Hormones – cortisol and corticosteroids
Cortisol is a hormone made by the two adrenal glands (one is located on each kidney). Some disorders can be treated with synthetic corticosteroids. One of the main side effects of long-term treatment with corticosteroids is osteoporosis (thinning of the bones).

Cortisol can:
- help the body to manage stress
- convert protein into glucose to boost flagging blood sugar levels
- work in tandem with the hormone insulin to maintain constant blood sugar levels
- reduce inflammation
- contribute to the maintenance of constant blood pressure
- contribute to the workings of the immune system.

Conditions treated with corticosteroids
A number of common conditions respond well when treated with corticosteroids (cortisol-like medications) including:
- skin disorders – such as psoriasis and dermatitis
- inflammatory diseases – such as asthma, ulcerative colitis, lupus and some forms of arthritis
- cancer – particularly cancers related to the immune system, such as leukaemia and lymphoma
- organ transplant – corticosteroids are used to inhibit the body's immune response so that a transplanted organ is not rejected
- Addison's disease – an autoimmune disorder that stops the adrenal glands from making sufficient hormones, including cortisol.

Cortisone (manufactured for use as a treatment) is used to manage rather than treat Addison's disease by replacing the cortisol naturally produced by the body. This may also occur in the management of pituitary disease. The dose required is much lower than the other examples above.

Types of corticosteroids
The type of corticosteroids administered depends on the person's condition. Where specialists use synthetic forms to treat these disorders, treatment forms include:
- creams – applied to the affected areas of the skin
- tablets – dosage varies, but is generally kept to the lowest dose possible
- injections – injecting straight into the affected joint, which prevents many of the side effects that occur with oral medication (taken by mouth)
- inhaler – administered to treat inflammation in the lungs or sinuses.

Side effects of corticosteroids
As cortisol acts on so many organs and tissues of the body, people treated with corticosteroids may experience unwanted side effects. Suddenly stopping the medication can be dangerous, so continue taking your regular dose and see your doctor if you are troubled by side effects.

Some of the more common side effects of cortisol-like drugs include:
- thin skin
- susceptibility to bruising
- high or increased blood pressure
- susceptibility to infections
- build-up of fat around the face, chest and abdomen
- thinning of the limbs
- osteoporosis (thinning of the bones) leading to bone fractures, particularly in the spine
- fluid retention (oedema)
Corticosteroid-induced osteoporosis

Corticosteroids can cause a loss of bone density in men and women, particularly among postmenopausal women. The bones of the spine are the most vulnerable to fracturing in this setting. Corticosteroids interfere with the proper functioning of bone cells and prevent the intestine from properly absorbing calcium, which also affects the bones.

Symptoms of osteoporosis can include:

- bone fractures
- severe back pain
- kyphosis (bunching of the upper back)
- loss of height.

Managing the side effects of corticosteroids

Suggestions to manage the side effects of cortisol treatment include:

- Reduce the daily dose under strict medical supervision.
- Seek immediate treatment for any infection.
- Use vitamin D and calcium supplements.
- Use other medications and do weight-bearing exercise to maintain bone strength.

High-dose corticosteroids

Disruption of the workings of the pituitary and adrenal glands may occur where long periods of high-dose corticosteroids have severely decreased the body’s natural cortisol production. When a person stops taking high-dose corticosteroids, they may experience cortisol insufficiency.

Symptoms of cortisol insufficiency can include:

- fatigue
- nausea and vomiting
- low blood pressure, particularly when standing up from a sitting or lying position (orthostatic hypotension)
- low blood sugar
- shock
- coma.

High levels of cortisol and Cushing’s syndrome

Cushing’s syndrome is characterised by high levels of the hormone cortisol. Another name for Cushing’s syndrome is hypercortisolism.

Some people develop Cushing’s syndrome symptoms when they take high levels of oral corticosteroid medication to treat inflammatory conditions such as asthma, lupus or rheumatoid arthritis. Other causes include tumours of the pituitary and adrenal glands, and tumours in other areas of the body. In these cases the body itself is producing too much cortisol.

