



# Gallbladder Cancer

## What is cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide, and die in an orderly fashion. 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 or dying cells or to repair injuries.

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 out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells continue to grow and form new, abnormal cells. Cancer cells can also invade (grow into) other tissues, something that normal cells cannot do. Growing out of control and invading other tissues are what makes a cell a cancer cell.

Cells become cancer cells because of damage to DNA. DNA is in every cell and directs all its actions. In a normal cell, when DNA gets damaged the cell either repairs the damage or the cell dies. In cancer cells, the damaged DNA is not repaired, but the cell doesn't die like it should. Instead, this cell goes on making new cells that the body does not need. These new cells will all have the same damaged DNA as the first cell does.

People can inherit damaged DNA, but most DNA damage is caused by mistakes that happen while the normal cell is reproducing or by something in our environment. Sometimes the cause of the DNA damage is something obvious, like cigarette smoking. But often no clear cause is found.

In most cases the cancer cells form a tumor. Some cancers, like leukemia, rarely form tumors. Instead, these cancer cells involve the blood and blood-forming organs and circulate through other tissues where they grow.

Cancer cells often travel to other parts of the body, where they begin to grow and form new tumors that replace normal tissue. This process is called metastasis. It happens when the cancer cells get into the bloodstream or lymph vessels of our body.

No matter where a cancer may spread, it is always named for the place where it started. For example, 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 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 particular kind of cancer.

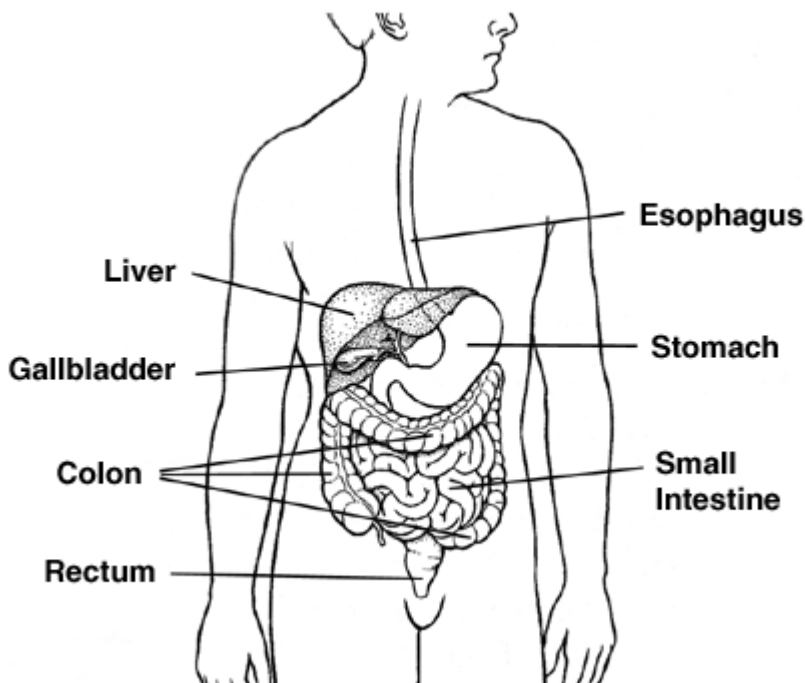
Not all tumors are cancerous. Tumors that aren't cancer are called benign. Benign tumors can cause problems -- they can grow very large and press on healthy organs and tissues. But they cannot grow into (invade) other tissues. Because they can't invade, they also can't spread to other parts of the body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

## What is gallbladder cancer?

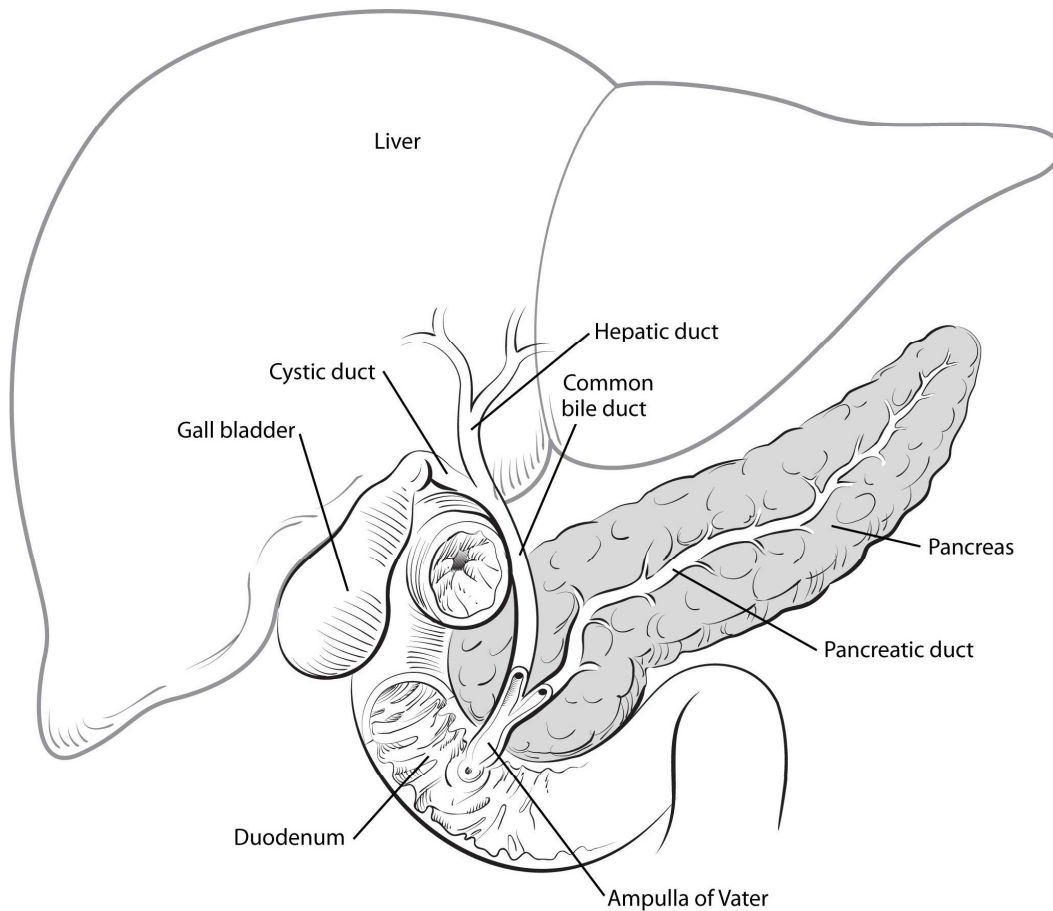
Gallbladder cancer is a cancer that starts in the gallbladder. To understand this cancer, it helps to know something about the normal structure and function of the gallbladder.

### About the gallbladder

The gallbladder is a small, pear-shaped organ under the right lobe of the liver. Both the liver and the gallbladder are behind the right lower ribs. The gallbladder is usually about 3 to 4 inches long and normally no wider than 1 inch.



The gallbladder concentrates and stores bile, a fluid made in the liver. Bile helps digest the fats in foods as they pass through the small intestine. Bile is either released from the liver directly into ducts that carry it to the small intestine, or stored in the gallbladder and released later. When food (especially fatty food) is being digested, the gallbladder contracts and releases bile through a small tube called the cystic duct. The cystic duct joins up with the hepatic duct, which comes from the liver, to form the common bile duct. The common bile duct joins with the main duct from the pancreas (the pancreatic duct) to empty into the duodenum (the first part of the small intestine).



The gallbladder is helpful, but you do not need it to live. Many people have their gallbladders removed and go on to live normal lives.

## Types of gallbladder cancers

About 9 out of 10 gallbladder cancers are adenocarcinomas. An adenocarcinoma is a cancer that starts in the cells with gland-like properties that line many internal and external surfaces of the body (including the inside the digestive system).

A type of gallbladder adenocarcinoma that deserves special mention is called *papillary adenocarcinoma* or just *papillary cancer*. These are gallbladder cancers whose cells are arranged in finger-like projections when seen under a microscope. In general, papillary cancers are not as likely to grow into the liver or nearby lymph nodes. They tend to have a better prognosis (outlook) than most other kinds of gallbladder adenocarcinomas. About 6% of all gallbladder cancers are papillary adenocarcinomas.

Other types of cancer can develop in the gallbladder, such as adenosquamous carcinomas, squamous cell carcinomas, small cell carcinomas, and sarcomas, but these are uncommon.

## What are the key statistics about gallbladder cancer?

The American Cancer Society's most recent estimates for cancer of the gallbladder and bile ducts in the United States are for 2012:

- About 9,810 new cases will be diagnosed: 4,480 in men and 5,330 in women
- About 3,200 people will die of these cancers: 1,240 men and 1,960 women

Of these new cases, more than half (about 60%, which is almost 6,000 cases) will be gallbladder cancers.

Gallbladder cancer is not usually found until it has become advanced and causes symptoms. Only about 1 out of 5 gallbladder cancers is found in the early stages, where the cancer has not yet spread beyond the gallbladder.

The chances of survival for patients with gallbladder cancer depend to a large extent on how advanced it is when it is found. For statistics on survival rates, see the section, "Survival statistics for gallbladder cancer by stage."

## What are the risk factors for gallbladder cancer?

A risk factor is anything that affects your chance of getting a disease such as cancer. Different cancers have different risk factors. For example, exposing skin to strong sunlight is a risk factor for skin cancer. Smoking is a risk factor for cancers of the lung, mouth, larynx (voice box), colon, bladder, kidney, and several other organs.

But risk factors don't tell us everything. Having a risk factor, or even several risk factors, does not necessarily mean that a person will get the disease. And many people who get the disease may not have any known risk factors.

