Bile Duct (Cholangiocarcinoma) Cancer

What is cancer?

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

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

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

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

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

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

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

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

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

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

What is bile duct cancer?

Bile duct cancer is a cancer that starts in the bile duct. In order to understand this cancer, it helps to know about the normal structure and function of the bile duct.

About the bile duct

The bile duct is a thin tube, about 4 to 5 inches long, that reaches from the liver to the small intestine. The major function of the bile duct is to transport a fluid called bile from the liver and gallbladder to the small intestine, where it helps digest the fats in foods.

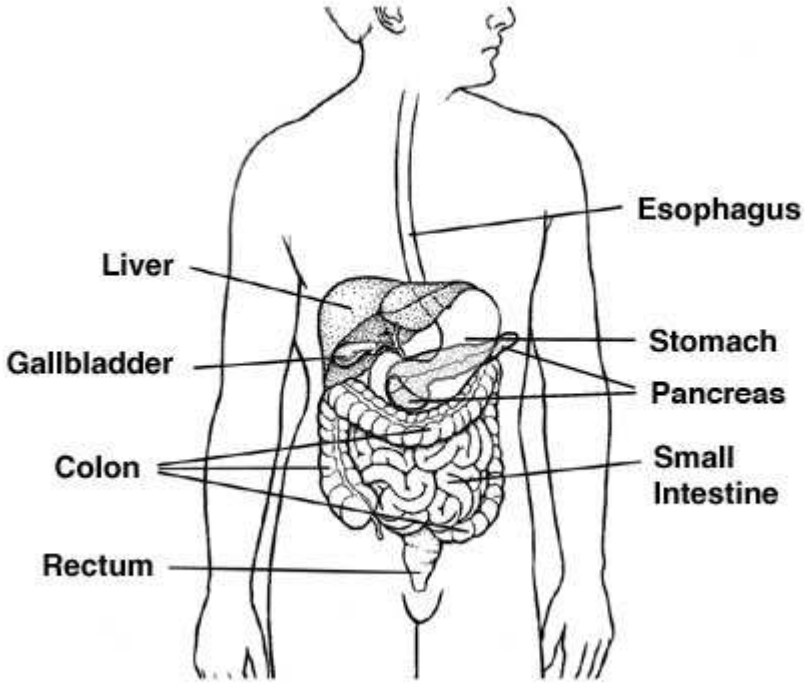
Different parts of the bile duct system have different names. In the liver, it begins as many tiny tubes (ductules) where bile collects from the liver cells. The ductules come together to form small ducts, which then merge into larger ducts and eventually the left and right hepatic ducts. The ducts within the liver are called *intrahepatic bile ducts*. These ducts exit from the liver and join to form the common hepatic duct at the *hilum*. About one third of the way along the length of the bile duct, the gallbladder (a small organ that stores bile) attaches by 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 empties into the first part of the small intestine (the duodenum), next to where the pancreatic duct also enters the small intestine.

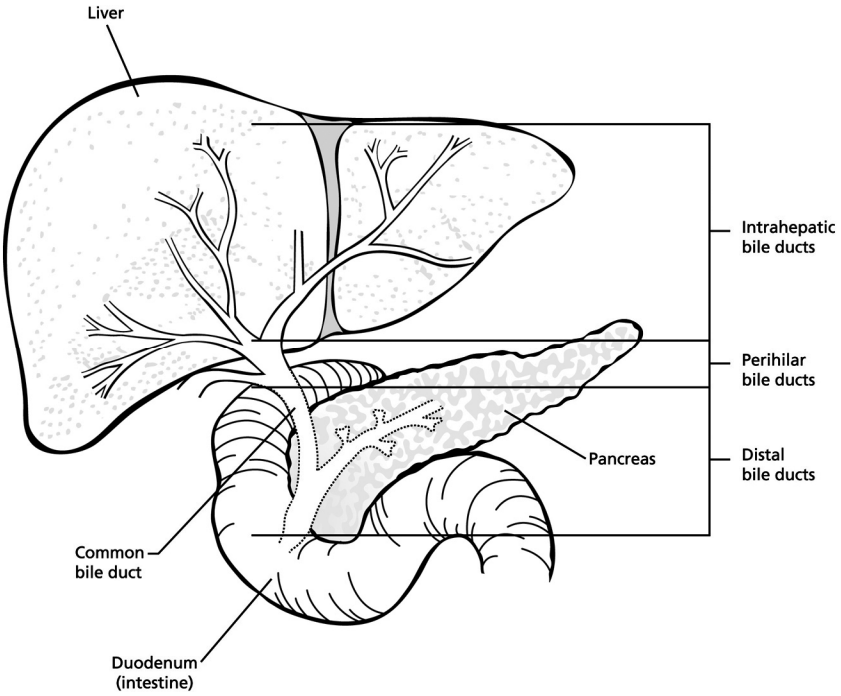
Types of bile duct cancers

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

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

Cancers in these different areas may 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 out of 10 bile duct cancers are intrahepatic.

Perihilar (also called hilar) bile duct cancers: These cancers develop at the hilum - where the hepatic ducts have joined and are just leaving the liver. They are also called *Klatskin tumors*. These are the most common type of bile duct cancer.

Distal bile duct cancers: These bile duct cancers are found further down the bile duct, closer to the small intestine. Because these bile ducts are outside of the liver, these cancers are also known as *extrahepatic bile duct cancers*

More than 95% of bile duct cancers are of the *adenocarcinoma* type. Adenocarcinomas are cancers of glandular cells that can develop in several organs of the body. Bile duct adenocarcinomas develop from the mucus glands that line the inside of the duct. *Cholangiocarcinoma* is another name for a bile duct adenocarcinoma.

Not all bile duct tumors are cancerous. Bile duct hamartomas and bile duct adenomas are benign (non-cancerous) tumors and, therefore, are not discussed further in this document.

Other cancers in the liver

Hepatocellular carcinomas develop from liver cells and are more common than cholangiocarcinomas of bile duct cells. Hepatocellular carcinoma is discussed in more detail in our document, *Liver Cancer.*

Adenocarcinomas that form in other organs, like the pancreas, colon, rectum, stomach, lung, breast, or prostate, may 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 cholangiocarcinoma), but instead depend on where the cancer started.

What are the key statistics about bile duct cancer?

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 Asia and the Middle East, mostly because of a common parasitic infection of the bile duct.

Bile duct cancer can occur at younger ages, but it is seen mainly in older people. The average age at the time of diagnosis is 73. More than 2 out of 3 people with bile duct cancer are older than age 65 when it is found.

