



## LAPAROSCOPIC AND OPEN, TOTAL AND PARTIAL NEPHRECTOMY

Nephrectomy is the surgical removal of the whole kidney, either for disease or for kidney donation. This information includes kidney cancer, which may not be relevant to patients with benign conditions or planning kidney donation.

There is an 85% chance that a solid kidney lump identified on CT scan, is a cancer. Benign pathology is more common with smaller tumours <3cm diameter and in woman. Unfortunately, biopsy is unreliable and therefore there is no accurate way to pre-operatively identify the benign tumours which account for 15% of solid kidney lesions. The only effective therapy for kidney cancer is surgical removal and most solid kidney lumps larger than 2-3 cm will ultimately be removed.

Kidney cancer accounts for just 3% of all adult cancers, but the incidence is currently rising. In the past, patients typically complained of bloody urine and abdominal pain. However, the widespread use and availability of ultrasound and CT scan allow identification of these tumours at an earlier, asymptomatic stage. Whether symptomatic or not, the likelihood of cure relates to the tumour size, smaller the better, and whether the tumour remains confined to the kidney.

Except in the context of donation for transplantation, the kidney or tumour is sent for pathological analysis. This may take a few weeks and the results are discussed at the follow-up visit. Follow-up for kidney cancer continues for 5 years, with regular blood tests and radiology, following international surveillance guidelines.

The traditional operation (open nephrectomy) involves removal of the entire kidney through a 6-8 inch abdominal incision. Long-term wound-related problems following this surgery have made laparoscopy a preferable approach to nephrectomy wherever possible, but the open technique is appropriate for some very large tumours, for certain kidney infections, for some partial nephrectomy and as a rescue procedure for intra-operative problems with laparoscopic nephrectomy. Open nephrectomy, radical or partial, is performed under general anaesthetic. The hospital stay is usually 7-10 days, and recovery of normal daily function takes up to 6 weeks.

Over the past 20 years, laparoscopic (key-hole) surgery using a camera and telescope system through the ports has largely replaced open kidney surgery and open nephrectomy is now performed only in specific circumstances when laparoscopic nephrectomy cannot be achieved. Laparoscopy is associated with less pain, fewer complications and superior recovery, compared to open surgery. Internally, the surgery is very similar to the older open operation, and achieves similar results in terms of cure of the underlying condition. Laparoscopy is also performed under general anaesthetic. If the tissue/specimen to be removed is large, this will usually require a wound just above the pubic symphysis (bikini-line) in addition to the port-site wounds.

In general, laparoscopy has longer operating times than open surgery but this does not equate to more complications. In common with all laparoscopic surgery, hospital stay is short and recovery is quicker than the open procedure with few or no wound-related problems.

We know from kidney donors that one normal kidney is sufficient for normal kidney function and normal life expectancy. The entire kidney is removed for larger and more central renal tumours. Partial nephrectomy is the removal of a kidney tumour with a small amount of adjacent normal kidney tissue, when technically possible. Partial nephrectomy preserves much of the normal kidney with the long-term benefit of preserved renal function. Where there is no opposite kidney, or the opposite kidney is diseased or itself at risk of tumour, there is a strong indication for partial nephrectomy.



This kidney-conserving surgery may be offered to patients with small tumours and a normal opposite kidney, as there is a lower rate of cardiovascular disease in patients having partial nephrectomy compared with total nephrectomy. However, the early risks from partial nephrectomy are higher than with radical nephrectomy and there is a 2% possibility of tumour recurrence in the remaining portion of kidney in the long-term.

**WHAT TO DO BEFORE YOUR PROCEDURE:**

- ensure laboratory tests are done > 48 hours prior to surgery, unless advised otherwise
- discontinue aspirin and other anticoagulants 1 week prior, other medications may also need to be stopped
- nothing to eat or drink from 6 hours prior to procedure - see Admission Booklet regarding diet restrictions
- microlax enema morning of the procedure for afternoon procedures, evening prior for morning procedures
- you will be admitted to hospital on the day of surgery.
- you do not need to shave prior to surgery
- splenectomy prophylaxis may be considered prior to left nephrectomy if splenic involvement or injury is anticipated

**WHAT HAPPENS IN HOSPITAL AFTER YOUR PROCEDURE:**

**Laparoscopic nephrectomy :**

- day 1: urethral catheter will be removed
- your hospital stay is commonly 1-3 days

**Open nephrectomy :**

- day 2: mobilisation, diet as tolerated
- your hospital stay is commonly 7-10 days

**WHAT HAPPENS AFTER YOU LEAVE HOSPITAL:**

- recovery after laparoscopic surgery is reasonably quick, with return to normal activities including driving after 10 days.
- recovery after open surgery is somewhat longer, with return to normal activities including driving after 4-6 weeks .
- withhold aspirin and other anticoagulants for 1 week but reinstate other usual medications.
- the Steristrip (tape) dressings should be left on the wounds for 4 weeks. If the Steristrips come off, the wounds should be left exposed without further dressings applied
- post-operative constipation is a common problem and may be minimised with good fluid intake, dietary fibre and laxatives.
- see Admission Booklet regarding restrictions on driving following general anaesthetic
- avoid heavy lifting for 2 weeks; thereafter resume normal activity including sexual intercourse as tolerated
- fatigue continues for several weeks after surgery. You are encouraged to return to normal activities early, accepting the fatigue, which although limiting, will resolve progressively and completely.



**WHAT CAN GO WRONG:**

Early complications are commoner with partial nephrectomy, occurring in <20% of patients. Although most cases proceed without particular difficulty and have excellent outcomes, surgical complications occur overall in 5% of patients. The list below details complications recognised as common or serious, but this does not include the rare and extraordinary. Risk of death is approximately 0.03% in generally healthy patients.

**AT THE TIME OF AND EARLY AFTER SURGERY:**

- Failed procedure and conversion to open procedure <1%
- Conversion from partial to total nephrectomy <5%
- Bleeding requiring blood transfusion in < 1% of total nephrectomies, <10% partial nephrectomies.
- Urine leak requiring stent and drainage: <10% of patients post partial nephrectomy. This may require a second procedure under general anaesthetic.
- Infection may require antibiotic treatment <3%
- Temporary shoulder pain is common after laparoscopy
- Damage to other organs, including bowels, spleen, liver and gall bladder, nerves and lymphatics, and CO2 gas embolism
- Splenic injury requiring splenectomy < 1% of left nephrectomies
- Rarely pleural injury requiring temporary chest drain
- Rarely colonic injury requiring temporary colostomy
- Damage to nerves includes injury to the sympathetic nerve trunk with retrograde ejaculation < 0.1% (usually temporary but if persistent may compromise later fertility).
- Numbness or tingling in legs, genitalia and perineum is usually temporary
- Clots (DVT, PE), gas embolism
- Risk of death may be estimated using the nzRISK <https://nzhisk.com> on-line pre-operative calculator. It has been developed and validated for patients in New Zealand over the age of 18, to help patients and doctors balance benefits and risks of treatment.

**LATER POTENTIAL COMPLICATIONS :**

- Secondary bleeding requiring radiological embolization < 5% of partial nephrectomies
- Functional deterioration of remaining kidney post partial nephrectomy
- Port site hernia
- Adhesions
- Tumour recurrence including port site tumour recurrence have occurred with laparoscopy for kidney cancers
- Wound pain, bulge and wound hernia may occur following open nephrectomy