Bladder Cancer Overview

The information that follows is an overview of this type of cancer. It is based on the more detailed information in our document, *Bladder Cancer: Detailed Guide*. This document and other information can be obtained by calling 1-800-227-2345 or visiting our Web site at www.cancer.org.

What is cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide into new cells, and die in an orderly way. During the early years of a person's life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out, damaged, or dying cells.

Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of this out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells keep on growing and form new cancer cells. These cancer cells can grow into (invade) other tissues, something that normal cells cannot do. Being able to grow out of control and invade other tissues is what makes a cell a cancer cell.

In most cases the cancer cells form a tumor. But some cancers, like leukemia, rarely form tumors. Instead, these cancer cells are in the blood and bone marrow.

When cancer cells get into the bloodstream or lymph vessels, they can travel to other parts of the body. There they begin to grow and form new tumors that replace normal tissue. This process is called *metastasis* (muh-**tas**-tuh-sis).

No matter where a cancer may spread, it is always named for the place where it started. For instance, breast cancer that has spread to the liver is still called breast cancer, not liver cancer. Likewise, prostate cancer that has spread to the bone is called metastatic prostate cancer, not bone cancer.

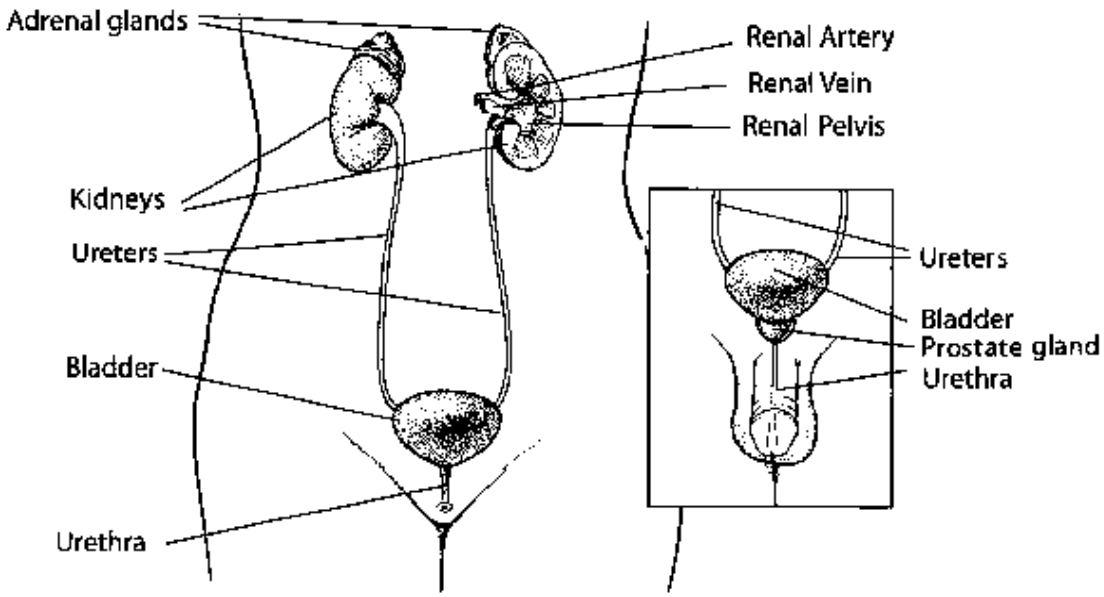
Different types of cancer can behave very differently. For example, lung cancer and breast cancer are very different diseases. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is aimed at their own kind of cancer.

Not all tumors are cancerous. Tumors that aren't cancer are called *benign* (be-nine). Benign tumors can cause problems – they can grow very large and press on healthy organs and tissues. But they cannot grow into other tissues. Because of this, they also can't spread to other parts of the body (metastasize). These tumors are almost never life threatening.

What is bladder cancer?

The normal bladder

To understand bladder cancer, it helps to know about the normal structure and function of the bladder. The bladder is a hollow organ that stores urine. Urine is made in the kidneys and flows into the bladder through thin tubes called *ureters*. Urine leaves the bladder through another tube called the *urethra*. In women the urethra is very short. In men it is longer and passes through the prostate gland to the tip of the penis.



The urinary system

The wall of the bladder is made of 4 main layers. The innermost layer of the bladder is lined with cells called *urothelial cells*. The same type of cells also lines parts of the kidneys, the tubes connecting the kidneys to the bladder (ureters), and the urethra.

Most bladder cancers start in this inner lining layer and grow into or through the other layers of the bladder. As the cancer grows through the layers it becomes more advanced and harder to treat.

Types of bladder cancer

Bladder cancers are grouped into several types by the way the cancer cells look under a microscope. The type of bladder cancer you have can affect your treatment options because different types need different treatments.

Transitional cell carcinoma: This is by far the most common type of bladder cancer. It starts in the cells that line the inside of the bladder – the urothelial cells. It is also called *urothelial carcinoma*.

Within this group there are subtypes. *Papillary* cancers grow like fingers from the inner bladder lining toward its hollow center, while *flat* cancers do not grow toward the center.

These tumors are also named based on whether they have grown into the bladder wall. If they grow deeper into the bladder wall they are called *invasive*; if not, they are *non-invasive*.

Squamous cell carcinoma: This type is much less common and is usually invasive.

Adenocarcinoma: This type is also much less common and almost all are invasive.

Small-cell carcinoma: A very small number of bladder cancers are of this type. These cancers often grow quickly.

Sarcoma: Sarcomas start in the muscle cells of the bladder, but they are rare. To find out more about sarcomas, see our documents: *Sarcoma - Adult Soft Tissue Cancer* and *Rhabdomyosarcoma*.

The rest of this document deals with transitional cell (urothelial) cancers of the bladder.

How many people get bladder cancer?

The American Cancer Society's estimates for bladder cancer in the United States for 2013 are:

- About 72,570 new cases of bladder cancer
- About 15,210 deaths from bladder cancer

Bladder cancer is more common among men than women and more common among whites than blacks. The chance of a man having this cancer during his lifetime is about 1 in 26. For women, it is about 1 in 90. Risk factors (such as smoking) can affect these chances.

This is a cancer mainly of older people. About 9 out of 10 people with this cancer are over the age of 55.

What are the risk factors for bladder cancer?

We do not yet know exactly what causes bladder cancer, but we do know that certain risk factors are linked to the disease. A risk factor is anything that affects a person's chance of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like smoking, can be controlled. Others, like a person's age or family history, can't be changed. But risk factors don't tell us everything. Having a risk factor, or even several, does not mean that you will get the disease.

