

**Percutaneous Nephrolithotomy (PCNL)**

**Enhanced Recovery After Surgery (ERAS)**

Your Guide to Healing



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Patient Name

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Surgery Date/Time to Arrive

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Surgeon

We want to thank you for choosing UVA Health for your surgery. Your care and well-being are important to us. We are committed to providing you with the best possible care using the latest technology.

This handbook should be used as a guide to help you through your recovery and answer questions that you may have. Please give us any feedback that you think would make your experience even better.

Please bring this handbook with you to:

- Every office visit
- Your admission to the hospital
- Follow up visits

# Your Care Team

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In addition to the nursing staff, the Urology Team will care for you. This team is led by your surgeon, and includes a chief resident along with residents and 1-2 medical students. There will always be a physician in the hospital 24 hours a day to tend to your needs.



Dr. Noah Schenkman



Dr. Haerin Beller



Patience Oteng, NP

# Contact Information

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The main hospital address:

UVA Health  
1215 Lee Street  
Charlottesville VA 22908

Contact	Phone Number
Urology Clinic at Fontaine	434.924.2224
Fontaine Clinic Fax	434.297.6555
OPSC: If no call received with a surgery time 3 days before surgery	434.982.6100
Interventional Radiology:	434.924.9401
Main OR: If no call received with a surgery time by 4:30pm the day before surgery	434.982.0160
Pre-anesthesia Evaluation and Testing Center (PETC)	434.924.5035
Hospital Inpatient Unit: 6E	434.924.2485
Hospital Inpatient Unit: Extended Stay	434.924.5386
UVA Main Hospital	434.924.0000 (ask for the Urology resident on call)
UVA Main Hospital (toll free)	800.251.3627
Lodging Arrangements/ Hospitality House	434.924.1299/ 434.924.2091
Parking Assistance	434.924.1122
Interpreter Services	434.982.1794
Hospital Billing Questions	800.523.4398
Provider Billing Questions	800.868.6600
Medical Record Requests	434.924.5136

For more information on ERAS, helpful links for getting ready for surgery, and to view this handbook online, visit:

[www.uvaeras.weebly.com](http://www.uvaeras.weebly.com)

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# Enhanced Recovery After Surgery (ERAS)

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## What is Enhanced Recovery?

Enhanced recovery is a new way of improving the experience of patients who need major surgery. It helps patients recover sooner so life can return to normal as quickly as possible. The ERAS program focuses on making sure that patients are actively involved in their recovery.



There are four main stages:

1. **Planning and preparing before surgery**– giving you plenty of information so you feel ready.
2. **Reducing the physical stress of the operation** – allowing you to drink up to 2 hours before your surgery.
3. **A pain relief plan** that focuses on giving you the right medicine you need to keep you comfortable during and after surgery.
4. **Early feeding and moving around after surgery** – allowing you to eat, drink and walk around as soon as you can.

It is important that you know what to expect before, during and after your surgery. Your care team will work closely with you to plan your care and treatment. You are the most important part of the care team.

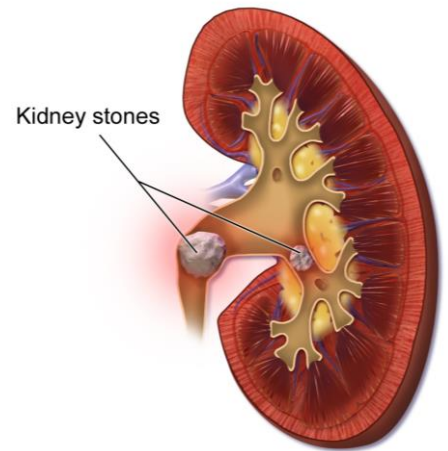
It is important for you to participate in your recovery and to follow our advice. By working together, you will be prepared to be discharged the same day of your surgery.

# Introduction to Kidney Stones

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## What are kidney stones?

Kidney stones form when substances in the urine start to form crystals. When the crystals grow, they become kidney stones. Kidney stones can remain in the kidney or pass into the ureter (tube) to the bladder then out the urethra (pee tube). If the stone causes blockage in the kidney or ureter, this can cause pain.