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, "How is bile duct cancer staged?"

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. For example, exposing skin to strong sunlight is a risk factor for skin cancer. Smoking is a risk factor for cancers of the lung, larynx (voice box), colon, bladder, kidney, and many other organs.

But risk factors don't tell us everything. Having a risk factor, or even several risk factors, does not necessarily mean that a person will get the disease. And many people who get the disease may not have had any 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 duct have an increased risk of developing bile duct cancer. Several conditions of the liver or bile duct may cause this.

- Primary sclerosing cholangitis is a condition in which inflammation of the bile duct (cholangitis) leads to the formation of scar tissue (sclerosis) and an increased risk of bile duct cancer. The cause of the inflammation is not usually known.
- Ulcerative colitis is a condition that results in inflammation of the large intestine. Some people with ulcerative colitis also develop inflammation in the bile duct, which puts them at increased risk for bile duct cancer.
- 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 duct. (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 developing bile duct cancer.
- Other abnormalities of the bile ducts: Some people have abnormalities where the bile duct and pancreatic duct normally meet that 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. These people are at higher risk of bile duct cancer.
- Cirrhosis is damage to the liver due to irritants such as alcohol and diseases such as hepatitis that causes scar tissue to form. Some studies have found it raises the risk of bile duct cancer.

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).

Liver fluke infections

In some Asian countries, infection by liver flukes (which are food) or water-borne parasite worms that invade the bile duct is a major cause of bile duct cancer. There are several types of liver flukes. The ones most closely related to bile duct cancer risk are called *Clonorchis sinensis* and *Opisthorchis viverrini*.

Aging

Older people are more likely than younger people to get bile duct cancer. More than 2 out of 3 patients with bile duct cancer are older than age 65.

Obesity

Being overweight or obese can increase the risk of developing cancers of the gallbladder and bile ducts. This may 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 and can lead to bile duct cancer, as well as to some types of liver cancer. This is why Thorotrast 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.

Other possible risk factors

Studies have found several other possible risk factors for bile duct cancers. More research is needed to confirm these possible links:

- Smoking
- Diabetes
- Pancreatitis (inflammation of the pancreas)
- Infection with hepatitis B virus or hepatitis C virus

- 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 duct, whether it's bile duct stones or infestation with a parasite.

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

Some genes contain instructions for controlling when cells grow and divide. Genes that promote cell division or keep cells alive longer than normal 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.

Some people inherit DNA mutations from their parents that greatly increase their risk for certain cancers. But inherited gene mutations are not believed 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 *p53* tumor suppressor gene are found in most cases of bile duct cancer. Other genes that may play a role in bile duct cancers include *K-ras*, *HER2/neu*, and *c-met*.

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

Can bile duct cancer be prevented?

The exact cause of most cases of bile duct cancer in the United States is not known, so it is not clear how it can be prevented. But there are some things that may reduce a person's risk.

Maintaining a healthy weight is one important way a person may reduce the chance of developing bile duct cancer, as well as cancers of the gallbladder, colon, prostate, endometrium (uterus), kidney, and breast. The American Cancer Society recommends

that people try to maintain a healthy weight throughout life by balancing what they eat with physical activity. This includes eating a healthy diet, with an emphasis on plant sources, and getting at least 30 minutes (preferably 45 to 60 minutes) of physical activity on 5 or more days of the week.

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

- Get vaccinated against the hepatitis B virus to help prevent cirrhosis.
- Take precautions to avoid blood-borne or sexually transmitted infections by other viruses (like hepatitis C) to help prevent cirrhosis.
- Avoid excessive alcohol use to help prevent cirrhosis.
- Quit (or don't start) smoking.
- Avoid exposure to the 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 completely removed by surgery.

The bile duct is located deep inside the body, so early tumors cannot be seen or felt by health care providers during routine physical exams. There are currently no blood tests or other tests that can reliably detect bile duct cancers early enough to be useful as screening tests. Without effective screening tests, most bile duct cancers are found only when the cancer has grown enough to cause symptoms. The most common symptom is jaundice, a yellowing of the skin and eyes, which is caused by a blocked bile duct

How is bile duct cancer diagnosed?

Most bile duct cancers are not found until patients go to a doctor because they have symptoms.

Signs and symptoms of bile duct cancer

Signs and symptoms may not be present until the later stages of bile duct cancer, but in some cases they may lead to an early diagnosis. If you go to your doctor when you first notice symptoms, your cancer might be diagnosed at an early stage, when it is most treatable.

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

Jaundice: This is the most common symptom of bile duct cancer. Jaundice occurs when the liver cannot get rid of bile, and one of the chemicals in bile called bilirubin "backs

up" into the bloodstream. Bilirubin is greenish yellow and colors all the body tissues, including the skin and the white part of the eyes, making people with this condition begin to look yellow.

It is important to realize that most cases of jaundice are not caused by cancer. It is more often due to 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 blood can also reach the skin, which can cause itching. Most people with bile duct cancer notice itching.

Abdominal pain: Early bile duct cancers usually do not cause pain, but more advanced cancers may lead to 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 unintentionally lose weight.

Fever: Some people with bile duct cancer develop fevers.

Light colored stools/dark urine: Bilirubin contributes to the brown color of bowel movements, so if its flow into the intestine is blocked the color of a person's stool might be lighter. When bilirubin levels in the blood get high, it can also come out in the urine and turn it dark.

Nausea/vomiting: This is not a common symptom of bile duct cancer, but it may be seen in people who develop an infection (cholangitis) as a result of bile duct blockage. It is often seen along with a fever.

These are symptoms and signs of bile duct cancer, but it is important to remember that they are more likely to be caused by non-cancerous diseases. For example, people with gallstones may have many of these same symptoms. There are many causes of abdominal pain that are far more common than bile duct cancer. And hepatitis (infection of the liver by 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.

History and physical exam

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

A physical exam is done to look for signs of bile duct cancer and other health problems. If bile duct cancer is suspected, the exam will focus mostly on the abdomen to check for any masses, tenderness, or build up 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 bile duct cancer might be present, more involved tests will likely be done. These may 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 gives the bile its yellow color. Problems in the bile duct, gallbladder, or liver may cause too much bilirubin to remain in the blood. A high bilirubin count tells the doctor that there may be problems with the bile duct, gallbladder, or liver.

The doctor may also order tests for other substances in your blood, such as albumin, alkaline phosphatase, AST, ALT, and GGT. These are sometimes called *liver enzymes* or *liver function tests*. They can also give an indication of bile duct, gallbladder, or liver disease. Although elevations of these substances may point to blockage of the bile duct, they cannot 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 carcinoembryonic antigen (CEA) and CA 19-9 tumor markers. High amounts of these substances often mean that there is cancer, but the absence of these markers does not mean there is no cancer, since not all cancers make them.

