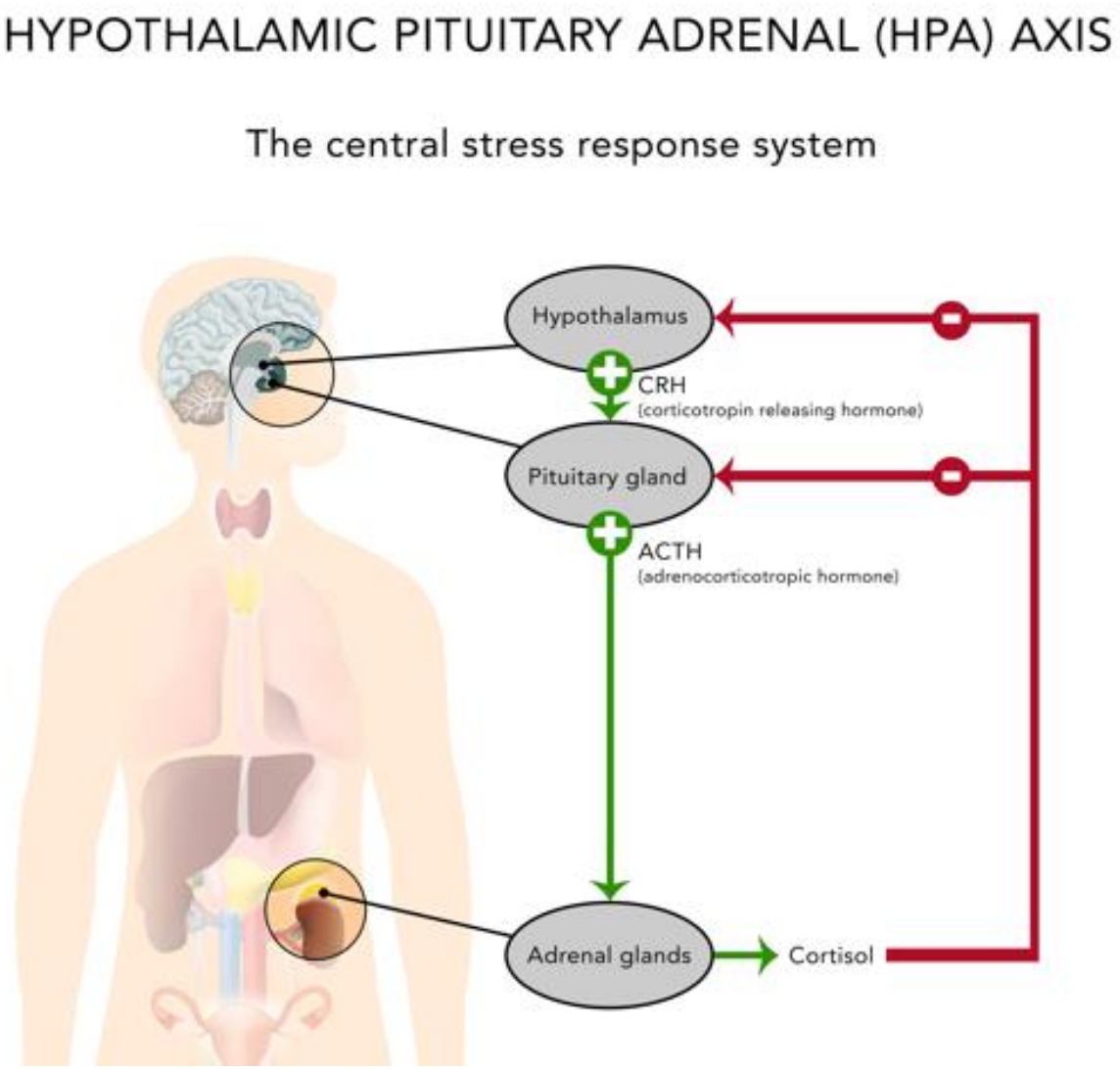
Fact Sheet

Understanding adrenal suppression

What is adrenal suppression?

Adrenal suppression is often caused by taking man made steroids (exogenous), for diseases of an inflammatory nature, such as asthma, rheumatoid arthritis, inflammatory bowel disease, transplant patients etc.

When the body is functioning normally the hypothalmic-pituitary-adrenal axis (HPA axis) releases adrenocorticotropic hormone (ACTH) from the pituitary gland, which triggers the adrenal glands to release cortisol. The increased cortisol then signals the pituitary and hypothalamus to stop ACTH production. This is called a negative feedback loop.



