Kidney stones

Preventing formation

You won’t soon forget the pain of passing your first kidney stone. And worse, your doctor says that there’s about a 50 percent chance you will pass another in the next 10 years.

Fortunately, most people who have had a kidney stone can take steps to reduce by half the risk of developing another. Simply drinking an adequate amount of water on a daily basis is one important step. Other steps are more specific to the type of kidney stone that you’re prone to developing.

Stone basics

Kidney stones are made up of crystal-forming minerals in the urine. If you drink an adequate amount of water, urine is diluted and these crystals pass out of the kidneys. Normal urine also contains substances that inhibit crystal formation. However, if urine is too concentrated or if these crystal-preventing compounds aren’t working properly, crystals may gradually accumulate and grow to form one or more kidney stones.

At some point, most kidney stones are naturally passed from the kidneys and down the tubes (ureters) connecting the kidneys to the bladder. They’re then passed from the bladder and out in your urine.
Smaller kidney stones may pass with little or no pain. However, some stones can cause extreme waves of pain, typically occurring on the side and back, just below the rib cage and radiating to the lower abdomen and groin. Additional signs and symptoms may include:

- Blood in the urine, which often makes it look pink
- Nausea or vomiting
- Persistent urge to urinate
- Pain with urination
- Fever and chills if an infection is present

Seeking care

Most people appropriately seek emergency medical care if they experience the extreme pain that can result from passing a kidney stone. Treatment often involves strong pain medications. If pain lessen, you’ll likely be sent home to naturally work the stone through your urinary system. Nonprescription pain medications may be enough for lesser degrees of pain.

The time it takes for a kidney stone to pass varies considerably. It may take hours or weeks to pass, but most commonly it takes around seven to 14 days.

Drinking 8 to 12 cups of water a day can help this process along. In addition, drugs that relax sphincter muscles related to urination, such as tamsulosin (Flomax) — which is usually used in men for benign prostatic hyperplasia (BPH) — are often prescribed to help both men and women to pass a stone.

As the stone passes from your system, your doctor may ask you to urinate through a strainer to try to capture the stone. Analyzing the composition of the stone is helpful for developing a plan to prevent future stone development.

If a stone is causing unrelenting pain or other complications, additional measures may be taken. These may also be needed if a stone appears too large to pass or if, after a month or so, it still hasn’t passed on its own. Measures may include:

- **Extracorporeal shock wave lithotripsy (ESWL)** — This outpatient procedure uses high-energy shock waves to break the stone into tiny pieces that can be more easily passed. Sedation or anesthesia is required due to the moderate pain caused by the shock waves.
- **Percutaneous nephrolithotomy** — If your stone is very large or ESWL isn’t effective, the stone may be removed using this procedure. Thin instruments are inserted through a small incision in your back and into your kidney, where the stone is crushed and extracted.
- **Ureteroscopic stone removal** — This is used to remove a stone lodged in a ureter. A thin scoping instrument (ureteroscope) is passed into the bladder and then up the ureter. The stone is snared or broken into pieces and removed.

Urine tests can help identify chemical imbalances in your urine that contribute to kidney stone growth. Various blood tests may be required to help rule out underlying problems — such as overactive parathyroid glands — that can lead to kidney stone formation.

In about 70 percent of people, kidney stones are formed primarily of calcium oxalate. Calcium phosphate is the main component of another 10 percent of stones. Stones made of pure uric acid — and struvite stones, which are caused by a bacterial infection — each account for another 10 percent of stones.

Prevention steps

Prevention strategies for calcium-based stones and uric acid stones aim to reduce the amount of calcium and uric acid — or possibly oxalate — in the urine. Reducing urine acidity — or increasing crystal-inhibiting substances in the urine — also may be a goal. The basic steps most people can take to reduce kidney stone risk include:

- **Drinking enough fluid** — Drinking at least 12 cups of fluid — preferably water — a day is the most basic kidney stone prevention step. This dilutes urine and decreases the risk of crystal formation.
- **Limiting meat intake** — Consuming more than 6 to 8 ounces of meat daily can increase calcium and uric acid in the urine, increase the acidity of urine and reduce chemicals that inhibit crystal formation.
- **Reducing sodium intake** — A low-sodium diet will reduce the ability of your kidneys to excrete calcium, thus reducing the amount of calcium in your urine.
- **Getting calcium in your diet** — Ironically, meeting daily calcium intake recommendations based on your age reduces risk of kidney stone development. That’s probably
because calcium binds to oxalate in the gut, reducing oxalate levels in urine. Dairy products and supplements containing calcium citrate are the preferred way of getting your daily calcium. Calcium carbonate supplements may slightly increase kidney stone risk, but the increase may be negated if you take them with meals.