Symptoms of Cushing’s syndrome may include:

- weight gain in the face, abdomen and chest
- wasting of the limbs
- a fatty hump between the shoulders
- flushed face
- high blood pressure
- skin changes – such as thin skin, easily bruised, slow healing and ulcers
- mood swings
- weakened bones
- irregular (or absence of) periods.

For more information visit Better Health Channel’s Cushing’s syndrome fact sheet.

Where to get help

- Your doctor

References

- Cushing syndrome, 2016, Mayo Clinic, USA. More information here.
- Prednisone and other corticosteroids, 2015, Mayo Clinic, USA. More information here.
Hormonal system (endocrine)

The following content is displayed as Tabs. Once you have activated a link navigate to the end of the list to view its associated content. The activated link is defined as Active Tab

- Hormonal system explained
- Adrenal gland
- Pituitary gland
- Thyroid gland

Hormonal system explained

- Hormonal (endocrine) system
  
  Hormones can be thought of as chemical messages that communicate with the body and bring about changes...

- Metabolism
  
  Your metabolism is influenced by your age, gender, muscle-to-fat ratio, the food you eat, physical activity and hormone function...

- Obesity and hormones
  
  The hormones leptin, insulin, oestrogens, androgens and growth hormone are factors in obesity...

Adrenal gland

- Addison's disease
  
  Most cases of Addison's disease are caused by an autoimmune response that attacks and damages the adrenal glands over time...

- Congenital adrenal hyperplasia (CAH)
  
  CAH is a rare genetic disorder, but it is well understood and treatment is readily available...

- Cushing's syndrome
  
  Some people have Cushing's syndrome symptoms when they take glucocorticoid hormones to treat inflammatory conditions such as asthma, lupus or rheumatoid arthritis...

- Hormones – cortisol and corticosteroids
  
  Cortisol helps to maintain blood pressure, immune function and the body's anti-inflammatory processes...

Pituitary gland

- Acromegaly
  
  Acromegaly is caused by an excess of growth hormone in adults, which causes the overgrowth of bones in the face, hands, feet and internal organs...

- Growth hormone
  
  Some athletes and bodybuilders wrongly believe that taking synthetic growth hormone will help build up their muscles...

- Pituitary tumour
  
  Generally, pituitary tumours are benign and slow growing, and pituitary cancers are extremely rare...

Thyroid gland

- Goitre
  
  Symptoms of a goitre can include enlargement of the throat, swallowing problems and breathing problems...

- Iodine
  
  Good sources of iodine include fortified bread and any type of seafood, including seaweed...

- Parathyroid glands
  
  The parathyroid glands make hormones that regulate calcium, phosphorus and magnesium in the bones and blood...

- Thyroid cancer
  
  Anyone can develop thyroid cancer, regardless of age or gender...
• **Thyroid gland**
If the thyroid gland is overactive or sluggish, the metabolism will be affected, leading to a variety of symptoms...

• **Thyroid - Hashimoto's disease**
Hashimoto's disease progresses very slowly over many years, so the symptoms may go unnoticed...

• **Thyroid - hyperthyroidism**
Hyperthyroidism can be diagnosed with a simple blood test that measures thyroid hormone levels...

• **Thyroid - hypothyroidism**
Hypothyroidism means the thyroid gland is underactive which causes the person's metabolism to slow down...

**Related Information**

• **Asthma management**
An asthma action plan can help you take control of your asthma and feel confident managing it...

• **Asthma-friendly home**
There are many ways in which you can transform your home into an asthma-friendly environment...

• **Epidemic Thunderstorm Asthma**
People who have asthma or hay fever can get severe asthma symptoms during pollen season when high grass pollen counts combine with a certain type of thunderstorm...

• **Asthma explained**
Asthma cannot be cured, but with good management people with asthma can lead normal, active lives...

• **Avoiding asthma triggers**
Asthma triggers are substances, conditions or activities that lead to symptoms of asthma. Asthma symptoms include difficulty breathing, coughing, wheezing and shortness of breath. These symptoms can...

Home

**Related information on other websites**

• Australian Rheumatology Association – Patient information sheets.

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