PEDIATRICS® PERSPECTIVES

The 2020 Focused Updates to the NIH Asthma Management Guidelines: Key Points for Pediatricians

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The National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group (hereinafter "panel") of the National Heart, Lung, and Blood Institute recently published its 2020 Focused Updates to the Asthma Management Guidelines (https://www.nhlbi.nih.gov/asthmaguidelines).[1] These are the first updates from the panel since 2007, a remarkably long interval given the advances in care of the last decade. Using the Grading Recommendations, Assessment, Development, and Evaluation platform,[2] the panel made 19 recommendations across six topic areas: intermittent inhaled corticosteroid (ICS) therapy, long-acting muscarinic antagonist (LAMA) therapy, indoor allergen-mitigation strategies, immunotherapy, fractional exhaled nitric oxide (FeNO) testing, and bronchial thermoplasty.[3] Of these, 18 are relevant to children and adolescents (Table 1). The panel made strong recommendations (to be implemented by clinicians for almost all their patients as standard of care) and conditional recommendations (intended for many individuals as part of a shared decision-making process involving the clinician, family, and patient). For pediatric clinicians, the most exciting updates are those affirming several treatment options for using ICS with long-acting β2-agonists (LABAs) and LAMAs. Those for allergen mitigation, immunotherapy, and FeNO testing provide useful clarifications but not transformative alternatives for care. Of note, the updates did not address biological therapies because at the time that a decision regarding which topics to update was made (2014), only one biologic (omalizumab) was available.

PHARMACOLOGIC THERAPY

The updates' most highly pediatric-relevant recommendations involve three treatment options: (1) intermittent ICS dosing with as-needed short-acting β2-agonist (SABA) for quick-relief therapy, (2) single maintenance and reliever therapy (SMART),[4] and (3) add-on LAMA therapy. As always, before making any changes that step up care, clinicians should assess adherence, inhaler technique, environmental triggers, and comorbid conditions.

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Intermittent ICS

In children 0 to 4 years with intermittent asthma, clinicians may now conditionally recommend a short (7–10 days) course of daily ICS with as-needed SABA at the start of a viral respiratory tract infection for children who have had ≥3 lifetime episodes of viral-induced wheezing or ≥2 episodes in the past year and who are asymptomatic between episodes. Similarly, in those ≥12 years with mild persistent asthma, clinicians and families may jointly decide to use intermittent as-needed concomitant ICS with SABA instead of daily ICS with as-needed SABA.[1] In deciding whether to implement this change, clinicians should consider the child's previous adherence to daily therapy as part of shared decision-making. The challenge to clinicians will be reeducating families that have long been taught the importance of adherence to daily ICS.

For patients ≥4 years with mild to moderate persistent asthma who are likely adherent with daily ICS alone, a short-term increase in the ICS dose (eg, doubling, tripling, or quadrupling the daily dose) is not recommended. It may be considered for patients whose adherence is less certain.[5]

SMART

SMART is treatment with ICS and a specific LABA (formoterol) for both daily and rescue therapy. It is strongly recommended as the preferred therapy for children ≥4 years who are not well controlled on a low- or medium-dose daily ICS alone.[4] Formoterol is the LABA of choice because it has a rapid onset of action and can be used more than twice daily. For patients, SMART is a "double win," reducing exacerbation rates and overall corticosteroid use.[4] Individuals whose asthma is uncontrolled on daily ICS-LABA maintenance therapy should also receive the preferred SMART before moving to a higher-step level of therapy. Not only is SMART more effective than daily ICS, but it also reduces total exposure to ICS and effects on growth rates in young children; effects on growth are related to ICS dose equivalence and treatment duration. SMART is also attractive because only one device and technique are necessary, but families will need to be educated to stop using their SABA. In addition, insurers will need to modify their policies regarding medication dispensing for individuals on SMART because one inhaler per month may be insufficient.

Add-on LAMA Therapy

These recommendations apply only to patients ≥12 years; LAMA therapy is approved for children 6 to 11 years of age but was not considered in the systematic reviews used to develop the recommendations. Daily ICS-LAMA is an alternative therapy after SMART (preferred choice) and after daily ICS-LABA (secondary choice) for moderate persistent disease. For severe persistent asthma, the preferred therapy for individuals not controlled on ICS-LABA is triple therapy with daily medium- to high-dose ICS-LABA plus add-on LAMA and as-needed SABA. This combination of three devices and techniques poses a unique challenge to patients.

