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City Health Information

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Managing Asthma

- **Diagnose asthma based on symptoms, medical history, physical examination, and spirometry.**
- **Initiate treatment using a stepwise approach that includes inhaled corticosteroids (ICS) for patients who have poorly controlled asthma.**
- **Complete an asthma Medication Administration Form (MAF) for families of school-aged children.**
  - **Include ICS on the MAF for children with poorly controlled asthma and medication adherence issues.**
- **Engage families in developing a treatment plan and promote asthma self-management, including specific guidance on reducing exposure to environmental asthma triggers.**

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Asthma affects more than 400,000 New Yorkers, including 84,000 children aged 12 years or younger.[1] In 2014, there were nearly 7,600 asthma-related hospitalizations among New York City children aged younger than 15 years.[1] Children in neglected communities are at disproportionate risk, with hospitalization rates more than 3 ½ times as high as in the wealthiest neighborhoods.[1]

The goal of asthma management is to minimize symptoms and exacerbations so people with asthma can lead full, active lives. To achieve this goal, primary care providers (PCPs) must:

- diagnose asthma based on symptoms, medical history, physical examination, and spirometry (**Box 1**[2,3]),
- assess asthma severity and prescribe a controller medication such as an inhaled corticosteroid (ICS) for patients who meet diagnostic criteria for persistent asthma,
- ensure that patients and families have strong self-management skills, and
- monitor and maintain asthma control at follow-up visits and adjust treatment as needed, prescribing a controller medication for those with poor asthma control.

DIAGNOSE ASTHMA

Avoid underdiagnosing asthma. This is especially important in children aged 4 years and younger because asthma-related chronic airway inflammation and structural changes can develop during preschool.[2]

Educate patients diagnosed with asthma and/or their caregivers about the disease and its triggers (**Box 2**[4]). People with asthma are at greater risk of influenza's sometimes life-threatening complications. Vaccinate all patients with asthma aged 6 months and older, regardless of severity. Also vaccinate against pneumococcal disease according to Pneumococcal ACIP Vaccine Recommendations.

ASSESS ASTHMA SEVERITY

The primary goal of assessing severity is to determine whether the patient has persistent asthma and needs a controller medication such as an ICS (**Table**[5,6]). Asthma severity is determined by the patient's **impairment** and **risk**.

Impairment refers to the frequency and intensity over the past 2 to 4 weeks of

- symptoms,
- nighttime awakenings,
- use of short-acting beta-agonists (SABAs) for symptom control, and
- functional limitations.[5]

Risk is related to the likelihood that the patient will experience

- asthma exacerbations,
- progressive loss of pulmonary function (or, for small children, reduced lung growth) or fixed, nonreversible airway obstruction, and
- adverse medication effects.[5]

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BOX 1. DIAGNOSING ASTHMA[2,3]

To establish a diagnosis of asthma

- Determine the presence of episodic symptoms of airflow obstruction or airway hyperresponsiveness
- Document that airflow obstruction is at least partially reversible
- Exclude alternate diagnoses

The work-up should include

- Detailed medical history, including symptoms (**Box 2**), precipitating factors, and family history of asthma
- Physical examination, focusing on the upper respiratory tract, chest, and skin (ie, eczema)
- Spirometry to demonstrate obstruction and assess reversibility in patients aged 5 years and older (primary care providers may choose to refer to a specialist for spirometry); *peak expiratory flow values are NOT an adequate diagnostic substitute for spirometry*
  - reversibility is determined by an increase in forced expiratory volume in the first second (FEV_1) of ≥12% and >200 mL from baseline after inhalation of a short-acting bronchodilator
- Additional studies as necessary to exclude alternative diagnoses (eg, chronic obstructive pulmonary disease or heart disease in adults; bronchiolitis, allergic rhinitis, or sinusitis in children; vocal cord dysfunction in both adults and children or foreign-body airway obstruction in children)

For children aged 5 years and younger

Diagnosis is based on

- Pattern of symptom recurrence and association with common asthma trigger
- Past medical history of other allergic disease
- Family history of asthma in first-degree relatives

Diagnosis of asthma during early childhood may also require a therapeutic trial with a low-dose inhaled corticosteroid and, as needed, a short-acting beta-agonist

BOX 2. WHAT TO TELL PATIENTS ABOUT ASTHMA[4]

What is asthma?

- Asthma is a lung disease that narrows your airways and makes it hard to breathe
- Asthma makes your airways very sensitive, and when you breathe in something that can trigger your asthma, your airways swell and make mucus; the muscles around the airways also tighten, squeezing the airways together
- If you have asthma, see a health care provider regularly; the swelling in your lungs can be occurring slowly, even if you don't realize it is happening

What are the symptoms?

- Symptoms include coughing, wheezing, shortness of breath, and chest tightness
- Symptoms can come and go, and they can be mild or severe
- When you have symptoms, it's called an episode, a flare-up, an attack, or an exacerbation

What can trigger an attack?

- Common triggers include
  - Cockroaches
  - Mold
  - Dust mites
  - Strong smells/odors
  - Exercising
  - Hot, humid weather
  - Cold weather
  - Weather changes
  - Pollen
  - Animal dander
  - Tobacco smoke
  - Laughing or crying
  - Strong emotions
  - Viral respiratory infections
  - Fumes from cleaning agents
  - Indoor air fresheners
  - Air pollution (such as ozone)

Can asthma be cured?

- Asthma can't be cured, but it can be controlled; people with asthma need to avoid their asthma triggers and take their medications as prescribed, even when they're feeling well

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FIGURE 1. ASSESSING AND MANAGING ASTHMA IN CHILDREN AGED 0-4 YEARS[5]

A. DETERMINE ASTHMA SEVERITY according to patient's most serious risk or impairment feature and initiate treatment at the appropriate step. ***A patient who meets any of the risk or impairment criteria for persistent asthma should be prescribed an ICS.***

Risk[a]	Impairment				Level of Severity	Recommended Initial Treatment
Exacerbations Requiring OCS[b]	**Symptoms**	**Nighttime Awakenings**	**Use of SABA for Symptom Relief**	**Interference With Normal Activity**		
0-1/year	≤2 days/wk	0	≤2 days/wk	None	Intermittent	Step 1
≥2 in 6 months; or ≥4 wheezing episodes/1 year lasting >1 day AND at risk for persistent asthma[a]	>2 days/ wk, not daily	1-2x/month	>2 days/wk, not daily	Minor limitation	Mild persistent	Step 2
	Daily	3-4x/month	Daily	Some limitation	Moderate persistent	Step 3 and consider short course of OCS
	Throughout the day	>1x/wk	Several x/day	Extremely limited	Severe persistent	

B. MONITOR CONTROL. Follow up every 2-6 weeks until control is achieved. Determine the level of control according to the most serious risk or impairment feature. Step up if needed, after checking adherence, inhaler technique, environmental control, and comorbid conditions. If no clear benefit in 4-6 weeks, consider adjusting therapy or alternate diagnosis.

