



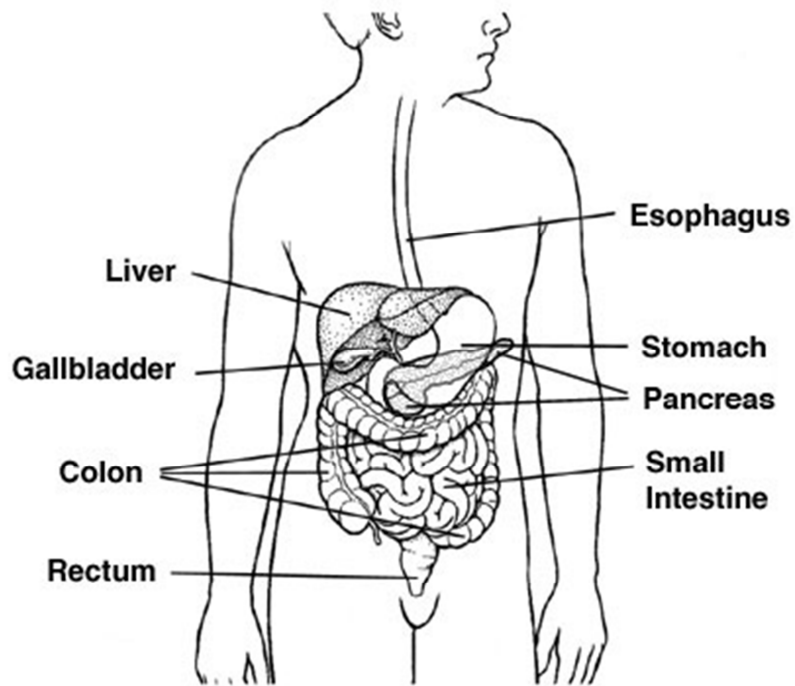
# Bile Duct Cancer (Cholangiocarcinoma)

## What is bile duct cancer?

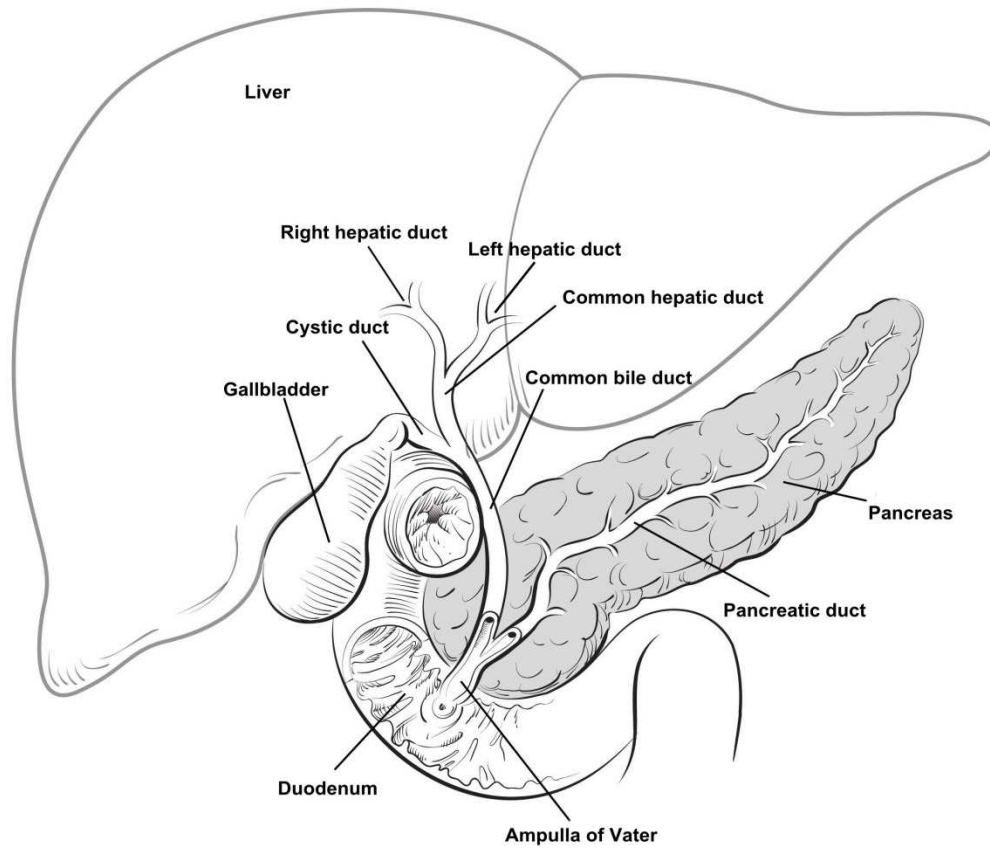
Cancer starts when cells in the body begin to grow out of control. Cells in nearly any part of the body can become cancer, and can spread to other areas of the body. To learn more about how cancers start and spread, see *What Is Cancer?*

Bile duct cancer starts in a bile duct. To understand this cancer, it helps to know about the normal bile ducts and what they do.

## About the bile ducts



The bile ducts are a series of thin tubes that reach from the liver to the small intestine. The major function of the bile ducts is to move a fluid called *bile* from the liver and gallbladder to the small intestine, where it helps digest the fats in food.



Different parts of the bile duct system have different names. In the liver it begins as many tiny tubes (called *ductules*) where bile collects from the liver cells. The ductules come together to form small *ducts*, which then merge into larger ducts and eventually the left and right hepatic ducts. All of these ducts within the liver are called *intrahepatic bile ducts*.

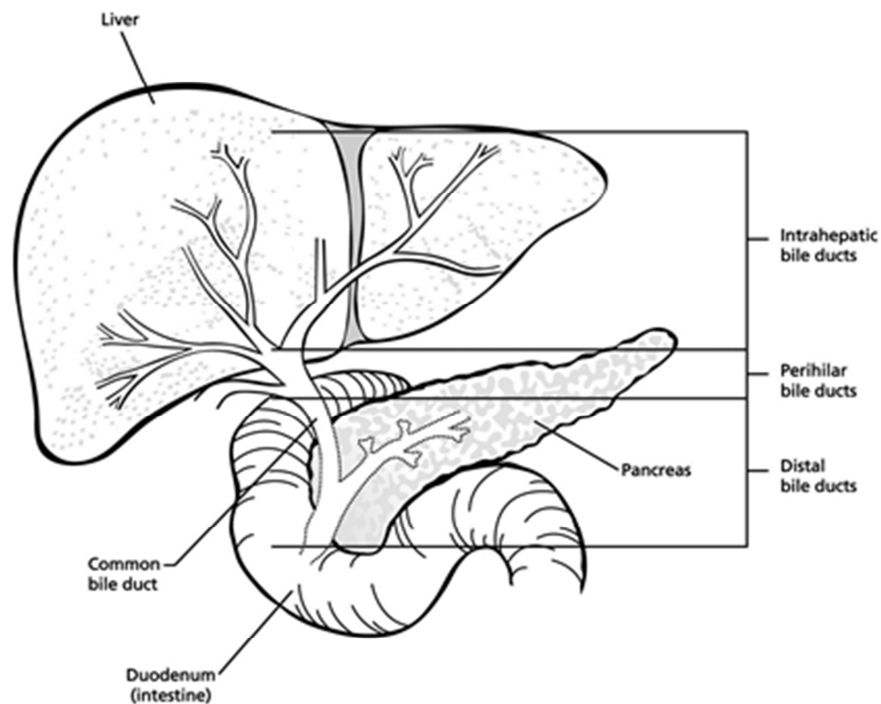
The left and right hepatic ducts exit from the liver and join to form the common hepatic duct in an area called the *hilum*. Lower down, the gallbladder (a small organ that stores bile) joins the common hepatic duct through a small duct called the *cystic duct*. The combined duct is called the *common bile duct*. The common bile duct passes through part of the pancreas before it joins with the pancreatic duct and empties into the first part of the small intestine (the *duodenum*) at the ampulla of Vater.

## Types of bile duct cancers by location

Cancers can develop in any part of the bile duct system and, based on their location (see picture below), are classified into 3 types:

- Intrahepatic bile duct cancers

- Perihilar (also called *hilar*) bile duct cancers
- Distal bile duct cancers



Cancers in these different areas can cause different symptoms.

### **Intrahepatic bile duct cancers**

These cancers develop in the smaller bile duct branches inside the liver. They can sometimes be confused with cancers that start in the liver cells, which are called *hepatocellular carcinomas*, and are often treated the same way. Only about 1 in 10 bile duct cancers are intrahepatic.