Still, it is good to know about some of the risk factors for bladder cancer because there may be things you can do that might lower your risk of getting it. If you are at higher risk because of certain factors, there are tests that might help find it early, when treatment is most likely to be helpful.

Risk factors for bladder cancer

The following risk factors have been linked to bladder cancer:

Smoking: Smoking is the greatest risk factor for bladder cancer. Smokers get bladder cancer at least 3 times as often as people who don't smoke. Certain chemicals in tobacco smoke are absorbed from the lungs into the blood. From the blood, they are filtered by the kidneys and collect in the urine. These chemicals in the urine damage the cells that line the inside of the bladder and increase the risk of cancer.

Work exposure: Some chemicals have been linked to bladder cancer. Industries that use certain chemicals may put workers at risk if good safety practices are not followed. Those with the highest risks include the makers of rubber, leather, textiles, dyes, and paint products, as well as printing companies. Other workers with a higher risk of bladder cancer include painters, hairdressers, machinists, printers, and truck drivers. Smoking can increase the risk even more among these workers.

Race: Whites are about twice as likely to get bladder cancer as are African Americans. Hispanics, Asian Americans, and American Indians have slightly lower rates of bladder cancer. We do not know the reason for this.

Age: The risk of bladder cancer goes up with age. About 9 out of 10 people with bladder cancer are over the age of 55.

Gender: Bladder cancer is much more common in men than in women.

Chronic (on-going) bladder irritation and infections: Urinary infections, kidney stones, and bladder stones have been linked with bladder cancer, but it is not clear if they actually cause bladder cancer.

Personal history of bladder (or other urothelial) cancer: People who have had a cancer in any part of the urinary tract have a higher chance of getting another tumor.

Bladder birth defects: Before birth, there is a connection between the belly button and the bladder. Very rarely this connection doesn't go away as it should, and cancer can start there. Another, very rare, birth defect called *exstrophy* can also lead to bladder cancer.

Genes and family history: People whose family members have had bladder cancer have a higher risk. People who inherit certain gene syndromes also have a higher risk of bladder cancer.

Earlier cancer treatment: Some drugs or radiation used to treat other cancers can increase the risk of bladder cancer.

Arsenic: Arsenic in drinking water has been linked to a higher risk of bladder cancer.

Not drinking enough liquids: People who drink lots of liquids each day have a lower rate of bladder cancer.

Can bladder cancer be prevented?

At this time, there is no sure way to prevent bladder cancer. The best way to lower your risk is not to smoke. Smoking is believed to cause about half of bladder cancer cases among men and women.

It's also important to follow good work safety habits if you work with chemicals called aromatic amines. They are commonly used by the makers of rubber, leather, printing materials, textiles, and paint products. They are also found in many hair dyes, so it is important for hairdressers and barbers who are often exposed to these products to use them safely. Most studies have not found that personal use of hair dyes increases bladder cancer risk. To learn more, see our document, *Hair Dyes*.

Some studies have found that drinking plenty of fluids (mainly water) may lower the risk of bladder cancer.

Some studies have suggested that a diet high in fruits and vegetables may help protect against bladder cancer, but other studies have not found this. Still, eating such a diet has been shown to have many health benefits, including lowering the risk of several other types of cancer.

How is bladder cancer found?

Bladder cancer can sometimes be found early. Finding it early improves the chances that it can be treated with success.

Screening for bladder cancer

Screening tests are used to look for a disease in people who do not have any symptoms. Expert groups do not advise screening tests for bladder cancer for most people, but they may be used if you are at very high risk. Risk factors that may lead to screening include having had bladder cancer in the past, certain defects of the bladder, and perhaps working with certain chemicals. If you are at high risk of bladder cancer, your doctor might suggest certain tests such as urine tests or cystoscopy. These tests are explained below.

If you don't have any known risk factors, the best advice is to contact your doctor if you have any symptoms that might be caused by bladder cancer.

Signs and symptoms of bladder cancer

Blood in the urine: In most cases, blood in the urine is the first sign of bladder cancer. Sometimes there is enough blood to change the color of the urine. The urine may be very pale yellow-red, pink or – less often – darker red. In other cases, the color of the urine is normal but small amounts of blood can be found by urine tests that were done because of other symptoms or as part of a check-up.

But blood in the urine does not mean you have bladder cancer. Much more often it is caused by other things, such as infection, benign tumors, or stones in the kidney or bladder.

Changes in bladder habits: Having to urinate more often, feeling pain or burning when going, or feeling as if you need to go right away even when your bladder is not full can be symptoms of bladder cancer. But these problems are more often caused by something other than cancer.

Other symptoms: Bladder cancers that have grown large enough may cause more symptoms, such as lower back pain or being unable to urinate.

Tests to find bladder cancer

If there is a reason to suspect you might have bladder cancer, the doctor will use one or more of the methods below to find out if the disease is really there.

Medical history and physical exam: Your doctor will ask you about your medical history to check for risk factors and learn more about your symptoms. If there is a tumor,

the doctor might check the rectum and vagina (in women) to help figure out how big it is and how far it may have spread. If the results of the exam are not normal, your doctor will likely refer you to a urologist (a doctor who treats problems of the urinary system) for further tests and treatment.

Cystoscopy: A cystoscope is a thin tube with a lens and a light on the end. The doctor puts it into the bladder through the urethra. The area may be numbed first, or drugs may be used to put you into a deep sleep. With the cystoscope the doctor can see the inside of the bladder. If there is anything that doesn't look normal, a small piece of tissue is removed (biopsied) and looked at under a microscope. (Read further for more about biopsies.)

Urine cytology: In this test, urine or cells "washed" from the bladder during cystoscopy are sent to the lab to see if cancer cells (or pre-cancer cells) are present. This test can help find some cancers, but it is not perfect. Not finding cancer on this test doesn't always mean you are cancer-free.

Urine culture: A sample of your urine is sent to the lab to see if germs grow in it, which can show if you have an infection. An infection can sometimes cause symptoms like those from bladder cancer. It may take a few days to get the results of this test.

Urine tumor marker tests: These tests look for certain substances released by cancer cells into the urine. Some doctors use these tests (along with cytology), but most think that cystoscopy is still the best way to find bladder cancer.

Biopsy: When a piece of tissue is removed to see if it contains cancer cells, the test is called a *biopsy*. Bladder biopsy samples are most often taken during cystoscopy.

