Gallbladder Cancer

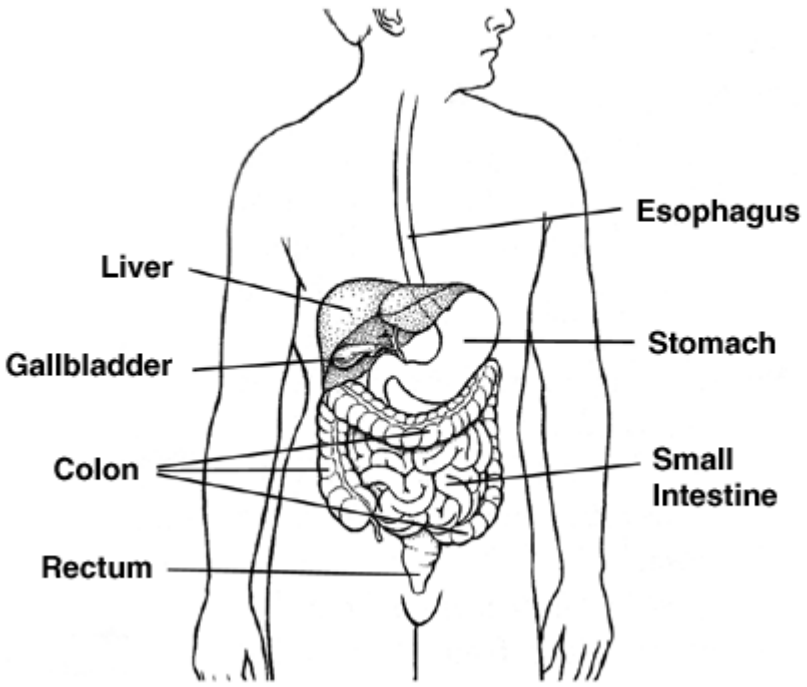
What is gallbladder cancer?

Cancer starts when cells in the body begin to grow out of control. Cells in nearly any part of the body can become cancer, and can spread to other areas of the body. To learn more about how cancers start and spread, see *What Is Cancer?*

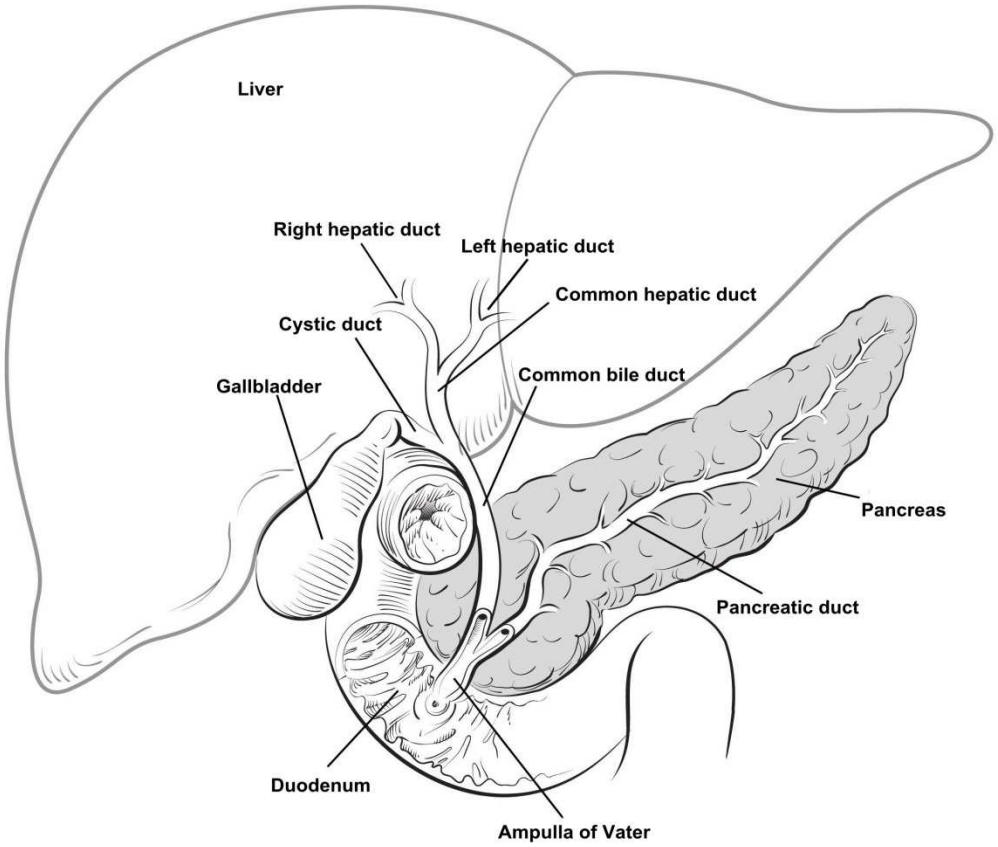
Gallbladder cancer is a cancer that starts in the gallbladder. To understand this cancer, it helps to know about the gallbladder and what it does.