Imaging tests

Imaging tests use x-rays, magnetic fields, or sound waves to create pictures of the inside of your body. Imaging tests may be done for a number of reasons, including to help find a suspicious area that might be cancerous, to learn how far cancer may have spread, and to help find out if treatment has been effective.

Imaging tests can often identify and locate a bile duct blockage. But they often do not reveal whether the blockage is due to a tumor or a benign problem such as scarring.

Ultrasonography (ultrasound)

Ultrasound 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. For this test, a small instrument called a transducer emits sound waves and picks up their echoes as they bounce off internal organs. The echoes are converted by a computer into a black-and-white image that is displayed on a video screen. The echoes produced by most tumors differ from those of normal tissue. The patterns of echoes can help distinguish between some types of benign and malignant tumors.

This is a very easy procedure to have done that does not use radiation. For an ultrasound exam of the liver, you simply lie on a table while the doctor or ultrasound technician places the transducer (which is shaped like a wand) on the skin over the right upper part of the abdomen. Usually, the skin is first lubricated with gel.

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

If there is a tumor, the doctor may be able to tell 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 may be a sign that cancer has reached them. It may also be used to guide a needle into a suspicious node so that cells can be removed (biopsied) and viewed under a microscope.

Computed tomography (CT) scan

The CT scan is an x-ray procedure that produces 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.

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

You need to lie still on a table while the scan is being done. During the test, the table moves in and out of the scanner, a ring-shaped machine that completely surrounds the table. You might feel a bit confined by the ring you have to lie in while the pictures are being taken.

CT scans can have several uses:

- They are often used to help make the initial diagnosis of bile duct cancer by showing tumors in the area.
- They can be helpful in staging the cancer (determining the extent of its spread). CT scans can also show the organs near the bile duct (especially the liver), as well as lymph nodes and distant organs where cancer may have spread to. This can help to find out if surgery is a good treatment option.
- CT scans can also be used to guide a biopsy needle precisely into a suspected tumor or metastasis. For this procedure, called a CT-guided needle biopsy, the patient remains on the CT scanning table, while a radiologist advances a biopsy needle

through the skin and toward the location of the mass. CT scans are repeated until the needle is within the mass. A biopsy sample is then removed and looked at under a microscope.

Magnetic resonance imaging (MRI) scan

Like CT scans, MRI scans provide detailed images of soft tissues in the body. But MRI scans use radio waves and strong magnets instead of x-rays. The energy from the radio waves is absorbed and then released in a pattern formed by the type of body tissue and by certain diseases. A computer translates the pattern into very detailed images of parts of the body. A contrast material called gadolinium is often 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 malignant 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 below in the section on cholangiography. *MR angiography* (MRA) looks at blood vessels and is mentioned below in the section on angiography.

MRI scans may be a little more uncomfortable than CT scans. They take longer -- often up to an hour. You may be placed inside a large cylindrical tube, which is confining and can upset people with a fear of enclosed spaces. Newer, "open" MRI machines can help with this if needed. The MRI machine makes buzzing and clicking noises that you may find disturbing. Some places will provide earplugs to help block this out.

Cholangiography

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

Endoscopic retrograde cholangiopancreatography (ERCP): In this procedure, a doctor passes a long, flexible tube (endoscope) down the patient's throat, through the esophagus and stomach, and into the first part of the small intestine. A small catheter (tube) is passed from the end of the endoscope and into the common bile duct. The patient is usually sedated so that the procedure is not uncomfortable. A small amount of contrast dye is injected through the tube to help outline the bile duct and pancreatic duct as x-rays are taken. The images can show narrowing or blockage of the bile duct or pancreatic duct. This test is more invasive than MRCP (see below), but has the advantage of allowing the doctor to take samples of cells or fluid to be viewed under a microscope. It can also be used to place a stent (a small tube) into a duct to help keep it open.

Magnetic resonance cholangiopancreatography (MRCP): This is a less 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.

Percutaneous transhepatic cholangiography (PTC): In this procedure, the doctor places a thin, hollow needle through the skin and into a bile duct within the liver. (A local anesthetic is 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, hollow tubes) in the bile duct to help keep it open.

Positron emission tomography (PET) scan

For a PET scan, a form of radioactive sugar (known as fluorodeoxyglucose or FDG) is injected into the blood. The amount of radioactivity used is very low. Cancer cells in the body grow rapidly, they absorb large amounts of the radioactive sugar. A short time later, a special camera is used to create a picture of areas of radioactivity in the body. The picture is not finely detailed like a CT or MRI scan, but it can provide helpful information about your whole body.

A PET scan can sometimes help tell if a bile duct obstruction is caused by a cancer or not, although not all doctors agree on how useful it is for bile duct cancer. PET scans can also be useful if your doctor thinks the cancer may have spread (or returned after treatment) but doesn't know where. PET scans can be used instead of several other imaging tests because they scan your whole body.

Some machines are able to perform both a PET and CT scan at the same time (PET/CT scan). This allows the radiologist to compare areas of higher radioactivity on the PET with the appearance of that area on the CT.

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 allow the doctors to see if blood flow in an area is blocked or affected by a tumor, and they can show any abnormal blood vessels in the area. Angiography can also show whether a 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.

Angiography can be uncomfortable because you have to hold very still while the radiologist who does the procedure puts a small catheter (a flexible hollow tube) into the artery leading to the bile duct 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 duct. A local anesthetic is often used to numb the area before inserting the catheter. Then the dye is injected quickly to outline all the vessels while the x-rays are being taken.

Angiography may also be done with a CT scanner (CT angiography) or an MRI scanner (MR angiography). These techniques give information about the blood vessels without the need for a catheter, although 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 such as the mouth.

Laparoscopy

In a laparoscopic procedure, a doctor inserts a thin tube with a light and a small video camera on the end (a laparoscope) through the abdominal wall to view the bile duct, gallbladder, liver, and other organs and tissues in the area. The tube is inserted through a small incision (cut) in the front of the abdomen. (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 provides a view of organs that can help in planning surgery or other treatments. By looking at areas where the cancer may have spread, your doctor can better 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 planning surgery to remove the cancer, in order to make sure the tumor can be removed completely.

Cholangioscopy

In this relatively new procedure, the doctor passes a very thin fiber-optic tube into the bile duct through the mouth after routine ERCP or through a needle placed into a liver bile duct through the abdominal wall. From there it can be maneuvered into the bile duct. This allows the doctor to see any tumors and even biopsy them.

