
Treating Bile Duct Cancer

If you've been diagnosed with bile duct cancer, your treatment team will discuss your options with you. It's important to weigh the benefits of each treatment option against the possible risks and side effects.

How is bile duct cancer treated?

The main types of treatment for bile duct cancer include:

- [Surgery for Bile Duct Cancer](#)
- [Radiation Therapy for Bile Duct Cancer](#)
- [Chemotherapy for Bile Duct Cancer](#)
- [Targeted Drug Therapy for Bile Duct Cancer](#)
- [Immunotherapy for Bile Duct Cancer](#)
- [Palliative Therapy for Bile Duct Cancer](#)

Common treatment approaches

Your treatment options will depend on several factors:

- The location and extent of the cancer
 - Whether the cancer is resectable (removable by surgery)
 - The likely side effects of treatment
 - Your overall health and personal preferences
 - The chances of curing the disease, extending life, or relieving symptoms
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- [Treatment Options Based on the Extent of Bile Duct Cancer](#)

Who treats bile duct cancer?

Based on your treatment options, you might have different types of doctors on your cancer care team. These might include:

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

Cancer care teams also include other health care professionals such as physician assistants, nurse practitioners, oncology nurses, social workers, pharmacists, counselors, dietitians, physical therapists, occupational therapists, and others.

- [Health Professionals Who Are Part of a Cancer Care Team](#)

Making treatment decisions

It's important to discuss all treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. You may feel that you need to make a decision quickly, but it's important to give yourself time to absorb the information you have learned. Ask your cancer care team questions.

If time permits, it is often a good idea to seek a second opinion, particularly for a rare cancer like bile duct cancer. A second opinion can give you more information and help you feel more confident about the treatment plan you choose.

- [Questions to Ask About Bile Duct Cancer](#)
- [Seeking a Second Opinion](#)

Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-the-art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to

treat cancer.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- [Clinical Trials](#)

Considering complementary, integrative, and alternative methods

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

Complementary and integrative methods are treatments that are used **along with** your regular medical care. **Alternative** treatments are used **instead of** standard medical treatment. Although some complementary and integrative methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be harmful.

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

- [Complementary and Integrative Medicine](#)

Help getting through cancer treatment

People with cancer need support and information, no matter what stage of illness they may be in. Knowing all of your options and finding the resources you need will help you make informed decisions about your care.

Whether you are thinking about treatment, getting treatment, or not being treated at all, you can still get supportive care to help with pain or other symptoms. Communicating with your cancer care team is important so you understand your diagnosis, what treatment is recommended, and ways to maintain or improve your quality of life.

Different types of programs and support services may be helpful, and they can be an important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services - including rides to

treatment, lodging, and more - to help you get through treatment. Call our Cancer Knowledge Hub at 1-800-227-2345 and speak with one of our caring, trained cancer helpline specialists. Or, if you prefer, you can use our chat feature on cancer.org to connect with one of our specialists.

- [Palliative Care](#)
- [Programs & Services](#)

Choosing to stop treatment or choosing no treatment at all

For some people, when treatments have been tried and are no longer controlling the cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors as you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

People who have advanced cancer and who are expected to live less than 6 months may want to consider hospice care. Hospice care is designed to provide the best possible quality of life for people who are near the end of life. You and your family are encouraged to talk with your doctor or a member of your supportive care team about hospice care options, which include hospice care at home, a special hospice center, or other health care locations. Nursing care and special equipment can make staying at home a workable option for many families.

- [If Cancer Treatments Stop Working](#)
- [Hospice Care](#)

The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask your cancer care team any questions you may have about your treatment options.

Surgery for Bile Duct Cancer

There are 2 general types of surgery for bile duct cancer: potentially curative surgery (for resectable cancer) and palliative surgery (for unresectable cancer).

- [Potentially curative surgery for bile duct cancer](#)
- [Laparoscopy to plan bile duct surgery](#)
- [Surgery for resectable bile duct cancers](#)
- [Palliative surgery for bile duct cancer](#)
- [Possible risks and side effects of bile duct surgery](#)
- [More information about Surgery](#)

Potentially curative surgery for bile duct cancer

Resectable (potentially curative surgery) means imaging tests or the results of earlier surgeries show there's a good chance the surgeon can remove all the cancer along with a rim (margin) of healthy tissue around it. This decision is based on the location of the tumor, its size and the extent of its spread. Only a small percentage of bile duct cancers are resectable when they're first found.

If potentially curative surgery is being considered, you may want to get a [second opinion](#)¹ or even be referred to a large [cancer center](#)². Nearly all doctors agree that surgery offers the only realistic chance for curing people with bile duct cancer. But there are differences of opinion about how advanced a bile duct cancer can be and still be treatable with surgery. The surgery needed for bile duct cancer is often complex and requires an experienced surgeon. These operations are most often done at major cancer centers.

If a tumor is unresectable, it means doctors think the cancer is too advanced, it has spread too far, or is in too difficult a place to be entirely removed by surgery.

Laparoscopy to plan bile duct surgery

If your surgical team is planning curative surgery, they first may do a laparoscopy (a type of minor surgery) to look for any spread of the cancer that could make curative surgery not an option. This procedure is described in [Tests for Bile Duct Cancer](#)³. During the laparoscopy, the surgeon can look for areas of cancer that did not show up on imaging tests. If the cancer is resectable, laparoscopy can also help plan the operation to remove it.

Surgery to remove bile duct cancer can have serious side effects. Depending on how extensive it is, you may need many weeks to recover. It's very important to understand how the surgery is likely to affect your quality of life.

