Bile Duct Cancer Early Detection, Diagnosis, and Staging

Know the signs and symptoms of bile duct cancer. Find out how bile duct cancer is tested for, diagnosed, and staged.

Detection and Diagnosis

Finding cancer early, when it's small and before it has spread, often allows for more treatment options. Some early cancers may have signs and symptoms that can be noticed, but that's not always the case.

- Can Bile Duct Cancer Be Found Early?
- Signs and Symptoms of Bile Duct Cancer
- Tests for Bile Duct Cancer

Stages and Outlook (Prognosis)

After a cancer diagnosis, staging provides important information about the extent of cancer in the body and the likely response to treatment.

- Bile Duct Cancer Stages
- Survival Rates for Bile Duct Cancer

Questions to Ask About Bile Duct Cancer

Here are some questions you can ask your cancer care team to help you better understand your bile duct cancer and treatment options.

- Questions to Ask About Bile Duct Cancer

Can Bile Duct Cancer Be Found Early?

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

The bile ducts are deep inside the body, so small tumors can't be seen or felt during routine physical exams. There are no blood tests or other tests that can reliably detect bile duct cancers early enough to be useful as screening tests. (Screening is testing for cancer in people without any symptoms.)

Because of this, most bile duct cancers are found only after the cancer has grown enough to cause signs or symptoms. The most common symptom is jaundice (a yellowing of the skin and eyes) which is caused by a blocked bile duct.

References

Abou-Alfa GK, Jarnagin W, Lowery M, et al. Liver and bile duct cancer. In: Neiderhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. Abeloff's Clinical Oncology. 5th ed. Philadelphia, PA: Elsevier; 2014:1373-1395.

Signs and Symptoms of Bile Duct Cancer

Bile duct cancer doesn’t usually cause signs or symptoms until later in the course of the disease, but sometimes symptoms can appear sooner and lead to an early diagnosis. If the cancer is diagnosed at an early stage, treatment[1] may work better.

When bile duct cancer does cause symptoms, it's usually because a bile duct is blocked. Symptoms tend to depend on whether the cancer is in ducts inside the liver (intrahepatic) or in ducts outside the liver (extrahepatic).

- Jaundice
- Itching
- Light-colored/greasy stools

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Hyperlinks

1. www.cancer.org/cancer/types/bile-duct-cancer/treating.html

References

Abou-Alfa GK, Jarnagin W, Lowery M, et al. Liver and bile duct cancer. In: Neiderhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. Abeloff's Clinical

Tests for Bile Duct Cancer

take your complete medical history to check for risk factors and learn more about your symptoms.

A physical exam is done to look for signs of bile duct cancer or other health problems. If bile duct cancer is suspected, the exam will focus mostly on your abdomen (belly) to check for any lumps, tenderness, or build-up of fluid. Your skin and the whites of your eyes will be checked for jaundice (a yellowish color). Your stool and urine will be checked for changes in color.

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

Blood tests

Your blood might be sent to the lab to test your liver and gallbladder function or to test for certain tumor markers.

Tests of liver and gallbladder function

Lab tests[1] might be done to find out how much bilirubin is in your blood. Bilirubin is the chemical that causes jaundice. Problems in the bile ducts, gallbladder, or liver can raise the blood level of bilirubin.

Your doctor may also do tests for albumin, liver enzymes (alkaline phosphatase, AST, ALT, and GGT), coagulation studies (PT, PTT, INR) and certain other substances in your blood. Some of these tests may be called **liver function tests**. They can help diagnose bile duct, gallbladder, or liver disease.

If you have higher levels of these substances in your blood, it might mean you have a blockage in your bile duct. But these tests can’t show if it's 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 markers called *CEA* and *CA 19-9*. High levels of these markers often mean cancer is present, but the high levels can also be caused by other types of cancer, or even by problems other than cancer.

Also, not all bile duct cancers make these tumor markers, so low or normal levels don't always mean cancer is not present.