### **Perihilar (also called *hilar*) bile duct cancers**

These cancers develop at the hilum, where the left and right hepatic ducts have joined and are just leaving the liver. These are also called *Klatskin tumors*. They are the most common type of bile duct cancer, accounting for more than half of all bile duct cancers. These cancers are grouped with distal bile duct cancers as *extrahepatic bile duct cancers*.

## Distal bile duct cancers

These cancers are found further down the bile duct, closer to the small intestine. Like perihilar cancers, these are extrahepatic bile duct cancers because they start outside of the liver. Distal bile duct cancers make up 2 to 3 of every 10 bile duct cancers.

## Types of bile duct cancer by cell type

Bile duct cancers can also be divided into types based on how the cancer cells look under the microscope.

Nearly all bile duct cancers are called *cholangiocarcinomas*. Most of these are adenocarcinomas, which are cancers that start in glandular cells. Bile duct adenocarcinomas develop from the mucous gland cells that line the inside of the duct.

Other types of bile duct cancers are much less common. These include sarcomas, lymphomas, and small cell cancers. This document does not discuss these other types of bile duct cancer.

**The rest of this document refers only to cholangiocarcinomas.**

## Benign bile duct tumors

Not all bile duct tumors are cancerous. Bile duct hamartomas and bile duct adenomas are examples of benign (non-cancerous) tumors, which aren't discussed further in this document.

## Other cancers in the liver

The most common type of cancer that starts in the liver – much more common than intrahepatic bile duct cancer – is hepatocellular carcinoma, which develops from liver cells. Hepatocellular carcinoma is discussed in more detail in our document *Liver Cancer*.

Cancers that start in some other organs can spread to the liver. These are called *secondary* liver cancers or liver metastases. Their outlook and treatment are not the same as cancer that starts in the liver (such as hepatocellular carcinoma) or bile ducts (like cholangiocarcinoma), but instead depend on where the cancer started. For this reason, it's important to know whether an adenocarcinoma in the liver started in bile ducts (and is a cholangiocarcinoma), or whether it started in another organ (such as the colon) and then spread to the liver.

# What are the key statistics about bile duct cancer?

Bile duct cancer is not common. About 2,000 to 3,000 people in the United States develop bile duct cancer each year. Bile duct cancer is much more common in Southeast Asia, mostly because a parasitic infection that can cause bile duct cancer is much more common there.

Bile duct cancer can occur at younger ages, but it is seen mainly in older people. The average age of people diagnosed with cancer of the intrahepatic bile ducts is 70, and for cancer of the extrahepatic bile ducts it is 72.

The chances of survival for patients with bile duct cancer depend to a large extent on its location and how advanced it is when it is found. For survival statistics, see the section “Survival statistics for bile duct cancers.”

## What are the risk factors for bile duct cancer?

A risk factor is anything that affects your chance of getting a disease like 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.

Researchers have found several risk factors that make a person more likely to develop bile duct cancer.

### Certain diseases of the liver or bile ducts

People who have chronic (long-standing) inflammation of the bile ducts have an increased risk of developing bile duct cancer. Several conditions of the liver or bile ducts can cause this.

- **Primary sclerosing cholangitis** is a condition in which inflammation of the bile ducts (cholangitis) leads to the formation of scar tissue (sclerosis). People with this condition have an increased risk of bile duct cancer. The cause of the inflammation is not usually known. Many people with this disease also have inflammation of the large intestine called *ulcerative colitis*.
- **Bile duct stones**, which are similar to, but much smaller than gallstones, can also cause inflammation that increases the risk of bile duct cancer.

- **Choledochal cysts** are bile-filled sacs that are connected to the bile ducts. (Choledochal means having to do with the common bile duct.) The cells lining the sac often have areas of pre-cancerous changes, which increase a person's risk for bile duct cancer.
- **Liver fluke infections** occur in some Asian countries when people eat raw or poorly cooked fish that are infected with these tiny parasite worms. In humans, these flukes live in the bile ducts and can cause bile duct cancer. There are several types of liver flukes. The ones most closely related to bile duct cancer risk are *Clonorchis sinensis* and *Opisthorchis viverrini*. Liver fluke infection is rare in the US, but it can affect people who travel to Asia.
- **Abnormalities where the bile duct and pancreatic duct normally meet** can allow digestive juices from the pancreas to reflux (flow back "upstream") 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 bile duct cancer.
- **Cirrhosis** is damage to the liver from irritants such as alcohol and diseases such as hepatitis that cause scar tissue to form. Studies have found it raises the risk of bile duct cancer.
- **Infection with hepatitis B virus or hepatitis C virus** increases the risk of intrahepatic bile duct cancers. This may be at least in part due to the fact that long-term infections with these viruses can also lead to cirrhosis.

Other rare diseases of the liver and bile duct that may increase the risk of developing bile duct cancer include **polycystic liver disease** and **Caroli syndrome** (a dilation of the intrahepatic bile ducts that is present at birth).

## Inflammatory bowel disease

Inflammatory bowel disease includes ulcerative colitis and Crohn's disease. People with these diseases have an increased risk of bile duct cancer. This is not explained completely by the link between ulcerative colitis and primary sclerosing cholangitis.

## Older age

Older people are more likely than younger people to get bile duct cancer. Most people diagnosed with bile duct cancer are in their 60s or 70s.

## Ethnicity and geography

In the United States, the risk of bile duct cancer is highest among Hispanic Americans and Native Americans. Worldwide, bile duct cancer is much more common in Southeast Asia and China, largely because of the high rate of infection with liver flukes in these areas.

## Obesity

Being overweight or obese can increase the risk of cancers of the gallbladder and bile ducts. This could be because obesity increases the risk of gallstones and bile duct stones. But there may be other ways that being overweight can lead to bile duct cancers, such as changes in certain hormones.

## Exposure to Thorotrast

A radioactive substance called *Thorotrast* (thorium dioxide) was used as a contrast agent for x-rays until the 1950s. It was found to increase the risk for bile duct cancer, as well as some types of liver cancer, which is why it is no longer used.

## Family history

A history of bile duct 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. Most bile duct cancers are not found in people with a family history of the disease.

## Diabetes

When taken together, the data from many different studies show that people with diabetes have a higher risk of bile duct cancer. This increase in risk is not high, and the overall risk of bile duct cancer in someone with diabetes is still low.

## Alcohol

People who drink alcohol are more likely to get intrahepatic bile duct cancer. The risk is higher in those who have liver problems from drinking alcohol.

## Other possible risk factors

Studies have found several other factors that might increase the risk of bile duct cancer, but the links are not as clear. These include:

- Smoking
- Pancreatitis (inflammation of the pancreas)
- Infection with HIV (the virus that causes AIDS)
- Exposure to asbestos
- Exposure to radon or other radioactive chemicals

- Exposure to dioxin, nitrosamines, or polychlorinated biphenyls (PCBs)

## Do we know what causes bile duct cancer?

We don't know the exact cause of most bile duct cancers, but researchers have found several risk factors that make a person more likely to develop bile duct cancer (see the section "What are the risk factors for bile duct cancer?"). There seems to be a link between this cancer and things that irritate and inflame the bile ducts, whether it's bile duct stones, infestation with a parasite, or something else.

Scientists are starting to understand how 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 bile duct cancers.

Gene mutations related to bile duct cancers are usually acquired during life rather than being inherited. For example, acquired changes in the *TP53* tumor suppressor gene are found in most bile duct cancers. Other genes that may play a role in bile duct cancers include *KRAS*, *HER2*, and *MET*. Some of the gene changes that lead to bile duct cancer might be caused by 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 bile duct cancer be prevented?

There is no known way to prevent most bile duct cancers in the United States. Many of the known risk factors for bile duct cancer, such as age, 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 at a healthy weight is one important way a person may reduce their risk of bile duct cancer, as well as many other types of cancer. 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 an emphasis on 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*.

Other ways that people may be able to reduce their risk of bile duct cancer include:

- Get vaccinated against the hepatitis B virus (HBV) to prevent infection with this virus and the cirrhosis it can cause.
- Take precautions to avoid blood-borne or sexually transmitted infections by HBV and other viruses (like hepatitis C virus) to help prevent cirrhosis.
- Treat hepatitis infections (such as B and C) to help prevent cirrhosis.
- Avoid excessive alcohol use to help prevent cirrhosis.
- Quit (or don't start) smoking.
- Avoid exposure to certain chemicals (see the section "What are the risk factors for bile duct cancer?").