Surgery for resectable bile duct cancers

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

- **Intrahepatic bile duct cancers** are in bile ducts that are inside 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 a whole lobe (right or left part) of the liver must be removed. This is called **hepatic lobectomy**. It is a complicated operation that requires an experienced surgical team. If the amount of liver removed is not too great, the liver will still work normally because it has some ability to grow back.
- **Perihilar bile duct cancer** develops where the branches of the bile ducts first leave the liver. Surgery for these cancers is complicated and requires great skill. Usually, part of the liver is removed along with the bile duct, gallbladder, nearby lymph nodes, and sometimes part of the pancreas and small intestine. Then the surgeon connects the remaining ducts to the small intestine. This is a complex operation that can lead to life-threatening complications for some people.
- **Distal bile duct cancers** are further down the bile duct near the pancreas and small intestine. Along with the bile duct and nearby lymph nodes, the surgeon often has to remove part of the pancreas and small intestine. This operation is called a **Whipple procedure**. Like the other operations, this is a complex procedure that requires an experienced surgical team.

Palliative surgery for bile duct cancer

Palliative surgery is done to relieve symptoms or treat (or even prevent) complications, such as blockage of the bile ducts. This type of surgery is done when the cancer is too widespread to be removed completely. Palliative surgery is not expected to cure the cancer, but it can sometimes help a person feel better and sometimes can even help them live longer.

In some cases, the doctor might think the cancer is resectable (can be removed) based on the information available (imaging tests, laparoscopy, etc.), but once surgery starts it becomes clear that the cancer is too advanced to be removed completely. In these

cases, the surgeon might still try to prevent or relieve symptoms using a different approach.

Biliary bypass

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. The bile duct may also be connected to the intestine itself. Often, the gallbladder is used to provide some of the bypass. Different types of biliary bypass operations may be done, based on where the blockage is. The bypass allows the bile to flow into the intestines and can help reduce symptoms such as jaundice or itching.

Stent placement

If a bypass can't be done, the surgeon may put a plastic or expandable metal tube (called a stent) inside the bile duct to keep it open and allow bile to flow. This may be done during an endoscopic retrograde cholangiopancreatography procedure (ERCP) or during a procedure similar to percutaneous transhepatic cholangiography (PTC).

These procedures can relieve side effects. As a result, after these procedures patients often experience long periods when all symptoms disappear and their quality of life improves.

Palliative surgery is described in more detail in [Palliative Therapy for Bile Duct Cancer](#).

Possible risks and side effects of bile duct surgery

The risks and side effects of surgery depend on the extent of the operation and a person's overall health before surgery. Another key factor is how well the liver is working. All surgery carries some risk, including the possibility of bleeding, blood clots, infections, complications from anesthesia, pneumonia, and even death in rare cases.

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

Surgery for bile duct cancer is a major operation that might mean removing parts of other organs. This can have a major effect on a person's recovery and health after the surgery. Serious problems soon after surgery can include bile leakage into the abdomen, infections, and liver failure. Because most of the organs removed are involved in digestion, eating and nutrition problems may be a concern after surgery.

More information about Surgery

For more general information about surgery as a treatment for cancer, see [Cancer Surgery](#)⁴.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)⁵.

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/finding-care/seeking-a-second-opinion.html
2. www.cancer.org/cancer/managing-cancer/finding-care/where-to-find-cancer-care.html
3. www.cancer.org/cancer/types/bile-duct-cancer/detection-diagnosis-staging/how-diagnosed.html
4. www.cancer.org/cancer/managing-cancer/treatment-types/surgery.html
5. www.cancer.org/cancer/managing-cancer/side-effects.html

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Radiation Therapy for Bile Duct Cancer

Radiation therapy uses high-energy rays or particles to destroy cancer cells. Radiation isn't often used to treat bile duct cancer. Still, it might be used in some situations.

- [How is radiation therapy used to treat bile duct cancer?](#)
- [External beam radiation therapy \(EBRT\)](#)
- [Proton beam therapy](#)
- [Brachytherapy \(internal radiation therapy\)](#)
- [More information about radiation therapy](#)

How is radiation therapy used to treat bile duct cancer?

Although radiation therapy is not often used to treat bile duct cancer, it might be helpful in some situations. Here are some of the ways it might be used:

After surgery to remove the cancer

This is called **adjuvant therapy**. It's used to kill any tiny deposits of cancer cells that are left after surgery but are too small to see. Not all doctors agree that adjuvant radiation therapy is helpful.

Before surgery for cancers that might be able to be taken out

Some doctors may use radiation therapy before surgery for certain cancers that are thought to be resectable (removable). This is done to try to shrink the cancer and make it easier to take it out. This is called **neoadjuvant therapy**. It's not clear how helpful this is.

As part of the main therapy for some advanced cancers

Radiation therapy can also be used as a main therapy for some patients whose cancer has not spread widely throughout the body but can't be removed with surgery. While treatment in this case does not offer a cure, it may help patients live longer.

As palliative therapy

Radiation therapy is often used to ease symptoms when a cancer is too advanced to be cured. It can help relieve pain or other symptoms by shrinking tumors that block bile ducts or blood vessels, or press on nerves.

There are different types of radiation therapy. External beam radiation therapy (EBRT) is the most common form of radiation used to treat bile duct cancer.

External beam radiation therapy (EBRT)

In this type of radiation therapy, a machine sends x-rays to a specific part of the body to kill cancer cells.