This test can tell if bladder cancer is present, what type of cancer it is, and how deep it has grown into (invaded) the bladder wall. It's important for the doctor to know whether cancer cells have spread into the bladder's muscle layers.

Bladder cancers are given a grade based on how they look under the microscope. Low-grade cancers look more like normal tissue and tend to grow more slowly. A high grade means the cancer looks less like normal tissue and is more likely to spread outside the bladder. These cancers can be harder to treat.

If imaging tests (see the next section) suggest the cancer may have spread outside of the bladder, a biopsy is the only way to be sure. In some cases, biopsy samples of suspicious areas are taken during the surgery to remove the bladder cancer. Or a thin, hollow needle may be used to take a small piece of tissue from the abnormal area. This is known as a needle biopsy, and it allows the doctor to take samples without an operation.

Imaging tests

Imaging tests are done to allow your doctor to "see" your bladder and other organs. If you have bladder cancer, your doctor may order some of these tests to find out whether

the cancer has spread to tissues near the bladder, to nearby lymph nodes, or to distant organs.

Intravenous pyelogram (IVP): An IVP is an x-ray of the urinary system taken after putting a special dye into a vein. The dye passes into the ureters and bladder. This more clearly outlines these organs on x-rays and helps find tumors. Some people are allergic to the dye, so be sure to tell your doctor if you have any allergies or have ever had any reactions to x-ray dyes.

Retrograde pyelogram: For this test, a thin, flexible tube called a catheter is put through the urethra and up into the bladder or into a ureter. Then a dye is put through the catheter to make the lining of the bladder, ureters, and kidneys easier to see on x-rays. Like IVP, this test can be used to find tumors in the urinary tract.

Computed tomography (CT): The CT scan is a special kind of x-ray that gives detailed pictures of your insides. It can help find tumors in your bladder, kidneys, and other organs, as well as show any swollen lymph nodes that might contain cancer.

A CT scanner has been described as a large donut, with a narrow table in the “hole”. You will need to lie still on the table while the scan is being done. CT scans take longer than regular x-rays, and you might feel a bit confined by the ring while the pictures are being taken. CT scans take longer than regular x-rays, but newer, faster machines (called s*piral* or *helical* CTs) are now used in many medical centers.

Before any pictures are taken, you may be asked to drink a liquid dye that helps to better outline your organs. You may also need an IV line through which you will get a different kind of contrast dye. The dye can cause some redness and warm feeling. A few people are allergic to it and get hives. Rarely, people have more serious problems like trouble breathing and low blood pressure. Be sure to tell the doctor if you have ever had a reaction to any contrast dye used for x-rays.

CT scans can also be used to guide a biopsy needle into a tumor. This is not used to biopsy tumors within the bladder, but it might be used to take tissue samples from places where the cancer may have spread.

Magnetic resonance imaging (MRI): MRI scans can be used to look at the urinary system or to look for signs that the cancer has spread outside of the bladder into nearby tissues or lymph nodes.

This test is like a CT scan, but it uses strong magnets and radio waves instead of x-rays to make very detailed pictures. For some scans, a contrast material (dye) may be put into your vein to help show some structures better.

MRI scans take longer than CT scans–often up to an hour. Also, for most MRI scans you will be inside a tight tube-like machine. This can upset people with fear of enclosed spaces. If you are worried about this, talk to your doctor about it before the test. Newer, more open MRI machines can sometimes be used instead. The machine makes buzzing

and clicking noises that you may find annoying. Some places will give you earplugs to help block these noises out.

Ultrasound: Ultrasound uses sound waves to make pictures of your insides. It can help show the size of a bladder cancer and whether it has spread beyond the bladder. It can also be used to look at the kidneys.

This is an easy test to have. You simply lie on a table while a kind of wand is placed on the skin over the part of your body being looked at. No radiation is used. Ultrasound can also be used to guide a biopsy needle into an area where cancer may have spread.

Chest x-ray: A chest x-ray may be done to look for spread of bladder cancer to the lungs. This test is not needed if a CT scan of the chest has been done.

Bone scan: A bone scan can help look for cancer that has spread to bones. For this test, a small amount of a radioactive substance is put into a vein. This substance collects in areas of bone that are damaged. A scanner can spot these places and show them on a picture. Doctors don't usually order this test unless you have symptoms such as bone pain, or if blood tests show the cancer may have spread to the bones.

Staging of bladder cancer

The stage of a bladder cancer is a standard summary of how far it has spread. The stage of a cancer is important when choosing the best treatment. The stage can also help predict the patient's outlook (prognosis).

There are 2 types of stages for bladder cancer. The *clinical stage* is based the results of the physical exam, imaging tests, and biopsies. The clinical stage is used to help plan treatment. The *pathological stage* is based on the results of these tests plus the results of surgery to remove the bladder and nearby lymph nodes. Sometimes the cancer has spread further than the estimate of the clinical stage. Because the pathological stage is based on what was found at surgery, it more accurately predicts the patient's outlook for survival.

The stages of bladder cancer are usually labeled using Roman numerals 0 through IV (0-4). As a rule, the lower the number, the less the cancer has spread. A higher number, such as stage IV (4), means a more advanced cancer.

Be sure to ask your doctor to explain your stage in a way you understand. This will help you both decide on the best treatment for you.

Survival rates for bladder cancer

Some people with cancer may want to know the survival rates for their type of cancer. Others may not find the numbers helpful, or may even not want to know them. If you would rather not read the survival rates for bladder cancer, skip to the next section.

The 5-year survival rate refers to the percentage of patients who live at least 5 years after their cancer is found. Of course, many people live much longer than 5 years. Five-year *relative* survival rates assume that some people will die of other causes and compare the observed survival with that expected for people without the cancer. This is a better way to see the impact that cancer can have on survival.

To get 5-year survival rates, doctors have to look at people who were treated at least 5 years ago. Improvements in treatment since then may result in a better outlook for people now being diagnosed with bladder cancer.

The numbers below come from the National Cancer Institute's SEER database. They are based on thousands of patients diagnosed with bladder cancer from 1988 to 2001.

Stage	**Relative 5-year Survival Rate**
0	98%
I	88%
II	63%
III	46%
IV	15%

These numbers provide an overall picture, but keep in mind that every person's situation is unique and the statistics can't predict exactly what will happen in your case. Talk with your doctors if you have questions about your personal chances of a cure, or how long you might survive your cancer. They know your situation best.

How is bladder cancer treated?

This information represents the views of the doctors and nurses serving on the American Cancer Society's Cancer Information Database Editorial Board. These views are based on their interpretation of studies published in medical journals, as well as their own professional experience.

