

*PERCUTANEOUS
NEPHROLITHOTOMY
(PCNL)
PATIENT
INFORMATION*

The information contained in this booklet is intended to assist you in understanding your proposed surgery; some of the content may or may not apply to you. Feel free to discuss any issues and questions you may have about your surgery with the medical and nursing staff looking after you. If required, your nurse will arrange for an interpreter to assist with explaining the contents of the booklet. The interpreter can also be present for doctors' consultations. Please bring this book with you to hospital as it is a useful guide.

What are the Kidneys?

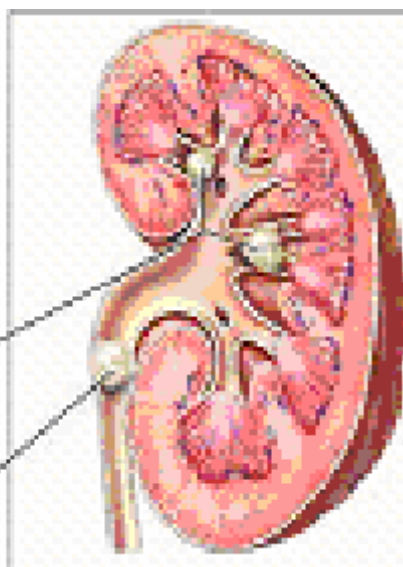
The kidneys are bean-shaped organs approximately 12cms long and are partially protected by the lower part of the rib cage. The main function of the kidneys is to produce urine. Urine travels through hollow tubes (one per kidney) called ureters to the bladder where it is stored and later passed. The kidneys also play a part in blood pressure control, the formation of red blood cells and the body's calcium balance.

What are the Kidney Stones?



**Kidney stones
in the Kidney**

**Kidney stone
in the ureter**



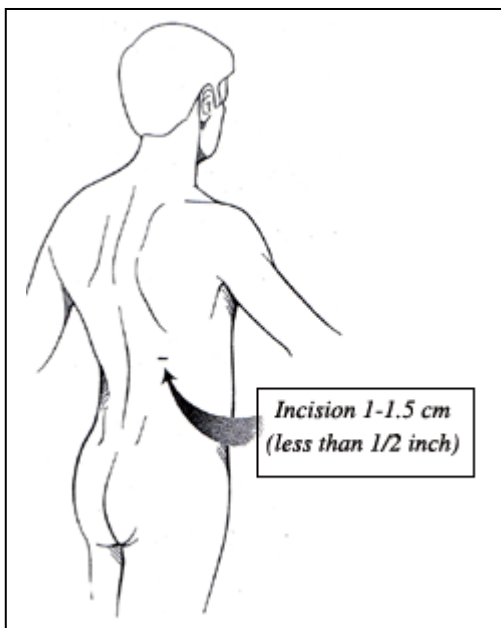
A kidney stone is a solid piece of material that forms in the kidney out of substances in the urine. A stone may stay in the kidney or break loose and travel down the urinary tract. A small stone may pass all the way out of the body without causing too much pain.

A larger stone may get stuck in a Kidney. A problem stone can block the flow of urine and cause great pain

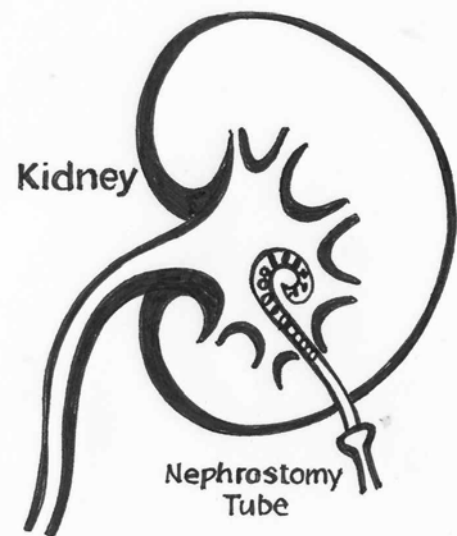
What is a PCNL?

A Percutaneous Nephrolithotomy (PCNL) is the removal of a kidney stone through a small opening in your side. An endoscope (a hollow tube with a light-enhanced telescope) is inserted into the opening to allow the surgeon to see into the kidney. Small kidney stones are removed by forceps. Larger stones and some stag horn stones are shattered by ultrasound so that they can be removed more easily.

Once the stone(s) is removed, a catheter (called a nephrostomy tube or Malecot) is inserted into the kidney. The catheter will drain urine and blood into a drainage bag and will be stitched to your skin to ensure it remains in place.



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PCNL?

A PCNL is performed to remove a kidney stone(s) that is causing problems with urine drainage resulting in pain or recurrent urinary infections. If you would like more information on kidney stone formation, please ask your nurse for a copy of the Kidney Stone Patient Information Sheet.

Potential Complications

All urological surgical procedures carry a small risk of post-operative bleeding and wound, chest and urinary tract infection. You will be monitored for these risks and treated promptly if they occur.

