KIDNEY STONES

What is a kidney stone?
A kidney stone is a solid piece of material that forms in a kidney when there are high levels of certain substances in the urine. These substances are normally found in the urine and do not cause problems at lower levels.

- Kidney stone

A stone may stay in the kidney or travel down the urinary tract. Kidney stones vary in size. Stones in the kidneys are typically not painful and may pass at any time. They can also grow bigger over time if not treated.

- Ureteral stone

When a kidney stone tries to pass, it moves down a small tube call the ureter. The ureter carries urine from the kidney to the bladder. When a kidney stone moves into the ureter it is called a ureteral stone. No matter what size, these stones can cause pain in the back, flank, bladder, testicles or with urination. They can also cause nausea and vomiting. Some stones are able to pass on their own with good hydration and a drug called Rapaflo/Tamsulosin/Flomax that helps dilate the ureter. However, sometimes these stones get stuck in the ureter which may back up the flow of urine from the kidney. This is not healthy for the kidney and if the ureteral stone does not pass over a certain period of time, surgical intervention is indicated.
Additionally if a stone, no matter the size, causes severe and uncontrolled pain or nausea/vomiting, it should be removed, as well.

What are typical symptoms of ureteral stone (kidney stone passing)?
Pain in the back or flank which is usually on one side, but can be on both sides. Other symptoms are visible blood in the urine, nausea, vomiting, testicular pain or pain with urination. Pain can be severe, but not all patients experience that level of pain.

What kind of imaging is used to determine if I have a stone?
- CT scans: Detailed imaging of the abdomen and pelvis. Most often used in the ER or if it appears you may be passing a stone.

- X-rays (KUB): A simple picture of your kidneys, ureter and bladder. It is used to look for stones in the kidneys mainly. It is helpful in determining if you are still making stones. A KUB is not always helpful if you are passing a stone because of possible bone and bowel obstructing the view.
- Renal ultrasound: This is a picture of the kidney and ureters. It is mainly used in older patients, patients that have previous imaging recently and for pregnant women. There is no radiation.

What about special cases?
If pregnant, the hormones released in pregnancy can oftentimes aid in passing a stone.
A renal ultrasound is the only safe imaging. A patient will only have the option of a ureteroscopy or a stent placement to help pass a stone. Shockwaves are contraindicated.
Shock waves are sometimes not a viable intervention for obese patients.

What are some treatments for a kidney stone or ureteral stone?
The treatment for kidney stones usually depends on their size, location in the urinary tract and what they are made of. Oftentimes, if a stone is greater than 5mm, it is less likely that it will pass without surgical intervention and you may need pain medicine. You should also drink lots of fluids. You should strain your urine and take Flomax (tamsulosin) if given. If you have a large kidney stone, your pain is not controlled by pain medications or your urinary tract is blocked, the stone can be removed by breaking it into small pieces with shock wave lithotripsy, ureteroscopy, or percutaneous nephrolithotomy. Usually we allow a patient 4-6 weeks to try to pass a ureteral stone as long as it doesn't severely obstruct the kidney and pain is well controlled. After that point, surgical intervention is indicated. If you try to pass the stone and no fragment is visualized, then repeat imaging is needed to determine if the stone has passed.

● Shock wave lithotripsy (ESWL). An ESWL is performed under general anesthesia at an outpatient surgical center. No incision is made. A shock wave machine is used to crush the kidney stone. The shock waves go from the machine into your body. The smaller pieces of the stone then pass through your urinary tract. If you have stones in both kidneys, you can only have shock wave lithotripsy on one side at a time. This procedure is best used for soft stones in the kidney or in the ureter near the kidney. It is not harmful to the kidneys as only a few attempts (shocks) can be given during a procedure. It is not appropriate for pregnant women or severely obese patients. It is important that you discontinue any blood thinners, including aspirin, at least 7 days before this procedure.

Pre Procedure
1. Pick up your prescriptions: Flomax (tamsulosin), strainer, antibiotic, pain medication, nausea medication.
2. Stop all blood thinners (including aspirin) 7 days before the procedure.
3. Discuss your medications, medical history and allergies with your provider.
4. Confirm the date and time of your procedure with the surgery center.
5. Secure a driver to and from the procedure.
6. We may ask that you have an x-ray performed shortly before the procedure.

Post Procedure/Recovery
Immediately after the procedure, we will speak with whoever is with you to discuss how the procedure went and discuss any follow-up or special instructions.

1. Complete the course of the antibiotics if prescribed. Continue Flomax (tamsulosin). Use all other medications as needed

2. Push water.

3. Expect some discomfort as fragments pass. Blood in the urine for up to 1 week is common.

4. You can likely go back to work the day after the procedure. You may have discomfort or bruising at the site where the shockwave was directed. You may have some discomfort with urination.

5. You do not need to restrict any activity.

Follow-up

1. You will be called the day after the procedure to address any questions or concerns.
2. We will ask you to schedule a follow-up appointment which may include an x-ray.

● Ureteroscopy with or without stent placement is performed under general anesthesia and most often at an outpatient surgical center. No incision is made. A long, tube-like tool with an eyepiece, called a ureteroscope, is used to find the stone. The scope is fed into the urethra, through the bladder and into the ureter. Once the stone is found, it can be removed or can be broken into smaller pieces with a laser. Sometimes a stent will be placed in the ureter to keep the ureter open while fragments pass after the surgery. This procedure is performed for ureteral stones, small stones or obstructing stones. It can also be used for stones in the kidney.

