

All About Prednisone

Many patients are not as well informed about prescription medications as they ought to be. We believe the more you know about your medications, the better. This leaflet has been written to help you understand more about what prednisone is and the importance of taking it properly. If any of the information below causes you special concern or if you want additional information about prednisone and its use, check with your doctor or pharmacist. Remember to keep all prescription drugs out of reach and sight of children when not in use. Store all medicines in their original labeled containers and always read the label before using.

What is prednisone?

Prednisone is a steroid. Steroids are a group of hormones with similar chemical structures. They are normally produced by your adrenal glands, located on top of your kidneys, and your reproductive organs (ovaries and testicles). Steroids help control metabolism, inflammation, immune function, salt and water balance, development of sexual characteristics and your ability to withstand the stress of illness and injury.

One of the steroids produced by the outer portion of the adrenal glands is called cortisone. It normally helps regulate the body's salt and water balance and reduces inflammation. Introduced in 1955, prednisone is a man-made replica of cortisone. The adrenal glands normally produces an amount of steroids equivalent to about 5 mg. of prednisone a day. When prescribed in doses that exceed natural levels, prednisone suppresses inflammation and can help treat a variety of diseases such as severe allergies or skin problems, asthma, arthritis, ulcerative colitis, and Crohn's disease. Prednisone is also used to help prevent rejection of organ transplants.

Prednisone is the generic form; some common brand names are Deltasone, Meticorten, Orasone, and SK-Prednisone.

What prednisone is not

Prednisone is not the same as the dangerous anabolic steroids used by weight lifters to increase muscle mass. It is not a sex hormone like testosterone or estrogen and does not cause sexual dysfunction. Prednisone is not addictive. It does not cause drowsiness and in the usual doses will not affect your driving or working. There is no special food interaction and mild alcohol consumption is not a problem on prednisone.

How does prednisone work?

The exact mechanism of how prednisone works is not known.

Taking prednisone properly

Unless instructed otherwise, prednisone should be taken all at once with breakfast. Prednisone is not to be taken randomly during the day. This minimizes the risk of adrenal gland suppression and

atrophy. (When high doses are required, the dose may have to be split between morning and evening doses for short periods of time.) In some patients prednisone can be given at twice the dose every other morning. This doesn't work for everyone, but when possible, allows your system a brief, yet helpful, reprieve from the drug.

- ***Prednisone is best taken with food.*** Prednisone can irritate the stomach lining and therefore should be taken with food which serves as a buffer and reduces the irritation. Tell your doctor if you have a tendency to form peptic ulcers since this may require special care.
- ***Take the dose as prescribed.*** There is no fixed rule for the correct dose of prednisone. Each case is different. Your doctor will determine what initial dose is best for you depending on the activity of your disease, your age, weight, any other medical conditions you may have, and your response to treatment. Do not alter the dose on your own without your doctor's consent. Fine tuning of your prednisone dosage will take place as your doctor follows your progress. The goal, of course, is to control your illness with the lowest effective dose of prednisone possible for the shortest period of time. Your doctor will routinely reassess what dose is necessary for you.
- ***Don't skip doses.*** This is not a casual drug and taking it inconsistently can be very dangerous. If you forget a dose, it is safe to take the normal dose of the medication as soon as you remember and resume your normal schedule the following morning. If you do not remember until the next day, skip the missed dose.
- ***Do not abruptly stop taking this medication on your own.*** If prednisone is taken for months and years, the adrenal glands within the body lose their ability to produce steroids naturally. In fact, the adrenal glands can shrink in size. If you have been on prednisone for more than one month, it is important that you do not stop it "cold turkey." This can cause an acute withdrawal reaction that can lead to a crisis situation. Prednisone must be slowly tapered under your doctor's supervision. When you travel, always carry a supply of medication with you. When flying, keep all your medications in your carry-on baggage. If your checked luggage is lost or delayed, you won't miss a dose.
- ***If you have taken prednisone for more than a month, you may require an extra dose during physically stressful situations such as major surgery or severe infections.*** These "booster" doses can be given either by vein or by mouth. Usually the dose need be raised for only a day or so. This may be true even up to one year after you have discontinued the medication. This point is well known to doctors, but it is important for you to remember if you are away from your doctor and require major surgery or develop a severe infection. If you are on long term prednisone therapy, carry a notice with you on a Medic-Alert bracelet or in your wallet. (Medic-Alert Foundation can be contacted a their website at www.medicalert.org at their toll-free number 800-825-3785.) Be sure that all your doctors know that you are taking chronic prednisone therapy.

What are the side effects?