Vitamin D — often consumed with calcium to help absorption — may raise your risk of developing calcium-based stones. Vitamin D has many health benefits, but if you’re predisposed to form calcium stones, it may be best to limit vitamin D intake to the recommended daily level for your age.

Limiting intake of oxalate-containing foods — such as spinach, beets, chocolate, peanuts, potatoes and many others — is an important preventive strategy for people with calcium oxalate stones who also have conditions such as Crohn’s disease that affect the small bowel.

For those who don’t have digestive conditions or high urine oxalate levels, Mayo Clinic experts often don’t emphasize this preventive strategy, because the preventive effect is unclear and it’s a tough diet to follow. However, in those who do have high urine oxalate levels, a low-oxalate diet can be important.

**Medications for stones**

More-specific prevention strategies include the following drugs:

- **Thiazide diuretics** — These decrease the amount of calcium that the kidneys release into the urine and may help prevent calcium-based stones.

- **Allopurinol** — If you have calcium oxalate stones and also have high blood levels of uric acid, this can lower your uric acid levels and thus your risk of developing calcium oxalate stones. Oddly, allopurinol doesn’t do much to prevent stones made of pure uric acid. Still, it may be used to try to prevent them if uric acid levels are high or if other attempts to prevent them don’t work.

- **Potassium citrate** — This substance inhibits calcium oxalate and calcium phosphate crystal formation in urine. In addition, potassium citrate can lower the acidity of urine. That’s important because uric acid isn’t likely to crystallize and form stones unless urine is acidic.

---

**Health tips**

**Measuring your blood pressure**

With age, blood pressure tends to creep upward — even if you don’t have high blood pressure (hypertension). That’s why regular blood pressure readings during doctor visits can be useful. To help ensure the most accurate results:

- **Sit correctly** — When having your blood pressure taken, sit quietly with your back supported and both feet flat on the floor — no leg or ankle crossing.

- **Dress accordingly** — The wrong clothes can make a difference when your blood pressure is taken. Wear a shirt with short sleeves, or one that has loose sleeves that can be easily pushed up. Wearing a shirt with sleeves that have to be rolled or pushed up to the point of tightness around your arm may interfere with getting an accurate reading.

- **Modify food and drink intake** — Avoid eating a big meal or drinking a caffeinated beverage or alcohol for at least 30 minutes before your blood pressure is taken. And if you smoke, don’t do so for at least an hour beforehand. All of these factors can temporarily elevate blood pressure for a period of time. The same holds true if you have a full bladder — empty your bladder before your appointment.

- **Be quiet, relaxed and still** — Avoid rushing to your appointment. Don’t talk while the reading is being taken.
News and our views

Psoriasis may tie in with coronary artery disease
Health concerns associated with psoriasis — an inflammatory skin disorder that results in thick, red, scaly, itchy plaques — may be more than just skin deep. Study results shared at the annual meeting of the American Academy of Dermatology (AAD) in March 2009 add to a growing body of evidence connecting the skin disorder with an increased risk of cardiovascular disease and diabetes.

Among the studies presented at the AAD meeting was one involving nearly 1,600 people with moderate to severe psoriasis. Their risk of coronary artery disease (CAD) was 28 percent greater than that of people without the skin disease. In addition, their risk of stroke was nearly 12 percent greater.

Mayo Clinic doctors agree. Diseases such as psoriasis and rheumatoid arthritis that cause widespread inflammation increase risk of CAD. Mayo experts believe psoriasis should be factored in on a level with other CAD risk factors, such as high cholesterol, high blood pressure, obesity, lack of exercise, smoking and diabetes, because the more risk factors you have, the higher your risk of CAD. Risk factors don’t just add up, they can actually multiply upon each other.

