INHALED BRONCHODILATORS

Inhaled medicines are the first choice. They begin to work within 5 minutes and have fewer side effects. The medicine goes right to the lungs and does not easily go into the rest of the body.

Inhaled bronchodilators are used for breathing trouble, chest tightness, neck/throat tightness, or chest pain. They should be used when needed, as recommended by your doctor.

Inhaled bronchodilators work in two ways. Some are immediate acting and give quick relief from asthma flare-up. They stop symptoms of asthma episodes and prevent asthma symptoms that are started by exercise.

Others, like SEREVENT and FORADIL, are long-acting and work more slowly. With long-acting medicines, you won’t feel any affects for at least 30 minutes. Some patients use long-acting bronchodilators are used on a daily basis to keep asthma flare ups from occurring.

SOME POSSIBLE SIDE EFFECTS OF THESE IMMEDIATE AND LONG-ACTING INHALED BRONCHODILATORS ARE: sore throat and throat irritation, cough, rapid heart beat, palpitations, nervousness, trembling, nausea, headaches, dizziness and feeling anxious.

SOME BRAND NAMES: Proventil, Ventolin, Albuterol, Alupent, Tornalate, Serevent, Maxair, Primatene.

REMINDER: Bronchodilators relieve symptoms but cannot reduce or prevent the swelling of airways that cause the symptoms. When you have to use a beta-agonist a lot, it may be a sign that the swelling in your airways is getting worse. You may need another kind of medicine, and you need to discuss this with your doctor right away.
CROMOLYN SODIUM (INTAL)

Cromolyn can be used in two ways:

- To prevent symptoms of asthma, it should be taken every day.
- To prevent symptoms of asthma that occur with exercise or contact with an asthma trigger (such as an animal), it can be taken 5-60 minutes before contact. The effects of the medicine last for 3 or 4 hours.

Cromolyn comes as a meter dose inhaler and a liquid that is used in a nebulizer.

Using cromolyn if an attack has already begun will not help.

**SOME POSSIBLE SIDE EFFECTS**: A cough may occur, but is not likely.

**REMINDER**:

- This medicine takes 4 to 6 weeks of everyday use before it starts to work.
- Cromolyn does not work for everybody.
- You must take it regularly, even when you feel good.
- **Taking more during an asthma attack will not work; this is only a preventive drug.**

Other effects are rare. If you get a cough or bad taste after you take your medicine, rinse out your mouth with water.

If you have any questions, do not hesitate to ask them.
PREVENTION AND RESCUE ASTHMA MEDICINES

There are many different medications that can be used for asthma. Some are given to help prevent asthma flare-ups, to reduce or reverse the swelling in the airways and to control asthma. These are called anti-inflammatory prevention medications, and are used as maintenance or control of asthma. They need to be taken everyday, even when there are no symptoms. These medications keep the inside of air passages from swelling and producing mucus.

Other medications, called bronchodilators, are used to relax airway muscles and open up air passages to let more air flow through. They are called rescue medicines and are used for quick relief, when symptoms are first noticed. These rescue medicines can also used before exercise.

SOME IMPORTANT THINGS TO REMEMBER:

- Learn how and when to take medications before starting to use them.
- Learn the names of all medications. Learn about prevention and rescue medications.
- Before you run out of medicine, call for a refill. If you have any problems getting insurance to cover the costs, call your pediatrician or pulmonologist.

HERE ARE SOME QUESTIONS YOU CAN ASK ABOUT ASTHMA MEDICINE:

- What is the name of the medicine?
- What other names are there for this medicine?
- What is it supposed to do?
- Does this medicine prevent flare-up from happening or rescue me from one that has started?
- How should this medicine be taken?
- When should this medicine be taken? Everyday? Or only when symptoms appear?
- What should be done if a dose is missed?
- How do I know that the medicine is not working?
- What are the side effects? What should I do if any side effects happen?
- Where should I keep the medicine?
- Are there other medicines, foods, or drinks that shouldn’t be taken with this medicine?
**PREVENTION MEDICINES:**

- Intal.
- Tilade.
- Inhaled steroids.
- Singulair.
- Accolade.
- Theophylline (Slobid, Theodur, Uniphy).
- Advair.