Risk	Impairment				Level of Control	Recommended Action
Exacerbations Requiring OCS[c]	**Symptoms**	**Nighttime Awakenings**	**Use of SABA for Symptom Relief**	**Interference With Normal Activity**		
0-1/year	≤2 days/wk	≤1x/month	≤2 days/wk	None	Well controlled	Maintain current treatment with regular follow-up every 1-6 months. Consider step-down if well controlled for ≥3 months
2-3/year	>2 days/wk	>1x/month	>2 days/wk	Some limitation	Not well controlled	Step up by 1 step and reevaluate in 2-6 wks. If no clear benefit in 4-6 wks, consider alternative diagnosis or adjusting therapy
>3/year	Throughout the day	>1x/wk	Several x/day	Extremely limited	Very poorly controlled	Consider short course of OCS. Step up 1-2 steps and reevaluate in 2 wks or sooner. If no clear benefit in 4-6 wks, consider alternative diagnosis or adjusting therapy

TREATMENT STEPS

Steps 3-6: Consult With Asthma Specialist

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
SABA as needed	*Preferred:* Low-dose ICS *Alternative:* Cromolyn or montelukast Consider consultation with specialist	Medium-dose ICS	Medium-dose ICS + either LABA or montelukast	High-dose ICS + either LABA or montelukast	High-dose ICS + either LABA or montelukast + OCS

ICS, inhaled corticosteroid; **LABA**, long-acting beta-agonist (note: LABA should be used only in conjunction with an ICS); **OCS**, oral corticosteroid; **SABA**, short-acting beta-agonist

[a] Children who have a positive asthma predictive index, as described on page 282 in Guidelines for the Diagnosis and Management of Asthma (EPR-3).

[b] Consider severity and interval since last exacerbation.

[c] Additional risk considerations: Reduction in lung growth can occur; evaluation requires long-term follow-up. Medication side effects can vary in intensity from none to very troublesome and worrisome. Level of intensity does not correlate with specific levels of control but should be considered in overall assessment of risk.

Quick-relief medication: SABA as needed for symptoms; intensity of treatment depends on severity of symptoms. Ages 0-4 years: With viral respiratory infection, every 4-6 hours up to 24 hours (longer with physician consult); consider short course of OCS if exacerbation is severe or patient has history of severe exacerbations. Caution: Frequent use of SABA may indicate the need to step up treatment.

The stepwise approach is meant to assist, not replace, clinical decision-making required to meet individual patients' needs. Consider alternative treatment options if side effects are a concern.

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FIGURE 2. ASSESSING AND MANAGING ASTHMA IN CHILDREN AGED 5-11 YEARS[5]

A. DETERMINE ASTHMA SEVERITY according to patient's **most serious risk or impairment feature** and start treatment at the appropriate step. ***A patient who meets any of the risk or impairment criteria for persistent asthma should be prescribed an ICS.***

Risk[a]	Impairment					Level of Severity	Recommended Initial Treatment
Exacerbations Requiring OCS[b]	Symptoms	Nighttime Awakenings	Use of SABA for Symptom Relief	Interference With Normal Activity	Lung Function[c]		
0-1/year	≤2 days/wk	≤2x/month	≤2 days/wk	None	• FEV_1 >80% between exacerbations • FEV_1/FVC >85%	Intermittent	Step 1
≥2/year	>2 days/wk, not daily	3-4x/month	>2 days/wk, not daily and not >1x/day	Minor limitation	• FEV_1 >80% • FEV_1/FVC >80%	Mild persistent	Step 2
	Daily	>1x/wk, not nightly	Daily	Some limitation	• FEV_1 = 60-80% • FEV_1/FVC = 75-80%	Moderate persistent	Step 3, medium-dose option; consider short course of OCS
	Throughout the day	Often 7x/wk	Several x/day	Extremely limited	• FEV_1 <60% • FEV_1/FVC <75%	Severe persistent	Step 3, medium-dose option, OR Step 4 and consider short course of OCS

B. MONITOR CONTROL. Follow up every 2-6 weeks until control is achieved. Determine the level of control according to the most serious risk or impairment feature. Step up if needed, after checking adherence, inhaler technique, environmental control, and comorbid conditions.

Risk[a]	Impairment					Level of Control	Recommended Action
Exacerbations Requiring OCS[b]	Symptoms	Nighttime Awakenings	SABA for Symptom Relief	Interference With Normal Activity	Lung Function[c]		
0-1/year	≤2 days/wk, not >1x/day	≤1x/month	≤2 days/wk	None	• FEV_1 or peak flow >80% • FEV_1/FVC >80%	Well controlled	Maintain current treatment with regular follow-up every 1-6 months. Consider step-down if well controlled for ≥3 months
2-3/year	>2 days/wk or multiple times on ≤2 days/wk	≥2x/month	>2 days/wk	Some limitation	• FEV_1 or peak flow = 60-80% • FEV_1/FVC = 75-80%	Not well controlled	Step up by at least 1 step and reevaluate in 2-6 wks
	Throughout the day	≥2x/wk	Several x/day	Extremely limited	• FEV_1 or peak flow <60% • FEV_1/FVC <75%	Very poorly controlled	Consider short course of OCS. Step up 1-2 steps and reevaluate in 2 wks

TREATMENT STEPS			Steps 4-6: Consult With Asthma Specialist		
				Step 5	Step 6
Step 1 SABA as needed	Step 2[d] *Preferred:* Low-dose ICS *Alternative:* Cromolyn, LTRA, or theophylline	Step 3[d] Either (a) low-dose ICS + either LABA, LTRA, or theophylline or (b) medium-dose ICS	Step 4[d] *Preferred:* Medium-dose ICS + LABA *Alternative:* Medium-dose ICS + either LTRA or theophylline	*Preferred:* High-dose ICS + LABA *Alternative:* High-dose ICS + either LTRA or theophylline	*Preferred:* High-dose ICS + LABA + OCS *Alternative:* High-dose ICS + either LTRA or theophylline + OCS

FEV_1, forced expiratory volume over 1 second; **FVC**, forced vital capacity; **ICS**, inhaled corticosteroid; **LABA**, long-acting beta-agonist (note: LABA should be used only in conjunction with an ICS); **LTRA**, leukotriene receptor antagonist; **OCS**, oral corticosteroid; **SABA**, short-acting beta-agonist

[a] Additional risk considerations: Reduction in lung growth can occur; evaluation requires long-term follow-up. Medication side effects can vary in intensity from none to very troublesome and worrisome. Level of intensity does not correlate to specific levels of control but should be considered in overall assessment of risk.

