

# Pamphlet #6: ASTHMA AND STEROIDS IN TABLET FORM

**Introduction** (also discussed in [Asthma and Inhaled Steroids](#), prepared by the Mass General Brigham Asthma Center).

"Steroids" are a family of chemicals normally made within the body. They serve as hormones — chemical signals that help to regulate the body's growth and function. Some steroid hormones, like testosterone, stimulate formation of protein and growth of muscle. Competitive athletes have been known to take illicit derivatives of these "body-building" steroids in large amounts to improve their athletic performance. A very different group of steroid hormones are the corticosteroids, steroid hormones made in the cortex (hence, "cortico-") of the adrenal glands, which sit adjacent to the kidneys. Corticosteroid hormones have many different effects on body function, including influences on how we use our energy stores (fat, protein, and sugar) and how we adjust the salt and water content of our body.

Early in this century it was discovered that corticosteroid hormones, if purified and taken in large amounts as a medicine, have powerful anti-inflammatory effects. Ever since this discovery, corticosteroids have been used to treat a great variety of diseases where inflammation (not infection and not cancer) is the major problem—from arthritis to psoriasis to asthma. When you and your doctor talk about steroids to treat your asthma, it is these anti-inflammatory corticosteroids about which you are speaking.

## **Steroids Swallowed or Steroids Inhaled**

To treat the inflammation of asthma within the bronchial tubes, steroids can be taken in tablet or liquid form or by inhalation. Occasionally, steroids are given by injection or—in hospitalized persons —directly into the veins (intravenous infusion). Taken as tablets, liquid, injection, or intravenous infusion, the steroid medication travels in the blood and is carried throughout the body, including to the bronchial tubes. Used in this way, steroids have their most powerful effects— both for the good (relieving asthmatic symptoms) and for the bad (undesirable side effects). On the other hand, steroid medications inhaled on the bronchial tubes act directly on these tubes; very little medication is carried into the bloodstream. Although not as powerful in their immediate effects, steroids by inhalation are better suited for long-term use in the treatment of inflamed bronchial tubes because they are free of major undesirable side effects.

Examples of steroids in tablet form are prednisone (Brand name: *Deltasone*<sup>®</sup>) and prednisolone (Brand name: *Medrol*<sup>®</sup>). Examples of steroids by inhalation are beclomethasone (*Qvar*<sup>®</sup>);

budesonide (*Pulmicort*<sup>®</sup>); ciclesonide (*Alvesco*<sup>®</sup>); fluticasone furoate (*Arnuity*<sup>®</sup>); fluticasone propionate (*Armonair*<sup>®</sup>, *Flovent*<sup>®</sup>); and mometasone (*Asmanex*<sup>®</sup>).

More information about the inhaled steroids is available in a separate pamphlet prepared by the Mass General Brigham Asthma Center, entitled, [Asthma and Inhaled Steroids](#). The remainder of this pamphlet focuses on the use of steroids in tablet or liquid form.

## A Short Course of Steroids

Steroids taken in tablet or liquid form ("oral steroids") are usually prescribed for asthma that has become difficult to control by any other means. They are the most effective treatment available for a severe "attack" of asthma. Most often, they are prescribed for a short period of time: a short course may be as brief as 3-4 days or as long as 2-3 weeks. They are stopped when the asthma has gotten better and other treatments suffice to keep it under control. Longer periods of treatment and continuous treatment with oral steroids are generally avoided except for the most difficult-to-control asthma because of the undesirable side effects that often develop with prolonged oral steroid treatment.

## Variable Doses and Schedules

The dose of oral steroids will vary with the severity of the asthma and an individual's sensitivity to the medication. As a rough guide, we consider less than 20 milligrams (abbreviated "mg") of prednisone a low dose, 20 to 30 mg a moderate dose, and 40 to 60 mg a high dose of oral steroids. When rapid relief from an asthma attack is needed, a high dose will often be recommended initially, followed by a gradual reduction in dose on successive days until the oral steroids are stopped: a "steroid taper." However, when a short course of oral steroids is used, it is not necessary to taper the dose. A high dose can be safely stopped abruptly (for instance, 40 mg of prednisone taken each day for 5 days, then stopped). There is no single schedule of oral steroid dosing that is right for all asthma attacks in all patients. Your provider will try to recommend the best schedule for you at that particular time, and he/she may need to adjust it over the ensuing days according to how you and your asthma are responding to it. Most often, we recommend taking the tablets altogether in the morning. Sometimes the steroid dose is divided up during the day and on occasion even given once daily in the evening.

