

Patient presents with respiratory signs & symptoms suggesting asthma – cough, wheezing, SOB, chest tightness

**Diagnosis: History and Physical – avoid under diagnosing asthma to reduce morbidity**

Diagnosis may be made from history and response to medications  
 Consider symptom pattern, precipitating factors, patient/family history of atopy, “colds” lasting > 10 days (a) or + asthma predictive index (e)  
 •Consider differential diagnosis (a)  
 •If asthma diagnosis is indicated, proceed.

**Assess SEVERITY if newly diagnosed or LEVEL of CONTROL in established asthmatics and Educate**

• Administer Test for Respiratory and Asthma Control in Kids “TRACK” (for patients on established medication for asthma) (b)  
 •Categorize level/severity (for patients not on controller medication for asthma) (Table 1 or c)

Assign to one of six treatment steps based on severity or level of control (f); initiate long-term control therapy as appropriate (e); treat co-morbidities (i.e. allergic rhinitis, GERD, etc.)

<p><b>Step 1 (g) (Intermittent Asthma)</b>  <i>Preferred:</i>  <b>SABA PRN</b>                  (inhaled short-acting beta<sub>2</sub>-agonist)</p>	<p><b>Step 2 (g)(Persistent Asthma)</b>  <i>Preferred:</i>  <b>SABA PRN + Low-dose ICS</b>                  (inhaled corticosteroid)  <i>Alternative:</i>                  Montelukast</p>	<p><b>Step 3 (g) (Persistent Asthma)</b>  <i>Preferred:</i>  <b>SABA PRN + Medium-dose ICS</b></p>	<p><b>For Step 4, 5 and 6:</b>                  Consider referral to RN Health Coach (or local equivalent) to evaluate adherence/barriers</p>	<p><b>Step 4 (g) (Persistent Asthma)</b>  <i>Preferred:</i>  <b>SABA PRN + Medium-dose ICS + LABA*</b>                  (inhaled long-acting beta<sub>2</sub>-agonist) or Montelukast</p>	<p><b>Step 5 (g) (Persistent Asthma)</b>  <i>Preferred:</i>  <b>SABA PRN + High-dose ICS + LABA* or Montelukast</b></p>	<p><b>Step 6(g) (Persistent Asthma)</b>  <i>Preferred:</i>  <b>SABA PRN + High-dose ICS + LABA* or Montelukast + oral corticosteroid</b></p>
<p>Use treatment step necessary to gain and maintain control. Reassess at each asthma visit. Exacerbations may require stepping up and a short course of oral corticosteroids. If using reliever for symptoms &gt; 2 days for weeks, step up therapy. <b>*Do not use LABA alone without daily anti-inflammatory medicine. Efficacy of LABA with ICS not established for &lt; age 5.</b></p>						

**Education of Caregivers**

Medication use: Controller vs. Reliever, Indications, Adverse Reactions  
 •Inhaler technique and use of holding device in all MDP’s, holding chamber with mask, or home nebulizer use if indicated (if too young to use mouthpiece, use mask not blow-by method)  
 •Identification & avoidance of triggers (d), family smoking cessation if needed and annual influenza vaccination for children > 6 months old. Promote active participation in physical activities.  
 •**Outline Asthma Action Plan (d):** monitor symptom and reliever medicine use, guidelines for seeking medical help. With viral respiratory symptoms: SABA q 4-6 hours up to 24 hours – consult physician if need > 24 hours. May need short course of oral corticosteroids.  
 •Consider subcutaneous allergy immunotherapy for patients who have persistent, allergic asthma

**Reassess**

If no clear and beneficial response in 4-6 weeks stop therapy and consider alternative diagnosis. If clear and beneficial response sustained for at least 3 months, consider step down therapy. Follow up well controlled every 1-6 months, every 2-6 weeks for partly controlled, and at 2 weeks for uncontrolled patients. Monitor linear growth closely. For medicine side effects consider alternative medications. Do TRACK (Test for Respiratory and Asthma Control in Kids) at every visit. Review Action Plan every visit.