[b] Consider severity and interval since last exacerbation.

[c] Use predicted value for FEV_1 and personal best for peak flow.

[d] Steps 2-4: Consider subcutaneous immunotherapy if patient has allergic asthma. Consult a specialist.

Quick-relief medication: SABA as needed for symptoms. The intensity of treatment depends on severity of symptoms: Up to 3 treatments every 20 minutes as needed. Short course of OCS may be needed. Caution: Increasing use of SABA or use >2 days/week for symptom relief (not prevention of exercise-induced bronchospasm) generally indicates inadequate control and the need to step up treatment.

The stepwise approach is meant to assist, not replace, clinical decision-making required to meet individual patients' needs. Consider alternative treatment options if side effects are a concern.

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FIGURE 3. ASSESSING AND MANAGING ASTHMA IN PATIENTS AGED 12 YEARS AND OLDER[5]

A. DETERMINE ASTHMA SEVERITY according to **patient's most serious risk or impairment feature** and start treatment at the appropriate step. ***A patient who meets any of the risk or impairment criteria for persistent asthma should be prescribed an ICS.***

Risk	Impairment					Level of Severity	Recommended Initial Treatment
Exacerbations Requiring OCS	Symptoms	Nighttime Awakenings	Use of SABA for Symptom Relief	Interference With Normal Activity	Lung Function[a]		
0-1/year	≤2 days/wk	≤2x/month	≤2 days/wk	None	• FEV_1 >80% between exacerbations • FEV_1/FVC normal	Intermittent	Step 1
≥2/year	>2 days/wk, not daily	3-4x/month	>2 days/wk, not daily or >1x/d	Minor limitation	• FEV_1 >80% • FEV_1/FVC normal	Mild persistent	Step 2
	Daily	>1x/wk, not nightly	Daily	Some limitation	• FEV_1 = 60-80% • FEV_1/FVC reduced 5%	Moderate persistent	Step 3; consider short course of OCS
	Throughout the day	Often 7x/wk	Several x/day	Extremely limited	• FEV_1 <60% • FEV_1/FVC reduced >5%	Severe persistent	Step 4 or 5; consider short course of OCS

B. MONITOR CONTROL. Follow up every 2-6 weeks until control is achieved. Determine the level of control according to the most serious risk or impairment feature. Step up if needed, after checking adherence, inhaler technique, environmental control, and comorbid conditions.

Risk	Impairment					Level of Control	Recommended Action
Exacerbations Requiring OCS	Symptoms	Nighttime Awakenings	SABA for Symptom Relief	Interference With Normal Activity	Lung Function[a]	For patients aged ≥12 years, validated questionnaires, such as the Asthma Therapy Assessment Questionnaire, Asthma Control Questionnaire, Asthma Control Test™, or GINA 4-point Symptom Control Questionnaire can be used to assess impairment without spirometry	
0-1/year	≤2 days/wk	≤2x/month	≤2 days/wk	None	• FEV_1 or peak flow >80% • FEV_1/FVC not applicable	Well controlled	Maintain current treatment with regular follow-up every 1-6 months. Consider step-down if well controlled for ≥3 months
≥2/year	>2 days/wk	1-3x/wk	>2 days/wk	Some limitation	• FEV_1 or peak flow = 60-80% • FEV_1/FVC not applicable	Not well controlled	Step up by at least 1 step and reevaluate in 2-6 wks
	Throughout the day	≥4x/wk	Several x/day	Extremely limited	• FEV_1 or peak flow <60% • FEV_1/FVC not applicable	Very poorly controlled	Consider short course of OCS. Step up 1-2 steps and reevaluate in 2 wks

TREATMENT STEPS			Steps 4-6: Consult Asthma Specialist		
					Step 6
		Step 3[b]	Step 4[b]	Step 5	
Step 1	Step 2[b]				
SABA as needed	*Preferred:* Low-dose ICS *Alternative:* Cromolyn, LTRA, or theophylline	*Preferred:* Either (a) low-dose ICS + LABA or (b) medium-dose ICS *Alternative:* Low-dose ICS + either LTRA, theophylline, or zileuton	*Preferred:* Medium-dose ICS + LABA *Alternative:* Medium-dose ICS + either LTRA, theophylline, or zileuton	High-dose ICS + LABA; consider omalizumab[c] for patients who have allergies	High-dose ICS + LABA + OCS; consider omalizumab[c] for patients who have allergies

FEV_1, forced expiratory volume over 1 second; **FVC**, forced vital capacity; **ICS**, inhaled corticosteroid; **LABA**, long-acting beta-agonist (note: LABA should be used only in conjunction with an ICS); **LTRA**, leukotriene receptor antagonist; **OCS**, oral corticosteroid; **SABA**, short-acting beta-agonist

[a] Normal FEV_1/FVC: 8-19 years, 85%; 20-39 years, 80%; 40-59 years, 75%; 60-80 years, 70%. Use predicted value for FEV_1.

[b] Steps 2-4: Consider subcutaneous immunotherapy if patient has allergic asthma. Consult a specialist.

[c] Omalizumab should only be administered in a setting equipped to treat acute anaphylaxis.

Caution: Increasing use of SABA or use >2 days/week for symptom relief (not prevention of exercise-induced bronchospasm) generally indicates inadequate control and the need to step up treatment.

The stepwise approach is meant to assist, not replace, clinical decision-making required to meet individual patients' needs. Consider alternative treatment options if side effects are a concern.

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Know your patient's risk factors for asthma exacerbations and possible adverse outcomes and prioritize patients at high risk or who need enhanced case management based on[7]:

- uncontrolled asthma symptoms,
- frequent SABA use (3 or more canisters/year),
  - risk of asthma-related mortality is increased with use of >1 canister (200 doses) of a SABA per month,
- inadequate use of an ICS due to poor adherence, no prescription when indicated, or incorrect inhaler use,
- higher bronchodilator reversibility,
- major psychosocial or economic problems,
- environmental exposures such as tobacco smoke or allergens if a patient is sensitized,
- comorbidities such as allergic rhinitis, obesity, rhinosinusitis, pregnancy, and confirmed food allergy,
- ever intubated or in intensive care for asthma, and
- one or more severe asthma exacerbations within 12 months.