About the gallbladder

The gallbladder is a small, pear-shaped organ under the liver. Both the liver and the gallbladder are behind the right lower ribs. In adults, the gallbladder is usually about 3 to 4 inches long and normally no wider than an 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 is 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 common 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) at the ampulla of Vater.



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 cells with gland-like properties that line many internal and external surfaces of the body (including the inside the digestive system).

Papillary adenocarcinoma or just papillary cancer is a type of gallbladder adenocarcinoma that deserves special mention. When seen under a microscope, the cells in these gallbladder cancers are arranged in finger-like projections. 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, such as adenosquamous carcinomas, squamous cell carcinomas, small cell carcinomas, and sarcomas, can develop in the gallbladder, but these are uncommon.

What are the key statistics about gallbladder cancer?

The American Cancer Society's estimates for cancer of the gallbladder and nearby large bile ducts in the United States for 2016 are:

- About 11,420 new cases diagnosed: 5,270 in men and 6,150 in women
- About 3,710 deaths from these cancers: 1,630 in men and 2,080 in women

Of these new cases, a little less than 4 in 10 (about 4,000 cases) will be gallbladder cancers.

Gallbladder cancer is not usually found until it has become advanced and causes symptoms. Only about 1 of 5 gallbladder cancers is found in the early stages, when 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 "Survival statistics for gallbladder cancer by stage."

Visit the American Cancer Society's Cancer Statistics Center for more key statistics.

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. Some risk factors, like smoking, can be changed. Others, like a person's age or family history, can't be changed.

But having a risk factor, or even several risk factors, does not mean that a person will get the disease. And many people who get the disease may have few or no 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 (irritation and swelling) in the gallbladder.

Gallstones

Gallstones are the most common risk factor for gallbladder cancer. Gallstones are pebble-like collections 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. But gallstones are very common, and 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 (cholecystitis), which can be caused by gallstones. People with this condition have a higher risk of developing gallbladder cancer (possibly because both conditions can be related to inflammation).

Female gender

In the United States, gallbladder cancer occurs more than twice as often in women. Gallstones and gallbladder inflammation are 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 might help explain this link.

Older age

Gallbladder cancer is seen mainly in older people, but younger people can develop it as well. The average age of people when they are diagnosed is 72. More than 2 out of 3 people with gallbladder cancer are 65 or older 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 India, Pakistan, and Central 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 large 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 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 an abnormality where these ducts meet that lets juice from the pancreas 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 if the increased risk is due to the action of the pancreatic juice or is 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 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 cancer, so doctors often recommend removing the gallbladder in patients with gallbladder polyps that size or larger.

Primary sclerosing cholangitis

In primary sclerosing cholangitis (PSC), there is inflammation and scarring of the bile ducts. People with this disease have an increased risk of cancer of the gallbladder and bile ducts. Many people with PSC also have ulcerative colitis, a type of inflammatory bowel disease.

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 hard 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 gallbladder cancer might occur more in workers in the rubber and textile industries than in 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 get gallbladder cancer than those not infected. This is probably because the infection can cause gallbladder inflammation. 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 "What are the risk factors for gallbladder cancer?") They are also beginning to understand how some of these risk factors might lead to gallbladder cancer.

Chronic gallbladder inflammation is a common link among many of the risk factors for 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 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 might allow juices from the pancreas to flow backward (reflux) into the gallbladder and bile ducts. This reflux of pancreatic juices might inflame and stimulate growth of the cells lining the gallbladder and bile ducts, which might increase the risk of gallbladder cancer.

Scientists are starting to understand how risk factors such as inflammation might 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. But DNA affects more than how we look.

Some genes control when cells grow, divide into new cells, and die. Genes that help cells grow, divide, and stay alive 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 *TP53* tumor suppressor gene are found in many cases of gallbladder cancer. Other genes that may play a role in gallbladder cancers include *KRAS*, *BRAF*, *CDKN2*, and *HER2*. Some of the gene changes that lead to gallbladder cancer might be caused by chronic inflammation. But sometimes what causes these changes

is not known. Many gene changes might just be random events that sometimes happen inside a cell, without having an outside cause.

Can gallbladder cancer be prevented?

There is no known way to prevent most gallbladder cancers. 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 things you can do that might lower your risk.

Getting to and staying a healthy weight is one important way a person may reduce their risk of 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 active and eating a healthy diet, with mostly plant foods. This includes at least 2½ cups of vegetables and fruits every day. Choose whole-grain breads, pastas, and cereals instead of refined grains. Eat fish, poultry, or beans and limit how much processed meat and red meat you eat. To learn more, see the *American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention*.

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 the stones are causing symptoms or other problems. This is because the possible risks and complications of surgery probably don't outweigh the possible benefit. Some doctors might advise removing the gallbladder if long-standing gallstone disease has resulted in a porcelain gallbladder.

Can gallbladder cancer be found early?

Gallbladder cancer is hard to find early. The gallbladder is deep inside the body, so early tumors can't be seen or felt during routine physical exams. There are 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.) Because of this, most gallbladder cancers are found only after the cancer has grown enough to cause signs or symptoms.