Many lose sleep due to economic issues
Most Americans have experienced at least some anxiety in the past year related to the economic environment. And according to a recent poll taken by the National Sleep Foundation, a lot of people have a hard time putting these worries aside at bedtime.

The poll, conducted in March 2009, found that one-third of Americans are losing sleep over the state of the economy and other personal financial concerns.

If worries are keeping you from sleeping, the foremost recommendation of Mayo Clinic sleep experts is to avoid confronting the issues that are causing your stress while trying to fall asleep.

How? Sort out your stresses during the day. You may try to write down your thoughts and worries and discuss them with a loved one, a friend or possibly a counselor. Identify problems that you have some control over, then determine actions you can take to address them.

Do what you can in a given day, recognizing that it may take time to resolve problems. Try to wrap up your daily efforts at least a few hours before bedtime. This gives you time to unwind, perhaps by taking a walk, having a good laugh, taking a warm bath, or practicing deep breathing or other relaxation exercises.

If you find yourself awake in bed and preoccupied by worry, get up out of bed and do a quiet activity — such as reading, listening to the radio or watching television — in another room. This can help take your mind off things until you feel tired enough to sleep.

If sleep problems persist for more than a few weeks despite these measures, talk to your doctor about medical or psychological problems that may be affecting sleep and how to manage them.

Vitamin D

Bone benefits and beyond
The buzz is growing over potential health benefits attributable to vitamin D. Aside from its reputation as calcium’s necessary sidekick for bone health, vitamin D’s influence appears to stretch from head to toe, possibly affecting everything from muscle stability to preserving thinking skills in older adults.

How much vitamin D do you need for optimal health? Clinicians and researchers continue to pursue the answer to that question, but it’s anything but clear-cut.

Consider the source
Vitamin D holds a unique position in the nutrient world. It’s the only nutrient your body can make itself. The catalyst is sunlight exposure. Specifically, ultraviolet B rays in sunlight interact with a chemical in the skin and change it to an inactive form of vitamin D. From there, your liver and kidneys make two more chemical changes to turn it into a form of vitamin D that can be used by the body in quantities equivalent to thousands of international units (IU) of vitamin D.

The needed amount of vitamin D may be generated by exposing your face, arms and hands to the sun for a short time during nonpeak hours. Just 10 or 15 minutes of exposure two or three times a week is considered adequate. Vitamin D acquired from sun exposure is very dependent on how far north you live, the time of day, the season, how dark your skin is and your age. Your kidneys and liver may become less efficient at processing it as you age.

However, sun exposure for the sake of vitamin D intake is clouded by the real concern over skin cancer risk. If you wear sun protection as is generally recommended, you’ll
need to get your vitamin D from other sources. Mayo Clinic dermatologists say it is safer to get vitamin D from food and supplements than from sun exposure.

Other D sources

It’s generally considered ideal to acquire the nutrients you need from food. However, food sources rich in vitamin D are limited. Fatty fish, fish-liver oils, liver and egg yolks top the short list. There are fortified foods, too, most notably milk.

Another option is vitamin D supplements in one of two forms:
- Ergocalciferol (vitamin D 2)
- Cholecalciferol (vitamin D 3)

Whether one is better than the other depends on how frequently you take them. If you take D 2 or D 3 on a daily basis, the same vitamin D blood levels are achieved. However, if you take vitamin D on a monthly basis, the D 3 form may be preferred. For those who are deficient, vitamin D is sometimes prescribed in doses such as 50,000 IU a week for eight weeks.

The power of D

There’s growing evidence that vitamin D may benefit health on multiple levels. For instance, there’s evidence to suggest that taking vitamin D supplements may improve balance in older adults. A study involving women in their mid-80s who took 800 IU of vitamin D every day for three months showed that doing so improved their leg strength, and they experienced fewer falls.

Some of the data being reported on vitamin D’s possible benefits include:
- Fracture prevention — An analysis of a dozen clinical trials found higher doses of vitamin D — 400 IU or more each day — lowered by 20 percent the risk of bone fractures in areas other than the spine in adults 65 and older. There was an 18 percent reduction in broken hips.

