

What Is Adrenal Insufficiency?



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Adrenal insufficiency occurs when your adrenal glands don't produce enough hormones, specifically cortisol. There are three types of adrenal insufficiency. Each type has different causes, but they have similar symptoms, such as chronic fatigue, weakness, and loss of appetite.



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Adrenal insufficiency is a condition that happens when your adrenal glands don't make enough of certain hormones. It can lead to life threatening complications if it's not managed.

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controlling blood pressure, and managing electrolytes in your blood. This article will take a closer look at the different types of adrenal insufficiency, the symptoms, and how adrenal insufficiency is diagnosed and treated.


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What are the different types of adrenal insufficiency?

There are three different types of adrenal insufficiency. Let's explore each type in more detail.

Primary adrenal insufficiency

Primary adrenal insufficiency happens when there's a problem with the [adrenal gland](#) itself, which leads to less production of the hormones [cortisol](#) and aldosterone. Primary adrenal insufficiency is also called [Addison's disease](#).

The most common cause of this type of adrenal insufficiency is autoimmune activity. In fact, [80% to 90%](#)  of people with primary adrenal insufficiency have [antibodies](#) that target an enzyme that's important for adrenal hormone production.

Other potential causes of primary adrenal insufficiency include:

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- surgery that removes all or part of the adrenal glands
- bleeding in the adrenal glands
- genetic disorders that affect adrenal gland function
- specific medications, such as certain [antifungals](#) and the anesthesia drug etomidate

Researchers estimate that primary adrenal insufficiency affects [82 to 144 per 1 million people](#) ✓. It happens more frequently in females, with most diagnoses made [between the ages of 30 and 50](#) ✓.

Secondary adrenal insufficiency

Secondary adrenal insufficiency happens when there's a problem with the [pituitary gland](#). The pituitary gland is found at the base of your brain and has many important functions.

One function is to make a hormone called adrenocorticotropin (ACTH). ACTH is what tells your adrenal glands to make cortisol. As such, when the pituitary gland doesn't make enough ACTH, the adrenal glands won't make enough cortisol.

Potential causes of secondary adrenal insufficiency include:

- traumatic brain injury
- cancer that affects the pituitary gland
- surgery around the pituitary gland
- bleeding in or around the pituitary gland
- genetic disorders that affect pituitary gland function

Secondary adrenal insufficiency is more common than primary adrenal insufficiency. It's estimated to affect [150 to 280 per 1 million people](#) ✓.

Tertiary adrenal insufficiency

the level of cortisol in your blood. Less often, tertiary adrenal insufficiency may happen due to a cancer, surgery, or injury that affects the hypothalamus.

High blood cortisol levels can cause your [hypothalamus](#), which is located in your brain, to make less corticotrophin-releasing hormone (CRH). CRH is the hormone that tells your pituitary gland to make ACTH in response to stress.

So, when there's less CRH, the pituitary gland makes less ACTH. Because ACTH promotes cortisol production in the adrenal glands, decreases in ACTH production lead to less cortisol production in the adrenal glands.

When corticosteroids are stopped abruptly, the adrenal glands are unable to make cortisol as it can take weeks to months for the hypothalamus-pituitary-adrenal (HPA) axis to recover.

What are the symptoms of adrenal insufficiency?

The symptoms of adrenal insufficiency are generally similar across all three types, although there are a few that are more associated with primary adrenal insufficiency.

The general symptoms of adrenal insufficiency typically include:

- chronic [fatigue](#)
- [muscle weakness](#)
- [reduced appetite](#)
- [unintended weight loss](#)
- [abdominal pain](#)
- digestive symptoms like [nausea](#), [vomiting](#), or [diarrhea](#)
- [irritability](#)
- [irregular](#) or [absence of](#) menstrual periods
- [lower sex drive](#)

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In primary adrenal insufficiency, aldosterone production is also reduced. Aldosterone works to maintain sodium (salt) and potassium levels in your blood. As such, people with primary adrenal insufficiency can also have symptoms like:

- too little salt in the blood ([hyponatremia](#))
- too much potassium in the blood ([hyperkalemia](#))
- [salt cravings](#)
- [orthostatic hypotension](#), where blood pressure drops when you stand up

Another symptom that happens more frequently in primary adrenal insufficiency is [hyperpigmentation](#). This is a darkening of the skin that's more prominent at the elbows, knees, and lips as well as in scars and skin folds.