Still, some 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 because of gallstones. When the gallbladder is looked at in the lab after it is removed, small cancers or pre-cancers that did not cause any symptoms are sometimes found.

Signs and symptoms of gallbladder cancer

Gallbladder cancer does not usually cause signs or symptoms until later in the course of the disease, but sometimes symptoms can appear sooner and lead to an early diagnosis. If the cancer is found at an earlier stage, treatment might be more effective.

Some of the more common symptoms of gallbladder cancer are:

Abdominal (belly) pain

Most people with gallbladder cancer will have abdominal pain. Most often this is in the upper right part of the belly.

Nausea and/or vomiting

People with gallbladder cancer sometimes have vomiting as a symptom.

Jaundice

Jaundice is a yellowing of the skin and the white part of the eyes. If the cancer grows large enough to block the bile ducts, bile from the liver can’t drain into the intestines. This can cause bilirubin (a chemical in bile that gives it a yellow color) to build up in the blood and settle in different parts of the body. This can often be seen in the skin and eyes.

Lumps in the belly

If the cancer blocks the bile ducts, the gallbladder can swell to larger than normal. Gallbladder cancer can also spread to nearby parts of the liver. These can sometimes be felt by the doctor as lumps on the right side of the belly. They can also be detected by imaging tests such as an ultrasound.

Other symptoms

Less common symptoms of gallbladder cancer include:

- Loss of appetite
- Weight loss
- Swelling in the abdomen (belly)
- Fever
- Itchy skin

- Dark urine
- Light-colored or greasy stools

Gallbladder cancer is not common, and these symptoms and signs are more likely to be caused by something other than gallbladder cancer. For example, people with gallstones also have many of these symptoms. There are many far more common causes of abdominal pain 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.

How is gallbladder cancer diagnosed?

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

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

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 examine you to look for signs of gallbladder cancer and other health problems. The exam will focus mostly on the abdomen to check for any lumps, 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 physical exam suggest you might have gallbladder cancer, other 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 find out how much bilirubin is in the blood. Bilirubin is the chemical that gives the bile its yellow color. Problems in the gallbladder, bile ducts, or liver can raise the blood level of bilirubin. A high bilirubin level tells the doctor that there may be gallbladder, bile duct, 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, bile duct, or gallbladder disease. These are sometimes referred to as *liver function tests*.

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.

These tests can sometimes be useful after a person is diagnosed with gallbladder cancer. If the levels of these markers are found to be high, they can be followed over time to help tell how well treatment is working.

Imaging tests

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

- To look for suspicious areas that might be cancer
- To help a doctor guide a biopsy needle into a suspicious area to take a sample
- To learn how far cancer has spread
- To help guide certain types of treatments
- To help determine if treatment is working
- To look for signs of the cancer coming back after treatment

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

Ultrasound

For this test, a small instrument called a *transducer* gives off sound waves and picks up their echoes as they bounce off organs inside the body. The echoes are converted by a computer into an image on a screen. The patterns of echoes can help find tumors and show how far they have grown into nearby areas.

Abdominal ultrasound: This 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.

This is an easy test to have done, and it uses no radiation. 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: In these techniques, the doctor puts the ultrasound transducer inside the body and closer to the gallbladder, which gives more detailed images than a standard ultrasound. The transducer is on the end of a thin, lighted tube that has an attached viewing device. The tube is either passed through the mouth, down through the stomach, and near the gallbladder area (*endoscopic ultrasound*) or through a small surgical cut in the belly (*laparoscopic ultrasound*).

If there is a tumor, ultrasound might 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 can be a sign that cancer has reached them.

Ultrasound can also be used to guide a needle into a suspicious lymph node so that cells can be removed (biopsied) and viewed under a microscope. This is known as an *ultrasound-guided needle biopsy*.

Computed tomography (CT) scan

The CT scan uses x-rays to make 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.

A CT scanner has been described as a large donut, with a narrow table that slides in and out of the middle opening. You will need to lie still on the table while the scan is being done. CT scans take longer than regular x-rays, and you might feel a bit confined by the ring while the pictures are being taken.

Before any pictures are taken, you might 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 might also need 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 can have several uses for gallbladder cancer:

- They are often used to help diagnose gallbladder cancer by showing tumors in the area.

- They can help stage the cancer (find 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 be used to look at the blood vessels near the gallbladder. This can help determine if surgery is a treatment option.
- CT scans can also be used to guide a biopsy needle into a suspected tumor or metastasis. For this procedure, called a *CT-guided needle biopsy*, you remain on the CT scanning table, while the doctor advances a biopsy needle through the skin and toward 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. 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 cancerous 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 angiography.

MRI scans can be a little more uncomfortable than CT scans. They take longer, often up to an hour. You may have to lie inside a narrow tube, which is confining and can upset people who have a fear of enclosed spaces. Special, 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 at the bile ducts to see if they are blocked, narrowed, or dilated. This can help show if someone might have a tumor that is blocking a duct. It can also be used to help plan surgery. There are several types of cholangiograms, each of which has 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 use of a contrast agent and is not invasive, unlike other types of cholangiograms. Because it is non-invasive, doctors often use MRCP if the purpose of the test is just to image the bile ducts. But this test can't be used to get biopsy samples of tumors or to place stents (small tubes) in the ducts to keep them open.