Scientists have found several risk factors that make a person more likely to develop gallbladder cancer. Many of these are related in some way to chronic inflammation in the gallbladder.

## Gallstones

Gallstones are the most common risk factor for gallbladder cancer. Gallstones are hard, rock-like formations of cholesterol and other substances that form in the gallbladder and can cause chronic inflammation. At least 3 out of 4 people with gallbladder cancer have gallstones when they are diagnosed. Gallstones are a very common condition, but gallbladder cancer is quite rare, especially in the United States. Most people with gallstones never develop gallbladder cancer.

## Porcelain gallbladder

Porcelain gallbladder is a condition in which the wall of the gallbladder becomes covered with calcium deposits. It sometimes occurs after long-term inflammation of the gallbladder. People with this condition may have a higher risk of developing gallbladder cancer (possibly because both conditions can be related to inflammation). Still, not all studies have found such a link.

## Female gender

In the United States, gallbladder cancer occurs more than twice as often in women. Gallstones and gallbladder inflammation are the 2 important risk factors for gallbladder cancer and are also much more common in women than men.

## Obesity

Patients with gallbladder cancer are more often overweight or obese than people without this disease. Obesity is also a risk factor for gallstones, which may help explain this link.

## Older age

Gallbladder cancer can occur in younger people, but it's seen mainly in older people. The average age of people when they are diagnosed is 73. Almost 3 out of 4 people with gallbladder cancer are older than age 65 when it is found.

## Ethnicity and geography

In the United States, the risk of developing gallbladder cancer is highest among Mexican Americans and Native Americans. They are also more likely to have gallstones than members of other ethnic and racial groups. The risk is lowest among African Americans. Worldwide, gallbladder cancer is much more common in Asian, Eastern European, and South American countries than it is in the United States.

## Choledochal cysts

Choledochal cysts are bile-filled sacs that are connected to the common bile duct, the tube that carries bile from the liver and gallbladder to the small intestine. (*Choledochal*

means having to do with the common bile duct.) The cysts can grow over time and may contain as much as 1 to 2 quarts of bile. The cells lining the sac often have areas of pre-cancerous changes, which increase a person's risk for developing gallbladder cancer.

## Abnormalities of the bile ducts

The pancreas is another organ that releases fluids through a duct into the small intestine to help digestion. This duct normally meets up with the common bile duct just as it enters the small intestine. Some people have abnormalities where these ducts meet that allow juice from the pancreas to reflux (flow backward) into the bile ducts. This backward flow also prevents the bile from being emptied through the bile ducts as quickly as normal. People with these abnormalities are at higher risk of gallbladder cancer. Scientists are not sure whether the increased risk is due to the action of the pancreatic juice or possibly due to the ducts being exposed longer to damaging substances in the bile itself.

## Gallbladder polyps

A gallbladder polyp is a growth that bulges out from the surface of the inner gallbladder wall. Some polyps are formed by cholesterol deposits in the gallbladder wall. Others may be small tumors (either cancerous or benign) or may be caused by inflammation. Polyps larger than 1 centimeter (almost a half inch) are more likely to be cancerous, so doctors often advise removing the gallbladder in patients with gallbladder polyps that size or larger.

## Industrial and environmental chemicals

It is not clear if exposure to certain chemicals in the workplace or the environment increases the risk of gallbladder cancer. This is a difficult area to study because this cancer is not common. Some studies in lab animals have suggested that chemical compounds called nitrosamines may increase the risk of gallbladder cancer. Other studies have found that workers in the rubber and textile industries may have more gallbladder cancers than the general public. More research is needed in this area to confirm or refute these possible links.

## Typhoid

People chronically infected with salmonella (the bacterium that causes typhoid) and those who are carriers of the disease are more likely to develop gallbladder cancer than those not infected. But typhoid is rare in the United States.

## Family history

Most gallbladder cancers are not found in people with a family history of the disease. A history of gallbladder cancer in the family seems to increase a person's chances of developing this cancer, but the risk is still low because this is a rare disease.

# Do we know what causes gallbladder cancer?

Researchers have found several risk factors that make a person more likely to develop gallbladder cancer. (See the previous section, "What are the risk factors for gallbladder cancer?") They are also beginning to understand how some of these risk factors may lead to gallbladder cancer.

Most doctors studying the subject think that chronic inflammation is the major cause of gallbladder cancer. For example, when someone has gallstones, the gallbladder may release bile more slowly. This means that cells in the gallbladder are exposed to the chemicals in the bile for longer than usual. This could lead to irritation and inflammation.

In another example, abnormalities in the ducts that carry fluids from the gallbladder and pancreas to the small intestine can cause juices from the pancreas to flow backward (reflux) into the gallbladder and bile ducts. This reflux of pancreatic juices may irritate the cells lining the gallbladder and bile ducts in a way that causes inflammation. This may stimulate their growth, which in turn might increase the risk of cancer.

Scientists have begun to understand how risk factors such as inflammation may lead to certain changes in the DNA of cells, making them grow abnormally and form cancers. DNA is the chemical in each of our cells that makes up our genes (the instructions for how our cells function). We usually look like our parents because they are the source of our DNA. However, DNA affects more than how we look.

Some genes contain instructions for controlling when cells grow and divide. Genes that promote cell division are called *oncogenes*. Genes that slow down cell division or cause cells to die at the right time are called *tumor suppressor genes*. Cancers can be caused by DNA changes (mutations) that turn on oncogenes or turn off tumor suppressor genes. Changes in several different genes are usually needed for a cell to become cancerous.

Some people inherit DNA mutations from their parents that greatly increase their risk for certain cancers. But inherited gene mutations are not thought to cause very many gallbladder cancers.

Gene mutations related to gallbladder cancers are usually acquired during life rather than being inherited. For example, acquired changes in the gene for the tumor suppressor *p53* are found in most cases of gallbladder cancer. Other genes that may play a role in gallbladder cancers include *KRAS*, *BRAF*, *FHIT*, *CDKN2*, and *HER2*.

Many newer cancer drugs target cells with specific gene changes. Knowing which genes are abnormal in gallbladder cancer cells may help doctors determine which of these new drugs might be effective.

## **Can gallbladder cancer be prevented?**

There is no known way to prevent most cases of gallbladder cancer. Many of the known risk factors for gallbladder cancer, such as age, gender, ethnicity, and bile duct abnormalities, are beyond our control. But there are some things you can do that may lower your risk.

Maintaining a healthy weight is one important way a person may reduce their chances of developing gallbladder cancer, as well as several other cancers. The American Cancer Society recommends that people try to stay at a healthy weight throughout life by being physically active and eating a healthy diet, with mostly plant foods.

Since gallstones are a major risk factor, removing the gallbladders of all people with gallstones would prevent many of these cancers. But gallstones are very common, and gallbladder cancer is quite rare, even in people with gallstones. Most doctors don't recommend people with gallstones have their gallbladder removed unless they are having symptoms. This is because the possible risks and complications of surgery probably don't outweigh the possible benefit. Still, there are other reasons a doctor may recommend removing the gallbladder.

## **Can gallbladder cancer be found early?**

Because the gallbladder is located deep inside the body, early tumors cannot be seen or felt during routine physical exams. There are currently no blood tests or other tests that can reliably detect gallbladder cancers early enough to be useful as screening tests. (Screening is testing for cancer in people without any symptoms.) Without effective screening tests, most gallbladder cancers are found only when the cancer has grown enough to cause symptoms. (See the next section, "How is gallbladder cancer diagnosed?")

Still, about 1 out of 5 gallbladder cancers are found before they have spread to other tissues and organs. Many of these early cancers are found unexpectedly when a person's gallbladder is removed as treatment for gallstones. When the gallbladder is looked at in the lab after it is removed, small cancers or pre-cancers are sometimes found that did not cause any symptoms.

## **How is gallbladder cancer diagnosed?**

Some gallbladder cancers are found after a gallbladder has been removed to treat gallstones or chronic (long-term) gallbladder inflammation. Gallbladders removed for those reasons are always looked at under a microscope by a pathologist (a doctor specializing in lab tests) to see if they contain cancer cells.

Most gallbladder cancers, though, are not found until patients go to a doctor because they have symptoms.

## Signs and symptoms of gallbladder cancer

Signs and symptoms are usually not present until the later stages of gallbladder cancer, but in some cases they may lead to an early diagnosis. If you go to your doctor when you first notice symptoms, your cancer might be diagnosed at an earlier stage, when treatment may be more effective. Some of the most common symptoms of gallbladder cancer are:

### **Abdominal pain**

Most people with gallbladder cancer have abdominal (stomach area) pain when they are first diagnosed. Most often this is in the upper right part of the abdomen.

### **Nausea and/or vomiting**

At the time of their diagnosis, many people with gallbladder cancer report vomiting as a symptom.

### **Jaundice**

Jaundice is a condition that gives a yellowish color to the skin and the white part of the eyes. This can happen when bile from the liver is unable to drain into the intestines because the cancer blocks the bile duct. Bilirubin, a chemical in bile that gives it a yellow color, may build up in the blood and settle in different parts of the body. This can cause the color changes seen in the skin and eyes. Some patients with gallbladder cancer have jaundice when they are diagnosed.

### **Gallbladder enlargement**

If the cancer blocks the bile duct, bile can also build up in the gallbladder, making it larger than usual. The enlarged gallbladder can sometimes be felt by the doctor during a physical exam. It can also be detected by imaging tests such as ultrasound.

### **Other symptoms**

Less common symptoms include loss of appetite, weight loss, abdominal swelling, severe itching, and black, tarry stools.