## **Can bile duct cancer be found early?**

Only a small number of bile duct cancers are found before they have spread too far to be removed by surgery.

The bile ducts are 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 bile duct cancers early enough to be useful as screening tests. (Screening is testing for cancer in people without any symptoms.) Because of this, most bile duct cancers are found only after the cancer has grown enough to cause signs or symptoms. The most common symptom is jaundice, a yellowing of the skin and eyes, which is caused by a blocked bile duct.

## **Signs and symptoms of bile duct cancer**

Bile duct 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 diagnosed at an early stage, treatment might be more effective.

When bile duct cancer does cause symptoms, it is usually because a bile duct is blocked.

## Jaundice

Jaundice is yellowing of the skin and eyes. Normally, bile is made by the liver and released into the intestine. Jaundice occurs when the liver can't get rid of bile, which contains a greenish-yellow chemical called *bilirubin*. As a result, bilirubin backs up into the bloodstream and settles in different parts of the body. This can often be seen in the skin and the white part of the eyes.

Jaundice is the most common symptom of bile duct cancer, but most cases of jaundice are not caused by cancer. Jaundice is more often caused by hepatitis (inflammation of the liver) or a gallstone that has traveled to the bile duct. But whenever jaundice occurs, a doctor should be seen right away.

## Itching

Excess bilirubin in the skin can also cause itching. Most people with bile duct cancer notice itching.

## Light-colored/greasy stools

Bilirubin contributes to the brown color of bowel movements, so if it doesn't reach the intestines, the color of a person's stool might be lighter.

If the cancer blocks the release of bile and pancreatic juices into the intestine, a person might not be able to digest fatty foods. The undigested fat can also cause stools to be unusually pale. They might also be bulky, greasy, and float in the toilet.

## Dark urine

When bilirubin levels in the blood get high, it can also come out in the urine and turn it dark.

## Abdominal (belly) pain

Early bile duct cancers usually do not cause pain, but more advanced cancers may cause abdominal pain, especially below the ribs on the right side.

## Loss of appetite/weight loss

People with bile duct cancer may not feel hungry and may lose weight (without dieting).

## Fever

Some people with bile duct cancer develop fevers.

## Nausea and vomiting

These are not common symptoms of bile duct cancer, but they may occur in people who develop an infection (cholangitis) as a result of bile duct blockage. They are often seen along with a fever.

Bile duct cancer is not common, and these symptoms and signs are more likely to be caused by something other than bile duct cancer. For example, people with gallstones may have many of these same symptoms. There are many far more common causes of abdominal pain than bile duct cancer. And hepatitis (an inflamed liver most often caused by infection with a virus) 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 bile duct cancer diagnosed?

Most bile duct cancers are not found until patients go to a doctor because they have symptoms. The doctor will need to take a history and do a physical exam, and then might order some tests.

### History and physical exam

If there is reason to suspect that you might have bile duct cancer, your doctor will want to take a complete medical history to check for risk factors and to learn more about your symptoms.

A physical exam is done to look for signs of bile duct cancer or other health problems. If bile duct cancer is suspected, 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).

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

## Blood tests

### Tests of liver and gallbladder function

The doctor may order lab tests to find out how much bilirubin is in the blood. Bilirubin is the chemical that causes jaundice. Problems in the bile ducts, gallbladder, or liver can raise the blood level of bilirubin. A high bilirubin level tells the doctor that there may be problems with the bile duct, gallbladder, or liver.

Along with tests for bilirubin, the doctor may also order tests for albumin, for liver enzymes (alkaline phosphatase, AST, ALT, and GGT), and certain other substances in your blood.

These are sometimes called *liver function tests*. They can indicate bile duct, gallbladder, or liver disease. If levels of these substances are higher, it might point to blockage of the bile duct, but they can't show if it is due to cancer or some other reason.

## **Tumor markers**

Tumor markers are substances made by cancer cells that can sometimes be found in the blood. People with bile duct cancer may have high blood levels of the CEA and CA 19-9 tumor markers. High amounts of these substances often mean that cancer is present, but the high levels can also be caused by other types of cancer, or even by problems other than cancer. Also, not all bile duct cancers make these tumor markers, so low or normal levels do not always mean cancer is not present.

These tests can sometimes be useful after a person is diagnosed with bile duct 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 help find 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 find out if treatment is working
- To look for signs of the cancer coming back after treatment

Imaging tests can often show a bile duct blockage. But they often can't show if the blockage is caused by a tumor or a benign problem such as scarring.

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

## **Ultrasound**

For this test, a small, microphone-like 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 echo patterns can help find tumors and show how far they have grown into nearby areas. They can also help tell whether some tumors are benign or malignant.

**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.

This is an easy test to have and does not use radiation. You simply lie on a table while the doctor or ultrasound technician moves the transducer along the skin over the right upper part of the abdomen. Usually, the skin is first lubricated with gel.

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

**Endoscopic or laparoscopic ultrasound:** In these techniques, the doctor puts the ultrasound transducer inside the body and closer to the bile duct, 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 into the small intestine near the bile ducts (endoscopic ultrasound) or through a small surgical cut in the side of the patient's body (laparoscopic ultrasound).

If there is a tumor, the doctor might be able to see how far it has grown and spread, which can help 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. Needle biopsies of suspicious areas might be taken as well.

## Computed tomography (CT) scan

The CT scan uses x-rays to make detailed cross-sectional images of your body. Instead of taking one x-ray, a CT scanner takes many pictures as it rotates around you. 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 in 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:

- They often help diagnose bile duct 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 bile duct (especially the liver), as well as lymph nodes and distant organs where cancer might have spread to.
- A type of CT known as *CT angiography* can be used to look at the blood vessels around the bile ducts. 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*, the patient remains 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 bile ducts and nearby organs. Sometimes they can help tell a benign tumor from a cancerous one.

Special types of MRI scans may also be used in people who may have bile duct cancer:

- **MR cholangiopancreatography (MRCP)** can be used to look at the bile ducts and is described in the section on cholangiography.
- **MR angiography (MRA)** looks at blood vessels and is mentioned in the 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 with a fear of enclosed spaces. Special, more open MRI machines can sometimes be used instead. The MRI machine makes buzzing and clicking noises that you may find 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 (widened). 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, which have different pros and cons.

**Magnetic resonance cholangiopancreatography (MRCP):** This is a non-invasive way to image the bile ducts using the same type of machine used for standard MRI scans. It does not require an endoscope or an IV infusion of a contrast agent, unlike the 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 it has the advantage of allowing the doctor to take samples of cells or fluid to be looked 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. Like ERCP, this approach can also be used to take samples of fluid or tissues or to place stents (small tubes) in the bile 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 is an x-ray procedure for looking at blood vessels. For this test, a small amount of contrast dye is injected into an artery to outline blood vessels before 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 bile duct cancer has grown through the walls of certain blood vessels. This information is mainly 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 bile ducts to inject the dye. Usually the catheter is put into an artery in your inner thigh and threaded up into the artery supplying the bile ducts. 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 give information about the blood vessels without the need for a catheter. You may still need an IV line so that a contrast dye can be injected into the bloodstream during the imaging.

## Other tests

Doctors may also place special instruments (endoscopes) into the body to get a more direct look at the bile duct and surrounding areas. The scopes may be passed through small surgical incisions or through natural body openings like the mouth.

### 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 cut in the front of the abdomen to look at the bile duct, gallbladder, liver, and other organs and tissues in the area. (Sometimes more than one cut is made.) This procedure is typically 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 assess the stage (extent) of the cancer. If needed, doctors can also insert instruments through the incisions to remove small biopsy samples to be looked at under a microscope. This procedure is often done before surgery to remove the cancer, to help make sure the tumor can be removed completely.

### Cholangioscopy

This procedure can be done during an ERCP (see above). The doctor passes a very thin fiber-optic tube with a tiny camera on the end down through the larger tube used for the ERCP. From there it can be maneuvered into the bile ducts. This lets the doctor see any blockages, stones, or tumors and even biopsy them.

## Biopsy

Imaging tests (ultrasound, CT or MRI scans, cholangiography, etc.) might suggest that a bile duct cancer is present, but in many cases a sample of bile duct cells or tissue is removed (biopsied) and looked at under a microscope to be sure of the diagnosis.