See **Figures 1-3** for age-based guidance on assessment of severity, stepwise treatment, and monitoring asthma control. If a patient meets any of the impairment or risk criteria for persistent asthma at the time of diagnosis, prescribe a daily controller medication.

TABLE. ESTIMATED COMPARATIVE DOSES OF INHALED CORTICOSTEROIDS[5,6]

- The most important determinant of appropriate dosing is the clinician's judgment of the patient's response to therapy. Monitor the patient's response on several clinical parameters and adjust the dose accordingly. Once asthma control is achieved, carefully titrate the dose to the minimum dose required to maintain control.
- Preparations are not interchangeable on a microgram or per-puff basis. This table presents estimated comparable daily doses. See National Asthma Education and Prevention Program Guidelines for full discussion.

	Ages 0-4 Years Daily Dose			Ages 5-11 Years Daily Dose			Ages 12 Years to Adult Daily Dose		
Inhaled Corticosteroid	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**
Beclomethasone 40 or 80 mcg/puff	NA	NA	NA	80-160 mcg	>160-320 mcg	>320 mcg	80-240 mcg	>240-480 mcg	>480 mcg
Budesonide DPI 90 or 180 mcg/inhalation	NA	NA	NA	180-360 mcg	>360-720 mcg	>720 mcg	180-540 mcg	>540-1080 mcg	>1080 mcg
Budesonide nebules 0.25, 0.5, or 1.0 mg	0.25-0.5 mg	>0.5-1.0 mg	1.0 mg	0.5 mg	1.0 mg	2.0 mg	NA	NA	NA
Ciclesonide DPI 80 or 160 mcg/puff	NA	NA	NA	80-160 mcg	>160-320 mcg	>320 mcg	160-320 mcg	>320-640 mcg	>640 mcg
Flunisolide MDI 80 mcg/puff	NA	NA	NA	160 mcg	320-480 mcg	≥480 mcg	320 mcg	>320-640 mcg	>640 mcg
Fluticasone MDI 44, 110, or 120 mcg/puff	176 mcg	>176-352 mcg	>352 mcg	88-176 mcg	>176-352 mcg	>352 mcg	88-264 mcg	>264-440 mcg	>440 mcg
Fluticasone DPI 50, 100, or 250 mcg/inhalation	NA	NA	NA	100-200 mcg	>200-400 mcg	>400 mcg	100-300 mcg	>300-500 mcg	>500 mcg
Mometasone DPI 110 or 220 mcg/inhalation	NA	NA	NA	110 mcg	220-440 mcg	>440 mcg	110-220 mcg	>220-440 mcg	>440 mcg
Other controller medications									
Combination therapies	Fluticasone propionate/salmeterol: ages 4 years and older Budesonide/formoterol: ages 12 years and older Mometasone/formoterol: ages 12 years and older Fluticasone furoate/vilanterol: ages 18 years and older								
Leukotriene modifier	Montelukast: ages 12 months and older								

DPI, dry powder inhaler; **MDI**, metered-dose inhaler; **NA**, not available (ie, not approved, no data available, or safety and efficacy not established for this age group)

- Some dosages may be outside the package labeling. Budesonide nebulizer suspension is the only FDA-approved inhaled corticosteroid for children aged <4 years.
- MDI dosages are expressed as the actuator dose (amount leaving the actuator and delivered to the patient), according to required FDA labeling. This is different from the valve dose (amount of drug leaving the valve, not all of which is available to the patient), which is used in many European countries and some scientific literature. DPI doses are expressed as the amount of drug in the inhaler after activation.

Use of brand names is for informational purposes only and does not imply endorsement by the NYC Health Department.

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TREAT ASTHMA USING THE STEPWISE APPROACH

Prescribe initial therapy according to the level of asthma severity, adjust treatment to maintain symptom control, and ensure that patients have good self-management skills.[5] All patients with asthma need a SABA for fast symptom relief.

Initiate medication and demonstrate proper inhaler technique

Recommended treatment regimens for asthma are outlined in 6 steps, based on asthma severity (**Figures 1-3**[5]). Step 1 is indicated for intermittent asthma. Steps 2 through 6 are indicated for persistent asthma. Estimated comparative doses of ICSs are given in the **Table**. For a list of all asthma medications, see Guidelines for the Diagnosis and Management of Asthma.

Encourage use of valved holding chambers (spacers)

If used properly, a metered-dose inhaler (MDI) with a valved holding chamber (VHC) can deliver at least as much inhaled medication to the lungs as a nebulizer machine. MDIs with a VHC are preferred over nebulizers for all children and caregivers who can demonstrate the correct technique.[7] Teach patients the proper technique for using an MDI with a VHC. At each visit, review and reinforce proper inhaler technique, and ask patients to demonstrate use of the device.[5]

Treat comorbid conditions to help improve asthma control

Screen for and treat comorbid conditions that may affect asthma management (**Box 3**[2,5]).

COMPLETE A MEDICATION ADMINISTRATION FORM FOR SCHOOLCHILDREN

School nurses from the NYC Health Department Office of School Health (OSH, see **Box 4**) administer prescribed medications to children during the school day. Give parents of schoolchildren with asthma a signed Medication Administration Form (MAF) (**Figure 4**) so that school nurses can either administer treatment or monitor students who self-administer medications. **All children in grades K through 12 must have an MAF for each school year, even if their medication is self-administered**. Complete the form in June, July, August, or September if possible.

Complete all sections of the MAF, including:

- Level of asthma control
- Student asthma risk assessment
- Rescue medications: Ventolin® HFA inhalers will be available to students whose MAFs indicate generic albuterol or Ventolin HFA, or if the parent or guardian initials consent to use medical room stock medication; if the MAF lists a different medication, the patient will need to provide that medication
- Controller medications for in-school administration: If requested on the MAF, the OSH nurse will administer prescribed ICS in school; this strategy has been shown to be very effective for managing patients with poorly controlled asthma and medication adherence issues[8]

Asthma exacerbations during school

All school-aged children with asthma should see their PCP annually to be assessed and have an MAF completed. The MAF provides a treatment plan for asthma exacerbations during school. Without an MAF on file, the school nurse cannot give the child rescue medication during an exacerbation. Emergency medical services will be called instead, even though the rescue medication is readily available at school.

