

For the Patient: Dexamethasone (DECADRON®, DEXASONE®, HEXADROL®) for Brain Tumours

Dexamethasone is a steroid medication that has powerful anti-inflammatory and immunosuppressant activities. Steroids, also known as glucocorticoids, are lipids (fats) that occur naturally in plants and animals, or may be made in a laboratory. Examples of steroids include cholesterol, hormones and some drugs. Dexamethasone is similar to a naturally occurring hormone called cortisol which is produced by the adrenals, two small glands which sit on top of the kidneys. Dexamethasone is commonly used in cancer treatment. For example, it may be used to *prevent nausea* associated with chemotherapy, to *stimulate appetite and energy*, or even as a *treatment for some forms of cancer*.

Brain tumours are often associated with swelling and inflammation in the brain, leading to headache, nausea, weakness, and other problems depending on the precise location of the tumour.

Dexamethasone is extremely effective in *treating brain swelling* that may occur during radiotherapy or when tumour cells are actively dividing. Relief from headache may occur within a few hours, but the full effect of dexamethasone can take 24-72 hours. Unfortunately, there are also a number of potential side effects from dexamethasone. These are found below, with suggestions for preventing or limiting these problems.

Potential Side Effects	Management
<p>Effects on protein and fat: At high levels, steroids break down protein and fat in the body and redistribute them to make new glucose. Protein breakdown causes <i>thinning of the skin</i> and loss of muscle mass, leading to <i>thin, weak arms and legs</i>, and <i>skin that is prone to bleeding, breakdown and stretch marks</i>.</p> <p>As fat is broken down and redistributed, <i>weight accumulates around the abdomen, face and upper back</i>. Dexamethasone also <i>stimulates appetite</i>, with further increase in weight and fat accumulation.</p>	<p>Regular mild activity will help to ensure that your strength is conserved as much as possible. You may benefit from a consultation with a physiotherapist or occupational therapist regarding safety and mobility. Assistive devices such as a raised toilet seat, a walker or cane may also be helpful.</p> <p>Reaching for low calorie, nutritious snacks will help to keep weight down.</p>

Potential Side Effects	Management
<p>Effects on bones: Steroids may also affect the strength of the bones through loss of calcium and promotion of <i>bone breakdown, leading to osteoporosis and bone fractures.</i></p>	<p>Your doctor may recommend calcium and vitamin D supplementation, or in certain cases other medications for bone health.</p>
<p>Effects on the stomach: Dexamethasone <i>irritates the stomach lining</i> and can lead to <i>heartburn, indigestion and stomach ulcers.</i></p>	<p>Take this medication with food and use daily antacids such as ranitidine (ZANTAC®) to protect the stomach. Antacids should be taken 1 to 2 hours after dexamethasone. You may also wish to take the medication in two or more smaller doses earlier in the day, rather than a single large dose, to prevent stomach irritation.</p>
<p>Effects on mood and energy: Steroids can affect mood and excitability, leading people to feel <i>surges of energy, but also irritability and sleeplessness.</i></p>	<p>If your sleep is affected, avoid taking this medication near your bedtime. It may be taken in a single dose in the morning with breakfast or two daily doses, with the last dose at lunchtime. You may also wish to do some mild exercise (eg. walking around the block) or discuss using a sleeping medication with your doctor. Rarely, the effects on the central nervous system can be extreme, causing severe agitation or even psychosis. Contact your health care team immediately should this occur.</p>
<p>Effects on ability to fight infection. Dexamethasone's anti-inflammatory action may suppress the body's ability to fight infection, making people on longterm treatment more at risk for <i>infection, including thrush, and slower recovery from wounds.</i></p>	<p>Sensible measures to restrict exposure to illness should be followed, such as regular handwashing and avoiding those with fevers or other illnesses. Your doctor may also prescribe an antibiotic to prevent some infections. Thrush is a fungal infection of the mouth and looks like a white or yellowish coating inside the mouth and throat. It may cause discomfort, especially when swallowing. Let your health care team know if you have signs of thrush so that it can be treated.</p>
<p>Effects on sex hormones. Glucocorticoids may suppress the synthesis and secretion of sex hormones such as testosterone and estrogen. For women, this can lead to changes in menstrual periods and temporary infertility.</p>	
<p>Effects on the body's ability to tolerate glucose: This may lead to <i>diabetes.</i></p> <p>If you already have diabetes, sugar control may be affected.</p>	<p>Report the development of excessive thirst and/or urination. You may require medication for diabetes. Tell your doctor if you have ever had high blood sugar or diabetes.</p> <p>Check your blood sugar regularly if you are diabetic.</p>

Potential Side Effects	Management
Effects on circulation: This may cause <i>fluid retention and swelling</i> especially in the legs and feet.	Elevate the legs whenever possible, or use stockings which can help improve circulation. Avoid tight clothing. Avoid food with high salt or sodium.
Other effects on skin: An <i>acne-like rash</i> may occur.	This is not harmful and will subside when the dexamethasone is discontinued.
Other effects: Persistent hiccups may rarely occur.	Let your health care team know if you develop hiccups which do not stop so that treatment can be provided.

To prevent and limit side effects, dexamethasone is used for as short a time, in as low a dose as possible. Adrenal gland production of cortisol stops when you take dexamethasone. For this reason, a person must *be tapered off the drug slowly*. This allows the adrenal glands to begin production of the natural cortisol again. Coming off the drug too rapidly may result in signs of *steroid withdrawal* such as *headache, fatigue, and muscle or joint pains*. Be sure to let your oncologist, pharmacist or nurse know if you're running out of dexamethasone so that they can guide you with a tapering schedule or provide a refill of the prescription if you are to continue taking the drug. Also, be sure to report all symptoms and side effects so that you can be advised on how to prevent or treat them.

The many complications of dexamethasone treatment have prompted an interest in alternative approaches to treating brain swelling. So far, an equivalent response from another drug has been hard to find. Boswellia (also known as frankincense) is sometimes recommended, but to date there is not sufficient evidence to recommend its use for brain swelling. The drug bevacizumab (AVASTIN®) is used to treat brain tumours and works by pruning off leaky blood vessels which support tumour growth. As a result, tumour cells are deprived of nourishment and swelling is also arrested. Unfortunately bevacizumab infusions are extremely expensive and also may be associated with potentially lethal side effects, so it's hard to justify the use of bevacizumab for brain swelling alone. However, those patients receiving bevacizumab therapy may be able to decrease or discontinue dexamethasone with guidance from the health care team.