Endoscopic retrograde cholangiopancreatography (ERCP): In this procedure, a doctor passes a long, flexible tube (endoscope) down the throat, through the esophagus and stomach and into the first part of the small intestine. This is usually done while you are sedated (given medicine to make you sleepy). 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 ducts 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 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 belly 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 might cause more pain), PTC is not usually used unless ERCP has already been tried or can't be done for some reason.

Angiography

Angiography or an angiogram is an x-ray test used to look 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 show if blood flow in an area is blocked or affected by a tumor, and any abnormal blood vessels in the area. The test can also show if 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.

X-ray angiography can be uncomfortable because the doctor 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 can 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

Laparoscopy is a type of minor surgery. The 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 doctors plan surgery or other treatments, and can help determine 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 abdomen 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

During a biopsy, the doctor removes a tissue sample 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 for a diagnosis. Biopsies are also used to help find out how far the cancer has spread. This is important when determining the best treatment options.

But a biopsy may not always be done before surgery to remove a gallbladder 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 “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 way to know for certain if it is cancer. For example, imaging tests may show that a tumor has spread or grown too large to be removed completely 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 see 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 and 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. 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.

For more information about biopsies and how they are tested, see *Testing Biopsy and Cytology Specimens for Cancer*.

How is gallbladder cancer staged?

The stage of a cancer describes how far it 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).

The stage is determined from the results of the physical exam, imaging tests (ultrasound, CT or MRI scan, etc.) and other tests, which are described in "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

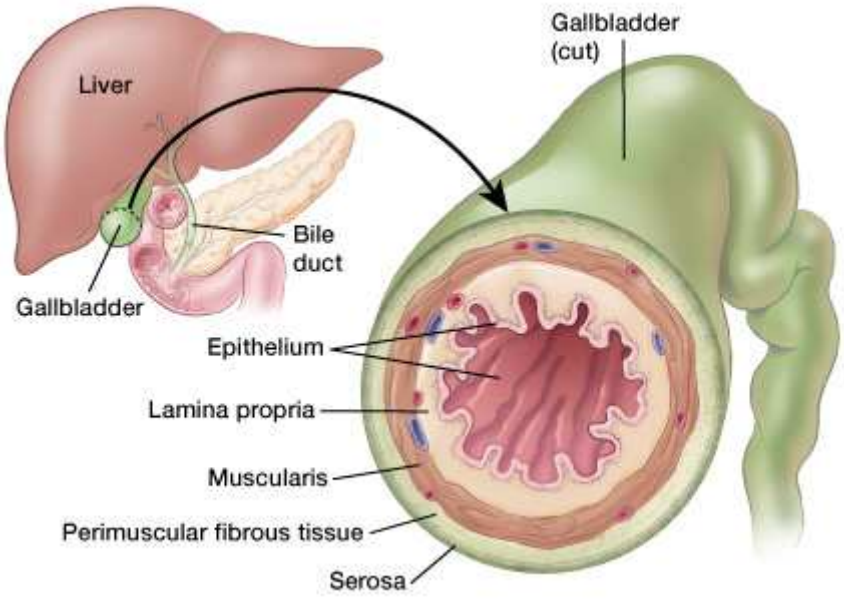
A staging system is a standard way for the cancer care team to describe the extent of a cancer. The main system used to describe the stages of gallbladder cancer is the American Joint Committee on Cancer (AJCC) TNM system. This system is also used to stage cancers that start in the cystic duct (the tube that carries bile away from the gallbladder). The TNM system is based on 3 key pieces of information:

- **T** describes how far the main (primary) **tumor** has grown into the wall of the gallbladder and if 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 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 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



Nearly all gallbladder cancers start in the epithelium (the inside wall of the gallbladder). Over time they grow through the various layers toward the outside of the gallbladder. They

may also grow to fill some or all of the space inside the gallbladder at the same time. If a tumor grows through the gallbladder wall, it may invade (grow into) nearby organs, such as the liver, 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: The primary tumor's extent cannot be assessed.

T0: There is no evidence of primary tumor.

Tis: Cancer cells are only found in the epithelium (the inner layer of the gallbladder) and have not grown into 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 a 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 structures outside of the liver.

N groups for gallbladder cancer

NX: Nearby (regional) lymph nodes cannot be assessed.

N0: The cancer has not spread to nearby 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 to lymph nodes in the abdomen that are farther away from the gallbladder, such as the lymph nodes 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.

Stage grouping

Once the T, N, and M categories have been determined, this information is combined in a process called *stage grouping*. The stage is expressed as stage 0 (the least advanced) or as Roman numerals up 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 (Tis). It has not spread outside 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 the gallbladder.

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

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

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

Stage IVA: T4, N0 or N1, M0: The tumor has grown into 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 (N0 or N1). It has not spread to tissues or organs far away from the gallbladder (M0).

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 (M0).