The treatment information in this document is not official policy of the Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor.

Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.

About treatment

There is a lot for you to think about when choosing the best way to treat or manage your cancer. There may be more than one treatment to choose from. You may feel that you need to make a decision quickly. But give yourself time to absorb the information you have learned. Talk to your doctor. Look at the list of questions in the section “What are some questions I can ask my doctor?” to get some ideas. Then add your own.

If time permits, you may want to get a second opinion about the best treatment option for you. Doing so can give you more information and help you feel better about the treatment plan you choose. You will want to weigh the benefits of each treatment against side effects and risks.

The main types of treatment for bladder cancer are:

- Surgery
- Intravesical therapy
- Chemotherapy
- Radiation therapy

Surgery, alone or along with other treatments, is used in nearly all cases.

You may have different types of doctors on your treatment team. The types of doctors who treat bladder cancers include:

- Urologists: surgeons who treat diseases of the urinary system
- Radiation oncologists: doctors who treat cancer with radiation
- Medical oncologists: doctors who treat cancer with medicines such as chemotherapy

Many other experts may be involved in your care as well, including nurse practitioners, nurses, psychologists, social workers, rehabilitation specialists, and others.

Surgery for bladder cancer

There are many kinds of surgery for bladder cancer. Some involve removing the whole bladder and others do not. The type of surgery depends on the stage of the cancer. The most common types of surgery are explained below.

Transurethral surgery

This operation is used for many early stage bladder cancers. Tumors in the bladder are removed using a slender tube with a lens and a light on the end that is put into the bladder

through the urethra. This tube is called a *resectoscope*. You will be in a deep sleep (under general anesthesia) or the lower part of your body will be numbed (regional anesthesia) for this. There is no need to cut into the belly (abdomen). After surgery, other things may be done to get rid of any remaining cancer. These could include burning the base of the tumor through a cystoscope or treatment with a laser.

The side effects of this surgery are often mild and do not usually last long. You might have some bleeding or mild pain right after surgery. You can usually go home the same day or the next day. In less than 2 weeks you should be able to go back to your normal activities.

This treatment usually works well, but bladder cancer still often returns in other parts of the bladder. If this surgery has to be done several times, long-term side effects may become a problem. There is a chance that the bladder can become scarred and not able to hold much urine. This means having to urinate often and the chance of losing control of your urine (incontinence).

In patients whose non-invasive, low-grade tumors tend to come back, the surgeon may sometimes just burn small tumors that are seen during cystoscopy (rather than taking them out). This can often be done using numbing medicine in the doctor's office. It is safe but can be somewhat uncomfortable.

Cystectomy

When bladder cancer is invasive (the cancer has spread beyond the layer of cells where it started and deeper into the bladder wall), all or part of the bladder may need to be removed. This operation is called a *cystectomy*.

When only part of the bladder is removed (along with part of the bladder wall), it is called a *partial cystectomy*. This surgery allows the person to keep part of the bladder, but they might have to go more often, and the cancer might come back in a different part of the bladder.

If the whole bladder is removed it is called a *radical cystectomy*. Nearby lymph nodes are also taken out. In men, the prostate is removed as well. In women, the womb (uterus), ovaries, fallopian tubes, and a small part of the vagina are often removed.

These surgeries are usually done through a cut in the belly (abdomen) to get to the bladder. In some cases, the surgery may be done through several smaller cuts using special long, thin instruments, one of which has a tiny video camera on the end. This is known as laparoscopic, or "keyhole" surgery.

For either operation, you will be given drugs to put you into a deep sleep. It is important that the surgeon doing this operation have experience in treating bladder cancer. If the surgery is not done well, the cancer is more likely to come back.

Reconstructive surgery: If the whole bladder is removed, you will need another way to store and remove urine. There are several ways to do this. These options can have a strong impact on how you feel about your body. You should talk to your doctors and nurses about any worries or concerns you might have when making these decisions.

One option is an *ileal conduit*. To do this, a short piece of the small intestine (bowel) is removed and used to connect the ureters to the skin of your belly though a small opening (called a *urostomy* or a *stoma*). A small bag is placed over the stoma to catch the urine. The bag needs to be emptied once it is full.

A second method is called a *continent diversion*. This does not require a bag outside the body. Instead, the surgeon creates a sac from a small piece of intestine and attaches the ureters to it. Urine is emptied when a drainage tube (catheter) is put into the hole (stoma) of the diversion.

Newer methods of surgery can route the urine back into the urethra by creating a new bladder (called a *neobladder*) out of a piece of intestine. This lets the patient urinate normally.

Possible side effects of surgery

Cystectomy is a major operation, and the complications and side effects can be serious. Short-term side effects of cystectomy could include problems from anesthesia, a lot of bleeding, blood clots, and infections. Most people will have some pain, which most often is helped by pain medicines.

Aside from changing how urine leaves the body, problems from having a urostomy could include wound infections, urine leaks (incontinence), pouch stones, and blocked urine flow. There can be an emotional impact as well. You can find more information in our document *Urostomy: A Guide*.

Sexual effects in men: After radical bladder surgery, a man no longer makes semen. So the orgasm will be “dry”– that is, there will not be any semen. Sperm cells are still made but they are reabsorbed into the body.

Many men have nerve damage that makes them unable to have an erection. Newer types of surgery may lower the chances of this problem, and sometimes the problem improves over time. As a rule, the younger a man is, the more likely he is to be able to have full erections. This is something men should talk to their doctors about before surgery.

To find out more about dealing with sexual issues, please see our document *Sexuality for the Man With Cancer*.

Sexual effects in women: A radical cystectomy often removes half of the vagina, which can make sex less comfortable for some women. Orgasms and lubrication may also be affected. You will want to talk with your doctor to learn how surgery is likely to affect your sex life. Most of the time intercourse is still possible. One option is to have the

vagina rebuilt. This is known as *vaginal reconstruction*. There is more than one way to do this, so talk with your doctor about the pros and cons of each.

Radical cystectomy can also affect a woman's ability to have an orgasm. During a cystectomy, the 2 nerve bundles that run along each side of the vagina can be damaged when the front of the vagina is removed. Women who have surgery that preserves these nerve bundles may have better sexual function after surgery than those whose nerve bundles are removed or cut. Talk with your doctor about whether these nerves can be left in place.