But a biopsy may not always be done before surgery for a possible bile duct cancer. If imaging tests suggest there is a tumor in the bile duct, the doctor may decide to proceed directly to surgery and to treat it as a bile duct cancer (see the section “Surgery for bile duct cancer”).

### Types of biopsies

There are several ways to take biopsy samples to diagnose bile duct cancer.

**During cholangiography:** If ERCP or PTC is being done, a sample of bile may be collected during the procedure to look for tumor cells within the fluid.

Bile duct cells and tiny fragments of bile duct tissue can also be sampled by biliary brushing. Instead of injecting contrast dye and taking x-ray pictures (as for ERCP or PTC), the doctor advances a small brush with a long, flexible handle through the endoscope or needle. The end of the brush is used to scrape cells and small tissue fragments from the lining of the bile duct, which are then looked at under a microscope.

**During cholangioscopy:** Biopsy specimens can also be taken during cholangioscopy. This lets the doctor see the inside surface of the bile duct and take samples of suspicious areas.

**Needle biopsy:** For this test, a thin, hollow needle is inserted through the skin and into the tumor without first 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. Sometimes, the FNA doesn't provide enough cells for a definite diagnosis, so a core needle biopsy may be done, which uses a slightly larger needle to get a bigger sample.

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

## How is bile duct cancer staged?

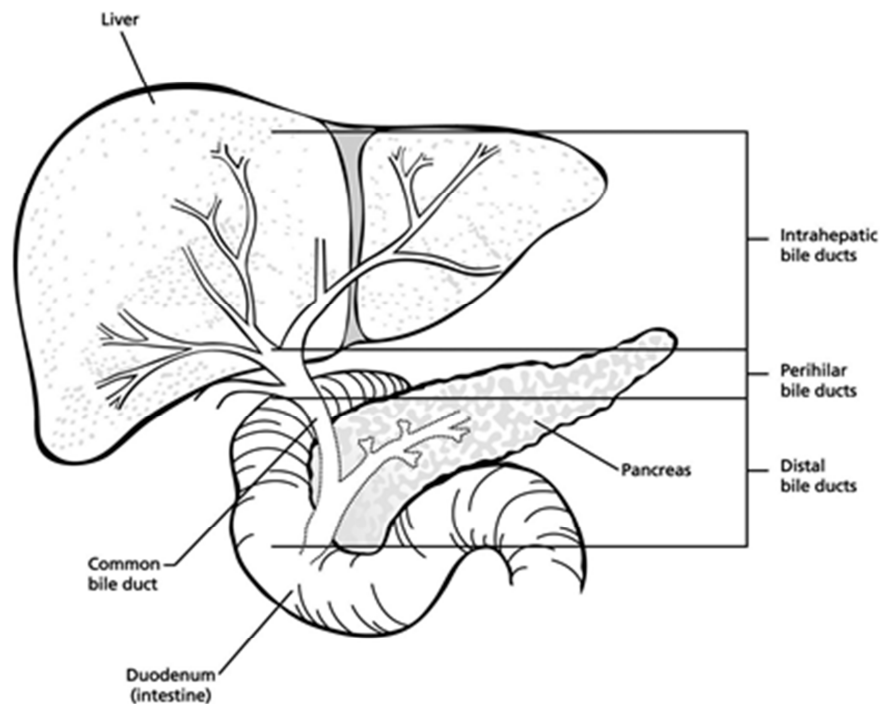
The stage of a cancer describes how far it has spread. The stage of bile duct cancer is one of the most important factors in selecting treatment options and estimating a patient's outlook (prognosis).

The stage is determined by the results of the physical exam, imaging and other tests (described in the section "How is bile duct 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 sum up the extent of a cancer. The main system used to describe the stages of bile duct cancer is the American Joint Committee on Cancer (AJCC) TNM system. There are actually 3 different staging systems for bile duct cancers, depending on where they start:

- Intrahepatic bile duct cancers (those starting within the liver)
- Perihilar (hilar) bile duct cancers (those starting in the *hilum*, the area just outside the liver)
- Distal bile duct cancers (those starting farther down the bile duct system)



No matter where they are, nearly all bile duct cancers start in the innermost layer of the wall of the bile duct. Over time they can grow through the wall toward the outside of the bile duct. If a tumor grows through the bile duct wall, it can invade (grow into) nearby blood vessels, organs, or other structures. It might also enter the nearby lymphatic or blood vessels, from which it can spread to nearby lymph nodes or to other parts of the body.

The TNM system for all bile duct cancers contains 3 key pieces of information:

- **T** describes whether the main (primary) **tumor** has invaded through the wall of the bile duct and whether it has invaded other nearby organs or tissues.
- **N** describes whether the cancer 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 bile duct cancer spread are the liver, peritoneum [the lining of the abdominal cavity], and the lungs.)

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

# Staging of intrahepatic bile duct cancers

## T categories

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

**T0:** There is no evidence of a primary tumor.

**Tis:** Cancer cells are only in the mucosa (the innermost layer of the bile duct) and have not grown into deeper layers of the bile duct. This stage is also known as *intramucosal carcinoma* and was previously called *carcinoma in situ*.

**T1:** There is a single tumor that has grown into deeper layers of the bile duct wall, but it is still only in the bile duct. The cancer has not grown into any blood vessels.

**T2:** Split into 2 groups:

- **T2a:** There is a single tumor that has grown through the wall of the bile duct and into a blood vessel.
- **T2b:** There are 2 or more tumors, which may (or may not) have grown into blood vessels.

**T3:** The cancer has grown into nearby structures such as the intestine, stomach, common bile duct, abdominal wall, diaphragm (the thin muscle that separates the chest from the abdomen), or lymph nodes around the portal vein.

**T4:** The cancer is spreading through the liver by growing along the bile ducts.

## N categories

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

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

**N1:** The cancer has spread to nearby lymph nodes.

## M categories

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

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

## 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 stage) or

as Roman numerals up to stage IV (the most advanced stage). Some stages are subdivided with letters.

**Stage 0 (Tis, N0, M0):** The cancer is only growing in the innermost layer of the bile duct (Tis) and has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage I (T1, N0, M0):** The cancer is a single tumor that has grown into deeper layers of the bile duct wall (T1), but it has not grown into any blood vessels. It has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage II (T2, N0, M0):** The cancer is either a single tumor that has grown into a blood vessel (T2a) or there are multiple tumors (T2b). The cancer has not grown into any nearby organs or structures. It has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage III (T3, N0, M0):** The cancer has grown into nearby structures such as the duodenum (first part of the small intestine), colon, stomach, abdominal wall, diaphragm, or lymph nodes around the portal vein (T3). It has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage IV:** Split into 2 groups:

- **Stage IVA (T4, N0, M0) OR (Any T, N1, M0):** Either the cancer is spreading through the liver by growing along the bile ducts (T4), OR the cancer has spread to nearby lymph nodes (N1). It has not spread to distant sites (M0).
- **Stage IVB (Any T, any N, M1):** The cancer has spread to distant sites (M1).

## Staging of perihilar bile duct cancers

### T categories

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

**T0:** There is no evidence of a primary tumor.

**Tis:** Cancer cells are only in the mucosa (the innermost layer of the bile duct) and have not invaded deeper layers of the bile duct. This stage is also known as *intramucosal carcinoma* and was previously called *carcinoma in situ*.

**T1:** The cancer has grown into deeper layers of the bile duct wall, such as the muscle layer or the fibrous tissue layer.

**T2:** The tumor has grown through the wall of the bile duct and into nearby tissue.

- **T2a:** The tumor has grown through the wall of the bile duct and into surrounding fat.
- **T2b:** The tumor has grown through the wall of the bile duct and into nearby liver tissue.

**T3:** The cancer is growing into branches of the main blood vessels of the liver (the portal vein and/or the hepatic artery) on one side (left or right).

**T4:** The cancer is growing into the main blood vessels of the liver (the portal vein and/or the common hepatic artery) or into branches of these vessels on both sides (left and right), OR the cancer is growing directly into other bile ducts while part of the tumor is growing into one of the main blood vessels.

## **N categories**

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

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

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

**N2:** The cancer has spread to lymph nodes farther away from the tumor, such as those around the major blood vessels of the abdomen (the aorta, the vena cava, the celiac artery, and the superior mesenteric artery).

## **M categories**

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

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

## **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 stage) or as Roman numerals up to stage IV (the most advanced stage). Some stages are subdivided with letters.

