



© 2009
WebMD,
LLC.
All rights
reserved.

Asthma Medications

- * [What Is Asthma?](#)
- * [What Causes Asthma?](#)
- * [What Are the Risks of Asthma?](#)
- * [Medical Treatment](#)
- * [Corticosteroid Inhalers](#)
- * [Oral and Intravenous Corticosteroids](#)
- * [Leukotriene Inhibitors](#)
- * [Beta-Agonists](#)
- * [Anticholinergic Inhalers](#)
- * [Methylxanthines](#)
- * [Mast Cell Inhibitors](#)
- * [Monoclonal Antibodies](#)
- * [For More Information](#)
- * [Web Links](#)
- * [Synonyms and Keywords](#)
- * [Authors and Editors](#)

What Is Asthma?

[Asthma](#) is a disease that affects the [breathing](#) passages of the lungs ([bronchi](#) and bronchioles). Asthma is caused by chronic (ongoing, long-term) inflammation of these passages.

What Causes Asthma?

Individuals with asthma are highly sensitive to various "triggers." When the inflammation is triggered by one or more of these external or internal factors, the air passages swell and fill with [mucus](#). The muscles within the breathing passages contract and narrow (bronchospasm). The narrow airways make it hard to exhale (breath out from the lungs).

What Are the Risks of Asthma?

Asthma causes [wheezing](#), breathing difficulties, [chest pain](#) or tightness, and spasmodic coughing that often worsens at night. Asthma may impair individuals' ability to exercise, to engage in outdoor activities, to have pets, or to tolerate environments with smoke, dust, or [mold](#). Although asthma can be controlled with medications, asthma attacks vary in intensity from mild to life threatening. Over the past several decades, the number of asthma attacks that result in death has increased dramatically.

Medical Treatment

The main goals in the medical treatment of asthma are to prevent asthma attacks and to control the disease. Avoiding triggers that induce or aggravate asthma attacks is an important aspect of prevention. Medications used to prevent asthma attacks (controller medications) focus on decreasing the [airway](#) inflammation that causes attacks. Rescue medications help open up your airway and are used for quick relief when asthma symptoms occur despite the use of controller medications.

Corticosteroid Inhalers

Beclomethasone (Beclovent, Vanceril), [budesonide](#) (Pulmicort), [flunisolide](#) (AeroBid), [fluticasone](#) (Flovent), and [triamcinolone](#) (Azmacort) are used as first-line medications to control asthma. A small amount of inhaled corticosteroids are swallowed with each dose but is much less than that contained in oral corticosteroids. Therefore, inhaled corticosteroids decrease the likelihood of adverse effects from long-term use.

How corticosteroid inhalers work

Inhaled corticosteroids are often the first type of medication prescribed to control asthma. By inhaling the medication, these drugs act locally to decrease inflammation within the breathing passages, thereby avoiding the side effects associated with long-term use of oral corticosteroids.

Who should not use these medications

- * Individuals allergic to corticosteroids or any of the inhaler contents should not use these drugs.
- * Individuals with status asthmaticus or [acute](#) asthma attacks should not use these drugs.

Use

Corticosteroids for asthma are typically available as handheld inhalers containing liquid or powder. Many inhaled products have specific devices, and you should be thoroughly informed on how to use the inhaler prescribed for you. Frequency of administration (how often you use the inhaler) depends on the specific product.

Drug or food interactions

Since the drug is localized to the airway, no drug interactions have been reported.

Side effects

Do not use for an acute asthma attack. Inhaled corticosteroids may decrease growth in children, so use the lowest dose possible. Inhaled corticosteroids may also increase the risk of serious or fatal infection in individuals exposed to serious viral infections like [chickenpox](#) or [measles](#). Long-term use may cause [cataracts](#) or

glaucoma (increased pressure within the eyes).