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BOX 3. COMORBID CONDITIONS THAT MAY AFFECT ASTHMA MANAGEMENT[2,5]

- Allergic bronchopulmonary aspergillosis
- Cough-variant asthma
- Gastroesophageal reflux disease
- Mental health disorders
- Obesity
- Obstructive sleep apnea
- Rhinitis or sinusitis
- Stress and depression
- Vocal cord dysfunction

BOX 4. ABOUT THE OFFICE OF SCHOOL HEALTH

- The Office of School Health (OSH) is a joint program of the NYC Department of Education (DOE) and the NYC Health Department
- To help schoolchildren achieve asthma control and avoid exacerbations, OSH works with the family and the child's primary care provider to plan in-school services at no cost to the family
- If decided by the family and primary care provider, OSH
  - Administers patients' rescue and controller medications during the school day
  - Provides free albuterol and free Flovent to children with a completed Medication Administration Form
  - Provides enhanced asthma education
  - Manages in-school asthma exacerbations
  - Conducts frequent asthma control assessments

OSH physicians are available to provide in-school asthma follow-up assessments. To learn how to connect with the OSH physician in your patient's school, email osh@health.nyc.gov.

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FIGURE 4. THE NEW ASTHMA MEDICATION ADMINISTRATION FORM

Attach student photo here

ASTHMA MEDICATION ADMINISTRATION FORM

PROVIDER MEDICATION ORDER FORM | Office of School Health | School Year **2018-2019**

DUE: JULY 15th. Forms submitted after July 15th may delay processing for new school year.

Student Last Name First Name Middle Initial | Date of Birth __ __ / __ __ / __ __ __ __ (M M D D Y Y Y Y) | ☐ Male ☐ Female

OSIS # __ __ __ __ __ __ __ __ __ | DOE District __ __ | Grade/Class _____

School Name, Number, Address, and Borough:

HEALTH CARE PRACTITIONERS COMPLETE BELOW

Diagnosis
- ☐ Asthma
- ☐ Other:_____

Control (*see NAEPP Guidelines*)
- ☐ Well Controlled
- ☐ Not Controlled / Poorly Controlled
- ☐ Unknown

Severity (*see NAEPP Guidelines*)
- ☐ Intermittent
- ☐ Mild Persistent
- ☐ Moderate Persistent
- ☐ Severe Persistent

Student Asthma Risk Assessment Questionnaire (Y = Yes, N = No, U = Unknown)

History of near-death asthma requiring mechanical ventilation	☐ Y	☐ N	☐ U	
History of life-threatening asthma (loss of consciousness or hypoxic seizure)	☐ Y	☐ N	☐ U	
History of asthma-related PICU admissions (ever)	☐ Y	☐ N	☐ U	
Received oral steroids within past 12 months	☐ Y	☐ N	☐ U	____ times last : __ __ /__ __ /__ __
History of asthma-related ER visits within past 12 months	☐ Y	☐ N	☐ U	____ times
History of asthma-related hospitalizations within past 12 months	☐ Y	☐ N	☐ U	____ times
History of food allergy or eczema, specify: _____	☐ Y	☐ N	☐ U	

Student Skill Level *(Select the most appropriate option)*
- ☐ Nurse-Dependent Student: nurse must administer medication
- ☐ Supervised Student: student self-administers under adult supervision
- ☐ Independent Student: student is self-carry / self-administer

_____ Practitioner Initials

I attest student demonstrated the ability to self-administer the prescribed medication effectively for school / field trips / school sponsored events.

Home Medications *(Include over the counter)*
- ☐ Reliever _____
- ☐ Controller _____
- ☐ Other _____

Quick Relief In-School Medication (Select ONE)

☐ **Albuterol MDI**
[*Ventolin® MDI can be provided by school for shared usage (plus individual spacer)*]:
- ☐ MDI w/ spacer
- ☐ DPI

☐ **Other**: Name: _____ Strength: _____
Dose: _____ Route: _____ Time Interval: ❑___ hrs

In-School Instructions *(Check all that apply)*

☐ **Standard Order:** Give 2 puffs/1 AMP q 4 hrs. PRN for coughing, wheezing, tight chest, difficulty breathing or shortness of breath ("asthma flare symptoms"). Monitor for 20 mins or until symptom-free. If not symptom-free within 20 mins may repeat **ONCE**.
If in Respiratory Distress*: Call 911 and give 6 puffs/1 AMP; may repeat q 20 minutes until EMS arrives.

☐ **Pre-exercise:** 2 puffs/1 AMP 15-20 mins before exercise.

☐ **URI Symptoms or Recent Asthma Flare** *(Within 5 days)*:
2 puffs/1 AMP @ noon for 5 days.

Special Instructions:

Controller Medications for In-School Administration
(*Recommended for Persistent Asthma, per NAEPP Guidelines*)

☐ **Fluticasone MDI**
[*Flovent® 110 mcg MDI can be provided by school for shared usage*]:
- ☐ MDI w/ spacer
- ☐ DPI

☐ **Other**: Name: _____ Strength: _____
Dose: _____ Route: _____ Time Interval: ❑ ___ hrs

☐ **Standing Daily Dose:**
___ puffs/1AMP ONCE a day at ___ AM

Special Instructions:

Health Care Practitioner (Please Print Name) Last First		Signature	Date __ __ /__ __ /__ __ __ __
Address	Tel. (_ _ _) _ _ _ - _ _ _ _	Fax (_ _ _) _ _ _ - _ _ _ _	NPI # _ _ _ _ _ _ _ _ _ _
Email Address	NYS License # **(Required)**	CDC and AAP strongly recommend annual influenza vaccination for all children diagnosed with asthma.	

INCOMPLETE PRACTITIONER INFORMATION WILL DELAY IMPLEMENTATION OF MEDICATION ORDERS. REV 3/18
FORMS CANNOT BE COMPLETED BY A RESIDENT

PARENTS MUST SIGN PAGE 2 ➔

Click **here** for a downloadable form.