Still, these tests can sometimes be useful after a bile duct cancer diagnosis. If the levels of these markers are found to be high, they can be followed over time to help see how well treatment is working.

Imaging tests

lymph node so that cells can be removed (biopsied) and looked at under a microscope. This is called an ultrasound-guided needle biopsy.

Endoscopic ultrasound (EUS) or laparoscopic ultrasound

In these techniques, the doctor puts the ultrasound transducer inside your body and closer to the bile duct. This gives more detailed images than a standard ultrasound. The transducer is on the end of a thin, lighted tube that has a camera on it. The tube is either passed through your mouth, down through your stomach, and into the small intestine near the bile ducts (endoscopic ultrasound) or through a small surgical cut in the skin on the side of your body (laparoscopic ultrasound).

If there's a tumor, the doctor might be able to see how far it has grown and spread, which can help in planning for surgery. Ultrasound may be able to show if nearby lymph nodes are enlarged, which can be a sign that cancer has reached them. Needle biopsies of suspicious areas might be done.

Multi-detector computed tomography (MDCT) scan

An MDCT scan uses x-rays to make detailed cross-sectional images of your body. It can be used to:

- Help diagnose bile duct cancer by showing tumors in the area.
- Help stage the cancer (find out how far it has spread). CT scans can show the organs near the bile duct (especially the liver), as well as lymph nodes and distant organs where cancer might have spread.
- Guide a biopsy needle into a suspected tumor. This is called a **CT-guided needle biopsy**. To do it, you stay on the CT scanning table while the doctor advances a biopsy needle through your skin and toward the mass. CT scans are repeated until the needle is inside the mass. A small amount of tissue (a sample) is then taken out through the needle.

Magnetic resonance imaging (MRI) scan

Like CT scans, MRI scans show detailed images of soft tissues in the body. But MRI scans use radio waves and strong magnets instead of x-rays. To see details better, a contrast material called **gadolinium** may be injected into a vein before the scan.

MRI scans can provide a great amount of detail and be very helpful in looking at the bile

ducts and other organs. Sometimes they can help tell a benign (non-cancer) tumor from one that's cancer.

A special type of MRI scan may also be used in people who might have bile duct cancer. This test is called an **MR cholangiopancreatography (MRCP)**, and it can be used to look at the bile ducts. It is described below in the section on cholangiography.

Cholangiography

A cholangiogram is an imaging test that looks at the bile ducts to see if they're blocked, narrowed, or dilated (widened). This can help show if someone might have a tumor that's blocking a duct. It can also be used to help plan surgery. There are several types of cholangiograms, each of which has different pros and cons.

Magnetic resonance cholangiopancreatography (MRCP)

This is a way to get images of the bile ducts with the same type of machine used for standard MRIs. Unlike other types of cholangiograms, this test doesn't use an endoscope or an IV contrast agent. Because it's non-invasive (nothing is put in your body), doctors often use MRCP if they just need images of the bile ducts. This test can't be used to get biopsy samples of tumors or to place stents (small tubes) in the ducts to keep them open.

Endoscopic retrograde cholangiopancreatography (ERCP)

In this procedure, a doctor passes a long, flexible tube (endoscope) down your throat, through your stomach, and into the first part of the small intestine. This is usually done while you are sedated (given medicine to make you sleepy). A small catheter (tube) is passed out of the end of the endoscope and into the common bile duct. A small amount of contrast dye is injected through the catheter. The dye helps outline the bile ducts and pancreatic duct as x-rays are taken. The images can show narrowing or blockage of these ducts.

This test is more invasive than MRCP, but it has the advantage of allowing doctors to take samples of cells or fluid for testing. ERCP can also be used to put a stent (a small tube) into a duct to help keep it open.

Percutaneous transhepatic cholangiography (PTC)

In this procedure, a doctor puts a thin, hollow needle through the skin of your belly and into a bile duct inside your liver. You're given medicines through an IV line to make you

sleepy before this test. A local anesthetic is also used to numb the area before putting in 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 test can also be used to take samples of fluid or tissues or to put a stent (small tube) in the bile duct to help keep it open. Because it's more invasive, PTC is not usually used unless ERCP has already been tried or can’t be done for some reason.