## What symptoms are associated with stones?

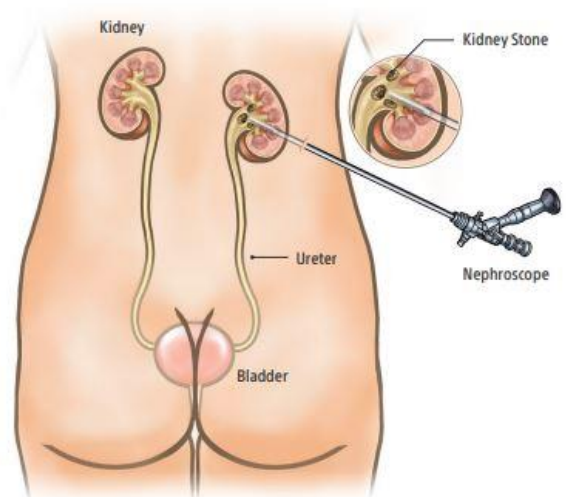
Some patients may not have symptoms. However, when stones block the urine flow between the kidney and bladder, it can cause pain. Pain is often felt along the sides between the ribs and hip and lower abdomen or groin. Other common symptoms are blood in urine, feeling of intense need to pass urine, nausea, and vomiting.

## How are stones diagnosed?

Image testing is done to confirm stones, the number of them, location, and size of stones. An abdominal x-ray and/or kidney ultrasound or non-contrast CT of the abdomen are most commonly used.

## Treatment

Given the size of your stones and location of your stones, we recommend **percutaneous nephrolithotomy (PCNL)**. It is a procedure used for patients with stones > 1.5 cm. A small cut is made in your back for direct access to the kidney. From there the stone can be broken apart and removed. It has the highest success rates for stone removal. Complications may include: pain or discomfort in the lower abdomen and back, bleeding/blood in the urine, injury to the kidney or any of the surrounding structures.



[www.mykidneystone.com](http://www.mykidneystone.com)



# Before Your Surgery

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## Clinic

During your clinic visit we will check to see if you need surgery and what type you will need. You will work with our entire team to prepare for surgery:

- The surgeons, who may have fellows, residents, or medical students working with them
- Nurse practitioner (NP)
- Nurse coordinators
- Clinic nurses
- Administrative assistants

## During your clinic visit, we may:

- Ask questions about your medical history
- Perform a physical exam
- Ask you to sign the surgical consent forms

## You will also receive:

- Instructions on preparing for surgery
- Special instructions for what to do before surgery (if you are on any blood thinners)
- Special antibacterial soap to shower with on the night before and morning of surgery
- Prescriptions for bowel cleansing, if needed





## Anesthesia Perioperative Medicine Clinic

The Anesthesia Perioperative Medicine Clinic will review your medical and surgical history to determine if you will need an evaluation prior to surgery.

If an in person anesthesia evaluation is needed, the Anesthesia Perioperative Medicine Clinic will notify you.

- An appointment will be scheduled for an office visit a few weeks prior to the surgical date.
- Your medications will be reviewed.
- You may have a blood test, test of the heart (EKG), and/or other tests the surgeon or anesthesiologist requests.
- For questions, or if unable to keep the appointment with Anesthesia Perioperative Medicine Clinic, please call 434-924-5035. Failure to keep this visit with Anesthesia Perioperative Medicine Clinic before surgery may result in cancellation of surgery.



There may be times that you are instructed to go to the Anesthesia Perioperative Medicine Clinic after your appointment with your surgeon. If this is the case you are welcome to a same day appointment but please allow for up to 2 hours.

**Please note:** If you were told by your surgical team that you did not need any testing or evaluation prior to surgery but receive a call to schedule with the Anesthesia Perioperative Medicine Clinic, this is because the anesthesia team feels it is in your best interest when they review your history.



Do you take anticoagulant/ antiplatelet (blood thinner) medications **like**

**Coumadin (warfarin), Plavix (clopidogrel), Pletal (cilostazol), Xarelto (rivaroxaban), Eliquis (apixaban), Lovenox (enoxaparin), or others?**

If so, be sure to tell your prescribing doctor and let them know you **will** be having surgery and need to stop these medications if you can.

It is the prescribing provider's responsibility to provide instructions for how long you can safely be off this medication.

We are giving you instructions on \_\_\_\_\_.

Last dose of blood thinning medication **before surgery** should be on \_\_\_\_\_.

We are recommending a bridge of this medication. Please refer to your After Visit Summary .

# Preparing for Surgery

You should expect to be in the hospital for about **1 day**. When you leave the hospital after your surgery, you will need some help from family or friends. It will be important to have help with meals, taking medications, etc.



