

## Dexamethasone Oral

(dex a meth' a sone)

<http://www.fda.gov/MedWatch/report.htm>

Alternate: **budesonide**

Dexamethasone is in a class of drugs called steroids. Dexamethasone prevents the release of substances in the body that cause inflammation. Dexamethasone, a corticosteroid, is similar to a natural hormone produced by your adrenal glands. It often is used to replace this chemical when your body does not make enough of it. It relieves inflammation (swelling, heat, redness, and pain) and is used to treat certain forms of arthritis; skin, blood, kidney, eye, thyroid, and intestinal disorders (e.g., colitis); severe allergies; and asthma. Dexamethasone is also used to treat certain types of cancer.

Dexamethasone is used to treat many different conditions such as allergic disorders, skin conditions, ulcerative colitis, arthritis, lupus, psoriasis, or breathing disorders.

Dexamethasone may also be used for other purposes.

Dexamethasone comes as a tablet and as an injection. Take dexamethasone exactly as directed. Do not take more or less of it or take it more often than prescribed.

Do not stop taking dexamethasone without talking to your doctor. Stopping the drug abruptly can cause loss of appetite, upset stomach, vomiting, drowsiness, confusion, headache, fever, joint and muscle pain, peeling skin, and weight loss. If you take large doses for a long time, your doctor probably will decrease your dose gradually to allow your body to adjust before stopping the drug completely. Watch for these side effects if you are gradually decreasing your dose and after you stop taking the tablets.

Before taking dexamethasone,

- tell your doctor if you are allergic to dexamethasone, aspirin, tartrazine (a yellow dye in some processed foods and drugs), or any other drugs.
- tell your doctor what prescription and nonprescription medications you are taking especially anticoagulants ('blood thinners') such as warfarin (Coumadin), arthritis medications, aspirin, cyclosporine (Neoral, Sandimmune), digoxin (Lanoxin), diuretics ('water pills'), ephedrine, estrogen (Premarin), ketoconazole (Nizoral), oral contraceptives, phenobarbital, phenytoin (Dilantin), rifampin (Rifadin), theophylline (Theo-Dur), and vitamins.
- if you have a fungal infection (other than on your skin), do not take dexamethasone without talking to your doctor.
- tell your doctor if you have or have ever had liver, kidney, intestinal, or heart disease; diabetes; an underactive thyroid gland; high blood pressure; mental illness; myasthenia gravis; osteoporosis; herpes eye infection; seizures; tuberculosis (TB); or ulcers.
- tell your doctor if you are pregnant, plan to become pregnant, or are breast-feeding. If you become pregnant while taking dexamethasone, call your doctor.
- if you are having surgery, including dental surgery, tell the doctor or dentist that you are taking dexamethasone.
- if you have a history of ulcers or take large doses of aspirin or other arthritis medication, limit your consumption of alcoholic beverages while taking this drug. Dexamethasone makes your stomach and intestines more susceptible to the irritating effects of alcohol, aspirin, and certain arthritis medications: this effect increases your risk of ulcers.

Your doctor may instruct you to follow a low-sodium, low-salt, potassium-rich, or high-protein diet. Follow these directions.

Dexamethasone may cause an upset stomach. Take dexamethasone with food or milk.

If you take dexamethasone once a day, take the missed dose as soon as you remember it. However, if it is almost time for the next dose, skip the missed dose and continue your regular dosing schedule. Do not take a double dose to make up for a missed one.

Dexamethasone may cause side effects. Tell your doctor if any of these symptoms are severe or do not go away:

- upset stomach
- stomach irritation
- vomiting
- headache
- dizziness
- insomnia
- restlessness
- depression
- anxiety
- acne
- increased hair growth
- easy bruising
- irregular or absent menstrual periods
- pancreatitis (severe pain in your upper stomach spreading to your back, nausea and vomiting, fast heart rate)
- low potassium (confusion, uneven heart rate, extreme thirst, increased urination, leg discomfort, muscle weakness or limp feeling); or
- dangerously high blood pressure (severe headache, blurred vision, buzzing in your ears, anxiety, confusion, chest pain, shortness of breath, uneven heartbeats, seizure).
- Psychiatric disturbances, including personality changes, irritability, euphoria, mania

- Osteoporosis under long term treatment, pathologic fractures (e.g., hip)
- Muscle atrophy, negative protein balance (catabolism)
- Elevated liver enzymes, fatty liver degeneration (usually reversible)
- Cushingoid (syndrome resembling hyperactive adrenal cortex with increase in adiposity, hypertension, bone demineralization, etc.)
- Depression of the adrenal gland is usually seen, if more than 1.5 mg daily are given for more than three weeks to a month.
- Hypertension, fluid and sodium retention, edema, worsening of heart insufficiency (due to mineral corticoid activity)
- Dependence with withdrawal syndrome is frequently seen.
- Increased intraocular pressure, certain types of glaucoma, cataract (serious clouding of eye lenses)
- Dermatologic: Acne, allergic dermatitis, dry scaly skin, ecchymoses and petechiae, erythema, impaired wound-healing, increased sweating, rash, striae, suppression of reactions to skin tests, thin fragile skin, thinning scalp hair, urticaria.
- Allergic reactions (though infrequently): Anaphylactoid reaction, anaphylaxis, angioedema. (Highly unlikely, since dexamethasone is given to *prevent* anaphylactoid reactions.)

