Bladder cancer

Spot it early, follow it closely

In 2013, it’s expected about 73,000 Americans will be diagnosed with new cases of bladder cancer.

Although bladder cancer can occur at any age, it typically affects older adults. The most significant increase in bladder cancer occurrence is seen in men and women older than 70. Among men, bladder cancer is the fourth most common cancer. It’s eighth on the list of most common cancers in women.

The good news is most bladder cancers are diagnosed at an early stage, when the cancer is highly treatable. However, even early-stage bladder cancer is likely to recur, so vigilant follow-up exams are typically continued for years to come.

Inner lining changes

The bladder is a hollow, muscular organ that stores urine until it’s passed out of the body through a narrow tube called the urethra. The wall of the bladder consists of multiple tissue layers. The innermost lining is made up of transitional cells, which stretch as your bladder fills with urine and then shrink when you empty your bladder. Most bladder cancers get their start in these transitional cells.

Bladder cancer is assigned a stage based on how far the cancer has grown into bladder tissue or if the cancer has spread.

The wall of the bladder is made up of multiple layers. The innermost lining is made up of transitional cells, which stretch as the bladder fills with urine and shrink when it empties. As shown above, most bladder cancers get their start in these transitional cells.
moved beyond the bladder. In general terms, bladder cancer may be:

- **Nonmuscle invasive** — This earliest form of bladder cancer involves only the superficial surface layer of the bladder. About 70 percent of diagnosed bladder tumors are confined to the bladder’s surface and don’t extend into the muscular layer. At this stage, treatment is likely to be successful, but bladder cancer can still recur or progress to an invasive form. That’s why regular follow-up medical exams are important throughout life.

- **Muscle invasive** — At this stage, tumor cells have found their way into the bladder’s muscle wall layer. Once the cancer is invasive, it’s likely your doctors will recommend bladder removal. Chemotherapy treatment also may be recommended either before or after an operation to remove the bladder.

- **Metastatic** — This term describes bladder cancer that’s spread beyond the bladder and invaded nearby structures, or distantly to other organs such as a lung or the liver. Treatment is typically chemotherapy, but may also include radiation or possibly some type of surgery if symptoms can’t be controlled by other means.

In the early stages of bladder cancer, you may or may not have signs or symptoms. Bladder cancer may be suspected based on findings of a microscopic amount of blood in the urine found during a routine urine test.

The most common sign is blood in the urine (hematuria), which makes urine appear bright red or orange. The appearance of blood in urine — whatever the cause — should always be evaluated by a doctor.

Other possible signs and symptoms of bladder cancer may include pain with urination, a change in bladder habits — such as increased frequency or an inability to urinate despite the urge to do so — pelvic pain and back pain.

**Cause and effect**

It’s not always clear what causes bladder cancer, but there are certain risk factors associated with its occurrence. In addition to aging, these include:

- **Smoking** — This is the major risk factor, whether you have smoked in the past or are a current smoker. When you smoke, your body has to process the chemicals in the smoke and excrete some of them in your urine. Compared with nonsmokers, smokers are four to seven times more likely to develop bladder cancer.

- **Exposure to certain chemicals** — Your kidneys help filter harmful chemicals from your bloodstream and move them into your bladder for excretion. Because of this, it’s thought that being around certain chemicals — including arsenic and chemicals used in the manufacture of dyes, rubber, textiles, leather and paint products — may increase bladder cancer risk.

- **Chemotherapy and radiation therapy** — The use of certain anti-cancer drugs, notably cyclophosphamide (Cytoxan), can increase bladder cancer risk. Radiation therapy directed at the pelvis as treatment for other cancers such as prostate or endometrial cancers may elevate risk, as well.

- **Bladder infection** — Although very rare in the United States, in other parts of the world infections with schistosomiasis — a parasitic infection — can give rise to a certain type of bladder cancer known as squamous cell cancer.