Adrenal crisis: A medical emergency

People with adrenal insufficiency, particularly the primary type, can experience a life threatening complication known as an [adrenal crisis](#). This happens in times of high physical or mental stress when the body needs additional levels of cortisol.

An adrenal crisis can cause symptoms that include:

- severe pain in your [back](#), abdomen, or [legs](#) that happens suddenly
- [weakness](#)
- vomiting
- [dehydration](#)
- diarrhea
- [confusion](#)
- [loss of consciousness](#)

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Adrenal crisis is a medical emergency. If you develop any of the symptoms above, seek immediate medical attention.

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How is adrenal insufficiency diagnosed?

The first steps a doctor will take to diagnose adrenal insufficiency is to go over your medical history and to do a [physical exam](#). Then, they'll likely order the following tests which can be used to find out what's causing your symptoms.

Blood tests

Blood tests are important for diagnosing adrenal insufficiency and may include:

- **Adrenocorticotropin (ACTH) stimulation test:** An ACTH stimulation test is the gold standard for helping diagnose adrenal insufficiency. During [this test](#), you're given ACTH via an IV and cortisol levels in your blood are measured over time. People with primary adrenal insufficiency won't have an increase in cortisol in response to ACTH.
- **Cortisol test:** A [cortisol test](#) measures the levels of early morning

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- **Aldosterone test:** An [aldosterone \(ALD\) test](#) looks at the levels of aldosterone in your blood. Aldosterone levels can be low in people with primary adrenal insufficiency.
- **ACTH test:** An [ACTH test](#) can test the levels of ACTH in your blood. High levels may be a sign of primary adrenal insufficiency while low levels may point to secondary or tertiary adrenal insufficiency.
- **Antibody test:** A blood test can look for enzyme 21-hydroxylase antibodies, which are present in most people with primary adrenal insufficiency.
- **Insulin tolerance test:** With an insulin tolerance test, you're given [insulin](#) to lower your blood sugar, which typically causes your pituitary gland to make ACTH. In people with secondary adrenal insufficiency, cortisol levels will remain low because the pituitary doesn't make enough ACTH.
- **Corticotrophin-releasing hormone (CRH) stimulation test:** In this test, you're given CRH via an IV and ACTH levels in your blood are measured over time. People with secondary adrenal insufficiency won't make ACTH in response to CRH, while people with tertiary adrenal insufficiency will have a slow rise in ACTH.

Imaging tests

Imaging tests like [CT scan](#) and [MRI scan](#) can create detailed images of the tissues of your body, including your adrenal glands and brain. Your doctor can use these images to help look for changes in these areas.

How is adrenal insufficiency treated?

Adrenal insufficiency is treated by increasing cortisol levels. This is typically achieved by prescribing the corticosteroid [hydrocortisone](#). Other corticosteroids like [prednisone](#) and [dexamethasone](#) are also sometimes used.

People with primary adrenal insufficiency may also not make enough

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The amount of medication you'll need to take will be tailored to you individually. You may also need to adjust your treatment plan in situations where you may experience additional stress, such as during:

- surgery
- an illness
- pregnancy

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corticosteroids and IV saline solution.

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Living with adrenal insufficiency

For many people, adrenal insufficiency is a chronic condition that requires lifelong management. Because it can lead to life threatening complications, it's important to take your medications exactly as directed by your doctor.

Most people who have adrenal insufficiency can live active lives. Making some lifestyle changes may make this easier. These include:

- adding more sources of [calcium](#) and [vitamin D](#) to your diet, as corticosteroid use can increase the risk of [osteoporosis](#)
- eating a high sodium diet under the supervision of your doctor if you

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- wearing a medical alert bracelet or necklace and carrying a medical information card to let emergency responders know that you have adrenal insufficiency
- finding effective ways to [manage stress](#) that happens in your daily life

The bottom line

Adrenal insufficiency is when your adrenal glands don't make enough of certain hormones, specifically cortisol. In some situations, the levels of other hormones produced by the adrenal glands may be affected as well.

There are several types of adrenal insufficiency. These are broken down based on what part of the body is causing low hormone production.

Adrenal insufficiency can lead to potentially life threatening complications. If you've recently received a diagnosis of adrenal insufficiency, be sure to stick closely to your treatment plan. Doing so can help to manage your condition.

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