**Stage 0 (Tis, N0, M0):** Cancer cells are only in the innermost layer of the bile duct and have not grown into deeper layers (Tis). Cancer has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage I (T1, N0, M0):** The cancer has grown into deeper layers of the bile duct wall, such as the muscle layer or the fibrous tissue layer (T1). It has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage II (T2, N0, M0):** The tumor has grown through the wall of the bile duct and into surrounding fat (T2a) or liver tissue (T2b). Cancer has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage III:** Has 2 substages:

- **Stage IIIA (T3, N0, M0):** The cancer is growing into branches of the main blood vessels of the liver (the portal vein and/or the hepatic artery) on one side (T3). Cancer has not spread to nearby lymph nodes (N0) or distant sites (M0).
- **Stage IIIB (T1 to T3, N1, M0):** The cancer has grown into deeper layers of the bile duct wall (T1) and may have grown through the wall and into nearby fat or liver tissue (T2). The cancer may be growing into branches of the main blood vessels of the liver on one side (T3). Cancer cells are found in nearby lymph nodes (N1), but the cancer has not spread to distant sites (M0).

**Stage IV:** Has 2 substages:

- **Stage IVA (T4, N0-1, M0):** The cancer is growing into the main blood vessels of the liver (the portal vein and/or the common hepatic artery), is growing into branches of these vessels on both sides, or part of the cancer is growing directly into other bile ducts while another part of the tumor is growing into one of the main blood vessels (T4). The cancer may have spread to nearby lymph nodes (N0 or N1), but it has not spread to distant sites (M0).
- **Stage IVB (Any T, N2, M0) or (Any T, any N, M1):** The cancer has either spread to lymph nodes away from the tumor (N2) or it has spread to distant sites (tissues or organs away from the bile duct) such as the lungs or bones (M1).

## Staging of distal bile duct cancers

### T categories for distal extrahepatic bile duct cancer

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

**T0:** There is no evidence of a primary tumor.

**Tis:** Cancer cells are only in the mucosa (the innermost layer of the bile duct) and have not invaded deeper layers. This stage is also known as *intramucosal carcinoma* and was previously called *carcinoma in situ*.

**T1:** The cancer has grown into deeper layers of the bile duct wall, but it is still only in the bile duct.

**T2:** The cancer has grown through the bile duct wall but is not growing into nearby structures.

**T3:** The cancer has grown into nearby structures such as the liver, gallbladder, pancreas, or duodenum (the first part of the small intestine), but it is not growing into the main blood vessels supplying the stomach and intestines (the celiac artery and the superior mesenteric artery).

**T4:** The cancer has grown into one or both of the main blood vessels supplying the stomach and intestines (the celiac artery and the superior mesenteric artery).

## **N categories**

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

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

**N1:** The cancer has spread to nearby lymph nodes.

## **M categories**

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

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

## **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 stage) or as Roman numerals up to stage IV (the most advanced stage). Some stages are subdivided with letters.

**Stage 0 (Tis, N0, M0):** The cancer is only in the innermost layer of the bile duct (Tis) and has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage IA (T1, N0, M0):** The cancer has grown into deeper layers of the bile duct wall, but it has not grown all the way through the wall (T1). It has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage IB (T2, N0, M0):** The cancer has grown through the bile duct wall but has not invaded nearby organs or structures (T2). It has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage IIA (T3, N0, M0):** The cancer has grown into nearby structures such as the liver, gallbladder, pancreas, or duodenum (the first part of the small intestine), but it is not growing into the main blood vessels supplying the stomach and intestines (the celiac artery and the superior mesenteric artery) (T3). It has not spread to nearby lymph nodes (N0) or distant sites (M0).

**Stage IIB (T1 to T3, N1, M0):** The cancer may or may not have spread outside of the bile duct to nearby organs. It has spread into nearby lymph nodes (N1) but not to distant sites (M0).

**Stage III (T4, any N, M0):** The cancer has grown into one or both of the main blood vessels supplying the stomach and intestines (the celiac artery and the superior mesenteric artery)

(T4). It may (N1) or may not (N0) have spread to nearby lymph nodes, but it has not spread to distant sites (M0).

**Stage IV (Any T, any N, M1):** The cancer has spread to distant sites (M1).

## Resectable versus unresectable bile duct cancers

The TNM staging system provides a detailed summary of how far the cancer has spread and gives doctors an idea about a person's prognosis (outlook). But for treatment purposes, doctors often use a simpler system based on whether or not the cancer 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.

In general terms, most stage 0, I, and II cancers and possibly some stage III cancers are resectable, while most stage III and IV tumors are unresectable. But this also depends on other factors, such as the size and location of the cancer and whether a person is healthy enough for surgery.

## Survival statistics for bile duct cancers

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 might not find the numbers helpful, or might even not want to know them. If you decide that 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, some of these people live much longer than 5 years.

Five-year *relative* survival rates, such as the numbers below, assume that some people will die of other causes and compare the observed survival with that expected for people without the cancer. This is a better way to see the impact of the cancer on survival.

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

There are some important points to note about the survival rates below:

These statistics come from the National Cancer Institute's SEER program and are based on people diagnosed with bile duct cancer in the years 2000 to 2006. SEER does not separate these cancers by AJCC stage, but instead puts them into 3 groups: localized, regional, and distant. Localized is like AJCC stage I. Regional includes stages II and III. Distant means the same as stage IV.

SEER also does not separate perihilar bile duct cancers from distal bile duct cancers. Instead, these are grouped together as extrahepatic bile duct cancers.

### **Intrahepatic bile duct cancer**

<b>Stage</b>	<b>5-year relative survival</b>
Localized	15%
Regional	6%
Distant	2%

### **Extrahepatic bile duct cancer**

<b>Stage</b>	<b>5-year relative survival</b>
Localized	30%
Regional	24%
Distant	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 bile duct cancer treated?

## Making treatment decisions

After bile duct cancer is found and staged, your cancer care team will discuss your treatment options with you. It is important for you to take time and think about your choices. In choosing a treatment plan, there are some factors to consider:

- The location and extent of the cancer
- Whether the cancer is resectable (removable by surgery)
- The likely side effects of treatment
- Your overall health
- The chances of curing the disease, extending life, or relieving symptoms

The main types of treatment for bile duct cancer include:

- Surgery
- Radiation therapy
- Chemotherapy
- Palliative therapy

Based on your treatment options, you might have different types of doctors on your cancer care team. These might 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
- A hepatologist: a doctor who treats disease of the liver and bile ducts

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 the section "What should you ask your doctor about bile duct cancer?" If time allows, it is often a good idea to seek a second opinion, particularly for an uncommon cancer like bile duct 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 "Clinical Trials" 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 *Complementary and Alternative Medicine* 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 next few sections describe the different types of treatment for bile duct cancer. This is followed by a discussion of the most common treatments for bile duct cancer based on whether it is resectable.

*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 bile duct cancer

There are 2 general types of surgery for bile duct cancer:

- Potentially curative surgery
- Palliative surgery

**Potentially curative surgery** is used when imaging tests or the results of earlier surgeries show there's 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 potentially curative surgery) and *unresectable* to describe those they think have spread too far or are in too difficult a place to be entirely removed by surgery. Unfortunately, only a small portion of bile duct 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 bile duct cancer. But there are differences of opinion about how advanced a bile duct cancer can be and still be treatable with surgery. The surgery needed for bile duct 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 symptoms or treat (or even prevent) complications, such as blockage of the bile ducts. This type of surgery is done when the tumor is too widespread to be removed completely. Palliative surgery is not expected to cure the cancer, but it can sometimes help a person feel better and sometimes can even help them live longer. Palliative surgery is described in more detail in the section "Palliative therapy for bile duct cancer."

Surgery to remove bile duct cancer can have serious side effects and, depending on how extensive it is, may require several weeks for recovery. If your cancer is very unlikely to be curable, be sure to carefully weigh the pros and cons of surgery or other treatments that require a lot of recovery time. It's very important to understand the goal of any surgery for bile duct cancer, what the possible benefits and risks are, and how the surgery is likely to affect your quality of life.

## Laparoscopy

If your surgical team is planning curative surgery, they first may do a laparoscopy (a type of minor surgery) to look for any spread of the cancer that could make curative surgery impossible. This procedure is described in the section “How is bile duct cancer diagnosed?” During the laparoscopy, the surgeon can look for areas of cancer that were not detected with imaging tests. If the cancer is still resectable, laparoscopy can also help plan the operation to remove it.

## Surgery for resectable cancers

For resectable cancers, the type of operation depends on the location of the cancer.

