INDIAN HEALTH SERVICE
National Pharmacy and Therapeutics Committee
Formulary Brief: ***Asthma Care Guidelines***

-April/May 2024-

Background:

The Indian Health Service (IHS) National Pharmacy and Therapeutics Committee (NPTC) provided a review of asthma care guidelines. Contemporary guidelines from the Global Initiative on Asthma (GINA), National Asthma Education and Prevention Program (NAEPP), and National Institute for Health and Care Excellence (NICE) served as foundational to the review. As a result of this review, the NPTC voted to **ADD dexamethasone** to the National Core Formulary.

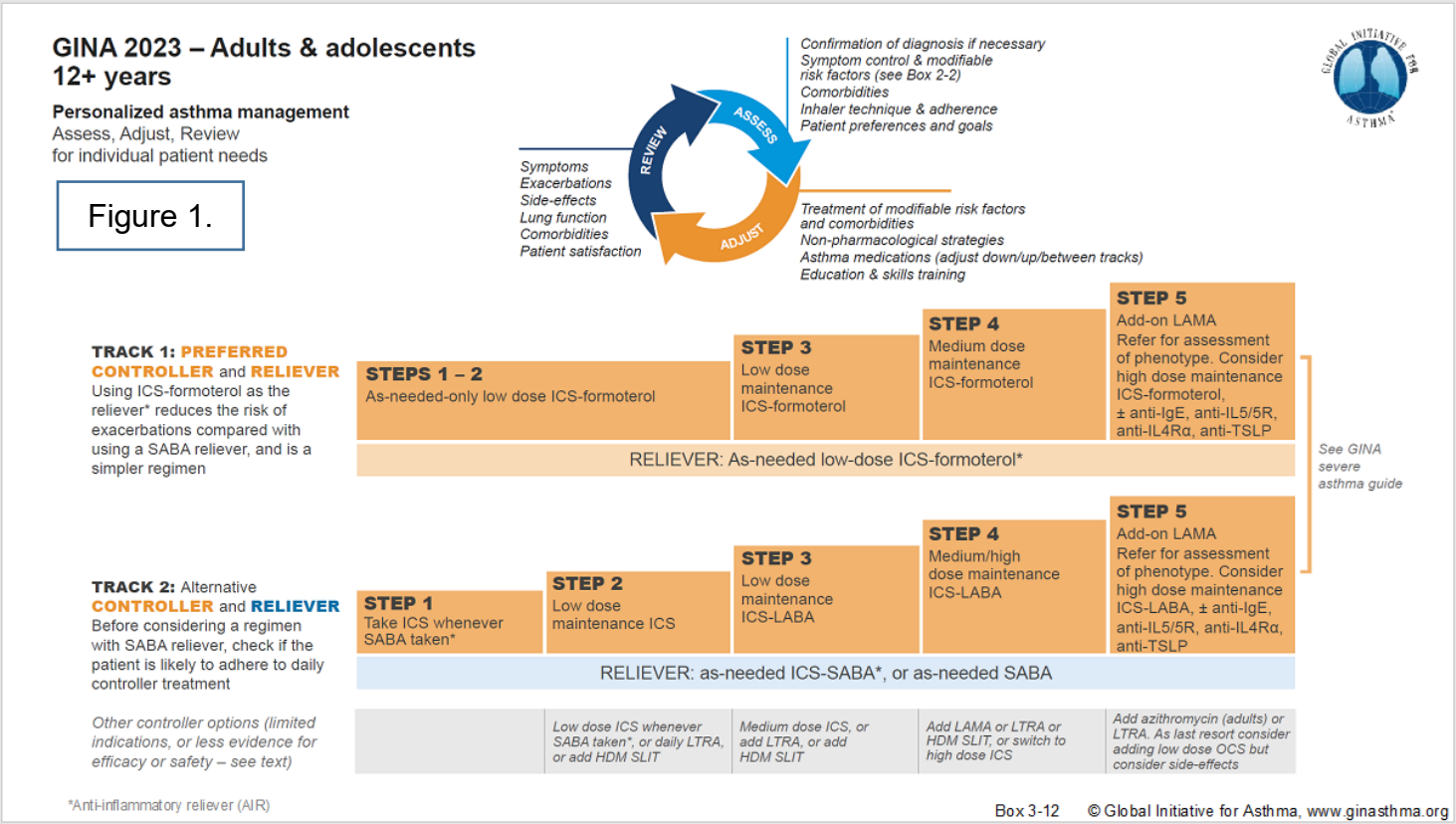
Discussion:

Asthma is a heterogeneous disease, which is usually characterized by chronic airway inflammation and airway hyper-responsiveness. Asthma control can vary over time and, if left untreated, it can lead to permanent airflow restriction. Asthma is diagnosed through patient history of characteristic symptom patterns and evidence of variable expiratory airflow limitation demonstrating bronchodilator reversibility, or via other lung function tests. Ideally, these lung function tests should be conducted prior to inhaled corticosteroid (ICS) treatment. Asthma phenotypes include allergic asthma, non-allergic asthma, adult-onset (late-onset) asthma, asthma with persistent airflow limitation, and asthma with obesity. Phenotypes do not determine treatment, except in severe disease.[1]

In 2018, over 278,000 American Indian/Alaska Native (AI/AN) adults were self-reported to have asthma.[2] AI/AN children were almost twice as likely to have ever had asthma as non-Hispanic white children, and AI/AN adults were 20% more likely to have asthma as compared to non-Hispanic whites. Identified causes of the increased prevalence of asthma among AI/AN include high rates of commercial tobacco usage, wood stoves, decreased healthcare access, and geographic isolation.[3] Additionally, there is a positive correlation between the following factors and increased incidence of asthma among AI/AN: annual household income of <$10,000 (OR 2.02; 95% CI: 1.64 to 2.49), less than high school education (OR 1.37; 95% CI: 1.16 to 1.63), type of housing (multi-unit dwelling vs. single-occupancy residence), and home infestation of rodents or insects.[4,5]

In the 1970's and 1980's, there was a significant increase in asthma prevalence and deaths in many countries. As a result, a number of countries published guidelines on the diagnosis and management of asthma. This included Australia and New Zealand, Canada, and the UK.[6] In 1989, the National Heart, Lung, and Blood Institute (NHLBI) established the NAEPP to address the growing national health problem of asthma. The NAEPP Coordinating Committee (NAEPPCC) convened the first Expert Panel with the primary goal to raise awareness among patients, health professionals, and the public that asthma is a serious chronic condition. The NAEPPCC guidelines were published in 1991, titled "Expert Panel Report: Guidelines for the Diagnosis and Management of Asthma", also known as EPR-1. In 1997, EPR-2 was published. In 2002, an update to EPR-2 was published, which was followed by EPR-3 in 2007 and EPR -4 in 2020. The EPR-4 includes stepwise (1 through 6) approaches for the initiation and treatment of asthma for patients 0-4 years old, 5-11 years old, and 12 and older. After adherence, inhaler technique, environmental factors are assessed, a step up in treatment can be considered if asthma control is not achieved once it has been reassessed after 2-6 weeks. If the patient's asthma is well controlled after 3 months, a step down can be considered. The guidelines include the preferred treatment option of utilizing a single maintenance and reliever therapy (SMART) for asthma treatment steps 3 and 4 among patients 4 and older. This most recent guideline contains data as recent as October 2018.[7,8]