Other tests

Doctors may also use special instruments (endoscopes) to go into your body to get a more direct look at your bile duct and nearby areas. The scopes may be passed through small surgical incisions (cuts) or through natural body openings like your mouth. These tests are not as commonly used, since non-invasive imaging tests (like MDCT and MRCP) allow for very detailed images.

Laparoscopy

Laparoscopy is a type of surgery. A doctor takes a laparoscope (a thin, lighted tube with a small camera on the end) and puts it through a small incision (cut) in the front of your belly. With the camera, the doctor looks at your bile ducts, gallbladder, liver, and other nearby organs and tissues. Sometimes more than one cut is made. This is typically

samples of bile duct cells or tissue are removed (biopsied) and looked at with a microscope to be sure of the diagnosis.

But a biopsy isn't always done before surgery for a possible bile duct cancer. If imaging tests show a tumor in the bile duct, the doctor may decide to proceed directly to surgery and to treat the tumor as a bile duct cancer (see Surgery for Bile Duct Cancer[3]).

Types of biopsies

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

Biopsy during cholangiography

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

Bile duct cells and tiny pieces of bile duct tissue can also be taken out by a process called biliary brushing. Instead of injecting contrast dye and taking x-ray pictures (as for ERCP or PTC), a small brush with a long, flexible handle is advanced 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. These are then looked at with a microscope.

Biopsy during cholangioscopy

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

Needle biopsy

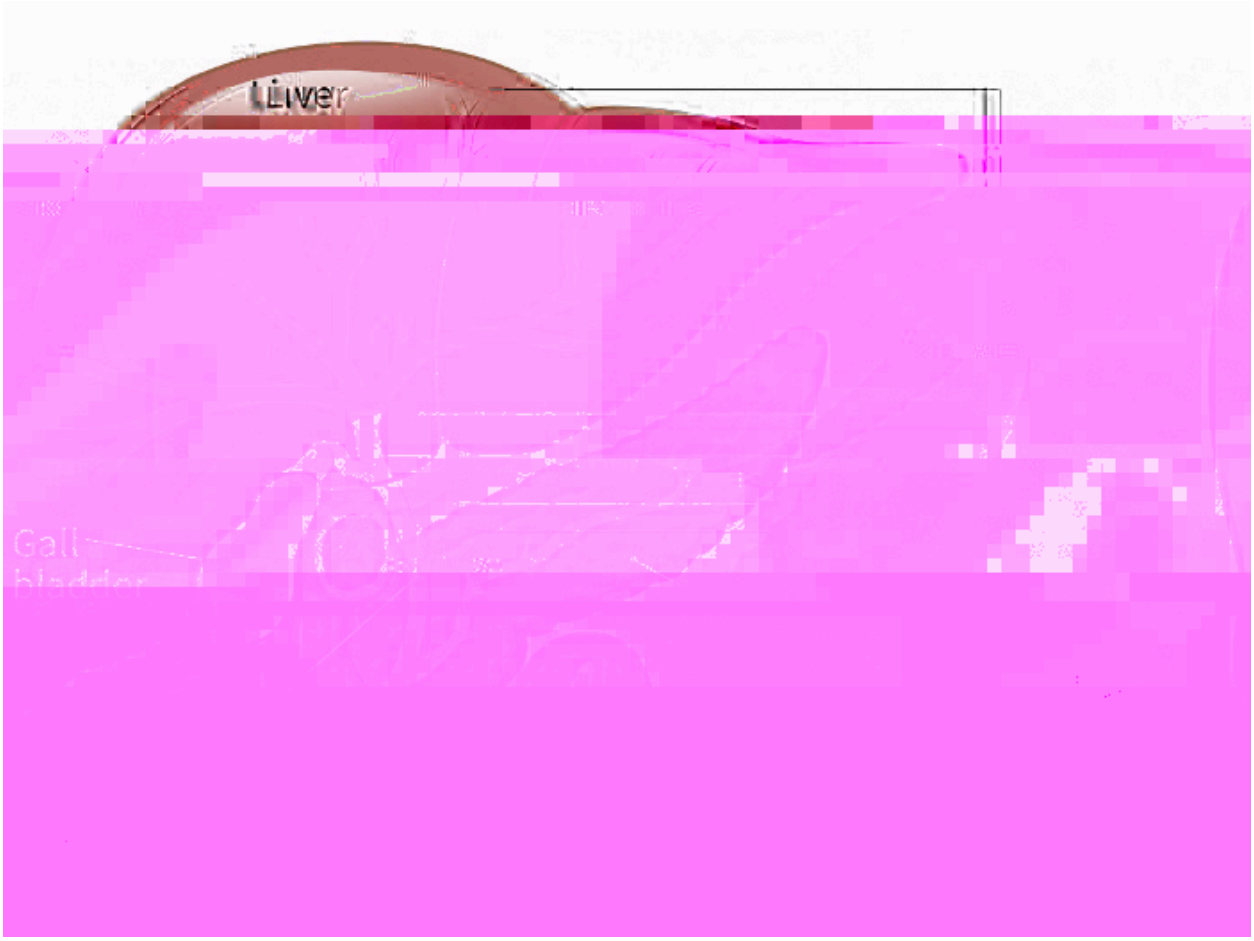
For this test, a thin, hollow needle is put through the skin and into the tumor without making a cut in the skin. (The skin is numbed first with a local anesthetic.) The needle is usually guided into place using ultrasound or CT scans. When the images show that the needle is in the tumor, cells and/or fluid are drawn into the needle and sent to the lab to be tested.