You can do a few simple things before you come into the hospital to make things easier for you when you get home:

- ☑ Arrange for someone to get your mail and take care of pets and loved-ones, if necessary.
- ☑ Put the things you use often between waist and shoulder height to avoid having to bend down or stretch too much to reach them.
- ☑ Bring the things you are going to use often during the day downstairs but remember that you **WILL** be able to climb stairs after surgery.
- ☑ Buy the foods you like and other things you will need since shopping may be hard when you first go home.
- ☑ We recommend you have the following non-prescription medications at home before your surgery:
  - Tylenol (acetaminophen) 325mg tablets (for pain)
  - Advil/Motrin (ibuprofen) 200mg tablets (for pain)
  - Miralax powder or Senna and Probiotics (for constipation)
- ☑ **STOP taking any herbal supplements or drinks 2 weeks before your surgery. A standard daily multivitamin can be continued.**

*If you are taking additional medications for chronic pain, please continue those up until your surgery unless discussed with your physician.*

## REMEMBER:

- Eat healthy food before your surgery – this helps you to recover faster
- Stop or cut back your smoking with the assistance of your primary care physician before surgery
- Follow the orders you were given regarding blood thinners and diabetes medications

## Pre-Surgery Checklist

### What you SHOULD bring to the hospital:

- This handbook
- A **list** of your current medications. Please leave your medications at home. They will be provided for you once you are in the hospital.
- Any paperwork given to you by your surgeon
- A copy of your Advance Directive form, if you completed one
- Your “blood” bracelet, if given one
- A book or something to do while you wait
- A change of comfortable clothes for discharge
- Any toiletries that you may need
- Your CPAP or BiPAP, if you have one**



### What you SHOULD NOT bring to the hospital:

- Large sums of money
- Valuables such as jewelry or non-medical electronic equipment

\*Please know that any belongings you bring will go to “safe keeping.”

### For your safety, you should plan to:

- Have a responsible adult with you to hear your discharge instructions and drive you home. If you plan to take public transportation, a responsible adult should travel with you.
- If possible, identify someone to stay with you the first week after discharge to help take care of you.

# Day Before Surgery

## Scheduled Surgery Time

A nurse will call you **the day before your surgery** to tell you what time to arrive at the hospital for your surgery. If your surgery is on a Monday, you will be called the Friday before.



If you do not receive a call by 4:30 pm, please call 434.982.0160.

## Remember:

- Remove nail polish, makeup, jewelry and all piercings.
- Do not eat solid foods after midnight before your surgery
- Be sure to have a 20-ounce Gatorade™ ready and available for the morning of surgery. If you are diabetic, you may drink Gatorade™ G2.
- After midnight, you CAN still have water or Gatorade up to 2 hours before you arrive at your surgery location. Finish drinking at the time instructed by the phone call nurse.
- Do NOT drink any other liquids. If you do, we may have to cancel the surgery.



Write any special instructions here:

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# Day of Surgery

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## Before You Leave Home

- ☑ You CAN still have water or Gatorade the morning of surgery. Finish drinking at the time instructed by the phone call nurse.

## Hospital Arrival

- ☑ Arrive at the hospital on the morning of surgery at the time you wrote on page 1 (this will be approximately **2 hours before surgery**).
- ☑ Check in at your scheduled time in the OR/Procedure Check In on the second floor of the Main Hospital



## Surgery

When it is time for your surgery, you will be brought to the pre-op area. There you will be checked in for surgery and meet your anesthesia and surgery teams.

## In the Operating Room

You will then be taken to the operating room (OR). Many patients do not recall being in the OR because of the medication we give you to relax and manage your pain.

During your surgery, the OR nurse will call your family approximately every 2 hours to update them, when possible.



# After Surgery

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## Recovery Room (PACU)

After surgery, you may be taken to the recovery room (PACU). Patients can remain in the recovery room for about 2-4 hours.

- ☑ You may have blood work drawn
- ☑ You may also get an X-ray of your chest. This helps to evaluate if there is any injury to the lung as the kidney is close to the lung.
- ☑ You will have a catheter in your bladder and possibly tubes coming out of your back to drain your kidney. Your nurse will help empty these a few times per day while you are in the hospital.



Once you are awake:

- ☑ You will get out of bed (with help) to start moving as soon as possible. This speeds up your recovery and decreases the chances you will get blood clots and pneumonia.

The surgeon will also call your family after surgery to give them an update.