Less serious side effects may include:

- sleep problems (insomnia), mood changes;
- acne, dry skin, thinning skin, bruising or discoloration;
- slow wound healing;
- increased sweating;
- headache, dizziness, spinning sensation;
- nausea, stomach pain, bloating;
- muscle weakness; or
- changes in the shape or location of body fat (especially in your arms, legs, face, neck, breasts, and waist).

If you experience any of the following symptoms, call your doctor immediately:

- skin rash
- swollen face, lower legs, or ankles
- vision problems
- cold or infection that lasts a long time
- muscle weakness
- black or tarry stool

This is not a complete list of side effects and others may occur. Tell your doctor about any unusual or bothersome side effect.

Keep all appointments with your doctor and the laboratory. Your doctor will order certain lab tests to check your response to dexamethasone. Checkups are especially important for children because dexamethasone can slow bone growth.

If your condition worsens, call your doctor. Your dose may need to be adjusted.

Carry an identification card that indicates that you may need to take supplementary doses (write down the full dose you took before gradually decreasing it) of dexamethasone during periods of stress (injuries, infections, and severe asthma attacks). This drug makes you more susceptible to illnesses. If you are exposed to chicken pox, measles, or tuberculosis (TB) while taking dexamethasone, call your doctor. Do not have a vaccination, other immunization, or any skin test while you are taking dexamethasone unless your doctor tells you that you may.

Report any injuries or signs of infection (fever, sore throat, pain during urination, and muscle aches) that occur during treatment.

Your doctor may instruct you to weigh yourself every day. Report any unusual weight gain.

If your sputum (the matter you cough up during an asthma attack) thickens or changes color from clear white to yellow, green, or gray, call your doctor; these changes may be signs of an infection.

If you have diabetes, dexamethasone may increase your blood sugar level. If you monitor your blood sugar (glucose) at home, test your blood or urine more frequently than usual. Call your doctor if your blood sugar is high or if sugar is present in your urine; your dose of diabetes medication and your diet may need to be changed.

### **What is the most important information I should know about dexamethasone?**

You should not use this medication if you are allergic to dexamethasone, or if you have a fungal infection anywhere in your body.

Before taking dexamethasone, tell your doctor about all of your medical conditions, and about all other medicines you are using. There are many other diseases that can be affected by steroid use, and many other medicines that can interact with steroids.

Your steroid medication needs may change if you have any unusual stress such as a serious illness, fever or infection, or if you have surgery or a medical emergency. Tell your doctor about any such situation that affects you during treatment.

Steroid medication can weaken your immune system, making it easier for you to get an infection or worsening an infection you already have or have recently had. Tell your doctor about any illness or infection you have had within the past several weeks.

Avoid being near people who are sick or have infections. Call your doctor for preventive treatment if you are exposed to chicken pox or measles. These conditions can be serious or even fatal in people who are using steroid medication.

Do not receive a "live" vaccine while you are taking dexamethasone. Vaccines may not work as well while you are taking a steroid.

Do not stop using dexamethasone suddenly, or you could have unpleasant withdrawal symptoms. Talk to your doctor about how to avoid withdrawal symptoms when stopping the medication. Carry an ID card or wear a medical alert bracelet stating that you are taking a steroid, in case of emergency.

You should not use this medication if you are allergic to dexamethasone, or if you have a fungal infection anywhere in your body.

Steroid medication can weaken your immune system, making it easier for you to get an infection. Steroids can also worsen an infection you already have, or reactivate an infection you recently had. Before taking this medication, tell your doctor about any illness or infection you have had within the past several weeks.

Other medical conditions you should tell your doctor about before taking dexamethasone include:

- liver disease (such as cirrhosis);
- kidney disease;
- a thyroid disorder;
- diabetes;
- a history of malaria;
- tuberculosis;
- osteoporosis;
- a muscle disorder such as myasthenia gravis;
- glaucoma or cataracts;
- herpes infection of the eyes;
- stomach ulcers, ulcerative colitis, or diverticulitis;
- depression or mental illness;
- congestive heart failure; or
- high blood pressure

If you have any of these conditions, you may need a dose adjustment or special tests to safely take dexamethasone.