These are the symptoms and signs of gallbladder cancer, but they are more likely to be caused by non-cancerous diseases. For example, people with gallstones also have many of these symptoms. There are many causes of abdominal pain that are far more common than gallbladder cancer. And viral hepatitis (infection of the liver) is a much more common cause of jaundice. Still, if you have any of these problems, it's important to see your doctor right away so the cause can be found and treated, if needed.

## Medical history and physical exam

If you have any signs or symptoms that suggest you might have gallbladder cancer, your doctor will want to take a complete medical history to check for risk factors and to learn more about your symptoms.

Your doctor will do a physical exam to look for signs of gallbladder cancer and other health problems. If gallbladder cancer is suspected, the exam will focus mostly on the abdomen to check for any masses, tenderness, or buildup of fluid. The skin and the white part of the eyes will be checked for jaundice (a yellowish color). Sometimes, cancer of the gallbladder spreads to lymph nodes, causing a lump that can be felt beneath the skin. Lymph nodes above the collarbone and in several other locations may be examined carefully.

If symptoms and/or the results of the physical exam suggest you might have gallbladder cancer, more involved tests will be done. These might include lab tests, imaging tests, and other procedures.

## Blood tests

### **Tests of liver and gallbladder function**

Your doctor may order lab tests to determine how much bilirubin is in the blood. Bilirubin is the chemical that gives the bile its yellow color. Problems in the gallbladder or liver may cause the level of bilirubin in the blood to get too high. When this happens the bilirubin can settle into other tissues, which can yellow the color of the skin and whites of the eyes (jaundice). A high bilirubin level tells the doctor that there may be either gallbladder or liver problems.

The doctor may also order tests for other substances in your blood, such as albumin, alkaline phosphatase, AST, ALT, and GGT, which can also be abnormal if you have liver or gallbladder disease.

### **Tumor markers**

CEA and CA 19-9 are tumor markers (proteins found in the blood when certain cancers are present). High levels of these substances are often (but not always) found in people with gallbladder cancer. Usually the blood levels of these markers are high only when the cancer is in an advanced stage. These markers are not specific for gallbladder cancer -- that is, other cancers or even some other health conditions can cause high levels.

## Imaging tests

Imaging tests use x-rays, magnetic fields, or sound waves to create pictures of the inside of your body. Imaging tests may be done for a number of reasons, including:

- To help find a suspicious area that might be cancerous

- To help a doctor guide a biopsy needle into a suspicious area to take a sample
- To learn how far cancer may have spread
- To help guide certain types of treatments
- To help determine if treatment has been effective
- To look for a possible recurrence of the cancer

People who have (or may have) gallbladder cancer may have one or more of the following tests.

## **Ultrasound**

Ultrasound (ultrasonography) is often the first imaging test done in people who have symptoms (such as jaundice or pain in the right upper part of their abdomen) that might be caused by gallbladder problems.

For this test, a small instrument called a transducer emits sound waves and picks up their echoes as they bounce off internal organs. The echoes are converted by a computer into a black-and-white image that is displayed on a video screen. The echoes produced by most tumors differ from those of normal tissue. The patterns of echoes can help find tumors and determine how far they may have grown into nearby areas.

This is an easy test to have done, and it uses no radiation. For a gallbladder ultrasound exam, you simply lie on a table while the doctor or ultrasound technician moves the transducer (which is shaped like a wand) along the skin over the right upper abdomen. Usually, the skin is first lubricated with gel.

**Endoscopic or laparoscopic ultrasound:** These techniques let the doctor to place the ultrasound transducer inside the body and closer to the gallbladder to produce more detailed images than a standard ultrasound. The transducer is on the end of a thin, lighted tube that has an attached viewing device (an endoscope or laparoscope). The tube is either passed through the mouth and down through the stomach and near the gallbladder area (endoscopic ultrasound) or through a surgical incision (cut) in the abdomen (belly) (laparoscopic ultrasound).

If there is a tumor, ultrasound may help the doctor tell if and how far it has invaded the gallbladder wall, which helps in planning for surgery. Ultrasound may be able to show if nearby lymph nodes are enlarged, which may be a sign that cancer has reached them. It may also be used to guide a needle into a suspicious node so that cells can be removed (biopsied) and viewed under a microscope.

## **Computed tomography (CT) scan**

The CT scan is an x-ray test that produces detailed cross-sectional images of your body. Instead of taking one picture, like a regular x-ray, a CT scanner takes many pictures as it rotates around you while you lie on a table. A computer then combines these into images of slices of the part of your body that is being studied.

Before any pictures are taken, you may be asked to drink 1 to 2 pints of a liquid called *oral contrast*. This helps outline the intestine so that certain areas are not mistaken for tumors. You may also receive an IV (intravenous) line through which a different kind of contrast dye (IV contrast) is injected. This helps better outline structures throughout your body.

The injection can cause some flushing (redness and warm feeling). Some people are allergic and get hives or, rarely, more serious reactions like trouble breathing and low blood pressure. Be sure to tell the doctor if you have any allergies or have ever had a reaction to any contrast material used for x-rays.

CT scans take longer than standard x-ray tests. You need to lie still on a table while the scan is being done. During the test, the table slides in and out of the scanner, a ring-shaped machine that completely surrounds the table. You might feel a bit confined by the ring you have to lie in while the pictures are being taken.

CT scans can have several uses:

- They are often used to help make the initial diagnosis of gallbladder cancer by showing tumors in the area.
- They can be helpful in staging the cancer (finding out how far it has spread). CT scans can show the organs near the gallbladder (especially the liver), as well as lymph nodes and distant organs the cancer might have spread to. A type of CT known as *CT angiography* can also be used to look at the blood vessels near the gallbladder. These tests can help determine if surgery is a good treatment option.
- CT scans can also be used to guide a biopsy needle precisely into a suspected tumor or metastasis. For this procedure, called a *CT-guided needle biopsy*, you remain on the CT scanning table, while a radiologist advances a biopsy needle through the skin and toward the location of the mass. CT scans are repeated until the needle is within the mass. A biopsy sample is then removed and looked at under a microscope.

## **Magnetic resonance imaging (MRI) scan**

Like CT scans, MRI scans provide detailed images of soft tissues in the body. But MRI scans use radio waves and strong magnets instead of x-rays. The energy from the radio waves is absorbed and then released in a pattern formed by the type of body tissue and by certain diseases. A computer translates the pattern into very detailed images of parts of the body. A contrast material called *gadolinium* may be injected into a vein before the scan to better see details.

MRI scans provide a great deal of detail and can be very helpful in looking at the gallbladder and nearby bile ducts and other organs. Sometimes they can help tell a benign tumor from a malignant one.

Special types of MRI scans can also be used in people who may have gallbladder cancer. MR cholangiopancreatography (MRCP), which can be used to look at the bile ducts, is

described below in the section on cholangiography. MR angiography (MRA), which looks at blood vessels, is mentioned below in the next section on cholangiography.

MRI scans may be a little more uncomfortable than CT scans. They take longer, often up to an hour. You may be placed inside a narrow tube, which is confining and can upset people with a fear of enclosed spaces. Newer, more open MRI machines can sometimes be used instead. The MRI machine also makes buzzing and clicking noises that might be disturbing. Some places will provide earplugs to help block this noise out.

## **Cholangiography**

A cholangiogram is an imaging test that looks specifically at the bile ducts to see if they are blocked, narrowed, or dilated. It can be used in people who may have gallbladder cancer to help plan surgery. There are several types of cholangiograms, which have different pros and cons.

**Magnetic resonance cholangiopancreatography (MRCP):** This is a non-invasive way to take images of the bile ducts using the same type of machine used for standard MRI scans. It does not require an IV infusion of a contrast agent and is not invasive, unlike other types of cholangiograms. Because it is non-invasive, doctors often use MRCP instead of these other tests if the purpose of the test is just to image the bile ducts.

**Endoscopic retrograde cholangiopancreatography (ERCP):** In this procedure, a doctor passes a long, flexible tube (endoscope) down the patient's throat, through the esophagus and stomach and into the first part of the small intestine. A small catheter (tube) is passed from the end of the endoscope and into the common bile duct. A small amount of contrast dye is injected through the tube to help outline the bile duct and pancreatic duct as x-rays are taken. The images can show narrowing or blockage of these ducts. This test is more invasive than MRCP, but the advantage is that the doctor can also take samples of cells or fluid to be look at under a microscope. ERCP can also be used to place a stent (a small tube) into a duct to help keep it open.

**Percutaneous transhepatic cholangiography (PTC):** In this procedure, the doctor places a thin, hollow needle through the skin of the abdomen and into a bile duct within the liver. You will get medicine through an IV line to make you sleepy before the test. A local anesthetic is also used to numb the area before inserting the needle. A contrast dye is then injected through the needle, and x-rays are taken as it passes through the bile ducts. As with ERCP, this approach can also be used to take samples of fluid or tissues or to place a stent into a duct to help keep it open. Because it is more invasive (and may cause more pain), PTC is not usually used unless ERCP has already been tried or can't be done for some reason.

## **Angiography**

Angiography is an x-ray test for looking at blood vessels. For this test, a small amount of contrast dye is injected into an artery to outline blood vessels while x-ray images are taken. The images allow the doctors to see if blood flow in an area is blocked or affected by a tumor, and they can show any abnormal blood vessels in the area. Angiography can

also show whether a gallbladder cancer has grown through the walls of certain blood vessels. This information is used to help surgeons decide whether a cancer can be removed and to help plan the operation.