**Intrahepatic bile duct cancer:** These cancers have started in bile ducts within the liver. To treat these cancers, the surgeon cuts out the part of the liver containing the cancer. Removing part of the liver is called a *partial hepatectomy*. Sometimes this means that a whole lobe (right or left part) of the liver must be removed. This is called *hepatic lobectomy*. It is a complicated operation and requires an experienced team of surgeons and assistants. If the amount of liver removed is not too great, the liver will still function normally because it has some ability to grow back.

**Perihilar bile duct cancer:** These cancers begin where the branches of the bile duct first leave the liver. Surgery for these cancers requires great skill, as the operation is quite extensive. Usually part of the liver is removed, along with the bile duct, gallbladder, nearby lymph nodes, and sometimes part of the pancreas and small intestine. Then the surgeon connects the remaining ducts to the small intestine. This is a complex operation that can even have life threatening complications for some patients.

**Distal bile duct cancer:** These cancers are further down the bile duct near the pancreas and small intestine. Along with the bile duct and nearby lymph nodes, in most cases the surgeon must remove part of the pancreas and small intestine, an operation called a *Whipple procedure*. Like the other operations, this is a complex procedure that requires an experienced surgical team.

**Possible risks and side effects:** The risks and side effects of surgery depend on the extent of the operation and a person’s general health. All surgery carries some risk, including the possibility of bleeding, blood clots, infections, complications from anesthesia, pneumonia, and even death in rare cases.

People will have some pain from the incision for some time after the operation, but this can usually be controlled with medicines.

Surgery for bile duct cancer is a major operation that might mean removing parts of several organs. This can significantly affect 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 and nutrition problems can be side effects of surgery for this cancer.

## **Surgery for unresectable cancers**

Surgery is less likely to be done for unresectable cancers, but there are some instances where it might be helpful.

**Liver transplant:** For some people with unresectable intrahepatic or perihilar bile duct cancers, removing the liver and bile ducts and then transplanting a donor liver may be an option. In some cases it might even cure the cancer.

But even for people who are eligible for a transplant, getting a new liver may not be easy. Not many centers accept patients with bile duct cancer into their transplant programs. Also, few livers are available for patients with cancer because they are generally used for more curable diseases. People needing a transplant must wait until a liver is available, which can take too long for some people with bile duct cancer.

One option might be having a living donor (often a close relative) give a part of their liver for transplant. This can be successful, but it carries risks for the donor. Another option might be to treat the cancer first with chemotherapy and radiation. This is followed by a transplant when a liver becomes available. Clinical trial results using this approach have been promising.

Like other surgeries for bile duct cancer, a liver transplant is a major operation with potential risks (bleeding, infection, complications from anesthesia, etc.). But there are also some additional risks after this surgery.

People who get a liver transplant have to be given drugs to help suppress their immune system to prevent it from rejecting the new organ. These drugs have their own risks and side effects, especially the risk of getting serious infections. Some of the drugs used to prevent rejection can also cause high blood pressure, high cholesterol, and diabetes, can weaken the bones and kidneys, and can lead to the development of another cancer. After a liver transplant, regular blood tests are important to check for signs of rejection. Sometimes liver biopsies are also taken to see if rejection is occurring and if the anti-rejection medicines need to be changed.

**Palliative surgery:** In some cases a doctor may think that a cancer is resectable based on the information available (imaging tests, laparoscopy, etc.), but once surgery is started it becomes clear that the cancer is too advanced to be removed completely. In these cases, the surgeon might still try to prevent or relieve symptoms using a different approach.

- **Biliary bypass:** One option at this point is to do a *biliary bypass* to allow the bile to flow into the intestines to reduce symptoms such as jaundice or itching. Different types of biliary bypass operations may be done, based on the location of the blockage. In these procedures, the surgeon creates a bypass around the tumor blocking the bile duct by

connecting part of the bile duct before the blockage with a part of the duct that lies past the blockage, or with the intestine itself. Often, the gallbladder is used to provide some of the bypass.

- **Stent placement:** If a bypass can't be done, the surgeon may place a plastic or expandable metal tube (called a *stent*) inside the bile duct to keep it open.

These palliative procedures are discussed further in the section "Palliative therapy for bile duct cancer."

For more general information about cancer surgery, see our document *A Guide to Cancer Surgery*.

## Radiation therapy for bile duct cancer

Radiation therapy uses high-energy rays or particles to destroy cancer cells. Radiation can be used in different settings to treat bile duct cancer:

- **After surgery for resectable cancers:** This is known as *adjuvant therapy*. It is meant to kill any tiny deposits of cancer cells that remain after surgery (but are too small to see). Some doctors believe adjuvant radiation therapy is helpful, but more research is needed to confirm this.
- **Before surgery for borderline resectable cancers:** Some doctors may use radiation therapy before surgery for certain cancers that are thought to be resectable. This is done to try to shrink the cancer and make the operation easier and is known as *neoadjuvant therapy*. It's not clear how helpful this is.
- **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 has not spread widely throughout the body, but is not resectable. While treatment in this case does not offer a cure, it may help patients live longer.
- **As palliative therapy:** Radiation therapy is often used to palliate (relieve) symptoms when a cancer is too advanced to be cured. It can help relieve pain or other symptoms by shrinking tumors that block passageways for blood or bile, or press on nerves.

Chemotherapy (chemo) is sometimes given along with the radiation therapy to help it work better. This is called *chemoradiation*. Most often, the chemo drugs used are 5-fluorouracil (5-FU) or capecitabine (Xeloda®). The main drawback of this approach is that the side effects tend to be worse than giving radiation alone.

The 2 main types of radiation therapy are external beam radiation therapy (EBRT) and brachytherapy. EBRT is the most common form of radiation for bile duct cancer.

## **External beam radiation therapy (EBRT)**

This type of radiation therapy uses x-rays from a machine outside the patient's body to kill cancer cells.

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 let doctors more accurately treat bile duct cancers while reducing the radiation exposure to nearby healthy tissues. This may increase the success rate and help reduce side effects.

**Three-dimensional conformal radiation therapy (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)** is an advanced form of 3D therapy. It uses a computer-driven machine that moves around you 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. IMRT is available in many major hospitals and cancer centers.

**Stereotactic body radiotherapy (SBRT)** uses the techniques of 3D-CRT and IMRT, but gives the radiation over fewer sessions. A course of SBRT may take less than a week, while a course of radiation using these other techniques often takes place over 3 to 6 weeks.

### **EBRT side effects**

Side effects of EBRT depend on the area of the body being treated. Some common side effects include:

- Skin changes, ranging from redness to blistering and peeling (in the area being treated)
- Nausea and vomiting
- Diarrhea
- Fatigue (tiredness)
- Hair loss (on the skin in the area being treated)
- Low blood cell counts

Nausea, vomiting, and diarrhea are more common if the abdomen (belly) is being treated.

Side effects from radiation often start a week or 2 into treatment, and improve once treatment is over.

## **Brachytherapy (internal radiation therapy)**

This type of treatment uses small pellets of radioactive material placed next to or directly into the cancer. The radiation travels a very short distance, so it affects the cancer without causing much harm to nearby healthy body tissues. For bile duct cancer, brachytherapy is sometimes done by placing the pellets in a tube, which is inserted into the bile duct for a short time.

For more general information about radiation therapy, see the Radiation Therapy section on our website or our document *A Guide to Radiation Therapy*.

## **Chemotherapy for bile duct 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 some cancers that have spread to organs beyond the bile duct. Because the drugs reach all the areas of the body, this is known as a *systemic* treatment. Chemo can help some people with bile duct cancer, but so far its effects against this type of cancer have been found to be limited.

For resectable bile duct cancers (cancers that can be removed completely), chemo may be used after surgery (often along with radiation therapy) to try to lower the risk that the cancer will return. This is known as *adjuvant chemo*. Some doctors may use it before surgery for borderline resectable cancers to try to improve the odds that surgery will be successful. This is called *neoadjuvant treatment*.

Chemo can also be used (sometimes with 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 give 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 bile duct cancer, doctors have tried giving the drugs directly into the main artery going into the liver, called the *hepatic artery*. Since the hepatic artery also supplies most bile duct 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. HAI may help some people whose cancer was not removable by surgery live longer, but more research is needed. This technique may not

be useful for some people because it often requires surgery to insert a catheter into the hepatic artery, an operation that many bile duct cancer patients might not tolerate well.

