PROCEDURE

Kidney removal

Kidney removal is surgery to remove part or all of a kidney.

PURPOSE
Remove diseased kidney tissue or a kidney being donated

PROCEDURE TYPE
Therapeutic; surgical, usually minimally invasive or open

WHERE IT IS DONE
Operating theatre

ANAESTHESIA
General anaesthesia

HOW LONG IT TAKES
About 2-4 hours, longer for complex surgery

PREPARATION
Fasting, medication review, tests, and arranged transport home

RECOVERY
Hospital stay one to several days; temporary driving restriction

MAIN RISKS
Bleeding, infection, organ injury, blood clots

RESULTS
Surgical findings immediately; pathology usually within several days

Overview

Kidney removal is an operation called a nephrectomy . It may remove the entire kidney or only the affected part.

A partial nephrectomy removes a tumour or damaged area while keeping as much working kidney tissue as possible. A simple nephrectomy removes the whole kidney. A radical nephrectomy removes the kidney and surrounding fatty tissue; nearby lymph nodes or the adrenal gland may also be removed when necessary.

The operation may be performed through several small cuts using laparoscopic or robot-assisted instruments. This is called minimally invasive surgery. An open operation uses one larger cut in the abdomen or side. The safest approach depends on the reason for surgery, the size and location of the problem, previous operations, and your overall health.

Most people can live with one healthy kidney. Your team will assess how well both kidneys work before recommending removal.

Why the procedure is performed

Kidney removal may be offered to:

For a small kidney mass, preserving kidney tissue may be especially important. A partial nephrectomy is often considered when it can remove the mass safely while leaving enough healthy kidney behind.

Removing a kidney does not treat every kidney condition. Long-term diseases affecting both kidneys are usually managed with medicines, monitoring, lifestyle changes, dialysis, or transplantation rather than nephrectomy.

- Treat kidney cancer or a kidney mass suspected to be cancer
- Remove a severely damaged, infected, or poorly functioning kidney
- Control serious bleeding or damage after an injury
- Treat selected problems that block urine flow and cannot be corrected otherwise
- Obtain a healthy kidney for living-donor transplantation

Who should and should not have it

Kidney removal may be appropriate when the expected benefit outweighs the effects and risks of surgery. Your team will consider the condition being treated, whether it is limited to the kidney, your kidney function, and whether less invasive options are suitable.

Removing the whole kidney may not be the best choice if you have only one functioning kidney, reduced function in both kidneys, or tumours in both kidneys. Partial nephrectomy or another kidney-preserving treatment may be preferred when technically possible.

Surgery may be avoided or delayed if:

Potential living kidney donors undergo a separate medical and psychological assessment. Donation should not proceed if it would place the donor at unacceptable risk. A donor can change their mind at any stage.

- A small mass can reasonably be monitored or treated another way
- An active infection needs treatment first

- Heart, lung, or other medical problems make anaesthesia unsafe at that time
- A bleeding problem or certain medicines create an unacceptably high surgical risk
- Further imaging or a biopsy is needed to clarify the diagnosis
- Advanced cancer is better managed first with systemic treatment, which works throughout the body

How to prepare

Follow the treating facility's own instructions, as these take priority over general information.

Before surgery, you may have blood and urine tests, an electrocardiogram to check heart rhythm, and imaging such as a CT or MRI scan. These help the team assess your kidney function and plan the operation.

Give the team a complete list of medicines, supplements, allergies, and previous reactions to anaesthesia. Blood thinners like warfarin or apixaban , diabetes medicines, and some supplements may need special instructions. Do not stop a prescribed medicine unless the surgical team tells you to.

You will be told when to stop eating and drinking. Arrange for someone to take you home and help during early recovery. Tell the team if you develop a fever, respiratory illness, skin infection, or other new health problem before the operation.

Smoking can slow healing and increase breathing complications. If you smoke, ask what support is available before surgery.

What happens during the procedure

You will receive general anaesthesia, so you will be unconscious and will not feel the operation. A tube may be placed in your bladder to measure urine output. Devices around your legs may help reduce the risk of blood clots.

For minimally invasive surgery, the surgeon makes several small cuts and inserts a camera and long instruments. The kidney or affected portion is separated from nearby tissue and blood vessels, placed in a protective bag, and removed through one of the cuts.

For open surgery, the surgeon reaches the kidney through a larger cut. Open surgery may be planned for a large or complex problem. A minimally invasive procedure may also need to be changed to open surgery if this becomes safer.

During partial nephrectomy, the surgeon removes the abnormal area and closes the remaining kidney. During total nephrectomy, the blood vessels and urine-carrying tube are sealed before the kidney is removed.

A temporary drain may be left near the surgical area. The cuts are closed with stitches, clips, surgical glue, or a combination.

Recovery and what to expect afterward

Pain: Soreness around the cuts is expected. Shoulder discomfort or bloating can occur after laparoscopic surgery because gas is used to create working space. Pain should gradually improve. Your team will provide a pain-control plan.

Eating: You may begin with drinks and light food once you are awake and nausea is controlled. Your usual diet is often restarted as your bowel function returns. Constipation can occur after surgery, especially with opioid pain medicines.