Oral and Intravenous Corticosteroids

[Methylprednisolone](#) (Medrol, Solu-Medrol), [prednisone](#) (Deltasone, Orasone), and [prednisolone](#) (Pediapred) may need to be prescribed when inhaled medications fail to control asthma. Examples of such situations include after an acute asthma attack or when a respiratory infection or allergy aggravates asthma symptoms.

How corticosteroids work

Corticosteroids decrease the inflammation within the airway passages that contributes to asthma symptoms and acute attacks.

Who should not use these medications

- * Individuals who are allergic to corticosteroids should not use these drugs.
- * Individuals with [systemic](#) fungal infections or [active tuberculosis](#) should not use these drugs without medical supervision.

Use

- * Dosage varies depending on the situation for which corticosteroids are being used.
- * Corticosteroids may be given as an intravenous (IV) injection for an acute asthma attack in the emergency room.
- * The frequency of initial oral use may be as often as 3-4 times per day for 1-2 days following an acute asthma attack, which is then slowly decreased over 1 week.
- * When corticosteroids are taken regularly, they should be taken once daily upon awakening (usually in the morning) to coincide with your body's normal biological rhythm. The smallest possible dose should be given to avoid long-term side effects. Some individuals can control their asthma symptoms with every-other-day dosing.
- * Your doctor may try other medications to control your asthma to avoid long-term use of oral corticosteroids.
- * Take these drugs with food or milk to avoid [stomach](#) upset.

Drug or food interactions

Use caution with other drugs that suppress the [immune system](#), such as [cyclosporine](#) (Sandimmune, Neoral), [Phenobarbital](#) (Luminol), [phenytoin](#) (Dilantin), or [rifampin](#) (Rifadin) may decrease the effectiveness of corticosteroids. Some drugs, such as [ketoconazole](#) (Nizoral) or [erythromycin](#) (E-Mycin, E.E.S.), may increase blood levels and toxicity of corticosteroids. An increased risk of stomach bleeding (bleeding ulcer) may occur when taken with high-dose [aspirin](#) or with blood thinners such as [warfarin](#) (Coumadin). Corticosteroids tend to increase blood glucose levels in individuals with [diabetes](#), so diabetic therapy, such as insulin or oral medicines, may need to be adjusted. Talk to your doctor or [pharmacist](#) before taking other medications with oral corticosteroids.

Side effects

Do not suddenly stop taking oral corticosteroids if you have used them for more than a week. Doses must be gradually decreased with precise directions from your doctor. These drugs may decrease growth in children, so the lowest dose possible must be used. Long-term use may cause mood changes, [osteoporosis](#), [sleep](#) irregularities, increased hair growth, roundness of the face, or thinning skin. Call your doctor if you experience any of the following:

- * Itching or [hives](#), swollen face or hands, [chest](#) tightness, breathing troubles, tingling in mouth or throat
- * [Headache](#), eye pain, or visual troubles
- * Increased urination or thirst
- * Seizures or [dizziness](#)
- * Stomach problems, stomach pain, bloody or black stools
- * Sudden pain, swelling, or loss of movement in the [lower leg](#)
- * Sudden fluid retention or weight gain

Leukotriene Inhibitors

[Montelukast](#) (Singulair), [zafirlukast](#) (Accolate), and [zileuton](#) (Zyflo) are used to control asthma symptoms. They are often used in addition to inhaled corticosteroids to avoid the use of oral corticosteroid.

How leukotrienes work

Leukotrienes are powerful chemical substances produced by the body. They promote the [inflammatory response](#) caused by exposure to allergens. Leukotriene inhibitors block the action or production of these chemicals, thereby reducing inflammation.

Who should not use these medications

- * Individuals who are allergic to leukotriene inhibitors should not take these drugs.
- * Individuals with phenylketonuria ([PKU](#)) should not take the chewable tablets that contain [aspartame](#) because this artificial sweetener contains phenylalanine

Use

- * Leukotrienes are available with a [prescription](#) as tablets, chewable tablets, and oral granules.
- * Granules may be taken directly in the mouth, or they may be mixed in soft foods like pudding or applesauce.
- * The drug is administered as a once-daily dose.