In 1948, physicians at the Mayo Clinic were the first to use steroids to treat disease. They gave cortisone to patients crippled by severe rheumatoid arthritis and were amazed by the results after just a few days of use. People, who couldn't rise from a chair, shave, open a door or lift a cup, now could walk and even dance. Cortisone was hailed as a "miracle drug." Unfortunately, it was too good to be true. Problems soon emerged. Patients taking cortisone in doses high enough to relieve inflammation routinely experienced harmful side effects. Physicians now recognize that prolonged use of cortisone-like drugs like prednisone can cause many side effects. But when serious disease occurs, the benefit of prednisone usually outweighs the potential risks. For difficult to manage conditions, prednisone can still be a miraculous medication. In general, the risk of side effects depends on the length of time you take prednisone and the amount you take. You can help limit side effects by taking the medication exactly as prescribed and reporting any problems to your doctor.

Weight gain

Usually the most dreaded of prednisone's side-effects, increased appetite and weight gain are seen to some degree by nearly all patients. The amount of weight gain varies from individual to individual. In addition to causing weight gain, prednisone also tends to redistribute body fat to places that are undesirable, particularly the face (moon face), back of the neck (buffalo hump), and abdomen. The higher the dose and the longer the treatment, the greater the effect. To some extent these changes can be minimized by exercise and the dietary changes described below. If you find this confusing, a consultation with a registered dietitian or nutritionist may be helpful. Ask your doctor for a recommendation.

Avoid salt

Most of us consume much more salt (sodium chloride) than our body needs. Normally, our kidneys keep our body in balance any excess salt is excreted in the urine. Prednisone causes sodium retention and potassium loss which may lead to fluid retention, weight gain, bloating and low blood potassium levels. In some patients, this can cause high blood pressure or worsen a pre-existing condition. We suggest a no-added salt diet and avoidance of highly salted pre-packaged convenience foods. Use fresh herbs whenever possible. Read food labels. Don't add salt to cooking and remove the salt shaker from your table. Instead use low-salt spices to add flavor to your meals. Ask your doctor about using salt-substitutes which are helpful since they contain extra potassium. It may be helpful to add high potassium foods such as bananas, citrus fruits, melons, and tomatoes to your diet. Be sure that your blood pressure and blood tests are checked regularly.

Avoid fat

Most Americans also eat too much fat. Fat has over twice the calories per gram than proteins and carbohydrates. By limiting the fat in your diet, you automatically reduce the calories and may lower your blood cholesterol at the same time. With the new food labels, it is easy these days to find low-fat items in your supermarket.

Avoid simple carbohydrates

Most foods contain some fat, protein, and carbohydrates. Carbohydrates (sugars and starches) can be either simple molecules or complex molecules. Avoid simple carbohydrates which are digested too quickly and leave you hungry. Complex carbohydrates are more satisfying since they must be broken down by the digestive process and are absorbed more slowly into your system. Simple carbohydrates are foods like candy, cakes, pies, white bread. Complex would include whole wheat bread, rice, beans, sweet potatoes, high fiber cereals, sugar-free candies.

Small frequent feedings

To combat increased hunger, snack frequently on low-calorie foods such as fruits, vegetables, low fat dairy products, low salt rice cakes, and sugar free candies. Instead of three large meals, eat smaller more frequent meals.

Eating out

When eating out, tell the waiter what you need. Don't be embarrassed or apologetic. Just ask directly for what you want. In our health conscious culture, most restaurants are used to special requests - just tip accordingly. When flying, call the airlines and request a low-fat low-salt meal in advance. They are quite prepared to help you. If you are in a situation where a special meal is not possible, don't panic. Eating salty high fat or sugary foods occasionally is not going to make much difference. Just enjoy them in moderation and be more careful the next day.

Blood Sugar

Another reason to avoid sugary foods is the fact that prednisone has a tendency to raise the level of glucose, or sugar, in the blood. In most individuals, this has little significance. However, in diabetics or those with a history of "borderline" diabetes, the rise in blood sugar can be significant. Overweight individuals, pregnant women, and those with a family history of diabetes may also be at risk. Some diabetics who have been previously controlled by diet or pills may have to switch to insulin for a short time. Fortunately, this rise in blood sugar usually resolves when the prednisone dose is decreased or discontinued. Make sure your doctor knows if you are diabetic and all patients on prednisone should have periodic blood sugar tests.

Osteoporosis

Most of us don't realize that our bones are living organs that are constantly changing. Every day old bone cells die and new ones are created to take their place. Prednisone increases the loss of bone and slows the formation of new bone cells. Eventually, this may result in a decrease in bone density, or osteoporosis. Osteoporosis is a common condition in adult Americans causing over 1.5 million fractures each year, including more than 300,000 hip fractures. Prednisone may cause osteoporosis even in people who are not usually at high risk such as males and young people. In people susceptible to osteoporosis, prednisone may accelerate the process of bone loss and increases the risk of fracture of the spine or hip. Other risk factors include:

- Female sex
- Caucasian or Asian heritage
- Small, thin frame
- Lack of regular weight-bearing exercise
- Poor calcium intake in diet
- Family history of osteoporosis
- Early menopause or removal of ovaries
- Low testosterone levels in men
- Tobacco use or heavy alcohol use
- Overactive thyroid/Thyroid hormone pills
- Diabetes
- Prior ulcer surgery
- Crohn's disease
- Eating disorders like anorexia

If you are on long term prednisone, you must aggressively counteract your increased risk as noted below.

