

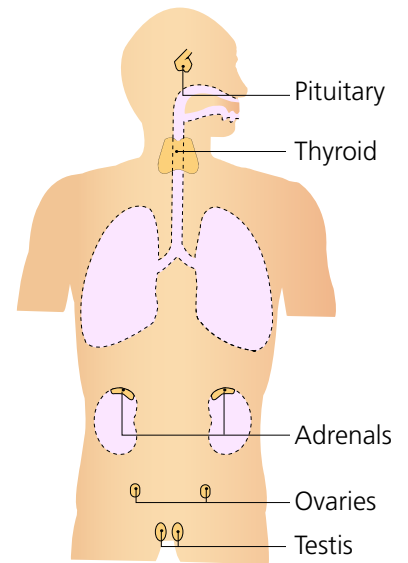
# Adrenal/Pituitary insufficiency following cancer immunotherapy - A patient quick reference guide

## What are the adrenal glands?

You have two adrenal glands, one sitting on top of each kidney. Each gland (part of your body that makes chemicals known as hormones) produces a number of our body's essential hormones including adrenaline, cortisol, aldosterone and testosterone.

## What is the pituitary gland?

The pituitary gland is a gland in the brain that releases a number of hormones, which regulates the function of the adrenal glands, the thyroid gland and the testis/ovaries.



## What is Adrenal Insufficiency?

Adrenal insufficiency occurs when your body is no longer able to produce sufficient amounts of cortisol and/or aldosterone. This may be a side-effect of your immunotherapy treatment on your adrenal and/or pituitary glands. Because the pituitary gland instructs the adrenal glands to work, if the immunotherapy has stopped the pituitary gland from working then the adrenal glands also stop working (known as 'secondary insufficiency'). The symptoms are non-specific such as tiredness or flu-like symptoms.

## What is Pituitary Insufficiency?

This gland can become inflamed as a side-effect of immunotherapy and then it becomes dysfunctional. As a result, your cortisol, thyroxine and testosterone/oestrogen can become low. The symptoms are non-specific such as tiredness. Other symptoms that may occur are headache and visual changes. The headache is often quite severe, painkillers may not help and it's often worse at the front of the head and when leaning forward. The visual disturbance may be double or tunnel vision and may occur with eye pain.

Should you experience any of these symptoms please call The Clatterbridge Cancer Centre Hotline on **0800 169 5555** for advice.

## How is Adrenal Insufficiency Diagnosed?

- Can be difficult to diagnose due to unspecific nature of symptoms
- If you feel unwell please contact the The Clatterbridge Cancer Centre Hotline
- A number of blood tests (cortisol, ACTH, 9am Cortisol)
- Short synacthen test may be performed to confirm diagnosis (see information booklet for more details)

## How is Pituitary Insufficiency Diagnosed?

- The same blood tests will be taken when you first get to hospital as in the case of adrenal insufficiency
- You may also have an MRI scan on your head
- It is very rare to require a short synacthen test

<b>A</b>	appetite loss, unintentional weight loss
<b>D</b>	discolouration of skin
<b>D</b>	dehydration
<b>I</b>	increased thirst and need to urinate frequently
<b>S</b>	salt, soy sauce or liquorice cravings
<b>O</b>	oligomenorrhoea (irregular or infrequent periods in women)
<b>N</b>	no energy or motivation (fatigue, lethargy), low mood
<b>S</b>	sore/painful, weak muscles and joints

## SIDE EFFECTS CAN OCCUR AT ANY TIME DURING YOUR IMMUNOTHERAPY TREATMENT

## How is Adrenal Insufficiency treated?

Once diagnosed with adrenal insufficiency, patients will need to take daily medications for the rest of their lives as this side effect is usually irreversible. Treatment is typically with corticosteroids (e.g. hydrocortisone three times daily), which aim to replace the body's natural cortisol and in some cases mineralocorticoids (e.g. fludrocortisone) to replace the body's natural aldosterone.

## How is Pituitary Insufficiency Treated?

Because the main issue with pituitary insufficiency is also low cortisol, the treatment is very similar. If you have severe headache or visual changes or the MRI shows any evidence of inflammation, then you may be commenced on methylprednisolone, which is given into the vein, followed by tablet prednisolone before starting hydrocortisone but you will end up on the same hydrocortisone doses as are given for adrenal insufficiency. Because the other hormones are also affected, then it is likely you will start on levothyroxine to treat the low thyroid hormone levels and gentlemen will often be started on testosterone replacement. We don't routinely replace oestrogen/ progesterone.