## Hospital Inpatient Unit:

Once to your room, you:

- ☑ Will be able to have clear liquids. Medicines required for the surgery make some people nauseous. If you are not having nausea, you will be able to have solid food.
- ☑ Will be given an incentive spirometer (breathing exerciser). We will ask you to use it 10 times an hour to keep your lungs open and help prevent pneumonia.
- ☑ Will get up and out of bed on the day of your surgery, with help from the nurse.

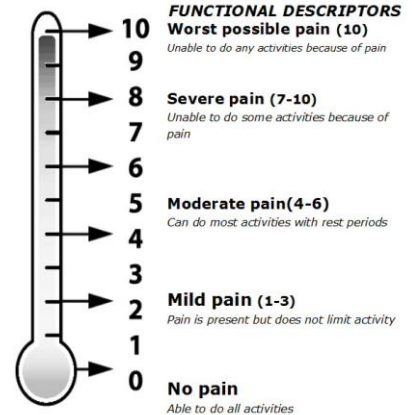


## Pain control following surgery

Managing your pain is an important part of your recovery. It is normal for you to have some pain for a few days after surgery. The goal is to lower the pain so that you can comfortably walk and take deep breaths effectively. We will ask you regularly about your level of comfort.

We will use many different types of pain medications during your recovery. The goal is to use as little *opioid* medication as possible to control your pain. If you need stronger pain medication, it is OK. If your pain is worsening and it is not relieved with any medication, you should let your surgeon know.

### **UVA ADULT PAIN SCALE TO HELP YOU CONTROL YOUR PAIN**



If you are on long-standing pain medication prior to surgery, you will be provided with an individualized regimen for pain control with the assistance of our pain specialists.

## First Day After Surgery



You will:

- Be asked to get out of bed with help, walk the hallways multiple times
- Be encouraged to drink clear fluids, try solid food
- Have your IV turned off but not removed
- Have your catheter removed

You may be able to go home if you:

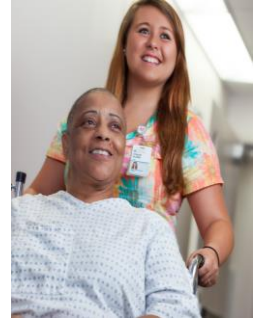
- Are off all IV fluids and drinking enough to stay hydrated
- Your pain is well controlled
- Are not nauseated or belching (burping)
- Do not have a fever
- Are able to get around on your own

Remember, we will not discharge you from the hospital until we are sure you are ready. For some patients this requires an additional day in the hospital.

## **Discharge**

Before you are discharged, you will be given:

- A copy of your discharge instructions.
- A list of any medications you may need.
- Instructions on when to return to see your surgeon in clinic (usually in 4-6 weeks), depending on your surgery. We may see you sooner if you have surgical wound or drain.



## **Before You Leave the Hospital**

We want to make sure you are prepared as you transition from the hospital to home. We will:

- Ask you to identify how you will get home and who will stay with you.
- Help you collect any belongings that were stored in “safe keeping.”
- Teach you how to change your dressing for your wound.
- Teach you how to measure, empty, and clean your drainage tubes (if you go home with any).

Our Case Managers help with discharge needs. Please let us know the names, locations, and phone numbers of:

- Your home pharmacy:

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- Your home healthcare agency (if you have one):

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- Any special needs after your hospital stay:

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# Complications Delaying Discharge

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Sometimes there are things that may happen after surgery which may keep you in the hospital longer. We do our best to prevent these from happening. These may include:

**Post-Operative Nausea & Vomiting** - After your surgery, you may feel sick to your stomach. This is common and we give you medication to help you feel better. The best way to avoid this from happening is to decrease the amount of opioid pain medications you take, get up to walk as much as possible after your surgery, and eat small amounts of food and drinks. As long as you can drink and keep yourself hydrated, the stomach upset will likely pass.

**Fever** – After your surgery, we monitor you closely. Fevers can be a sign of infection. Kidney stones can harbor bacteria and sometimes removing the stones can give you an infection. If we are concerned about infection, you may need to stay longer to receive more antibiotics.

**Bleeding** –We monitor you closely to watch for any signs of bleeding.

**Kidney injury** –We need to make a hole in the kidney to remove the stones. We monitor your kidney function with blood work on the day of surgery and after surgery. Often this is a short-term change in your kidney function.

**Lung injury** – The kidney is located near the lung. Sometimes the hole we make in your back during surgery is close to the lung and causes air and fluid from surgery to get between the lung and the lining (pleura). If we are concerned for this then we get an X-ray of your chest, often in the recovery unit. If there is air or fluid in the chest, then we may need to call lung experts to place a tube to remove the air and fluid and to reinflate the lung.