Another factor that may increase bladder cancer risk is taking the diabetes medication pioglitazone (Actos) for more than a year, or taking combination diabetes drugs such as pioglitazone and metformin (Actoplus Met), or pioglitazone and glimepiride (Duetact).

**Tests and treatments**

Several tests may be done when bladder cancer is suspected, including tests to help assign a stage and plan treatments. Urine tests can check not only for blood in the urine but also for the presence of cancer cells. Imaging studies may be done, such as computerized tomography (CT) urogram, which uses dye to visualize the entire urinary tract.

The gold standard test for bladder cancer is cystoscopy, which allows your doctor to view the inside of the urethra and the lining of your bladder and check for abnormalities. A narrow, flexible tube (cystoscope) that has a lens and fiber-optic lighting is inserted into the urethra and up into the bladder. Local anesthesia is typically used to make cystoscopy more comfortable.

If suspicious tissue changes are seen inside the bladder during cystoscopy, a special tool may be passed through the scope in order to collect a cell sample (biopsy) for testing. In cases where the biopsy indicates a nonmuscle invasive bladder cancer, a small wire loop may be passed through the cystoscope to remove the cancer and burn away remaining cancer cells with an electric current.

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**MAYO CLINIC HEALTH LETTER**
Biological therapy (immunotherapy) may be used after removal of a nonmuscle invasive bladder cancer to reduce risk of cancer recurrence. This therapy activates your immune system to help fight cancer cells. Bacillus Calmette-Guerin (BCG) is the most commonly used. It’s given through a catheter directly into the bladder through the urethra.

As with other cancers, treatment options for bladder cancer are tailored based on the type of tumor, the cancer’s aggressiveness (grade) and how far it has progressed.

Surgical removal of the entire bladder and other nearby tissues (radical cystectomy) is the standard of care once cancer has become invasive and spread into the bladder’s muscle layer. In very rare situations where there’s a single small tumor in the dome of the bladder with very specific features, a limited portion of the bladder may be surgically removed (partial cystectomy) if removal can easily be done without harming bladder function.

After bladder removal, a new route must be surgically created for urine to be expelled. There are several options to consider with your surgeon — all involve using a piece of your intestine.

One option uses a segment of intestine to create a tube that diverts urine from your kidneys to an opening on the skin’s surface (stoma) to which a bag can be attached to collect urine.

Another approach involves creating a small reservoir for urine under the skin of your abdomen. A channel is connected to a hole in the skin that can be accessed periodically using a thin tube (catheter) to drain collected urine.

A third option is to create a bladder-like reservoir inside the body that’s attached to the urethra and allows for the potential for more normal urination.

Researchers continue preliminary work to create tissue-engineered bladders in the laboratory. However it will be some time before these efforts move beyond the early phases of study.

Additional bladder cancer therapies that may be considered are chemotherapy and radiation therapy. Chemotherapy drugs may be administered directly to the bladder through the urethra or given through a vein (intravenously). Chemotherapy may be used before surgery to shrink a tumor or afterward to destroy any remaining cancer. Radiation therapy may be done after surgery if some cancer still remains, or it may be used if surgery is not an option or the cancer has moved to other areas of the body.

**Ongoing vigilance**

Tumors that are confined to the bladder have a tendency to recur at some point following treatment — that’s the nature of this type of cancer. For that reason, your doctor will want to see you back for regular bladder re-checks and follow-up tests.

If treatment has included surgery to remove the bladder and your cancer was confined to the bladder alone, the cure rate is generally very high if there’s no cancer recurrence within two to three years.

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**Health tips**

**Optimal hospital recovery**

A hospital stay — even one that’s just a day or two long — can contribute to physical and mental decline, especially among older adults. Here are ways to help you maintain and regain strength, stamina and mental clarity:

- **Get moving** — Inactivity can set off functional decline. The drive to get moving is especially important for older adults whose reduced reserves make it easier for health to get off track. Work with your care team to develop a rehabilitation plan. Getting active as soon as possible in a safe and appropriate manner can be critical for continued improvement once you return home.

