Nephrectomy – Kidney removal

Indications :

Kidney tumour – Radical or partial Nephrectomy

Obstructed Non functioning kidney

Chronic kidney Disease induced non functioning kidney (NFK)

Chronic pyelonephritis (chronic kidney infection)

Acute Emphysematous Pyelonephritis (EPN) – acute infection – common in diabetics

Polycystic kidney Disease – pain and infection

Approach – Open and Laparoscopic

Type – Radical and Partial

- **Radical (complete) nephrectomy.** During a radical nephrectomy, the urologic surgeon removes the entire kidney and often some additional structures, such as part of the tube that connects the kidney to the bladder (ureter), or other adjacent structures such as the adrenal gland or lymph nodes.
- **Partial nephrectomy.** In a partial nephrectomy, also called kidney-sparing (nephron-sparing) surgery, the surgeon removes diseased tissue from a kidney and leaves healthy tissue in place.

Most often a nephrectomy is performed to treat kidney cancer or to remove a noncancerous (benign) tumor. In some cases, a nephrectomy is performed to deal with a diseased or seriously damaged kidney. In the case of a donor nephrectomy, the urologic surgeon removes a healthy kidney from a donor for transplant into a person who needs a functioning kidney.

The urologic surgeon may perform a nephrectomy through a single incision in the abdomen or side (open nephrectomy) or through a series of small incisions in the abdomen using a camera and small instruments (laparoscopic nephrectomy).

In some cases, these laparoscopic procedures are performed using a robotic system. In robotic surgery, the surgeon sits at a computer console near the operating table. He or she controls the camera arm and mechanical arms, which have surgical instruments attached to them that are working inside the patient's body.

Why it's done

The most common reason a urologic surgeon performs a nephrectomy is to remove a tumor from the kidney. These tumors are usually cancerous, but they can be noncancerous (benign). Sometimes a nephrectomy is needed because of other kidney diseases.

Kidney function

Most people have two kidneys — fist-sized organs located near the back of the upper abdomen. Your kidneys:

- Filter wastes and excess fluid and electrolytes from your blood
- Produce urine
- Maintain proper levels of minerals in your bloodstream
- Produce hormones that help regulate your blood pressure and that influence the number of circulating red blood cells

Cancer treatment

Often a urologic surgeon performs nephrectomy to remove a cancerous tumor or abnormal tissue growth in a kidney. The most common kidney cancer in adults, renal cell carcinoma, begins in the cells that line the small tubes within your kidneys.

Kidney tumors in children are rare. But when they occur, children are more likely to develop a type of kidney cancer called Wilms' tumor, probably caused by the poor development of kidney cells.

The decision about how much kidney tissue to remove depends on:

- Whether a tumor is confined to the kidney
- Whether there is more than one tumor

- How much of the kidney is affected
- Whether the cancer affects nearby tissue
- How well the other kidney functions
- Whether other diseases affect kidney function
- Overall kidney function

The urologic surgeon makes a decision based on the results of imaging tests, which may include:

- Computerized tomography (CT), a specialized X-ray technology that produces images of thin cross-sectional views of soft tissues
- Magnetic resonance imaging (MRI), which uses a magnetic field and radio waves to produce cross-sectional views or 3-D images
- Ultrasound, an image of soft tissues produced with the use of sound waves

Risks

Nephrectomy is generally a safe procedure. But as with any surgery, nephrectomy carries a potential risk of complications, such as:

- Bleeding
- Infection
- Injury to nearby organs
- Rarely, other serious problems

Long-term complications from a nephrectomy relate to potential problems of living with less than two complete, fully functioning kidneys. Although overall kidney function decreases after a nephrectomy, the remaining kidney tissue usually works well enough for a healthy life.

