# Pancreatic Cancer - Treatment Options [1]

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**ON THIS PAGE**: You will learn about the different ways doctors use to treat people with this type of cancer. To see other pages, use the menu on the side of your screen.

This section outlines treatments that are the standard of care (the best proven treatments available) for this specific type of cancer. When making treatment plan decisions, patients are also encouraged to consider clinical trials as an option. A clinical trial is a research study to test a new approach to treatment to evaluate whether it is safe, effective, and possibly better than the standard treatment. Clinical trials may test such approaches as a new drug, a new combination of standard treatments, or new doses of current therapies. Your doctor can help you review all treatment options. For more information, see the Clinical Trials [3] and Latest Research [4] sections.

## Treatment overview

In cancer care, different types of doctors and other health care professionals often work together to create a patient?s overall treatment plan that combines different types of treatments. This is called a multidisciplinary team [5].

Descriptions of the most common treatment options for pancreatic cancer are listed below. The current treatment options for pancreatic cancer are surgery, radiation therapy, chemotherapy, and targeted therapy. Your care plan may also include treatment for symptoms and side effects, an important part of cancer care. Treatment options and recommendations depend on several factors, including the type and stage of cancer, possible side effects, and the patient?s preferences and overall health. Take time to learn about all of your treatment options and be sure to ask questions about things that are unclear. Also, talk about the goals of each treatment with your doctor and what you can expect while receiving the treatment. Learn more about making treatment decisions [6].

When detected at an early stage, pancreatic cancer has a much higher chance of being successfully treated. However, there are also treatments that can help control the disease for patients with later stage pancreatic cancer to help them live longer.

## Surgery

Surgery for pancreatic cancer includes removing all or part of the pancreas, depending on the location and size of the tumor in the pancreas. A surgical oncologist is a doctor who specializes in treating cancer using surgery. Learn more general information about cancer surgery [7]. Only about 20% of patients with pancreatic cancer are able to have surgery because most pancreatic cancers are first diagnosed when the disease has already spread. If surgery is not an option, you and your doctor will talk about other treatment options.

Surgery for pancreatic cancer may be combined with radiation therapy and/or chemotherapy (see below). Typically, radiation therapy and chemotherapy are given after surgery, called adjuvant therapy. If a tumor is borderline resectable, meaning it is unclear if it can be removed with surgery, radiation therapy and/or chemotherapy may be given first to try to shrink the tumor so it can be removed with surgery. This is called neoadjuvant therapy.

Different types of surgery are performed depending on the purpose of the surgery:

**Laparoscopy.** Sometimes, the surgeon may choose to start with a laparoscopy. During a laparoscopy, several small holes are made in the abdomen and a tiny camera is passed into the body while a patient receives anesthesia, which is medication to help block the awareness of pain. This helps the surgeon find out if the cancer has spread to other parts of the abdomen. If it has, surgery to remove the primary tumor is generally not recommended.

**Surgery to remove the tumor.** Different types of surgery are used depending on where the tumor is located in the pancreas. In all of the surgeries discussed below, nearby lymph nodes are removed as part of the operation. More than one type of surgeon, as well as other specialists, will usually be involved in your surgery.

- If the cancer is located only in the head of the pancreas, the surgeon may do a Whipple procedure. This is an extensive surgery in which the surgeon removes the head of the pancreas and part of the small intestine, bile duct, and stomach, and then reconnects the digestive tract and biliary system. An experienced pancreatic cancer surgeon should perform this procedure.
- If the cancer is located in the tail of the pancreas, the common operation is a distal pancreatectomy, in which the surgeon removes the tail and body of the pancreas, as well as the spleen.
- If the cancer has spread throughout the pancreas, or is located in many areas in the pancreas, a total pancreatectomy may be needed. A total pancreatectomy is the removal of the entire pancreas, part of the small intestine, a portion of the stomach, the common bile duct, the gallbladder, the spleen, and nearby lymph nodes.