Goals of therapy met (h); TRACK ≥ 80 and asymptomatic

**Consider These Before Stepping Up**

- Reassess medication adherence (especially daily use of controller)
- Evaluate inhaled medicine technique
- Adherence to environmental control
- Investigate other possible precipitating factors (i.e. allergens, GERD, Sinus infection, vocal cord dysfunction, etc) or asthma mimickers
- Consider consultation with asthma specialist (pediatric pulmonologist or allergist) if needing step 3 therapy; consult if needing step 4 or higher

**Follow up at 6 month intervals:**

- TRACK and action plan
- Environmental control
- Flu shot > 6 months age
- Medication review
- Monitor linear growth

**Table a: Asthma Signs, Symptoms and Triggers**

- Wheezing
- History of any of the following
  - Cough, worse particularly at night
  - Recurrent wheeze
  - Recurrent difficult breathing
  - Recurrent chest tightness
- Symptoms occur or worsen at night, awakening patient
- Symptoms occur or worsen in a seasonal pattern
- Patient has eczema, hay fever or family history of asthma or atopic diseases
- Symptoms occur or worsen in presence of animals with fur, aerosol chemicals, change in temperature, domestic dust mites, drugs (aspirin, beta blockers), pollen, respiratory viral infections, smoke, strong emotional expression
- Symptoms exacerbated by aerobic activity
- Symptoms respond to anti-asthma therapy
- Patient's colds "go to chest" & last > 10 days

**Differential Diagnosis Possibilities:**

- Upper airway diseases – allergic rhinitis and sinusitis
- Obstructions involving large airways – foreign body in trachea or bronchus, vocal cord dysfunction, vascular rings or laryngeal webs, laryngotracheomalacia, tracheal stenosis, or bronchostenosis, enlarged lymph nodes or tumor
- Obstructions involving small airways – viral bronchiolitis or obliterative bronchiolitis, cystic fibrosis, bronchopulmonary dysplasia, heart disease
- Other causes – recurrent cough not due to asthma, aspiration from swallowing mechanism dysfunction or gastroesophageal reflux

**Table c: Classification of Asthma Severity**

Use for initial classification if patient not on controller medicine for asthma

1. Intermittent – Symptoms  $\leq 2$  days/week; nighttime awakenings  $\leq 2$ x/month; reliever use for symptoms  $\leq 2$  days/week; activity interference none (Initial therapy start on Step 1)
2. Mild Persistent - Symptoms > 2 days/week not daily; nighttime awakenings 3-4x/month; reliever use for symptoms  $\geq 2$  days/week but not daily; activity interference minor limitation (Initial therapy start on Step 2)
3. Moderate Persistent - Symptoms daily; nighttime awakenings > 1x/week but not nightly; reliever use for symptoms daily; activity interference some limitation.
4. Severe Persistent - Symptoms throughout the day; nighttime awakenings often 7x/week; reliever use for symptoms several time/day; activity interference extremely limited.

**Table e: Initiation of long-term control therapy**

In patients who had  $\geq 4$  episodes in past year that lasted > 1 day and affected sleep AND who have + **asthma predictive index either** (1) of one of the following: a parental history of asthma, a physician's diagnosis of atopic dermatitis, or evidence of sensitization of aeroallergens; OR (2) two of the following: evidence of sensitization to foods, > 4% peripheral blood eosinophilia, or wheezing apart from colds.

**Table g: Medications approved for ages 0-4**

SABA – albuterol MDI and nebulizer solution, levalbuterol nebulizer solution  
ICS – budesonide nebulizer solution 0.25- 0.5 mg dose, fluticasone MDI  
LTRA – montelukast 4 mg chewable or granules

**Table b: Test for Respiratory and Asthma Control in Kids (TRACK)**

Have caregiver answer and score. questions 5-

1. During the past 4 weeks, how often was your child bothered by breathing problems, such as wheezing, coughing, or shortness of breath? Not at all = 20, once or twice = 15, once every week = 10, 2 or 3 times a week = 5, 4 or more time a week = 0.
2. During the past 4 weeks, how often did your child's breathing problems (wheezing, coughing, shortness of breath) wake him or her up at night? Not at all = 20, once or twice = 15, once every week = 10, 2 or 3 times a week = 5, 4 or more time a week = 0.
3. During the past 4 weeks, to what extent did your child's breathing problems, such as wheezing, coughing, or shortness of breath, interfere with his or her ability to play, go to school, or engage in usual activities that a child should be doing at his or her age? Not at all = 20, slightly = 15, moderately = 10, quite a lot = 5, extremely = 0.
4. During the past 3 months, how often did you need to treat your child's breathing problems (wheezing, coughing, shortness of breath) with quick-relief medications (albuterol, Ventolin, Proventil, Maxair, ProAir, Xopenex, or Primatene Mist)? Not at all = 20, once or twice = 15, once every week = 10, 2 or 3 times a week = 5, 4 or more time a week = 0.
5. During the past 12 months, how often did your child need to take oral corticosteroids (prednisone, prednisolone, Orapred, Prelone, or Decadron) for breathing problems not controlled by other medications? Never= 20, once = 15, twice = 10, 3 times = 5, 4 or more times = 0.