**RESCUE MEDICINES:**

- Albuterol.
- Proventil.
- Ventolin.
- Alupent.
- Metaproterenol.
- Maxair.
- Primatene.
- Atrovent.
- Atropine.
- Short course of oral or intravenous steroids.

**NOTE:** Asthma medicines are safe, if taken as directed. Some people are afraid that they will become addicted to their medicines. This is not true. Others are concerned that if medicine is taken all the time, it will no longer work. This problem occurs rarely and can be managed.

**REMININDER:** Your asthma medicine plan is not working if you still have symptoms with exercise, at rest, at night, or early in the morning. Talk to your doctor.
ORAL BRONCHODILATORS

SOME BRAND NAMES: Proventill, Ventolin, Alupent, Albuterol.

Oral bronchodilators do the same thing as the inhaled bronchodilators—helping to relax muscles around the windpipes and give a feeling of being able to breathe more easily within a short time. These medicines are used for breathing trouble, wheezing, coughing, chest tightness, neck-throat tightness, or chest pain. They come in liquid or pill. Results might not be felt for 15-30 minutes, or more. If used before exercise, this medication must be taken at least 30 minutes prior to exercise.

SOME POSSIBLE SIDE EFFECTS ARE: rapid heartbeat, upset stomach, palpitations, nervousness. Taking too much can be very serious and life-threatening. DO NOT take extra doses.

REMINDER: Bronchodilators will give you some relief of your symptoms but will not reduce the swelling of your airways. If you find that you need to take a bronchodilator often (more than twice a week), you also should be taking a preventive inhaler on a daily basis. Your medication plan will need to be adjusted.

Overall, beta agonists account for over 50% of all asthma prescriptions

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**IMS Prescription Audit - Total Asthma Prescriptions**
**NEDOCROMIL SODIUM (TILADE)**

Nedocromil sodium (TILADE) is taken through an inhaler. It helps to prevent asthma flare-ups by keeping the airways from swelling and also keeps the airway muscles relaxed.

Nedocromil should be taken every day by people with chronic asthma, if it is recommended by a physician. It can also be used to prevent flare-ups of symptoms if taken before exercising or before exposure to any asthma triggers.

Do not use Nedocromil through an inhaler if an attack has already begun.

**SOME POSSIBLE SIDE EFFECTS:** A cough may occur but is not likely. The taste of the medicine may be irritating.

**REMAINDER:**

- This medicine takes 1-2 weeks of every day use before it starts to work.
- You must take it regularly, even if you feel good.
- **Taking more during an asthma attack will not work, this is only a preventive drug.**

Other effects are rare. If you get a cough or bad taste in your mouth, rinse with water.

**NOTE:** Nedocromil Sodium (Tilade) should always be used with a spacer.
CORTICOSTEROIDS

Corticosteroids are not the same as the steroids used by some athletes. Oral steroids taken for a short time, or inhaled steroids taken for several months do not damage the liver and they do not cause other long-lasting changes in the body.

INHALED STEROIDS

These are key drugs that will help your child to control his/her asthma. These medicines will help prevent flare-ups. They decrease mucus production, and help to prevent asthma flare-ups. They prevent the airways from being too sensitive to inhaled allergens or irritants, such as pollen, dust, and animal dander.

Some brand names for inhaled steroids are: Aerobid, Azmacort, Beclovent, Flovent, Pulmicort, Q-Var and Vancercil. Advair contains two medications – Flovent and Serevent.

Steroids are used for better control of breathing trouble, chest tightness, cough, and excess mucus production.

Note: The key is to use inhaled steroids everyday. These drugs will not work if they are used only when symptoms start to happen. They must be used regularly to prevent attacks and get your asthma under control.

Some possible side effects of inhaled steroids are: Sore throat, thrush (yeast infection in the throat), hoarseness. The bad effects of inhaled steroids are much less serious than those of oral steroids. Using a spacer with your inhaler and rinsing your mouth out after taking the medicine will reduce side effects.
If you get a cough or bad taste after you use your medicine, rinsing with water will help.