This medication may be harmful to an unborn baby, it can pass into breast milk and may harm a nursing baby. Do not use this medication without telling your doctor if you are breast-feeding a baby.

This medication can cause you to have unusual results with certain medical tests. Do not stop using dexamethasone suddenly, or you could have unpleasant withdrawal symptoms.

A single large dose of dexamethasone is not expected to produce life-threatening symptoms. However, long-term use of high steroid doses can lead to symptoms such as thinning skin, easy bruising, changes in the shape or location of body fat (especially in your face, neck, back, and waist), increased acne or facial hair, menstrual problems, impotence, or loss of interest in sex.

Avoid drinking alcohol while you are taking dexamethasone.

### **What other drugs will affect dexamethasone?**

There are many other medicines that can interact with steroids. Below is only a partial list of these medicines:

- aspirin (taken on a daily basis or at high doses);
- a diuretic (water pill);
- a blood thinner such as warfarin (Coumadin);
- cyclosporine (Gengraf, Neoral, Sandimmune);
- insulin or diabetes medications you take by mouth;
- antibiotics such as ketoconazole (Nizoral), rifampin (Rifadin, Rifater, Rifamate, Rimactane), or troleandomycin (Tao); or
- seizure medications such as phenytoin (Dilantin) or phenobarbital (Luminal, Solfoton).

This list is not complete and there may be other drugs that can interact with dexamethasone. This includes vitamins, minerals, herbal



products, and drugs prescribed by other doctors. Do not start using a new medication without telling your doctor.

## **Overnight Dexamethasone Suppression Test**

The overnight dexamethasone suppression test checks to see how taking a corticosteroid medicine (called dexamethasone) changes the levels of the hormone cortisol in the blood. This test checks for a condition in which large amounts of cortisol are produced by the adrenal glands (Cushing's syndrome).

Normally, when the pituitary glands make less adrenocorticotrophic hormone (ACTH), the adrenal glands make less cortisol. Dexamethasone, which is like cortisol, decreases the amount of ACTH released by the pituitary gland, which in turn decreases the amount of cortisol released by the adrenal glands.

After taking a dose of dexamethasone, cortisol levels often stay abnormally high in people who have Cushing's syndrome. Occasionally other conditions (such as major depression, alcoholism, stress, obesity, kidney failure, pregnancy, or uncontrolled diabetes) can keep cortisol levels from decreasing after taking a dose of dexamethasone.

Occasionally an ACTH test may be done at the same time as the cortisol test.

## **How To Prepare**

You will not be able to eat or drink anything for 10 to 12 hours before the morning blood test.

Many medicines can change the results of this test. Be sure to tell your doctor about all the nonprescription and prescription medicines you take. You may be asked to stop taking some medicines (such as birth control pills, aspirin, morphine, methadone, lithium,

monoamine oxidase inhibitors [MAOIs], and diuretics) for 24 to 48 hours before your blood is drawn.

### **Risks of a blood test**

There is very little chance of a problem from having blood sample taken from a vein.

- You may get a small bruise at the site. You can lower the chance of bruising by keeping pressure on the site for several minutes.
- In rare cases, the vein may become swollen after the blood sample is taken. This problem is called phlebitis. A warm compress can be used several times a day to treat this.
- Ongoing bleeding can be a problem for people with bleeding disorders. Aspirin, warfarin (Coumadin), and other blood-thinning medicines can make bleeding more likely. If you have bleeding or clotting problems, or if you take blood-thinning medicine, tell your doctor before your blood sample is taken.
- Bruising may be more likely in people with high ACTH and cortisol levels.

### **Results**

Test results are usually available in 2 to 3 days.

High cortisol levels may be caused by:

- Cushing's syndrome.
- Other health problems, such as a heart attack or heart failure, fever, poor diet, an overactive thyroid gland (hyperthyroidism), depression, anorexia nervosa, uncontrolled diabetes, or alcoholism.
- Cancers that make ACTH, such as lung cancer.

### **What Affects the Test**

Reasons you may not be able to have the test or why the results may not be helpful include:

- Pregnancy or extreme obesity.
- Severe weight loss, dehydration, or acute alcohol withdrawal.
- Severe injury.
- Diabetes.
- You take medicines, such as barbiturates, phenytoin (Dilantin), birth control pills, aspirin, morphine, methadone, lithium, monoamine oxidase inhibitors (MAOIs), spironolactone (Aldactone), and diuretics.

Some people may quickly process (metabolize) the dose of dexamethasone. In these people, cortisol levels will not drop unless a higher dose of the medicine is given.

Because Cushing's syndrome can be hard to diagnose, an endocrinologist should be consulted if test results are uncertain or if the test results do not help explain your symptoms.