Biopsy

Imaging tests can suggest that a bile duct cancer is likely to be 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 (ultrasound, CT or MRI scans, cholangiography, etc.) 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, "How is bile duct cancer treated?").

Types of biopsies

There are several ways to take biopsy samples of the bile duct.

If cholangiography (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.

Biopsy specimens can also be taken during cholangioscopy. This allows the doctor to view the inside surface of the bile duct and take samples of suspicious areas.

In other cases, a needle biopsy may be done. For this test, a thin, hollow needle is inserted through the skin and into the tumor without making a surgical incision. (The skin is numbed first with a local anesthetic.) The needle is usually guided into place using ultrasound or CT scanning. With this approach, the needle is slowly moved forward while doctors check its position by viewing images provided by one of these imaging tests. When the images show that the needle is in the tumor, a sample is drawn into the needle and sent to the lab to be viewed under a microscope.

In most cases, this is done as a fine needle aspiration (FNA) biopsy, which uses a very thin needle attached to a syringe to suck out (aspirate) a sample of cells. If this isn't successful, a core needle biopsy may be done, which uses a slightly larger needle to get a bigger sample.

How is bile duct cancer staged?

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

A staging system is a standardized way for members of the cancer care team to summarize the extent of a cancer's spread. The stage of a cancer is determined by the results of the physical exam, testing (such as imaging and other tests), and by the results of surgery if it has been done.

The American Joint Committee on Cancer (AJCC) TNM system

The major system used to describe the stages of 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) are staged separately from extrahepatic bile duct cancers. Also, extrahepatic bile duct cancers are split into 2 groups: perihilar tumors and distal tumors. The TNM system for all bile duct cancers contains 3 key pieces of information:

- **T** describes whether the main 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 located 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:

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

Intrahepatic bile duct cancer

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 growing 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: 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:** A single tumor that has grown through the wall of the bile duct and into a blood vessel.
- **T2b**: 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, or lymph nodes around the portal vein.

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

N categories

NX: Regional (nearby) 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 a patient's T, N, and M categories have been determined, this information is combined in a process called stage grouping. The stage is expressed in Roman numerals from stage 0 (the least advanced stage) 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 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 lymph nodes or distant sites.

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 (N0) spread to nearby lymph nodes or distant sites.

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, OR the cancer has spread to nearby lymph nodes. It has not spread to distant sites.
- **Stage IVB (Any T, any N, M1)**: The cancer has spread to distant sites (M1).

Extrahepatic bile duct cancer of the perihilar bile ducts

T categories for perihilar 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 growing 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 on one side (the main blood vessels of the liver are the portal vein and the hepatic artery).

T4: The cancer is growing into the main blood vessels of the liver (the portal vein and or the common hepatic artery) or branches of these vessels on 2 sides, 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 for perihilar bile duct cancer

NX: Regional (nearby) 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 further away from the tumor, such as those around the major blood vessels of the abdomen (such as 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 a patient's T, N, and M categories have been determined, this information is combined in a process called stage grouping. The stage is expressed in Roman numerals from stage 0 (the least advanced stage) to stage IV (the most advanced stage). Some stages are subdivided with letters.

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

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. It has not spread to nearby lymph nodes or distant sites.

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 or distant sites.

Stage III: Split into 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 or distant sites.
- **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: Split into 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 2 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.
- **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).

Distal extrahepatic bile duct cancer

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 limited to 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, but it is still only in the bile duct.

T2: The cancer has grown through the bile duct wall but has not started 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 for distal extrahepatic bile duct cancer

NX: Regional (nearby) 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 for distal extrahepatic bile duct cancer

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 a patient's T, N, and M categories have been determined, this information is combined in a process called stage grouping. The stage is expressed in Roman numerals from stage 0 (the least advanced stage) 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 lymph nodes (N0) or distant sites (M0).

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

Stage IB (T2, N0, M0): The cancer has grown through the bile duct (T2) but has not invaded nearby organs or structures and 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.

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 has not spread to distant sites.

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

Resectable versus unresectable cancers

The TNM system divides bile duct cancers into several groups that help give doctors an idea about a person's prognosis (outlook). But for treatment purposes, doctors often use a simpler system based on whether these cancers are likely to be resectable (able to be completely removed by surgery) or unresectable. In general terms, most stage III and IV tumors are unresectable, but there may be exceptions. Resectability is based on the size and location of the tumor, how far it has spread, and whether or not a person is healthy enough to have surgery.

Survival statistics for bile duct cancers

Survival rates are a way for doctors to discuss and compare the prognosis (outlook) for patients, based on the stage of the cancer or other traits. Accurate survival rates can be hard to determine for bile duct cancers because these cancers are not common. Some of the more important factors affecting survival include the location and extent of the cancer, whether or not it is resectable, and a person's general health.

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

- These statistics come from the National Cancer Institute's SEER program. 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.

- The 5-year survival rate refers to the percentage of patients who live at least 5 years after being diagnosed. Of course, some of these patients live much longer than 5 years after diagnosis. Relative survival rates assume that some people will die of other causes and compare the observed survival with that expected for people without the cancer. This is a more accurate way to describe the prognosis for patients with a particular type and stage of cancer.

- These numbers are among the most current we have available, but they represent people who were first diagnosed and treated several years ago. Because of improvements in treatment since then (including more aggressive surgery), survival rates for people now being diagnosed with these cancers may be higher.

- Survival statistics can sometimes be useful as a general guide, but they may not accurately represent any one person's prognosis. A number of other factors, including other tumor characteristics, how the cancer was treated, and a person's age and general health, can also affect outlook. Your doctor is likely to be a good source as to

whether these numbers may apply to you, as he or she is familiar with the aspects of your particular situation.

Intrahepatic bile duct cancer

Stage	5-year relative survival
Localized	15%
Regional	6%
Distant	2%

Extrahepatic blie duct cancer

Stage	5-year relative survival
Localized	30%
Regional	24%
Distant	2%

How is bile duct cancer treated?

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

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

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

General treatment information

This section begins with a summary of the types of treatments available to people with bile duct cancer. This is followed by a discussion of the usual treatments for bile duct cancers in certain situations.

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

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

If surgery is possible, it is usually the main type of treatment for bile duct cancer, as it offers the only reasonable chance to cure the cancer. Radiation therapy and/or chemotherapy may be added after surgery in some cases, or they may be used instead of surgery if the cancer cannot be entirely removed. In rare cases a liver transplant may also be an option.

