

Shock Wave Lithotripsy

Prior to Surgery

Surgery Scheduling

You will be contacted in the near future by one of the department's surgery schedulers with the date of the procedure. An appointment will also be made for you at the Preoperative Medicine Clinic (PMC). Shortly thereafter you will receive by mail an informational packet with instructions on where to go for your PMC visit and surgery. Three days prior to surgery you will be contacted by one of OHSU's OR schedulers with the final surgery time and when to check in the morning of surgery.

Preoperative Testing

During your PMC visit the items listed below will be ordered as deemed necessary based upon your age and medical history. You will have an opportunity to speak with the anesthesia staff regarding the types of anesthesia available and their relative risks and benefits.

- EKG (electrocardiogram)
- CBC (complete blood count)
- PT / PTT (blood coagulation profile)
- Comprehensive Metabolic Panel (blood chemistry profile)
- Urinalysis

Medications to Discontinue

Unfortunately it is not safe to perform shock wave lithotripsy (breaking up a kidney stone with ultrasonic waves) while taking anti-coagulation (blood thinning) medications. A list of medications that decrease your body's ability to clot are listed below. ***All blood thinning medications need to be discontinued at least 5 days prior to surgery to prevent serious bleeding from the kidney and/or nearby organs following the procedure.***

Do not stop any of these medications without contacting your prescribing doctor for approval. If your prescribing doctor does not feel it is safe for you to discontinue one of these medications please contact the urology office to let us know. We will discuss with you alternative treatment options such as ureteroscopic lithotripsy, which can be performed while taking blood thinning medications.

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|-------------------------------------|------------------------|
| - Vitamin E | - Celecoxi (Celebrex) |
| - Aspirin | - Rofecoxib (Vioxx) |
| - Aspirin / dipyridamole (Aggrenox) | - Clopidogrel (Plavix) |
| - Ibuprofen (Advil, Motrin) | - Ticlopidine (Ticlid) |
| - Naproxen (Aleve) | - Warfarin (Coumadin) |
| - Diclofenac (Voltaren) | - Enoxaparin (Lovenox) |

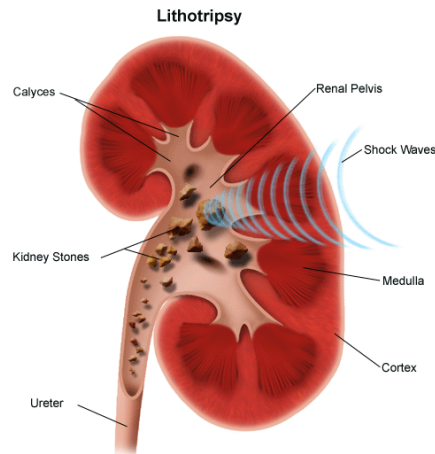
Diet Day Before Surgery

You may eat a regular diet until midnight the night before surgery. After midnight please do not eat or drink anything. If instructed to do so, you may take your prescription medications with a sip of water.

Surgery

Procedure Description

Once asleep the shock wave machine will be brought into contact with the skin overlying the stone. With the use of x-rays the stone will be located, allowing the shock waves to be focused on the stone. A series of ultrasonic shock waves are generated, which travel out of the machine, through the skin and strike the stone causing it to break up into pieces. The number of shock waves needed to treat the stone depends upon the size and hardness of the stone. Each machine has a maximum number of shocks that can be safely administered.



If the stone being treated is very large a ureteral stent (piece of surgical plastic that goes from the kidney to the bladder through the ureter) will be placed at the beginning of the procedure once you are asleep. This is done by passing a small instrument through the urethra (water channel) into the bladder. The stent prevents the ureter from becoming occluded by stone fragments following surgery. The stent typically stays in one to two weeks depending upon the size of the stone that was treated.



Potential Risks and Complications

Although uncommon, complications may occur following shock wave lithotripsy. Potential risks include, but are not limited to the following:

Ureteral Obstruction and Residual Stones

The goal of the procedure is to turn the stone into small pieces that drain out of the kidney on their own. However, it is not possible to precisely control the size of the stone fragments. As a result, a piece of stone may become lodged in the ureter temporarily blocking it resulting in kidney pain. This is usually temporary and responds to hydration and pain control. In a rare number of instances (<5%) a separate procedure will be required to remove the pieces. It is also possible that some of the stone fragments remain in the kidney, which over time may grow in size necessitating future treatment. The larger the stone being treated the more likely both are to occur.