OR

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

Resectable versus unresectable gallbladder cancer

The AJCC staging system provides a detailed summary of how far the cancer has spread. But for treatment purposes, doctors often use a simpler staging system, which divides the cancers based on whether or not they can likely be removed (resected) with surgery:

- *Resectable* cancers are those that doctors believe can be removed completely by surgery.
- *Unresectable* cancers have spread too far or are in too difficult a place to be removed entirely by surgery.

Generally speaking, stage I, II, and some stage III cancers are potentially resectable. But other factors, such as whether a person is healthy enough for surgery, can affect whether surgery is a good treatment option.

Unfortunately, only a small portion of gallbladder cancers are resectable when they are first found.

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 better 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 people 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.

When discussing cancer survival statistics, doctors often use a number called the *5-year survival rate*. 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 some people with gallbladder cancer may die from other causes. These survival rates do not take other causes of death into account.

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 better outlook for people now being diagnosed with gallbladder cancer.

The rates below are based on the stage of the cancer *at the time of diagnosis*. When looking at survival rates, it's important to understand that the statistics may be different for cancers that have come back or progressed during treatment. Still, the stage of a cancer does not change over time, even if the cancer progresses. A cancer that comes back or spreads is still referred to by the stage it was given when it was first found and diagnosed, but more information is added to explain the current extent of the cancer. (And of course, the treatment plan is adjusted based on the change in cancer status.)

The numbers below come from the American College of Surgeons/American Cancer Society National Cancer Data Base as published in the AJCC Cancer Staging Manual in 2010 and are based on more than 10,000 patients diagnosed with gallbladder cancer from 1989 to 1996.

Stage	**5-Year Survival Rate**
0	80%
I	50%
II	28%
IIIA	8%
IIIB	7%
IVA	4%
IVB	2%

Survival rates are often based on previous outcomes of large numbers of people who had the disease, but they can't predict what will happen with any particular person. Many other factors can also affect a person's outlook, such as their age and overall health, and how well the cancer responds to treatment. Even when taking these other factors into account, survival rates are at best rough estimates. Your doctor can tell you how the numbers above apply to you, as he or she knows your situation best.

How is gallbladder cancer treated?

General treatment information

After gallbladder cancer is found and staged, your cancer care team will discuss your treatment options with you. The doctors on this team may include:

- A surgeon or a surgical oncologist (a surgeon who specializes in cancer treatment)
- A radiation oncologist: a doctor who uses radiation to treat cancer
- A medical oncologist: a doctor who uses chemotherapy and other medicines to treat cancer
- A gastroenterologist (GI doctor): a doctor who treats diseases of the digestive system

Many other specialists might be part of your treatment team as well, including physician assistants (PAs), nurse practitioners (NPs), nurses, psychologists, social workers, rehabilitation specialists, and other health professionals. See *Health Professionals Associated With Cancer Care* for more on this.

It's important to discuss all of your treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. It's also very important to ask questions if there is anything you're not sure about. You can find some good questions to ask in "What should you ask your doctor about gallbladder cancer?"

Take time to think about your choices. In choosing a treatment plan, factors to consider include the 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. The main types of treatments for gallbladder cancer include:

- Surgery
- Radiation therapy
- Chemotherapy
- Palliative therapy

Your treatment plan will depend on the stage of your cancer and other factors. See "Treatment options based on the extent of gallbladder cancer" for information about comment treatment plans.

If time allows, 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.

Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-the art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they are not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials. You can also call our clinical trials matching service at 1-800-303-5691 for a list of studies that meet your medical needs, or see the Clinical Trials section to learn more.

Considering complementary and alternative methods

You may hear about alternative or complementary methods that your doctor hasn't mentioned to treat your cancer or relieve symptoms. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods refer to treatments that are used along with your regular medical care. Alternative treatments are used instead of a doctor's medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be dangerous.

Be sure to talk to your cancer care team about any method you are thinking about using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision. See the Complementary and Alternative Medicine section to learn more.

Help getting through cancer treatment

Your cancer care team will be your first source of information and support, but there are other resources for help when you need it. Hospital- or clinic-based support services are an important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services – including rides to treatment, lodging, support groups, and more – to help you get through treatment. Call our National Cancer Information Center at 1-800-227-2345 and speak with one of our trained specialists on call 24 hours a day, every day.

The treatment information given here is not official policy of the American Cancer 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.

Surgery for gallbladder cancer

There are 2 general types of surgery for cancer of the gallbladder:

- Potentially curative surgery
- 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 can remove all of the cancer. Doctors 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 removed by surgery. Unfortunately, only a small portion of gallbladder cancers are resectable when they are first found.

If potentially curative surgery is being considered, you may want to get a second opinion or even be referred to a large cancer center. Nearly all doctors agree that surgery offers the only realistic 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.

Palliative surgery is done to relieve pain or prevent complications, such as blockage of the bile ducts, if the tumor is too widespread to be removed completely. 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 "Palliative therapy for gallbladder cancer."