Surgery

Surgery for bile duct cancer is a complex operation and should be done by an experienced surgeon working at a major medical center whenever possible.

There are 2 general types of surgical treatment for bile duct cancer -- *potentially curative surgery* and *palliative surgery*.

Potentially curative surgery is used when imaging tests indicate a good chance that the surgeon will be able to remove all of the cancer. Doctors may use the term *resectable* to describe cancers they believe can be removed completely (by 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 at the time they are first found.

Palliative surgery may be performed to relieve symptoms or treat (or even prevent) complications, such as blockage of the bile ducts. This type of surgery is performed when the tumor is too widespread to be completely removed. Palliative surgery is not expected to cure the cancer, but it can sometimes help someone feel better and sometimes can even help them live longer. Palliative surgery is described in more detail in the section "Palliative therapy."

Surgery to remove bile duct cancer can have significant side effects and, depending on how extensive it is, may require several weeks for recovery. Patients whose cancer is not

curable may want to carefully weigh the pros and cons of surgery or treatments that require significant recovery time. Unless there is clear evidence that such treatments will improve the patient's chance for longer survival or improved quality of life, some patients with very advanced stages of bile duct cancer may choose to avoid them.

If your surgical team is planning curative surgery, they first may perform a laparoscopy to get a better idea of the extent of the cancer. This procedure is described in the section, "How is bile duct cancer diagnosed?" Laparoscopy allows the surgeon to look for any spread of the cancer that may make curative surgery impossible.

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 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 tissue removed is not too great, the liver will function normally because its tissue has some ability to grow back.

Perihilar bile duct cancer: These cancers begin where the branches of the bile duct first exit the liver. Surgery for these cancers requires great skill, as the operation is quite extensive. Usually part of the liver must be removed, along with the bile duct, gallbladder, nearby lymph nodes, and sometimes part of the pancreas and small intestine. Then the surgeon must connect the remaining ducts to the small intestine. This is not an easy operation for the patient. About 1 out of 3 patients have serious complications with this procedure, and 5% to 10% of patients die from these complications.

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. Just 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 in large part on the extent of the operation and a person's general health before the surgery. All surgeries carry some risk, including the possibility of bleeding, 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 may involve the removal of parts of several organs. This can have a significant effect on a person's recovery and health after the surgery. Because most of the organs are involved in digestion, eating problems may be a concern for some time after surgery.

Surgery for unresectable cancers

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 may even cure the cancer.

But even for people who are eligible for a transplant, getting a new liver may not be easy. Not many 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. An option that has become more popular in recent years is having a living donor give a part of their liver for transplant to a close relative. This can be successful, but it carries risks for the donor.

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 the immune system and prevent the body 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, diabetes, and can weaken the bones and kidneys. 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 whether changes in the anti-rejection medicines are needed.

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 the surgery is started it becomes clear that the cancer is too advanced to be removed completely. At this point the surgeon may do a *biliary bypass* to allow the bile to flow into the intestines to reduce symptoms such as jaundice or itching.

In this palliative procedure, 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. Often, the gallbladder is used to provide some of the bypass.

If a bypass can't be done, the surgeon may simply place a plastic or expandable metal tube (called a stent) through the bile duct to keep it open. This is discussed below in the section "Palliative therapy."

Radiation therapy

Radiation therapy is treatment with high-energy rays or particles that destroy cancer cells. There are different kinds of radiation therapy.

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. It is the most common form of radiation therapy for bile duct cancer.

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

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

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

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. Brachytherapy is sometimes used in treating people with bile duct cancer by placing the pellets in a tube, which is inserted into the bile duct for a short time.

Uses of radiation therapy

Radiation therapy may be used in different ways 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). Radiation therapy is often given along with a chemotherapy drug called 5-fluorouracil (5-FU), which may make the radiation more effective. This is called chemoradiation. Some doctors believe adjuvant radiation therapy is helpful, but more research is needed to confirm this.

As treatment 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 is not resectable but has not spread widely throughout the body. Most often it is given along with chemotherapy. While treatment in this case does not offer a cure, it may help patients to live longer.

As palliative therapy: Radiation therapy is often used to palliate (relieve) symptoms when a patient's cancer is too advanced to be cured. It may be used to relieve pain or

other symptoms by shrinking tumors that are blocking passageways for blood or bile, or are pressing on nerves.

Possible side effects of radiation therapy

Side effects of external radiation therapy might include:

- Skin changes (similar to a sunburn) where the radiation enters the body
- Nausea and vomiting
- Diarrhea
- Fatigue

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

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

Chemotherapy

Chemotherapy ("chemo") is treatment with anti-cancer drugs that are given into a vein or by mouth. These drugs enter the bloodstream and reach all areas of the body, making this treatment useful in 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. Unfortunately, chemo has not been found to be very effective against bile duct cancer, and for that reason its use has been somewhat limited.

For bile duct cancers that are resectable, chemotherapy may be used after surgery (often along with radiation therapy) to try to lower the risk that the cancer will return. This is 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. Chemotherapy may also be used (with or without radiation therapy) for more advanced cancers. But it is not clear if chemo used in this situation helps people live longer.

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

Hepatic artery infusion: Because of the poor response to regular (systemic) chemo, doctors have tried giving the drugs directly into the hepatic artery. This is known as hepatic artery infusion (HAI). The hepatic artery supplies blood to most bile duct tumors. The healthy liver can remove most of the remaining drug before it can reach the rest of the body. HAI may allow some people whose cancer was not removable by surgery to

live longer, but more research is needed. This technique may not be useful in all cases because it often requires surgery to insert a catheter into the hepatic artery, an operation that many bile duct cancer patients may 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 that have been used most often to treat bile duct cancer include:

- 5-fluorouracil (5-FU)
- Gemcitabine
- Mitomycin C
- Doxorubicin (Adriamycin)
- Cisplatin
- Capecitabine
- Oxaliplatin

Possible side effects

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

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

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

These side effects are usually short-term and go away after treatment is finished. There are often ways to lessen these side effects. For example, there are drugs that 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 him or her know when you do have side effects so they can be managed effectively.

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

Palliative therapy

Palliative therapy is treatment that is given to help control or reduce symptoms caused by advanced cancer. It is not meant to be a curative treatment. If the cancer has spread too far to be completely removed by surgery, doctors may focus on palliative operations, palliative radiation, and other palliative therapies. Because these cancers tend to advance quickly, doctors try to use palliative therapies that are less likely to affect a person's quality of life, when possible.