INDOOR ALLERGEN MITIGATION

In contrast to the panel's recommendations for pharmacologic therapies, its recommendations for allergen mitigation are less notable. In fact, the panel conditionally recommends against it as part of routine asthma care.[1] Mitigation should be used only for individuals who are exposed to a specific allergen to which they are either sensitized or become symptomatic after exposure. When used, multicomponent tailored intervention strategies should be used. For example, dust-mite mitigation might include a combination of dust-mite impermeable pillow and mattress covers, frequent damp dusting, and HEPA vacuums. The exception is integrated pest management, which is recommended either alone or as part of a multicomponent intervention strategy.

SUBCUTANEOUS AND SUBLINGUAL IMMUNOTHERAPY

Subcutaneous immunotherapy (SCIT) or sublingual immunotherapy (SLIT) (in liquid or tablet form) reduces the immunoglobulin E–mediated allergic response associated with asthma. The panel defines a narrow role for SCIT as an adjunct to standard pharmacotherapy in individuals aged ≥5 years with mild to moderate allergic asthma for whom a potential decrease in long-term medication is important.[1] SCIT should not be administered in individuals with severe asthma or any individuals with persistent asthma whose asthma is not under control at the time the injections are administered. Clinicians should administer SCIT in a clinical setting that has the capacity to monitor and treat reactions, which are frequent and of wide-ranging severity. SCIT should not be administered at home. The panel recommends against the use of SLIT in asthma treatment,[1] but it may benefit individuals with certain comorbid conditions, such as allergic rhinitis with or without conjunctivitis.

FENO TESTING

Like immunotherapy, the panel recommends a narrow role for FeNO testing in asthma management. Nitric oxide in exhaled breath is an indirect measure of type 2 (or eosinophilic) airway inflammation. Measurement is safe and noninvasive; the biggest barrier to office-based implementation is purchasing the equipment. Results can be difficult to interpret, however, because levels are confounded by different conditions (eg, ICS use, allergic rhinitis, or

TABLE 1 New Recommendations of the 2020 Focused Updates by Age Group

Age Group	Recommendation (Strength of Recommendation[a] and Certainty of Evidence)
0–4 y	In children aged 0–4 y with recurrent wheezing triggered by respiratory tract infections and no wheezing between infections, the expert panel conditionally recommends starting a short course of daily ICS at the onset of a respiratory tract infection with as-needed SABA for quick-relief therapy, as opposed to as-needed SABA for quick-relief therapy only (conditional recommendation, high certainty of evidence)
	In children aged 0–4 y with recurrent wheezing, the expert panel recommends against FeNO measurement to predict the future development of asthma (strong recommendation, low certainty of evidence)
4 y and older	In individuals aged 4 y and older with moderate to severe persistent asthma, the expert panel recommends ICS-formoterol in a single inhaler used as both daily controller and reliever therapy (strong recommendation, high certainty of evidence for ages >12 y, moderate certainty of evidence for ages 4–11 y), as opposed to either higher-dose ICS as daily controller therapy and SABA for quick-relief therapy or same-dose ICS-LABA as daily controller therapy and SABA for quick-relief therapy
	In individuals aged 4 y and older with mild to moderate persistent asthma who are likely to be adherent to daily ICS treatment, the expert panel conditionally recommends against a short-term increase in the ICS dose for increased symptoms or decreased peak flow (conditional recommendation, low certainty of evidence)
5 y and older	In individuals aged 5 y and older with mild to moderate allergic asthma, the expert panel conditionally recommends the use of SCIT as an adjunct treatment to standard pharmacotherapy in those individuals whose asthma is controlled at the initiation, build-up, and maintenance phases of immunotherapy (conditional recommendation, moderate certainty of evidence)
	In individuals aged 5 y and older with persistent allergic asthma, for whom there is uncertainty in choosing, monitoring, or adjusting antiinflammatory therapies on the basis of history, clinical findings, and spirometry, the expert panel conditionally recommends the addition of FeNO measurement as part of an ongoing asthma monitoring and management strategy that includes frequent assessments (conditional recommendation, low certainty of evidence)
	In individuals aged 5 y and older with asthma, the expert panel recommends against the use of FeNO measurements in isolation to assess asthma control, predict future exacerbations, or assess exacerbation severity. If used, it should be as part of an ongoing monitoring and management strategy (strong recommendation against, low certainty of evidence)
	In individuals aged 5 y and older for whom the diagnosis of asthma is uncertain by using history, clinical findings, clinical course, and spirometry, including bronchodilator responsiveness testing, or in whom spirometry cannot be performed, the expert panel conditionally recommends the addition of FeNO measurement as an adjunct to the evaluation process (conditional recommendation, moderate certainty of evidence)
12 y and older	In individuals aged 12 y and older with mild persistent asthma, the expert panel conditionally recommends either daily low-dose ICS and as-needed SABA for quick-relief therapy or as-needed ICS and SABA used concomitantly (conditional recommendation, moderate certainty of evidence)
	In individuals aged 12 y and older with moderate to severe persistent asthma, the expert panel conditionally recommends ICS-formoterol in a single inhaler used as both daily controller and reliever therapy, as opposed to higher-dose ICS-LABA as daily controller therapy and SABA for quick-relief therapy (conditional recommendation, high certainty of evidence)
	In individuals aged 12 y and older with uncontrolled persistent asthma, the expert panel conditionally recommends against adding LAMA to ICS, as opposed to adding LABA to ICS (conditional recommendation against, moderate certainty of evidence)
	If LABA is not used, in individuals aged 12 y and older with uncontrolled persistent asthma, the expert panel conditionally recommends adding LAMA to ICS controller therapy, as opposed to continuing the same dose of ICS alone (conditional recommendation, moderate certainty of evidence)
	In individuals aged 12 y and older with uncontrolled persistent asthma, the expert panel conditionally recommends adding LAMA to ICS-LABA, as opposed to continuing the same dose of ICS-LABA (conditional recommendation, moderate certainty of evidence)
All ages	In individuals with asthma who do not have sensitization to specific indoor allergens or who do not have symptoms related to exposure to specific indoor allergens, the expert panel conditionally recommends against allergen-mitigation interventions as part of routine asthma management (conditional recommendation against, low certainty of evidence)
	In individuals with asthma who have symptoms related to exposure to identified indoor allergens, confirmed by history taking or allergy testing, the expert panel conditionally recommends a multicomponent allergen-specific mitigation intervention (conditional recommendation, low certainty of evidence)
	In individuals with asthma who have sensitization or symptoms related to exposure to pests (cockroaches and rodents), the expert panel conditionally recommends the use of integrated pest management alone or as part of a multicomponent allergen-specific mitigation intervention (conditional recommendation, low certainty of evidence)
	In individuals with asthma who have sensitization or symptoms related to exposure to dust mites, the expert panel conditionally recommends impermeable pillow and mattress covers only as part of a multicomponent allergen-mitigation intervention, not as a single-component intervention (conditional recommendation, moderate certainty of evidence)
	In individuals with persistent allergic asthma, the expert panel conditionally recommends against the use of SLIT in asthma treatment (conditional recommendation against, moderate certainty of evidence)

