



# ROBOTIC-ASSISTED LAPAROSCOPIC (KEYHOLE) REMOVAL OF PART OF THE KIDNEY

Information about your procedure from  
The British Association of Urological Surgeons (BAUS)

This leaflet contains evidence-based information about your proposed urological procedure. We have consulted specialist surgeons during its preparation, so that it represents best practice in UK urology. You should use it in addition to any advice already given to you.

To view the online version of this leaflet, type the text below into your web browser:

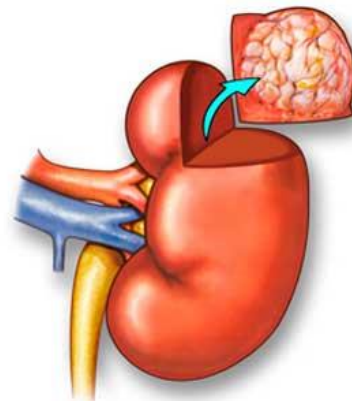
[http://www.baus.org.uk/\\_userfiles/pages/files/Patients/Leaflets/Partial nephrectomy robotic.pdf](http://www.baus.org.uk/_userfiles/pages/files/Patients/Leaflets/Partial%20nephrectomy%20robotic.pdf)

## Key Points

- The aim of robotic-assisted laparoscopic partial nephrectomy is to remove the part of your kidney containing a suspected cancerous tumour
- We use very small, robotic instruments that allow precise surgery through tiny keyhole incisions in your abdomen
- One of the keyhole incisions may need to be enlarged to remove the resected part of your kidney
- If successful, the procedure allows better preservation of kidney function than complete removal of your kidney
- If partial removal is not considered feasible, or is felt to be unsafe, we may decide to perform complete removal of your kidney
- Bleeding, incomplete tumour clearance and urine leakage from the cut edge of the kidney are the major side-effects

## What does this procedure involve?

Removal of part of your kidney, with its surrounding fat (pictured), for suspected cancer of the kidney through three to five “keyhole” incisions, using a telescope and robotic instruments inserted into your abdominal (tummy) cavity. One of these



incisions may need to be enlarged to extract the removed part of kidney.

Robotic surgery uses sophisticated mini-instruments which are totally under the control of the surgeon. The robot mimics and assists the surgeon's movements; it does **not** do the operation. This technique is now widely used because of its high degree of surgical accuracy, and because recovery is much faster than it is for open surgery.



## What are the alternatives?

- **Observation alone** – leaving the tumour in your kidney and observing it carefully for any signs of enlargement
- **[Cryoablation](#)** – freezing the tumour with cooled metal probes inserted through the skin under image guidance or during keyhole surgery
- **[Radiofrequency ablation](#)** – heating the tumour with metal probes inserted through the skin under image guidance
- **[Laparoscopic partial nephrectomy](#)** – removing only the part of the kidney containing the tumour using a keyhole technique without robotic assistance
- **[Open partial nephrectomy](#)** – removing only the part of the kidney containing the tumour through an abdominal or loin incision
- **[Laparoscopic radical nephrectomy](#)** – removing the whole kidney, using a keyhole technique
- **[Open radical nephrectomy](#)** – removing the whole kidney and its surrounding tissues through an abdominal or loin incision

## **What happens on the day of the procedure?**

Your urologist (or a member of their team) will briefly review your history and medications, and will discuss the surgery again with you to confirm your consent.

An anaesthetist will see you to discuss the options of a general anaesthetic or spinal anaesthetic. The anaesthetist will also discuss pain relief after the procedure with you.

We may provide you with a pair of TED stockings to wear, and we may give you a heparin injection to thin your blood. These help to prevent blood clots from developing and passing into your lungs. Your medical team will decide whether you need to continue these after you go home.

## **Details of the procedure**








- we carry out the procedure under a general anaesthetic, meaning that you are asleep throughout
- we usually give you an injection of antibiotics before the procedure, after you have been checked for any allergies
- we make five or six keyhole cuts in your abdomen through which we insert robotic instruments
- we inflate your abdominal cavity by injecting carbon dioxide gas to create a working space
- we remove the part of your kidney which contains the tumour, together with its surrounding fat
- we extract the removed part of your kidney from your abdomen by enlarging one of the port incisions
- we close the wounds with absorbable stitches (which normally disappear within two to three weeks) and inject local anaesthetic into the wounds for pain relief
- we sometimes put a catheter in your bladder to monitor your urine output; this is removed as soon as you are mobile
- we insert a drain close to the area where the tumour was removed to prevent fluid accumulation; this is removed when it stops draining
- the procedure takes two to three hours to complete depending on complexity
- you can expect to be in hospital for two to three days







We will encourage you to get up and about as soon as possible. This reduces the risk of blood clots in your legs and helps your bowel to start working again. You will sit out in a chair shortly after the procedure and be

shown deep breathing/leg exercises. We will encourage you to start drinking and eating as soon as possible.