In most cases, this is done as a **fine needle aspiration (FNA) biopsy**, which uses a very thin needle attached to a syringe to suck out (aspirate) a sample of cells. Sometimes, the FNA doesn’t get enough cells for a definite diagnosis. If not, a **core needle biopsy** may be done. A core needle biopsy uses a slightly larger needle to get a bigger sample.

Lab tests of biopsy samples

Along with looking at the biopsy samples with a microscope to see if they contain cancer cells, other lab tests might also be done on the samples.

For example, cancer cells in biopsy samples (or surgery samples) might be tested for



Nearly all bile duct cancers start in the innermost layer of the wall of the bile duct, called the **mucosa**. Over time, they can grow through the wall toward the outside of the bile duct. If a tumor grows through the bile duct wall, it can invade (grow into) nearby blood vessels, organs, and other structures. It might also grow into nearby lymphatic or blood vessels. From there, it might spread to nearby lymph nodes or to other parts of the body.

Resectable versus unresectable

The TNM staging system gives a detailed summary of how far the bile duct cancer has spread. It also gives doctors an idea about a person's prognosis (outlook).

For treatment purposes, doctors often use a simpler system based on whether or not they think the cancer can be removed (resected) with surgery[3]:

- **Resectable** cancers are cancers that doctors believe can be removed completely by surgery.

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Staging of Intrahepatic Bile Duct Cancers

If you are diagnosed with intrahepatic bile duct cancer, your doctors will try to figure out if it has spread, and if so, how far. This process is called **staging**. The stage of a cancer describes how much cancer is in the body. It helps determine how extensive the cancer is and how best to treat it. Doctors also use a cancer's stage when talking about survival statistics.

The earliest stage for intrahepatic bile duct cancers is **stage 0 (also called carcinoma *in situ*, or CIS)**. Stages then range from stage I (1) through stage IV (4). As a rule, the lower the number, the less the cancer has spread. A higher number, such as stage IV, means the cancer has spread more. Within each numbered stage, an earlier letter (A, B) means a lower stage.

Although each person's cancer experience is unique, cancers with similar stages tend to have a similar outlook and are often treated in much the same way[1].