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

These are some of the ways EBRT might be given:

- **Three-dimensional conformal radiation therapy (3D-CRT)** uses special computers to precisely map the location of the tumor(s). Radiation beams are then shaped and aimed at the tumor(s) from several directions, which makes it less likely to damage normal tissues. It may be used to treat localized intrahepatic bile duct cancers that can't be removed with surgery.
- **Intensity-modulated radiation therapy (IMRT)** is an advanced form of 3D-CRT. It uses a computer-driven machine that moves around you as it delivers radiation. Along with shaping the beams and aiming them at the cancer from many angles, the intensity (strength) of the beams can be adjusted to limit the dose reaching the most sensitive normal tissues. This lets doctors deliver an even higher dose to the cancer.
- **Stereotactic body radiotherapy (SBRT)** uses the techniques of 3D-CRT and IMRT, but it gives a high dose of radiation over fewer sessions. A course of SBRT may take a week, while a course of radiation using these other techniques often takes 3 to 6 weeks.

Chemoradiation is when chemotherapy (chemo) is given along with EBRT to help the radiation work better. The main drawback of this approach is that the side effects tend to be worse than giving radiation alone.

EBRT side effects

Some common side effects of EBRT to treat bile duct cancer include:

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

Side effects from radiation often start a week or 2 into treatment, and usually get better over time once treatment is over.

Proton beam therapy

In people with bile duct cancer, especially if the cancer is unresectable, proton therapy may be an option. Proton therapy is a type of radiation that uses protons rather than x-rays. A proton is a positively charged particle, which can be targeted specifically to the tumor. Compared to x-rays, proton therapy beams are less likely to damage surrounding organs. This form of radiation therapy continues to be studied.

Brachytherapy (internal radiation therapy)

This type of treatment uses small pellets of radioactive material that are put next to or right into the tumor. The radiation travels a very short distance, so it affects the cancer without causing much harm to nearby healthy body tissues.

For bile duct cancer, brachytherapy is sometimes done with a thin radioactive wire that's put into the bile duct for a short time. This may be called **intrabiliary brachytherapy**. Brachytherapy can be used alone, or it may be used along with EBRT. At this time it's mostly used as a [palliative treatment](#).

More information about radiation therapy

To learn more about how radiation is used to treat cancer, see [Radiation Therapy](#)¹.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)².

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/treatment-types/radiation.html
2. www.cancer.org/cancer/managing-cancer/side-effects.html

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Abou-Alfa GK, Jarnagin W, Lowery M, D'Angelica M, Brown K, Ludwig E, Covey A, Kemeny N, Goodman KA, Shia J, O'Reilly EM. 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.

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Chemotherapy for Bile Duct Cancer

Chemotherapy (chemo) is treatment with cancer-killing drugs that are usually given into a vein (IV) or taken by mouth. These drugs enter the bloodstream and reach all areas of the body, making this treatment useful for some cancers that have spread to organs beyond the bile duct. Because the drugs reach all the areas of the body, this is known as a **systemic** treatment.

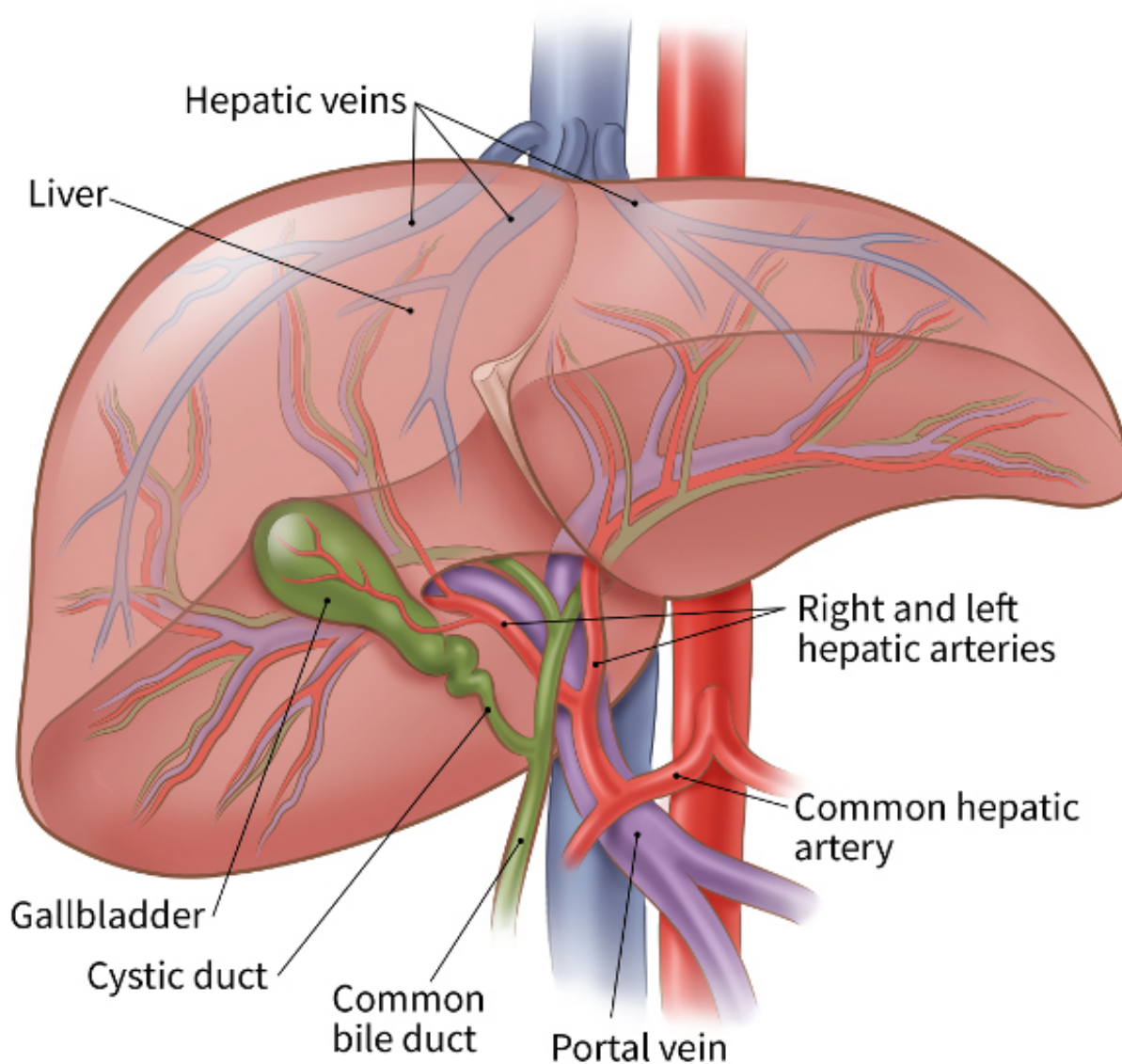
- [How is chemotherapy used to treat bile duct cancer?](#)
- [Drugs used to treat bile duct cancer](#)
- [Possible side effects of chemotherapy](#)
- [More information about chemotherapy](#)