A critical balance

Most people associate bone health with getting adequate calcium, but another critical factor is having enough vitamin D in your blood to help absorb the calcium. Vitamin D increases calcium absorption in the small intestine and allows calcium to enter the bloodstream.

If you don’t get enough vitamin D, the calcium level in your bloodstream drops. This drop signals the parathyroid glands in your neck to secrete extra parathyroid hormone (PTH). Higher than normal PTH levels in the blood signal bones to release more calcium into circulation. Over time, vitamin D deficiency causes increased bone remodeling due to increased PTH levels in the blood that deplete bones of calcium. This results in abnormal bone loss.

Better cognitive function in older adults — A recent study found that adults over 65 who had higher blood levels of vitamin D also scored higher on tests of executive function — they were better able to plan, organize, tend to details and think abstractly. The higher levels of vitamin D also correlated with less small blood vessel damage in the brain. Another study of more than 1,700 older adults found that those with the lowest vitamin D levels were more than twice as likely to have impaired thinking skills as were those who had the highest vitamin D levels.

Lower levels of vitamin D are associated with diabetes, cardiovascular disease, multiple sclerosis and other autoimmune disorders, infections such as tuberculosis, and periodontal disease. Low vitamin D levels may also affect certain cancers — including colon, breast and prostate cancers, among others. However, it’s yet to be proved that adequate levels of vitamin D can actually prevent cancer or metabolic disease such as diabetes, cognitive decline, immune function problems or death.

How much is enough?

For now, the current daily recommended intake of vitamin D for adults 50 and older is 400 to 600 IU, but there’s ongoing debate over whether the amount should be higher. Many researchers believe a higher amount is warranted and would benefit people more prone to vitamin D deficiency. As it stands, the National Osteoporosis Foundation guideline recommends a daily intake of 800 to 1,000 IU for adults over age 50. Currently, the upper daily limit considered for safe use is no more than 2,000 IU a day, but there is debate among specialists in this area. Generally, it’s agreed that 5,000 to 10,000 units a day of vitamin D is safe — although rarely needed — and should be done only under your doctor’s supervision.

Experts generally agree that an optimal vitamin D blood level is 30 nanograms per milliliter (ng/mL) or more. Regular screening for vitamin D levels in blood — specifically, the measurement of 25-hydroxyvitamin D (25-D) — generally isn’t done. However, if you’re older, dark skinned or live in northern latitudes, you may want to talk with your doctor about having your 25-D blood level checked.

Very large doses of vitamin D supplements taken over time can cause nausea, vomiting, poor appetite, constipation, weakness and weight loss. Excessive doses can raise the level of calcium in your blood, which can cause confusion and changes in heart rhythm. □
Primary care

Home base for health care

In today’s world, “doctoring” decisions can be complex. The field of choices is peppered with large and small medical centers as well as specialty clinics, individual practitioners and an ever-growing field of complementary and alternative medicine providers.

How do you navigate your way to the care best suited to your needs? You may find that a more focused approach to managing your health care needs is possible if you establish an ongoing relationship with a primary care doctor.

Define primary

In a general sense, primary care providers focus not just on diseases, but on the well-being of people who may also have diseases. This includes care that promotes health and health maintenance, disease prevention, education, diagnosis and disease management.

A team of providers may manage your primary care services. Those providing adult care may include nurses, nurse practitioners and physician assistants, in collaboration with your primary care physician who is a family practitioner or general internist.

When you consider primary care from the standpoint of a health care consumer, it offers many potential advantages and potential cost savings. Some of these are demonstrated by the following scenarios in the primary care setting:

- Your primary care team works with you over the long term to set personal health goals and to make significant behavior changes.
- Knowing that you didn’t do well on a certain type of drug in the past, your primary care doctor prevents a drug-related problem.

Watch the cracks

Even with the best of primary care, there can still be cracks in the communication system. This may be especially so when transitions occur from a hospital to a rehabilitation center, nursing facility or even back home.

Never assume your primary care team knows that you’ve been admitted to or dismissed from the hospital. If need be, contact your health care provider team and request authorization forms necessary to send hospital records and results of any tests to your doctor.