Gallbladder cancer surgery can have serious side effects and, depending on how extensive it is, may require several weeks for recovery. Patients whose cancer is very unlikely to be curable need to carefully weigh the pros and cons of surgery or treatments that require a lot of recovery time. It's 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 how far the cancer has spread and if it can be resected 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 inside the abdomen for signs of cancer spread. If the cancer is resectable, laparoscopy can also help plan 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 by accident after a person has a cholecystectomy for another reason, such as gallstones. If the cancer is at a very early stage (T1a) and is thought to have been removed completely, 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. The surgeon 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 abdomen. Long surgical tools are placed through 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 might 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 a complex operation, so make sure your surgeon is experienced in treating gallbladder cancer.

The extent of the surgery depends on where the cancer is 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 your surgeon feels it is needed and you are healthy enough, the operation may also include removing one or more of the following:

- A larger part 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*)
- The common bile duct
- Part or all of the ligament that runs between the liver and the intestines
- 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
- The pancreas
- The duodenum (the first part of the small intestine into which the bile duct drains)
- Any other areas or organs to which cancer has spread

Possible risks and side effects

The risks and side effects of surgery depend on how much tissue is removed and your general health before the surgery. All surgery carries some risk, including the possibility of bleeding, blood clots, 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. 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 remove parts of several organs. This can have a significant effect on a person’s recovery and health after the surgery. Serious problems soon after surgery can include bile leakage into the abdomen, infections, and liver failure. Because most of the organs removed are involved in digestion, eating problems may be a concern 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 cancer surgery, see *A Guide to Cancer 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

For gallbladder cancer, a machine is used to create a beam of x-rays or particles that are aimed at the cancer. This is known as *external beam radiation therapy* (EBRT).

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. The treatment is much like getting an x-ray, but the radiation is much stronger. The procedure itself is painless. 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.

Newer radiation techniques now allow doctors to more accurately treat gallbladder cancers while reducing the radiation exposure to nearby healthy tissues. These may increase success rates and help reduce side effects.

Three-dimensional conformal radiation therapy (3D-CRT): 3D-CRT uses special computers to precisely map the location of the tumor(s). Radiation beams are then shaped and aimed at the tumor(s) from several directions, which makes it less likely to damage normal tissues.

Intensity modulated radiation therapy (IMRT): IMRT is an advanced form of 3D therapy. It uses a computer-driven machine that moves around the patient as it delivers radiation. Along with shaping the beams and aiming them at the cancer from several angles, the intensity (strength) of the beams can be adjusted to limit the dose reaching the most sensitive normal tissues. This lets doctors deliver an even higher dose to the cancer areas.

Uses of radiation therapy

Radiation therapy can 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 drug such as 5-fluorouracil (5-FU) or capecitabine, which can 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.

Possible side effects of radiation therapy

Side effects of radiation therapy can include sunburn-like skin problems where the radiation enters the body, nausea, vomiting, diarrhea, fatigue, and poor appetite. Often these go away after treatment. When radiation is given with chemotherapy, the side effects are often worse. Ask your doctor or nurse what side effects to expect and how you might prevent or relieve them.

To learn more about radiation therapy, see the Radiation Therapy section or *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 taken by mouth. These drugs enter the bloodstream and reach all areas of the body, making this treatment useful for cancers that have spread beyond where they started. Chemo can help some people with gallbladder cancer, but so far its effects against this type of cancer has been found to be limited.

For resectable gallbladder cancers, chemo 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 treating gallbladder cancer.

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

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

Hepatic artery infusion (HAI): Because giving chemo into a vein is not always helpful for gallbladder cancer, doctors have studied giving it a different way – directly into the main artery going into the liver, called the *hepatic artery*. Since the hepatic artery also 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 couldn't be removed by

surgery 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

The chemo 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 are combined to try to make them more effective. For example, 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

Chemo drugs attack 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 (where new blood cells are made), the lining of the mouth and intestines, and the hair follicles, also divide quickly. These cells can also be affected by chemo, which can lead to side effects.

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

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea
- Increased chance of infections (from having too few white blood cells)
- Easy bruising or bleeding (from having too few blood platelets)
- Fatigue (from having too few red blood cells)

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 can 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 *Peripheral Neuropathy Caused by Chemotherapy*.

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

To learn more about chemo, see the Chemotherapy section, or *A Guide to Chemotherapy*.

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 removed completely by surgery, doctors may advise palliative operations, radiation, chemotherapy, or other treatments 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 affect 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 or liver 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 endoscopic retrograde cholangiopancreatography (ERCP) or percutaneous transhepatic cholangiography (PTC) (see "How is gallbladder cancer diagnosed?") or, in some cases, during surgery.

- 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.

These procedures are often done to help relieve or prevent symptoms from more advanced cancers, but they can also be done to help relieve jaundice before potentially curative surgery is done. This helps lower the risk of complications from the surgery.

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 surgery to create 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** (also known as a *gastric bypass*) joins the stomach directly to the jejunum.
- A **hepaticojejunostomy** joins the duct that carries bile from the liver to the jejunum.

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*.

A biliary bypass can often give longer-lasting relief than a stent, which might need to be cleaned out or replaced. Still, this can be a major operation, so it’s 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 be worried about taking 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.