## **Drugs used to treat bile duct cancer**

Several drugs can be used to treat bile duct cancer. In some cases, 2 or more of these drugs may be combined to try to make them more effective. The drugs used most often to treat bile duct cancer include:

- 5-fluorouracil (5-FU)
- Gemcitabine (Gemzar<sup>®</sup>)
- Cisplatin
- Capecitabine (Xeloda<sup>®</sup>)
- Oxaliplatin (Eloxatin<sup>®</sup>)

## **Possible side effects of chemotherapy**

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
- Nerve damage (neuropathy), which can lead to trouble swallowing or numbness, tingling, and even pain in the hands and feet
- 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, and let them know when you do have side effects so they can be managed effectively.

To learn more about chemo, see the [Chemotherapy](#) section of our website, or our document *A Guide to Chemotherapy*.

## Palliative therapy for bile duct cancer

Palliative therapy is treatment given to help control or reduce symptoms caused by advanced cancer. It is not meant to cure the cancer. If the cancer has spread too far to be removed by surgery, doctors may focus on palliative operations, radiation, or other treatments to help make you feel better or to help prevent possible complications from the cancer. Because these cancers tend to advance quickly, doctors try to use palliative therapies that are less likely to have unpleasant short-term side effects, when possible.

### Biliary stent or biliary catheter

If cancer is blocking a bile duct, it can lead to jaundice and other problems. The doctor may insert a small tube (either a *stent* or *catheter*) into the duct to help keep it open. This may be done as part of a cholangiography procedure such as ERCP or PTC (see the section “How is bile duct 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. One end of the tube is placed into a bile duct to allow bile to drain 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 prevent or relieve 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 if it becomes clogged and to reduce the risk of infection and gallbladder inflammation.

### Biliary bypass

Another option to allow bile to reach the small intestine is to use a surgery called *biliary bypass*. There are several different biliary bypass operations, and the decision on which one to use is based on the location of the blockage. In these procedures, the surgeon creates a

bypass around the tumor blocking the bile duct by connecting part of the bile duct before the blockage with a part of the duct that lies past the blockage, or with the intestine itself.

As mentioned in the section “Surgery for bile duct cancer”, this option is more likely to be used if a patient is already having surgery to try to cure the cancer, but it turns out to be unresectable. While a bypass is clearly more invasive than placing a stent or catheter, it has some advantages in that the effects may last longer and infection is less likely to be a problem.

### **Palliative radiation therapy**

Radiation therapy may be used to help relieve pain and other symptoms by killing some cancer cells that are causing blockage of the bile duct or are pressing on nerves.

### **Tumor ablation (radiofrequency ablation or cryosurgery)**

Tumors in the liver that can’t be resected can sometimes be destroyed (ablated) by placing a long metal probe through the skin and into the tumor. The tip of the probe is then heated (in radiofrequency ablation) or frozen (in cryotherapy) to kill the cancer cells.

### **Photodynamic therapy (PDT)**

For this technique, a light-activated drug is injected into a vein. The drug is more likely to collect in cancer cells than in normal cells. A few days later, an endoscope (a long, flexible tube that can be used to look inside the body) is passed down the throat, through the stomach and intestine, and into the bile ducts. A special red light on the end of the endoscope is aimed at the tumor, causing the cells to die. The combination of PDT and stenting can be helpful for patients with bile duct cancer whose tumors aren’t resectable.

This drug can also collect in normal cells in the body, making a person very sensitive to sunlight or strong indoor lights. You will likely need to stay out of any strong light for several weeks after the injection.

### **Alcohol injection**

To relieve pain, doctors may deaden the nerves that convey sensations of pain from the bile duct 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 opioid 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 of our website, or our *Guide to Controlling Cancer Pain*.

## Treatment of bile duct cancer based on the situation

The extent of a bile duct cancer is an important factor in determining treatment options. Whenever possible, surgery is the main treatment for bile duct cancers, as it offers the only realistic chance for a cure. Because of this, doctors generally divide bile duct 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.

Unfortunately, most bile duct cancers have spread too far to be resectable by the time they are found.

### Resectable bile duct cancers

Most stage 0, I, and II cancers and possibly some stage III cancers in the TNM staging system are potentially resectable. But this also depends on other factors, such as the location of the cancer and if a person is healthy enough for major surgery.

Surgery to remove the cancer completely is the preferred treatment if it is possible. If surgery is being considered, a staging laparoscopy may be done first to look inside the abdomen for any spread of the cancer that could make it unresectable. This procedure is described in the section "How is bile duct cancer diagnosed?"

The type of operation done to remove the cancer depends on the location and extent of the cancer. (See the "Surgery for bile duct cancer" section for more details.) 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 help make a person healthy enough for the operation.

Adjuvant radiation therapy and/or chemotherapy (chemo) may be given after surgery to try to lower the risk that the cancer will come back, but doctors aren't sure how helpful this is. Adjuvant therapy is more likely to be used if there's a higher chance that the cancer wasn't removed completely (based on looking at the tissue removed at surgery in the lab). If it is clear that some cancer was left behind at the primary site, a second surgery may also be an option in some cases.

Sometimes it isn't clear from imaging or other tests whether the cancer can be removed completely. These cancers are often called *borderline resectable* tumors. Some doctors may recommend neoadjuvant treatment with radiation and/or chemo before surgery to try to shrink the tumor. Then, if the cancer shrinks, surgery can be done to try to remove all of the cancer. Although this approach is helpful with some other types of cancer, there is no strong evidence that this helps patients with bile duct cancer live longer.

## **Unresectable bile duct cancers**

This includes most stage III and IV cancers, as well as some earlier stage cancers if a person isn't healthy enough for surgery. Most bile duct cancers are unresectable.

As noted above, in uncommon cases where it isn't clear if a cancer is resectable, chemotherapy and/or radiation therapy may be used first to try to shrink the cancer and make it resectable. Surgery could then be done to try to remove the cancer completely.

In some cases, the doctor might think that a cancer is resectable, but once the operation starts it becomes clear that it can't be removed completely. For example, the cancer may turn out to have spread farther than was visible on imaging tests before surgery. At this point it would not usually be helpful to remove only part of the cancer, and surgery could still cause major side effects, so this part of the operation is stopped. The surgeon may instead do a biliary bypass at this time to relieve any bile duct blockage or to try to prevent it from becoming a problem in the future. Placing stents in the bile ducts to keep them open may also be an option during surgery.

For some unresectable intrahepatic or perihilar bile duct cancers, a liver transplant (after complete removal of the liver and bile duct) may be an option. Chemo and radiation may be given first. Although, it is often hard to find a compatible liver donor, a liver transplant can provide a chance for a cure.

For most bile duct cancers, it's clear from imaging tests and/or laparoscopy that they are not resectable. For these cancers, treatment is aimed at trying to control the growth of the cancer for as long as possible and to relieve any symptoms it is causing.

Radiation therapy and/or chemo may shrink or slow the growth of the cancer for a time. When chemo is given alone (without radiation) the drugs cisplatin and gemcitabine (Gemzar)

are often used. When chemo is given with radiation, the drug 5-FU is most often used. For bile duct cancers within the liver, ablation using extreme heat (radiofrequency ablation) or cold (cryotherapy) may help control the tumors. Unfortunately, almost all of these cancers begin to grow again eventually. For people looking to continue to try to treat the cancer, taking part in clinical trials of newer treatments may be an option.

Much of the focus of treating people with unresectable cancers is on relieving symptoms from the cancer. Two of the most important problems are bile duct blockage (which can lead to jaundice, itching, and other symptoms) and pain.

Bile duct blockage can be treated (and in some cases prevented) with surgery or other procedures. In most people with unresectable cancer, it's probably best to avoid a major operation if it can be helped. A biliary bypass may be a good option if a patient is already having surgery and the cancer turns out to be unresectable. In other cases, a stent or catheter may be placed in the bile duct to keep it open or allow it to drain. This can be done by placing a needle through the skin over the liver (percutaneously) or using an endoscope (an instrument used to look inside the body) passed down the mouth. It can also be done surgically in some cases.

Other options to help keep the bile duct open include brachytherapy (placing a tube with radioactive pellets inside the bile duct for a short time) and photodynamic therapy (injecting a light-sensitive drug into the blood and then using an endoscope with a special light on the end inside the bile duct).