Don’t assume the team providing your care knows the results of all your tests, especially if they were ordered by other providers.

- Your primary care provider helps you make a decision about your medical care based on knowing you and helping you to weigh potential risks and benefits.
- Your primary care team, in consultation with a specialty doctor, saves you money by coordinating and following through on a care plan designed by the specialist for your needs.
- As part of a chronic disease management plan, your primary care doctor knows your medical situation well enough to provide certain care without an office visit. This may involve using nurse phone contacts, phone follow-ups and email.

Simply primary

Primary care providers are in your corner in sickness and in health, providing continuity of care and a medical “home base." Establishing an ongoing relationship with a primary care team allows for effective communication that makes it possible for you to become a partner in your health care.

Among advantages connected with having a primary care team is working with professionals who:

- **Act as care coordinators** — Your primary care team acts on your behalf in collaborating with other health professionals. They can help set up specialty consultations or make referrals as needed. They also can help you think through the pros and cons of having tests or treatments: Why might a particular test be beneficial? What might be the downside of a test? Are a treatment’s potential side effects worth the risk?
- **Act as central processing** — Not only do they provide diagnosis and treatment of short-term (acute) and chronic illnesses, but they typically play a coordinating role in various settings outside of the usual office visits. These may include hospitalizations, critical care, long term care and home care.

It’s personal

You play a critical role in the relationship with your primary care providers. A little preparation and thought before your office visit can be extremely helpful to both you and your doctor (see our September 2008 “Health tips” article).

For instance, if you’re being seen because of a new problem related to hip pain, your primary provider will seek information only you can provide. This may include information such as when the pain started, whether a particular activity was associated with the start of the problem, when the pain is most bothersome, what seems to help it and what aggravates it.

The better prepared you are when you meet with your primary care provider, the more productive your time together can be.
Ordinary snoring

Aiming for quiet

Snoring has gotten a lot of attention in recent years due to its link to obstructive sleep apnea. Indeed, it’s often recommended that loud, frequent snorers be tested to rule out this harmful problem.

But what if it’s found that you simply snore loudly?

Unlike sleep apnea, in which you actually stop breathing, ordinary snoring doesn’t appear to harm your health. Still, many people appropriately seek treatment for snoring because it can cause embarrassment and seriously disrupt the sleep of a bed partner.

Causes

As you doze off and progress from light to deeper sleep, your tongue relaxes, as do the soft tissues of your throat and the roof of your mouth (soft palate). These tissues can sag into the airway, causing it to narrow. As inhaled or exhaled air is forced through the smaller opening, the relaxed tissues of the soft palate vibrate, resulting in snoring.

Talk to your doctor about your snoring if you:

■ Wake up from a night’s sleep feeling unrefreshed and have daytime sleepiness
■ Snore loudly and frequently
■ Snore in any sleep position
■ Have pauses in breathing or have startled awakenings with shortness of breath
■ Disrupt the sleep of others

The goal of diagnosis is usually to rule out sleep apnea. A physical exam and snoring history from both you and your bed partner, or someone who hears you snore, are important to this process. An overnight sleep study may be recommended.

Conservative first

If you don’t have sleep apnea, steps you can take to reduce snoring take aim at the many factors that can contribute to a more narrowed airway. These factors include:

■ Being overweight or obese — Extra bulk narrows your airway. Losing weight can improve snoring.
■ Alcohol consumption — This can cause excessive relaxation of muscles and tissues around your throat. Avoid drinking alcoholic beverages at least four hours before bed.
■ Nasal obstruction — Upstream factors such as nasal obstruction can cause waves downstream, such as airway flow at the level of the throat. Your doctor may suggest a range of therapies for obstructed nasal passages, such as adhesive nasal strips (Breathe Right, others) or corticosteroid nasal sprays.
■ Sleep position — Lying on your back allows your tongue to sag and narrow your airway. A number of techniques can be used to train yourself to sleep on your side.

Devices that work

Medical devices can significantly reduce snoring, but they can be costly. If you’re a snorer who doesn’t have sleep apnea, look carefully at the costs of treatment options, as many insurance plans don’t cover them.