Angiography can be uncomfortable because the radiologist who does the procedure has to put a small catheter (a flexible hollow tube) into the artery leading to the gallbladder to inject the dye. Usually the catheter is put into an artery in your inner thigh and threaded up into the artery supplying the gallbladder. A local anesthetic is often used to numb the area before inserting the catheter. Then the dye is injected quickly to outline all the vessels while the x-rays are being taken.

Angiography may also be done with a CT scanner (CT angiography) or an MRI scanner (MR angiography). These techniques are now used more often because they can give information about the blood vessels near the gallbladder without the need for a catheter in the artery. You may still need an IV line so that contrast dye can be injected into the bloodstream during the imaging.

## Laparoscopy

For laparoscopy, a doctor inserts a thin tube with a light and a small video camera on the end (a laparoscope) through a small incision (cut) in the front of the abdomen to look at the gallbladder, liver, and other organs. (Sometimes more than one cut is made.) This procedure is done in the operating room while you are under general anesthesia (in a deep sleep).

Laparoscopy can help in planning surgery or other treatments, and can help doctors confirm the stage (extent) of the cancer. If needed, doctors can also insert instruments through the incisions to remove biopsy samples, which are then looked at under a microscope to make or confirm the diagnosis of cancer.

Laparoscopy is often used to remove the gallbladder to treat gallstones or chronic inflammation of the gallbladder. This operation is called a *laparoscopic cholecystectomy*. If gallbladder cancer is found or suspected during that operation, surgeons usually convert the operation to an *open cholecystectomy* (removal of the gallbladder through a larger cut in the abdomen). The open method lets the surgeon see more and may lower the chance of releasing cancer cells into the abdominal cavity when the gallbladder is removed. The use of the open procedure depends on the size of the cancer and whether surgery can remove all the cancer.

## Biopsy

A biopsy procedure is the removal of a sample of tissue to be looked at under a microscope to see if cancer (or some other disease) is present. For most types of cancer, a biopsy is needed to diagnose cancer. Biopsies may also be used to help find out how far the cancer has spread. This is important when determining the best treatment options.

But when gallbladder cancer is likely, a biopsy may not always be done before surgery to remove the tumor. Doctors are often concerned that sticking a needle into the tumor or

otherwise disturbing it without completely removing it might allow cancer cells to spread to other areas.

If imaging tests (ultrasound, CT or MRI scans, cholangiography, etc.) suggest there is a tumor in the gallbladder and there are no obvious signs of distant spread, the doctor may decide to proceed directly to surgery and to treat it as a gallbladder cancer. (See the section, "Surgery for gallbladder cancer.") In these cases, the gallbladder tissue is looked at under a microscope after the gallbladder is removed.

In other cases, a doctor may feel that a biopsy of a suspicious area in the gallbladder is the best approach to know for certain that it is gallbladder cancer. For example, imaging tests may show that a tumor has spread or grown too large to be completely removed by surgery. Unfortunately, many gallbladder cancers are not removable by the time they are first found.

## **Types of biopsies**

There are several ways to take biopsy samples of the gallbladder.

If cholangiography (ERCP or PTC) is being done, a sample of bile may be collected during the procedure to look for cancer cells within the fluid.

As noted earlier, biopsy specimens can be taken during laparoscopy. This lets the doctor to view the surface of the gallbladder and nearby areas and take samples of suspicious areas.

If the cancer appears to be too advanced for surgery, a needle biopsy may be done to confirm the diagnosis, which may help guide treatment. For this test, a thin, hollow needle is inserted through the skin and into the tumor without making a surgical incision. (The skin is numbed first with a local anesthetic.) The needle is usually guided into place using ultrasound or CT scans. Then the needle is slowly moved forward while doctors check its position by viewing images from one of these imaging tests. When the images show that the needle is in the tumor, a sample is drawn into the needle and sent to the lab to be viewed under a microscope.

In most cases, this is done as a fine needle aspiration (FNA) biopsy, which uses a very thin needle attached to a syringe to suck out (aspirate) a sample of cells. If this isn't successful, a core needle biopsy, which uses a slightly larger needle to get a bigger sample, may be done. Doctors don't usually do a core needle biopsy first because it has a higher chance of spreading cancer cells.

## **How is gallbladder cancer staged?**

Staging is the process of finding out how far a cancer has spread. The stage of gallbladder cancer is one of the most important factors in selecting treatment options and estimating a patient's prognosis (outlook for recovery).

A staging system is a standard way for members of the cancer care team to describe the extent of a cancer's spread. The stage of a cancer is determined from the results of the physical exam, imaging tests (ultrasound, CT or MRI scan, etc.) and other tests, which are described in the section, "How is gallbladder cancer diagnosed?" and by the results of surgery if it has been done.

## The American Joint Committee on Cancer (AJCC) TNM system

The major system used to describe the stages of gallbladder cancer is the American Joint Committee on Cancer (AJCC) TNM system. This system is also used to stage cancers that start in the cystic duct (the tube that carries bile away from the gallbladder). This system is based on 3 key pieces of information:

- **T** describes how far the primary **tumor** has grown into the wall of the gallbladder and whether it has grown into other nearby organs or tissues.
- **N** describes whether the cancer has spread to nearby (regional) lymph **nodes** (bean-sized collections of immune system cells located throughout the body).
- **M** indicates whether the cancer has **metastasized** (spread) to other organs of the body. (The most common sites of gallbladder cancer spread are the liver, peritoneum [the lining of the abdominal cavity], and the lungs.)

Numbers or letters after T, N, and M provide more details about each of these factors:

- The numbers 0 through 4 indicate increasing severity.
- The letter X means "cannot be assessed" because the information is not available.

Nearly all gallbladder cancers begin in the tissue on the inside wall of the gallbladder. Over time they grow deeper into the gallbladder wall, pushing through the various layers toward the outside of the gallbladder.

The gallbladder wall has several layers. From the inside out, these are:

- The epithelium, a thin sheet of cells closest to the inside of the gallbladder
- The lamina propria, a thin layer of loose connective tissue (the epithelium plus the lamina propria form the mucosa)
- The muscularis, a layer of muscular tissue that helps the gallbladder contract, squirting its bile into the bile duct
- The perimuscular ("around the muscle") fibrous tissue, another layer of connective tissue
- The serosa, the outer covering of the gallbladder that comes from the peritoneum, which is the lining of the abdominal cavity

The tumor may grow to fill some or all of the space inside the gallbladder at the same time that it grows through the various layers of gallbladder in the opposite direction. If it

grows through the gallbladder wall, the tumor may invade nearby organs, such as the liver, by growing directly into those organs, or it may enter the lymphatic or blood vessels within the gallbladder wall and spread to lymph nodes, the liver, and other parts of the body.

## **T groups for gallbladder cancer**

**TX:** No description of the tumor's extent is possible because of incomplete information.

**T0:** No evidence of primary tumor.

**Tis:** Cancer cells are only found in the epithelium (the innermost layer of the gallbladder) and have not grown into (invaded) deeper layers of the gallbladder. This is also known as *carcinoma in situ*.

**T1:** The tumor has grown into the lamina propria or the muscle layer (muscularis).

- **T1a:** Tumor has grown into lamina propria.

- **T1b:** Tumor has grown into the muscularis.

**T2:** The tumor has grown into perimuscular fibrous tissue.

**T3:** The tumor has grown through the serosa (the outermost covering of the gallbladder) and/or it has grown from the gallbladder directly into the liver and/or one nearby structure such as the stomach, duodenum (first part of the small intestine), colon, pancreas, or bile ducts outside the liver.

**T4:** The tumor has grown into one of the main blood vessels leading into the liver (portal vein or hepatic artery) or it has grown into 2 or more organs outside of the liver.

Generally speaking, most doctors think T3 tumors are potentially resectable (removable by surgery), while T4 tumors are not. However, there may be other factors that affect whether surgery is a good treatment option in any given case.

## **N groups for gallbladder cancer**

**NX:** Regional (nearby) lymph nodes cannot be assessed.

**N0:** The cancer has not spread to regional lymph nodes.

**N1:** The cancer has spread to lymph nodes near the gallbladder, such as those along the cystic duct, common bile duct, hepatic artery, and portal vein.

**N2:** The cancer has spread lymph nodes in the abdomen that are further away from the gallbladder, such as the lymph nodes lying along the aorta (periaortic), the vena cava (pericaval), the superior mesenteric artery, and the celiac artery.

## **M groups for gallbladder cancer**

**M0:** The cancer has not spread to tissues or organs far away from the gallbladder.

**M1:** The cancer has spread to tissues or organs far away from the gallbladder.

## **TNM stage grouping for gallbladder cancer**

Once the T, N, and M categories have been determined, this information is combined in a process called *stage grouping*. The stage is expressed in Roman numerals from stage 0 (the least advanced) to stage IV (the most advanced). Some stages are subdivided with letters.

**Stage 0: Tis, N0, M0:** There is a small cancer only in the epithelial layer of the gallbladder. It has not spread outside of the gallbladder.

**Stage I: T1 (a or b), N0, M0:** The tumor has grown into the lamina propria (T1a) or the muscle layer (T1b). It has not spread outside of the gallbladder.

**Stage II: T2, N0, M0:** The tumor has grown into the perimuscular fibrous tissue (T2). It has not spread outside of the gallbladder.

**Stage IIIA: T3, N0, M0:** The tumor extends through the serosa layer and/or directly grows into the liver and/or one other nearby structure (T3). It has not spread to lymph nodes or to tissues or organs far away from the gallbladder.

**Stage IIIB: T1 to T3, N1, M0:** The tumor has spread to nearby lymph nodes (N1), but it has *not* invaded the main blood vessels leading into the liver or reached more than one nearby organ other than the liver. It has not spread to tissues or organs far away from the gallbladder.

