

Keegan DA
Kim G
Thornton TH



Diagnosis

3 key elements to diagnosis:

1. Documentation of Airflow Obstruction

Preferred: documented wheezing and/or other signs of obstruction by MD or other health professional.

Alternative: convincing parent/ guardian report of wheezing or other obstructive symptoms.

2. Documentation of Reversibility of Airflow Obstruction

Preferred: documented improvement of wheezing and/or other signs of obstruction by MD or other health professional, in response to SABA +/- steroid.

Alternative 1: convincing parent/guardian report of improvement of obstructive symptoms in response to 3 mo tx with ICS (and PRN SABA)

Alternative 2: convincing parent/guardian report of improvement of obstructive symptoms in response to SABA

3. No Clinical Evidence of Alternative Diagnosis

Clues for Alternative Diagnoses

chronic nasal discharge	rhinosinusitis (infxs. or allergic)
stridor; loud breathing when crying, eating, supine, resp infxn	upper airway obstruction (infxs, intrinsic, extrinsic)
acute onset cough/wheeze when eating or playing; recurrent pneumonia (same location)	foreign body; aspiration (food, gastric contents)
first wheeze and child < 1y.o.	bronchiolitis
sick contacts, xray with focal findings	pneumonia, atelectasis, TB, pertussis
paroxysms of cough +/- whoop	pertussis
prem. birth, prolonged O ₂ +/- vent sx since birth, +ve xray, recurrent pneumonia	bronchopulmonary dysplasia congenital pulm. artery malform.; bronchiectasis; cystic fibrosis
neon. resp. distress, chronic daily cough	primary ciliary dyskinesia
cough when supine, eating	GERD
difficulty feeding, cough with/post feeding	eosinophilic esophagitis; swallowing problem +/- aspiration
recurrent, persist. infections	immune disorder
murmur, heart failure, FTT, tachypnea, hepatomegaly	pulm. edema 2° to myocarditis, pericarditis, congen. cardiac dz

3 ways to diagnose:

1. Reversible Airway Obstruction on Spirometry (Preferred)

↓ FEV₁/FEV (vs. norms) **and** ≥ 11% ↑ in FEV₁ after SABA or ICS course

2. Peak Expiratory Flow Variability (Alternative)

≥ 20% improvement in PEF with SABA or ICS course (or in adults, > 8% variability during the day, or >20% over multiple days)

3. Positive Challenge Test (Alternative)

positive methacholine challenge test, or positive exercise challenge (> 10% ↓ in FEV₁ following exercise)

CHILDREN < 6 y.o.

6 y.o. - ADULTS

Check-Up

1. Assess control: good control if following criteria are met

- | | |
|---|--|
| <input type="checkbox"/> no daytime symptoms | <input type="checkbox"/> no nighttime symptoms |
| <input type="checkbox"/> normal physical activity | <input type="checkbox"/> mild/infrequent exacerbations |
| <input type="checkbox"/> no school/work absences | <input type="checkbox"/> < 4 doses SABA / wk (not counting 1 dose/day for exercise sx) |
| <input type="checkbox"/> FEV ₁ or Peak flow > 90% pers. best | |

2. Observe & assess inhaled drug technique (use mask chamber if < 6 years old)

Routine Management

1. Develop Asthma Action Plan with patient; involve asthma educator if available

2. Address co-morbidities: rhinitis, GERD, obesity

3. Environmental control:

- smoking cessation & avoidance
- dust/particle exposure reduction
- allergy testing & allergen avoidance

4. Maintenance Drug therapy: First line: All patients should have PRN short-acting β₂-agonist (eg. salbutamol) AND inhaled corticosteroids (ICS) (ICS starting dose should be customized to patient's initial severity and age)

Typical Age Dose Ranges (years)	DAILY equivalency	Beclomethasone (Qvar device)	Fluticasone	Budesonide (turbuhaler device)	Ciclesonide (not for <6 years old)
0-6	Ultra low	100ug	100-125ug	100ug	100ug
6-11	Low dose	200ug	200-250ug	200ug	200ug
> 11	Medium	400ug	500ug	400ug	400ug
	High	> 400ug	> 500ug	>400ug	800ug

If insufficient control, consider:

- ↑ ICS dose
- adding long-acting β₂-agonist or leukotriene antagonist
- exploring alternate/comorbid conditions

5. Exacerbation:

[A] determine (and resolve if possible) underlying cause(s):

- tobacco/irritant/allergen exposure
- respiratory infection
- medication/administration errors

[B] give oral systemic steroids

Kids: prednisone (or prednisolone) 1-2 mg/kg (up to 50mg/day) x 5 days or dexamethasone 0.3-0.6 mg/kg x 1-5 days
Adults (and kids > 50kg): prednisone 50mg daily x 5 days

Emergency Management

- O₂ if hypoxic; activate EMS & arrange transportation to ED
- salbutamol by chamber mask (or nebulizer); may require back-to-back dosing
- systemic steroids if initial SaO₂ <96% (children), <94%(adults)
- consider ipratropium bromide, MgSO₄
- if deteriorating, rule out pneumothorax and upper airway obstruction
↳ consider IV β₂- agonist, inhalational anaesthetics, intubation