- **Excessive bleeding**

Your wound, drain(s) and vital signs (blood pressure and pulse) will be monitored for signs of excessive bleeding.

- **Infection**

Your chest, wound and urine will be monitored for early signs of infection and intervention will be put in place if it occurs. To reduce the risk of infection antibiotics are given directly into your bloodstream during your operation and continued post-operatively if necessary. You can also assist with the prevention of infection by maintaining good hygiene and doing your deep breathing exercises. Early mobilisation also helps.

- **Sepsis**

If you have a kidney infection before your surgery this will be treated in order to reduce the risk of developing a severe infection in your bloodstream after the procedure. The treatment may include the insertion of a nephrostomy to release any infected urine and/or pus as well as intravenous antibiotics. In some people the risk of severe infection remains high despite all these actions. If this is the case with you, your doctor will discuss this before you proceed with the surgery.

Length of Stay

The usual length of stay is two to three days. However, if you need to stay longer because of kidney infection or other medical reasons, your doctor will discuss this with you.

Before Surgery

Informed consent

After consultation with the doctor you will be asked to sign a form to give written consent for the surgeon to perform the operation and for an anaesthetic to be administered. Relevant sections of the form must also be completed if you agree to a blood transfusion and/or if your particular surgery involves the removal of a body part and you wish to have this returned. Our expectation is that you feel fully informed about all aspects of your surgery before giving written consent.

The following health professionals are available to help you with this process.

Medical staff

Your surgeon will explain the reason for the PCNL and the risks associated with the surgery. Your doctors will visit you every day while you are in hospital to provide medical care and answer questions about your surgery and progress.

Nurses

A nurse will explain what to expect before and after surgery. Please ask questions and express your concerns; your family or people close to you are welcome to be involved.

When you are discharged from hospital your nurse will arrange for you to receive ongoing support, advice and practical help, if needed.

Tests

Blood samples

Samples of your blood will go to the laboratory to check your general health before surgery.

Blood transfusions

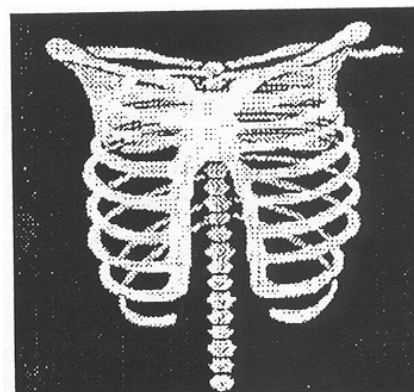
A sample of your blood will go to the blood bank to identify your blood type so this can be matched with donated blood. This donated blood is then ready for transfusion during or after surgery if required. **We will need your written consent before a transfusion is able to take place.**

Midstream urine

A sample of your urine is sent to the laboratory to check that there are no bacteria

Chest x-ray

If requested by the doctor or Anaesthetist, a chest x-ray will be performed to check on the health of your lungs.



ECG

An electrocardiogram (ECG) of your heart may be required depending on your age and any diagnosed heart conditions.

KUB x-ray

A KUB (kidneys, ureters and bladder) is a plain x-ray of your urinary system that is used to check the position of the stone prior to surgery.

Other measures

Nil by mouth

As your stomach should be empty before an anaesthetic, you must not eat anything or drink milk products six hours prior to surgery. You may, however, be able to drink clear fluids up to two hours before surgery - the Pre-Admission Clinic or ward nurse will clarify this with you.



Bowels

If required for your surgery, you will have been given an enema to use at home. This empties the lower bowel and helps to prevent constipation after your surgery.

Breathing exercises

Breathing exercises will be taught to you by your nurse or physiotherapist pre-operatively. They are important as they help to keep your lungs clear of fluid and prevent chest infection. They should be carried out regularly after surgery by supporting your abdomen with a soft pillow, taking four to five deep, slow breaths, then one deep cough.

Leg exercises

Leg exercises help keep muscle tone and promote the return of blood in your leg veins to your heart. These include pedalling the feet, bending the knees and pressing the knees down into the mattress. *Do not cross your legs - this squashes your veins causing obstruction to the blood circulation*

Anti-embolus stockings

These are special stockings that help prevent clotting of the blood in your veins while you are less mobile. The stockings are used in combination with leg exercises and are fitted by your nurse before your surgery. If you currently have leg

ulcers, please let your nurse know as the stockings may not be suitable for you.

After Surgery

You are transferred to the Recovery Room next to the theatre. Your condition is monitored and when you are awake and comfortable a nurse and an orderly will escort you back to the ward on your bed.

On the ward

Your nurse will check the following regularly:

- Vital signs - your blood pressure, pulse, respiration rate and temperature
- The severity and location of any pain or discomfort
- The amount of urine you are producing
- The wound site and wound drains
- The effectiveness of pain relief
- The amount of oxygen in your blood

You may have

Intravenous fluids

A small tube (leur) is placed into a vein in the forearm to give you fluids and medications.

Oxygen

Oxygen is often given for the first 24 hours after surgery via nasal prongs or a facemask to help with breathing and healing.

