

Asthma: Medication Classes Overview

	<i>Indication</i>	<i>MOA</i>	<i>Common Side Effects (>3% reported frequency)</i>	<i>Warnings/Precautions</i>	<i>Counseling Points</i>
Short-Acting Beta₂-Agonists (SABA)	<ul style="list-style-type: none"> - Treatment or prevention of bronchospasm - Prevention of exercise-induced bronchospasm (only albuterol HFA/DPI) 	<p>Activation of beta₂-adrenergic receptors leads to the activation of adenylyl cyclase and to an increase in the intracellular concentration of cyclic-3', 5'-adenosine monophosphate (cyclic AMP). This increase of cyclic AMP is associated with muscle relaxation. Albuterol/ Levalbuterol relaxes the smooth muscle of all airways, from the trachea to the terminal bronchioles.</p>	<ul style="list-style-type: none"> - Headache - Tachycardia - Pain - Dizziness - Pharyngitis - Rhinitis - Cough 	<ul style="list-style-type: none"> - Hypersensitivity reactions: angioedema, rash, urticaria - Hypokalemia and changes in blood glucose may occur - Cardiovascular effects may occur - Paradoxical bronchospasm - Overdosage - Asthma Deterioration: monitor need for more doses 	<ul style="list-style-type: none"> - Do not exceed recommended dose - The use of DPI inhalers, such as ProAir Respiclick, is contraindicated in patients with severe hypersensitivity to milk proteins (avoid if lactose-intolerant)
Inhaled Corticosteroids (ICS)	<p>Maintenance and prophylactic therapy for asthma in patients, as indicated by age.</p> <p>**NOT INDICATED FOR THE RELIEF OF ACUTE BRONCHOSPASM**^{1,2}</p>	<p>ICS have been shown to have multiple anti-inflammatory effects that contribute to their efficacy in asthma, including inhibiting both inflammatory cells (mast cells, eosinophils, basophils, lymphocytes, macrophages, and neutrophils) and release of inflammatory mediators (histamine, eicosanoids, leukotrienes, and cytokines).</p>	<ul style="list-style-type: none"> - Dysphonia/hoarseness - Headache - Nausea - Oral candidiasis - Upper RTI - Allergic rhinitis 	<ul style="list-style-type: none"> - Hypersensitivity reactions: angioedema, rash, urticaria - Localized infection: Candida albicans infection of the mouth and throat - Immunosuppression: potential worsening of existing infections - Paradoxical bronchospasm - Adrenal suppression/Cushing's - Decrease in bone mineral density - Eye Disorders: changes in vision - Growth effects: reduction in growth velocity in pediatrics 	<ul style="list-style-type: none"> - Treat acute asthma exacerbations with an inhaled, SABA (such as albuterol). - Rinsing the mouth with water without swallowing after inhalation is advised to help reduce the risk of thrush - The use of DPI inhalers is contraindicated in patients with severe hypersensitivity to milk proteins (avoid if lactose-intolerant)

<p style="text-align: center;">Inhaled Corticosteroids/ Long-Acting Beta₂-Agonists (ICS/LABA)</p>	<ul style="list-style-type: none"> - Treatment of asthma/prevention of bronchospasm - Maintenance treatment of airflow obstruction and reducing exacerbations in patients with COPD. <p>**NOT INDICATED FOR THE RELIEF OF ACUTE BRONCHOSPASM**²</p>	<p>ICS: See ICS LABA: Long-acting Beta₂-agonists act locally in the lung as bronchodilators.</p>	<ul style="list-style-type: none"> - See ICS 	<ul style="list-style-type: none"> - BBW: LABA monotherapy increase risk of asthma-related death - See ICS 	<ul style="list-style-type: none"> - See ICS
<p style="text-align: center;">Biologics</p>	<ul style="list-style-type: none"> - Treatment of moderate to severe, persistent asthma - Reserved for allergy phenotypes and not responding to alternative therapies 	<p>Immune targets include: IgE antagonists, IL-antagonists and/or IL=4 and IL-13 dual inhibitors</p>	<ul style="list-style-type: none"> - Injection site reactions - Headache - Fatigue - Myalgias and arthralgias - Anaphylaxis 	<ul style="list-style-type: none"> - Omalizumab BBW: anaphylaxis, treatment under medical supervision 	<ul style="list-style-type: none"> - Risk of allergy reaction requires EpiPen - Initial doses generally administered at healthcare facility
<p style="text-align: center;">Oral Corticosteroids (OCS)</p>	<ul style="list-style-type: none"> - Acute asthma exacerbations to reduce inflammation and swelling in the airways 	<p>Enhance the beta-adrenergic response to relieve muscle spasm associated with asthma. Also acts by reversing the mucosal edema, decreasing vascular permeability by vasoconstriction, and inhibiting the release of LTC₄ and LTD₄.</p>	<ul style="list-style-type: none"> - Nausea - Heartburn - Headache - Moodiness - Acne - Increased blood sugar - Increased appetite and weight gain - Insomnia 	<ul style="list-style-type: none"> - Immunosuppression: potential worsening of existing infections and concern for thrush - Adrenal suppression/Cushing's - Decrease in bone mineral density - Eye Disorders: changes in vision - Growth effects: reduction in growth velocity in pediatrics 	<ul style="list-style-type: none"> - Administer after meals or with food or milk to decrease GI upset. - May administer antacids between meals to help prevent peptic ulcers. - Administer in the morning to minimize sleep disturbance.

¹ Adults and adolescents (≥12 years) with mild persistent asthma are recommended to EITHER use daily low-dose ICS and PRN SABA for quick-relief therapy or PRN concomitant ICS/SABA (Moderate, Certainty of Evidence).

²Traditionally, ICS/LABA has been classified as a controller therapy for asthma and has not been used for relief during acute exacerbations. However, newer studies suggest that the utilization of SMART therapy (using low-dose ICS/formoterol) in patients with mild asthma results in a significant reduction of asthma exacerbations, lower average ICS dose, and an improvement in daily asthma symptoms when compared with patients on SABA alone or maintenance ICS therapy (*Beasley et al, NEJM 2019; Hardy et al, Lancet 2019*).