**Stage IVA: T4, N0 or N1, M0:** The tumor invades the main blood vessels leading into the liver or has reached more than one nearby organ other than the liver (T4). It may or may not have spread to nearby lymph nodes. It has not spread to tissues or organs far away from the gallbladder.

**Stage IVB:** Either of the following is true:

**Any T, N2, M0:** The main tumor may or may not have grown outside the gallbladder. It has spread to lymph nodes further away from the gallbladder (N2). It has not spread to tissues or organs far away from the gallbladder.

**OR**

**Any T, any N, M1:** The main tumor may or may not have grown outside the gallbladder. It may or may not have spread to lymph nodes. The tumor has spread to tissues or organs far away from the gallbladder (M1).

## **Grading gallbladder cancer**

Another factor that can affect the patient's outlook (prognosis) is the grade of the cancer. The grade describes how closely the cancer resembles normal gallbladder tissue when looked at under a microscope.

The scale used for grading gallbladder cancers goes from G1 (where the cancer looks much like normal gallbladder tissue) to G4 (where the cancer looks very abnormal). The grades G2 and G3 fall somewhere in between.

Typically, low-grade cancers are less likely to grow and spread quickly than high-grade cancers, and tend to have a more favorable outlook. Intermediate grade cancers have an appearance and prognosis between that of low- and high-grade cancers.

## Survival statistics for gallbladder cancer, by stage

Survival rates are often used by doctors as a standard way of discussing a person's prognosis (outlook). Some patients may want to know the survival statistics for people in similar situations, while others may not find the numbers helpful, or may even not want to know them. If you decide you don't want to know them, stop reading here and 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 diagnosed. Of course, many of these people live much longer than 5 years and all of their deaths may not be caused by gallbladder cancer. These survival rates do not take other causes of death into account.

In order to get 5-year survival rates, doctors have to look at people who were treated at least 5 years ago. Although the numbers below are among the most current we have available, improvements in treatment since then may result in a more favorable outlook for people now being diagnosed with gallbladder cancer.

Survival rates are often based on previous outcomes of large numbers of people who had the disease, but they cannot predict what will happen in any particular person's case. Knowing the type and the stage of a person's cancer is important in estimating their outlook. But many other factors may also affect a person's outlook, such as how well the cancer responds to treatment and a person's age and overall health. Even when taking these other factors into account, survival rates are at best rough estimates. Your doctor can tell you if the numbers below may apply, as he or she is familiar with the aspects of your particular situation.

The numbers below come from the American College of Surgeons/American Cancer Society National Cancer Data Base and are based on more than 10,000 patients diagnosed with gallbladder cancer from 1989 to 1996.

<b>Stage</b>	<b>5-Year Survival Rate</b>
0	80%
I	50%
II	28%

IIIA	8%
IIIB	7%
IVA	4%
IVB	2%

## How is gallbladder 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.*

### Making treatment decisions

After gallbladder cancer is found and staged, your cancer care team will discuss your treatment options with you. This team may include a surgeon, a radiation oncologist, a medical oncologist, and other health professionals.

It is important for you to take time to think about your choices. In choosing a treatment plan, factors to consider include the type and stage of the cancer, the possible side effects of treatment, your overall health, and the chances of curing the disease, extending life, or relieving symptoms.

If time permits, it is often a good idea to seek a second opinion, particularly for an uncommon cancer such as gallbladder cancer. A second opinion can provide more information and help you feel more confident about your chosen treatment plan.

A second opinion may be especially important if surgery may be an option to treat the cancer. Nearly all doctors agree that surgery offers the only real chance for curing people with gallbladder cancer. But there are differences of opinion about how advanced a gallbladder cancer can be and still be treatable with surgery. The surgery needed for gallbladder cancer is often complex and requires an experienced surgeon. These operations are most often done at major cancer centers and may not be available in every community.

In general, some cancers that have not spread far beyond the gallbladder may still be treatable by surgery, unless the cancer has spread into major blood vessels. For instance, if the cancer has only invaded the liver in one area and not too deeply, it may be possible to remove all of the cancer by surgery. On the other hand, if the cancer has spread to both

sides of the liver, to the lining of the abdominal cavity, to organs far away from the gallbladder, or if it surrounds a major blood vessel, surgery is unlikely to remove it all.

For cancers that can't be treated with surgery, other options may include radiation therapy, chemotherapy, or other treatments to try to slow the growth of the cancer or relieve symptoms.

## Surgery for gallbladder cancer

There are 2 general types of surgical treatment for cancer of the gallbladder: potentially curative surgery and palliative surgery.

Potentially curative surgery is done when imaging tests or the results of earlier surgeries show there is a good chance that the surgeon will be able to remove all of the cancer. Doctors may use the term *resectable* to describe cancers they believe can be removed completely by surgery and *unresectable* to describe those that have spread too far or are in too difficult a place to be entirely removed by surgery. Unfortunately, only a small portion of gallbladder cancers are resectable when they are first found.

Palliative surgery may be done to relieve pain or prevent complications, such as blockage of the bile ducts, if the tumor is too widespread to be completely removed. Palliative surgery is not expected to cure the cancer, but it can sometimes help relieve symptoms and/or prolong a person's life. Palliative surgery is described in more detail in the section, "Palliative therapy for gallbladder cancer."

Surgery to remove gallbladder cancer can have significant side effects and, depending on how extensive it is, may require several weeks for recovery. Patients whose cancer is not curable may want to carefully weigh the pros and cons of surgery or treatments that require significant recovery time. It is very important to understand the goal of any surgery for gallbladder cancer, what the possible benefits and risks are, and how the surgery is likely to affect your quality of life.

### Staging laparoscopy

Often, when gallbladder cancer is suspected, the surgeon will do a laparoscopy before any other surgery. This is done to help determine the extent of the cancer and whether it may be resectable or not. Laparoscopy may let the surgeon see areas of cancer that were not detected with imaging tests.

In this procedure, a small cut is made so that a long, lighted tube called a laparoscope can be inserted into the abdomen. The doctor uses the laparoscope to look around the abdominal cavity for signs of cancer spread. If the cancer is resectable, laparoscopy can also help in planning the operation to remove it.

### Cholecystectomy (simple cholecystectomy)

The operation to remove the gallbladder is called a *cholecystectomy*. If only the gallbladder is removed, the operation may be called *simple cholecystectomy*.

This operation is often used to remove the gallbladder for other reasons such as gallstones, but it is not done if gallbladder cancer is known or suspected (a more extensive operation is done instead).

Gallbladder cancers are sometimes found incidentally (by accident) after a person has a cholecystectomy for another reason, such as gallstones. If the cancer is found to be at a very early stage (T1a) and is thought to have been completely removed, no further surgery may be needed. If there's a chance the cancer may have spread beyond the gallbladder, more extensive surgery may be advised.

A simple cholecystectomy can be done in 2 ways:

**Laparoscopic cholecystectomy:** This is the most common way to remove a gallbladder for non-cancerous problems, such as gallstones. This method uses a laparoscope, a thin, flexible tube with a tiny video camera on the end that is inserted through a small cut in the skin of the patient's abdomen. Long surgical tools are placed through several other small openings to remove the gallbladder.

Laparoscopic surgery tends to be easier for patients because of the smaller incision size. But this type of operation is not used if gallbladder cancer is suspected. This surgery offers the surgeon only a limited view of the area around the gallbladder, so there is a greater chance that some cancer might be missed and left behind. It may also lead to the accidental spread of the cancer to other parts the body.

**Open cholecystectomy:** In this approach, the surgeon removes the gallbladder through a large incision (cut) in the abdominal wall. This method is sometimes used if a non-cancerous gallbladder problem is suspected (such as gallstones), which in some cases may lead to the discovery of gallbladder cancer. But if gallbladder cancer is suspected before surgery, doctors prefer to do an extended cholecystectomy.

### **Extended (radical) cholecystectomy**

Because of the risk that the cancer will come back if just the gallbladder is removed, a more extensive operation, known as an extended (or radical) cholecystectomy, is done in most cases of gallbladder cancer. This can be an involved, complex operation, and it is best done by a surgeon who is experienced in treating gallbladder cancer.

The extent of the surgery depends on where the cancer is located and how far it might have spread. At a minimum, an extended cholecystectomy removes:

- The gallbladder
- About an inch or more of liver tissue next to the gallbladder
- All of the lymph nodes in the region

If the surgeon feels it is needed and the patient is healthy enough, the operation may also include one or more of the following:

- Removing more of the liver, ranging from a wedge-shaped section of the liver close to the gallbladder (*wedge resection*) to a whole lobe of the liver (*hepatic lobectomy*)
- Removing the common bile duct
- Removing part or all of the ligament that runs between the liver and the intestines
- Removing lymph nodes around the pancreas, around the major blood vessels leading to the liver (the portal vein and hepatic artery), and around the artery that brings blood to most of the small intestine and to the pancreas
- Removing the pancreas
- Removing the duodenum (the first part of the small intestine into which the bile duct drains)
- Removing any other areas of organs to which cancer has spread

### **Possible risks and side effects**

The risks and side effects of surgery depend in large part on how much tissue is removed and a person's general health before the surgery. All surgery carries some risk, including the possibility of bleeding, infections, complications from anesthesia, and pneumonia.

Laparoscopic cholecystectomy is the least invasive operation and tends to have fewer side effects. Most people will have at least some pain from the incisions for a few days after the operation, although this can usually be controlled with medicines if needed. The incision is larger for an open cholecystectomy, so there is usually more pain and a longer recovery time.