**Pneumonia** – We encourage you to do deep breathing exercises to prevent pneumonia. Walking is the best exercise but using the incentive spirometer (lung exerciser) will also help to prevent pneumonia after surgery. It can be hard to take deep breaths after surgery, but this is very important.

**Blood clots** – Blood clots can be very dangerous. They can cause blockage or travel to other parts of the body. We encourage you to get up and walk around as much as possible to prevent blood clots from forming. While you are in the hospital, you will wear boots that squeeze your legs. We strongly recommend that you walk around as much as possible.



# After Discharge

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## When to Call

Complications do not happen very often, but you need to know what to look for if you start to feel bad.



**After you leave the hospital, you should call us at any time if you:**

- Have worsening or new pain unrelieved by pain medication
- Have back or flank (side) pain
- Have a fever greater than 101 ° F or shaking chills.
- Are vomiting, nauseated and unable to keep liquids down
- Have frequent stools/diarrhea or stools that look lighter, or are abnormal in color
- Are unable to have a bowel movement for more than 3 days while using stool softeners and laxatives (Senna, Miralax, Milk of Magnesia)
- Have difficulty passing your urine, it becomes bloody (like ketchup) or cloudy, or you are passing blood clots
- Tubes (stents or nephrostomy tubes) that fall out early

**Please call us if your surgical site:**

- Becomes bright red and painful, or redness starts spreading
- Starts to drain infected material that is not clear yellow or light red/pink
- Releases cloudy or foul smelling fluid
- Starts draining more than normal

## Contact Numbers

If you have trouble or questions between 8:00am and 4:30pm, call the Urology nurse triage line at 434.924.2224.



After 4:30pm and on weekends, call 434.924.0000. This is the main hospital number. Ask to speak to the Urology Resident on call. The resident on call is often managing patients in the hospital so it may take a few minutes longer for your call to be returned.

## Prescriptions

We use multiple methods to help with your pain and other symptoms after surgery. Below are a few medications that we often use. Your doctors will weigh your other medical conditions and kidney function to decide if all of the below medications are appropriate for you.

Take the **Pyridium (phenazopyridine)** as needed three times a day if you are having burning when passing urine. This will turn your urine orange.

Take **Flomax (tamsulosin)** to help with pain from the stent and to help pass small pieces of stone left over. Possible side effects may be lightheadedness, dizziness, semen going backwards into bladder instead of out tip of penis (retrograde ejaculation). Tell your eye doctor if you have taken this medication and have eye surgery coming up.

Take **Ditropan (oxybutynin)** as needed three times a day for bladder spasms (feeling like you need to urinate).

Take with a stool softener such as **Senna**. You should also take a laxative medication (**Miralax**) to help prevent constipation.

If you are given an **antibiotic** take for as many days as prescribed.

If you have normal kidney function, starting the **third day after your surgery**, you **will** alternate Tylenol and ibuprofen (if you have normal kidney function) for improved pain control. These medications work well together in different parts of the pain pathway. Ibuprofen especially helps with pain from inflammation after this surgery. For example:

- 6AM take acetaminophen 975 mg
- 9AM take ibuprofen 600 mg
- 12PM/noon take acetaminophen 975 mg
- 3PM take ibuprofen 600 mg
- 6PM take acetaminophen 975 mg
- Continue alternating acetaminophen and ibuprofen
- Do not exceed acetaminophen 4,000 mg (4g) in 24 hours



If you **do not have normal kidney function**, do not take ibuprofen. Only take acetaminophen. This is 975 mg every 6 hours. For example, you could take this at 6AM, 12PM/noon, 6PM and 12AM/midnight. Do not exceed acetaminophen 4,000 mg (4g) in 24 hours.

Additionally, we **may** send you home with a prescription for an opioid pain medication (**oxycodone or dilaudid**) to use for severe pain only. Since opioid pain medications can often cause nausea, you should **take this medication with a small amount of food**.

Taking opioids may not provide good pain relief over a long time and sometimes opioids can cause your pain to get worse. Opioids can have many different **side effects including constipation, nausea, tiredness, and even addiction**. **Operating heavy equipment or driving is not permitted when using narcotic pain medications**.

Prescriptions can be written for amounts not to exceed 7 days after surgery. There are now regulatory limits on the number and dose of medication that can be prescribed at one time. **Medication refills may be requested Monday-Friday during business hours 8am to 4pm. Please allow 48 hours for approval of medication refill. Medication refills are not available evenings or on weekends or holidays. The UVA Urology on Call provider WILL NOT refill prescriptions for pain medications.** Refill of narcotic prescriptions may require an office visit for the provider to evaluate you in person as per Virginia State regulations.