Drug or food interactions

No drug or food interactions have been reported.

Side effects

Leukotrienes are typically well tolerated and side effects are similar to those of patients taking a [placebo](#) (sugar pill). Reports of headache, [earache](#), [sore throat](#), and respiratory infections have been noted.

Beta-Agonists

[Albuterol](#) (Ventolin, Proventil), [formoterol](#) (Foradil), [levalbuterol](#) (Xopenex), [metaproterenol](#) (Alupent, Metaprel), pirbuterol (Maxair), and [salmeterol](#) (Serevent) are used to decrease bronchospasm.

Some long-acting (>12 hours) beta-agonists (for example, [formoterol](#) and [salmeterol](#)) are specifically designed to prevent asthma attacks and NOT to treat acute attacks. Other beta-agonists have a quicker [onset](#) and may be used for prevention (along with corticosteroid inhalers) and as rescue therapy. Beta-agonists are also useful to use before exercise for [exercise-induced asthma](#).

How beta-agonists work

These drugs relax muscles within the airway that cause bronchospasm. Beta-agonists also cause the airway passages to open wider, thus making breathing easier.

Who should not use these medications

Individuals who are allergic to beta-agonists should not take these drugs.

Use

Both handheld inhalers and a solution for use with a [nebulizer](#) are available. Many inhaled products have specific devices and you should be thoroughly informed on how to use the inhaler or nebulizer prescribed for you. Frequency of administration depends on the specific product.

Drug or food interactions

Inhaled anticholinergic medications, such as [ipratropium](#) (Atrovent), enhance beta-agonists' effectiveness.

Side effects

Beta-agonists may cause rapid heartbeat and [tremor](#) (shakiness). Individuals with [heart disease](#), [hyperthyroidism](#), [seizure disorders](#), or hypertension should be closely monitored by their doctor.

Anticholinergic Inhalers

[Ipratropium](#) bromide (Atrovent) is used with beta-agonists for severe symptoms.

How anticholinergic inhalers work

These drugs decrease bronchospasm and secretion of mucus in airways and are often used with [albuterol](#) to enhance effectiveness. In general, they are not as effective as the beta-agonists in treating asthma.

Who should not use these medications

- * Individuals who are allergic to any components of the inhaled product should not take these drugs.
- * Individuals who are allergic to soya lecithin or similar food products, such as soybeans or peanuts, should not take these drugs.

Use

Both handheld inhalers and a solution for use with a nebulizer are available. Many inhaled products have specific devices and you should be thoroughly informed on how to use the inhaler or nebulizer prescribed for you. These drugs are typically used 3-4 times per day.

Drug or food interactions

Since anticholinergic inhalers have little or no effect beyond the area applied, they are unlikely to interact with other drugs.

Side effects

Anticholinergic inhalers are not indicated for acute asthma attacks. The most common [adverse effect](#) is [dry mouth](#). Individuals with glaucoma should be closely monitored by their [ophthalmologist](#).

Methylxanthines

[Theophylline](#) (Theo-24, Theolair, Theo-Dur, Slo-Bid, Slo-Phyllin) may be prescribed to take with other controller medications.

How methylxanthines work

Methylxanthines are related to [caffeine](#). These drugs provide mild-to-moderate relaxation of muscles in the airway to decrease bronchospasm. Essentially, they work as long-acting bronchodilators. These medications may have a mild anti-inflammatory effect.

Who should not use these medications

- * Individuals who are allergic to methylxanthines
- * Individuals with abnormal heart rhythms that are poorly controlled

- * Individuals with seizures ([epilepsy](#)) that are poorly controlled
- * Individuals diagnosed with hyperactive [thyroid](#)
- * Individuals with active [peptic ulcer](#) disease

Use

Methylxanthines are administered orally as tablets, capsules, liquid preparations, or sprinkles (tiny beads that may be sprinkled on the tongue or on soft food). Some oral preparations are available in long-acting doses, allowing the dose to be taken once or twice each day. Your doctor will adjust the dose to maintain specific blood levels known to be effective to decrease bronchospasm.

