

Practice Guidelines

Asthma Management: Updated Guidelines from the National Heart, Lung, and Blood Institute

Key Points for Practice

- In patients 12 years and older with mild, persistent asthma, intermittent low-dose ICS and as-needed inhaled SABAs should be used as rescue therapy instead of daily controller therapy.
- In patients four years and older with moderate to severe asthma, ICS/formoterol therapy should be considered as a daily controller and rescue therapy, a SMART strategy.
- Adding an inhaled LABA to an ICS in uncontrolled asthma is preferred over adding a LAMA because of increased hospitalizations associated with LAMA therapy.
- Subcutaneous immunotherapy can reduce the severity of mild or moderate asthma over time in patients with proven allergies.

From the AFP Editors

The National Heart, Lung, and Blood Institute (NHLBI) published asthma management guidelines in 1991 and 2007. In 2020, the NHLBI released an update focusing on six priority topics.

Intermittent ICS Rescue Therapy

Intermittent use of inhaled corticosteroids (ICS) is an option for mild persistent asthma. In patients 12 years and older with mild persistent asthma, using both an ICS and a short-acting beta-agonist

See related editorial on page 446.

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This series is coordinated by Michael J. Arnold, MD, contributing editor.

A collection of Practice Guidelines published in AFP is available at <https://www.aafp.org/afp/practguide>.

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(SABA) as rescue therapy is equivalent to daily ICS controller therapy with SABA rescue therapy. In children younger than 12 years, the benefit of rescue ICS therapy is uncertain.

As-needed ICS therapy is also beneficial in other situations. In children up to four years of age who only experience wheezing with respiratory infections, a seven- to 10-day course of ICS daily at the start of a respiratory infection reduces exacerbations and systemic corticosteroid use. The effects of short-term ICS use on growth are uncertain, but they are likely less than systemic corticosteroids.

In patients four years and older with moderate to severe persistent asthma, a single inhaler can be used as rescue therapy. In single maintenance and reliever therapy (SMART), a combination of an ICS and the long-acting beta-agonist (LABA) formoterol can be used as a daily controller and a rescue inhaler to a maximum of eight puffs daily for children four to 11 years of age and 12 puffs daily for patients older than 12 years. SMART reduces asthma exacerbations and overall corticosteroid use compared with standard treatment. SMART using other LABA medications has not been studied.

Limited Indications for Long-Acting Muscarinic Antagonists

In patients with uncontrolled asthma despite daily ICS therapy, adding a LABA is recommended instead of adding a long-acting muscarinic antagonist (LAMA). Although effects on symptoms are similar, adding a LAMA is associated with increased hospitalizations, especially in one study of Black adults.

Adding a LAMA to an ICS may be indicated for contraindications to or intolerance of LABA medications. Adding a LAMA to ICS/LABA therapy does not decrease the frequency of exacerbations or the use of systemic corticosteroids or rescue medications. LAMA medications should be avoided in patients at risk of urinary retention and glaucoma.

Immunotherapy Useful Adjunct for Mild to Moderate Asthma

Subcutaneous immunotherapy (repeated subcutaneous injections for desensitization) is an option if skin testing or in vitro antigen-specific immunoglobulin E testing suggests that allergen exposure worsens asthma control. Subcutaneous immunotherapy is not recommended for patients with severe asthma because of increased anaphylaxis risk. In patients with mild or moderate asthma, immunotherapy can have a disease-modifying effect, reducing asthma severity over time. Sublingual immunotherapy is approved for allergic rhinitis but not for asthma. Patients with asthma should not administer immunotherapy at home.

Marginal Benefit from Multicomponent Allergen Mitigation

Single-component allergen mitigation does not improve outcomes, but multicomponent interventions slightly reduce exacerbations and marginally improve quality of life, asthma control, and symptoms. These interventions can be expensive and difficult to perform or maintain.

Integrated pest management of cockroaches and mice, mattress and pillow covers for dust mites, high-efficiency particulate air-filtered vacuums, and home mold mitigation are beneficial when combined. Although pet removal is expected to improve pet-related allergies, the few studies are inconclusive. Cleaning and integrated pest management interventions may transiently worsen asthma symptoms. Because of the marginal benefits, patient burden, and costs, interventions should be considered for patients with symptoms related to identified indoor allergen exposure confirmed by allergy testing or clinical history.

Fractional Exhalation of Nitric Oxide Testing Has Limited Benefit in Ruling Out Asthma

Fractional exhalation of nitric oxide can be measured with pulmonary function testing to indicate bronchial eosinophilic inflammation. Fractional exhalation of nitric oxide testing may be useful if an asthma diagnosis is uncertain. A level less than 20 parts per billion in children five to 12 years of age, or less than 25 parts per billion in patients older than 12 years, rules out asthma with 79% sensitivity.

Fractional exhalation of nitric oxide levels may also be elevated with allergic rhinitis, atopy,

smoking, and chronic lung conditions. Tracking fractional exhalation of nitric oxide levels does not improve outcomes or quality of life and should not be used to assess asthma control or predict future exacerbations.

Avoid Bronchial Thermoplasty

In bronchial thermoplasty, radiofrequency energy is delivered by a catheter to bronchi to limit airway constriction. Although thermoplasty is approved for severe persistent asthma, the moderate risks and uncertain long-term outcomes outweigh small benefits in asthma control.

Editor's Note: This is the first update to asthma guidelines from the National Heart, Lung, and Blood Institute in 13 years. These recommendations match the most recent *AFP* article on management of severe asthma (<https://www.aafp.org/afp/2021/0301/p286.html>). They are also generally consistent with guidance from the Global Initiative for Asthma (GINA; <https://www.aafp.org/afp/2020/0615/p762.html>), which more strongly recommends intermittent use of long-acting inhalers as primary therapy. GINA also has the opposite interpretation of immunotherapy, supporting sublingual immunotherapy while being wary of subcutaneous immunotherapy.—Michael J. Arnold, MD, Contributing Editor

The views expressed in this article are those of the authors and do not reflect the official policy of the U.S. Army, Department of Defense, or the U.S. government.

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