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FIGURE 5. ASTHMA ACTION PLAN

Asthma Action Plan

Date Completed

Name	Date of Birth	Grade/Teacher
Health Care Provider	Health Care Provider's Office Phone	Medical Record Number
Parent/Guardian	Phone	Alternate Phone
Parent/Guardian/Alternate Emergency Contact	Phone	Alternate Phone

DIAGNOSIS OF ASTHMA SEVERITY

☐ Intermittent ☐ Persistent [◯ Mild ◯ Moderate ◯ Severe]

ASTHMA TRIGGERS (Things That Make Asthma Worse)

☐ Smoke ☐ Colds ☐ Exercise ☐ Animals ☐ Dust ☐ Food
☐ Weather ☐ Odors ☐ Pollen ☐ Other _____

GREEN ZONE: GO! — Take These DAILY CONTROLLER MEDICINES (PREVENTION) Medicines EVERY DAY

You have ALL of these:
- Breathing is easy
- No cough or wheeze
- Can work and play
- Can sleep all night

☐ No daily controller medicines required
☐ Daily controller medicine(s):_____
☐ _____
Take _____ puff(s) or _____ tablet(s) _____ daily.
☐ For asthma with exercise, ADD: _____
_____ puffs with spacer _____ minutes before exercis
ALWAYS RINSE YOUR MOUTH AFTER USING YOUR DAILY INH

GREEN ZONE: Emphasize to patients with persistent asthma the importance of using a controller medication every day, even when they have no symptoms, in order to prevent airway changes that lead to symptoms

YELLOW ZONE: CAUTION! — Continue DAILY CONTROLLER MEDICINES and ADD QUICK-RELIEF Medicines

You have ANY of these:
- Cough or mild wheeze
- Tight chest
- Shortness of breath
- Problems sleeping, working, or playing

Take daily controller medicine if ordered and add this quick-relief medicine when you have breathing problems:
☐ _____ inhaler mcg
Take _____ puffs every _____ hours, *if needed*. Always us
☐ _____
Take a _____ nebuliz
☐ Other _____
If quick-relief medicine does not HELP within _____ minutes, take
If using quick-relief medicine more than _____ times in _____ h
IF IN THE YELLOW ZONE MORE THAN 24 HOURS, CALL HEALTH CARE PROVIDER.

YELLOW ZONE: Instruct patients to continue to follow Green Zone instructions and to use quick relief medication at the first sign of a cold, exposure to a known trigger, or early, mild asthma symptoms

RED ZONE: EMERGENCY! — Continue DAILY CONTROLLER MEDICINES and QUICK-RELIEF Medicines and GET HELP!

You have ANY of these:
- Very short of breath
- Medicine is not helping
- Breathing is fast and hard
- Nose wide open, ribs showing, can't talk well
- Lips or fingernails are grey or bluish

☐ _____ inhaler _____ mcg
Take _____ puffs every _____ hours, *if needed*. Always us
☐ _____
Take a _____ nebuliz
☐ Other _____
CALL HEALTH CARE PROVIDER AGAIN WHILE GIVING QUICK-REL
be contacted, CALL 911 FOR AN AMBULANCE OR GO DIRECTLY

RED ZONE: Review the specific symptoms of worsening asthma for which a patient should seek medical attention. Instruct patients to continue to follow Green and Yellow Zone instructions and to use up to 3 treatments of albuterol at 20-minute intervals as a final step before seeking emergency medical attention

REQUIRED PERMISSIONS FOR ALL MEDICATION USE AT SCHOOL

Health Care Provider Permission: I request this plan to be followed as written. This plan is valid for the school year _____ – _____.

Signature _____ Date _____

Parent/Guardian Permission: I give consent for the school nurse to give the medications listed on this plan or for trained school staff to assist my child to take them after review by the school nurse. This plan will be shared with school staff who care for my child.

Signature _____ Date _____

OPTIONAL PERMISSIONS FOR INDEPENDENT MEDICATION CARRY AND USE AT SCHOOL

Health Care Provider Independent Carry and Use Permission: I attest that this student has demonstrated to me that they can self-administer this rescue medication effectively and may carry and use this medication independently at school with no supervision by school personnel.

Signature _____ Date _____

Parent/Guardian Independent Carry and Use Permission (If Ordered by Provider Above): I agree my child can self-administer this rescue medication effectively and may carry and use this medication independently at school with no supervision by school personnel.

Signature _____ Date _____

4850 New York State Department of Health 5/17

COPY FOR PATIENT

Click here for a downloadable form.

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(Continued from page 49)

The OSH medical room team (physician or nurse) will notify you and the parent or caregiver if your patient has asthma exacerbations at school and/or is transferred to an emergency facility for continued asthma management.

For children who have not submitted an MAF

Children with asthma who have not submitted an MAF will be evaluated by an OSH physician if they appear to have poor asthma control. If the evaluation establishes that the student has poorly controlled asthma or is at risk for poor asthma outcomes, the OSH physician, after discussion with the student's PCP and with the parent's or guardian's consent, can authorize administration of fluticasone 110 mcg daily to the student on school days.

BOX 5. WHAT TO TELL PATIENTS ABOUT ASTHMA TRIGGERS[2,9,10]

Secondhand smoke
- If you smoke, I can help you quit
- Ask your family members to quit smoking
- Don't allow smoking in your home, car, or around you

Cold and flu viruses
- Wash hands frequently to prevent cold and flu
- Get a flu shot every year

Dust
- Remove clutter and dust regularly
- Mop, vacuum, and use microfiber or wet cloths; sweeping spreads dust around and can make asthma symptoms worse

Animal dander
- Keep pets with fur or hair out of your home
- If furry pets live in your home
  - Do not allow pets on furniture or in rooms where people sleep
  - Remove carpets and replace cloth-covered furniture, when possible

Mold and mildew
- Fix leaking faucets, pipes, or other sources of water
- Clean moldy surfaces: Scrub mold off hard surfaces with detergent and water, and dry them completely; absorbent materials containing mold may have to be thrown away
- Use air conditioners
- Avoid humidifiers

Strong odors
- Try to stay away from strong odors such as the smells of fresh paint and new carpet
- Avoid using chemical products with strong smells

Cold air
- Cover your nose and mouth with a scarf on cold or windy days

Air pollution and pollen
- Check the air quality index and try not to work or play hard outside when air pollution or pollen levels are high (if you are allergic to pollen)
- Keep windows closed during pollen season

Call 311 to order copies of patient education handouts in English or Spanish.

TEACH SELF-MANAGEMENT

Collaborate with the patient and family to tailor self-management approaches and treatment goals to their needs.

Develop a customized Asthma Action Plan

The Asthma Action Plan (**Figure 5[2,9]; Resources for Providers**) is organized by action color zones and is guided by symptoms, peak flow meter ranges, or a combination of the two.[4] The green section contains your instructions for daily management, including long-term controller medication for patients with persistent asthma. The yellow and red sections contain instructions for managing worsening asthma symptoms.