Urinary Tract Infection

Developing a urinary tract infection following the procedure is uncommon. Serious infections requiring hospitalization occur less than 1% of the time. Patients with large stones who have had recurrent infections in the past are at increased risk of infection.

Following Surgery

Postoperative Symptoms

The vast majority of patients do well after the procedure and are able to go home the same day. The following symptoms can be expected.

Pain

Most patients experience mild to moderate pain in the kidney following surgery. This is generally well controlled with oral narcotic pain medication. If not provided prior to surgery, you will be sent home with a prescription for either Percocet or Vicodin. These medications can impair judgment and reaction time. As a result, ***you must not drive or operate dangerous equipment while on these medications***. You should transition to Acetaminophen (Tylenol) and/or Ibuprofen within a day or two of surgery if possible.

Bruising

You may notice a small bruise involving the skin overlying the stone. This occurs where the shock wave machine contacts the skin during the procedure.

Hematuria

Hematuria (blood in the urine) is common following the procedure. The amount of blood in the urine is typically heaviest over the first one to two days. Significant bleeding (passing blood clots) is rare.

Stent Related Symptoms

If a ureteral stent is placed at the beginning of surgery, you can expect to experience some symptoms related to the stent. It is common to feel like you have to urinate more frequently and urgently due to the stent irritating the bladder. You may also feel a dull ache in your kidney when you urinate due to urine backing up the stent into the kidney. Lastly, you may also experience some discomfort in the urethra or tip of the penis at the end of urination. These symptoms are usually mild and can be controlled with oral medications. A small number of patients will have severe symptoms related entirely to the stent, which resolve following removal.

Constipation

Narcotic pain medications such as Percocet and Vicodin cause constipation. Over the counter stool softeners such as Colace and Senna are invaluable while taking narcotic pain medications. Laxatives such as Miralax may also be used if you have not had a bowel movement in several days. Drinking plenty of fluids and transitioning to over the counter pain medications will help minimize constipation.

Postoperative Instructions

Showering and Baths

You may shower and bath following surgery.

Activity

- Driving: you may begin driving once you are off narcotic pain medications.
- Lifting / Exercise: There are no lifting or exercise restrictions. However, if you notice an increase in your pain, urinary symptoms, or blood in the urine following an activity, then it is best to limit this activity until your symptoms resolve.
- Intercourse: You may resume intercourse as tolerated but it is best to wait at least 48 hours after the procedure.

Diet

Most patients only desire clear liquids for the first 24 hours following shock wave lithotripsy, as your intestinal function may be sluggish due to the effects of surgery and general anesthesia. However, there are no dietary restrictions. You may resume a regular diet as tolerated.

Returning to Work

Most patients go back to work a couple of days after the procedure. Occasionally patients may need to take more time off. Our office can provide you with documentation as needed.

Postoperative Appointment

Please call the clinic the day after surgery to arrange a postoperative visit (503-346-1500). The timing of that visit will be told to you prior to discharge and will be included in your discharge paperwork.

Stent Removal

If you are sent home with a ureteral stent, it must be removed. Failure to remove the stent will result in stone formation on the sent with eventual obstruction and infection, which over time can damage the kidney and make removal very difficult.

Preparation

Unless you have abnormal kidney function or an allergy to Ibuprofen, ***please take 600 mg of Ibuprofen 1 hour before stent removal.*** Ibuprofen helps prevent ureteral spasms after stent removal. Nevertheless, it is not uncommon to have some pain in the kidney following stent removal. This is usually mild and lasts only a few hours. If you develop pain that is not controlled with oral medications or a fever greater than 101.5 degrees then please contact the clinic or go to the emergency department.

Technique

A small scope (cystoscope) will be inserted through the urethra into the bladder. The stent will be grasped with a small instrument and removed. The procedure usually takes about a minute and is very well tolerated. You may drive home following the procedure.

Things to Watch For After Surgery

Although uncommon, there are a number of things to watch out for after discharge. These include...

- Pain that is not controlled by oral pain medications
- Severe nausea with the inability to keep any fluids or medications down
- Fever greater than 101.5 degrees Fahrenheit

If you develop any of these conditions during normal business hours (Monday through Friday from 8 am to 5 pm) please call the clinic (503-346-1500) to speak with one of the nurses. If after hours, then go to the OHSU emergency department if you live locally or the nearest ER if you live further away.