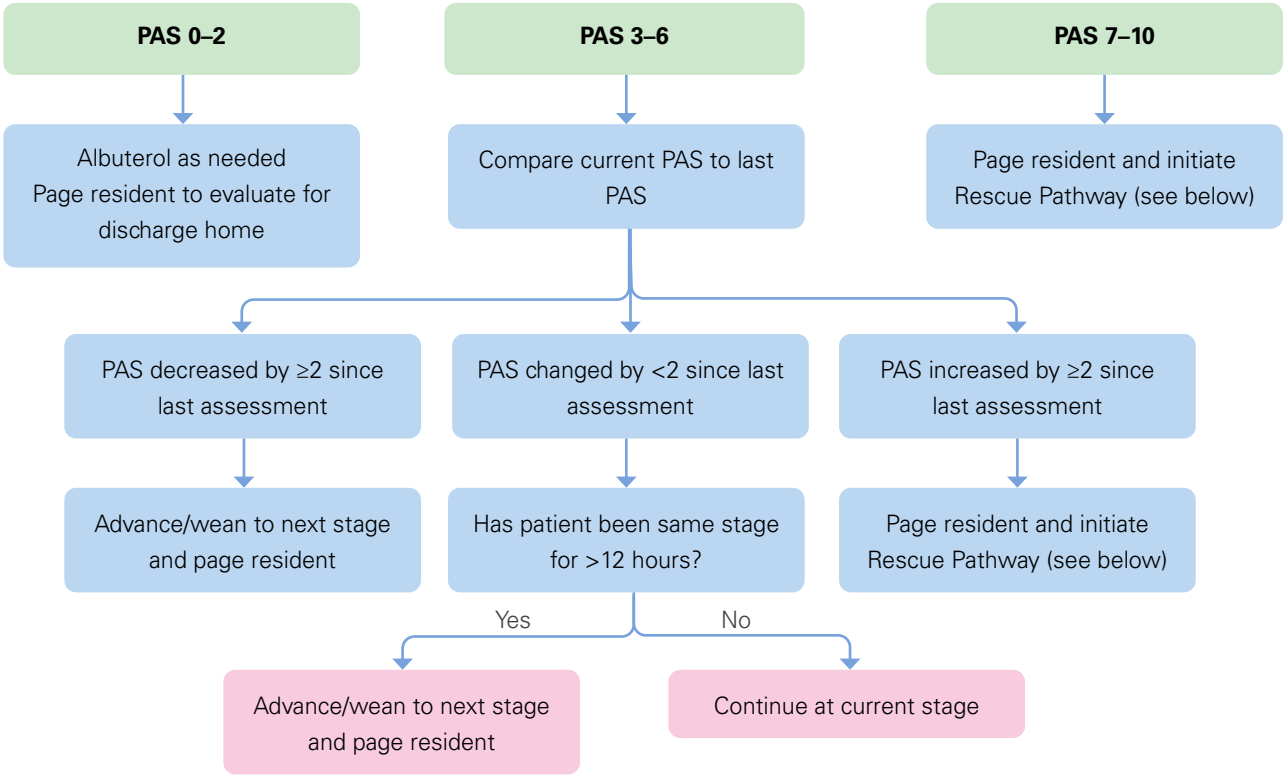
## Asthma

### Pediatric Acute Care

*This guideline should not replace clinical judgment.*

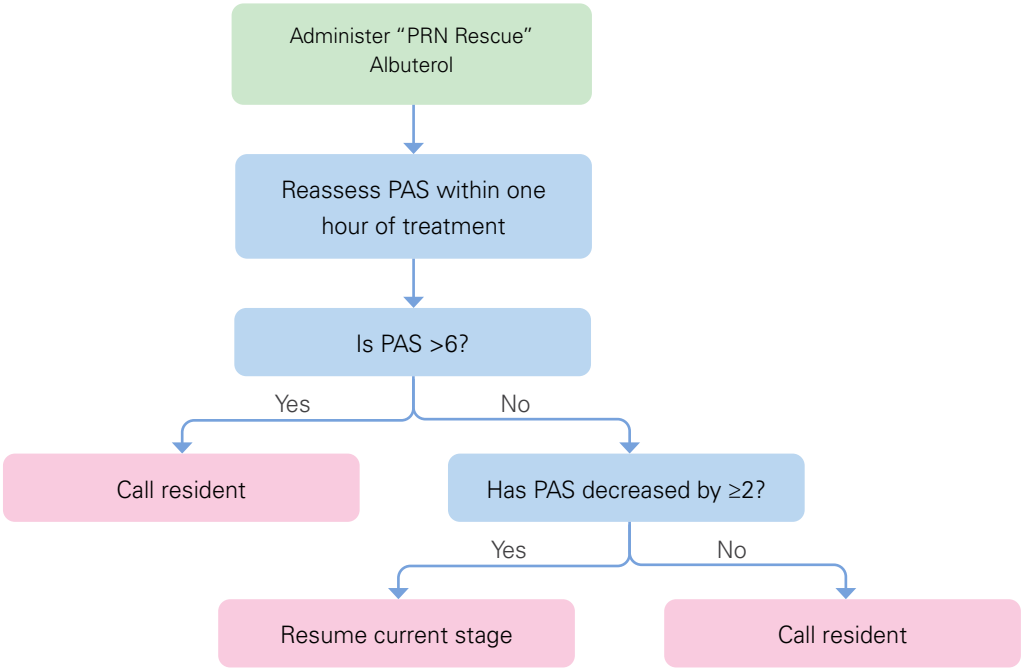
**Some children with severe chronic airway inflammation may have persistent wheezing and hypoxia without signs of respiratory distress after bronchospasm has resolved. If this is suspected, the appropriate treatment should be discussed with the pulmonary consultant.*

**PAS Assessment Pathway: How a patient progresses toward discharge**




**Rescue Pathway**

***Call RRT as needed**




Children's Hospital of Richmond at VCU

For questions concerning this guideline, contact:
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Last updated: November 2022
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**Standard medications (for all patients)**

- Albuterol MDI 6 puffs regardless of weight and age.
- MDI delivery should incorporate a valved holding chamber with either a mouthpiece or facemask, dependent upon patient's ability to coordinate placement and inhalation, under age 4 years use mask, over age 4 years can try mouthpiece. The mouthpiece on valved holding chamber roughly doubles airway deposition compared to mask.
- Use nebulized albuterol only if patient is unable to perform/tolerate MDI delivery
- Continue patient's prescribed inhaled corticosteroids.

**Initiate supplemental oxygen if SpO2<90%**

**Inclusion criteria**

- Children age 2–18 years
- Known history of asthma
- History consistent with asthma, use of albuterol, symptoms of reversible airway obstruction

**Exclusion criteria**

- Age<2 or >18 years
- Other pulmonary diseases including: CLD, CF, bronchiolitis, croup, stridor, aspiration, pneumonia, BPD,
- Airway issues including: vocal cord paralysis, tracheostomy, tracheomalacia
- Congenital heart disease