Pre Procedure

1. Pick up your prescriptions: Flomax/Rapaflo/Tamsulosin, strainer, antibiotic, pain medication, nausea medication.
2. Stop all blood thinners (including aspirin) 7 days before the procedure if possible
3. Discuss your medications, medical history and allergies with your provider.
4. Confirm the date and time of your procedure with the surgery center.
5. Secure a driver to and from the procedure.

Post Procedure/Recovery

Immediately after the procedure, we will speak with whoever is with you to discuss how the procedure went and discuss any follow-up and any special post procedure instructions.

1. You will be called the day after the procedure to address any concerns or questions.
2. Hydrate well. Take Flomax or Rapaflo. Finish your antibiotic. Use any other medications as needed.
3. We will ask you to schedule a follow-up appointment. If a stent was placed, it would be removed in the office in 3-7 days depending on how big the stone was. A stent can temporarily cause irritative voiding symptoms and discomfort. Blood in the urine is common.
3. Before you come in to have the stent removed, we ask you to take one prescription Motrin.

● Percutaneous nephrolithotomy. This procedure is performed for very large stones in the kidney. It is performed under general anesthesia. A small incision is made and a wire-thin viewing tool, called a nephroscope is inserted, to locate and remove the stone. The tool is fed

directly into the kidney through a small cut made in your back. For larger stones, shock waves may also be used to break the stone into smaller pieces.

PRE-SURGERY

You will hear from our office shortly after it is decided to proceed with the surgery. Our surgery scheduler will notify you of the date, time and location of the surgery. The surgery center will usually contact you 24 hours before the surgery to go over instructions and get a thorough medical history. Also, the surgery center will go over insurance coverage of your surgery, but it is also recommended you discuss the potential costs with your insurance company directly if you are insured. Below are specific instructions previous to surgery:

1. Pick up prescriptions.
2. Discontinue any blood thinners, including aspirin, approximately 7 days before the surgery.
3. Disclose all medical and surgical history to Midtown Urology and the surgery center, including any medications or supplements that you take.
4. Secure a driver to and from the procedure.
5. If cardiac clearance has been requested, we ask that this is done as soon as possible as our office must be notified of the results before surgery.
6. If any blood work has been ordered, we ask that this is done as soon as possible as our office must be notified of the results before surgery.

Please fill all prescriptions that we give you and read the instructions on the bottle. These prescriptions will have been given to you at your preoperative appointment or when we call prior to your procedure.

Please note: Any narcotic medication (Tylenol with Codeine, Hydrocodone, Vicodin, Norco, Oxycodone, and Percocet) can cause constipation. It is recommended to get over the counter Miralax and a stool softener to help prevent constipation if you choose to use these Medications.

You must notify your provider if you are taking any **SGLT2 inhibitors** such as

- Brenzavvy (bexaglifloxin)
- Inovokana (canaglifozin)
- Farziga (dapagliflozin)
- Jardiance (empagliflozin)
- Steglatro (ertugliflozin)

OR any **GLP-1 receptor agonists** such as

-Ozempic (semaglutide subcutaneous)
-Trulicity (dulaglutide)
-Bytetta (exenatide)
-Bydureon Bcise
-Victoza (liraglutide)
-Adlyxin (lixisenatide)

If you take any **blood thinners** on the following list, this will need to be discussed with your provider. Do not stop these medications on your own. According to the schedule below, unless otherwise noted by your cardiologist or Dr. Trotter/Dr. McClintock.

o Plavix (Clopidrogel)
o Pradaxa (Dabigatran)
o Xarelto (Rivaroxaban)
o Elquis (Aphixaban)
o Effient (Prasugel)
o Brillinta (Ticagrelor)
o Aspirin or Baby Aspirin
o Fish Oil
o Meloxicam

What are the risks involved in surgical options?

-Excessive bleeding
-Urinary retention
-Pain or discomfort
-Infection
-Inability to break up the stone, resulting in additional surgeries
-Inability to access the stone due to abnormal anatomy, thus delaying surgical intervention
-If indicated, you may be admitted to the hospital for 24 hours

What are the risks involved in waiting and watching for the stone to pass?

We will allow a patient to attempt to pass a stone for up to 4-6 weeks if the kidney isn't compromised on initial imaging, pain is controlled, no fever is present and the size of the stone is considered passable.

When should I call the office after a surgical procedure?

-Excessive bleeding
-Inability to urinate
-Symptoms of a urinary tract infection
-Fever of 101
-Severe pain
-Vomiting that does not subside

What is the risk of not passing a stone?

If you do not pass a stone that is in the ureter it may cause an obstruction to your kidney which could prevent urine from passing. This could result in kidney dysfunction if not removed within a certain period of time. Most of the time, we allow a patient 4-6 weeks from the onset of a kidney stone passing into the ureter, as long as it doesn't obstruct the kidney, pain is well controlled and there are no indications of infection.

How do I keep from getting stones in the future?
In the future, we will assess your risk factors in making stones in the future and discuss methods of prevention.