The most effective treatment for snoring is a continuous positive airway pressure (CPAP) machine. This delivers pressurized air through a mask, keeping your upper airway open during sleep. One downside is that some people have difficulty adjusting to wearing a mask at night.

Oral appliances available from specially trained dentists or orthodontists are designed to keep your throat open. They can reduce the frequency and intensity of snoring and may be a less obtrusive option than a CPAP machine.

Last resort

Several surgical procedures are available to help reduce snoring, either by cutting away excess mouth and throat tissue or by stiffening tissues of the soft palate to prevent vibration and sagging.

But surgery is usually considered a last resort for snoring because it’s costly, it can cause side effects or complications — and there’s typically no more than a 50 percent chance that your snoring will improve over the long term.
Second opinion

Questions and our answers

Q: I take a blood thinner daily. Before year’s end, I’m scheduled to have a couple of teeth pulled. My dentist wants me to stop my medication a day or two beforehand so there won’t be too much bleeding, but a friend says her doctor told her not to stop the medication ahead of time. I’m confused.

A: Generally, a blood thinner (anticoagulant) doesn’t need to be stopped prior to having dental procedures such as tooth extractions, gum (gingival) surgery, fillings, or crown and bridge work.

There’s always a chance of some bleeding during minor dental surgeries, whether or not you regularly take an anticoagulant. Even if you do take an anticoagulant and stop taking it ahead of a dental procedure, there’s no guarantee doing so will eliminate the risk of some post-operative bleeding. However, most cases of bleeding after minor dental surgery can be easily controlled.

A serious risk may occur when anticoagulant therapy is put on hold prior to minor dental surgery. Permanent disability and even death may occur if a clotting complication — such as stroke or heart attack — develops in the absence of anticoagulant therapy.

Anticoagulants are used for many different reasons. These include preventive or therapeutic measures to control the risk of heart disease, stroke, clotting related to heart valve replacement, stents and other circumstances that increase risk of clot formation.

If there’s consideration given to discontinuing an anticoagulant, a consultation between your dentist and doctor may be in order. They can decide whether a simple blood test to measure how well your blood is thinned — called an international normalized ratio (INR) — might be of help. An INR on the day of your surgery may be a good idea, especially if yours tends to fluctuate significantly.

Q: I have an anal fissure that isn’t getting better even though I’ve increased my fiber and water intake over the past few months. My doctor is recommending surgery to cut part of the anal sphincter. Are there any other treatment options?

A: Yes there are. In years past, the surgery you describe was a more common procedure for curing hard-to-treat small tears in the anal canal — anal fissures. These tears may extend into the internal anal sphincter muscle, which often causes this muscle to spasm. Cutting a portion of the sphincter muscle reduces the muscle spasm, decreasing pain and promoting healing.

Several newer treatments aim to relax the sphincter muscle without surgery. One option is a specially compounded ointment containing a drug in the calcium channel blocker class, such as nifedipine or diltiazem. Studies have shown fissure healing rates in the range of 50 to over 90 percent with this option. An ointment containing a small amount of nitroglycerin may be similarly effective, but side effects such as headache are more of a problem than with the calcium channel blocker ointment.

Another option is an injection of botulinum toxin (Botox) into the internal sphincter muscle to temporarily paralyze the muscle. Healing rates with the injection range from 60 to 96 percent. A possible side effect is temporary, mild leakage of gas or stool.

Surgery to cut part of the sphincter muscle remains an important procedure of last resort. No matter what type of treatment you receive for your anal fissures, measures to reduce strain with bowel movements — such as softening your stool with increased fiber and water intake, getting daily exercise, and heeding the call of nature in a timely manner — are sensible habits to maintain to avoid a recurrence.

Have a question or comment?
We appreciate every letter sent to Second Opinion but cannot publish an answer to each question or respond to requests for consultation on individual medical conditions. Editorial comments can be directed to:
Managing Editor, Mayo Clinic Health Letter, 200 First St. SW, Rochester, MN 55905, or send email to HealthLetter@Mayo.edu
For information about Mayo Clinic services, you may telephone any of our three facilities:

Check out Mayo Clinic Health Solution’s Web site, at www.MayoClinic.com