- Neurologic diseases including: cerebral palsy, ventilator dependence
- Sickle cell anemia
- ICU status

*Patients with the exclusion health conditions are not excluded from asthma exacerbation treatment

**Notify provider**

- For all stage transitions based on respiratory assessment
- Signs of clinical deterioration (PEWS increasing, PAS of 7 or higher, silent chest exam, drowsiness, confusion, agitation) consider calling an RRT

**Asthma education to begin at admission and include:**

- Pulmonary consultant and UCAN involvement
- Parental knowledge assessment and education on etiology, prognosis, risk factors of exacerbation
- Focus on modifiable environmental exposures: smoking cessation, avoidance of known triggers (if patient has a positive smoking screen family to receive educational handout and cessation counseling)
- Medication compliance
- Demonstration of proper MDI usage
- Asthma action plan reviewed (completed asthma action plans are available in UCAN folder outside education office.)

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**Discharge criteria**

- Patient is well appearing and has a low PAS score (0-2).
- PO adequate to maintain hydration
- Patient has been off supplemental oxygen for >12 hours
- Flu and COVID vaccine offered (if not given previously)
- Recommendations for controller medication(s) made and discussed with family if indicated
- Prescriptions complete and in hand or escribed
- Asthma education complete, asthma discharge folder provided to parent (Folder to be provided and reviewed with parent/patient by UCAN nurse or provider. If UCAN provider is not available, folder to be reviewed with parent/patient by Pediatric Hospital Medicine provider. Extra folders are in UCAN folder outside education office.)
- Plan communicated with pediatrician and follow up arranged
- Follow up scheduled with pulmonology unless not indicated

