Madigan Army Medical Center
Referral Guidelines

Urolithiasis and Renal Colic

Urology Clinic: 968-1541/1543

Diagnosis/Definition

- Urolithiasis, nephrolithiasis, and ureterolithiasis refer to the presence of mineralized stones, or calculi, in the bladder, kidney, or ureter, respectively.
- Patients may present with classic symptoms of renal colic and hematuria.
- Renal colic is paroxysmal pain that ranges from mild to severe and is related to the movement of the stone through the ureter and associated ureteral spasm.
- Gross or microscopic hematuria occurs in the majority of patients with renal colic, but the absence of hematuria in symptomatic patients does not exclude nephrolithiasis.

Initial Diagnosis and Management

Assess for symptoms of renal colic:

- Acute onset of severe, unilateral flank or lower quadrant abdominal pain with radiation to the groin or genitalia is typical. The patient is often unable to find a position of comfort when the pain is at its peak.
- Nausea, vomiting, and diarrhea are common.
- Urinary frequency and urgency may occur when stones are near the ureterovesicular junction.
- May present as acute pyelonephritis if fever is present.
- Assess for risks of renal calculi including previous renal stones, family history, prolonged immobilization, osteolytic cancer, hyperthyroidism, gout or hyperuricemia, hypercalcemia.

Physical exam findings:

Costovertebral angle tenderness is usually present.

Lab Tests:

- Urinalysis and urine culture. Gross hematuria may be present, although microscopic hematuria is more likely. Up to 15% of patients with stones may have no gross hematuria and a normal urinalysis.
- Serum electrolytes: BUN and creatinine, calcium, uric acid, and magnesium.
- Pregnancy test for all women of child-bearing age.
- Analysis of the stone: If stone has passed, please send the stone to the laboratory for stone analysis.
- Imaging
- Prior to specialty urology referral, all patients with suspicion of urolithiasis must have a definitive, radiological diagnosis.

- The “CT kidney – stone protocol” or Non-contrast spiral CT scan is the preferred study at MAMC.
- If CT scan is obtained, please order a plain film KUB in addition to evaluate for visibility of the stone.
- NOTE: If the patient has microhematuria or gross hematuria and the imaging studies are negative for stone, please refer to the MAMC hematuria guidelines.

Differential Diagnosis:

- The primary clinician should assess for, and rule out etiology of pain that may mimic renal colic. These include:
- Acute gastroenteritis
- Acute pyelonephritis
- Appendicitis
- Colitis
- Dissecting or ruptured aortic aneurysm
- Diverticulitis
- Ectopic pregnancy
- Pelvic inflammatory disease (PID)
- Renal infarction
- Urinary tract infection

Ongoing Management and Objectives

- The vast majority of kidney stones do not require surgery. If the stone is <6 mm in size, it will likely pass spontaneously and even larger stones have a chance of passage without surgical intervention.
- All patients with active urolithiasis as defined and diagnosed above should be initially managed with increased oral fluid hydration (greater than 2 liters a day), scheduled NSAIDs (ie ibuprofen 800 mg every 8 hours until stone passes or a week after pain resolves), and an oral opiate as needed for intense pain (ie percocet or vicodin).
- Please place patients on "medical expulsive therapy" which includes an alpha-blocker, we recommend alfuzosin 10 mg daily for 6 weeks.
- They should also be given a urinary strainer to catch the stone if passed.

Indications for Specialty Care Referral

- Routine referral: All patients with active urolithiasis as defined and diagnosed above should be given a routine consult to Urology.
- Emergent referral: Refer to Urology emergently (on-call resident) for ANY ONE of the following:
    - Fever
    - Intractable pain unrelieved by narcotic medication

- Intractable nausea and vomiting that precludes oral hydration despite outpatient antiemetic treatment.
- Presence or evidence of obstruction (fever, elevated creatinine, fluid around kidney on CT scan)
- Patients with solitary kidney
- Stone that does not pass within 2 to 3 weeks despite optimal medical management.

*** Please note, that you do not need to place an additional consult if: the patient is currently seen in Urology Clinic for kidney stone treatment (surgical or metabolic) AND has been see in the previous 2 years. They only need to call the clinic to schedule a follow-up.**

*** Specific questions about patient's and referrals can be directed to clinic or the resident on call.**

Criteria for Return to Primary Care

- Patients will be returned to primary care after resolution of acute stone episode.
- Urology will continue to coordinate follow up in patients with residual stones and those at high risk for recurrence.

Stone Pathway:
Patient diagnosed with kidney stones will be automatically enrolled in the Urology Clinic's Stone Pathway, and follow-up will be closely coordinated. Information for providers and patients can be found in the Urology Service Kidney Stone Pathway Handout (below).