How is the stage determined?

The staging system most often used for intrahepatic bile duct cancer is the American Joint Committee on Cancer (AJCC) **TNM** system. This system is based on 3 key pieces of information:

- The extent (size) of the main **tumor (T)**: How large has the cancer grown? Has the cancer reached nearby structures or organs?
- The spread to nearby lymph **nodes (N)**: Has the cancer spread to nearby lymph nodes?
- The spread (**metastasis**) to distant sites **(M)**: Has the cancer spread to distant lymph nodes or distant organs such as the bones, lungs, or peritoneum (the lining of the abdomen)?

		and has not invaded nearby blood vessels (T1a).
	N0	
	M0	It has not spread to nearby lymph nodes (N0) or to distant sites (M0).
	T1b	The tumor is more than 5 cm across but has not invaded nearby blood vessels (T1b).
IB	**N0**	
	M0	The cancer has not spread to nearby lymph nodes (N0) or to distant sites (M0).
	T2	The tumor has grown into nearby blood vessels, **OR** there are 2 or more tumors, which may or may not have grown into nearby blood vessels (T2).
II	**N0**	
	M0	The cancer has not spread to nearby lymph nodes (N0) or to distant sites (M0).
	T3	The cancer has grown through the visceral peritoneum (the outer lining of organs in the abdomen) (T3).
IIIA	**N0**	
	M0	The cancer has not spread to nearby lymph nodes (N0) or to distant sites (M0).
IIIB	**T4**	The cancer has grown

		directly into nearby structures outside of the liver (T4).
	N0	
	M0	The cancer has not spread to nearby lymph nodes (N0) or to distant sites (M0).
OR		
Any T	The cancer is any size and might or might not be growing outside the bile duct (Any T) and has spread to nearby lymph nodes (N1).	
N1		
	It has not spread to distant sites (M0).	
M0		
		The cancer is any size and may or may not be growing outside the bile duct (Any T).
	Any T	
IV	**Any N**	It may or may not have spread to nearby lymph nodes (Any N).
	M1	
		It has spread to distant organs such as the bones or lungs (M1).

*The T categories are described in the table above, except for:

- **TX:** Main tumor cannot be assessed due to lack of information.
- **T0:** No sign of a primary tumor.

The N categories are described in the table above, except for:

- **NX:** Nearby lymph nodes cannot be assessed due to lack of information.

Hyperlinks

1. www.cancer.org/cancer/types/bile-duct-cancer/treating.html
2. www.cancer.org/cancer/diagnosis-staging/staging.html

References

American Joint Committee on Cancer. Intrahepatic Bile Ducts. In: *AJCC Cancer Staging Manual*. 8th ed. New York, NY: Springer; 2017: 295-302.

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Staging of Perihilar Bile Duct Cancers

If you are diagnosed with perihilar (hilar) bile duct cancer, your doctors will try to figure out if it has spread, and if so, how far. This process is calledbtar. This ls G 1 r30 1 72 532.65 Tm /F1 2

understand.

Stages of perihilar bile duct cancer

AJCC Stage	Stage grouping	Stage description*
0	Tis	The cancer is only in the mucosa (the innermost layer of cells in the bile duct). It hasn't started growing into the deeper layers (Tis).
I	N0 M0 T1	It has not spread to nearby lymph nodes (N0) or to distant sites (M0). The cancer has grown into deeper layers of the bile duct wall, such as the muscle layer or fibrous tissue layer (T1).
II	N0 M0 T2a or T2b	It has not spread to nearby lymph nodes (N0) or to distant sites (M0).