Eat calcium rich foods

Increasing the amount of calcium in your diet can lessen the risk of osteoporosis. Your goal should be 1500 mg per day. Low fat dairy products (skim milk, low fat yogurt, fat free cottage cheese) are a good source of calcium. Many new products are even fortified with extra calcium. Certain vegetables are a good source of calcium including kale, turnips, collard greens, and broccoli. Another simple way to add extra calcium is by taking Tums tablets that contain calcium carbonate. Take two tablets during a meal twice a day.

Take vitamin D

Just eating more calcium is not enough. Vitamin D is required to help calcium be absorbed into your system and strengthen your bones. Vitamin D is obtained by exposure of your skin to sunshine, vitamin D fortified foods, and taking a vitamin supplement. We suggest about 800 mg per day - more can be harmful. One way to add calcium and vitamin D is a combination such as Citracal caplets + D which can be purchased without a prescription in the vitamin section of your local pharmacy. Take two tablets twice daily with food. This will provide an extra 1260 mg. of calcium and plenty of vitamin D each day. It is also recommended that you take a multivitamin supplement daily.

Exercise

Prednisone can also cause muscle weakness and atrophy. A low impact daily exercise program will help burn up more calories, improve your sense of well-being, and help prevent muscle and bone loss. Exercise can also help prevent the weight gain that often occurs during prednisone therapy. This exercise program should include both

aerobic exercises which burn calories and improve cardiovascular fitness as well as moderate weight-training which strengthens muscles and slows bone loss. It doesn't have to be complicated and you don't have to join a gym. For bone and muscle strength, weight-bearing exercises are especially important. A simple walking program is a good way to start. Start slowly and do the best you can. You don't have to be jock. If you are too fatigued one day, just try harder next time. The important thing is to have a program of regular exercise.

Estrogen replacement

Estrogen, a female sex-hormone, protects and strengthens bones. After menopause, estrogen levels drop and women become more susceptible to osteoporosis. Adding prednisone to the picture more than doubles the risk. The good news is that taking a low dose estrogen supplement helps prevent this problem. If you are a post-menopausal woman and on prednisone, ask your gynecologist if you would be a candidate for hormonal replacement therapy.

Medications to strengthen bones

In addition to diet, vitamins, exercise, and estrogen, two new drugs show great promise in prevention of osteoporosis. Miacalcin (calcitonin) is given as a nasal spray once a day and reduces bone loss. Fosamax (alendronate) is another new drug that has been shown to actually strengthen weak bones. It is given as a tablet, but may cause ulcers of the esophagus in some patients. Be sure you know how to take it correctly before starting treatment. Much research is being done and other new drugs are on the way.

Measuring bone density

A simple painless x-ray is called a bone densitometry test can tell your doctor if your bone density is normal or below normal. In general, the lower your bone density, the higher your risk for fracture. Since osteoporosis has no early warning symptoms, beginning its first visible sign may be a debilitating. Now we can better estimate who is at risk. If you are on long-term prednisone therapy, ask your doctor about bone densitometry.

Avascular necrosis

Fortunately, this side effect of high dose prednisone is not common. For reasons that are not known, some patients develop a rare form of damage to the hip joint called avascular necrosis (or osteonecrosis, meaning "bone death"). This syndrome causes pain with weight-bearing and some loss of joint function. Many patients with avascular necrosis require joint replacements.

Skin problems

Prednisone may cause acne of the face, chest, and back - "steroid acne." This is especially a problem in teenagers, but can occur at any age. In most cases, keeping the skin as clean as possible and using topical anti-acne medications will control the problem. If simple measures don't help, a consultation with a dermatologist may be needed. Patients on prednisone also

often notice that they bruise easily, even with only slight trauma. Other skin problems include slow wound healing, redness of the face (plethora), stretch marks, night sweats, and increased facial hair. People on prednisone should keep their skin clean and protected and avoid skin trauma including sunburn.

Digestive upset

Prednisone is helpful to those with inflammatory disorders of the colon and small intestine such as colitis and Crohn's disease; but high doses may cause irritation of the upper digestive system. When inflammation occurs in the stomach lining, it is called gastritis. If severe, a peptic ulcer may develop. This is especially true if the patient has a past history of ulcers or regularly takes other anti-inflammatory drugs such as aspirin or prescription medications for arthritis.