Drug or food interactions

Ingesting large amounts of caffeine contained in coffee, tea, or soft drinks may increase [theophylline](#) side effects. Some drugs that may increase theophylline blood levels include [cimetidine](#) (Tagamet), [erythromycin](#) (E-Mycin, E.E.S.), and [ciprofloxacin](#) (Cipro). Some drugs that may decrease theophylline blood levels include [phenytoin](#) (Dilantin) and [carbamazepine](#) (Tegretol). Check with your doctor or pharmacist before taking or stopping other medications to know how your theophylline blood levels will be affected by the change.

Side effects

Side effects include severe [nausea](#) or vomiting, tremors, muscle twitching, seizures, severe weakness or confusion, and irregular heartbeat. Less severe side effects include [heartburn](#), loss of appetite, upset stomach, nervousness, restlessness, [insomnia](#), headache, and loose [bowel](#) movements.

Mast Cell Inhibitors

[Cromolyn sodium](#) (Intal) and [nedocromil](#) (Tilade) are used to prevent allergic symptoms like [runny nose](#), itchy eyes, and asthma. The response is not as potent as that of corticosteroid inhalers.

How mast cell inhibitors work

These drugs prevent the release of [histamine](#) and other chemicals from mast cells that cause asthma symptoms when you come into contact with an [allergen](#) (for example, [pollen](#)). The drug is not effective until 4-7 days after you begin taking it.

Who should not use these medications

Individuals who are allergic to any components of the inhaled product should not take these drugs.

Use

Frequent dosing is necessary, since the effects last only 6-8 hours. Mast cell inhibitors are available as a liquid to be used with a nebulizer, a [capsule](#) that is placed in a device that releases the capsule powder to inhale, and handheld inhalers.

Drug or food interactions

Since these drugs have little or no effect beyond the area applied, they are unlikely to interact with other drugs.

Side effects

These drugs are only effective for prevention and are NOT to be used to treat an acute asthma attack.

Monoclonal Antibodies

[Omalizumab](#) (Xolair) is the newest asthma medication. It may be considered for individuals with persistent, moderate-to-severe asthma due to seasonal allergies that is not controlled by inhaled corticosteroids. The cost of [omalizumab](#) is estimated at \$12,000-15,000 per year.

How monoclonal antibodies work

Monoclonal antibodies bind to human [immunoglobulin E](#) (IgE) on the surface of mast cells and basophils (cells that release chemicals that cause allergic symptoms). By binding to IgE, omalizumab reduces the release of the allergy-inciting chemicals.

Who should not use these medications

Individuals who are allergic to omalizumab or its contents should not use it.

Use

Adults and children older than 12 years are given an injection every 2-4 weeks. The dose depends on the body's IgE levels.

Drug or food interactions

Drug interactions have not been reported.

Side effects

Omalizumab is not effective in treating acute asthma attacks. Inhaled corticosteroids should not be suddenly stopped when initiating omalizumab.

Swelling or pain at the area of injection may be experienced.

For More Information

American College of Allergy, Asthma & Immunology
85 West Algonquin Road
Suite 550
Arlington Heights, IL 60005

American Academy of Asthma, Allergy, and Immunology
611 East Wells Street
Milwaukee, WI 53202
(800) 822-2762

American Lung Association
61 Broadway
6th floor
New York, NY 10006
(212) 315-8700

Asthma & Allergy Foundation of America
1233 20th Street NW
Suite 402
Washington, DC 20036
(800) 7-ASTHMA

Asthma Society of Canada
130 Bridgeland Avenue
Suite 425
Toronto, Ontario M6A 1Z4
(866) 787-4050

Centers for Disease Control and Prevention/
National Center for Environmental Health
(888) 232-6789

National Institute of Allergy and Infectious Diseases
6610 Rockledge Drive, MSC 6612
Bethesda, MD 20892
(301) 496-5717