How is chemotherapy used to treat bile duct cancer?

Chemo can help some people with bile duct cancer and can be used in these ways:

- **After surgery:** Chemo may be given after surgery (sometimes with radiation therapy) to try to lower the risk that the cancer will come back. This is called **adjuvant chemo**.
- **Before surgery:** It may be given before surgery for cancers that might be able to be completely removed. Chemo might shrink the tumor enough to improve the odds that surgery will be successful. This is called **neoadjuvant treatment**.
- **As part of the main treatment for some advanced cancers:** Chemo can be used (usually with immunotherapy) for more advanced cancers that cannot be removed or have spread to other parts of the body. Chemo does not cure these cancers, but it might help people live longer.
- **As palliative therapy:** Chemo can help shrink tumors or slow their growth for a time. This can help relieve symptoms from the cancer, for instance, by shrinking tumors that are pressing on nerves and causing pain.

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



Hepatic artery infusion (HAI)

Because giving chemo into a vein (IV) isn't always helpful for bile duct cancer, doctors have tried giving the drugs right into the main artery going into the liver, called the **hepatic artery**. The hepatic artery also supplies most bile duct tumors, so putting the chemo into this artery means more chemo goes to the tumor. The healthy liver then removes most of the remaining drug before it can reach the rest of the body. This can lessen chemo side effects.

HAI may help some people whose cancer couldn't be removed by surgery live longer, but more research is needed. This technique often requires surgery to put a catheter

into the hepatic artery, and many people with bile duct cancer are not well enough to have this surgery.

Trans-arterial chemoembolization (TACE)

Embolization is a procedure where a substance is put into the blood vessels to help stop blood from getting to a tumor. TACE uses tiny beads of chemo to do this. A catheter is used to put the beads into the artery that "feeds" the tumor. The beads lodge there to block blood flow and give off the chemo. TACE may be used for tumors that can't be removed.

Drugs used to treat bile duct cancer

The drugs used most often to treat bile duct cancer include:

- Gemcitabine (Gemzar)
- Cisplatin (Platinol)
- Capecitabine (Xeloda)
- Oxaliplatin (Eloxatin)
- 5-fluorouracil (5-FU)

In some cases, 2 or more of these drugs may be combined to try to make them more effective. For example, combining gemcitabine and cisplatin may help people live longer than getting just gemcitabine alone.

Possible side effects of chemotherapy

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

The side effects of chemo depend on the type and dose of drugs given, how they're given, and the length of treatment. Side effects can include:

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting

- Diarrhea
- Nerve damage (neuropathy) which can lead to numbness, tingling, and even pain in the hands and feet
- Increased chance of infections (from having too few white blood cells)
- Easy bruising or bleeding (from having too few blood platelets)
- Fatigue (from having too few red blood cells)
- Organ dysfunction (can affect function of the kidney and liver)

Ask your cancer care team what you should watch for. Most side effects are short-term and go away after treatment ends. There are often ways to lessen these side effects. For example, drugs can be given to help prevent or reduce nausea and vomiting. Be sure to ask your cancer care team about medicines to help reduce side effects.

Tell your cancer care team about any side effects you notice, so they can be treated right away. Most side effects can be treated. In some cases, the doses of the chemo drugs can be reduced or treatment can be delayed or stopped to keep the side effects from worsening.

More information about chemotherapy

For more general information about how chemotherapy is used to treat cancer, see [Chemotherapy](#)¹.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)².

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy.html
2. www.cancer.org/cancer/managing-cancer/side-effects.html

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Targeted Drug Therapy for Bile Duct Cancer

As researchers learn more about the changes in cells that cause cancer, they've developed drugs to target some of these changes. These targeted drugs work differently from standard chemotherapy (chemo) drugs, and they often have different side effects. This type of treatment blocks the growth and spread of cancer cells and limits damage to healthy cells.

- [FGFR2 inhibitors](#)
- [IDH1 inhibitor](#)
- [TRK inhibitors](#)
- [RET inhibitors](#)
- [BRAF inhibitor and MEK inhibitor](#)
- [KRAS inhibitor](#)
- [HER2 inhibitor](#)
- [More information about targeted therapy](#)

FGFR2 inhibitors

FGFRs (fibroblast growth factor receptors) are proteins on cells that help them grow and divide normally. A small number of people with bile duct cancer within the liver have changes in the genes that make FGFRs. These changes result in abnormal FGFR proteins that cause cells to grow out of control and turn into cancer.