After surgery, the patient will need to stay in the hospital for several days and will probably need to rest at home for about one month. Side effects of surgery include weakness, tiredness, and pain for the first few days after the procedure. Other side effects caused by the removal of the pancreas include difficulty digesting food and diabetes from the loss of insulin produced by the pancreas. For more information on relieving these side effects, see Getting care for the symptoms and side effects, below.

## Radiation therapy

Radiation therapy is the use of high-energy x-rays or other particles to destroy cancer cells. A doctor who specializes in giving radiation therapy to treat cancer is called a radiation oncologist. The most common type of radiation treatment is called external-beam radiation therapy, which is radiation given from a machine outside the body. A radiation therapy regimen (schedule) usually consists of a specific number of treatments given over a set period of time. Learn more general information about radiation therapy [8].

Radiation therapy may be given for pancreatic cancer in the following situations:

- After surgery for patients who have a high risk of their cancer coming back in the area of surgery. This includes patients with a tumor that is large or was removed with close or positive surgical margins, meaning that cancer cells are seen up to or very close to the edge of the tissue removed during surgery.
- Before surgery to try to shrink a borderline resectable tumor
- For patients with locally advanced, unresectable disease
- To relieve severe pain for people with metastatic cancer

External-beam radiation therapy is the type of radiation therapy used most often for pancreatic cancer, and treatment usually takes five to six weeks with once-daily doses of radiation. Newer types of radiation therapy, such as stereotactic radiosurgery (for example, Cyberknife), are being used for pancreatic cancer because they can provide more localized treatment and require a fewer number of treatment sessions. However, these newer types of radiation therapy have not been compared with standard-fractionation radiation therapy and should not be considered a replacement for it.

Often, chemotherapy (see below) will be given at the same time as radiation therapy because it can enhance the effects of the radiation therapy, which is called radiosensitization. Combining chemotherapy and radiation therapy may occasionally help shrink the tumor enough so it can be removed by surgery. However, chemotherapy given at the same time as radiation therapy often has to be given at lower doses than when given alone.

It is important to note that radiation may be helpful for decreasing the likelihood of a pancreatic cancer returning or re-growing at the original location, but that there remains much uncertainty as to how much, if at all, it lengthens a person?s life.

Side effects from radiation therapy may include fatigue, mild skin reaction, nausea, upset stomach, and loose bowel movements. Most side effects go away soon after treatment is finished.

## Chemotherapy

Chemotherapy is the use of drugs to destroy cancer cells, usually by stopping the cancer cells? ability to grow and divide. Chemotherapy is given by a medical oncologist, a doctor who specializes in treating cancer with medication.

Systemic chemotherapy is delivered through the bloodstream to reach cancer cells throughout

the body. Common ways to give chemotherapy include an intravenous (IV) tube placed into a vein using a needle or in a pill or capsule that is swallowed (orally). A chemotherapy regimen (schedule) usually consists of a specific number of cycles given over a set period of time. A patient may receive one drug at a time or combinations of different drugs at the same time.

**Adjuvant chemotherapy.** Adjuvant chemotherapy is given after a pancreatic tumor is removed with surgery to prevent the cancer from coming back. Currently, the standard adjuvant chemotherapy uses gemcitabine (Gemzar) alone. Ongoing clinical trials are looking at combinations of different drugs for adjuvant treatment, including more intensive combinations similar to those used for advanced pancreatic cancer; see First-line chemotherapy, below. Chemotherapy given before surgery is generally used for patients with borderline resectable disease, when shrinking the tumor may increase the chance of removing it with surgery.

**First-line chemotherapy.** This is generally the first treatment used for patients with either locally advanced or metastatic pancreatic cancer (see Stages [9]). Gemcitabine was the first drug approved for first-line chemotherapy in 1997, as it was shown to lengthen patients? lives and improve quality of life. Since then, many large clinical trials have tested whether adding a second drug to gemcitabine is more effective when compared to treatment with gemcitabine alone. However, until 2010, only the drug erlotinib (Tarceva; see Targeted therapy, below) was shown to lengthen patients? lives when added to gemcitabine, and the increase in survival was quite small.