- **Avoid sensory deprivation** — If you normally use glasses or hearing aids, arrange to have them available in your hospital room. Ask if it’s possible to have a room with windows to help you keep track of day and night. A clock and calendar can help you keep oriented, too.

- **Stay mentally active** — Keep your mind engaged as much as possible. You might catch up on some reading or write letters. Computer use and personal electronic devices can keep your mind occupied. Be aware that mental clarity can be a challenge after general anesthesia, and receiving pain-relieving drugs can sometimes cause confusion.

If possible, enter the hospital at your best attainable levels of physical and mental well-being. Doing so may help improve the chances you will recover well once you return home.
Pelvic organ prolapse

Deciding on surgery

For aging women, parts of the pelvic floor including muscles and ligaments can stretch or weaken. As a result, one or more of the pelvic organs may sag (prolapse) from their normal position.

Pelvic organ prolapse doesn’t always cause symptoms. It may simply feel like something has fallen out of place. However, sometimes it may cause problems such as:

■ A bulge of tissue at the vaginal opening
■ Bothersome pressure or pulling in the pelvic area that gets worse with standing, lifting, coughing or straining
■ Incontinence of urine or stool with coughing or sneezing
■ Difficulty emptying your bladder or bowels
■ Sexual discomfort or embarrassment

Pelvic floor prolapse usually isn’t a threat to your overall health. Deciding on a course of action after diagnosis — whether surgical, nonsurgical or doing nothing — often hinges on how much it bothers you, and your treatment preferences. Deciding on no treatment or non-surgical treatment at the outset doesn’t mean you can’t change your mind later — nor does it limit your surgical options in the future.

Common causes

It’s not entirely understood why some women develop pelvic floor prolapse, and others don’t. But factors that may increase your risk include having given birth vaginally, menopause and aging — and factors that increase pressure on the pelvic floor such as chronic coughing, straining to have bowel movements or being overweight.

Weakness or bulging of the pelvic floor can occur:

■ At the front, causing your bladder or urethra to sag into the vagina.
■ On the top, which causes your uterus to sag downward or — if you have had your uterus removed (hysterectomy) — causes tissues on the top of the vagina to sag down.
■ At the back, which causes the rectum to bulge into the vagina.

Managing without surgery

Nonsurgical steps to help manage pelvic floor prolapse symptoms include:
■ Physical therapy — Kegel exercises are the main way to strengthen pelvic floor muscles. These involve a daily routine of contracting the muscles that you’d use to stop the flow of urine. To get started, it’s often best to work with a physical therapist or doctor specializing in pelvic floor training. That’s because many people who think they’re doing Kegel exercises correctly aren’t exercising the proper muscles.
■ Reducing pressure on the pelvic floor — Weight loss if you’re overweight, working to correct constipation issues, avoiding heavy lifting and, with the help of your doctor, addressing chronic coughing, can all help reduce pressure on your pelvic floor.

These steps won’t put a prolapsed organ back in place. Still, you may be able to improve symptoms or keep them from getting worse, particularly if you have a milder amount of prolapse. Even women who opt for surgery can benefit, as good pelvic floor habits may help with recovery from surgery and may be helpful in preventing future prolapse problems.

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Choosing the best procedure for you depends on many factors, including the nature of your problem. Some procedures are done through the abdomen, either as an open surgery or by using minimally invasive techniques that involve inserting thin surgical instruments through several small incisions. Many procedures can be done through the vagina, without an incision. Minimally invasive and intravaginal procedures generally cause less pain and result in quicker recovery.

Each procedure has pros and cons.

Bladder and bowel issues

Bladder or bowel issues can be associated with pelvic floor prolapse. For example, having a prolapsed rectum or bladder can make it hard to empty the bowel or the bladder. In many cases, repairing the prolapse surgically also will improve the bowel or bladder problem. However, returning the bladder or rectum to its proper place doesn’t always ensure return of normal function.