Pemigatinib (Pemazyre) and **futibatinib (Lytgobi)** are FGFR2 inhibitors. They block the abnormal FGFR2 protein in bile duct cancer cells and keep them from growing and spreading to other places.

These drugs can be used to treat some advanced bile duct cancers that cannot be removed by surgery or have spread to distant areas after at least one previous chemotherapy treatment. For these drugs to work, your cancer must have an abnormal *FGFR2* gene, so your cancer will be tested before you start any of these drugs.

These medicines are taken by mouth as tablets, typically once a day.

Possible side effects of FGFR2 inhibitors

The most common side effects of FGFR2 inhibitors include kidney problems, hair loss, diarrhea, constipation, nail problems, fatigue, taste changes, nausea, vomiting, dry mouth or mouth sores, loss of appetite, dry skin, dry eye or other eye problems, hand-foot syndrome, abdominal (belly) pain, and changes in blood mineral levels.

IDH1 inhibitor

In some people with bile duct cancer (about 15% of patients), the cancer cells have a change (mutation) in the *IDH1* gene, which normally helps cells make the IDH1 protein. Mutations in this gene can lead to an abnormal IDH1 protein, which can stop cells from maturing the way they normally would.

Ivosidenib (Tibsovo) is an IDH1 inhibitor. It blocks the abnormal IDH1 protein, which seems to help the cancer cells mature into more normal cells. This drug can be used in people with advanced, previously treated bile duct cancer if the cancer cells are found to have an *IDH1* mutation. Your doctor can test your cancer cells to see if they have an *IDH1* mutation.

This drug is taken by mouth, once a day.

Possible side effects of IDH1 inhibitor

Common side effects can include fatigue, nausea, vomiting, abdominal (belly) pain or swelling, diarrhea, loss of appetite, cough, low red blood cell counts (anemia), rash, and changes in lab tests showing the drug is affecting the liver.

Less common but more serious side effects can include changes in heart rhythm, pneumonia, and jaundice (yellowing of the eyes and skin).

TRK inhibitors

A very small number of bile duct cancers have changes in one of the *NTRK* genes, called *NTRK* gene fusions. A gene fusion is when 2 separate genes join together and don't function normally as a result. Cells with these gene changes make abnormal TRK proteins, which can lead to abnormal cell growth and cancer.

Larotrectinib (Vitrakvi), **entrectinib (Rozlytrek)**, and **repotrectinib (Augtyro)** are TRK inhibitors. TRK inhibitors target and disable the proteins made by the *NTRK* genes. These drugs can be used in people with advanced bile duct cancer who have not received prior systemic therapy.

These drugs are taken as pills, once or twice daily.

Possible side effects of TRK inhibitors

Common side effects can include abnormal liver tests; decreased white blood cell and red blood cells; muscle and joint pain; tiredness; diarrhea or constipation; nausea and vomiting; and stomach pain.

Less common but more serious side effects can include mental changes such as confusion, changes in mood, and changes in sleep; liver damage; changes in heart rhythm and/or function; vision changes; and harm to a fetus.

RET inhibitors

In a small percentage of bile duct cancers, the tumor cells have a rearrangement in the *RET* gene that cause them to make an abnormal form of the RET protein. This abnormal protein helps the tumor cells grow.

Selpercatinib (Retevmo) and **pralsetinib (Gayreto)** are RET inhibitors and can be

used to treat advanced bile duct cancers with the RET rearrangement.

These drugs are taken by mouth as capsules, typically once or twice a day.

Possible side effects of RET inhibitors

Common side effects can include dry mouth, diarrhea or constipation, high blood pressure, tiredness, swelling in hands and/or feet, skin rash, muscle and joint pain, low blood cell counts, or changes in other blood tests.

Less common but more serious side effects can include liver damage, lung damage, allergic reactions, changes in heart rhythm, bleeding easily, and problems with wound healing.

BRAF inhibitor and MEK inhibitor

In some bile duct cancers, the cells have changes in the *BRAF* gene. Cells with these changes make an altered BRAF protein that helps them grow. Some drugs target this and other related proteins. A combination of a BRAF inhibitor and a MEK inhibitor is often given together to treat advanced cancer with the *BRAF V600E* mutation.

Dabrafenib (Tafinlar) is a BRAF inhibitor. **Trametinib (Mekinist)** is a MEK inhibitor. This drug combination can be used in people with advanced, previously treated bile duct cancer if the cancer cells are found to have a *BRAF V600E* mutation.

These drugs are taken as pills or capsules each day.

Possible side effects

Common side effects can include skin thickening, rash, itching, sensitivity to the sun, headache, fever, joint pain, tiredness, hair loss, nausea, and diarrhea.

Less common but more serious side effects can include bleeding, heart rhythm problems, liver or kidney problems, lung problems, severe allergic reactions, severe skin or eye problems, increased blood sugar levels, and squamous cell skin cancer.

KRAS inhibitor

In some bile duct cancers, the cancer cells have changes in the *KRAS* gene called a *KRAS G12C* mutation. This mutation makes an abnormal form of the KRAS protein,

which helps the cancer cells grow and spread. KRAS inhibitors attach to the KRAS G12C protein, which helps keep cancer cells from growing.

Adagrasib (Krazati) is a KRAS inhibitor and is used to treat advanced bile duct cancer with the *KRAS G12C* mutation in people who've already had at least one other type of drug treatment.