	N0 **M0**	to nearby lymph nodes (N0) or to distant sites (M0).
	T3	The cancer is growing into branches of the main blood vessels of the liver (the
IIIA		
	N0 **M0**	

IVA	**M0**	It has not spread to distant sites (M0).
	Any T **N2**	The cancer is any size and may or may not be growing outside the bile duct or into nearby blood vessels (Any T). It has also spread to 4 or more nearby lymph nodes (N2).
IVB	**M0**	It has not spread to distant sites (M0).
	Any T **Any N**	The cancer is any size and may or may not be growing outside the bile duct or into nearby blood vessels (Any T). It may or may not have spread to nearby lymph nodes (Any N).
	M1	

to have a similar outlook and are often treated in much the same way[1].

How is the stage determined?

The staging system most often used for distal bile duct cancer is the American Joint Committee on Cancer (AJCC) **TNM** system. This system based on 3 key pieces of information:

- The extent (size) of the main **tumor (T)**: Has the cancer grown through the wall of the bile duct? Has the cancer reached nearby structures or organs?
- The spread to nearby lymph **nodes (N)**: Has the cancer spread to nearby lymph nodes?
- The spread (**metastasis**) to distant sites **(M)**: Has the cancer spread to distant lymph nodes or distant organs such as the bones, lungs, or peritoneum (the lining of the abdomen)?

The system described below is the most recent AJCC system. It's used only for **distal bile duct cancers**, which are bile duct cancers that start along the common bile duct. Staging systems for cancers starting in other parts of the bile ducts are described in:

- Intrahepatic Bile Duct Cancer Stages (for cancers starting in bile ducts within the liver)
- Perihilar (Hilar) Bile Duct Cancer Stages (for cancers starting in the hilum, just outside the liver)

Numbers or letters after T, N, and M provide more details about each of these factors. Higher numbers mean the cancer is more advanced.

Once a person's T, N, and M categories have been determined, this information is combined in a process called **stage grouping** to assign an overall stage. For more on this, see Cancer Staging[2].

Distal bile duct cancer is typically given a **clinical stage** based on the results of a physical exam, biopsy, and imaging tests (described in Tests for Bile Duct Cancer). If surgery is done, the **pathologic stage** (also called the **surgical stage**) is determined by examining the tissue removed during the operation.

Cancer staging can be complex, so ask your doctor to explain it to you in a way you understand.

Stages of distal bile duct cancer

AJCC Stage	Stage grouping	Stage description*
0	Tis N0 M0	The cancer is only in the mucosa (the innermost layer of cells in the bile duct). It

M0	It has not spread to distant sites (M0).	
	T3	The cancer has grown more than 12 mm into the bile duct wall (T3).
IIB		
	N0	It has not spread to nearby lymph nodes (N0) or to distant sites (M0).
	M0	
OR		
T2 or T3	The cancer has grown 5 mm or more into the bile duct wall (T2 or T3) and has spread to 1 to 3 nearby lymph nodes (N1).	
N1		
M0	It has not spread to distant sites (M0).	
	T1, T2, or T3	The cancer has grown to any depth into the bile duct wall (T1, T2, or T3) and to 4 or more nearby lymph nodes (N2).
	N2	
IIIA		
	M0	It has not spread to distant sites (M0).
	T4	The cancer is growing into nearby blood vessels (the celiac artery or its branches, the superior mesenteric artery, and/or the common hepatic artery) (T4).
IIIB		
	Any N	

		The cancer may or may not have spread to nearby lymph nodes (Any N).
	M0	It has not spread to distant sites (M0).
	Any T	The cancer has grown to any depth within the bile duct wall and may or may not be growing into nearby blood vessels (Any T).
	Any N	
IV		It may or may not have spread to nearby lymph nodes (any N).
	M1	It has spread to distant organs such as the liver, lungs, or peritoneum (inner lining of the abdomen) (M1).

*The T categories are described in the table above, except for:

- TX: Main tumor cannot be assessed due to lack of information.

The N categories are described in the table above, except for:

- NX: Nearby lymph nodes cannot be assessed due to lack of information.

Hyperlinks

1. www.cancer.orgamericancancer-my.sharepoint.com/cancer/types/bile-duct-cancer/treating.html
2. www.cancer.org/cancer/diagnosis-staging/staging.html

References

American Joint Committee on Cancer. Distal Bile Duct. In: *AJCC Cancer Staging Manual*. 8th ed. New York, NY: Springer; 2017: 317-325.