[a] A strong recommendation for a course of action is made for an intervention that almost all individuals with asthma (or their caregivers on their behalf) will want and that should be standard of care. A strong recommendation against a course of action is made for an intervention that almost all individuals with asthma will not want and should not receive. Conditional recommendations for and against an intervention are made for interventions that most individuals with asthma will want but many will not (conditional for) or that most individuals will not want but many will (conditional against).

smoking). FeNO testing should not be used alone to diagnose or manage asthma.[1] FeNO measurement may support a diagnosis of asthma in individuals ≥5 years for whom the diagnosis remains uncertain after completion of a history, physical examination, and spirometry with bronchodilator responsiveness. In children ≥5 years with an established diagnosis of asthma, FeNO measurements every 2 to 3 months

can supplement history, clinical findings, and spirometry in an ongoing asthma monitoring and management strategy. FeNO monitoring is not recommended to assess adherence to treatment (typically for ICS). FeNO testing should not be used in children aged 0 to 4 years with recurrent wheezing to predict the future development of asthma.

CONCLUSIONS AND FUTURE DIRECTIONS

The 2020 Focused Asthma Updates provide recommendations across multiple domains of asthma care. Those related to intermittent ICS may reduce asthma impairment and risk with lower overall exposure to ICS. Patients, caregivers, clinicians, payers, and institutions will need to adapt to these changes. Clinicians may wish to update their quality measures to adapt, for example, to recommendations for SMART, targeted allergen mitigation, and immunotherapy. Finally, the panel should move quickly to address several topics that were emerging at the time the revision process began, including personalized management with biological therapies and primary asthma prevention, an especially important area for pediatricians.

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ABBREVIATIONS

FeNO: fractional exhaled nitric oxide
ICS: inhaled corticosteroid
LABA: long-acting β2-agonist
LAMA: long-acting muscarinic antagonist
SABA: short-acting β2-agonist
SCIT: subcutaneous immunotherapy
SLIT: sublingual immunotherapy
SMART: single maintenance and reliever therapy

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