

**b. Unique advice related to the particular surgery**  
If you have a nephrostomy post-operatively, try not to make sudden movements with the bag attached as this may result in pain or the tube being dislodged. The nephrostomy will be clamped for a short period of time prior to its removal. This tube is normally removed before discharge.

The catheter will be removed once the blood in your urine has cleared up. You will be informed if a JJ stent has been inserted during the operation. Some patients have a feeling of flank fullness and urgency to pass urine with an indwelling stent. However, these symptoms usually improve with time. A date for removal will be given.

The hospital stay after operation is usually three to five days depending on patients' progress after surgery.

**c. Home advice**

**i. Supervision**

You will need supervision to get out of bed and start ambulating after the surgery.

**ii. Activity**

You are allowed to shower even with a nephrostomy tube. However, the tube exit site should be patted dry after showering to reduce the risk of infection. Walking about is advised to prevent blood clot formation in your legs. Avoid driving for at least 2 weeks after surgery. Do not drive while on narcotic pain medications eg tramadol or morphine. Avoid heavy lifting and straining for 4 weeks as this may lead to blood in the urine. You can expect to return to work 1 to 2 weeks after surgery.

**iii. Diet**

You can be back on your normal diet with higher intake of fluid than usual to flush some blood clots and debris and to prevent the infection.

**iv. Complications to watch out for at home**

Please watch out for worsening pain despite being on pain medication after the surgery. Large amounts of blood clots in the urine may lead to difficulty emptying your bladder. These signs should prompt you to seek medical attention at the emergency department of our hospital.

**E. Commonly asked questions**

**a. Can multiple stones in the same kidney be treated simultaneously with PCNL?**

Yes. Multiple stones can be identified, fragmented and removed during this procedure. However, at times it may not be possible to clear all the stones due to various reasons. A second procedure may be required in such situations.

**b. How do I know if PCNL was successful?**

Following PCNL, imaging such as X-ray, ultrasound or CT scan will be done to assess if the PCNL was successful.

**c. Can stones recur after PCNL?**

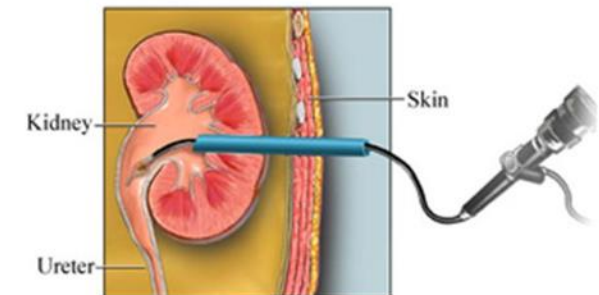
Yes. You will be kept on a surveillance programme to detect any new stone formation.

**F. Useful contact numbers**

- Urology ward (9TD) - 0379494328
- Urology daycare - 0379492981
- Minor OT (for removal of stent) - 0379492765



# PERCUTANEOUS NEPHROLITHOTOMY (PCNL)



**A. Information on the surgery**

**1. Introduction to the surgery:**

a. Percutaneous nephrolithotomy (PCNL) is a keyhole surgery performed to remove kidney stones through the skin.

**b. Indications**

PCNL is generally indicated for kidney stones more than 2 cm in diameter, staghorn calculi (stones filling up most of the kidney), or stones not responding to less invasive procedures such as extracorporeal shock wave lithotripsy (ESWL) or ureteroscopy.

### **c. How is the procedure performed?**

This procedure is commonly performed under general anesthesia. After keeping you in operative position, cleaning and covering the area, your urinary bladder will be checked and a dye study of your upper urinary tract and stone is done before puncturing the kidney.

Under image guidance, a tract will be created through the skin to reach targeted kidney. After dilatation on same tract, Nephroscope will be inserted and stones will be broken with laser or special energy device.

During the procedure, stones fragments will be extracted. After checking for bleeding, a tube may be left as drain along the operating tract and that tube can be removed after a few days.

Another internally placed tube called a stent may be placed into the ureter (JJ stent). There may be a tube from the urinary bladder into a drainage bag outside the body (continuous bladder drainage, CBD). These tubes will be removed either before or after discharge from the hospital.

### **2. Advantages of the surgery**

This surgery is less invasive than the traditional method of open surgery. It involves a small puncture which results in less pain, shorter hospital stay and recovery time, as well as faster return to daily activities of living.

### **3. Risks of surgery**

As with any surgery, there are potential risks and complications involved. The risks are blood loss, which may require blood transfusion. Rarely, embolization of the bleeding blood vessels might be indicated if the bleeding persists.

Stones may harbor infection which may manifest during or after surgery.

The risk of infection is mitigated with antibiotics administered prior to surgery. Serious infection may occur in 0.5% of patients. Injury to adjacent structures such as the liver, spleen, bowel or lung is a rare occurrence.

Other uncommon complications include injury to the ureter or kidney, at times resulting in permanent loss of the kidney. Sometimes, complete stone clearance is not achievable. This may necessitate a second procedure later.

### **4. Other options if surgery is declined**

Depending on the size and location of the stone, other methods of removal include extracorporeal shock wave lithotripsy (ESWL) or ureteroscopy. Open surgery is another method for stone extraction.

### **B. Before the surgery**

#### **1. Pre-admission clinic procedures**

##### **a. Details on your health**

Several weeks before the surgery, you will be seen in the pre-operative anesthesiology assessment clinic. Blood tests, heart pacing (electrocardiogram, ECG), X-rays and other tests which are deemed necessary for your pre-operative investigation will be performed. A discussion will be held regarding the mode of anesthesia. Depending on your other medical conditions, visits to other doctors such as the cardiologist, respiratory physician or endocrinologist may be needed to assess your fitness and optimize you for surgery.

##### **b. Medications**

If you are on blood thinners, instructions will be given on when to withhold or adjust your medication.

#### **2. Preparing for admission**

##### **a. Advice prior to admission**

Please arrange leave from work before your surgery. You may need help to care for your dependents during your hospital stay.

##### **b. Medications, fasting etc**

Please follow your doctor's advice regarding when to withhold your blood thinners before the operation. Failure to do so may result in the operation being postponed to another date.

Fasting should commence at least 6 hours before your surgery. You may be advised to withhold other medications such as your diabetes and high blood pressure medicines while you are fasting. Please let us know of any known allergies towards medications.

### **3. Arrival to UMMC**

You will need to be admitted one day before the surgery. However, you may be advised to be admitted earlier depending on your medical conditions. The registration counter is located on the 1st floor of Menara Selatan. From there, you will be brought up to the ward.

Pre-operative investigations will be carried out upon admission and this may include blood taking, urine sampling, ECG and X-ray. You will be seen by the urology and anesthesiology teams. You may be asked to purchase equipment necessary for the surgery, eg laser.

### **C. Operation**

Anesthesia: refer anesthesia leaflet

### **D. After the operation**

#### **a. Template for post-op care after anesthesia.**

You will be observed in the recovery area of the operating theater after the surgery. Following this, you will be transferred back to the ward. Once the effects of anesthesia have worn off and you are alert, you may start taking fluids followed by your usual diet.

You will be given regular pain medication as there may be pain around the incision site. You may notice some blood in your urine, however, this will clear up with time.

It is important that you get out of bed and begin walking under supervision after your surgery to prevent blood clots from forming in your legs. You will be informed when your regular medications can be restarted.