Biliary stent or biliary catheter

If cancer is blocking the bile duct, the doctor may insert a small tube (called a stent or catheter) into the duct to help keep it open. This may be done as part of a cholangiography procedure such as PTC or ERCP (see the section, "How is gallbladder cancer diagnosed?") or, in some cases, during surgery. A stent opens the duct to allow the bile to drain into the small intestine, while a catheter drains into a bag outside the body that can be emptied when needed. 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. As mentioned in the "Surgery" section, this option is more likely to be used if a patient is already having surgery and the cancer 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

Tumors within 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. A few days later, an endoscope is passed down the throat and into the bile duct. A special red light on the end of the bronchoscope is aimed at the tumor, causing the cells to die. PDT is still being studied for use in bile duct cancers.

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 later under the guidance of a CT scan.

Pain medicines

Doctors can prescribe strong pain-relieving drugs if needed. Some people with cancer may hesitate to use 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.

Clinical trials

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

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

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

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

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

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

Complementary and alternative therapies

When you have cancer you are likely to hear about ways to treat your cancer or relieve symptoms that are different from mainstream (standard) medical treatment. These methods can include vitamins, herbs, and special diets, or methods such as acupuncture or massage -- among many others. You may have a lot of questions about these treatments. Here are some you may have thought of already:

- How do I know if a non-standard treatment is safe?
- How do I know if it works?
- Should I try one or more of these treatments?
- What does my doctor know/think about these methods? Should I tell the doctor that I'm thinking about trying them?
- Will these treatments cause a problem with my standard medical treatment?
- What is the difference between "complementary" and "alternative" methods?
- Where can I find out more about these treatments?

The terms can be confusing

Not everyone uses these terms the same way, so it can be confusing. The American Cancer Society uses *complementary* to refer to medicines or methods that are used *along with* your regular medical care. *Alternative* medicine is a treatment used *instead of* standard medical treatment.

Complementary methods: Complementary treatment methods, for the most part, are not presented as cures for cancer. Most often they are used to help you feel better. Some methods that can be used in a complementary way are meditation to reduce stress, acupuncture to relieve pain or peppermint tea to relieve nausea. There are many others. Some of these methods are known to help, while others have not been tested. Some have been proven not be helpful. A few have even been found harmful. However, some of these methods may add to your comfort and well-being.

There are many complementary methods that you can safely use right along with your medical treatment to help relieve symptoms or side effects, to ease pain, and to help you enjoy life more. For example, some people find methods such as aromatherapy, massage therapy, meditation, or yoga to be useful.

Alternative treatments: Alternative treatments are those that are used instead of standard medical care. These treatments have not been proven safe and effective in

clinical trials. Some of these methods may even be dangerous and some have life-threatening side effects. The biggest danger in most cases is that you may lose the chance to benefit from standard treatment. Delays or interruptions in your standard medical treatment may give the cancer more time to grow.

Deciding what to do

It is easy to see why people with cancer may consider alternative methods. You want to do all you can to fight the cancer. Sometimes mainstream treatments such as chemotherapy can be hard to take, or they may no longer be working.

Sometimes people suggest that their method can cure your cancer without having serious side effects, and it's normal to want to believe them. But the truth is that most non-standard methods of treatment have not been tested and proven to be effective for treating cancer.

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

- Talk to your doctor or nurse about any method you are thinking about using.
- Check the list of "red flags" below.
- Contact the American Cancer Society at 1-800-227-2345 to learn more about complementary and alternative methods in general and to learn more about the specific methods you are thinking about.

Red flags

You can use the questions below to spot treatments or methods to avoid. A "yes" answer to any one of these questions should raise a "red flag."

- Does the treatment promise a cure for all or most cancers?
- Are you told not to use standard medical treatment?
- Is the treatment or drug a "secret" that only certain people can give?
- Does the treatment require you to travel to another country?
- Do the promoters attack the medical or scientific community?

The decision is yours

Decisions about how to treat or manage your cancer are always yours to make. If you are thinking about using a complementary or alternative method, be sure to learn about the method and talk to your doctor about it. With reliable information and the support of your health care team, you may be able to safely use the methods that can help you while avoiding those that could be harmful.

Treatment of bile duct cancer based on the situation

Whenever possible, surgery is the main treatment for bile duct cancers, as it offers the only reasonable chance for a cure. Whether or not the cancer is resectable (completely removable by surgery) is a major factor when looking at treatment options.

Resectable bile duct cancers

This includes most stage 0, I, and II cancers and possibly some stage III cancers, but it also depends on the location of the cancer and a person's overall health. Surgery to completely remove the cancer is the preferred treatment if it is possible. The type of operation will depend on the location and extent of the cancer. (See the "Surgery" section for more details.)

Adjuvant radiation therapy and/or chemotherapy may be given after surgery to try to lower the risk that the cancer will come back, although 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 completely removed (based on looking at the surgery specimen 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.

In cases where the resectability of the cancer is not clear to begin with, some doctors may advise neoadjuvant radiation and/or chemotherapy to try to shrink the tumor before attempting surgery, although there is no strong evidence that this is helpful.

Unresectable bile duct cancers

This includes most stage III and IV cancers, as well as some earlier stage cancers if a person is not healthy enough for surgery.

As noted above, if it's not 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 may 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 be much more extensive than was visible on imaging tests before surgery. At this point it would not usually be helpful to go through with such a major operation, but the surgeon may 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 duct to keep it 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. Unfortunately, it is often hard to find a compatible liver donor. If a donor can be found, a liver transplant may provide a chance for a cure.

For other bile duct cancers that are clearly not resectable (based on the results of imaging tests and/or laparoscopy), treatment is aimed at trying to control the growth of the cancer and to keep symptoms to a minimum for as long as possible.

Radiation therapy and/or chemotherapy may shrink or slow the growth of the cancer for a time. For bile duct cancers within the liver, ablation using extreme heat (radiofrequency ablation) or cold (cryotherapy) may help control the tumors. Unfortunately, almost all 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 above the liver (percutaneously) or using an endoscope 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 of 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-killing drugs as needed. Some patients may hesitate to use opioid drugs for fear of becoming addicted to them. Yet some of the most effective pain-killing drugs are opioids, and studies show that most patients are not at risk of becoming addicted to drugs prescribed for them to stop pain for medical conditions.

It is important to realize that 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 or bone). In most cases if the cancer comes back after initial treatment, it will not be resectable. Treatment will be aimed at trying to control the cancer growth and relieve symptoms, as described above for unresectable cancers. In rare cases, if the cancer recurs in the area where it started, surgery to try to completely remove the cancer (and possibly adjuvant therapy) may be an option. Because the vast majority of these cancers are not curable, people may want to consider taking part in a clinical trial of newer treatments.