Another problem that can happen during radical cystectomy is that the doctor takes out the end of the urethra where it opens outside the body. This can make the clitoris lose a good deal of its blood supply and may affect some parts of sexual arousal. Talk with your doctor about whether the end of the urethra can be spared, and how that may affect your chances of normal clitoris function.

To learn more about ways to cope with these and other sexual issues, see our document *Sexuality for the Woman With Cancer*.

Sexual effects of urostomy: For both men and women, it is normal to be concerned about your sex life with a urostomy. Having your ostomy pouch fit right and emptying it before sex lowers the chances of a major leak. A pouch cover or small ostomy pouch can be worn with a sash to keep the pouch out of the way. Wearing a snug fitting shirt may work even better. To reduce rubbing against the pouch, choose positions for sex that keep your partner's weight off of it.

Intravesical therapy for bladder cancer

With intravesical treatment the doctor puts the drug right into the bladder rather than giving it by mouth or putting it into a vein. Drugs given this way mainly affect the cells lining the bladder, with little to no effect on cells elsewhere. For this reason, intravesical therapy is only used for some early stage bladder cancers.

Intravesical immunotherapy

Bacillus Calmette-Guerin therapy (BCG) is an example of immunotherapy that is useful for treating low-stage bladder cancer. BCG is a type of germ that is usually harmless. It is given right into the bladder through a thin, flexible tube called a catheter. The body's immune system cells are drawn to the bladder and attack the cancer. BCG is usually started a few weeks after a transurethral resection of the tumor and is given once a week for 6 weeks. Sometimes BCG is given long-term.

BCG treatment may cause flu-like symptoms (fever, chills, and tiredness) as well as a burning feeling in the bladder. A high fever (over 101.5° F) that does not get better when you take a pain reliever could mean a life-threatening spread of BCG throughout the

body. If this happens, you should call your doctor right away. These infections can be treated with antibiotics.

Interferons are substances normally made by the body to turn on the immune system. They can also be made in the lab and given as medicine in the intravesical treatment of bladder cancer. Other drugs are often given with the interferon to relieve common side effects such as muscle aches, bone pain, headaches, tiredness, nausea, and vomiting.

Intravesical chemotherapy

In this treatment, anti-cancer drugs are put into the bladder through a thin, flexible tube called a catheter. Drugs given this way reach cancer cells in the bladder lining without affecting cells elsewhere, which helps limit side effects.

The main side effects of intravesical chemotherapy are irritation and a burning feeling in the bladder.

Chemotherapy for bladder cancer

Chemotherapy (chemo) is the use of drugs to kill cancer cells. The drugs can be given in different ways. Often they are given into a vein or by mouth. Once the drugs enter the bloodstream, they spread throughout the body. Chemo is useful in treating cancer that has spread beyond the bladder to lymph nodes and other organs.

Chemo might be used to shrink a large tumor so it is easier to remove during surgery. When used this way it is called *neoadjuvant therapy* (giving the drugs *before* the local treatment). It can also be given after surgery or radiation to try to prevent the growth of stray cancer cells still in the body. This is called *adjuvant therapy*. It can lower the chance that the cancer will come back later.

Chemotherapy is often the main treatment for advanced cancers, such as those that have spread to distant parts of the body. Sometimes chemo is given along with radiation in order to help the radiation work better. This can increase the side effects of radiation.

Doctors give chemo in cycles, with each round of treatment followed by a rest period to allow the body time to recover. Each chemo cycle typically lasts for a few weeks.

While chemo for bladder cancer can be hard to endure, especially for older patients who have other medical problems, older age itself doesn’t mean that you can’t get chemo.

Side effects of chemo

While chemo drugs kill cancer cells, they also damage some normal cells and this can lead to side effects. These side effects depend on the type of drugs used, the amount taken, and the length of treatment. Short-term side effects might include:

- Nausea and vomiting
- Not feeling hungry
- Hair loss
- Mouth sores
- Diarrhea
- Greater chance of infection (from a shortage of white blood cells)
- Bleeding or bruising after minor cuts or injuries (from a shortage of blood platelets)
- Tiredness (from low red blood cell counts, called anemia)

Some chemo drugs can cause other, less common side effects. For example, some drugs can damage nerves, which can lead to pain, numbness, or burning or tingling in the hands and feet.

Most of these side effects go away over time when treatment ends. If you have any problems with side effects, be sure to tell your doctor or nurse, as there are often ways to help. To find out more about chemotherapy, please see our document, *Understanding Chemotherapy: A Guide for Patients and Families*.

Radiation therapy for bladder cancer

Radiation therapy is treatment with high-energy rays (such as x-rays) to kill cancer cells or shrink tumors. The type of radiation most often used to treat bladder cancer uses radiation from outside of the body on the cancer.

Before your treatments start, careful measurements will be done to decide on the correct angles for aiming the radiation beams and the proper dose of radiation. The treatment is much like getting an x-ray, but the dose is stronger. The treatment itself is painless and lasts only a few minutes, but the setup time – getting you into place for treatment – usually takes longer. Most often, radiation treatments are given 5 days a week for several weeks.

Radiation treatment can be used:

- As part of the treatment for early stage bladder cancer, after limited surgery
- As the main treatment for people with early stage cancers who can’t have surgery
- As part of the treatment for advanced bladder cancers
- To help prevent or treat symptoms caused by advanced bladder cancers

Radiation treatment is often combined with chemotherapy to help it work better.

Side effects of radiation

Side effects of radiation depend on the dose given and the place being treated. They tend to be worse if chemotherapy is given with the radiation. Side effects may include:

- Skin changes - ranging from redness to severe irritation with blistering
- Nausea and vomiting
- Bladder symptoms, like burning or pain with urination, feeling the need to go often, or blood in the urine
- Diarrhea
- Tiredness
- Low blood counts, which can lead to fatigue, easy bruising or bleeding, or increased risk of infection

These problems usually go away after treatment ends. Some people can have long-term side effects such as problems holding urine, blood in the urine, or pain when urinating. If you have any side effects, you should talk to your doctor. Often there are ways to help.

Clinical trials for bladder cancer

You may have had to make a lot of decisions since you've been told you have cancer. One of the most important decisions you will make is deciding which treatment is best for you. You may have heard about clinical trials being done for your type of cancer. Or maybe someone on your health care team has mentioned a clinical trial to you.

Clinical trials are carefully controlled research studies that are done with patients who volunteer for them. They are done to get a closer look at promising new treatments or procedures.