This drug is taken as a pill, typically twice a day.

Possible side effects of KRAS inhibitor

Common side effects can include diarrhea, nausea and vomiting, muscle pain, fatigue, cough, decreased white blood cell and red blood cell counts, and changes in other blood tests.

Less common but more serious side effects can include kidney damage, liver damage, lung damage called interstitial lung disease (ILD)/pneumonitis, and a heart condition called QTc interval prolongation.

HER2 inhibitor

Some bile duct cancers have too much of the HER2 protein on the surface of their cells, which can help cancer cells grow. Having too much of this protein is caused by having too many copies of the *HER2* gene. Cancers with increased levels of HER2 are called **HER2-positive**.

Zanidatamab (Ziihera) is a medicine that attaches to 2 different parts of the HER2 protein. It can be used to treat HER2-positive bile duct cancer that can't be removed completely or that has spread to other parts of the body, if other treatments have already been tried.

This drug is given as an infusion into a vein (IV), typically once every 2 weeks.

Possible side effects

Some people might have an **infusion reaction** while getting this drug. This is like an allergic reaction, and can include fever, chills, flushing of the face, rash, itchy skin, feeling dizzy, wheezing, and trouble breathing. It's important to tell your doctor or nurse right away if you have any of these symptoms while getting this drug. You will be given medicines before each infusion to help lower this risk.

This drug can cause **heart damage** in some people. Before and during treatment with this drug, your doctor will test your heart function with an echocardiogram or a MUGA scan.

This drug can cause **diarrhea**, which might be severe, so it's very important to let your health care team know about any changes in your bowel habits as soon as they happen.

Other side effects of this drug can include stomach pain and feeling very tired.

More information about targeted therapy

To learn more about how targeted drugs are used to treat cancer, see [Targeted Cancer Therapy](#)¹.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)².

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/treatment-types/targeted-therapy.html
2. www.cancer.org/cancer/managing-cancer/side-effects.html

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Immunotherapy for Bile Duct Cancer

Immunotherapy is the use of medicines to help a person's immune system better recognize and destroy cancer cells. Many types of immunotherapy are being tested in [clinical trials](#)¹, and some are used to treat bile duct cancer.

- [Immune checkpoint inhibitors](#)
- [More information about immunotherapy](#)

Immune checkpoint inhibitors

An important part of the immune system is its ability to keep itself from attacking the body's normal cells. To do this, it uses "checkpoint" proteins on immune cells, which act like switches that need to be turned on (or off) to start an immune response. Cancer cells sometimes use these checkpoints to avoid being attacked by the immune system.

Drugs that target these checkpoints (called **immune checkpoint inhibitors**) can be used to treat some bile duct cancers.

PD-1 inhibitors

Pembrolizumab (Keytruda) and **nivolumab (Opdivo)** are drugs that target PD-1, a checkpoint protein on immune system cells called **T cells**. PD-1 normally helps keep T cells from attacking other cells in the body (including some cancer cells). By blocking PD-1, this drug boosts the immune response against cancer cells. This can shrink some tumors or slow their growth.

These drugs can be used in different ways to treat bile duct cancers:

- **Pembrolizumab (Keytruda) with chemotherapy:** This drug can be given along with the chemo drugs gemcitabine and cisplatin to treat bile duct cancer that can't

be removed by surgery or that has spread to other parts of the body.

- **Pembrolizumab (Keytruda) alone:** This drug might be used if your tumor has a high number of specific gene changes (a level of microsatellite instability or MSI-H), if there is a defect in a mismatch repair gene (dMMR), or if your tumor cells have a generally high number of gene changes (a high tumor mutational burden or TMB-H).
- **Nivolumab (Opdivo) with ipilimumab (Yervoy):** These drugs might be used together if your tumor cells have a high number of gene mutations (a high mutational burden or TMB-H).

These drugs are given as an intravenous (IV) infusion, typically every 2 to 6 weeks.

PD-L1 inhibitor

Durvalumab (Im finzi) is a drug that targets PD-L1, a protein related to PD-1 that is found on some tumor cells and immune cells. Blocking this protein can help boost the immune response against cancer cells.

This drug can be used along with the chemotherapy drugs gemcitabine and cisplatin to treat bile duct cancer that can't be removed by surgery or that has spread to other parts of the body.

This drug is given as an intravenous (IV) infusion, typically every 2 to 4 weeks.

CTLA-4 inhibitor

Ipilimumab (Yervoy) is another checkpoint inhibitor, but it has a different target. It blocks CTLA-4, another protein on T cells that normally helps keep them in check.

It can be given with Nivolumab (Opdivo) to people with bile duct tumors that have a high mutational burden (TMB-H).

This drug is given as an intravenous (IV) infusion, usually once every 3 weeks.

Possible side effects of immune checkpoint inhibitors

Some of the more common side effects of these drugs can include fatigue, cough, nausea, skin rash, poor appetite, constipation, joint pain, and diarrhea.

Other, more serious side effects occur less often.

Infusion reactions: Some people might have an infusion reaction while getting these drugs. This is like an allergic reaction. It can include fever, chills, flushing of the face, rash, itchy skin, feeling dizzy, wheezing, and trouble breathing. It's important to tell your cancer care team right away if you have any of these symptoms while getting these drugs.

Autoimmune reactions: These drugs remove one of the safeguards on the body's immune system. Sometimes the immune system responds by attacking other parts of the body, which can cause serious or even life-threatening problems in the lungs, intestines, liver, hormone-making glands, kidneys, or other organs.

It's very important to report any new side effects to someone on your cancer care team as soon as possible. If serious side effects do occur, treatment may need to be stopped and you might be given high doses of corticosteroids to suppress your immune system.

