

Dominion Urological Consultants

(A division of Northern Virginia Urology)

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General Information and Guidelines for Patients with Kidney Stones

You have been diagnosed with kidney stones; now what?

General information

It is estimated that 5% of the population in the United States is affected by kidney stones, with a higher incidence in men. The probability of developing a second stone after an initial episode is 50-90% within 5-10 years. Therefore, prevention is very important.

In general, stones form when urine is supersaturated with certain crystals or salts. Types of kidney stones include calcium stones (80-85%), uric acid stones (5-10%), infection-related struvite stones (10%), and cystine stones (1-2%).

Stones in the kidneys do not generally cause any pain, unless they travel out of the kidney towards the bladder and block the flow of urine. This can cause very severe pain called renal colic.

Risks factors for stone formation include male gender, age >30yrs, family history of kidney stones, high level of minerals in your urine, abnormal urine pH, certain medical conditions (inflammatory bowel disease, gastric-bypass, hyperparathyroidism, gout, high blood pressure), and certain metabolic disorders. Sometimes there is no obvious underlying cause for the formation of kidney stones but prevention can still be achieved following general guidelines.

General prevention guidelines

- ✓ **Increased hydration:** 2-3 liters (68-100 ounces) of water daily, **this is the most important preventative measure** since it hinders formation by diluting the urine.
You may add fresh lemon to your water; this is high in citrate which also helps to prevent kidney stones
- ✓ **Moderate-protein diet:** **reduce your red meat consumption** to no more than once or twice per week. Cut back on portion sizes : a smaller steak, one less chicken leg, ect.
- ✓ **Moderate-sodium diet:** 2,000-3,000 milligrams of salt daily, **do not add salt to your food at the table**
- ✓ **No calcium restricted diet:** studies have shown that restriction can actually increase your risk of developing kidney stones. You may eat the **recommended dosage of calcium between 800 and 1,200 mg daily**. Try to get most of your calcium from food as it is absorbed slowly. If supplements are needed **Citracal** is recommended because it is high in citrate. *Antacids such as tums should be avoided if possible.*

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Preventive Guidelines for Patients with Kidney Stones

Prevention Plan

- KUB x-ray annually

to re-evaluate stone disease including amount and size of stones; certain stones including uric acid stones are radiolucent and cannot be seen on x-ray

- renal-bladder ultrasound annually

to re-evaluate stone disease including amount and size of stones, also evaluates for hydronephrosis (distention and dilation of the kidney cause by obstruction)

- CT-scan without contrast every one or two years

in some patients this may be required when x-ray and ultrasound are not adequate in evaluating stone disease

- Blood work initially and annually

- Blood work every 6 months if medical/supplemental therapy is initiated

- 24 hr urine analysis initially and annually

for any patient with recurrent stone or more than 1 stone,

- 24 hr urine analysis 6 months after a treatment is implemented

to assess results after a treatment, this may be repeated again until stone disease is stable.

Medical/Supplemental Therapy

Will depend on results of your 24 hr analysis and blood work

See results of your specific 24 hr analysis for further details

Low-Sodium diet

- ✓ Typically a diet between 2,000-3,000 milligrams of salt daily
- ✓ Do not add salt to your food at the table or during cooking
- ✓ Replace salt seasonings with salt-free herb mixes, spices, and salt substitutes
- ✓ Check labels on all packaged foods for sodium content
- ✓ Look for packaged foods labeled low-sodium,
 - including frozen and canned goods, soups, crackers, bread, salad dressing, and snack chips
- ✓ Avoid prepared frozen meals with more than 400 milligrams of sodium per serving
- ✓ Restaurant meals can have between 1,000-5,000 mg of sodium per meal
 - When dining out avoid table salt and high-sodium condiments (pickles, olives, mustard, ketchup, ect), request sauces and dressings on the side, and request that food be prepared without added salt when possible.
- ✓ Foods to avoid or to eat in moderation
 - **Breads**-salted crackers, pancake and waffle mixes, biscuits, english muffins, doughnuts
 - **Cereals**-instant cooked cereals, prepared commercial cereals including corn flakes and bran flakes
 - **Cheese**-all except those labeled low-sodium
 - **Desserts**-desserts made with salt or baking sodas, cake or cookie mixes, chocolate pudding
 - **Fat**-bacon fat, salted butter, margarine, regular salad dressing, mayonnaise
 - **Fruit and Vegetables**-tomato juice, canned vegetables, sauerkraut
 - **Meat, Fish and Poultry**-ham, bacon, cold cuts, bologna, hot dogs, salted or smoked meats
 - **Snack/Chips**-potato chips, corn chips, tortilla chips, pretzels, microwave popcorn, salted nuts
 - **Soups**-canned soups and bouillon cubes
 - **Seasonings**-salt, onion or garlic salt, MSG, ketchup, chili sauce, seasoned salts, lemon pepper, meat tenderizers, Worcestershire sauce
 - **Miscellaneous**- olives, pickles and relish, gravy, salsa
- ✓ If one of your favorite foods is on this list, cut back on the number of times you eat this food and always drink a glass of water before and after.