Certain issues — such as constipation — aren’t caused by prolapse and won’t improve with surgery. Other issues — such as urinary urgency or frequency — are less likely to improve with surgery than are problems related to emptying the bladder. Urinary incontinence may require its own surgical fix, which can be done in conjunction with pelvic floor prolapse repair, or as a separate surgery, if pelvic floor repair doesn’t improve the problem.

If you’re not having surgery in the near term, nonsurgical methods can improve bowel and bladder function. These can also be used after surgery, if the surgery itself doesn’t lead to symptom improvement.

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Each procedure has pros and cons. It’s important to have a detailed conversation with your surgeon about the risks and benefits of surgical choices.

One area of controversy is the use of mesh inside the vagina to reinforce prolapse repair. The Food and Drug Administration in 2011 issued a statement saying that intravaginal mesh procedures pose complication risks that don’t occur with repairs that use only stitches — and that there may be no clinical benefit of mesh placement.

The surgical option

Whether chosen first or after a period of more-conservative therapy, many women opt to have their pelvic floor prolapse surgically repaired. Surgery generally involves moving shifted organs back to their normal locations. Often, removal of the uterus is done to facilitate this goal.

In the time leading up to surgery, Mayo Clinic surgeons often recommend that postmenopausal women use a low-dose estrogen replacement cream applied directly to the vagina. Estrogen applied in this way isn’t associated with the health risks of taking an estrogen pill, and it helps thinned vaginal tissues to become thicker and healthier. This may make surgery more effective and facilitate better healing.
Calories and weight loss

Complicated, yet simple

It’s often taken as fact that if you can cut 500 calories from your diet each day, you’ll lose 1 pound of weight in a week. The basis for this is that 1 pound of fat equals 3,500 calories. Therefore, if you cut 3,500 calories out of your diet over seven days, you’ll lose a pound of fat.

It turns out that calculating weight loss is a lot more complicated than that. But before you get lost in the details, remember that the steps you can take to reduce weight remain simple.

Dynamic model

The body is a very dynamic organism consisting of many interwoven aspects. These include such things as how hot your metabolism burns, your body composition and how your brain perceives what you put in your mouth. These factors are constantly adjusting to changes in your diet or lifestyle.

Because of this, there are many factors that can alter the calculation of 3,500 calories equals 1 pound. Some of them include:

- **What type of weight you lose** — One pound of fat may equal 3,500 calories, but when you lose weight, you don’t lose just fat. You lose a mixture of fat, lean tissues such as muscles and water. In the short term, the diet you follow can affect the composition of the weight you lose. This also affects the pace of your weight loss, independent of the number of calories you cut from your diet. For example, low-carbohydrate diets lead to water loss in the body, and thus quicker — but likely temporary — weight loss than would be expected based on your calorie reduction.
- **Your metabolic rate** — This refers to the energy your body burns at rest. Basic organ function accounts for about 70 percent of your metabolic rate. Most of the rest comes from maintenance of lean muscle tissue. Fat burns very few calories at rest.

If you have a lower amount of muscle tissue, you may not burn as many calories at rest as someone with more, thus making it harder to lose weight even if the amount of calories cut from the diet is similar. Men generally have more lean tissue than do women, and older adults tend to have less muscle and a lower base metabolism.

- **Your body’s response to reduced calories** — Drastic reductions in calorie intake or eating all of your daily calories in one meal a day are signals to the body that you’re starving. This sets off a cascade of responses. For example, your body conserves energy by reducing the rate that your base metabolism burns calories. The response to starvation may make it hard to lose an amount of weight that corresponds to the number of calories you’re cutting.

Reducing calories in a more gradual way and spreading the calories you eat into a few meals a day helps minimize this adaptation.

- **Poor judgment of calories in and calories out** — You may think that you’ve cut 500 calories from your diet each day, but it’s hard to accurately measure your calorie intake. Most overweight people underestimate their calorie intake by 30 percent or more. It’s also easy to overestimate the number of calories you burn through exercise.