As your pain improves, you will need to wean off your opioid pain medication. Weaning means slowly reducing the amount you take until you are not taking it anymore. We recommend slowly reducing the dose you are taking. For example, increase the amount of time between doses. If you are taking a dose every 4 hours, extend that time:

- Take a dose every 5 to 6 hours for 1 or 2 days.
- Then, take a dose every 7 to 8 hours for 1 or 2 days.

You can also reduce the dose:

- If you are taking 2 pills each time, reduce to start taking 1 pill each time. Do this for 1 or 2 days.
- Then, increase the amount of time between doses, as explained above.

Once your pain has improved and/or you have effectively weaned off opioids, you may have opioids remaining. The **UVA Pharmacy** is now a **DEA registered drug take-back location**. There is a Drop Box available in the main lobby of the pharmacy 24 hours 7 days per week for patients or visitors to safely dispose of unwanted or unused medications.

Ask your health care team if you have specific questions.



## Constipation

Constipation is very common after surgery. We designed the ERAS program to decrease the risk of constipation by using pain medicine alternatives. It is very important to AVOID CONSTIPATION AND HARD STOOLS after surgery.

We will ask you to take a **stool softener (Senna)** or **laxative medication (Miralax)** to help prevent constipation once you are home. Please continue to take this each night until you stop your opioid pain medication. If diarrhea occurs, please stop this medication. If you have not had a bowel movement after 2 days, take a suppository or an enema. If you are still having constipation, please call the Urology clinic to discuss with a nurse.



## Wound Care Instructions

Some drainage from your incision is expected for the next few days, up to 2 weeks. The drainage should decrease a little every day. You can keep a dry clean dressing on the incision. Once the wound is no longer draining, you may leave it open to air.

You may shower 48 hours after surgery. Let warm soapy water wash over your wound. Do not scrub, soak in a tub, or swim for at least 4 weeks or until your wounds are completely healed.

It is normal if the wound is mildly pink and has a thick firm ridge underneath it. This is referred to as a healing ridge and will resolve over the next 4-6 weeks.

## Urine Expectations

Some blood in the urine is expected for a few days after your surgery. This can continue for the entire time you have tubes in your urinary tract. Urine that looks like pink lemonade, punch or red wine should get better on its own. It only takes a few drops of blood – often left over from your surgery – to stain lots of urine. This is like making Kool-Aide where a small package of dye turns a full pitcher of water red. **Urine that looks thick and dark like ketchup is concerning; please contact us immediately if that happens.** It is important to drink plenty of fluids to keep your urine flowing and as clear as possible. **You should drink 6-8 glasses of water a day.**

It is also normal to have dribbling, urine leakage, or burning when you urinate after this procedure. This generally improves within a few days. If you cannot urinate for >8 hours, please call the clinic or after business hours go to Emergency Room immediately.

## Eating and Weight Changes After Surgery

It is most important that you stay well hydrated. You can eat any food you can tolerate after surgery. It is normal for you not to be as hungry after your surgery.

## Hobbies and Activities

Walking is strongly encouraged. Plan to walk 5 times a day, beginning the day after your surgery.

You should NOT:

- Do any heavy lifting for 4-6 weeks.  
(No more than a gallon of milk = 10 lbs.).
- Do heavy exercise or return to your exercise routine.

You SHOULD:

- Be able to climb stairs and go outside after you are discharged.
- Return to hobbies and activities soon after your surgery. This will help you recover. You may slowly return to your exercise routine after 6 weeks.



## Work

You should be able to return to work **approximately 7-10 days after your surgery**. This may be longer or shorter depending on your recovery rate and how you are feeling. If your job is a heavy manual job, you should not perform heavy work until 6 weeks after your operation. You should check with your employer on the rules and policies of your workplace, which may be important for returning to work.

If you need a “Return to Work” form for your employer or disability papers, ask your employer to fax them to our Fontaine office at 434.297-6555.

## Driving

You may drive when you are off narcotics for 24 hours and feel secure and pain-free enough to react quickly. Your doctor will have to clear you before you drive. For most patients, this occurs at 4 weeks following surgery.