## Effects of a Short Steroid Course

The beneficial effects of oral steroids are usually evident within a day or so and sometimes over a period as short as several hours. Breathing becomes easier and wheezing, cough, mucus production, and chest tightness all gradually lessen. Other allergic diseases, such as eczema (also called allergic or atopic dermatitis) and nasal congestion and drip ("allergic rhinitis and sinusitis"), are also likely to be helped by the anti-inflammatory action of the oral steroids. Similarly, joint aching may dramatically improve, due to the anti-inflammatory effect of the

steroids on arthritis and bursitis. Many people also find that oral steroids, independent of their effect on breathing, give a powerful boost of energy—for a short while.

## Undesirable Side Effects of a Short Steroid Course

At the same time, there are undesirable side effects of oral steroids that are common, even during a short course, although not necessarily experienced by every person with every course. An individual may experience none, some, or all of these side effects, which generally go away quickly when the medication is stopped. These side effects include: stomach irritation ("indigestion"); fluid retention causing a sense of bloating; hunger; sleeplessness; blurry vision; irritability and short temper; and difficulty concentrating. Women may have their menstrual cycle become irregular for a brief while and may develop a vaginal yeast infection. Rare complications include loss of a sense of reality (psychosis), triggering the onset of diabetes, and injury to the bone in a joint (avascular necrosis of a bone). You can avoid or minimize some of these side effects, as follows. To minimize stomach upset, take your oral steroids with food and, if necessary, over-the-counter medicines that neutralize or block formation of stomach acid (such as Maalox<sup>®</sup> or Mylanta<sup>®</sup>; famotidine (Pepcid<sup>®</sup>) or ranitidine (Zantac<sup>®</sup>); or esomeprazole (Nexium<sup>®</sup>) or omeprazole (Prilosec<sup>®</sup>). To minimize fluid retention and bloating, avoid excessive salt intake. And to reduce the risk of avascular necrosis of the bone (which is rare), avoid heavy alcohol consumption. If needed, over-the-counter medications are available to treat vaginal yeast infections, including miconazole (Monistat<sup>®</sup>) and clotrimazole (Gyne-Lotrimin<sup>®</sup>).

When the steroid dose is being tapered or stopped, one may experience a different set of side effects. These include: a flu-like stiffness or aching in the joints; lack of energy and appetite; and sadness or teariness that seems inappropriate to one's situation. Bear with them; these side effects will likely go away in a short while.

## Undesirable Side Effects of Prolonged Use of Oral Steroids

If taken for a long time (months to years), daily oral steroids, especially in moderate to high doses, can cause many harmful side effects. These complications of long-term use include: cataracts and high pressure (glaucoma) of the eyes; thinning of the bones (osteoporosis); weakness of the muscles (myopathy); fragile skin with a tendency to bruise easily; hair loss; facial hair growth in women; puffy cheeks; a fatty bulge at the base of the back of the neck; and weight gain. Long-term steroid use also predisposes to certain types of unusual infections, to the development of high blood pressure and diabetes, and to shrinkage of the glands that normally make corticosteroid hormones in the body, the adrenal glands. This latter effect makes it dangerous to stop suddenly oral steroids if you have taken them regularly in moderate to high doses for more than about 3 to 4 weeks. You might then become sick from a lack of the normal amounts of corticosteroids in your bloodstream, a condition called "adrenal insufficiency." Also, should you undergo major surgery or suffer a severe medical illness, your

adrenal glands might be unable to produce the extra amounts of corticosteroid hormone usually made under these circumstances. To prevent this from happening, your medical provider would routinely provide you with supplemental steroids either by tablet or by intravenous infusion at the time of this severe medical stress.

### **Are Steroids Too Dangerous? Should They Be Avoided?**

A severe attack of asthma that is not getting better with other treatments is dangerous. A short course of oral steroids for severe asthma can often keep you from being rushed to the Emergency Department of the hospital for treatment of your asthma, can prevent the need for hospitalization, and—in an extreme case—can save your life. Many persons with asthma have said that when you need them, oral steroids "work like a miracle." If needed to treat severe asthma, oral steroids should not be avoided; they should be taken promptly. Their risk comes only with overuse or prolonged continuous use; and long-term oral steroid use is not necessary for the vast majority of persons with asthma because other effective treatment strategies are now routinely available.