Pain medicines work best when they are taken on a regular schedule. They do not work as well if they are only used when the pain becomes severe. Several long-acting forms of morphine and other opioids are in pill form and only need be taken once or twice a day. There is even a long-acting patch that only needs to be applied every few days.

Common side effects of these drugs are nausea and feeling sleepy, which often get better over time. Constipation is a common side effect that does not get better on its own, so it needs to be treated. Most people on these drugs need to take laxatives daily.

To learn more about the options for managing cancer pain, see the Cancer Pain section, or our *Guide to Controlling Cancer Pain*.

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 removed entirely by surgery.

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.

In terms of stages, stage I and II cancers and some stage III cancers may be resectable. Still, other factors, such as whether a person is healthy enough for surgery, can affect whether it's a good option.

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

If gallbladder cancer is suspected or diagnosed, it's a good idea to be seen by a surgeon with experience treating this type of cancer. Gallbladder cancer is uncommon, and 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's 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 removed completely by surgery. Treatment of these cancers depends in part on how they are first found.

Cancer found after surgery for another gallbladder problem

Some gallbladder cancers are found 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. These are typically early stage cancers. If the cancer is confirmed to be only in the inner layers of the gallbladder (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 (chemo), 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 can’t be resected, the treatment will be the same as described for unresectable cancers.

Cancer found during surgery for another gallbladder problem

In some cases, gallbladder cancer is discovered *during* a simple cholecystectomy. The surgeon finds areas that look suspicious for cancer during the operation and sends samples to the lab to be checked quickly. Cancer cells are 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 “Surgery for gallbladder cancer.”)

If the surgeon isn’t experienced in treating gallbladder cancer or isn’t sure if the cancer is resectable, the operation may be stopped at this point. Other tests such as CT or MRI scans will then be done to look for any remaining cancer in the body and to determine whether or not it is resectable.

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 scans show that the cancer can't be resected, the treatment will be the same as described for unresectable cancers.

Cancer found on imaging tests or because of symptoms

Sometimes, gallbladder cancer is suspected because a person is having symptoms such as jaundice. Imaging tests may then detect areas suspicious for cancer on or near the gallbladder. Further imaging tests and staging laparoscopy may be done to look for any other suspicious areas in the body. These tests can 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 can't be resected, a biopsy may be done to confirm the diagnosis. Treatment will then be the same as described 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 chemo 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 chemo.

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, you might 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 depends on where the cancer recurs, what kind of treatment was previously used, and on the patient's health. Rarely, the cancer may recur in a small area near where it started, in which case surgery to try to remove it (perhaps followed by chemo 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 you might want to consider taking part in a clinical trial of new treatments.

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?
- Do I need other tests before we consider treatment options?
- Do I need to see any other kinds of doctors?
- How much experience do you have treating this type of cancer?
- What are my treatment options?
- Can my cancer be removed with surgery?
- What do you recommend and why?
- What is the goal of 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 be like? 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 my options be if the treatment doesn't work or if the cancer comes back?
- 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.

Keep in mind that doctors are not the only ones who can provide you with information. Other health care professionals, such as nurses and social workers, may have the answers to some of your questions. You can find out more about speaking with your health care team in *Talking With Your Doctor*.

What happens after treatment for gallbladder cancer?

For some people with gallbladder cancer, treatment can 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. See *Living With Uncertainty: The Fear of Cancer Recurrence* for more about this.

For other people, the 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 under control and help relieve symptoms from it. Learning to live with cancer that does not go away can be difficult and very stressful. It has its own type of uncertainty. See *When Cancer Doesn't Go Awa*y for more about this.

Follow-up care

If you have completed treatment, your doctors will still want to watch you closely. It's 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 had 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 healthcare 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 bothering you so they can help you manage them.

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

It's also very 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 where the cancer is, what treatments you've had before, and your health. For more information on how recurrent cancer is treated, see "Treatment options based on the extent of gallbladder cancer." For more general information on dealing with a recurrence, you may also want to see *When Your Cancer Comes Back: Cancer Recurrence*.

Seeing a new doctor

At some point after your treatment, you may be seeing a new doctor who doesn't know anything about your medical history. It's important to able to give your new doctor the details of your diagnosis and treatment. Gathering these details soon after treatment may be easier than trying to get them at some point in the future. Make sure you have this information handy (and always keep copies for yourself):

- A copy of your pathology report(s) from any biopsies or surgeries
- Copies of imaging tests (CT or MRI scans, etc.), which can usually be stored digitally (on a DVD, etc.)
- If you had surgery, a copy of your operative report(s)
- If you stayed in the hospital, a copy of the discharge summary that the doctor wrote when you were 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 names and contact information of the doctors who treated your cancer

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. Our 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. This is especially true for cancers of the gallbladder. The cancer or its treatment may affect your appetite or alter how you digest foods. Nausea can be a problem. You may not feel like eating and lose weight when you don't want to. All of these things can be very frustrating.

If treatment causes 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.