Extended cholecystectomy is a major operation that may involve removing parts of several organs. This can have a significant effect on a person's recovery and health after the surgery. Because most of the organs are involved in digestion, eating problems may be a concern for some time after surgery. Your doctor or nurse will discuss the possible side effects with you in more detail before your surgery.

For more general information about surgery, please see our document, *Surgery*.

### **Radiation therapy for gallbladder cancer**

Radiation therapy uses high-energy rays (such as x-rays) or atomic particles to destroy cancer cells. There are different kinds of radiation therapy.

- External-beam radiation therapy (EBRT) uses x-rays or particles from a machine outside the patient's body to kill cancer cells.
- Brachytherapy (internal radiation therapy) uses small pellets of radioactive material placed next to or directly into the cancer.

External beam radiation therapy is the most common form of radiation therapy for gallbladder cancer. The treatment is much like getting an x-ray, but the radiation is more intense. The procedure itself is painless. Before your treatments start, the radiation team will take careful measurements to determine the correct angles for aiming the radiation beams and the proper dose of radiation. Each treatment 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.

Standard (conventional) EBRT is used much less often than in the past. With newer techniques, doctors can more accurately treat gallbladder cancers while reducing the radiation exposure to nearby healthy tissues. This may offer a better chance of increasing the success rate and reducing side effects.

**Three-dimensional conformal radiation therapy (3D-CRT):** 3D-CRT is a type of external beam radiation therapy that uses special computers to precisely map the location of the tumor(s). Radiation beams are shaped and aimed at the tumor(s) from several directions, which makes it less likely to damage normal tissues. Most doctors now recommend using 3D-CRT when it is available.

## Uses of radiation therapy

Radiation therapy may be used in several ways to treat gallbladder cancer.

**After surgery has removed the cancer:** Radiation may be used to try to kill any cancer that might have been left after surgery but was too small to see. This is known as *adjuvant therapy*. Radiation therapy is often given along with a chemotherapy drugs such as 5-fluorouracil (5-FU) or capecitabine, which may make the radiation more effective. Giving chemotherapy and radiation together is called *chemoradiation*. Some studies have shown that giving chemoradiation after surgery may help patients live longer, especially those whose cancer had spread to lymph nodes.

**As part of the main therapy for some advanced cancers:** Radiation therapy can also be used as a main therapy for some patients whose cancer is not resectable but has not spread widely throughout the body. Most often it is given along with chemotherapy (chemoradiation). The treatment in this case does not cure the cancer, but it may help patients live longer. More research is needed to find out how useful such therapy is and to figure out the best way to give it.

**As palliative therapy:** Radiation therapy is often used to help relieve symptoms if the cancer is too advanced to be cured. It may be used to relieve pain or other symptoms by shrinking tumors that are blocking passageways for blood or bile, or are pressing on nerves. Doctors generally agree that palliative radiation therapy for gallbladder cancer is useful.

## Possible side effects of radiation therapy

Side effects of external radiation therapy might include sunburn-like skin problems where the radiation enters the body, nausea, vomiting, diarrhea, and fatigue. Often these go

away after treatment. When radiation is given with chemotherapy, the side effects are often worse.

For more general information about radiation therapy, please see our document, *Understanding Radiation Therapy: A Guide for Patients and Families*.

## Chemotherapy for gallbladder cancer

Chemotherapy (chemo) is treatment with anti-cancer drugs that are usually given into a vein or by mouth. These drugs enter the bloodstream and reach all areas of the body, making this treatment useful for cancers that have spread outside the organs where they started. Chemotherapy may help some people with gallbladder cancer, but most studies have found its effectiveness against this type of cancer is limited.

For gallbladder cancers that are resectable, chemotherapy may be used after surgery (often along with radiation therapy) to try to lower the risk that the cancer will return. This is called *adjuvant treatment*. Doctors aren't yet sure how useful it is in the treatment of gallbladder cancer.

Chemotherapy may also be used (with or without radiation therapy) for more advanced cancers. Chemotherapy does not cure these cancers, but it may help shrink or slow the growth of tumors for a time. This may help relieve symptoms from the cancer, and may help people live longer.

Doctors give chemotherapy in cycles, with each period of treatment followed by a rest period to allow the body time to recover. Chemotherapy cycles generally last about 3 to 4 weeks. Chemotherapy is often not recommended for patients in poor health, but advanced age by itself is not a barrier to getting chemotherapy.

**Hepatic artery infusion:** Because the chemotherapy given into a vein is not always helpful, doctors have studied giving it a different way – directly into the hepatic artery. This is called hepatic artery infusion or HAI. Since the hepatic artery supplies most gallbladder tumors, more chemo goes to the tumor. The healthy liver then removes most of the remaining drug before it can reach the rest of the body. This can lessen the chemo side effects. HAI may help some people whose cancer was not removable by surgery to live longer, but more research is needed. This technique may not be useful in some patients because it often requires surgery to insert a catheter into the hepatic artery, an operation that many gallbladder cancer patients may not tolerate well.

## Drugs used to treat gallbladder cancer

Several drugs can be used to treat gallbladder cancer. The drugs most often used for gallbladder cancer include:

- Gemcitabine (Gemzar®)
- Cisplatin (Platinol®)
- 5-fluorouracil (5-FU)

- Capecitabine (Xeloda®)
- Oxaliplatin (Eloxatin®)

In some cases, 2 of these drugs may be combined to try to make them more effective. For example, one study found that combining gemcitabine and cisplatin may help people live longer than getting just gemcitabine alone. When chemo is given with radiation, most often 5-FU or capecitabine is used.

## **Possible side effects**

Chemotherapy drugs work by attacking cells that are dividing quickly, which is why they work against cancer cells. But other cells in the body, such as those in the bone marrow, the lining of the mouth and intestines, and the hair follicles, also divide quickly. These cells are also likely to be affected by chemotherapy, which can lead to side effects.

The side effects of chemotherapy depend on the type and dose of drugs given and the length of time they are taken. These side effects can include:

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea
- Increased chance of infections (from low white blood cell counts)
- Easy bruising or bleeding (from low blood platelet counts)
- Fatigue (from low red blood cell counts)

These side effects are usually short-term and go away after treatment is finished. There are often ways to lessen these side effects. For example, drugs can be given to help prevent or reduce nausea and vomiting. Be sure to ask your doctor or nurse about medicines to help reduce side effects.

Along with the possible side effects above, some drugs may have their own specific side effects. For example, cisplatin and oxaliplatin can damage nerves (called *neuropathy*). This can cause numbness, tingling, weakness, and sensitivity to cold or heat, especially in the hands and feet. This goes away in most patients after treatment stops, but in some cases the effects can be long lasting. For more information, see our document, *Peripheral Neuropathy Caused by Chemotherapy*.

You should report any side effects you notice while getting chemotherapy to your medical team so that they can be treated promptly. In some cases, the doses of the chemotherapy drugs may need to be reduced or treatment might need to be delayed or stopped to prevent the effects from getting worse.

For more general information about chemotherapy, please see our document, *Understanding Chemotherapy: A Guide for Patients and Families*.

## Palliative therapy for gallbladder cancer

Palliative therapy is treatment given to help control or reduce symptoms caused by advanced cancer. It does not try to cure the cancer. If the cancer has spread too far to be completely removed by surgery, doctors may advise palliative operations, palliative radiation, or other palliative therapies to help make you feel better or to help prevent possible complications from the cancer. Because gallbladder cancers tend to advance quickly, doctors try to use palliative therapies that are less likely to have negative effects on a person's quality of life, when possible.

### **Biliary stent or biliary catheter**

If cancer is blocking a duct that carries bile from the gallbladder to the small intestine, it can lead to jaundice and other problems. The doctor may insert a small tube (either a *stent* or a *catheter*) into the bile duct or the gallbladder to help the bile drain out. This may be done as part of a cholangiography procedure such as percutaneous transhepatic cholangiography or endoscopic retrograde cholangiopancreatography (see the section, "How is gallbladder cancer diagnosed?") or, in some cases, surgically.

- A stent is a small metal or plastic tube that keeps the duct open to allow the bile to drain into the small intestine.
- A catheter is a thin, flexible tube that drains into a bag outside the body through a small hole in the skin of the abdomen. The bag can be emptied when needed. If you have a catheter, your doctor or nurse will teach you how to care for it.

The stent or catheter may need to be replaced every few months to reduce the risk of it becoming blocked, which could lead to jaundice or gallbladder inflammation.

### **Biliary bypass**

In people who are healthy enough, another option to allow bile to drain from the liver and gallbladder is to use a surgery called *biliary bypass*. This operation creates a new way for bile to get past the blockage in the bile ducts caused by the cancer.

There are several different biliary bypass operations, and the decision on which one to use is based on the location of the blockage.

- A *choledochojejunostomy* joins the common bile duct to the jejunum (the second part of the small intestine).
- A *gastrojejunostomy* joins the stomach directly to the jejunum.
- A *hepaticojejunostomy* joins the duct that carries bile from the liver to the jejunum of the small intestine.

Sometimes these operations can be done through several small holes made in the abdomen using special long surgical tools. This is known as *laparoscopic* or *keyhole surgery*. Still, a biliary bypass can be a major operation, so it is important that you are healthy enough to withstand it and that you talk with your doctor about the possible benefits and risks before you have the surgery.

## **Alcohol injection**

To relieve pain, doctors may deaden the nerves that carry sensations of pain from the gallbladder and intestinal area to the brain by injecting these nerves with alcohol. This can be done during surgery or by guiding a long, hollow needle into place with the help of a CT scan.

## **Pain medicines**

Doctors can prescribe strong pain-relieving drugs if needed. Some people with cancer may hesitate to use narcotic drugs such as morphine for fear of being sleepy all the time or becoming addicted to them. But many people get very effective pain relief from these medicines without serious side effects. It's very important to let your cancer care team know if you are having pain so that it can be treated effectively.