When the body has an excessive loading of steroids by taking them externally the hypothalamus and pituitary gland react to this overload 'thinking' there is already too much cortisol in the system and suppress the hormones that produce cortisol. Over a period of prolonged use or when taking large doses of steroids, for some people this may result in adrenal suppression and the adrenal glands may atrophy. The patient can become very ill and, if the process is not halted, permanent loss of cortisol production can occur. When this occurs, the patient is diagnosed through tests as having secondary adrenal insufficiency.

(Ref: Central Hypoadrenalism, R. K. Crowley, N. Argese, J. W. Tomlinson, and P. M. Stewart, Centre for Endocrinology Diabetes and Metabolism (R.K.C., N.A., J.W.T.), University of Birmingham; and University of Leeds School of Medicine.)

Taking exogenous steroids is now the most common cause of secondary adrenal insufficiency, and prevalence is growing. However, with increased awareness, the development of this disease may be lessened. Compared to other forms of secondary adrenal insufficiency, mostly pituitary disease, or primary adrenal insufficiency, adrenal crisis is much less common in patients with adrenal suppression.

(Ref: Adrenal Insufficiency in Corticosteroids Use: Systematic Review and Meta-Analysis, Leonie H. A. Broersen, Alberto M. Pereira, Jens Otto L. Jørgensen, and Olaf M. Dekkers Department of Clinical Epidemiology, Leiden University Medical Centre, Leiden The Netherlands; Department of Medicine Division of Endocrinology, Leiden University Medical Centre, Leiden The Netherlands; Department of Endocrinology, Aarhus University, 8000 Aarhus C, Denmark; and Department of Clinical Epidemiology, Aarhus University, Denmark)

(Ref: Glucocorticoid-induced Adrenal Insufficiency: a study of the incidence in hospital patients and a review of peri-operative management.Rushworth RL, Chrisp GL, Torpy DJ. Endocr Pract. 2018 May; 24(5):437-445.)

Steroids that are known to cause adrenal suppression

The use of the following steroids has been linked with Adrenal Suppression

- Oral hydrocortisone / prednisone
- Inhaled asthma steroids eg. Symbicort, Seretide
- Intravenous steroids eg. methylprednisolone
- Intra-articular steroid injection
- Steroid creams for skin conditions

There is a chance of causing adrenal suppression by taking as little as 5mg of prednisone, or 20mg of hydrocortisone, for three or more weeks. Extended periods of steroid treatment can increase the risk of adrenal suppression.

(Ref: Glucocorticoid Therapy and Adrenal Suppression, Chrousos, MD, Aikaterini N Pavlaki, M.D., and Maria Alexandra Magiakou, M.D)

Symptoms of adrenal suppression

- extreme fatigue
- joint and muscle aches and pains
- muscle spasms
- dizziness
- low blood pressure
- breathlessness
- diarrhoea & abdominal pain
- tachycardia
- excessive sweating anorexia
- cushingoid features
- growth retardation in young children

It is recommended that people taking external steroids must report any of these symptoms to their treating doctor immediately.

Precautions and safe weaning

If adrenal suppression is monitored and recognised before permanent damage is done to the HPA axis lifelong adrenal insufficiency can be prevented.

If the patient is experiencing adrenal suppression the HPA axis can, in some cases, be kick-started again by the slow weaning of prescribed steroids under medical supervision. This process can take many months, even up to one to two years. Slow weaning may allow the HPA axis to readjust and come back to full function.

Precautions during weaning

During the weaning phase, and for up to a year after this has successfully been completed, it is recommended the patient carry information that they have been on steroid treatment, a medical alert bracelet, hydrocortisone tablets for sick day use, and an emergency injection kit containing Solu-Cortef, syringes, needles and instructions. This is necessary because in times of illness, injury, or surgery, the patient is at risk of adrenal crisis.

While weaning, the patient may experience uncomfortable symptoms and, depending on the severity of the symptoms, the medical practitioner may advise the patient to go back up to a higher dose and stay there for a while until they feel stable, and then dropping by a smaller amount. The closer the patient gets to a physiological dose (what the body needs normally), the more difficult the weaning process may become. Following weaning patients do need to be careful over the following 12 months in times of extreme stress e.g. surgery, and have the emergency injection kit on hand.

(Ref: Glucocorticoid Therapy and Adrenal Suppression, Chrousos, MD, Aikaterini N Pavlaki, M.D., and Maria Alexandra Magiakou, M.D.)

For more information on testing after HPA axis suppression has occurred, please see the "Glucocorticoid tapering and adrenal suppression testing guide" under Tapering in the research library at aiunited.org. https://aiunited.org/glucocorticoid-tapering-and-adrenal-suppression-testing-guide