If you would like to take part in a clinical trial, you should start by asking your doctor if your clinic or hospital conducts clinical trials. You can also call our clinical trials matching service for a list of clinical trials that meet your medical needs. You can reach this service at 1-800-303-5691 or on our Web site at www.cancer.org/clinicaltrials. You can also get a list of current clinical trials by calling the National Cancer Institute's Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials Web site at www.cancer.gov/clinicaltrials.

There are requirements you must meet to take part in any clinical trial. If you do qualify for a clinical trial, it is up to you whether or not to enter (enroll in) it.

Clinical trials are one way to get state-of-the art cancer treatment. Sometimes they may be the only way to get some newer treatments. They are also the only way for doctors to learn better methods to treat cancer. Still, they are not right for everyone.

You can get a lot more information on clinical trials, in our document called *Clinical Trials: What You Need to Know*. You can read it on our Web site or call our toll-free number (1-800-227-2345) and have it sent to you.

Complementary and alternative therapies for bladder cancer

When you have cancer you are likely to hear about ways to treat your cancer or relieve symptoms that your doctor hasn't mentioned. Everyone from friends and family to Internet groups and Web sites may offer ideas for what might help you. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

What are complementary and alternative therapies?

It can be confusing because not everyone uses these terms the same way, and they are used to refer to many different methods. We use *complementary* to refer to treatments that are used *along with* your regular medical care. *Alternative* treatments are used *instead of* a doctor's medical treatment.

Complementary methods: Most complementary treatment methods are not offered as cures for cancer. Mainly, they are used to help you feel better. Some examples of methods that are used along with regular treatment are meditation to reduce stress, acupuncture to help relieve pain, or peppermint tea to relieve nausea. Some complementary methods are known to help, while others have not been tested. Some have been proven not to be helpful, and a few are even harmful.

Alternative treatments: Alternative treatments may be offered as cancer cures. These treatments have not been proven safe and effective in clinical trials. Some of these methods may be harmful, or have life-threatening side effects. But the biggest danger in most cases is that you may lose the chance to be helped by standard medical treatment. Delays or interruptions in your medical treatments may give the cancer more time to grow and make it less likely that treatment will help.

Finding out more

It is easy to see why people with cancer think about alternative methods. You want to do all you can to fight the cancer, and the idea of a treatment with few or no side effects sounds great. Sometimes medical treatments like chemotherapy can be hard to take, or they may no longer be working. But the truth is that most of these alternative methods have not been tested and proven to work in treating cancer.

As you think about your options, here are 3 important steps you can take:

- Look for “red flags” that suggest fraud. Does the method promise to cure all or most cancers? Are you told not to have regular medical treatments? Is the treatment a “secret” that requires you to visit certain providers or travel to another country?
- Talk to your doctor or nurse about any method you are thinking of using.
- Contact us at 1-800-227-2345 to learn more about complementary and alternative methods in general and to find out about the specific methods you are looking at.

The choice is yours

Decisions about how to treat or manage your cancer are always yours to make. If you want to use a non-standard treatment, learn all you can about the method and talk to your doctor about it. With good information and the support of your health care team, you may be able to safely use the methods that can help you while avoiding those that could be harmful.

What are some questions I can ask my doctor about bladder cancer?

As you cope with cancer and cancer treatment, you need to have honest, open talks with your doctor. You should feel free to ask any question that’s on your mind, no matter how small it might seem. Here are some questions you might want to ask. Be sure to add your own questions as you think of them. Nurses, social workers, and other members of the treatment team may also be able to answer many of your questions.

- Would you please write down the exact type of cancer I have?
- Do you think the cancer has spread beyond my bladder?
- What is the stage and grade of my cancer? What does that mean in my case?
- Are there other tests that need to be done before we can decide on treatment?
- Will I need to see other doctors?
- How much experience do you have treating this type of cancer?
- What treatment choices do I have? What do you recommend? Why?
- What is the goal of the treatment?
- How quickly do we need to decide on treatment?

- How long will treatment last? What will it involve? Where will it be done?
- What are the risks or side effects of different treatments?
- Will I be able to have children after my treatment?
- What are the chances of my cancer coming back with the treatment you suggest?
- Should I follow a special diet?
- What should I do to get ready for treatment?
- What would we do if the treatment doesn't work or if the cancer recurs?
- What type of follow-up will I need after treatment?

Add your own questions below:

Moving on after treatment for bladder cancer

For some people with bladder cancer, treatment may remove or destroy the cancer. Completing treatment can be both stressful and exciting. You may be relieved to finish treatment, but find it hard not to worry about cancer growing or coming back. (When cancer comes back after treatment, it is called *recurrence*.) This is a very common concern in people who have had cancer.

It may take a while before your fears lessen. But it may help to know that many cancer survivors have learned to live with this uncertainty and are living full lives. Our document, *Living With Uncertainty: The Fear of Cancer Recurrence* gives more detailed information on this.

For other people, the bladder cancer may never go away completely. These people may get regular treatments with chemotherapy, radiation, or other treatments to help keep the cancer in check. Learning to live with cancer as more of a chronic disease can be difficult and very stressful. It has its own type of uncertainty.

Follow-up care

If you have finished treatment, your doctors will still want to watch you closely. People who have had bladder cancer are at high risk of getting a second bladder cancer, so it is very important to go to all of your follow-up visits. Your doctors will ask questions about any problems you may have and may do exams, lab tests (such as urine cytology), and imaging tests. These tests are described in the section “How is bladder cancer found?”

In people with no signs of cancer left, most doctors will do repeat exams every 3 to 6 months to see if the cancer is growing back or if there is a new cancer within the urinary system. Your own schedule of exams and tests will depend on the extent and grade of the cancer when it was found, what treatments you’ve had, and other factors. Be sure to follow your doctor’s advice about follow-up tests. A typical follow-up plan includes urine cytology, a physical exam, imaging tests, and routine blood tests. If your bladder has not been removed, regular cystoscopy exams will be part of the plan as well. The time between doctor visits may be longer after a few years if no new cancers are seen.

Some doctors will order other lab tests as well. Many different kinds of urine tests can help see if the cancer is coming back, but so far none of these can take the place of cystoscopy.

Almost any cancer treatment can have side effects. Some may last for a few weeks or months, but others can last the rest of your life. Please tell your cancer care team about any symptoms or side effects that bother you so they can help you manage them. Use this time to ask your health care team questions and discuss any concerns you might have.

It is also important to keep health insurance. While you hope your cancer won’t come back, it could happen. If it does, you don’t want to have to worry about paying for treatment. Should your cancer come back, our document *When Your Cancer Comes Back: Cancer Recurrence* can help you manage and cope with this phase of your treatment.