At every visit, review the Asthma Action Plan to reinforce key educational messages.[5]

Ask about environmental triggers

Review simple steps for minimizing environmental triggers (**Boxes 5[2,9,10] and 6[10]**). Strongly recommend that adults refrain

BOX 6. WHAT TO TELL PATIENTS AND CAREGIVERS ABOUT PEST-PROOFING A HOME[10]

Keep your home clean and dry
- Keep food in sealed containers
- Keep counters and sinks free from food waste and dirty dishes
- Get rid of clutter, such as cardboard, newspapers, and paper bags
- Do not leave pet food out overnight

Manage garbage
- Use garbage cans with tight-fitting lids
- Rinse recyclables before putting them in recycling bins
- Take garbage and recycling out every day
- Tie up garbage bags before putting them in compactor chutes; do not overstuff compactor chutes

If you need to use pest control products
- Use bait stations and gel for cockroaches and ants
- Use traps for mice
- Never use foggers, sprays, bombs, or loose rodent bait
- Never use illegal or unlabeled pesticides such as Tres Pasitos, Chinese Chalk, or Tempo
- Store pesticides safely and place traps where children and pets can't get to them

Report water leaks, holes, and pests to building staff
- Let building staff into your home to make any needed repairs
- Let pest management professionals into your home for pest control services
- Be sure to tell them if there are children or pets in the home
- If you see pests, tell your landlord immediately; if your landlord does not fix the problem, call 311

Call 311 to order copies of patient education handouts in English or Spanish.

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from smoking at home and refer them to smoking cessation resources (for example, nyc.gov/health/smokefree) if needed. Advise patients to pest-proof their homes by eliminating sources of food, water, and shelter that pests need to live. This includes removing access to garbage and repairing leaks and cracks in the home. These interventions improve asthma symptoms and decrease the need to use chemical pesticides.

MONITOR AND MAINTAIN ASTHMA CONTROL

Assess control

After treatment starts, follow up in 2 to 6 weeks to assess level of asthma control (**Figures 1-3**).

For patients aged ≥12 years, validated questionnaires such as the Asthma Therapy Assessment Questionnaire (ATAQ),[11] Asthma Control Questionnaire (ACQ, which can be used for children aged as young as 6 years),[12] Asthma Control Test™ (ACT),[13] or GINA 4-point Asthma Symptom Control Questionnaire can be used to assess impairment (**Resources**).

Use the stepwise approach to adjust medications[5]

Until control is achieved, reevaluate every 2 to 6 weeks (**Figures 1-3**).

- **If asthma is very poorly controlled,**
  - Step up therapy by 1 to 2 steps and consider a short course of oral systemic corticosteroids after assessing medication adherence, delivery device technique, environmental control (**Box 5**), and treatment of comorbid conditions (**Box 3**).
  - Reevaluate every 2 to 6 weeks (or sooner, if indicated).
- **If asthma is not well controlled,** step up therapy by at least 1 step and reevaluate every 2 to 6 weeks.
- **If asthma is well controlled for ≥3 months,** consider stepping down treatment.
  - Step down.
  - Follow up at 3-month intervals if a step-down in therapy is anticipated, and then follow up every 1 to 6 months to ensure that the patient is maintaining control.

Refer patients with poorly controlled asthma or special needs to case-management programs offered by managed care health plans and community providers if available.[2]

WHEN TO CONSULT A SPECIALIST

Consult with an asthma specialist (allergist or pulmonologist) for comanagement when[2]:

- a patient is not meeting the goals of therapy after 3 to 6 months,
- there are difficulties achieving or maintaining control,
- a patient requires ≥2 short courses of oral systemic corticosteroids in 1 year or has an exacerbation requiring hospitalization,
- a patient requires Step 4 level of care or higher (Step 3 care or higher for children aged ≤4 years),
- immunotherapy or omalizumab (Xolair®, anti-immunoglobulin E) or interleukin-5 asthma inhibitors such as mepolizumab (Nucala®) or reslizumab (Cinqair®) are being considered,
- additional testing is indicated (eg, allergy testing, pulmonary function studies, exhaled nitric oxide (FeNO) measurement, or bronchoscopy), or
- a patient with asthma becomes pregnant or is planning a pregnancy.

Screen for mental health issues and refer patients to mental health support when needed, as mental health problems have been shown to interfere with adherence to treatment.

SPECIAL SITUATIONS

Exercise-induced bronchospasm

Exercise-induced bronchospasm (EIB) is suggested by a history of cough, shortness of breath, chest pain or tightness, wheezing, or endurance problems associated with exercise; it should be anticipated in all patients with asthma.[2]

Asthma should not limit a person's ability to participate in vigorous activities. Advise patients to be physically active and to use quick-reliever medicine about 15 minutes before starting exercise.[14]

Frequent or severe EIB may indicate the need to initiate or step up long-term control medications such as the leukotriene inhibitor montelukast or daily ICS. For patients with EIB who continue to have symptoms despite using an inhaled SABA before exercise, or who require an inhaled SABA daily or more frequently, daily administration of an ICS is strongly recommended as maintenance therapy. It may take 2 to 4 weeks after the initiation of therapy to see maximal improvement.[15]

Pregnancy

Check asthma control at all prenatal visits for the health and well-being of the mother. **Budesonide is the only inhaled corticosteroid that is a Category B medication for pregnancy.** Pregnant patients with asthma should be followed closely by an asthma specialist.

Surgery

Patients who have asthma are at risk for respiratory complications during and after surgery. Patients with asthma should be referred to a pulmonologist prior to surgery for surgical clearance. Attempts should be made to improve lung function (FEV_1 or peak expiratory flow rate [PEFR]) preoperatively to either their predicted values or the patient's personal best level.[2] A short course of oral systemic corticosteroids may be necessary, especially for patients who have received them during the past 6 months or select patients on long-term high-dose ICS therapy. Clinically important adrenal suppression has been reported in selected patients previously treated with high-dose ICS therapy. Consider stress doses of corticosteroids for such patients, particularly children.[2]

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Allergic rhinitis

Seek comanagement with an allergist for patients with allergy symptoms because upper airway inflammation contributes to lower airway inflammation. Intranasal corticosteroids are recommended for treatment of allergic rhinitis because they have a low risk of systemic side effects. Consider subcutaneous immunotherapy for patients aged ≥5 years at management Steps 2 to 4 when there is a clear relationship between symptoms and allergen exposure (**Figures 2** and **3**). Immunotherapy can improve asthma control, especially for patients with dust mite allergy and patients with allergic rhinitis, but is often underutilized in urban settings.[2]

World Trade Center exposure

Adults and children exposed to the World Trade Center disaster may have persistent respiratory symptoms.[16-18] The federal World Trade Center Health Program makes services available to eligible persons at no out-of-pocket cost for care for 9/11-related respiratory symptoms.