Urinary catheter

You will have a tube in the urethra that will drain the urine from your bladder. This can be secured to your leg for comfort.

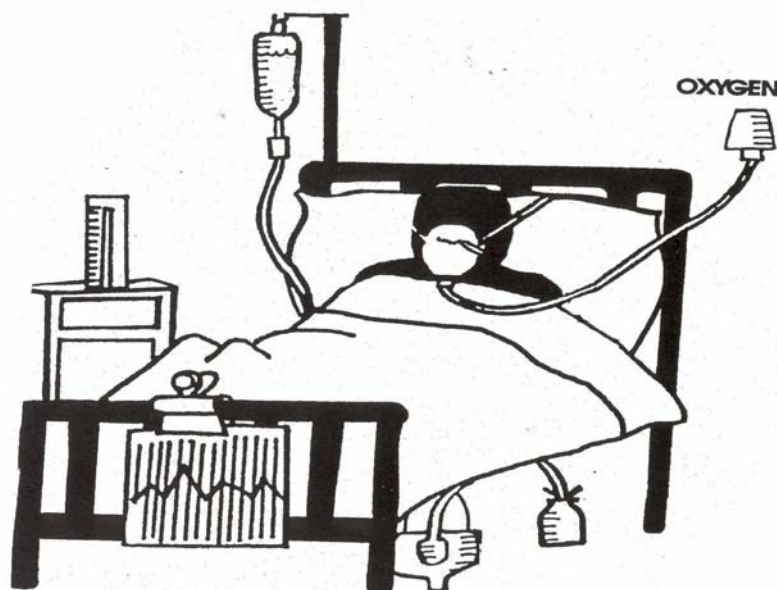
Wound drains

You may have a wound drain. This will drain blood and fluid from your operation site. Good drainage will promote healing.

Nephrostomy

A nephrostomy is a tube inserted in your side into the kidney. If your stone(s) was large it may have been necessary to make

more than one opening into your kidney. If this is the case, you may have two or more nephrostomy tubes in place.



Pain relief after your surgery

Your nurse will work alongside your doctors and the anaesthetist to keep your pain at a minimum.

The **PAIN SCORE** is a way of your nurse establishing how much pain you are experiencing by asking you to grade your pain from 0 to 10 where 0 = no pain and 10 = the worst pain you can imagine.

The following methods of pain relief may be used singly or in combination with each other.

Intravenous pain relief

Intravenous (IV) pain relief can be administered to supplement a PCA or epidural or on its own to manage pain that is not controlled by tablets or suppositories alone.

Rectal pain relief

Pain may also be controlled by the insertion of suppositories whilst you are not able to take tablets orally.

Oral pain relief

When you are able to drink, you may have tablets by mouth (orally).



Sutures

Sutures are usually removed prior to discharge.

Food and fluids

You will be able to progress from sips to a full diet in a short space of time after you have fully woken up from your anaesthetic.

Mobility

You will usually be up in a chair and assisted to walk a short distance within a day of your surgery. Your level of activity will increase as you recover.



Removal of drips and drains

Intravenous fluid

This is removed when you are drinking normally. The leuc (plastic tube) is removed when you are no longer requiring IV medications.

Nephrostomy

The nephrostomy is usually clamped the day after surgery. If there is no pain in your kidney or leakage at the entry site, the nephrostomy can then be removed. Sometimes a Nephrostogram (an x-ray study) is required before the nephrostomy is clamped, to ensure that urine is able to drain

freely to the bladder. When a nephrostomy is removed there is usually some leakage from the site that will be absorbed by a dressing. However, if this leakage is prolonged or excessive, a bag can be attached to ensure your clothes stay dry.

Urinary catheter

The urinary catheter is usually removed a day or two after surgery.

Discharge Advice

- See your GP promptly if you experience chills, fever or pain in your bladder or back, or your urine is cloudy and offensive smelling. These symptoms may be indicative of a urinary tract infection and require treatment.
- Drink two to three litres of fluid daily to help prevent the formation of new stones.
- Avoid strenuous activity, heavy lifting and straining for four to six weeks post surgery. This includes such things as contact sports, mowing lawns, gardening, vacuuming and lifting heavy washing baskets.
- Sexual activity may be resumed when you feel comfortable to do so.
- Your hospital doctor will provide your first sickness benefit certificate/medical certificate and will advise you when you are able to return to work.

Follow-up

Discharge letter

You and your GP will receive a copy of a letter outlining the treatment you received during your hospital stay. This will be posted to you if it is not completed by the time you leave hospital

GP

When you are discharged from hospital you will be under the care of your GP who will look after your general health and monitor your progress.

Outpatients appointments

You will receive an appointment for Urology Outpatients approximately six weeks after discharge. This will be posted to you.



3 References: Mosby's Genitourinary Disorders, Clinical Nursing, Mikel Gray 1992
Urological Nursing 3rd Edition, Urological Nursing' 2004
Campbell's Urology 7th Edition, Urology, 1998