Inhaled steroids, that come as meter dose inhaler, should always be used with a spacer. Pulmicort comes as a dry powder inhaler and also as a solution for nebulizer. Advair is a dry powder inhaler.
Always brush your teeth or rinse mouth with mouthwash after using inhaled steroids. If using a face mask (with a spacer or nebulizer), wipe your face after use.
**ORAL STEROIDS**

**SOME BRAND NAMES FOR ORAL STEROIDS ARE:** Prelone, Prednisolone, Medrol, Decadron, Pediapred, Liqui-Pred.

Oral steroids work like inhaled steroids to reduce the swelling of the airways and get your asthma under control. If you have a severe flare-up of your asthma, a 5-7 days course of one of the medications will be recommended. Prednisone and other oral steroids are considered generally safe when used for short-termed treatment in this way.

**SOME POSSIBLE SIDE EFFECTS OF ORAL STEROIDS ARE:** Nausea, puffiness, weight gain, increased appetite, headache, personality changes, mood swings, and bruising. Long-term use of oral steroids might cause weak bones, growth retardation, increased infections, stretch marks, and facial hair.
THEOPHYLLINE

Theophylline is a bronchodilator medicine that opens airways by relaxing the muscles in and around the airways that tighten during an asthma episode. It is also thought to have anti-inflammatory effects.

HOW THEOPHYLLINE IS PRESCRIBED:

- Theophylline comes in four forms: 1) Tablets to be swallowed 2) Capsules to be swallowed 3) Liquid to be swallowed 4) Intravenous form - that is used only in hospitals for severe asthma attacks.
- Theophylline may be prescribed to be taken every 8 or every 12 hours. This makes it an easy medicine to use.

TAKING THEOPHYLLINE:

- Theophylline should not be mixed with hot food. This will dissolve the medicine and release too much into the body.
- Theophylline should not be chewed. Chewing releases too much medicine all at once.
- Taking theophylline with food rather than on an empty stomach is better tolerated.

THEOPHYLLINE LEVELS:

- It takes some time for theophylline to build up in the blood stream, where it must stay at a constant amount to have a lasting effect. This means that it has to be taken at the time and in the amount that the doctor prescribes.
- If a patient develops a fever, or a viral infection, or starts certain medications, the level of theophylline in the blood system may change. The dose will then have to be adjusted.
- A simple blood test can check to make sure the level is good.

Some Possible Side Effects: Side effects may include nausea, vomiting, stomach cramps, diarrhea, headache, muscle cramps, irregular heartbeat, and/or feeling shaky or restless. These side effects may mean that the amount of medicine being taken has to be changed. Mild side effects often go away after a few days.
LEUKOTRIENE INHIBITORS

Leukotrienes are mediators that the body releases in certain situations, such as when infected with a respiratory virus.

Leukotrienes lead to bronchoconstriction, airway edema, mucus secretion and eosinophil recruitment.

Leukotriene inhibitors are medications that prevent these mediators from causing inflammation and symptoms of asthma.

There are three different kinds of leukotriene inhibitors available.

**Montelukast or Singulair** is the one that used most frequently. It is taken once a day as a tablet that can be chewed or swallowed.

**SOME POSSIBLE SIDE EFFECTS:** are minimal. May cause headaches, and nasal congestion.
Asthma medications are effective when taken as prescribed. When evaluating effectiveness or efficacy of medication following are factors that have to be taken into consideration:

**Issues with Current Asthma Controller Therapy**

- Oral vs. Inhaled
- Dosing frequency
- Side effects
- Cost
- Patient education
- Onset of Action

Effectiveness = Efficacy x Adherence

"Does it work?"
"Can it work?" (e.g., controlled clinical trial)
Inhalation technique

**Corticosteroids for Asthma:**

**Benefits and Risks**

- Reduces inflammation
- Most effective long-term control medication for asthma
- Decreases morbidity / mortality
- Dose, drug, & route dependent
- Generally known and can be monitored

*Risks

Sometimes, asthma medications, especially β-agonists are used for different reasons.

In preschool children, asthma is diagnosed less than half of the time when a beta agonist is used.

In school aged children, asthma is usually the diagnosis when a beta agonist is used.
Asthma medications can be taken by mouth, by aerosols, meter dose inhalers or dry powder inhalers.

Meter dose inhalers should always be taken with spacers. Spacers are devices that improve the delivery of medication to the lungs. Different spacers are available.

When a medication is inhaled, some will be swallowed, and a portion is inhaled into the airway. Medicine that is swallowed is removed from the body through the liver or the kidney.

If the patient can be taught to take the inhaled medication properly, then inhaled medications are preferred because smaller doses are required and there are fewer side effects.