## **Clinical trials for gallbladder 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 choosing 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](http://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](http://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. They are 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 gallbladder 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 exactly are complementary and alternative therapies?

Not everyone uses these terms the same way, and they are used to refer to many different methods, so it can be confusing. 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 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 have even been found 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 pose danger, 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 consider 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 about 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.

## **Treatment options based on the extent of gallbladder cancer**

The extent of a gallbladder cancer is an important factor in determining treatment options. Doctors use the TNM system to formally stage the cancer (as described in "How is gallbladder cancer staged?"). But for treatment purposes, doctors generally divide gallbladder cancers into 2 groups:

- **Resectable cancers** are those that doctors believe can be removed completely by surgery, based on the results of imaging tests and other tests.
- **Unresectable cancers** have spread too far or are in too difficult a place to be entirely removed by surgery.

In general, stage I and II cancers and some stage III cancers are resectable, but other factors, such as whether a person is healthy enough for surgery, may affect whether it is a good option.

How the cancer is discovered may also affect treatment options. For example, some cancers may be found on imaging tests before surgery, while others may be discovered only after surgery has been done to treat another condition such as gallstones.

If gallbladder cancer is suspected or diagnosed, it is a good idea to be seen by a surgeon with experience treating this type of cancer. Since gallbladder cancer is uncommon, not all surgeons are skilled at the more extensive operations needed to treat this cancer.

No matter what stage the cancer is, it's very important that you understand the goal of treatment before it starts – whether it is to try to cure the cancer or to help relieve symptoms – as well as the likelihood of the benefits and risks. This can help you make an informed decision when looking at your treatment options.

## **Potentially resectable gallbladder cancers**

These are earlier stage cancers that doctors believe can be totally removed by surgery. Treatment of these cancers depends in part on how they are initially found.

### **Cancer found after surgery for another gallbladder problem**

Some gallbladder cancers are found after a simple cholecystectomy (either laparoscopic or open) when the gallbladder is removed to treat gallstones or chronic inflammation. The gallbladder is then looked at under a microscope in the lab, at which time the cancer is discovered. There are typically early stage cancers. If the cancer is confirmed to be only T1a, with no signs of spread outside the gallbladder, no further treatment may be needed, as there is a very good chance that all of the cancer was removed.

If the cancer is found to be more extensive within the gallbladder (T1b or greater), other tests will be done to look for any remaining cancer in the body and to determine if it is resectable. These tests may include CT or MRI scans and a staging laparoscopy.

If the cancer is thought to be resectable after these tests, a more extensive operation will be done to remove part of the liver, nearby lymph nodes, and possibly parts of the bile duct. (If the initial surgery was a laparoscopic cholecystectomy, the skin around the original incision sites may be removed as well.) This may be followed by chemotherapy, with or without radiation, to try to prevent the cancer from coming back, but it's not clear how helpful this is.

If the imaging tests or staging laparoscopy show that the cancer is unresectable, the treatment will be as described below.

### **Cancer found during surgery for another gallbladder problem**

In some cases, gallbladder cancer may be discovered *during* a simple cholecystectomy. The surgeon may find areas that look suspicious for cancer during the operation and may send samples to the lab to be checked quickly. Cancer cells may be seen in the samples while the operation is still going on.

If the surgeon is experienced in treating gallbladder cancer and believes the cancer is resectable, he or she may change the operation to a more extensive operation called an extended cholecystectomy. (See the section, "Surgery for gallbladder cancer.")

If the surgeon does not have experience treating gallbladder cancer or is not sure if the cancer is resectable, the operation may be stopped at this point. Other tests will then be done to look for any remaining cancer in the body and to determine whether or not it is resectable. These tests may include CT or MRI scans and a staging laparoscopy.

If the cancer is thought to be resectable after these tests, a more extensive operation will be done to remove part of the liver, nearby lymph nodes, and possibly parts of the bile duct. This may be followed by chemotherapy, with or without radiation, to try to prevent the cancer from coming back, but it's not clear how helpful this is.

If the imaging tests or staging laparoscopy show that the cancer is unresectable, the treatment will be as described below.

### **Cancer found on imaging tests or because of symptoms**

In other cases, gallbladder cancer may be suspected because a person is having symptoms such as jaundice. Imaging tests may then detect areas on or near the gallbladder that are suspicious for cancer. Further imaging tests and staging laparoscopy may be done to look

for any other suspicious areas in the body. These tests may be able to help the doctor determine if these areas are cancer and whether or not it is resectable.

If the cancer is thought to be resectable and the patient is healthy enough for surgery, an extended cholecystectomy (removing the gallbladder, part of the liver, nearby lymph nodes, and possibly the bile duct and other nearby organs) is the preferred treatment. If the patient has jaundice before the surgery, a stent or catheter may be placed in the bile duct first to allow the bile to flow. This can help relieve symptoms over a few days and might make a person healthy enough for the operation. After the surgery, doctors may advise chemotherapy, with or without radiation, to try to lower the chance the cancer will come back, but it's not clear how helpful this is.

If the imaging tests or a staging laparoscopy show that cancer is likely but that it is unresectable, a biopsy may be done to confirm the diagnosis. Treatment will then be as described below for unresectable cancers.

### **Unresectable gallbladder cancers**

If the doctor feels that surgery is not a good option (for example, because of the size or location of the cancer or because of a person's general health), the focus of treatment is usually on trying to control the cancer. This can help with symptoms and may help people live longer. Treatment with radiation therapy and/or chemotherapy may be helpful for some people.

For those who are jaundiced because of bile duct blockage, a stent or catheter may be placed in the duct to allow the bile to flow. If needed, surgery to bypass the bile duct may be an option if the person is healthy enough. Relieving bile duct blockage is often the first palliative treatment done, before starting other treatments such as chemotherapy.

For people having pain, radiation therapy, alcohol injections to the nerves around the gallbladder, and pain medicines may all be helpful.

Because these cancers can be very hard to treat with current options, some people may want to consider taking part in a clinical trial of new treatments.

### **Recurrent gallbladder cancer**

Cancer is called *recurrent* when it comes back after treatment. Recurrence can be local (in or near the same place it started) or distant (spread to organs such as the lungs or bone). If the cancer comes back after initial treatment, further treatment may depend on where the cancer recurs, what kind of treatment was previously used, and on the patient's general health. In rare cases, the cancer may recur in a small area near where it started, in which case surgery to try to remove it (perhaps followed by chemotherapy and/or radiation therapy) might be an option. But in most cases the recurrent cancer is unresectable and is treated as described above.

Recurrent gallbladder cancer is usually very hard to treat, so patients might want to consider taking part in a clinical trial of new treatments.

## More treatment information about gallbladder cancer

For more details on treatment options – including some that may not be addressed in this document – the National Cancer Institute (NCI) and the National Comprehensive Cancer Network (NCCN) are good sources of information.

The NCI provides treatment information via telephone (1-800-4-CANCER) and its Web site ([www.cancer.gov](http://www.cancer.gov)). Information for patients as well as more detailed information intended for use by cancer care professionals is also available on [www.cancer.gov](http://www.cancer.gov).

The NCCN, made up of experts from many of the nation's leading cancer centers, develops cancer treatment guidelines for doctors to use when treating patients. These are available on the NCCN Web site ([www.nccn.org](http://www.nccn.org)).

## What should you ask your doctor about gallbladder cancer?

It is important to have honest, open discussions with your cancer care team. They want to answer all of your questions, no matter how minor they might seem. For instance, consider these questions:

- Has my cancer spread beyond the gallbladder?
- What is the stage of my cancer, and what does that mean in my case?
- Are there other tests that need to be done before we consider treatment options?
- Are there other doctors I need to see?
- How much experience do you have treating this type of cancer?
- What treatment choices do I have?
- Can my cancer be removed with surgery?
- What do you recommend and why?
- What is the goal of the treatment?
- What risks or side effects are there to the treatments you suggest? How long are they likely to last?
- How quickly do we need to decide on treatment?
- What should I do to be ready for treatment?
- How long will treatment last? What will it involve? Where will it be done?
- How will treatment affect my daily activities?

- What are the chances my cancer can be cured with these treatment plans?
- What would we do if the treatment doesn't work or if the cancer recurs?
- What type of follow-up might I need after treatment?

Along with these sample questions, be sure to write down some of your own. For instance, you might want more information about recovery times so you can plan your work or activity schedule. Or you might want to ask about second opinions or about clinical trials for which you may qualify.

## What happens after treatment for gallbladder cancer?

For some people with gallbladder 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 gallbladder cancer may never go away completely. These people may get regular treatments with chemotherapy, radiation therapy, or other therapies to try to help keep the cancer in check. Learning to live with cancer that does not go away can be difficult and very stressful. It has its own type of uncertainty. Our document, *When Cancer Doesn't Go Away*, covers more about this.

## Follow-up care

If you have completed treatment, your doctors will still want to watch you closely. It is very important to go to all follow-up appointments. During these visits, your doctors will ask about symptoms, do physical exams, and may order blood tests or imaging tests such as CT scans.

If you have been treated with surgery and have no signs of cancer remaining, many doctors recommend follow-up with imaging tests about every 6 months for at least the first 2 years, but not all doctors may follow this same schedule. Follow-up is needed to check for cancer recurrence or spread, as well as possible side effects of certain treatments.

This is the time for you to ask your health care team any questions you need answered and to discuss any concerns you might have.

Almost any cancer treatment can have side effects. Some may last for a few weeks to months, but others can last the rest of your life. Don't hesitate to tell your cancer care team about any symptoms or side effects that bother you so they can help you manage them.