More treatment information

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

The NCI provides treatment guidelines via its telephone information center (1-800-4-CANCER) and its Web site (www.cancer.gov). Detailed guidelines intended for use by cancer care professionals are also available on www.cancer.gov.

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

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 to you. For instance, consider these questions:

- Where is my cancer located?
- Has my cancer spread beyond the bile duct?
- What is the stage of my cancer and what does that mean in my case?
- Are there other tests that need to be done before we consider treatment options?
- Is the cancer likely to be resectable?
- How much experience do you have treating this type of cancer?
- Should I get a second opinion?
- What treatment choices do I have?
- What do you recommend and why?
- What is the goal of treatment?
- What risks or side effects are there to the treatments you suggest?
- What should I do to be ready for treatment?
- How long will treatment last? What will it involve? Where will it be done?
- How will treatment affect my daily activities?
- What are the chances my cancer will come back with these treatment plans?

- What would we do if the treatment doesn't work or if the cancer recurs?
- What type of follow-up might I need after treatment?
- 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.

What happens after treatment for bile duct cancer?

Completing treatment can be both stressful and exciting. You will be relieved to finish treatment, yet it is hard not to worry about cancer coming back. (When cancer returns, it is called recurrence.) This is a very common concern among those who have had cancer.

It may take a while before your confidence in your own recovery begins to feel real and your fears are somewhat relieved. You can learn more about what to look for and how to learn to live with the possibility of cancer coming back in our document, *Living With Uncertainty: The Fear of Cancer Recurrence,* available at 1-800-227-2345.

Follow-up care

After your treatment is over, it is very important to keep all follow-up appointments. During these visits, your doctors will ask about symptoms, do physical exams, and may order blood tests or imaging tests such as CT scans or x-rays.

There are no well-proven follow-up schedules for bile duct cancer. Doctors may recommend blood and/or imaging tests about every 6 months for at least the first couple of years after treatment. Follow-up is needed to check for cancer recurrence or spread, as well as possible side effects of certain treatments.

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

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

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

It is also important to keep medical insurance. Even though no one wants to think of their cancer coming back, it is always a possibility. If it happens, the last thing you want is to have to worry about paying for treatment.

Seeing a new doctor

At some point after your cancer diagnosis and treatment, you may find yourself in the office of a new doctor. Your original doctor may have moved or retired, or you may have moved or changed doctors for some reason. It is important that you be able to give your new doctor the exact details of your diagnosis and treatment. Make sure you have the following information handy:

- A copy of your pathology report(s) from any biopsy or surgery
- If you had surgery, a copy of your operative report(s)
- Copies of x-rays and scans, preferably on a disc for ease of transport and for review by new radiologists
- If you were hospitalized, a copy of the discharge summary that doctors must prepare when patients are sent home
- If you had radiation therapy, a summary of the type and dose of radiation and when and where it was given
- If you had chemotherapy, a list of your drugs, drug doses, and when you took them

Lifestyle changes to consider during and after treatment

Having cancer and dealing with treatment can be time-consuming and emotionally draining, but it can also 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 begin this process during cancer treatment.

Make healthier choices

Think about your life before you learned you had cancer. Were there things you did that might have made you less healthy? Maybe you drank too much alcohol, or ate more than you needed, or smoked, or didn't exercise very often. Emotionally, maybe you kept your feelings bottled up, or maybe you let stressful situations go on too long.

Now is not the time to feel guilty or to blame yourself. However, you can start making changes today that can have positive effects for the rest of your life. Not only will you feel better but you will also be healthier. What better time than now to take advantage of the motivation you have as a result of going through a life-changing experience like having cancer?

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

Diet and nutrition

Eating right can be a challenge for anyone, but it can get even tougher during and after cancer treatment. For instance, treatment often may change your sense of taste. Nausea can be a problem. You may lose your appetite for a while and lose weight when you don't want to. On the other hand, some people gain weight even without eating more. This can be frustrating, too.

If you are losing weight or have taste problems during treatment, do the best you can with eating and remember that these problems usually improve over time. You may want to ask your cancer team for a referral to a dietitian, an expert in nutrition who can give you ideas on how to fight some of the side effects of your treatment. You may also find it helps to eat small portions every 2 to 3 hours until you feel better and can go back to a more normal schedule.

One of the best things you can do after treatment is to put healthy eating habits into place. You will be surprised at the long-term benefits of some simple changes, like increasing the variety of healthy foods you eat. Try to eat 5 or more servings of vegetables and fruits each day. Choose whole grain foods instead of white flour and sugars. Try to limit meats that are high in fat. Cut back on processed meats like hot dogs, bologna, and bacon. Get rid of them altogether if you can. If you drink alcohol, limit yourself to 1 or 2 drinks a day at the most. And don't forget to get some type of regular exercise. The combination of a good diet and regular exercise will help you maintain a healthy weight and keep you feeling more energetic.

Rest, fatigue, work, and exercise

Fatigue is a very common symptom in people being treated for cancer. This is often not an ordinary type of tiredness but a "bone-weary" exhaustion that doesn’t get better with rest. For some, this fatigue lasts a long time after treatment, and can discourage them from physical activity.

However, exercise can actually help you reduce fatigue. Studies have shown that patients who follow an exercise program tailored to their personal needs feel physically and emotionally improved and can cope better.

If you are ill and need to be on bed rest during treatment, it is normal to expect your fitness, endurance, and muscle strength to decline some. Physical therapy can help you maintain strength and range of motion in your muscles, which can help fight fatigue and the sense of depression that sometimes comes with feeling so tired.

Any program of physical activity should fit your own situation. An older person who has never exercised will not be able to take on the same amount of exercise as a 20-year-old

who plays tennis 3 times a week. If you haven’t exercised in a few years but can still get around, you may want to think about taking short walks.

Talk with your health care team before starting, and get their opinion about your exercise plans. Then, try to get an exercise buddy so that you're not doing it alone. Having family or friends involved when starting a new exercise program can give you that extra boost of support to keep you going when the push just isn’t there.

If you are very tired, though, you will need to balance activity with rest. It is okay to rest when you need to. It is really hard for some people to allow themselves to do that when they are used to working all day or taking care of a household.

Exercise can improve your physical and emotional health.

It improves your cardiovascular (heart and circulation) fitness.

- It strengthens your muscles.
- It reduces fatigue.
- It lowers anxiety and depression.
- It makes you feel generally happier.
- It helps you feel better about yourself.