If eating problems last a long time, your doctor may have you see a nutritionist, who can work with you and give you information about your individual nutritional needs. They might recommend that you use nutritional supplements, which can help you maintain your weight and nutritional intake. For serious nutrition problems, the doctor might need to put a feeding tube into the stomach to improve nutrition and energy levels. This is usually temporary. For more information and nutrition tips for during and after cancer treatment, see *Nutrition for the Person With Cancer During Treatment: A Guide for Patients and Families.*

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 often doesn't get better with rest. For

some people, fatigue lasts a long time after treatment, and can make it hard for them to be active 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's normal for your fitness, endurance, and muscle strength to decline. Any plan for physical activity should fit your own situation. If you haven't been active in a few years, you will have to start slowly – maybe just by taking short walks.

Talk with your healthcare 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 activity 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 learn to balance activity with rest. It's 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, 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.

Getting regular physical activity also 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 gallbladder cancer progressing or coming back?

Most people want to know if they can make certain lifestyle changes to reduce their risk of cancer progressing or coming back. Unfortunately, for most cancers there isn't much 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 help. Healthy behaviors such as not smoking, eating well, and staying at a healthy weight might help, but no one knows for sure. But we do know that these types of changes can have positive effects on your health that can extend beyond your risk of gallbladder cancer or other cancers.

So far, no dietary supplements have been shown to clearly help lower the risk of gallbladder cancer progressing or coming back. Again, this doesn't mean that none will help, but it's important to know that none have been proven to do so.

How might 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 might be stressed by financial concerns resulting from your treatment. You might also 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, religious 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. Some 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's 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 don't 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. See *Distress in People with Cancer* or the Emotional Side Effects section for more information.

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 keep it under control enough to help you live longer and feel better. Clinical trials also might offer chances to try newer treatments that could be helpful. But when a person has tried many different treatments and the cancer is still growing, even newer treatments might no longer be helpful. 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 treatments and nothing's working anymore. Your doctor might 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. Your doctor can estimate how likely it is the cancer will respond to treatment you're 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's important to have realistic expectations if you do choose this plan.

Palliative care

No matter what you decide to do, it's 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* or *supportive 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 goal 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 pain caused by cancer that has spread. Or a stent might be placed in a bile duct to keep it from being blocked by the cancer. But this is not the same as treatment to try to cure the cancer. Some of the treatments that might be used are discussed in "Palliative therapy for gallbladder cancer."

Hospice care

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 the 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. See *Hospice Care* for more information.

Staying hopeful is important, too. Your hope for a cure may not be as bright, but there's 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.

To learn more

You can learn more about the changes that occur when treatment stops working, and about planning ahead for yourself and your family, in *Advance Directives* and *Nearing the End of Life*.

What's new in gallbladder cancer research and treatment?

Research into the causes, diagnosis, and treatment of gallbladder cancer is 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 3-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 (chemo) has been found to be of limited use against gallbladder cancer, but newer drugs and combinations of drugs are now being tested.

Targeted therapy

Newer drugs are being developed that work in different ways from standard chemo drugs. These drugs target specific parts of cancer cells or their surrounding environments. Many of these newer drugs target cells with specific gene changes. As noted in “Do we know what causes gallbladder cancer?”, researchers now know some of the gene changes commonly found in gallbladder cancer cells. Knowing which genes are abnormal could help doctors determine which of these new drugs might be effective.

One target of several newer drugs is tumor blood vessels. Gallbladder tumors need new blood vessels to grow beyond a certain size. Bevacizumab (Avastin®) and pazopanib (Votrient®) are examples of drugs that target blood vessel growth and are 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, such as cetuximab (Erbitux®) and lapatinib (Tykerb®), are now being studied for use in people with gallbladder cancer, usually in combination with chemotherapy or other targeted drugs.

Drugs known as MEK inhibitors, such as trametinib (Mekinist®) and selumetinib, are also being studied for use against gallbladder cancer.

Additional resources for gallbladder cancer

We have a lot more information that you might find helpful. Explore www.cancer.org or call our National Cancer Information Center toll-free number, 1-800-227-2345. We’re here to help you any time, day or night.

National organizations and websites*

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

National Cancer Institute (NCI)
Toll-free number: 1-800-422-6237 (1-800-4-CANCER)
TTY: 1-800-332-8615
Website: www.cancer.gov

> Offers a wide variety of free, accurate, up-to-date information about cancer to patients, their families, and the general public; also can help people find clinical trials in their area.

National Coalition for Cancer Survivorship (NCCS)
Toll-free number: 1-888-650-9127
Website: www.canceradvocacy.org

Has publications on many cancer-related topics; also offers the Cancer Survival Toolbox – a free program that teaches skills that can help people with cancer meet the challenges of their illness.

Cancer Support Community
Toll-free number: 1-888-793-9355
Website: www.cancersupportcommunity.org

Provides support for those living with cancer and their loved ones. Offers information, stress management, a Cancer Support Helpline, and online support groups led by professionals, including some in Spanish.

Cancer Legal Resource Center (CLRC)
Toll-free number: 1-866-843-2572 (1-866-THE-CLRC)
TTY: 1-213-736-8310
Website: www.cancerlegalresourcecenter.org

A non-profit program that gives free and confidential information and resources on cancer-related legal issues to cancer survivors, their families, friends, employers, health care professionals, and others coping with cancer.

**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.

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