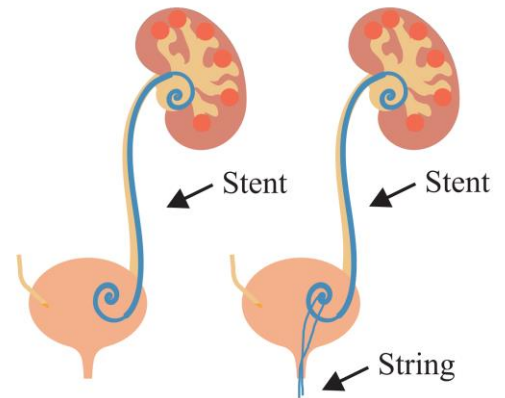
## Stents after PCNL

### What are ureteral stents?

A thin, straw-like, flexible tube with a curl on each end. Stents can be left in with or without a string.

### When is a stent needed?

Stents are placed to help with urine drainage from the kidney.



<https://musicurology.com/>

### What can I expect with a stent?

Most patients have some of the symptoms, but they usually go away once the stent is removed. You may:

- Rush to urinate
- Pass urine more often
- Have burning or pain in your lower back during urination
- Have blood in the urine (pink or red color)
- Feel like you are unable to empty your bladder fully
- Discomfort, pain or cramps in the bladder, lower abdomen and/or lower back

### How can side effect symptoms be managed?

- Increase the amount of water intake to about 6-8 cups a day
- Avoid sugary drinks, caffeine, and alcohol
- Prescribed medications to reduce bladder spasms and cramps
- Warm bath or heating pad to relieve pain
- Lying in a reclined position with knees bent
- High fiber diet and stool softeners for constipation

### Are there any activity modifications?

You may restart your normal physical routine. If you have increased blood in your urine when you become more active, then rest and drink plenty of fluids. Having a stent should not affect work activities, social life, or travel. If you have a stent with a string coming outside the body through the urethra, sexual activities should be avoided until the stent is removed.

### How and when is the stent removed?

If there is a string on the stent, you may be able to remove it at home or at your urologist's office in as short as 3 days. Drink plenty of water and take some pain medication. Stent is removed by pulling on the string until a long plastic tube with 2 curls is entirely removed.

Date of stent removal: \_\_\_\_\_

If there is no string on the stent, it will need to be removed in the operating room if an additional procedure is needed or in the office with a small flexible camera inserted in the urethra (pee tube; also called cystoscopy). This may happen after about 1 month.

**What can I expect after the stent is removed?**

While most patients do not experience any symptoms after the stent is removed, some patients experience cramping due to bladder spasms which may lead to feelings of nausea or voiding more urgently or frequently. This is common and will pass with time. Continue to drink a lot of liquids and keep taking your pain medication as directed.

## Nephrostomy Tube after PNCL

A nephrostomy tube is a plastic tube inserted through the skin of the back to drain out the kidney.

### What can I expect with a nephrostomy tube?

After placement, you will see blood in the urine. Drinking fluids will clear the blood. If it continues after a week, or at any time if you have decreased urinary output, call your doctor.

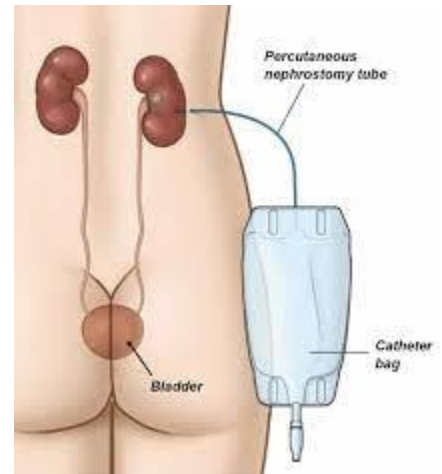
It's important to avoid pulling the tube or removing the suture that is in place. Avoid stretching and exertion. The tube needs to remain dry. Activities like swimming and baths should be avoided. Showers are okay if the tube remains dry.

Your urologist will want a scan before deciding when it should be removed.

### How do I care for my nephrostomy tube?

Good hygiene is very important when you have a nephrostomy tube. Follow the reminders below to care for your tube:

- You will change the nephrostomy tube dressing every day for the first 2 weeks. After 2 weeks, you will change the dressing twice a week, unless it becomes soiled. It is very important to avoid tugging at the suture. If the suture is accidentally removed, contact your doctor immediately.
- You should clean your hands with soap and water before you touch your tube. Use soap and water to clean around the tube site. Do not use alcohol to clean.
- You should have someone look at your incision site frequently. Increased redness, swelling, foul smelling odor, or pus at the site could indicate infection.
- It is important to make sure there is no kinking along the tube.
- The drainage bag should be kept below the level of the kidney to keep flow opened.
- When the drainage bag becomes 2/3's full, it should be emptied.