For patients with a urostomy

If you have a urostomy, you may worry about even everyday activities at first. It’s normal to have worries and concerns when getting used to such as major change, but it’s important to know there are health care experts with special training to help people with their urostomies. They can teach you about the care of your urostomy and help you cope with the changes it brings. You can also ask the American Cancer Society about programs offering information and support near you. For more information, see our document, *Urostomy: A Guide*.

Seeing a new doctor

At some point after your cancer is found and treated, you may find yourself in the office of a new doctor. It is important that you be able to give your new doctor the exact details of your diagnosis and treatment. Gathering these details soon after treatment may be easier than trying to get them at some point in the future. Make sure you have this information handy and always keep copies for yourself:

- A copy of your pathology report from any biopsy or surgery
- Copies of imaging tests (CT or MRI scans, etc.), which can usually be stored on a CD, DVD, etc.
- If you had surgery, a copy of your operative report
- If you stayed in the hospital, a copy of the discharge summary that the doctor wrote when you were sent home from the hospital
- If you had radiation treatment, a summary of the type and dose of radiation and when and where it was given
- If you had chemotherapy or other treatments, a list of your drugs, drug doses, and when you took them

Lifestyle changes after bladder cancer

You can’t change the fact that you have had cancer. What you can change is how you live the rest of your life – making choices to help you stay healthy and feel as well as you can. This can be a time to look at your life in new ways. Maybe you are thinking about how to improve your health over the long term. Some people even start during cancer treatment.

Make healthier choices

For many people, finding out they have cancer helps them focus on their health in ways they may not have thought much about in the past. Are there things you could do that might make you healthier? Maybe you could try to eat better or get more exercise. Maybe you could cut down on the alcohol, or give up tobacco. Even things like keeping your stress level under control might help. Now is a good time to think about making changes that can have positive effects for the rest of your life. You will feel better and you will also be healthier.

You can start by working on those things that worry you most. Get help with those that are harder for you. For instance, if you are thinking about quitting smoking and need help, call the American Cancer Society at 1-800-227-2345.

Eating better

Eating right can be hard for most people, but it can get even tougher during and after cancer treatment. Treatment may change your sense of taste. Nausea can be a problem. You may not feel like eating and lose weight when you don't want to. Or you may have gained weight that you can't seem to lose. All of these things can be very hard to deal with.

If treatment caused weight changes or eating or taste problems, do the best you can and keep in mind that these problems usually get better over time. You may find it helps to eat small portions every 2 to 3 hours until you feel better. You may also want to ask your cancer team about seeing a dietitian, an expert in nutrition who can give you ideas on how to deal with these treatment side effects.

One of the best things you can do after cancer treatment is put healthy eating habits into place. You may be surprised at the long-term benefits of some simple changes, like increasing the variety of healthy foods you eat. Getting to and staying at a healthy weight, eating a healthy diet, and limiting your alcohol intake may lower your risk for a number of types of cancer, as well as having many other health benefits.

Rest, fatigue, and exercise

Feeling tired (fatigue) is a very common problem during and after cancer treatment. This is not a normal type of tiredness but a bone-weary exhaustion that doesn't get better with rest. For some people, fatigue lasts a long time after treatment and can keep them from staying active. But exercise can actually help reduce fatigue and the sense of depression that sometimes comes with feeling so tired.

If you are very tired, though, you will need to balance activity with rest. It is OK to rest when you need to. To learn more about fatigue, please see our document, *Fatigue in People With Cancer* and *Anemia in People With Cancer*.

If you were very ill or weren't able to do much during treatment, it is normal that your fitness, staying power, and muscle strength declined. You need to find an exercise plan that fits your own needs. An older person who has never exercised will not be able to do as much as a 20-year-old who plays tennis twice a week. If you haven't exercised in a few years, you will have to start slowly – maybe just by taking short walks. Talk with your health care team before starting. Get their input on your exercise plans. Then try to get an exercise buddy so that you're not doing it alone.

Exercise can improve your physical and emotional health.

- It improves your cardiovascular (heart and circulation) fitness.
- It makes your muscles stronger.

- It reduces fatigue.
- It can help lower anxiety and depression.
- It can make you feel generally happier.
- It helps you feel better about yourself.

Long term, we know that getting regular physical activity plays a role in helping to lower the risk of some cancers, as well as having other health benefits.

Can I lower my risk of the cancer growing or coming back?

Most people want to know if there are specific lifestyle changes they can make to reduce their risk of cancer growing or coming back. Unfortunately, for most cancers there is little solid evidence to guide people. This doesn't mean that nothing will help – it's just that for the most part this is an area that hasn't been well studied. Most studies have looked at lifestyle changes as ways of preventing cancer in the first place, not slowing it down or keeping it from coming back.

At this time, not enough is known about bladder cancer to say for sure if there are things you can do that will be helpful. Studies are now looking to see if certain vitamins, minerals, supplements, or medicines might lower the risk of bladder cancer returning (see "What's new in bladder cancer research and treatment?"). Healthy behaviors such as not smoking, eating well, and staying at a healthy weight may help, but no one knows for sure. But we do know that these types of changes can have good effects on your health that can extend beyond your risk of cancer.

How does having bladder cancer affect your emotional health?

During and after treatment, you may be surprised by the flood of emotions you go through. This happens to a lot of people.

You may find yourself thinking about death and dying. Or maybe you're more aware of the effect the cancer has on your family, friends, and career. You may take a new look at your relationships with those around you. Money may be a concern if medical bills pile up. You may see your health care team less often after treatment and have more time on your hands. These changes can make some people anxious.

This is a good time to look for emotional and social support. You need people you can turn to. Support can come in many forms: family, friends, cancer support groups, church or spiritual groups, online support groups, or private counselors.

The cancer journey can feel very lonely. You don't need to go it alone. Your friends and family may feel shut out if you decide not include them. Let them in – and let in anyone

else who you feel may help. If you aren't sure who can help, call your American Cancer Society at 1-800-227-2345 and we can put you in touch with a group or resource that may work for you.

You can't change the fact that you have had cancer. What you can change is how you live the rest of your life – making healthy choices and helping your body and mind feel well.

What if bladder cancer treatment is no longer working?

When a person has had many different treatments and the cancer has not been cured, over time the cancer tends to resist all treatment. At this time you may have to weigh the possible benefits of a new treatment against the downsides, like treatment side effects and clinic visits.