Survival Rates for Bile Duct Cancer

What is a 5-year relative survival rate?

A **relative survival rate** compares people with the same type and stage of cancer to people in the overall population.

For example, if the **5-year relative survival rate** for a specific stage of bile duct cancer (cholangiocarcinoma) is 30%, it means people who have that cancer are, on average, about 30% as likely as people who don't have that cancer to live for at least 5 years after being diagnosed.

Where do these numbers come from?

The American Cancer Society relies on information from the Surveillance, Epidemiology, and End Results (SEER) database to provide survival statistics for different types of cancer. This database is maintained by the National Cancer Institute (NCI).

The SEER database tracks 5-year relative survival rates for bile duct cancer in the United States, based on how far the cancer has spread. However, the database does not group cancers by AJCC TNM stages (stage 1, stage 2, stage 3, etc.). Instead, it groups cancers into localized, regional, and distant stages:

- **Localized:** There is no sign that the cancer has spread outside of the bile ducts.
- **Regional:** The cancer has spread outside the bile ducts to nearby structures or lymph nodes.
- **Distant:** The cancer has spread to distant parts of the body, such as the lungs.

5-year relative survival rates for bile duct cancer

These numbers (which are the most recent available) are based on people diagnosed with cancers of the bile duct between 2012 and 2018. They are divided into intrahepatic and extrahepatic bile duct cancers.

Intrahepatic bile duct cancers (those starting within the liver)

SEER* stage	5-year relative survival rate
Localized	23%
Regional	9%

Distant	3%
All SEER stages combined	9%

Extrahepatic bile duct cancers (those starting outside the liver)

This includes both perihilar and distal bile duct cancers.

Questions to Ask About Bile Duct Cancer

It's important to have honest, open discussions with your cancer care team. They want to answer all your questions, no matter how minor they might seem. Don't be afraid to ask them. Below is a list of questions to get you started.

When you're told you have bile duct cancer

- What type of bile duct cancer[1] do I have? Where is it located?
- Has my cancer spread beyond the bile ducts?
- What is the stage of my cancer, and what does that mean in my case?
- What is my prognosis (outlook)?
- Do I need other tests before we consider treatment options?
- Do I need to see any other kinds of doctors?
- How much experience do you have treating this type of cancer?
- Should I get a second opinion[2]?

When deciding on a treatment plan

- What are my treatment options[3]?
- Can my cancer be removed with surgery[4]?
- What treatment do you recommend and why?
- What is the goal of treatment?
- What risks or side effects are there to the treatments you suggest? How long are they likely to last?
- How quickly do we need to decide on treatment?
- What should I do to be ready for treatment?
- How long will treatment last? What will it be like? Where will it be done?
- How will treatment affect my daily activities?
- What are the chances my cancer can be cured with these treatment plans?

During treatment

- How will we know if the treatment is working?
- Is there anything I can do to help manage side effects[5]?
- What symptoms or side effects should I tell you about right away?
- How can I reach you on nights, holidays, or weekends?
- Do I need to change what I eat during treatment?
- Are there any limits on what I can do?
- Can you suggest a mental health professional I can see if I start to feel overwhelmed, depressed, or distressed[6]?

After treatment

- What would my options be if the treatment doesn't work or if the cancer comes back?
- What type of follow-up might I need after treatment?
- What long-term side effects or late effects should I expect?
- Where can I get more information and support?

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

Keep in mind that doctors are not the only ones who can give you information. Other health care professionals[7], such as nurses and social workers, can answer some of your questions.

After Bile Duct Cancer Treatment [8]

Clinical Trials: What You Need to Know

5. www.cancer.org/cancer/managing-cancer/side-effects.html
6. www.cancer.org/cancer/managing-cancer/side-effects/emotional-mood-changes.html