National Heart Lung and Blood Institute
PO Box 30105
Bethesda, MD 20824
(301) 592-8573

Web Links

[American College of Allergy, Asthma & Immunology](#)

[American Academy of Allergy, Asthma & Immunology](#)

[American Lung Association](#)

[Asthma & Allergy Foundation of America](#)

[Asthma Society of Canada](#)

[Centers for Disease Control and Prevention/National Center for Environmental Health](#)

[National Institute of Allergy and Infectious Diseases](#)

[National Heart, Lung, and Blood Institute](#)

Synonyms and Keywords

corticosteroid inhalers, beclomethasone, Beclovent, Vanceril, [budesonide](#), Pulmicort, flunisolide, AeroBid, fluticasone, Flovent, triamcinolone, Azmacort, [methylprednisolone](#), Medrol, Solu-Medrol, [prednisone](#), Deltasone, Orasone, [prednisolone](#), Pediapred, leukotriene inhibitors, [montelukast](#), Singulair, [zafirlukast](#), Accolate, [zileuton](#), Zflo, beta-agonists, albuterol, Ventolin, Proventil, formoterol, Foradil, [levalbuterol](#), Xopenex, [metaproterenol](#), Alupent, Metaprel, pirbuterol, Maxair, salmeterol, Serevent, anticholinergic inhalers, ipratropium bromide, Atrovent, methylxanthines, monoclonal antibodies, omalizumab, Xolair, asthma attack, [occupational asthma](#), exercise-induced asthma, adult-onset asthma, nocturnal asthma, [asthmatic](#), allergen, [bronchiolitis](#), bronchial asthma, acute asthma, allergies, [allergic reaction](#), bronchial airways, bronchial airway narrowing, allergy, [dyspnea](#), airway narrowing, noisy breathing, difficulty breathing, asthma triggers, reactive airways disease, [RAD](#), reversible [airway obstruction](#), increased bronchial reactivity, airway inflammation, passive [smoke inhalation](#), allergic disease, aeroallergen exposure, viral respiratory illness, airway hyperreactivity, AHR, airway remodeling, [atopy](#), nonallergic [rhinitis](#), early allergic response, EAR, late allergic response, LAR, chest tightness, breathlessness, airway hyperreactivity, bronchial hyperresponsiveness, BHR, understanding asthma medications, [hay fever](#), indoor allergies, indoor allergy, [indoor allergens](#), indoor allergen, asthma assessment, asthma quiz, [metered dose inhaler](#), MDI, nebulizer, [asthma FAQs](#), asthma frequently asked questions, asthma, breathing passages, airways, chronic airway inflammation, wheeze, bronchiolitis, acute asthma, asthma medications, inflammation of the bronchi, wheezing, noisy breathing, difficulty breathing, exposure to allergens, exposure to environmental irritants, exposure to [viruses](#), exposure to cold air, [allergic rhinitis](#), acute bronchoconstriction, airway [edema](#), chronic [mucous](#) plug formation

Authors and Editors

Author: Mary L Windle, Pharm D, Adjunct Assistant Professor, University of

Nebraska Medical Center College of Pharmacy; Pharmacy Editor,
eMedicine.com, Inc.

Editors: Ryland P Byrd Jr, MD, Chief of Pulmonary Medicine, Medical Director of Respiratory Therapy, Quillen VA Medical Center; Professor, Department of Internal Medicine, Division of Pulmonary Diseases and Critical Care Medicine, James H Quillen College of Medicine, East Tennessee State University; Francisco Talavera, PharmD, PhD, Senior Pharmacy Editor, eMedicine; Zab Mosenifar, MD, Director, Division of Pulmonary and Critical Care Medicine, Executive Vice Chair, Department of Medicine, Cedars Sinai Medical Center, Professor of Medicine, University of California at Los Angeles School of Medicine.

Last Editorial Review: 9/27/2005

© 2009 WebMD, LLC.

All rights reserved.

eMedicineHealth does not provide medical advice, diagnosis or treatment. [See Additional Information.](#)