Add all scores together and if score is less than 80, it may indicate child's asthma is not as controlled as is it should be.

**Table d: See Attached action plan and trigger sheet**

Action Plan (self-management plan): written instructions include what to do daily when well, when symptoms start, when urgent care is needed, medication doses and purposes.

Source Control – Individualized; avoidance or decreasing exposure leads to greater control and often need for less medications. (See Table a for triggers.)

**Guideline for Treating Tobacco Dependence**

Ask – document tobacco use at every visit

Advise – strongly urge all tobacco users to quit

Assess – determine willingness to make a quit attempt

Assist – aid the patient in quitting: set quit date

Arrange – refer to resources such as quit lines, give prescription for medications as needed.

**Table f: Medication Abbreviations****Relievers:**

SABA – inhaled short-acting beta<sub>2</sub>-agonist

**Controllers**

ICS – inhaled corticosteroid

LABA – inhaled long-acting beta<sub>2</sub>-agonist

LTRA – Leukotriene receptor antagonist

**Table h: Asthma Therapy Goals**

- Prevent chronic and troublesome symptoms
- Require infrequent symptoms-related SABA use ( $\leq 2$ x/week)
- Maintain near normal pulmonary function/ prevent loss of lung function
- Maintain normal activity levels
- Meet patient/family care expectations
- Prevent recurrent exacerbations and urgent care needs
- No to minimal medication adverse effects

Table 1: Assessing Asthma Control & Adjusting Therapy

	Components of Control	Well Controlled (all of the following)	Not Well Controlled (Any measure present in any week)	Very Poorly Controlled
<b>Impairment</b>	Daytime symptoms	≤ 2 days/week but not more than once on each day	> 2 days/week or multiple times on ≤ 2 days/week	Throughout day
	Nighttime awakenings	≤ 1x/month	> 1x/month	> 1x/week
	Interference with normal activity	None	Some limitation	Extreme limitation
	Need for reliever/rescue treatment (not EIB* prevention)	≤ 2 days/week	> 2 days/week	Several times/day
	Exacerbations	None	One or more/year*	One in any week
	TRACK	> 80	< 80	
<b>Risk</b>	Exacerbations requiring oral steroids	0-1 x/year	2-3 x/year	≥ 3/year
	Progressive loss of lung function	Evaluation	requires long-term	follow up care
	Treatment-related adverse effects	Monitor & adjust		
<b>Recommended</b>	<b>Action (see steps)</b>	Maintain current step. Follow-up 1-6 months. Consider step down if well controlled <b>for at least 3 months.</b>	Step up 1 step. Reevaluate in 2-6 weeks. For side effects, consider alternate options.	Consider short course oral steroid. Step up 1-2 steps. Reevaluate in 2 weeks. For side effects, consider alternative treatment options

\* EIB = Exercise induced bronchospasm. Preferred treatment is 2 puffs MDI or nebulized 1 unit dose short-acting beta<sub>2</sub>-agonist 15-30 minutes prior to activity. If not controlled, treat as persistent asthma at lowest possible step to achieve control.

## References:

Pocket Guide for Asthma Management and Prevention: A pocket guide for physicians and Nurses  
Updated 2008 form the Global Initiative for Asthma

National Asthma Education And Prevention Program. Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma 2007. (NIH Publication No. 07-4051). 2007. National Heart, Lung, and Blood Institute.

*Test for Respiratory and Asthma Control in Kids: A caregiver-completed questionnaire for preschool-aged children*, Journal of Allergy and Clinical Immunology April 2009 Vol 123, Issue 4, pages 833- 839,

*Treating Tobacco Use and Dependence, U.S. Department of Health and Human Services, 2000*