More information about immunotherapy

To learn more about how drugs that work on the immune system are used to treat cancer, see [Cancer Immunotherapy](#)².

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)³.

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html
2. www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy.html
3. www.cancer.org/cancer/managing-cancer/side-effects.html

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Palliative Therapy for Bile Duct Cancer

Palliative care (also called supportive care) is treatment used to help control or reduce symptoms caused by cancer. It's not meant to cure the cancer.

- [When are palliative treatments used?](#)
- [Biliary stent or biliary catheter](#)
- [Biliary bypass](#)
- [Tumor ablation \(radiofrequency ablation, cryosurgery, or alcohol ablation\)](#)
- [Photodynamic therapy \(PDT\)](#)
- [More information about palliative care](#)

When are palliative treatments used?

If bile duct cancer has spread too far to be removed by surgery, doctors may focus on palliative treatments. However, palliative treatments can be used at any point during

cancer. For example, [pain medicines](#)¹ and [drugs to control nausea](#)² or itching might be used to help you feel better. Chemotherapy and radiation can also be used to relieve problems caused by the tumor(s). Sometimes, surgery or other treatments are used to help you feel better or to help prevent possible problems the cancer might cause.

Because bile duct cancers tend to grow and spread quickly, doctors try to use palliative therapies that are less likely to have unpleasant short-term side effects, whenever possible. Your cancer care team will talk with you about the pros and cons of all the treatments that might help you.

Listed below are some examples of procedures that might be used as part of palliative care for bile duct cancer.

Biliary stent or biliary catheter

If cancer is blocking a bile duct, it can lead to jaundice (yellowing of the skin and eyes) as well as other problems, like infection and liver failure. A small tube (stent) or a catheter can be put into the duct to help keep it open.

- A **stent** is a small metal or plastic tube that's put through the blockage in the duct. It keeps the duct open to allow bile to drain into the small intestine.
- A **catheter** is a thin, flexible tube that's put in through the skin of the abdomen (belly). One end of the tube is put into a bile duct and the other end is outside the body. This allows the bile to drain into a bag. The bag can be emptied when needed. If you have a catheter, your doctor or nurse will teach you how to care for it.

These procedures can be done as part of a cholangiography procedure such as ERCP or PTC (see [Tests for Bile Duct Cancer](#)³) or, in some cases, during surgery. They're often done to help prevent or relieve symptoms from more advanced cancers, but they can also be done to help relieve jaundice before [potentially curative surgery](#). This helps lower the risk of complications from the surgery.

The stent or catheter might need to be replaced every few months to help reduce the risk of infection and gallbladder inflammation. It will also need to be replaced if it becomes clogged.

Biliary bypass

A surgery called a **biliary bypass** is another option to allow bile to go into the small

intestine and not build up in the liver. The surgeon creates a bypass around the tumor blocking the bile duct by connecting part of the bile duct before the blockage with a part of the duct that lies past the blockage, or with the intestine itself. There are different biliary bypass operations:

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

The decision on which bypass operation to use depends on where the blockage is.

As mentioned in [Surgery for Bile Duct Cancer](#), biliary bypass is more likely to be done if you are already having surgery to try to cure the cancer by taking it out, but it turns out the cancer cannot be totally removed. A bypass is more invasive than placing a stent or catheter, but it has some advantages in that it may last longer and infection is less likely to be a problem.

Tumor ablation (radiofrequency ablation, cryosurgery, or alcohol ablation)

Tumors in the liver that can't be resected can sometimes be destroyed (ablated) by putting a long metal probe through a small hole in the skin and into the tumor. A CT scan or ultrasound is used to guide it to the right place. The tip of the probe is then heated (in [radiofrequency ablation](#)⁴) or frozen (in cryotherapy). Or, an alcohol solution is injected (alcohol ablation) to kill the cancer cells.

Photodynamic therapy (PDT)

For [photodynamic therapy \(PDT\)](#)⁵, a light-activated drug is injected into a vein. Over time, the drug tends to collect in cancer cells more than in normal cells. A few days later, an endoscope (a long, flexible tube that can be used to look inside the body) is passed down the throat, through the stomach and intestine, and into the bile ducts.

A special laser light on the end of the endoscope is aimed at the tumor. The light turns on the drug, causing the cells to die. PDT can be helpful for people with bile duct cancer whose tumors can't be removed with surgery.

The drugs used for PDT can also collect in normal cells in the body, making a person very sensitive to sunlight or strong indoor lights. You'll need to stay out of any strong light for several weeks after the injection.

More information about palliative care

To learn more about how palliative care can be used to help control or reduce symptoms caused by cancer, see [Palliative Care](#)⁶.

To learn about some of the side effects of cancer or treatment and how to manage them, see [Managing Cancer-related Side Effects](#)⁷.

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/side-effects/pain.html
2. www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/nausea-and-vomiting/managing.html
3. www.cancer.org/cancer/types/bile-duct-cancer/detection-diagnosis-staging/how-diagnosed.html
4. www.cancer.org/cancer/managing-cancer/treatment-types/hyperthermia.html
5. www.cancer.org/cancer/managing-cancer/treatment-types/radiation/photodynamic-therapy.html
6. www.cancer.org/cancer/managing-cancer/palliative-care.html
7. www.cancer.org/cancer/managing-cancer/side-effects.html

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Treatment Options Based on the Extent of Bile Duct Cancer

The extent of bile duct cancer is an important factor in deciding on treatment options. Whenever possible, [surgery](#) is the main treatment for bile duct cancers. It offers the only realistic chance for a cure. Because of this, doctors generally divide bile duct cancers into:

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

Most bile duct cancers are unresectable by the time they're found.