Advanced bile duct cancer may be painful, so it is important to tell your doctor about any pain right away so it can be managed effectively. Radiation therapy, alcohol injection, and ablation of tumors within the liver can be used to relieve pain in some cases. Doctors often prescribe opioid pain medicines (like morphine) as needed. Some people may worry about taking opioid drugs for fear of becoming addicted to them. Yet some of the most effective pain medicines are opioids, and studies show that most people are not at risk of becoming addicted to drugs prescribed for them to stop pain for medical conditions.

Maintaining your quality of life is an important goal. Please don't hesitate to discuss pain, other symptoms, or any quality-of-life concerns with your cancer care team.

## **Recurrent bile duct cancer**

Cancer is called *recurrent* when it come backs after treatment. Recurrence can be local (in or near the same place it started) or distant (spread to organs such as the lungs). If the cancer comes back, further treatment depends on where the cancer recurs, what kind of treatment was previously used, and on the patient's health.

In most cases if the cancer comes back after initial treatment, it will not be resectable. Treatment will be aimed at controlling the cancer growth and relieving symptoms, as described above for unresectable cancers. In rare cases, if the cancer recurs in the area where it started, surgery to try to remove the cancer (and possibly adjuvant therapy) may be an

option. Because most of these cancers are not curable, people might want to consider taking part in a clinical trial of newer treatments.

## **What should you ask your doctor about bile duct cancer?**

It is important to have frank, 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:

- Where exactly is my cancer?
- Has my cancer spread beyond the bile ducts?
- What is the stage of my cancer, and what does that mean to me?
- 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?
- Should I get a second opinion?
- What treatment choices do I have?
- 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 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?

- Where can I go for information and support?

Along with these sample questions, be sure to write down some of your own. For instance, you might want to ask 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 our document [\*Talking With Your Doctor\*](#).

## What happens after treatment for bile duct cancer?

For some people with bile duct 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 coming back. (When cancer comes back after treatment, it is called *recurrence*.) This is a very common concern in people who have had cancer.

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

For other people, the cancer may never go away completely. These people may get regular treatments with chemotherapy (chemo), 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. Our document *When Cancer Doesn't Go Away* talks 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 of your follow-up appointments. During these visits, your doctors will ask questions about any problems you may have. They will examine you and may check lab tests or x-rays and scans to look for signs of cancer or treatment side effects.

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. Talk to your cancer care team about any changes or problems you notice and about any questions or concerns you have.

There is not set follow-up schedule for bile duct cancer that all doctors follow. Many doctors recommend blood and/or imaging tests about every 6 months for at least the first couple of years after treatment.

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 the section "Treatment of bile duct cancer based on the situation." For more general information on dealing with a recurrence, you may also want to see our document *When Your Cancer Comes Back: Cancer Recurrence*.

It is 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.

## 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 be 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
- If you had surgery, a copy of your operative report(s)
- Copies of x-rays and other imaging tests (these can often be stored digitally DVD, etc.)
- 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 chemo or some other drug therapy, 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 treatment for bile duct 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 bile duct cancers. 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 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 our document [\*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. For more information, see our document *Nutrition and Physical Activity During and After Cancer Treatment: Answers to Common Questions.*

Talk with your health care team before starting anything. Get their opinion about your exercise plans. Then, try to find an exercise buddy so you're not doing it alone. Having

family or friends involved when starting a new 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 bile duct 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 bile duct 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 may 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 bile duct cancer or other cancers.

So far, no dietary supplements have been shown to clearly help lower the risk of bile duct 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 bile duct 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. Others would rather talk in an informal setting, such as church. Others may feel more at ease talking one-on-one with a trusted friend or counselor. Whatever your source of strength or comfort, make sure you have a place to go with your concerns.

The cancer journey can feel very lonely. It'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 you feel may help. If you aren't sure who can help, call your American Cancer Society at 1-800-227-2345 and we can put you in touch with a group or resource that may work for you. You can also read our document *Distress in People with Cancer* or see the Emotional Side Effects section of our website for more information.

## If treatment of bile duct 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 is important to have realistic expectations if you do choose this plan.

## **Palliative care**

No matter what you decide to do, you need to 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 the section “Palliative therapy for bile duct 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. You can learn more about hospice in our document *Hospice Care*.

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 our documents *Nearing the End of Life* and *Advance Directives*.

## What's new in bile duct cancer research and treatment?

Bile duct cancer is an uncommon cancer, which in some ways makes it harder to study than more common cancer types. But research into the causes, diagnosis, and treatment of bile duct cancer is currently being done in many medical centers throughout the world.

### Surgery

Doctors are constantly improving the surgical techniques used to treat bile duct cancers and looking for ways to make more people eligible for surgery. One potential option, a liver transplant, was discussed in the section “Surgery for bile duct cancer.”

Other options are also being explored. For example, sometimes surgery to remove the cancer might technically be possible, but it can't be done because it might not leave enough healthy liver behind after the operation. One option might be to cut off the blood supply to the part of the liver that's going to be removed (known as *portal vein embolization*). As this part of the liver shrinks, the other part of the liver grows to compensate. After several weeks, there might be enough healthy liver on this side to go ahead with the operation to remove the tumor.

### Radiation therapy and chemotherapy

Researchers are looking at newer ways of increasing the effectiveness of radiation therapy. Some techniques, such as three-dimensional conformal radiation therapy (3D-CRT), intensity modulated radiation therapy (IMRT), and stereotactic body radiation therapy (SBRT), are widely available and allow doctors to better aim radiation to affect only the tumor and to spare nearby normal tissues. Other radiation techniques such as intra-operative radiation therapy (IORT) and proton beam radiation therapy may be helpful but are not widely available.

Other forms of radiation therapy are also being studied. For example, doctors are looking at whether radioactive stents placed inside bile ducts might help shrink tumors and keep the ducts open longer than standard stents. Another approach being studied is the injection of tiny radioactive beads into the hepatic artery (known as *radioembolization*). The beads lodge in the blood vessels near the tumor, where they give off small amounts of radiation.

Doctors are also testing different combinations of chemotherapy (chemo) drugs with radiation therapy, both on their own and before and after surgery.

In general, the effects of chemo against bile duct cancer have been found to be limited, but newer drugs and combinations of drugs are being tested. Newer ways to give chemo are also being studied. For example, *trans-arterial chemoembolization* (TACE) combines embolization (blocking off blood vessels supplying the tumor) with chemotherapy. Most often, this is done by using tiny beads that give off a chemo drug to plug up the hepatic artery.

## Targeted therapy

Newer drugs are being developed that work differently from standard chemo drugs. These drugs target specific parts of cancer cells or their surrounding environments.

One target of several newer drugs is tumor blood vessels. Bile duct tumors need new blood vessels to grow beyond a certain size. Sorafenib (Nexavar<sup>®</sup>), bevacizumab (Avastin<sup>®</sup>), pazopanib (Votrient<sup>®</sup>), and regorafenib (Stivarga<sup>®</sup>) are examples of drugs that target blood vessel growth and are being studied against bile duct cancer.

Other new drugs have different targets. For example, EGFR, a protein that helps cells grow, is found in high amounts on some cancer cells. Drugs that target EGFR have shown some benefit against several types of cancer. Some of these drugs, such as cetuximab (Erbix<sup>®</sup>) and panitumumab (Vectibix<sup>®</sup>) are now being studied for use in people with bile duct cancer, usually in combination with chemotherapy or other targeted drugs.

Drugs known as MEK inhibitors, such as trametinib (Mekinist<sup>®</sup>), are also being studied for use against bile duct cancer.

## Additional resources for bile duct cancer

### More information from your American Cancer Society

We have a lot more information that you might find helpful. Explore [www.cancer.org](http://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**

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

Website [www.cancer.gov](http://www.cancer.gov)

Offers free, accurate, up-to-date information about cancer to patients, their families, and the general public; also helps people find clinical trials in their area.

**National Coalition for Cancer Survivorship (NCCS)**

Toll-free number: 1-888-650-9127

Website: [www.canceradvocacy.org](http://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](http://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](http://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](http://www.cancer.org).

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Surveillance, Epidemiology, and End Results (SEER) Program ([www.seer.cancer.gov](http://www.seer.cancer.gov))  
SEER\*Stat Database: Incidence - SEER 17 Regs Limited-Use + Hurricane Katrina Impacted Louisiana Cases, Nov 2008 Sub (1973-2006 varying) - Linked To County Attributes - Total U.S., 1969-2006 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2009, based on the November 2008 submission. Analyzed using Surveillance Research Program, National Cancer Institute SEER\*Stat software ([www.seer.cancer.gov/seerstat](http://www.seer.cancer.gov/seerstat)) version 6.5.2.

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