**You will have been given a Steroid Alert Card that has the advice below and the number to contact us on – please carry this with you at all times.**

**If you feel unwell in any way, please contact us on the emergency number on your immunotherapy alert card.**



## Cortisol when you are unwell

Cortisol is essential for life and the body produces extra cortisol during times of stress, for example, when you have a fever, when you have an infection, when you undergo surgery or are hurt in an accident. If your adrenal gland is not producing enough cortisol, your body may not be able to cope with this added stress, which can be life threatening. This is known as an adrenal crisis and is a medical emergency. Signs of adrenal crisis include low blood pressure, abdominal pain, vomiting, and nausea, severely abnormal salt levels in the blood, and sometimes fever and confusion. If you become unwell when taking hydrocortisone, please follow the sick day rules below.

**DO NOT STOP TAKING YOUR STEROIDS UNLESS TOLD TO DO SO.  
ENSURE YOU HAVE SUFFICIENT SUPPLY FOR WEEKENDS AND HOLIDAYS**

## How should you take your medications?

Hydrocortisone tablets should be taken two or three times throughout the day (total daily dose 20-40mg). These are typically split into a higher dose in the morning and lower doses at noon and/or evening dose. It is common to start on a higher dose (20mg in the morning then 10mg at lunch and dinner) and then drop down to a lower dose of hydrocortisone after two weeks (10mg in the morning then 5mg at lunch and dinner). After this time your dose may be further adjusted based on your symptoms and blood tests. It is important to keep the timings of your doses consistent to help match your body's natural cortisol release pattern. Your evening dose should be taken no later than 6pm, or 4 hours before going to sleep to minimise sleep disturbance. Most patients are advised to take steroid medications with food. However, most patients with adrenal insufficiency can take their medication first thing in the morning on an **empty stomach** with just water. Please speak to your pharmacist or doctor if you have concerns over side effects of these medications. Further information can be found in your patient information leaflet, which you will have received with your medications.

If you are prescribed levothyroxine, these tablets are taken once a day and you will have regular blood test to determine your dose. The tablets are taken on an empty stomach, approximately 30 minutes before your breakfast, other medications and caffeine-containing liquids. Testosterone can be given by an injection or a gel rubbed onto the skin. Please ensure to follow the directions in the patient information leaflet given with this medication. Again, the dose may be adjusted over time based on your blood tests.

Further information on a range of topics, including shift working, exercise, diet, travelling, managing adrenal crisis and pregnancy can be found on the Addison's Disease Self-Help Group website ([www.addisons.org.uk](http://www.addisons.org.uk)).

## Monitoring

You will remain under the care of your oncologist while you are receiving treatment for your cancer. This may also be managed in collaboration with your GP and/or an endocrinologist (a gland specialist).

You should monitor your own health and be alert for signs of illness when you need to adjust your daily steroid medication. Keeping a diary is advised.

During your cancer treatment, and for six months after, please contact our 24-hour Clatterbridge Cancer Centre Hotline on **0800 169 5555** if you feel unwell or have symptoms of over or under dosing of your steroid medication.

## What will happen with my immunotherapy?

Whilst both of these side effects are serious and need to be managed urgently the development of adrenal or pituitary insufficiency rarely means we have to stop treatment for your cancer with immunotherapy. It is important to make sure you recover from the symptoms that occur at the point of diagnosis and that your hormones are sufficiently replaced, but once this has occurred immunotherapy is restarted in the vast majority of cases.

## 'Sick day' rules

Your body will produce extra cortisol during times of stress, therefore it is essential that you adhere to the following rules to ensure you increase your steroids enough to replicate this during times of sickness/significant stress (see information leaflet for more information).

1. Should you become in anyway unwell (including a temperature of 37.5 C or more) then you must **DOUBLE** your daily dose of steroid and contact The Clatterbridge Cancer Centre Hotline.
2. If you are unable to take tablets, or are vomiting you must attend A&E as you may need an injection of steroid.
3. If you do vomit upon taking your steroids, take a further dose of your steroids and contact the hotline for further advice.
4. Steroid dose should only be reduced once you are well again and you don't have a fever.

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**PLEASE READ AND CARRY YOUR STEROID ALERT CARD WITH YOU AT ALL TIMES AND SHOW TO OTHER HEALTHCARE PROFESSIONALS**