In the past few years, large clinical trials have identified two particular chemotherapy combinations as new standards of care, each of which has been shown to lengthen patients? lives and delay the growth and spread of metastatic pancreatic cancer for a longer than with gemcitabine alone. The first of these is a combination of drugs called FOLFIRINOX, which uses fluorouracil (5-FU), leucovorin (Wellcovorin), irinotecan (Camptosar), and oxaliplatin (Eloxatin). Because of the side effects, this regimen is only for patients who are in good physical condition and otherwise healthy despite the cancer. The second is a combination of gemcitabine plus nanoparticle-bound nab-paclitaxel (Abraxane).

There are generally more side effects when two or more drugs are used together, and combination treatments are usually best for patients who are able to carry out their usual activities of daily living without help. The choice of which combination to use varies depending on the cancer center and often depends on the oncologist?s experience with the drugs, as well as the different side effects. For patients who are older and less healthy, gemcitabine alone may still be the most appropriate option.

**Second-line chemotherapy.** When treatment does not work or stops working to control cancer growth, the cancer is called refractory. Sometimes, first-line treatment does not work at all, which is called primary resistance. Or, treatment may work well for a while and then stop being effective later, which is sometimes called secondary or acquired resistance. In these situations, patients may benefit from additional treatment with different drugs if the patient?s overall health is good. For example, now that two different and effective combinations (FOLFIRINOX and gemcitabine/nab-paclitaxel) are available, it is common to the other regimen if the first regimen given is no longer working. Therefore, a patient who started treatment with gemcitabine/nab-paclitaxel may switch to FOLFIRINOX, or some simplified version of it, as second-line therapy;

and vice-versa. While this makes a great deal of sense, it is important to recognize that there is not yet a lot of evidence to support how well each of these regimens works as second-line therapy. There is significant ongoing research focused on developing new treatments for second-line treatment, some of which have shown considerable promise. Learn more general information about second-line treatment [10].

**Off-label use.** This is when a drug is used to treat conditions not listed on the label, which are the conditions that drug is approved for, or is given differently than the instructions on the label. Off-label drug use in pancreatic cancer treatment is common for many reasons. First, drugs are generally approved for treating only a particular type or stage of cancer. Second, many cancer treatments use a combination of drugs and one or more of the drugs is often being used off label. Drug regimens are also constantly changing as doctors study new combinations to improve patient care.

**Side effects.** The side effects of chemotherapy depend on which drugs the patient receives. These can include poor appetite, nausea, vomiting, diarrhea, gastrointestinal problems, mouth sores, hair loss, and a lack of energy. People receiving chemotherapy also are more likely to get infections and bruise and bleed easily because chemotherapy decreases the production of white blood cells, red blood cells, and platelets. Certain drugs used in pancreatic cancer are also associated with specific side effects. For example, capecitabine (Xeloda) can cause redness and discomfort on the palms of the hands and the soles of the feet. This condition is called hand-foot syndrome [11]. Oxaliplatin, one of the drugs used in the FOLFIRINOX regimen, can cause cold sensitivity and numbness and tingling in the fingers and toes, called peripheral neuropathy [12]. Peripheral neuropathy is a side effect of nab-paclitaxel as well. These side effects typically go away between treatments and after the treatments have ended, but some can be longer-lasting and can worsen as treatment continues. The doctor can suggest ways to relieve these side effects [13].

**Palliative chemotherapy.** Any chemotherapy regimen discussed above may help relieve the symptoms of pancreatic cancer, such as lessening pain, improving a patient?s energy and appetite, and stopping or slowing weight loss. This is called palliative care or supportive care; see below. When making decisions about palliative chemotherapy, it is important that you and your doctor weigh the benefits with the possible side effects and consider how each treatment might affect your quality of life.