Sometimes a more extensive dexamethasone suppression test may be done. For this test, you will take up to 8 dexamethasone pills over 2 days and then cortisol levels in your blood and urine will be measured.

Some doctors think that a 24-hour urine free cortisol test is more accurate than an overnight dexamethasone suppression test. Like an overnight dexamethasone suppression test, a 24-hour urine free cortisol test is used to look for Cushing's syndrome. Also check the Cortisol in Urine.

An adrenocorticotrophic hormone (ACTH) test may be done at the same time as the cortisol test.

A new steroid called **budesonide** may become available in 1998. It has the same beneficial properties as dexamethasone without many of the major side effects. Finally, newer forms of treatment for some of

these conditions are coming along and, hopefully, the chronic use of steroid drugs can be reduced further.

### **Therapeutic use**

Dexamethasone is used to treat many inflammatory and autoimmune conditions, e.g., rheumatoid arthritis. It is also given to cancer patients undergoing chemotherapy, to counteract certain side-effects of their antitumor treatment. Dexamethasone can augment the antiemetic effect of 5-HT<sub>3</sub> receptor antagonists like ondansetron. It is also given in small amounts (usually 5-6 tablets) before and/or after some forms of dental surgery, such as the extraction of the wisdom teeth, an operation which often leaves the patient with puffy, swollen cheeks.

In brain tumours (primary or metastatic), dexamethasone is used to counteract the development of edema, which could eventually compress other brain structures. Dexamethasone is also given in cord compression where a tumor is compressing the spinal cord.

Dexamethasone is also used in certain hematological malignancies, especially in the treatment of multiple myeloma, in which dexamethasone is given alone or together with thalidomide (thal-dex) or a combination of adriamycin and vincristine (VAD). It is injected into the heel when treating plantar fasciitis, sometimes in conjunction with triamcinolone acetonide. It is useful to counteract allergic shock, if given in high doses. It is present in certain eye drops and as a nasal spray.

Dexamethasone can be used in the context of congenital adrenal hyperplasia, to prevent virilisation of a female fetus. If one or both parents are carriers of mutations to the CYP21A gene, the mother may start dexamethasone treatment within 7 weeks of conception. At the 12th week, a chorionic villus sample will determine whether the fetus is male (in which case the dexamethasone is stopped) or female. Subsequent DNA analysis can then reveal whether the female fetus is a carrier of the mutation, in which case dexamethasone treatment must continue until birth. The side-effects for the mother can be

severe and the long-term impact on the child is not clear. Dexamethasone is also given to women at risk of delivering prematurely in order to promote maturation of the fetus' lungs. This has been associated with low birth weight, although not with increased rates of neonatal death.

Dexamethasone is used in the treatment of high altitude cerebral edema as well as Pulmonary Oedema. It is commonly carried on mountain climbing expeditions to help climbers deal with altitude sickness.

### **Diagnostic use**

Dexamethasone is also used in a *diagnostic* context, namely in its property to suppress the natural pituitary-adrenal axis. Patients presenting with clinical signs of glucocorticoid excess (Cushing's syndrome) are generally diagnosed by a 24-hour urine collection for cortisol or by a *dexamethasone suppression test*. During the latter, the response of the body to a high dose of glucocorticoids is monitored. Various forms are performed. In the most common form, a patient takes a nighttime dose of either 1 or 4 mg of dexamethasone, and the serum cortisol levels are measured in the morning. If the levels are relatively high (over 5 µg/dl or 150 nmol/l), then the test is positive and the patient has an autonomous source of either cortisol or ACTH, indicating Cushing's syndrome where the tumor does not have a feedback mechanism. If ACTH levels are lowered by at least 50%, this would indicate Cushing's Disease, since the pituitary adenoma has a feedback mechanism that has been reset to a higher level of cortisol. Longer versions rely on urine collections on oral dexamethasone over various days.

### **Veterinary use**

Combined with marbofloxacin and clotrimazole, dexamethasone is available and used to treat difficult ear infections, especially in dogs.

It can also be combined with Trichlormethiazide to treat horses with swelling of distal limbs and general bruising.

The short time treatment for allergic reaction, shock, and diagnostic purposes usually does not cause serious side effects.

### **Dosage**

- Shock: 4 to 8 mg intravenously initially, repeat if necessary to a total dose of 24 mg.
- Autoimmune diseases and inflammations: longterm therapy with 0.5 to 1.5 mg oral per day. Avoid more than 1.5 mg daily, because serious side effects are more frequently encountered with higher doses.
- Adjuvant to or part of chemotherapy: individual schedule
- Diagnostic purposes: special schedule

### **Sports doping**

In 2005, Polish cross country skier Justyna Kowalczyk was disqualified from Intercontinental Competition in Germany and issued a 2-year suspension for her doping offenses on dexamethasone.