### Are there any after-effects?

The possible after-effects and your risk of getting them are shown below. Some are self-limiting or reversible, but others are not. We have not listed very rare after-effects (occurring in less than 1 in 250 patients) individually. The impact of these after-effects can vary a lot from patient to patient; you should ask your surgeon's advice about the risks and their impact on you as an individual:

After-effect	Risk
Pain or discomfort at the incision site	 Almost all patients
Shoulder tip pain due to irritation of your diaphragm by the carbon dioxide gas	 Almost all patients
Temporary abdominal bloating (gaseous distension)	 Almost all patients
The abnormality in the kidney may turn out not to be cancer	 Between 1 in 10 & 1 in 20 patients
Bleeding, infection, pain or hernia at the incision site requiring further treatment	 Between 1 in 10 & 1 in 50 patients
Removal of the whole kidney may be needed if partial removal is not thought to be possible	 Between 1 in 10 & 1 in 50 patients
Bleeding during or after surgery requiring transfusion, embolisation or conversion to open surgery (and sometimes loss of the entire kidney)	 Between 1 in 10 & 1 in 50 patients

Failure to remove all the tumour requiring close observation or re-operation at a later date	 Between 1 in 10 & 1 in 50 patients
Recognised (or unrecognised) injury to organs/blood vessels requiring conversion to open surgery (or deferred open surgery)	 Between 1 in 50 & 1 in 250 patients
Entry into your lung cavity requiring insertion of a temporary drainage tube	 Between 1 in 50 & 1 in 250 patients
Urinary leakage from the cut edge of the kidney requiring further treatment (e.g. putting in a ureteric stent)	 Between 1 in 50 & 1 in 250 patients
Involvement or injury to nearby local structures (blood vessels, spleen, liver, lung, pancreas & bowel) requiring more extensive surgery	 Between 1 in 50 & 1 in 250 patients
Anaesthetic or cardiovascular problems possibly requiring intensive care (including chest infection, pulmonary embolus, stroke, deep vein thrombosis, heart attack and death)	 Between 1 in 50 & 1 in 250 patients (your anaesthetist can estimate your individual risk)

## What is my risk of a hospital-acquired infection?

Your risk of getting an infection in hospital is between 4 & 6%; this includes getting *MRSA* or a *Clostridium difficile* bowel infection. This figure is higher if you are in a “high-risk” group of patients such as patients who have had:

- long-term drainage tubes (e.g. catheters);
- bladder removal;
- long hospital stays; or
- multiple hospital admissions.

## What can I expect when I get home?

- you will get some abdominal discomfort especially at the cuts which may go on for several weeks; this can be controlled by simple painkillers such as paracetamol
- you should have recovered completely after 10 to 14 days

- most people can return to work after two to four weeks
- you will be given advice about your recovery at home
- you will be given a copy of your discharge summary and a copy will also be sent to your GP
- any antibiotics or other tablets you may need will be arranged & dispensed from the hospital pharmacy
- the pathology results on your kidney will be discussed in a multi-disciplinary team (MDT) meeting
- you and your GP will be informed of the results at the earliest possible opportunity
- we normally arrange a follow-up appointment for you once the pathology results are available

## **General information about surgical procedures**

### ***Before your procedure***

Please tell a member of the medical team if you have:

- an implanted foreign body (stent, joint replacement, pacemaker, heart valve, blood vessel graft);
- a regular prescription for a blood thinning agent (e.g. warfarin, aspirin, clopidogrel, rivaroxaban, dabigatran);
- a present or previous MRSA infection; or
- a high risk of variant-CJD (e.g. if you have had a corneal transplant, a neurosurgical dural transplant or human growth hormone treatment).

### ***Questions you may wish to ask***

If you wish to learn more about what will happen, you can find a list of suggested questions called "[Having An Operation](#)" on the website of the Royal College of Surgeons of England. You may also wish to ask your surgeon for his/her personal results and experience with this procedure.

For several years, BAUS has collected data from urologists undertaking this surgery. You can view these data, by unit and by Consultant, in the [Surgical Outcomes Audit](#) section of the BAUS website.

### ***Before you go home***

We will tell you how the procedure went and you should:

- make sure you understand what has been done;
- ask the surgeon if everything went as planned;
- let the staff know if you have any discomfort;
- ask what you can (and cannot) do at home;



- make sure you know what happens next; and
- ask when you can return to normal activities.

We will give you advice about what to look out for when you get home. Your surgeon or nurse will also give you details of who to contact, and how to contact them, in the event of problems.

### ***Smoking and surgery***

Ideally, we would prefer you to stop smoking before any procedure. Smoking can worsen some urological conditions and makes complications more likely after surgery. For advice on stopping, you can:

- contact your GP;
- access your local [NHS Smoking Help Online](#); or
- ring the free NHS Smoking Helpline on **0300 123 1044**.

### ***Driving after surgery***

It is your responsibility to make sure you are fit to drive after any surgical procedure. You only need to [contact the DVLA](#) if your ability to drive is likely to be affected for more than three months. If it is, you should check with your insurance company before driving again.

## **What should I do with this information?**

Thank you for taking the trouble to read this information. Please let your urologist (or specialist nurse) know if you would like to have a copy for your own records. If you wish, the medical or nursing staff can also arrange to file a copy in your hospital notes.

## **What sources have we used to prepare this leaflet?**

This leaflet uses information from consensus panels and other evidence-based sources including:

- the [Department of Health \(England\)](#);
- the [Cochrane Collaboration](#); and
- the [National Institute for Health and Care Excellence \(NICE\)](#).

It also follows style guidelines from:

- the [Royal National Institute for Blind People \(RNIB\)](#);
- the [Information Standard](#);
- the [Patient Information Forum](#); and
- the [Plain English Campaign](#).

## **Disclaimer**

We have made every effort to give accurate information but there may still be errors or omissions in this leaflet. BAUS cannot accept responsibility for any loss from action taken (or not taken) as a result of this information.

### **PLEASE NOTE**

The staff at BAUS are not medically trained, and are unable to answer questions about the information provided in this leaflet. If you do have any questions, you should contact your urologist, specialist nurse or GP.