MANAGE EXACERBATIONS

Early treatment by the patient at home is the best strategy for preventing progression of an asthma exacerbation.

Home treatment

Instruct patients and caregivers to[2,5]:

- recognize asthma warning signals, including worsening PEFR (for patients who use a peak flow meter), which may appear 24 to 48 hours before the exacerbation;
- recognize "red alert" signs of respiratory distress (**Figure 5**):
  - ineffectiveness of medicine,
  - breathing hard and fast and nostrils widely open,
  - talking in words and phrases instead of sentences or not walking well,
  - sitting or standing in a hunched forward position or cannot lay down,
  - neck muscles and rib muscles sinking in and out;
- remove or minimize exposure to environmental allergens or irritants that may contribute to the exacerbation;
- monitor response to treatment and promptly tell a provider about worsening symptoms or PEFR or decreased responsiveness to albuterol; and
- advise **immediate transfer to an urgent-care center or the emergency department** if a child is in respiratory distress ("red alert" in the Asthma Action Plan; **Figure 5**), has no response to rescue medication within 1 to 2 hours after receiving treatment, has worsening symptoms after getting an asthma treatment, or if resources are lacking at home.

In your office

Prescribe an oral steroid burst for acute asthma exacerbations that are refractory to bronchodilator treatment.[7] Considerations when determining need for a short course of systemic corticosteroids are[7]:

- importance of early treatment,
- special attention to patients who are at high risk of asthma-related death, and
- special attention to infants.

A course of 5 days of oral steroids is usually sufficient for an asthma exacerbation in most patients and can be stopped abruptly without tapering, since adverse effects from discontinuation of short-term steroid use are unlikely.[19]

Patients who have experienced an asthma exacerbation are at risk of further exacerbations. **Follow-up should be arranged within 1 week** of the exacerbation to plan ongoing asthma management.

Immediately transport the patient from your office to the emergency department in cases of[7]:

- drowsiness or confusion,
- silent chest on auscultation,
- lack of favorable response to 3 every-20-minute sequential rescue albuterol doses,
- use of accessory muscles of respiration,
- pulse oximetry readings that are below 95% in spite of rescue albuterol treatments in the office, or
- a lack of resources at home.

SUMMARY

Diagnose asthma based on symptoms, medical history, physical examination, and spirometry. Engage families in the treatment plan, including avoidance of asthma triggers, and vaccinate patients who have asthma against influenza every year. Initiate treatment using a stepwise approach that includes a SABA for all patients and an ICS for patients with poorly controlled asthma. For families with schoolchildren, complete an asthma MAF every school year. ◆

ASTHMA QUIZ

1. A 7-year-old girl with well-controlled asthma should be seen for follow-up visits every
   A. 1-2 months
   B. 3 months
   C. 4 months
   D. 6-12 months
2. The preferred treatment approach for children with moderate persistent asthma is
   A. Medium-dose inhaled corticosteroid (ICS)
   B. Low-dose ICS in combination with a long-acting beta agonist (LABA)
   C. Low-dose ICS in combination with a leukotriene pathway modifier
   D. Low-dose ICS in combination with theophylline
3. The preferred treatment approach for adults with mild persistent asthma is
   A. Medium-dose ICS
   B. Low-dose ICS
   C. Leukotriene inhibitor
   D. Cromolyn

Answers: 1-**D**; 2-**A**; 3-**B**

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RESOURCES FOR PROVIDERS

Clinical guidelines

- National Asthma Education and Prevention Program. Asthma Care Quick Reference: www.nhlbi.nih.gov/files/docs/guidelines/asthma_qrg.pdf
- Global Initiative for Asthma (GINA). Global Strategy for Asthma Management and Prevention 2018 report: ginasthma.org/2018-gina-report-global-strategy-for-asthma-management-and-prevention

CME/CNE

- Medscape Asthma CME Learning Center (free): www.medscape.org/resource/asthma/cme

Validated Asthma Questionnaires (recommended for ages 12 and older)

- Asthma Control Test™ (ACT): campaign.optum.com/optum-outcomes/what-we-do/disease-specific-health-surveys/asthma-control-test-act.html
- Asthma Therapy Assessment Questionnaire: getasthmahelp.org/documents/2007Guidelines_ValidatedQuestionnaires.pdf
- Asthma Control Questionnaire: www.qoltech.co.uk/acq.html (for purchase)
- GINA 4-point Symptom Control Questionnaire: ginasthma.org/2018-pocket-guide-for-asthma-management-and-prevention

Forms

- Asthma Medication Administration Form (MAF): schools.nyc.gov/NR/rdonlyres/96D0E662-BBB9-49EB-B834-08B0DADD1088/0/AsthmaMedicationAdministrationFormSY201819.pdf
- Asthma Action Plan (English and Spanish): www.health.ny.gov/diseases/asthma/brochures.htm

City Health Information archives: www1.nyc.gov/site/doh/providers/resources/city-health-information-chi.page

RESOURCES FOR PATIENTS

NYC Health Department

- Asthma webpage: www1.nyc.gov/site/doh/health/health-topics/asthma.page
- East Harlem Asthma Center of Excellence: www1.nyc.gov/site/doh/health/neighborhood-health/east-harlem-asthma-center-of-excellence.page

National Heart, Lung, and Blood Institute. Information for Patients, Families, and Caregivers: www.nhlbi.nih.gov/health-pro/resources/lung/naci/audiences/patients-families.htm

Centers for Disease Control and Prevention. Know How to Use Your Asthma Inhaler (video): www.cdc.gov/asthma/inhaler_video/default.htm

JOIN THE HEALTH DEPARTMENT SCHOOL HEALTH ASTHMA COALITION

The NYC Health Department is recruiting community medical care providers to serve on an advisory committee on the needs of children with asthma.

If you would like to participate, or have questions, please contact osh@health.nyc.gov.

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City Health Information

Volume 37 (2018) The New York City Department of Health and Mental Hygiene No. 6; 43-56

NYC Health
nyc.gov/health

42-09 28th Street, Long Island City, NY 11101 (347) 396-2914

E-mail *City Health Information* at: nycdohrp@health.nyc.gov
New York City Department of Health and Mental Hygiene.
Managing asthma.*City Health Information*. 2018;37(6):43-56.

ASK CHI
Have questions or comments about Asthma?
E-mail
AskCHI@health.nyc.gov

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