In 1993, World Health Organization (WHO) and NHLBI established the GINA with the goals to increase awareness about asthma and to improve prevention and management through a coordinated worldwide effort. In 1995, the initial GINA report was published. Currently, the guidelines undergo a bi-annual literature evaluation. Major revisions to the GINA guidelines were published in 2002, 2006, and 2014. The most recent update to the GINA guidelines was published in 2023 and contains the following terminology changes; "controller" is now known as "maintenance", "rescue" is now known as "reliever", AIR is an acronym for Anti-Inflammatory Reliever (ICS-formoterol or ICS-Short-Acting Beta Agonist (SABA)), and MART is an acronym for Maintenance and Reliever Therapy, also known as SMART. Goals of asthma treatment include symptom control and risk reduction. It is important to assess and acknowledge that a patient's goals may be different and that symptom control and risk may not be consistent. The GINA includes a 4-step treatment approach for patients 5 years and younger, and a 5-step treatment approach for 6 to 11 years old, and 12 and older (see figure 1). Patients 6 years and older should be started on step 1 if asthma symptoms occur less than twice a month, Step 2 if asthma symptoms occur twice a month or more, but less than daily, Step 3 if asthma symptoms occur most days, or waking with asthma once a week or more, and Step 4 if patients have daily symptoms or if waking with asthma once a week or more, and low lung function. Similar to the NAEPP guidelines, asthma medications can be stepped up if asthma control is not achieved following reassessment 2-6 weeks thereafter. Conversely, if the patient's asthma is stable and well controlled after 3 months, a step down in dosage or therapy can be considered.[1,9]



Adapted from the GINA 2023 Slide set: What's new in GINA 2023?

The GINA guidelines provide guidance on oral steroid treatment for asthma exacerbation in pediatric patients. These include prednisolone and dexamethasone. The dose of prednisolone is 1-2mg/kg/day (max: 40mg) in divided doses x 5-7 days.[1] Prednisolone dosing is straightforward and familiar to most providers however, many pediatric patients may have difficulty with adherence to the regimen as prednisolone tastes bad, requires multiple daily doses, and has a long duration of therapy. The dose of dexamethasone is 0.6mg/kg/day (max: 16mg) x 1-2 days.[1] Dexamethasone treatment is administered once daily, for a shorter duration, and tablets can be easily crushed and mixed with applesauce or yogurt to mask the taste. Additionally, the injectable formulation can be given orally for quick in-clinic administration.

Findings:

Asthma causes significant morbidity among AI/AN. For most patients, treatment of asthma is successively managed utilizing an evidenced based, stepwise approach. Asthma guidelines consistently recommend the use of AIR and SMART or MART, utilizing ICS + formoterol combination medication. Pediatric asthma exacerbations can be efficiently treated using dexamethasone or prednisolone, but dexamethasone has a simpler treatment regimen.

If you have any questions regarding this document, please contact the NPTC at IHSNPTC1@ihs.gov . For more information about the NPTC, please visit the NPTC website.

References:

1. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2023. Updated July 2023.
2. U.S. Dept. of Health and Human Services. Office of Minority Health. Asthma and American Indians/Alaska natives. Accessed: 16 April 2024.
3. National Heart Lung and Blood Institute. Asthma in American Indian/Alaska native communities fact sheet (2023). Accessed: 16 April 2024.
4. Laffey KG, Nelson AD, Laffey MJ, et al. Chronic respiratory disease disparity between American Indian/Alaska Native and white populations, 2011-2018. BMC Public Health. 2021;21(1):1466.
5. Univ. of Washington. Department of Epidemiology. Social Determinants of asthma in American Indian Children (2018). Accessed: 16 April 2024.
6. Boulet LP, Reddel HK, Bateman E, et al. The global initiative for asthma: 25 years later. Eur Respir J. 2019; 54(2):1900598.
7. U.S. Department of Health and Human Services. National Heart, Lung and Blood Institute. National Asthma Education and Prevention Program Coordinating Committee. Accessed 11 April 2024.
8. Expert Panel Working Group of the National Heart, Lung, and Blood Institute (NHLBI) administered and coordinated National Asthma Education and Prevention Program Coordinating Committee (NAEPPCC). 2020 Focused Updates to the Asthma Management Guidelines: A Report from the NAEPPCC Expert Panel Working Group. J Allergy Clin Immunol. 2020; 146(6):1217-70.
9. Global Initiative for Asthma. What's new in 2023 – Slide Set. Updated: 2024. Accessed 1 April 2024.
10. National Institute for Health and Care Excellence. Asthma: diagnosis, monitoring and chronic asthma management. Last Updated: March 22, 2021.