In mild cases, simple over-the-counter antacids may be helpful; but all antacids - including Tums - can decrease the absorption of prednisone - so antacids shouldn't be taken within an hour of prednisone. If persistent symptoms of nausea or heartburn develop while on prednisone, your doctor can prescribe stronger medications that easily control stomach inflammation.

Mood swings

People on prednisone commonly experience changes in mood, particularly when they are taking high doses. One day, they may feel euphoric for no apparent reason. Many have difficulty sleeping at night. At other times, there may be unexplained feelings of anxiety or a lack of concentration. It is common to feel tired and blue for a few days each time the dose of prednisone is being tapered downward. In most patients, these effects are mild, but can be very disturbing - both for the patient and their family.

Be prepared. If you experience mental changes during prednisone therapy, be reassured that you are not crazy and that these changes will subside as the medication is withdrawn. It is important to anticipate this problem and to discuss it with your friends and family. Let them know that you may experience mood swings, short temper, and irritability and it's not their fault. Try to minimize the stresses in your life. If you can't cope, discuss it with your doctor. He may have to adjust your dosage or suggest stress reduction counseling. In some cases, it may be necessary to take medications for anxiety or antidepressants for a short while. If insomnia is a problem, try taking a short nap in the afternoon.

Eye changes

High dose or long-term use of prednisone can cause two types of eye problems - cataracts and glaucoma. Cataracts are deposits in the lens of the eye and are part of the normal aging process. They are more common after long term prednisone usage and there is nothing you can do to prevent them. Fortunately, the cataracts caused by prednisone are usually small and usually not the type that interfere with normal vision. Prednisone can also increase the pressure of the fluid inside the eyeball, a painless condition known as glaucoma. If eyeball pressure rises high enough, vision may be permanently damaged. Blindness can result.

However, once diagnosed, glaucoma can be treated with prescription eyedrops. Patients on prednisone should see their eye doctor at least once a year for a complete eye examination.

Immune system

One of the actions of prednisone is to weaken the body's immune system. This effect is beneficial when treating allergies or so-called "autoimmune" diseases like arthritis, lupus, ulcerative colitis and Crohn's disease. However, whenever you weaken the immune system, you increase the body's susceptibility to infection. Prednisone does not make an individual more likely to get a flu or catch a cold. But, it can increase susceptibility to chickenpox (varicella) and other herpes viruses. Individuals, who have recovered from tuberculosis, or TB, can experience reactivation of the disease when on prednisone. If you have not previously had chickenpox, tell your doctor. Do not take prednisone if you have tuberculosis (active or inactive), shingles or other herpes infection of eyes, lips, or genitals. You should not be vaccinated against any infectious disease while you are on prednisone especially live polio vaccine. Allergy skin tests and TB skin tests will usually be invalid while you are on prednisone. A small number of patients on prednisone develop yeast infections of the mouth (thrush) or vagina. Fortunately, effective medications are available to combat this problem should it occur.

Withdrawal

Prednisone is one of the most powerful medicines prescribed and has many beneficial actions, but as noted above there can be many potential problems. Side effects are usually dose-dependent. This means the more prednisone you take over a longer period of time, the greater the risk of side effects. Therefore, once your condition comes under control, your doctor will usually suggest that the dose be gradually reduced. The goal is to get off the medication entirely although this is not possible in every case.

Just as taking prednisone can cause side effects, reducing the dose may cause problems as well. Prednisone is not addicting like a narcotic, but many patients experience withdrawal symptoms as the dose is reduced. These often include muscle soreness, joint pain, fatigue, and depression. Know that these effects are also temporary and worth bearing to allow a cutback in your dose. If you experience any unusual symptoms as your prednisone dose is reduced, contact your doctor. It may be necessary to temporarily increase your steroid dose until you are feeling better and then taper the dose more slowly.

Precautions

Notify your doctor if you suffer from severe depression, diabetes, or high blood pressure. Be sure to inform him if you are taking diuretics (water pills), digoxin, Coumadin, phenobarbital, or medications for arthritis. Let your doctor know if you may be pregnant or plan to become pregnant in the near future. Low dose prednisone can be used in pregnancy if necessary. However, it is best to avoid all potent prescription drugs during pregnancy whenever possible.

Remember

Prednisone is a type of steroid medication that resembles cortisone, a hormone naturally produced by the body. It is a powerful drug with many helpful properties and, when used properly, prednisone saves lives. But as with all medications, side effects may occur. Before prescribing prednisone, your doctor considers alternatives and carefully weighs the benefits against the risks. You can best limit problems with this medication by taking it exactly as prescribed and seeing your doctor for regular follow-up visits. If you have any questions or concerns, please discuss them with your doctor.

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