And long term, we know that exercise plays a role in preventing some cancers. The American Cancer Society, in its guidelines on physical activity for cancer prevention, recommends that adults take part in at least 1 physical activity for 30 minutes or more on 5 days or more of the week, 45 to 60 minutes of intentional physical activity are preferable. Children and teens are encouraged to try for at least 60 minutes a day of energetic physical activity on at least 5 days a week.

How about your emotional health?

Once your treatment ends, you may find yourself overwhelmed by emotions. This happens to a lot of people. You may have been going through so much during treatment that you could only focus on getting through your treatment.

Now you may find that you think about the potential of your own death, or the effect of your cancer on your family, friends, and career. You may also begin to re-evaluate your relationship with your spouse or partner. Unexpected issues may also cause concern -- for instance, as you become healthier and have fewer doctor visits, you will see your health care team less often. That can be a source of anxiety for some.

This is an ideal time to seek out emotional and social support. You need people you can turn to for strength and comfort. Support can come in many forms: family, friends, cancer support groups, church or spiritual groups, online support communities, or individual counselors.

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

The cancer journey can feel very lonely. It is not necessary or realistic to go it all by yourself. And your friends and family may feel shut out if you decide not to include them. Let them in -- and let in anyone else who you feel may help. If you aren't sure who can help, call your American Cancer Society at 1-800-227-2345 and we can put you in touch with an appropriate group or resource.

You can't change the fact that you have had cancer. What you can change is how you live the rest of your life -- making healthy choices and feeling as well as possible, physically and emotionally.

What happens if treatment is no longer working?

If cancer continues to grow after one kind of treatment, or if it returns, it is often possible to try another treatment plan that might still cure the cancer, or at least shrink the tumors enough to help you live longer and feel better. On the other hand, when a person has received several different medical treatments and the cancer has not been cured, over time the cancer tends to become resistant to all treatment. At this time it's important to weigh the possible limited benefit of a new treatment against the possible downsides, including continued doctor visits and treatment side effects.

Everyone has his or her own way of looking at this. Some people may want to focus on remaining comfortable during their limited time left.

This is likely to be the most difficult time in your battle with cancer -- when you have tried everything medically within reason and it’s just not working anymore. Although your doctor may offer you new treatment, you need to consider that at some point, continuing treatment is not likely to improve your health or change your prognosis or survival.

If you want to continue treatment to fight your cancer as long as you can, you still need to consider the odds of more treatment having any benefit. In many cases, your doctor can estimate the response rate for the treatment you are considering. Some people are tempted to try more chemotherapy or radiation, for example, even when their doctors say that the odds of benefit are less than 1%. In this situation, you need to think about and understand your reasons for choosing this plan.

No matter what you decide to do, it is important that you be as comfortable as possible. Make sure you are asking for and getting treatment for any symptoms you might have, such as pain. This type of treatment is called "palliative" treatment.

Palliative treatment helps relieve these symptoms, but is not expected to cure the disease; its main purpose is to improve your quality of life. Sometimes, the treatments you get to

control your symptoms are similar to the treatments used to treat cancer. For example, radiation therapy might be given to help relieve bone pain from bone metastasis. Or chemotherapy might be given to help shrink a tumor and keep it from causing a bowel obstruction. But this is not the same as receiving treatment to try to cure the cancer.

At some point, you may benefit from hospice care. Most of the time, this is given at home. Your cancer may be causing symptoms or problems that need attention, and hospice focuses on your comfort. You should know that receiving hospice care doesn't mean you can't have treatment for the problems caused by your cancer or other health conditions. It just means that the focus of your care is on living life as fully as possible and feeling as well as you can at this difficult stage of your cancer.

Remember also that maintaining hope is important. Your hope for a cure may not be as bright, but there is still hope for good times with family and friends -- times that are filled with happiness and meaning. In a way, pausing at this time in your cancer treatment is an opportunity to refocus on the most important things in your life. This 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.

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 under way in many medical centers throughout the world.

Radiation therapy and chemotherapy

Researchers are looking at new ways of increasing the effectiveness of radiation therapy. With newer techniques, such as three-dimensional conformal radiation therapy (3D-CRT) and intensity modulated radiation therapy (IMRT), doctors can 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. Doctors have also found that giving certain chemotherapy drugs just before radiation therapy may make it more effective.

In general, chemotherapy has not been found to be very effective against bile duct cancer, but newer drugs and combinations of drugs are now being tested.

Photodynamic therapy (PDT)

This technique uses a special fiber-optic light source to shine on tumors after the patient has been injected with a drug (porfimer) that absorbs the special light rays. The light causes a chemical change that activates the drug and causes the cancer cells to die. Since the drug is only active in the areas exposed to the special light, this approach causes fewer side effects than use of drugs that spread throughout all tissues of the body. PDT is

not able to destroy bile duct cancers completely, but it is used as a palliative technique (often along with stents) to help keep the bile duct open. Several clinical trials are now studying its use.

Targeted therapy

Unfortunately, so far chemotherapy has not been found to work very well against bile duct cancer. Newer drugs are being developed that work in different ways than standard chemotherapy drugs. These drugs target specific parts of cancer cells or their surrounding environments.

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

Other new drugs have different targets. For example, EGFR is a protein found in high amounts on some cancer cells that helps them grow. Drugs that target EGFR have shown some benefit against several types of cancer. Some of these, including erlotinib (Tarceva), cetuximab (Erbitux), and panitumumab (Vectibix), are now being studied for use in people with bile duct cancer.

A new drug called vandetanib (Zactima), which targets both new blood vessels and EGFR, is also being studied.

Additional resources

More information from your American Cancer Society

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

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

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

Pain Control: A Guide for Patients and Their Families (available in Spanish)

Surgery (also available in Spanish)

Understanding Chemotherapy (also available in Spanish)

Understanding Radiation Therapy (also available in Spanish)

When Your Cancer Comes Back: Cancer Recurrence

The following books are available from the American Cancer Society. Call us at 1-800-227-2345 to ask about cost or to place your order.

American Cancer Society's Guide to Pain Control

Cancer in the Family: Helping Children Cope With a Parent's Illness

Caregiving: A Step-By-Step Resource for Caring for the Person With Cancer at Home

Consumers Guide to Cancer Drugs

National organizations and Web sites*

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

American Gastroenterological Association
Telephone: 1-301-654-2055
Web site: www.gastro.org

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

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

The American Cancer Society is happy to address almost any cancer-related topic. If you have any more questions, please call us at 1-800-227-2345 at any time, 24 hours a day.

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Last Medical Review: 1/21/2010

Last Revised: 1/21/2010

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