This is likely to be the hardest time in your battle with cancer – when you have tried everything within reason and it's just not working anymore. Your doctor may offer you new treatment, but you will need to talk about whether the treatment is likely to improve your health or change your outlook for survival.

No matter what you decide to do, it is important for you to feel as good as possible. Make sure you are asking for and getting treatment for pain, nausea, or any other problems you may have. This type of treatment is called *palliative care*. It helps relieve symptoms but is not meant to cure the cancer.

At some point you may want to think about hospice care. Most of the time it is given at home. Your cancer may be causing symptoms or problems that need to be treated. The focus of hospice is on your comfort. You should know that having hospice care doesn't mean you can't have treatment for the problems caused by your cancer or other health issues. It just means that the purpose of your care is to help you live life as fully as possible and to feel as well as you can. You can learn more about this in our document, *Hospice Care*.

Staying hopeful is important, too. Your hope for a cure may not be as bright, but there is still hope for good times with family and friends – times that are filled with joy and meaning. Pausing at this time in your cancer treatment gives you a chance to focus on the most important things in your life. Now is the time to do some things you've always wanted to do and to stop doing the things you no longer want to do. Though the cancer may be beyond your control, there are still choices you can make.

What's new in bladder cancer research?

Research into bladder cancer is being done right now in many hospitals, medical centers, and other institutions around the world.

Genetic changes in bladder cancer

Scientists have learned a lot about how cancer cells differ from normal cells. Some changes in the DNA of bladder cancers have been found. Now they are working to find out if the tests that find the DNA changes are useful in finding bladder cancers that come back after treatment. Other studies are aimed at deciding whether these tests can help predict the course of the disease. This information may be useful in choosing treatments.

Urine tests to look for bladder cancer

Several newer urine tests look for substances in the urine that might show that a person has bladder cancer. These tests are also used to look for cancer that has come back in people who have already been treated. Researchers are now looking to see if these tests might be helpful even earlier, to screen for bladder cancer in people without symptoms.

Reducing the risk of bladder cancer coming back

People who have had one bladder cancer that has been treated are at risk for having a new cancer in the urinary tract (the bladder, lining of the kidneys, ureters, and urethra). Studies are being done to see if certain foods, vitamins, minerals, supplements, or drugs could reduce the risk of a second cancer. Researchers are also looking for a vaccine to help lower the risk of a second cancer.

Bladder cancer treatments

Surgery

Some surgeons are using a newer approach to cystectomy in which they sit at a control panel in the operating room and move robotic arms to do the surgery. This approach, known as *robotic-assisted surgery*, lets the surgeon work through several small cuts (incisions) instead of one large one. This may help patients recover more quickly from surgery. This approach is being studied to see if it is as good as standard surgery.

Intravesical therapy

Researchers are looking at a number of new compounds to see if putting them into the bladder after surgery can help lower the risk of the cancer coming back. The hope is to find some that are better and/or safer than the drugs now used.

Photodynamic therapy (PDT)

PDT is a newer treatment method that that is now being studied to see if it is useful in treating early stages of bladder cancer. A chemical is put into the blood. It collects in the tumor over a few days. Then a special type of laser light is focused on the bladder lining through a cystoscope. This light changes the chemical so that it can kill cancer cells. One drawback is that this method only works for cancers near the surface of the bladder. The advantage is that PDT does very little harm to normal cells.

The main side effect of PDT is an intense sensitivity to the sun that can last for a few weeks. Even small amounts of sunlight can cause severe burns in a short time, so it is very important to be careful while getting this treatment.

Targeted therapies

Researchers are learning more about the parts of bladder cancer cells that control their growth and spread in order to develop new drugs called targeted therapies. These new drugs work differently from standard chemotherapy drugs. They may work in some cases when chemotherapy drugs do not, and they tend to have different (and often less severe) side effects. These drugs have been found to be useful in other cancers, such as lung cancer and colorectal cancer. Studies are being done to test some of these drugs against bladder cancer.

Some of these drugs target the blood vessels that allow tumors to grow. These are known as anti-angiogenesis drugs. They are now being studied for use against bladder cancer, usually along with chemotherapy.

Gene therapy

Gene therapy is another new method being tested for bladder cancer. One of these methods uses special viruses that have been changed in the lab. The changed virus is put into the bladder and infects the bladder cancer cells. When this happens, the virus puts a gene into the cancer cell that may help the immune system to attack it.

More information about bladder cancer

From your American Cancer Society

Here is more information you might find helpful. You also can order free copies of our documents from our toll-free number, 1-800-227-2345, or read them on our Web site, www.cancer.org.

Bladder Cancer: Detailed Guide (also in Spanish)

After Diagnosis: A Guide for Patients and Families (also in Spanish)

Caring for the Patient With Cancer at Home (also in Spanish)

Clinical Trials: What You Need to Know

Hair Dyes

Living With Uncertainty: The Fear of Cancer Recurrence

Pain Control (also in Spanish)

Questions About Smoking, Tobacco, and Health (also in Spanish)

Sexuality for the Man With Cancer (also in Spanish)

Sexuality for the Woman With Cancer (also in Spanish)

Understanding Cancer Surgery: A Guide for Patients and Families (also in Spanish)

Understanding Chemotherapy: A Guide for Patients and Families (also in Spanish)

Understanding Radiation Therapy (also in Spanish)

Urostomy

When Your Cancer Comes Back: Cancer Recurrence

Your American Cancer Society also has books that you might find helpful. Call us at 1-800-227-2345 or visit our bookstore online at cancer.org/bookstore to find out about costs or to place an order.

National organizations and Web sites*

Along with the American Cancer Society, other sources of information and support include:

Urology Care Foundation
Toll-free number: 1-800-828-7866
Web site: www.urologyhealth.org

Bladder Cancer Advocacy Network (BCAN)
Web site: www.bcan.org

Bladder Cancer Webcafe
Web site: www.blcwebcafe.org

National Cancer Institute
Toll-free number: 1-800-4-CANCER (1-800-422-6237)
Web site: www.cancer.gov

United Ostomy Associations of America, Inc. (UOAA)
Toll-free number: 1-800-826-0826
Web site: www.ostomy.org

International Ostomy Association
Web site: www.ostomyinternational.org

*Inclusion on this list does not imply endorsement by the American Cancer Society.

No matter who you are, we can help. Contact us anytime, day or night, for cancer-related information and support. Call us at 1-800-227-2345 or visit www.cancer.org.

Last Medical Review: 12/3/2012
Last Revised: 1/21/2013

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For additional assistance please contact your American Cancer Society
1-800-227-2345 or www.cancer.org