- **What you eat** — For reasons that aren’t fully understood, calories consumed in moderate amounts of alcohol or moderate portions of nuts don’t appear to contribute to weight gain in the same way that other calories do. In contrast, sugar substitutes found in products such as diet soda may contain few, if any, calories, but people who consume diet soda tend to weigh more than those who don’t drink soda.

- **Many other factors** — Your stress level, your genetics, the bacteria in your gut and the amount of sleep you get are some of the additional factors that can skew the exact calculation of calories you consume and weight you can expect to lose.

What really works

In many ways, the calculations of weight loss are hopelessly complex. But the basics of weight control are much simpler. Two of the most basic essentials include:

- **A low-calorie diet** — Make minimally processed plant foods such as fruits, vegetables, whole grains, beans and nuts the mainstay of your diet. Portion control — except for vegetables and fruits — is also important.

- **Physical activity** — Get at least 150 minutes of moderately intense physical activity a week. This can be achieved with 30 minutes of exercise, five days a week. It’s also important to be active throughout your daily activities.
Fallen arches

Beware the arch enemy

You’ve had it with the nagging pain along the inside of your foot and ankle. A month ago, you could ignore it and keep up with your daily walking group. But the pain is worse. So today, instead of going on your two-mile walk, you’re headed in to see your doctor to figure out what gives with your foot.

Actually, what’s giving way is the arch in your foot. Your doctor says it’s due to changes in a tendon that normally provides support for the foot’s arch and stability when you walk. Left unchecked, that loss of support can result in flatfoot.

Known as posterior tibial tendon dysfunction, this is one of the more common foot and ankle problems. The good news is that the earlier the problem is identified, the more likely non-invasive treatments will work. Left unchecked, this problem can lead to further degeneration of the tendon.

Vital connections

The posterior tibial tendon is located on the inside of your lower leg. It starts at a muscle in the calf and attaches to the bones on the inside of your foot.

Injury to this tendon isn’t uncommon. It may occur over time from everyday wear and tear. Sometimes, damage is due to an accident, such as a fall that produced a tear or caused inflammation. Overuse during high-impact activities, such as tennis or basketball, may cause tears or aggravation. Overstress of the tendon can occur due to obesity.

Posterior tibial tendon dysfunction generally occurs in adults older than 40, and it’s more commonly seen in women. Other factors that may increase risk of tendon injury include:

- Diabetes
- High blood pressure
- Steroid injections

Signs and symptoms associated with posterior tibial tendon dysfunction vary, depending on how long the tendon has been unable to support the arch. In addition to pain, you may encounter:

- Swelling on the inside of the ankle
- Pain that gets worse with activity or walking on uneven ground
- Difficulty with walking or standing for long periods

Over time, arch collapse can produce pain along the outside of the ankle. This pain is due to the heel bone shifting outward.

Don’t wait

If you have ongoing pain along the inside of your foot when you put weight on it and it doesn’t improve over a few weeks, see your doctor. During the foot and ankle exam, you may be asked to stand on one leg and then rise up to your tiptoes. A healthy posterior tibial tendon allows you to stand on tiptoes. That isn’t possible when its function is impaired. Your doctor may check for flatfoot deformity. As you stand, your doctor may view your heels and feet from behind. If your feet and toes are shifted outward away from the center of your body due to flatfoot changes, the majority of your toes may be visible from behind. Additional tests, including X-rays, diagnostic ultrasound or magnetic resonance imaging (MRI), may be considered.

Treatment choices are made based on how advanced the tendon problem may be. The goal of treatment is to reduce pain, stabilize the foot and prevent additional changes in the foot’s integrity. If rest and supportive measures fail to give lasting relief, you may be referred to a foot care specialist, such as an orthopedist, podiatrist, or physical medicine and rehabilitation doctor.