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Low Oxalate Diet

- ✓ Oxalate is found mostly in foods from plants.
- ✓ When oxalate in the gut is not bound by calcium it is available for absorption and stones can form.
- ✓ Foods with high or moderate amounts of oxalate should be reduced or eliminated
 - Recommended diet of no more than 50 mg of oxalate per day
 - Foods high in oxalate have approximately 10 mg per ½ cup serving
- ✓ Examples of foods high in oxalate
 - Dark leafy greens/spinach
 - Parsley
 - String beans, wax beans
 - Okra
 - Endive
 - Parsley
 - Celery
 - Leeks
 - Beets
 - Eggplant
 - Summer squash
 - Sweet potato
 - Draft beer
 - Tea
 - Instant coffee (more than 8oz/day)
 - Blackberries
 - Strawberries
 - Goosenberries
 - Rhubarb
 - Soy Products (tofu)
 - Grits (white corn)
 - Fruit cake
 - Chocolate/cocoa
 - Peanuts
 - Almonds
 - Cashew Nuts
 - Colas (more than 12oz/day)
- ✓ If one of your favorite foods is on this list, cut back on the number of times you eat this food and always drink a glass of water before and after.
 - Try to eat no more than one serving of the above high oxalate foods per meal

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24 hr Urine Results Hypercalciuria

✓ You have been diagnosed with hypercalciuria, excessive amounts of calcium in your urine

- Urine excretion >300mg per day in men
- Urine excretion >250mg per day in woman

✓ Regardless of the underlying causes of hypercalciuria, the treatment is the same

✓ Initial treatment is dietary recommendations:

- The more salt you eat, the more calcium you will excrete in your urine
- **The best diet is low salt and moderate calcium**

Increased hydration: 2-3 liters (67-100 ounces) of water daily, this is the most important preventative measure since it hinders formation by diluting the urine.

You may add fresh lemon to your water; this is high in citrate which helps to prevent kidney stones

Low-sodium diet: 2,000-3,000 milligrams of salt daily, do not add salt to your food.

See low-sodium diet sheet for further information

No calcium restricted diet: Studies have shown that restriction can actually increase your risk of developing kidney stones. You may eat the **recommended dosage of calcium between 800 and 1,200 mg daily**. Try to get most of your calcium from food as it is absorbed slowly. If supplements are needed **Citracal** is recommended because it is high in citrate. *Antacids such as tums should be avoided if possible.*

Moderate-protein diet: Reduce your red meat consumption to no more than once or twice per week. Cut back on portion sizes : a smaller steak, one less chicken leg, ect.

✓ 24 hr urine test will be re-done 6 months after diet modification

- If hypercalciuria still persists, medical therapy will be considered

✓ Medical/Supplemental therapies

- Hydrochlorothiazide (HCTZ) 25-50mg/daily
 - ✓ Lowers urine calcium by removing sodium from the body
- Urocit-K 10meg, 2-3 tablets three times/day
- Polycitrate-K packets, 1 packet two to four times/day
- Theralith XR, 2 tabs twice/day

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24 Hour Urine Results

Hypocitraturia

✓ You have been diagnosed with hypocitraturia which means low amounts of citrate in your urine

- Urine excretion <320mg/day
- Affects 40% of patients with kidney stones

✓ Citrate is important in decreasing calcium oxalate calculi

✓ Treatment includes a combination of dietary modifications and medical therapy

✓ Dietary modification:

Increased hydration: 2-3 liters (67-100 ounces) of water daily, this is the most important preventative measure since it hinders formation by diluting the urine.

You may add fresh lemon to your water; this is high in citrate which helps to prevent kidney stones

Moderate-protein diet: reduce your red meat consumption to no more than once or twice per week. Cut back on portion sizes : a smaller steak, one less chicken leg, ect.

Moderate-sodium diet: 2,000-3,000 mg of salt daily, do not add salt to your food at the table

No calcium restricted diet: Studies have shown that restriction can actually increase your risk of developing kidney stones. You may eat the **recommended dosage of calcium between 800 and 1,200 mg daily**. Try to get most of your calcium from food as it is absorbed slowly. If supplements are needed citracal is recommended because it is high in citrate. *Antacids such as tums should be avoided if possible.*

✓ Medical/Supplemental therapy:

Urocit-K 10meg, 2-3 tablets three times/day

Polycitrate-K packets, 1 packet two to four times/day

Theralith XR, 2 tabs twice/day

**All 3 meds are high in citrate*

24 hr Urine Results

Hyperuricosuria

- ✓ You have been diagnosed with hyperuricosuria, excessive amounts of uric acid in your urine.
 - Urine uric acid >750 mg/day
 - Found in approximately 35% of stone formers
- ✓ It is important to correct excessive uric acid since this can cause crystallization of calcium and thus stone formation.
- ✓ Your urine pH is most likely <6.0, this will have to be corrected with medication to keep the pH between 6.5 to 7.0.
 - Urine pH > 6.5 allows uric acid to dissolve and crystals don't form in the urine
- ✓ Blood test will be performed to rule out elevated uric acid levels in the blood
 - If you have a history of gout, you may be referred to a rheumatologist for further evaluation
- ✓ **Dietary Recommendations:**
 - **Try to reduce your daily intake of protein** (beef, chicken, pork and fish) to 8 oz per day; if this not possible then cut back significantly on portion size.
 - **Avoid eating organ meats** such as liver and brain
 - **Avoid or reduce foods that are high in purine** (a compound found mostly in meats and when metabolized breaks down into uric acid)
 - **Very High Purine Foods:** anchovies, bacon, bouillon, brains, broth, codfish, consommé, goose, liver, kidney, herring, mackerel, mincemeat, roe, mussels, sardines, shrimp, scallops, veal, venison, yeast
 - **Moderate Purine Foods:** Asparagus, fish, ham, lentils, mushrooms, pork, poultry, red meat, spinach, dried peas
 - **If one of your favorite foods is listed**, cut back on portion size and the number of times you eat the food. Always drink a glass of water before and after.
 - **Observe general dietary recommendations for all stone formers:** increased hydration, moderate-sodium diet, and normal calcium diet.
- ✓ **Medical/Supplemental therapy:**
 - **Urocit-K** 10meg, 2-3 tablets three times/day
 - **Polycitrate-K** packets, 1 packet two to four times/day
 - **Theralith XR**, 2 tabs twice/day
 - ✓ All 3 increase the urine pH to dissolve uric acid to treat and prevent stones
 - **Allopurinol** 300 mg daily (lowers urine uric acid by blocking the conversion of purines to uric acid; doesn't treat active uric acid stones)

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24 hr Urine Results Hyperoxaluria

✓ You have been diagnosed with hyperoxaluria, excessive amounts of oxalate in your urine

- Urine oxalate >50mg per day

✓ Occurs in 8% of patients with kidney stones

✓ Risk factors include:

- Excessive dietary intake of foods high in oxalate
- Inflammatory bowel disease
- History of jejunoileal bypass surgery
- Calcium restriction

✓ Dietary Recommendations:

Low-oxalate diet: found mostly in foods from plants such as green leafy vegetables, *see low-oxalate diet sheet for further information*

No calcium restricted diet: Studies have shown that restriction can actually increase your risk of developing kidney stones. You may eat the **recommended dosage of calcium between 800 and 1,200 mg daily.**

General dietary recommendations:

Increased hydration: 2-3 liters (67-100 ounces) of water daily, this is the most important preventative measure since it hinders formation by diluting the urine.

You may add fresh lemon to your water; this is high in citrate which helps to prevent kidney stones

Moderate-protein diet: reduce red meat consumption to no more than once or twice per week

Moderate-sodium diet: 2,000-3,000 milligrams of salt daily, do not add salt to your food at the table

✓ Medical/Supplemental therapy:

Urocit-K 10meg, 2-3 tablets three times/day

Polycitrate-K packets, 1 packet two to four times/day

Theralith XR, 2 tabs twice/day

* All 3 above meds have citrate which decrease calcium oxalate calculi

Calcium supplementation with Citracal, 2 tabs/day

* Calcium binds to oxalate in the gut or urine to form an insoluble substance; when oxalate in the gut is not bound by calcium it is available for absorption and stones can form.

24 hr Urine Results

Normal Results

✓ The results of your 24 hour urine analysis are normal

✓ Stone prevention can still be achieved following general guidelines

✓ Dietary Recommendations:

Increased hydration: 2-3 liters (67-100 ounces) of water daily, this is the most important preventative measure since it hinders formation by diluting the urine.

You may add fresh lemon to your water; this is high in citrate which helps to prevent kidney stones

Moderate-protein diet: reduce red meat consumption to no more than once or twice per week

Moderate-sodium diet: 2,000-3,000 milligrams of salt daily, do not add salt to your food at the table

No calcium restricted diet: studies have shown that restriction can actually increase your risk of developing kidney stones; You may eat the **recommended dosage of calcium between 800 and 1,200 mg daily**. Try to get most of your calcium from food as it is absorbed slowly. If supplements are needed **Citracal** is recommended since it is high in citrate. *Antacids such as tums should be avoided if possible..*

✓ If results are not optimal following dietary changes:

- medical/supplemental therapy will be considered to prevent stone formation

✓ Medical/supplemental therapy:

Urocit-K 10meg, 2-3 tablets three times/day

Polycitrate-K packets, 1 packet two to four times/day

Theralith XR, 2 tabs twice/day

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Starter Packet for Urinary Stone Patients

1) General Info and Guidelines

2) Prevention Plan