Learn more about chemotherapy [14] and preparing for treatment [15]. The medications used to treat cancer are continually being evaluated. Talking with your doctor is often the best way to learn about the medications prescribed for you, their purpose, and their potential side effects or interactions with other medications. Learn more about your prescriptions by using searchable drug databases [16].

## Targeted therapy

Targeted therapy is a treatment that targets the cancer?s specific genes, proteins or the tissue environment that contributes to cancer growth and survival. This type of treatment blocks the growth and spread of cancer cells while limiting damage to healthy cells.

Recent studies show that not all tumors have the same targets. To find the most effective

treatment, your doctor may run tests to identify the genes, proteins, and other factors in your tumor. As a result, doctors can better match each patient with the most effective treatment whenever possible. In addition, many research studies are taking place now to find out more about specific molecular targets and new treatments directed at them. Learn more about targeted treatments [17].

The targeted therapy erlotinib is approved by the U.S. Food and Drug Administration (FDA) for patients with advanced pancreatic cancer in combination with gemcitabine. Erlotinib blocks the effect of the epidermal growth factor receptor (EGFR), a protein that can become abnormal and help cancer grow and spread. Side effects of erlotinib include a skin rash similar to acne [18]. Talk with your doctor about possible side effects for a specific medication and how they can be managed.

## Getting care for symptoms and side effects

Cancer and its treatment often cause side effects. In addition to treatment to slow, stop, or eliminate the cancer, an important part of cancer care is relieving a person?s symptoms and side effects. This approach is called palliative or supportive care, and it includes supporting the patient with his or her physical, emotional, and social needs.

Palliative care is focused on helping a person at any stage of illness and ideally begins when a person is first diagnosed. People often receive treatment for the cancer and treatment to ease side effects at the same time. In fact, patients who receive both often have less severe symptoms, better quality of life, and report they are more satisfied with treatment. Palliative care should not be confused with hospice care, which is discussed further below.

Palliative treatments vary widely and often include medication, nutritional changes, relaxation techniques, and other therapies. You may also receive palliative treatments similar to those meant to eliminate the cancer, such as chemotherapy, surgery, and radiation therapy. Talk with your doctor about the goals of each treatment in the treatment plan.

Before treatment begins, talk with your health care team about the possible side effects of your specific treatment plan and supportive care options. And during and after treatment, be sure to tell your doctor or another health care team member if you are experiencing a problem so it is addressed as quickly as possible.

Supportive care for people with pancreatic cancer includes:

**Relieving bile duct or small intestine blockage.** If the tumor is blocking the common bile duct or small intestine, placement of a tiny tube called a stent to help keep the blocked area open can be performed to relieve the blockage using nonsurgical approaches, such as ERCP, PTC, or endoscopy (see the Diagnosis [19] section for more information). A stent can be either plastic or metal. The type used depends on the availability, cost, a person?s expected lifespan, and whether the cancer will eventually be removed with surgery. In general, plastic stents are less expensive and are easier to insert and remove, but need to be replaced every few months, are associated with more infections, and more likely to move out of place. Stents are typically placed inside the body, but sometimes, a tube may need to be placed through a hole in the skin of the abdomen to drain fluid, such as bile, to the outside, called percutaneous drainage. Sometimes, a

patient may need surgery to create a bypass, even if the tumor itself cannot be completely removed.

**Improving digestion and appetite.** A special diet, medications, and specially prescribed enzymes may help a person digest food better if their pancreas is not working well or has been partially or entirely removed. Meeting with a nutritionist is often helpful for patients who are losing weight and have a poor appetite because of the disease.

**Controlling diabetes.** Insulin will usually be recommended if a person develops diabetes due to the loss of insulin produced by the pancreas, which is more common after a total pancreatectomy.