Conservative treatment choices may include some or all of the following:

- Stopping or decreasing activities that aggravate foot pain
- Applying cold packs to the painful area three or four times a day for up to 20 minutes
- Taking nonsteroidal anti-inflammatory medications, such as ibuprofen (Advil, Motrin IB, others) or naproxen (Aleve, others), to reduce pain and inflammation
- Losing weight and getting low-impact physical activity, such as using an exercise bike

Wearing a short leg cast or walking boot for four to eight weeks may be recommended to immobilize the tendon and reduce pain and swelling. Orthotics can often be of help. Custom orthotics may be necessary if you have moderate to severe changes in the shape of your foot in order to better control the foot’s position. Sometimes, an ankle brace is used to support the joints at the back of the foot and alleviate tension on the tendon. Physical therapy for ankle strength and flexibility may be added to the treatment mix if there’s improvement.

If pain doesn’t improve after six months of conservative treatments, surgery may be considered. The approach depends on the extent of damage to the posterior tibial tendon and where the damage is located on the tendon. Procedures may include replacing the damaged tendon with another tendon from the foot, realigning bones in the foot to create a more normal arch shape, and sometimes, fusing joints to stabilize the back of the foot.
Second opinion

**Q**
I have a fungal toenail infection. My doctor says treatment typically takes several months, and even then, a cure isn’t guaranteed. I just assumed there would be some kind of medicine to take that would get rid of the problem. Is it really that hard to treat these infections?

**A**
Nail fungus can be difficult to treat. Even with prescribed antifungal oral drugs, repeat infections are common.

Fungal toenail infection — onychomycosis (on-ih-koh-my-KOH-sis) — typically results in a thickened toenail with yellowish discoloration. It’s a common problem that becomes more prevalent with age. It may be seen more if your immune system is compromised, or if a toenail has been previously damaged. It affects almost half of adults older than 70.

The most effective oral drugs are terbinafine (Lamisil) and itraconazole (Sporanox). Treatment duration typically runs 12 weeks, but due to the slow rate of toenail growth, it can take up to a year or longer to determine whether treatment is successful.

Of the two drugs, terbinafine generally produces better outcomes. One study compared the clinical cure rate of the two drugs 3 1/2 years after treatment and found terbinafine was associated with a complete cure rate of 35 percent and itraconazole resulted in 14 percent. However, treatment success rates with these drugs are lower in adults older than 65 and the relapse rate is 25 to 30 percent.

Another consideration for some is possible side effects from antifungal drugs. These can range from skin rash to severe liver damage. Their use may not be recommended if you have liver disease or congestive heart failure. Drug interactions also may occur with either drug.

A topical antifungal drug — ciclopirox (Penlac) — that’s painted onto the affected nail regularly for up to a year resolves fungal nail infection in less than 10 percent of those who try it. Combining this with the oral drug terbinafine is no more effective than taking the oral drug alone.

All of this is to say that there’s still considerable ground to be gained in finding a relatively successful treatment for fungal toenail infection. Laser and other light-based therapies also are being studied to see how effective they might be. The clinical role of these therapies has yet to be determined.

**Q**
What is walking pneumonia? How is it different from other types of pneumonia?

**A**
Walking pneumonia doesn’t refer to any specific type of pneumonia. Rather, as the name suggests, it’s a term used to describe any type of lung infection that’s mild enough so that you’re able to avoid hospitalization.

You may still feel quite ill with walking pneumonia — and you may ironically spend a good portion of the illness lying in bed. Still, you’ll be able to either get better on your own with rest, or go to a health clinic for treatment.

Sometimes, walking pneumonia is associated with certain types of infectious agents that are called atypical pneumonias. A common germ causing atypical pneumonia is Mycoplasma pneumoniae. Infections caused by Mycoplasma pneumoniae are usually milder than other bacterial causes of pneumonia, hence its association with walking pneumonia.

In another linguistic twist, atypical causes of pneumonia are actually fairly typical. They received the name “atypical” because they fall outside the mainstream types of pneumonia-causing bacteria, such as Streptococcus pneumoniae. But in studies that have sought to identify the causes of lung infections, the atypical germs have been found to be quite common.