- [Resectable bile duct cancers](#)
- [Unresectable bile duct cancers](#)
- [Palliative care](#)
- [Recurrent bile duct cancer](#)

Resectable bile duct cancers

Most [stage](#)¹ 0, I, and II cancers and possibly some stage III cancers are potentially resectable (meaning it might be possible to remove them completely with surgery). But other factors can impact whether or not this is a good option, such as is the location of the cancer and whether the patient is healthy enough to have major surgery.

Surgery to remove the cancer completely is the preferred treatment if it's possible. If surgery is being considered, a staging laparoscopy may be done first. This allows the doctor to look inside the abdomen (belly) for any spread of the cancer that could make it unresectable. (Laparoscopy is described in [Tests for Bile Duct Cancer²](#).)

Types of surgery

The type of surgery done to remove the cancer depends on the location and extent of the cancer. (See [Surgery for bile duct cancer](#) for more details.)

Other treatments that may be used with surgery

If a person has jaundice (yellowing of the skin and eyes) before surgery, a stent or catheter may be put in the bile duct first. This allows the bile to flow the way it should. It can help relieve symptoms over a few days and might help make a person healthy enough to have the operation.

[Radiation therapy](#) and/or [chemotherapy](#) (chemo) may be given after surgery to try to lower the risk that the cancer will come back. This is called **adjuvant therapy**.

If it's clear that some cancer was left behind, a second surgery to take out more tissue may also be an option in some cases.

Sometimes it isn't clear from imaging or other tests whether the cancer can be removed completely. These cancers may be called **borderline resectable tumors**. Some doctors may recommend treatment with radiation and/or chemo before surgery to try to shrink the tumor. (This is called **neoadjuvant treatment**.) Then, if the cancer shrinks, surgery can be done to try to remove all of it.

Unresectable bile duct cancers

These cancers cannot be removed with surgery. This includes most stage III and IV cancers. It might also include earlier stage cancers if a person isn't healthy enough for surgery.

Trying surgery

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

In some cases, the doctor might think that a cancer is resectable, but once the operation starts it becomes clear that it can't be removed completely. For example, the cancer might turn out to have spread farther than was seen on the imaging tests done before surgery.

It doesn't help to remove only part of the cancer, and surgery could still cause major side effects, so this part of the operation is stopped. But while the doctor can see the area, a [biliary bypass](#) may be done to relieve any bile duct blockage or to try to keep it from happening in the future. Putting stents in the bile ducts to keep them open may also be an option.

Liver transplant

For some unresectable intrahepatic or perihilar bile duct cancers, a liver transplant (complete removal of the liver and bile ducts and replacement with a healthy organ) may be an option. Chemo and radiation may be given first.

It's often hard to find a compatible liver donor, but a liver transplant can provide a chance for a cure. However, bile duct cancer tends to recur (come back) very quickly after transplantation. As a result, liver transplant is rarely used.

Other options

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

Radiation and/or chemo: Radiation therapy and/or chemo may shrink or slow the growth of the cancer for a time. When chemo is given alone (without radiation) the drugs cisplatin and gemcitabine are often used. When chemo is given with radiation, 5-FU is the drug most often used.

Chemo plus immunotherapy: For advanced bile duct cancers that can't be removed completely, another option might be chemo (cisplatin and gemcitabine), plus the [immunotherapy](#) such as pembrolizumab (Keytruda) or Durvalumab (Imfinzi).

Targeted therapy: For advanced bile duct cancers that have specific gene mutations (gene changes), [targeted therapy](#) drugs might be an option.

Ablation: For bile duct cancers within the liver, ablation using extreme heat (radiofrequency ablation) or cold (cryotherapy) or alcohol (alcohol ablation) might help

control the tumors. But almost all of these cancers will start to grow again in the future.

Clinical trials: For people who want to continue trying to treat the cancer, taking part in [clinical trials](#)³ of newer treatments may be an option. This way patients can get the best treatment available now and may also get treatments that are thought to be even better.

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.

Palliative care

Palliative care is supportive care. It's aimed at preventing and treating symptoms or problems caused by the cancer. Palliative care is used with every type of cancer treatment and at every stage of bile duct cancer. It includes things like medicines to prevent nausea, pain control, and maintaining the flow of bile where a tumor may block it. Palliative care is focused on helping you feel better. It is not used to treat the cancer.

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.

See [Palliative Therapy for Bile Duct Cancer](#) for details on some of these treatments.

Recurrent bile duct cancer

Cancer is called **recurrent** when it come backs after treatment. [Recurrence](#)⁴ can be local (in the same place it started), regional (near the place it started), or distant (in other parts of the body, like the lungs). If the cancer comes back, further treatment depends on where the cancer recurs, the kind of treatment used in the past, and the patient's overall health.

In most cases if the cancer comes back after initial treatment, it will not be resectable. Treatment will be aimed at controlling the cancer growth and relieving symptoms, as described above for unresectable cancers and palliative care.

In rare cases, if the cancer comes back where it started, surgery to try to remove the cancer (and possibly adjuvant therapy afterwards) may be an option. Because most of these cancers are not curable, people might want to consider taking part in a clinical trial of newer treatments.

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1. www.cancer.org/cancer/types/bile-duct-cancer/detection-diagnosis-staging/staging.html
2. www.cancer.org/cancer/types/bile-duct-cancer/detection-diagnosis-staging/how-diagnosed.html
3. www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html
4. www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence.html

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