<https://healthjade.net/percutaneous-nephrostomy/>

#### Call your doctor if you start experiencing:

- Fevers, shaking chills
- Severe back or side pain
- Significantly decreased or no urine drainage
- Foul smelling urine
- Redness, swelling, pus at the skin insertion site
- Nephrostomy tube comes out

# Prevent Kidney Stones with Your Diet

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For the next 5 to 7 years, about 1 in 2 people will form a new stone. The risk is higher if you have a family history of kidney stones or have medical problems like high blood pressure, obesity, or diabetes. Most kidney stones are made of calcium and can be managed by changes to your lifestyle and diet.

## INCREASE FLUID INTAKE

We recommend increasing your water intake. It is the simplest thing you can do to prevent formation of stones.

- **Drink plenty of fluids each day. Increase water intake (2-3L/day or 70-100 ounces/day). Try drinking water before bedtime so you will pass urine overnight and try drinking water as soon as you wake up in the morning.**
- Remember that if you are losing moisture on a hot day through sweating, you will need to drink more than usual to make up for that loss through your skin.
- Fluid intake should be spread out as evenly as possible during the day.
- If you don't get up once at night to urinate, you're not drinking enough. When you get up to urinate, drink another glass of water!



## INCREASED DIETARY CITRATE

Citric acid is an organic acid and a natural part of many fruits and fruit juices. Citric acid (not ascorbic acid/vitamin C), is helpful for people with kidney stones. It stops stone formation and breaks up small stones that are beginning to form. Citric acid is in citrus fruits and juices.

- **Eat 5 or more fruits and vegetables daily.**  
Lemons and limes provide the most citric acid.
- **Squeeze fresh lemon or lime juice directly into your beverages.**
- **Use lemon juice or lemonade daily**  
Dilute 2 ounces lemon juice with 6 ounces of water. Drink twice a day – once in the morning and once in the evening – to reach the goal of 4 ounces of lemon juice per day.  
To make homemade lemonade, squeeze a cup of fresh lemon juice into a pitcher of cold water; bottled lemon juice may also be used. You can add sugar or sugar substitute if you prefer.



If you use premade lemonade, we strongly recommend low-calorie lemonades and lemonade mixes (such as Minute Maid Light, Tropicana Light, or Crystal Light). These are high in citric acid but have little sugar and few calories.

- **Read the label.**

Choose products that are high in citric acid. Some lemon-lime sodas, for example, are high in citric acid. If you drink soda, consider switching to one that is high in citric acid.

## REDUCE SODIUM

Most of the sodium (salt) in our diet comes from packaged and restaurant food (not the saltshaker) and is a result of food processing. Even foods that may not taste salty can be major sources of sodium.

- Limit salt intake to **2 grams (1 teaspoon) per day**. Use limited amounts when cooking, and don't add salt at the table.
- Fast foods, processed and canned foods are usually high in salt. Try to avoid these. When available, buy low sodium, lower sodium, reduced sodium, or "no salt added" versions of products.
- Use spices and salt-free seasonings to flavor your food.
- Ask for no salt added when eating out.

## FOOD RECOMMENDATIONS:

- Limit protein to 80g per day
- Eat a normal amount of calcium per day. The recommended daily amount is around 1000-1200 mg/day. Talk to your primary care doctor if you are taking calcium supplements.
- If you take vitamin C as a supplement, don't take more than 500 mg a day.
- Avoid dark sodas that contain phosphoric acid. Diet clear sodas (like Diet 7UP and Diet Sprite) are OK to drink.



## Other Resources:

### Kidney Stone Diet: Eat to Prevent Kidney Stones

by Kristie Leong M.D. (Author), Apollo Leong M.D. (Author)

[https://www.amazon.com/Kidney-Stone-Diet-Prevent-Stones-ebook/dp/B00JK1VEVO/ref=sr\\_1\\_1?ie=UTF8&qid=1501696268&sr=8-1&keywords=kidney+stone+d](https://www.amazon.com/Kidney-Stone-Diet-Prevent-Stones-ebook/dp/B00JK1VEVO/ref=sr_1_1?ie=UTF8&qid=1501696268&sr=8-1&keywords=kidney+stone+d)

### How to treat kidney stones with diet

<https://www.youtube.com/watch?v=988R33mdv64>