PROCEDURE

# Adrenal gland removal

Adrenal gland removal is surgery to take out one or both adrenal glands.

**PURPOSE**
Remove a diseased or hormone-producing adrenal gland

**PROCEDURE TYPE**
Therapeutic surgery, usually minimally invasive

**WHERE IT IS DONE**
Operating theatre

**ANAESTHESIA**
General

**HOW LONG IT TAKES**
Usually 2 to 4 hours; open surgery may take longer

**PREPARATION**
Fasting, medicine review, blood thinner and hormone planning

**RECOVERY**
Overnight to several days; no driving until considered safe

**MAIN RISKS**
Bleeding, infection, organ injury, hormone imbalance

**RESULTS**
Surgical findings immediately; laboratory and pathology results within days

## Overview

Adrenal gland removal, or adrenalectomy, is surgery to remove one adrenal gland or, less often, both. The two adrenal glands sit above the kidneys and produce hormones that control blood pressure, stress responses and salt balance.

Most operations use several small cuts and a camera. This is called laparoscopic surgery; robotic surgery is a similar approach. Open surgery uses one larger cut and may be needed for a very large tumour or suspected cancer involving nearby tissue.

## Why the procedure is performed

Adrenalectomy may be performed for:

Many adrenal masses are found accidentally during imaging. Most do not require surgery. Decisions depend on hormone tests, appearance, growth, size, symptoms and overall health.

- A tumour producing too much cortisol, aldosterone or adrenaline-like hormones
- Suspected or confirmed cancer
- A growing or large mass with concerning scan features
- A mass causing pain, bleeding or pressure
- Cancer that has spread only to the adrenal gland, in selected cases

## Who should and should not have it

Surgery may be offered when removing the gland is expected to provide more benefit than risk, especially for hormone-producing tumours or masses with features suggesting cancer.

Monitoring is often preferred for a small, non-hormone-producing mass that looks benign. Surgery may be delayed or avoided if hormone overproduction is not controlled, you have an active infection, general anaesthesia is unsafe, widespread cancer makes surgery unlikely to help, or monitoring is a safe alternative.

Open surgery may be advised if cancer appears to involve nearby tissue so the tumour can be removed without breaking it apart.

Removing both glands is generally reserved for conditions affecting both sides. Because the body can no longer produce essential adrenal hormones, lifelong replacement steroids like prednisone or hydrocortisone are required afterward.

## How to prepare

Your team may arrange blood and urine hormone tests, imaging, heart tests and an anaesthetic assessment.

Some hormone-producing tumours require treatment before surgery. A pheochromocytoma, for example, can cause dangerous blood pressure changes. If your body has been producing excess cortisol, you may need steroid replacement around the operation.

Tell the team about all medicines and supplements. They will explain what to pause or change. Do not stop a blood thinner or steroid on your own.

Follow the facility's instructions about when to stop eating and drinking. The treating facility's own preparation instructions take priority over general information in this article.

Arrange transport home and help during early recovery.

## What happens during the procedure

You receive general anaesthesia and are unconscious. Your breathing, heart rate and blood pressure are monitored.

During minimally invasive surgery, the surgeon makes small cuts in the abdomen or back. Using a camera and instruments, they separate the gland from nearby tissue and blood vessels and remove it in a protective bag.

Open surgery uses a larger cut in the abdomen, side or back. Nearby tissue or organs may also be removed if cancer has grown into them.

The gland is usually sent for laboratory examination. Minimally invasive surgery may need to be changed to open surgery because of bleeding, scar tissue, difficult anatomy or concern about safe tumour removal.

## Recovery and what to expect afterward

Soreness around the cuts is expected. Minimally invasive surgery may also cause temporary shoulder pain from the gas used during the procedure. Pain should gradually improve.

You may start with fluids and return to regular food as nausea settles. Tell the team if you cannot keep down fluids or essential medicines.

Walking soon after surgery supports circulation and recovery. Increase activity gradually and avoid heavy lifting or strenuous exercise until your surgeon says it is safe.

Do not drive home or drive while taking opioid pain medicine. Resume only when pain does not limit movement or reactions and your surgeon's and local anaesthesia restrictions have ended.

Return to work depends on the operation and your job. Open surgery and physically demanding work usually require more recovery time.

An uncomplicated minimally invasive operation may require an overnight stay. Open surgery, complex hormone monitoring or removal of both glands usually requires longer.

## Risks and possible complications

Risks include:

Hormone levels can change quickly after surgery. Blood pressure, blood sugar, salt levels and cortisol may need monitoring.

After removal of a cortisol-producing tumour, the remaining gland may temporarily make too little cortisol. Missing required steroid doses can cause adrenal crisis, a medical emergency.

If both glands are removed, lifelong cortisol and aldosterone replacement is required. You will need instructions for taking extra steroid during illness and carrying medical identification.

- Bleeding, sometimes requiring transfusion or further surgery
- Infection
- Blood clots in the legs or lungs
- Injury to nearby organs or blood vessels
- Reactions to anaesthesia
- Conversion from minimally invasive to open surgery

## Results and follow up

Your surgeon can usually explain how the operation went once you are awake and stable. Final pathology commonly takes several days or longer and may show the tumour type, whether it is cancerous and whether it was removed with a clear edge.

Follow-up may include:

Keep taking prescribed hormone replacement until your team changes it. Do not stop steroid medicine suddenly.

- Wound and recovery checks
- Blood pressure and hormone tests
- Medicine adjustments
- Review of pathology
- Further imaging or cancer care

## Alternatives

Alternatives depend on why surgery was recommended.

Active monitoring uses repeat scans and hormone tests and may suit a benign-looking mass that does not produce excess hormones.

Medicines may control hormone production or its effects, but they do not necessarily remove the tumour or provide a tissue diagnosis.

Cancer treatments , including drug therapy, radiation or image-guided ablation, may be appropriate in selected cases.

No active treatment may be reasonable when a mass is harmless or surgery would cause more burden than benefit. For advanced cancer, care may focus on slowing disease and controlling symptoms.

Ask what is likely with and without surgery, whether monitoring is safe, and why an open or minimally invasive approach is recommended.

## When to call your healthcare team

Contact your surgical team promptly for increasing pain, worsening wound redness, drainage, fever, repeated vomiting, difficulty taking medicines or new leg swelling.

Seek emergency care for:

Routine questions about pathology, activity, work or medicine adjustment can usually wait for clinic hours or follow-up.

- Severe breathing difficulty, chest pain or coughing up blood
- Fainting, confusion or extreme weakness
- Heavy bleeding or a rapidly swelling abdomen
- Severe vomiting or diarrhoea while relying on steroid replacement
- Symptoms of adrenal crisis despite following your emergency steroid plan

## Common questions

Will I be asleep?

Yes. Adrenalectomy is performed under general anaesthesia.

Can I drive home?

No. Arrange for someone to take you home. Resume driving only when restrictions have ended, you are not taking impairing pain medicine and you can control the vehicle safely.

How painful is it?

Pain and soreness are expected, especially with movement or coughing. Minimally invasive

surgery usually causes less wound pain than open surgery. Pain should improve rather than steadily worsen.

When will I know the results?

Your surgeon can describe the operation soon afterward. Hormone results may be available within hours or days; final pathology usually takes several days or longer.

Can I live normally with one adrenal gland?

Usually, one healthy gland makes enough hormones. Temporary steroids may still be needed, particularly after removal of a cortisol-producing tumour.

Will I need steroids for life?

Lifelong replacement is necessary if both glands are removed. After removal of one gland, treatment may be temporary or unnecessary, depending on hormone tests and the reason for surgery.

## Sources

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