**Relieving pain and other side effects.** Radiation therapy may be given to help relieve pain, and gemcitabine has also been shown to improve cancer-related symptoms, such as weight loss, pain, and weakness. Morphine-like drugs called opioid analgesics are often needed to help reduce pain. Special types of nerve blocks done by pain specialists may also be used. One type of nerve block is a celiac plexus block, which helps relieve abdominal pain. During a nerve block, the nerves are injected with either an anesthetic to stop pain for a short time or a medication that destroys the nerves and can relieve pain for a longer time. A nerve block can be performed either through the skin or through an endoscope [20] that is placed through the mouth and past the stomach. Learn more about managing pain [21]. Recommended supportive care may also include complementary and alternative therapies [22].

Palliative and supportive care is not limited to managing a patient?s physical symptoms. There are also emotional and psychological issues patients experience that can be managed with professional help and support, such as anxiety, depression, help with coping skills, and the overall difficulty of dealing with cancer. Cancer also affects caregivers and loved ones, and they are encouraged to develop support networks as well.

Learn more about palliative care [23].

## Metastatic pancreatic cancer

If cancer has spread to another location in the body, it is called metastatic cancer. Patients with this diagnosis are encouraged to talk with doctors who are experienced in treating this stage of cancer, because there can be different opinions about the best treatment plan. Learn more about seeking a second opinion [24] before starting treatment, so you are comfortable with the treatment plan chosen. This discussion may include clinical trials [3].

Your health care team may recommend a treatment plan that includes a combination of the treatments discussed above. Supportive care will also be important to help relieve symptoms and side effects.

For most patients, a diagnosis of metastatic cancer is very stressful and, at times, difficult to bear. Patients and their families are encouraged to talk about the way they are feeling with doctors, nurses, social workers, or other members of the health care team. It may also be helpful to talk with other patients, including through a support group.

## Remission and the chance of recurrence

A remission is when cancer cannot be detected in the body and there are no symptoms. This may also be called ?no evidence of disease? or NED.

A remission can be temporary or permanent. This uncertainty leads to many survivors feeling worried or anxious that the cancer will come back. While many remissions are permanent, it?s important to talk with your doctor about the possibility of the cancer returning. Understanding the risk of recurrence and the treatment options may help you feel more prepared if the cancer does return. Learn more about coping with the fear of recurrence [25].

If the cancer does return after the original treatment, it is called recurrent cancer. Pancreatic cancer may come back in or near the pancreas (called a local or regional recurrence), or elsewhere in the body (distant recurrence, which is similar to metastatic disease).

When this occurs, diagnostic testing will begin again to learn as much as possible about the extent and location of the recurrence. After testing is done, you and your doctor will talk about your treatment options. The treatment of recurrent pancreatic cancer is similar to the treatments described above and usually involves chemotherapy (see first-line and second-line chemotherapy above). Radiation therapy or surgery may also be used to help relieve symptoms (see above). Your doctor may also suggest clinical trials that are studying new ways to treat this type of recurrent cancer.

People with recurrent cancer often experience emotions such as disbelief or fear. Patients are encouraged to talk with their health care team about these feelings and ask about support services to help them cope. Learn more about dealing with cancer recurrence [26].

## If treatment fails

Recovery from cancer is not always possible. If treatment is not successful, the disease may be called advanced or terminal cancer.

This diagnosis is stressful, and this is difficult to discuss for many people. However, it is important to have open and honest conversations with your doctor and health care team to express your feelings, preferences, and concerns. The health care team is there to help, and many team members have special skills, experience, and knowledge to support patients and their families. Making sure a person is physically comfortable and free from pain is extremely important.

Patients who have advanced cancer and who are expected to live less than six months may want to consider a type of palliative care called 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 think about where you would be most comfortable: at home, in the hospital, or in a hospice environment. Nursing care and special equipment can make staying at home a workable alternative for many families. Learn more about advanced cancer care planning [27].

After the death of a loved one, many people need support to help them cope with the loss. Learn more about grief and loss [28].

*The next section helps explain clinical trials, which are research studies. Use the menu on the side of your screen to select About Clinical Trials, or you can select another section, to continue reading this guide.*

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**Links:**
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