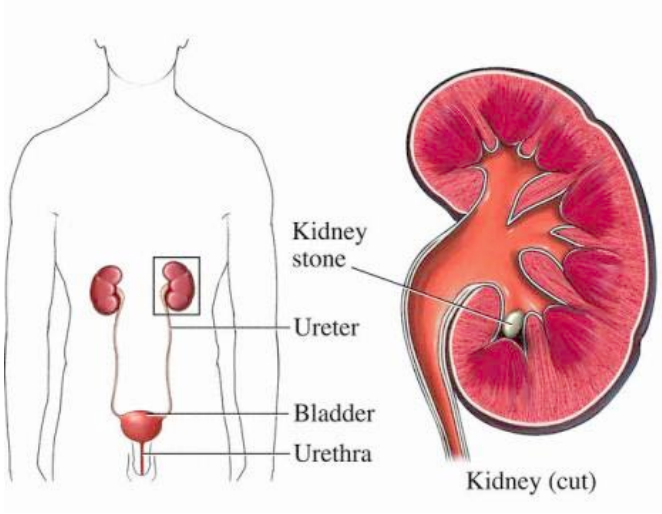
Last Review for this Guideline: **December 2010**
Referral Guidelines require review every three years.

Maintained by the Madigan Army Medical Center - Quality Services Division
Clinical Practice and Referral Guidelines Administrator

Kidney Stone Pathway
Madigan Army Medical Center
Urology Service

You have been diagnosed with a kidney stone. Kidney stones are very common, and despite being quite painful, they can usually be managed with medications and conservative measures, thereby avoiding the need for surgery. In some cases, however, one or multiple procedures are necessary to treat a patient's stone(s).

Kidney stones that are in the kidney itself, and "non-obstructing" generally do not cause pain, and in fact, most patients do not even know they have them! But once a stone is expelled from the kidney and moves down the ureter (the tube that connects the kidney to the bladder) patients can experience pain. This pain can vary in its type and location, and can be sharp, dull, "colicky," and can be present in the flank, abdomen, or even the genital region.



It is also common to have blood in the urine, called hematuria. This can be microscopic (ie only seen on urinalysis lab tests) or gross (meaning you can see the blood in the urine). A small amount of blood can turn the urine quite red, and life-threatening hemorrhage from a kidney stone is *extremely* rare, so red colored urine is to be expected, and is not typically a cause for concern.

Conservative Management with "Medical Expulsive Therapy (or MET)"

Because the ureter is a muscular tube, medications that relax the ureter are effective in helping patients expel the stones without the need for surgery. Studies show that MET can decrease pain and increase your chance of passing the stone. Typically, MET consists of 3 medications, including an alpha blocker, non-steroidal anti-inflammatory (NSAID), and pain medicines that help propel the stone down your ureter. Several different medications can be used, and you will likely be discharged from the emergency department with the following medications:

> **Alfuzosin (or Uroxatral):** This is a medication that helps relax the ureteral muscle, and has been shown to increase the likelihood that a stone passes without the need for surgery.
>
> **Ibuprofen (or Motrin):** This is an anti-inflammatory medication that helps quell the inflammation the stone causes in the ureter, thereby opening it up even more and allowing stones to pass. You should take this medication scheduled, 800 mg every 8 hours (with food). Taking it regularly helps decrease inflammation much better than taking it only "as needed" when you experience pain.

Percocet or Vicodin: These are narcotic medications that help with extreme pain, and when a stone moves down, many patients find that these “stronger” pain medications help when the pain is particularly severe.

It is also important to drink plenty of fluids to help “flush” out the stones. You should be drinking enough to urinate between 2-3 liters of urine daily. This will also help you feel better.

Urine Straining: You will be provided a strainer to strain your urine, which you should do every time you urinate until you pass the stone. This works best by urinating into a urinal (men) or toilet hat (women), and pouring the urine through the strainer. The strainers can be re-used, but discard if they become too soiled. If you run out of strainers, or would like a plastic one, please contact the urology clinic. If you do catch the stone, congratulations! You should call the Urology Clinic and bring it in for analysis, because the composition of the stone can influence therapy.

What happens next: Once your pain is controlled in the emergency room, and you are safe to return home, you will be called within 48-72 hours (usually the next duty day) by a nurse from the Urology Clinic who will ask you questions about your medical history and see how you are doing. He or she will assure you have enough medications, and arrange a follow-up plan to allow for passage or schedule you for any needed evaluations or procedures.

Reasons to return to the Emergency Room: Occasionally kidney stones can cause problems that need emergent attention. These include:

Unrelenting pain: Sometimes, the pain is so severe that it cannot be managed with oral medications. If this happens, they you should call the urology clinic, or if after duty hours, you should return to the emergency room.

Severe nausea/vomiting: Some nausea and occasional vomiting is typical, however if you cannot keep fluids down for a sustained period of time, then you run the risk of dehydration, and you will likely need IV fluids.

Fevers over 101.5°F: This could be an indication of a severe, life-threatening infection, and you should return to the hospital immediately.

Confusion, Altered Mental Status: This could also be indicative of a severe, life-threatening condition and you should return immediately

If you have any questions or concerns, feel free to contact the Urology Clinic and ask! During duty hours (0800-1600) a nurse or technician can speak to you, and consult with a Urologist regarding your care.

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