After your cancer treatment is finished, you will probably need to still see your cancer doctor for many years. So ask what kind of follow-up schedule you can expect.

It is important to keep health insurance. Tests and doctor visits cost a lot, and even though no one wants to think of their cancer coming back, this could happen.

If cancer does recur, further treatment will depend on the location of the cancer, what treatments you've had before, and your health. For more information on how recurrent cancer is treated, see the section "Treatment options based on the extent of gallbladder cancer." For more general information on dealing with a recurrence, you may also want to see our document, *When Your Cancer Comes Back: Cancer Recurrence*. You can get this document by calling 1-800-227-2345.

## Seeing a new doctor

At some point after your cancer diagnosis and treatment, you may find yourself seeing a new doctor who does not know anything about your medical history. It is important that you are able to give your new doctor the details of your diagnosis and treatment. Make sure you have this information handy:

- A copy of your pathology report(s) from any biopsies or surgeries
- Copies of imaging tests (CT or MRI scans, etc.), which can usually be stored on a CD or DVD
- If you had surgery, a copy of your operative report(s)
- If you were in the hospital, a copy of the discharge summary that doctors prepare when patients are sent home
- If you had radiation therapy, a copy of the treatment summary
- If you had chemotherapy, a list of your drugs, drug doses, and when you took them

The doctor may want copies of this information for his records, but always keep copies for yourself.

## Lifestyle changes after having gallbladder 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.

## **Making healthier choices**

For many people, a diagnosis of 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 alcohol, or give up tobacco. Even things like keeping your stress level under control may 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 for information and support. This tobacco cessation and coaching service can help increase your chances of quitting for good.

## **Eating better**

Eating right can be hard for anyone, 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 frustrating.

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**

Extreme tiredness, called *fatigue*, is very common in people treated for cancer. This is not a normal 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 make it hard for them to exercise and do other things they want to do. But exercise can help reduce fatigue. Studies have shown that patients who follow an exercise program tailored to their personal needs feel better physically and emotionally and can cope better, too.

If you were sick and not very active during treatment, it is normal for your fitness, endurance, and muscle strength to decline. Any plan for physical activity should fit your own situation. An older person who has never exercised will not be able to take on the same amount of exercise 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 anything. Get their opinion about your exercise plans. Then, try to find an exercise buddy so you're not doing it alone. Having family or friends involved when starting a new exercise program can give you that extra boost of support to keep you going when the push just isn't there.

If you are very tired, you will need to balance activity with rest. It is OK to rest when you need to. Sometimes it's really hard for people to allow themselves to rest when they are used to working all day or taking care of a household, but this is not the time to push yourself too hard. Listen to your body and rest when you need to. (For more information on dealing with fatigue, please see *Fatigue in People With Cancer* and *Anemia in People With Cancer*.)

Keep in mind exercise can improve your physical and emotional health.

- It improves your cardiovascular (heart and circulation) fitness.
- Along with a good diet, it will help you get to and stay at a healthy weight.
- It makes your muscles stronger.
- It reduces fatigue and helps you have more energy.
- It can help lower anxiety and depression.
- It can make you feel happier.
- It helps you feel better about yourself.

And 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 progressing or coming back?**

Most people want to know if there are specific lifestyle changes they can make to reduce their risk of cancer progressing 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 preventing it from coming back.

At this time, not enough is known about gallbladder cancer to say for sure if there are things you can do that will be helpful. Adopting healthy behaviors such as eating well and maintaining a healthy weight may help, but no one knows for sure. However, we do know that these types of changes can have positive effects on your health that can extend beyond your risk of cancer.

## How does having gallbladder cancer affect your emotional health?

During and after treatment, you may find yourself overcome with many different emotions. 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. Unexpected issues may also cause concern. For instance, 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.

Almost everyone who is going through or has been through cancer can benefit from getting some type of support. You need people you can turn to for strength and comfort. Support can come in many forms: family, friends, cancer support groups, church or spiritual groups, online support communities, or one-on-one counselors. What's best for you depends on your situation and personality. Some people feel safe in peer-support groups or education groups. Others would rather talk in an informal setting, such as church. Others may feel more at ease talking one-on-one with a trusted friend or counselor. Whatever your source of strength or comfort, make sure you have a place to go with your concerns.

The cancer journey can feel very lonely. It is not necessary or good for you to try to deal with everything on your own. And your friends and family may feel shut out if you do 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.

## If treatment for gallbladder cancer stops working

If cancer keeps growing or comes back after one kind of treatment, it may be possible to try another treatment plan that might still cure the cancer, or at least shrink the tumors enough to help you live longer and feel better. But when a person has tried many different treatments and the cancer has not gotten any better, the cancer tends to become resistant to all treatment. If this happens, it's important to weigh the possible limited benefits of a new treatment against the possible downsides, including treatment side effects. Everyone has their own way of looking at this.

This is likely to be the hardest part of your battle with cancer – when you have been through many medical treatments and nothing's working anymore. Your doctor may offer you new options, but at some point you may need to consider that treatment is not likely to improve your health or change your outcome or survival.

If you want to continue to get treatment for as long as you can, you need to think about the odds of treatment having any benefit and how this compares to the possible risks and side effects. In many cases, your doctor can estimate how likely it is the cancer will

respond to treatment you are considering. For instance, the doctor may say that more treatment might have about a 1 in 100 chance of working. Some people are still tempted to try this. But it is important to think about and understand your reasons for choosing this plan.

No matter what you decide to do, it is important that you feel as good as you can. Make sure you are asking for and getting treatment for any symptoms you might have, such as nausea or pain. This type of treatment is called *palliative care*.

Palliative care helps relieve symptoms, but is not expected to cure the disease. It can be given along with cancer treatment, or can even be cancer treatment. The difference is its purpose – the main purpose of palliative care is to improve the quality of your life, or help you feel as good as you can for as long as you can. Sometimes this means using drugs to help with symptoms like pain or nausea. Sometimes, though, the treatments used to control your symptoms are the same as those used to treat cancer. For instance, radiation might be used to help relieve bone pain caused by cancer that has spread to the bones. Or chemo might be used to help shrink a tumor and keep it from blocking the bowels. But this is not the same as treatment to try to cure the cancer.

At some point, you may benefit from hospice care. This is special care that treats the person rather than the disease; it focuses on quality rather than length of life. Most of the time, it is given at home. Your cancer may be causing problems that need to be managed, and hospice focuses on your comfort. You should know that while getting hospice care often means the end of treatments such as chemo and radiation, it doesn't mean you can't have treatment for the problems caused by your cancer or other health conditions. In hospice, the focus of your care is on living life as fully as possible and feeling as well as you can at this difficult time. You can learn more about hospice in our document called *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 happiness and meaning. Pausing at this time in your cancer treatment gives you a chance to refocus 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 gallbladder cancer research and treatment?**

Research into the causes, diagnosis, and treatment of gallbladder cancer is currently under way in many medical centers throughout the world.

### **Chemotherapy and radiation therapy**

Researchers are looking at new ways of increasing the effectiveness of radiation therapy. With newer techniques such as three-dimensional conformal radiation therapy (3D-CRT),

intensity modulated radiation therapy (IMRT), and proton beam radiation therapy, doctors can better aim radiation to affect only the tumor and to spare nearby normal tissues. Doctors have also found that giving certain chemotherapy drugs just before radiation therapy may make it more effective.

In general, chemotherapy has been found to be of limited use against gallbladder cancer, but newer drugs and combinations of drugs are now being tested.

## Targeted therapy

So far, chemotherapy has not been found to work very well against most gallbladder cancers. Newer drugs are being developed that work in different ways from standard chemotherapy drugs. These drugs target specific parts of cancer cells or their surrounding environments.

One target of several newer drugs is tumor blood vessels. Gallbladder tumors need new blood vessels to grow beyond a certain size. The drug sorafenib (Nexavar®), which is already used for some liver cancers, works in part by hindering new blood vessel growth (angiogenesis). It is now being studied for use against gallbladder cancer. Bevacizumab (Avastin®), another drug that targets blood vessel growth, is also being studied against gallbladder cancer.

Other new drugs have different targets. For example, EGFR is a protein found in high amounts on some cancer cells that helps them grow. Drugs that target EGFR have shown some benefit against several types of cancer. Some of these, including erlotinib (Tarceva®), cetuximab (Erbix®), and lapatinib (Tykerb®), are now being studied for use in people with gallbladder cancer, usually in combination with chemotherapy or other targeted drugs.

## Additional resources for gallbladder cancer

### More information from your American Cancer Society

We have some related information that may be helpful to you. These items may be viewed on our Web site or ordered from our toll-free number, 1-800-227-2345.

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

Caring for the Patient With Cancer at Home: A Guide for Patients and Families (also available in Spanish)

Clinical Trials: What You Need to Know (also available in Spanish)

Living With Uncertainty: The Fear of Cancer Recurrence

Pain Control: A Guide for Those With Cancer and Their Loved Ones (also available in Spanish)

Peripheral Neuropathy Caused by Chemotherapy

Surgery (also available in Spanish)

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

Understanding Radiation Therapy: A Guide for Patients and Families (also available in Spanish)

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 to find out about costs or to place an order.

## National organizations and Web sites\*

In addition to the American Cancer Society, other sources of patient information and support include:

### **National Cancer Institute**

Toll-free number: 1-800-422-6237 (1-800-4-CANCER)

Web site: [www.cancer.gov](http://www.cancer.gov)

*\*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 information and support. Call us at **1-800-227-2345** or visit [www.cancer.org](http://www.cancer.org).

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