**Discharge plan**

- Pediatrician follow up within 3 days from discharge
- Prednisolone/prednisone 1mg/kg/day (round up), max dose 60mg/day. Total length of administration, on average, should be 5 days but may be 3–10 days, depending on the perceived degree of airway inflammation as judged by history and clinical inpatient course. Pulmonology consult should be helpful in making this determination. Preferred administration time is afternoon/evening, however a time of day that family would remember to administer daily is most important.
- Albuterol MDI 6 puffs q4–6 hours PRN for cough or wheezing.
- Discharge instructions to include: If significant wheezing develops, administer 6 puffs every 4–6 hours. If your child needs more frequent albuterol treatments, call pediatrician or UCAN program or return to the emergency department.
- If discharge team considers parent or child to be a poor perceiver of asthma symptoms, albuterol may be prescribed every 4–6 hours for the first 24–48 hours post discharge with pediatrician follow up at that time.

## Phase 1

Initial assessment using Modified Pediatric Asthma Score (PAS)

- Does patient meet inclusion criteria
- Is patient followed by Pulmonology and have they been contacted in the ED

**Table 1: (Modified) Pediatric Asthma Score**

| Variable | Score | | |
|---|---|---|---|
| | **0 points** | **1 point** | **2 points** |
| **Resp Rate (b/min)**<br>2–3 years<br>4–5 years<br>6–12 years<br>>12 years | <br><35<br><31<br><27<br><24 | <br>35–39<br>31–35<br>27–30<br>24–27 | <br>>39<br>>35<br>>30<br>>27 |
| **Dyspnea** | Full sentences **and** good PO intake | Poor sentences **or** poor PO | Single words **or** unable to PO |
| **Retractions*** | 1 or less accessory group | 2 accessory groups | 3 or more accessory groups |
| **Auscultation** | Normal breath sounds | Expiratory wheezing only | Inspiratory and expiratory wheezing **or** diminished breath sounds |
| **Oxygen Sats (%) On Room Air** | >95 | 90–95 | <90 |

*Accessory muscle groups considered in evaluation of retractions:
1. Nasal (flaring), 2. Supra-sternal (retractions), 3. Intercostals (retractions), 4) Substernal (retractions)

**Instructions for assessment of PAS**

1. If applicable, turn oxygen therapy off on entry into patient's room.
2. Step-wise assesment (RR, Dyspnea, Retractions, Auscultation).
3. Throughout assessment, monitor oxygen saturation. Determine score for oxygen saturation based on overall assessment throughout exam (i.e. an unsustained downward drift to 88% with self-resolution to 94% would be scored as "1." Alternatively, a progressive decline in saturations from 97% to 85% following cessation of $0_2$ should be scored as "2" and oxygen therapy should be resumed immediately.)
4. Calculate total score.

# Asthma

## Pediatric Acute Care

### Phase 2

Provider uses total score from PAS to determine appropriate intensity of service and bronchodilator stage

**Table 2: Initial Assessment of Service and State**

| Score | Intensity of Service | Brochodilator Stage |
|---|---|---|
| **7–10** | Intensive Care Unit | Stage 1 |
| **3–6** | Inpatient Floor | Stage 2 |
| **0–2** | 23-hour observation or discharge home from pediatric Emergency Department | Stage 3 |

### Phase 3

Determine albuterol frequency and PAS assessment frequency as per Bronchodilator stage

- Follow titrating protocol
- Begin asthma education

**Table 3: Description of Bronchodilator Stages**

| Stage/PAS Score | Bronchodilator | Frequency of PAS assessments | Other |
|---|---|---|---|
| **Stage 1 /7–10** | Albuterol Neb Cont | Every hour | See PICU pathway for Status Asthmaticus |
| **Stage 2/3–6** | Albuterol MDI q2 hrs | Every 2 hrs | Asthma ed |
| **Stage 3/0–2** | Wean albuterol MDI, administer as needed | Every 4 hrs | -Asthma ed<br>-Fill Rx<br>-Evaluate for d/c |

**A rapidly improving patient can quickly move through bronchodilator stages and pathway, PAS score and frequent reassessments can help to determine treatment and discharge home.*

### Phase 4

Nurse and/or RT performs PAS at interval depicted based on stage, see table above

- Nurse and/or RT uses total score from PAS to determine next course of action

(PAS Assessment Pathway Algorithm on page 1)

### Phase 5

Assess the patient for discharge status

(Discharge criteria on page 3)

# Pediatric Acute Care Asthma Guideline
# **Executive Summary**

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