Problems that may occur with long-term reduced kidney function include:

- High blood pressure (hypertension)
- Chronic kidney disease

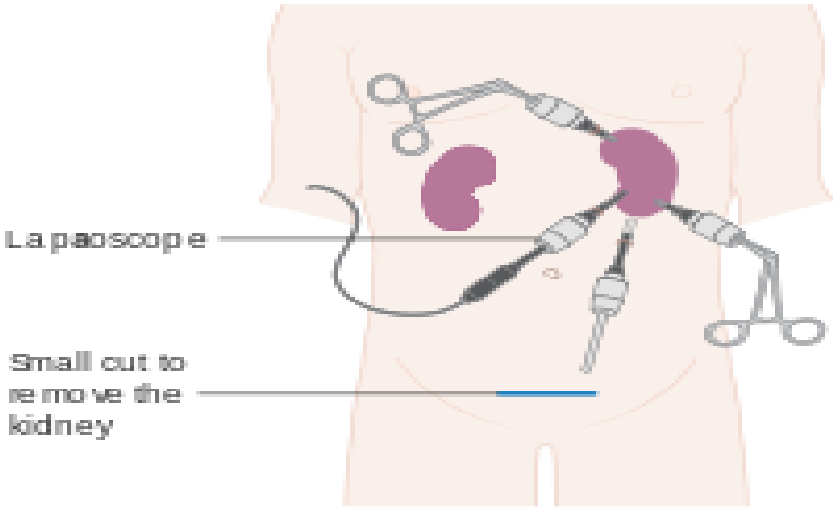
Potential risks and complications depend on the type of surgery, reasons for surgery, patient's overall health and many other issues, including surgical expertise and experience.

During the procedure

The nephrectomy procedure varies, depending on how the surgery is performed and how much of the kidney is removed. Variations include:

- **Laparoscopic surgery.** In this minimally invasive procedure, the surgeon makes a few small incisions in your abdomen to insert wandlike devices equipped with video cameras and small surgical tools. The surgeon must make a slightly larger opening if your entire kidney needs to be removed.
- **Open surgery.** In an open nephrectomy, the urologic surgeon makes a cut (incision) along your side or on your abdomen. This open approach allows surgeons to perform some surgeries that still can't be performed safely with less invasive approaches.
- **Radical nephrectomy.** In a radical nephrectomy, the surgeon removes the whole kidney, the fatty tissues surrounding the kidney and a portion of the tube connecting the kidney to the bladder (ureter). The surgeon may remove the adrenal gland that sits atop the kidney if a tumor is close to or involves the adrenal gland. In some cases lymph nodes or other tissues are removed as well.
- **Partial nephrectomy.** In a partial nephrectomy — also called kidney-sparing (nephron-sparing) surgery — the surgeon removes a cancerous tumor or diseased tissue and leaves in as much healthy kidney tissue as possible.

Your urologic surgeon will discuss the advantages and disadvantages of robotic or other types of minimally invasive surgery versus open surgery, including issues such as scarring and the time it takes to return to normal activities.



After the procedure

Recovery time after the procedure and the length of your hospital stay depend on your overall health and the type of nephrectomy performed. The urinary catheter remains in place for a short time during your recovery.

Expect to receive instructions before leaving the hospital about restrictions to your diet and activities. You may be encouraged to begin light, everyday activities as soon as you feel able, but you'll need to avoid strenuous activity or heavy lifting for several weeks.

For most patients, these procedures don't affect quality of life — once you're completely recovered, you can expect to resume your normal routine and activities.

Monitoring kidney function

Most people can function well with only one kidney or with one whole kidney and part of the second. You'll likely have checkups to monitor the following factors related to kidney function.

- **Blood pressure.** You'll need careful monitoring of your blood pressure because decreased kidney function can increase blood pressure — and high blood pressure can, in turn, damage your kidney.
- **Protein urine levels.** High protein urine levels (proteinuria) may indicate kidney damage and poor kidney function.

- **Waste filtration.** Glomerular filtration rate is a measure of how efficiently your kidney filters waste. The test is usually performed with a sample of blood to measure the creatinine level. A reduced filtration rate indicates decreased kidney function.

Taking care of your remaining kidney

After a nephrectomy or partial nephrectomy, you may have overall normal kidney function. To preserve normal kidney function, your doctor may recommend that you eat a healthy diet, engage in daily physical activity and attend regular checkups to monitor your kidney health.

If you develop chronic kidney disease (reduced kidney function) after complete or partial nephrectomy, your doctor may recommend additional lifestyle changes, including possible dietary changes and being careful about prescription and over-the-counter medications.