Activity: Staff will encourage you to stand and walk soon after surgery. Movement and breathing exercises help reduce blood clots and lung problems. Avoid heavy lifting and strenuous exercise until your surgeon says the wounds have healed enough. Follow the instructions given for bathing and wound care.

Driving: Do not drive immediately after general anaesthesia or while taking medicines that make you sleepy. You should also be able to turn comfortably, wear a seat belt, and perform an emergency stop. Your facility may set a minimum waiting period.

Returning to work: Timing depends on whether surgery was minimally invasive or open, how recovery progresses, and whether your job involves lifting or physical work. Ask for a work certificate and a personalised return plan before leaving hospital.

A hospital stay may range from overnight to several days. Open or complicated surgery usually requires a longer recovery than an uncomplicated minimally invasive operation.

Risks and possible complications

Kidney removal is major surgery. Possible complications include:

Kidney function may fall after part or all of a kidney is removed. The remaining kidney often takes on more work, but this may not be enough if it was already impaired. A small number of people may require dialysis, particularly when kidney function was poor before surgery or serious complications occur.

Cancer surgery may not remove every cancer cell, or cancer may return later. Pathology and follow-up testing help guide whether further care is needed.

- Bleeding that may require a blood transfusion or another procedure
- Infection of the wound, urinary tract, abdomen, or lungs
- Blood clots in the legs or lungs
- Reactions to anaesthesia or breathing problems
- Injury to nearby organs, nerves, or blood vessels
- A urine leak from the remaining kidney after partial nephrectomy
- Hernia, numbness, or ongoing discomfort around the incision
- Conversion from minimally invasive to open surgery

Results and follow up

The surgeon can usually explain what was found and what was removed soon after the operation. If tissue was sent to a laboratory, a pathologist examines it under a microscope. Results commonly take several days, although complex testing can take longer.

For a kidney mass, the pathology report may describe whether it is cancer, the cancer type and grade, its size, and whether the cut edges are free of tumour. These findings help determine whether surveillance or additional treatment is needed.

Routine follow-up may include a wound check, blood pressure measurement, and blood tests for kidney function. Cancer follow-up may also include scans. Living donors need long-term monitoring of blood pressure, urine protein, and kidney function.

Keep routine appointments even if you feel well. They are intended to monitor healing and the health of your remaining kidney tissue.

Alternatives

The alternatives depend on why kidney removal has been proposed.

Partial nephrectomy preserves more kidney function than total removal, but it can be technically harder and carries a risk of urine leakage or bleeding from the remaining kidney.

Active surveillance uses repeat scans to monitor selected small masses. It avoids immediate surgery but may allow a tumour to grow or change before treatment.

Thermal ablation destroys a small tumour with heat or cold, usually through a needle placed using imaging. Recovery is often shorter, but it may be less suitable for large or difficult-to-reach tumours and can require repeat treatment.

Biopsy can provide more information about a kidney mass before treatment. It does not remove the mass, and a sample may occasionally be inconclusive.

Embolisation blocks blood flow to part or all of the kidney. It may control bleeding or reduce symptoms when surgery is unsuitable, but it does not provide the same treatment as surgical removal for many cancers.

For advanced kidney cancer, medicines such as immunotherapy or targeted therapy may be more appropriate than immediate surgery. These treatments affect the whole body and have different side effects.

For severe injury or infection, drainage, antibiotics like amoxicillin or doxycycline , blood-vessel procedures, or surgical repair may sometimes preserve the kidney. They may not work when damage is extensive.

When to call your healthcare team

Contact your surgical team promptly for:

Seek emergency help for severe shortness of breath, chest pain, fainting, confusion, coughing up blood, uncontrolled bleeding, or a sudden severe deterioration. These are not routine recovery symptoms.

- A fever at or above the threshold they gave you
- Increasing redness, swelling, warmth, discharge, or opening of a wound
- Pain that is worsening or not controlled by the prescribed plan
- Repeated vomiting or inability to keep fluids down
- New difficulty urinating or much less urine than expected
- Increasing abdominal swelling
- New calf pain or one-sided leg swelling

Common questions

Will I be asleep?

Yes. Kidney removal is performed under general anaesthesia, so you will be unconscious

during the operation.

Can I drive home?

No. Arrange for someone else to drive you. Do not resume driving until you are off sedating pain medicine, can move comfortably, and meet your facility's instructions.

How painful is kidney removal?

Pain and soreness are expected, especially during movement or coughing. Open surgery usually causes more incision pain than minimally invasive surgery. Pain should become more manageable as healing progresses.

When will I know the results?

The surgeon can discuss the operation soon afterward. Laboratory examination of removed tissue usually takes several days and may take longer if extra tests are required.

Can I live normally with one kidney?

Many people live active lives with one healthy kidney. Ongoing blood pressure and kidney-function checks are important, especially if you have diabetes, high blood pressure, or previous kidney disease.

Will I need dialysis afterward?

Most people with a healthy remaining kidney do not need dialysis. The possibility is greater if kidney function was already reduced or both kidneys are affected.

Sources

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