Esophageal Cancer

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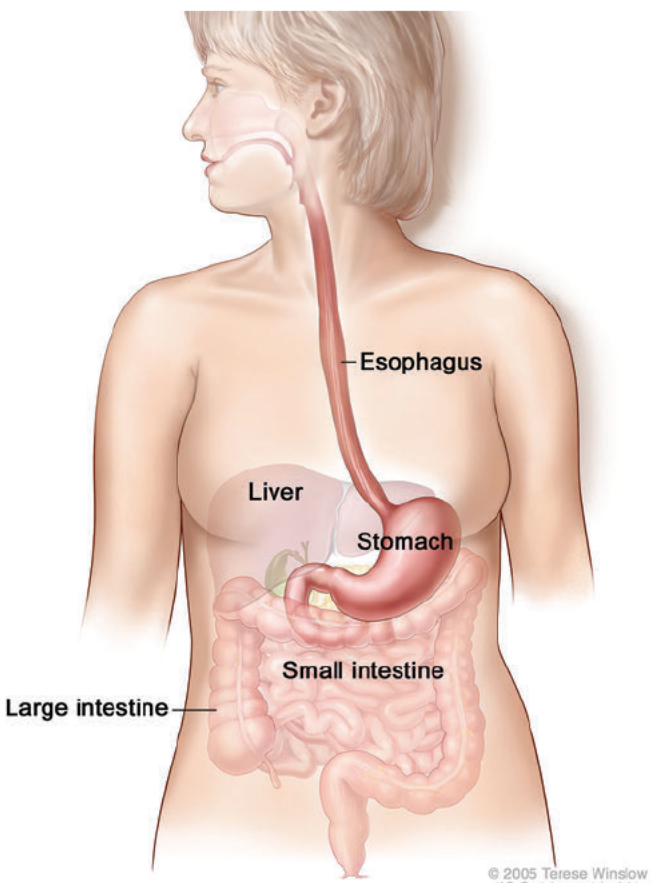
General Information About Esophageal Cancer

KEY POINTS

- Esophageal cancer is a disease in which malignant (cancer) cells form in the tissues of the esophagus.
- Smoking, heavy alcohol use, and Barrett esophagus can increase the risk of esophageal cancer.
- Signs and symptoms of esophageal cancer are weight loss and painful or difficult swallowing.
- Tests that examine the esophagus are used to diagnose esophageal cancer.
- Certain factors affect prognosis (chance of recovery) and treatment options.

Esophageal cancer is a disease in which malignant (cancer) cells form in the tissues of the esophagus. The esophagus is the hollow, muscular tube that moves food and liquid from the throat to the stomach. The wall of the esophagus is made up of several layers of tissue including mucous membrane, muscle, and connective tissue. Esophageal cancer starts on the inside lining of the esophagus and spreads outward through the other layers as it grows.

Upper Gastrointestinal Anatomy



The esophagus and stomach are part of the upper gastrointestinal (digestive) system.

The two most common forms of esophageal cancer are named for the type of cells that become malignant (cancerous):

- **Squamous cell carcinoma:** Cancer that forms in the thin, flat cells lining the inside of the esophagus. This cancer is most often found in the upper and middle part of the esophagus, but it can occur anywhere along the esophagus. This is also called epidermoid carcinoma.
- **Adenocarcinoma:** Cancer that begins in glandular cells. Glandular cells in the lining of the esophagus produce and release fluids such as mucus. Adenocarcinomas usually form in the lower part of the esophagus near the stomach.

Health history affects the risk of developing esophageal cancer.

Risk factors for esophageal cancer include the following:

- Tobacco use.
- Heavy alcohol use.
- Barrett esophagus: A condition in which the cells lining the lower part of the esophagus have changed or been replaced with abnormal cells that could lead to cancer of the esophagus. Gastric reflux (heartburn) is the most common cause of Barrett esophagus.
- Older age.

Signs and Symptoms

These and other signs and symptoms may be caused by esophageal cancer or by other conditions. Check with your doctor if you have any of the following:

- Painful or difficult swallowing.
- Weight loss.
- Pain behind the breastbone.
- Hoarseness and cough.
- Indigestion and heartburn.
- A lump under the skin.

Testing

Tests that examine the esophagus are used to diagnose esophageal cancer. The following are tests and procedures that may be used:

- **Physical exam and health history:** An exam of the body to check general signs of health, including checking for signs of disease, such as lumps or anything else that seems unusual. A history of the patient's health habits and past illnesses and treatments will also be taken.
- **Chest X-ray:** An X ray of the organs and bones inside the chest. An X ray is a type of energy beam that can go through the body and onto film making a picture of areas inside the body.
- **Esophagoscopy:** A procedure to look inside the esophagus to check for abnormal areas. An esophagoscope is inserted through the mouth or nose and down the throat into the esophagus. An esophagoscope is a thin, tube like instrument with a light and a lens for viewing. It may also have a tool to remove tissue samples which are checked under a microscope for signs of cancer. When the esophagus and stomach are examined, it is called an upper endoscopy.
- **Biopsy**: The removal of cells or tissues, so they can be viewed under a microscope by a pathologist to check for signs of cancer. The biopsy is usually done during an esophagoscopy. Sometimes a biopsy shows changes in the esophagus that are not cancer but may lead to cancer.

Prognosis Factors

Certain factors affect the prognosis (chance of recovery) and treatment options. The prognosis and treatment options depend on the following:

- The stage of the cancer (whether it affects part of the esophagus, involves the whole esophagus, or has spread to other places in the body).
- Whether the tumor can be completely removed by surgery.
- The patient's general health.

When esophageal cancer is found very early, there is a better chance of recovery. Esophageal cancer is often in an advanced stage when it is diagnosed. At later stages, esophageal cancer can be treated but rarely can be cured.

Taking part in one of the clinical trials being done to improve treatment should be considered.

Stages of Esophageal Cancer

KEY POINTS

- After esophageal cancer has been diagnosed, tests are done to find out if cancer cells have spread within the esophagus or to other parts of the body.
- There are three ways that cancer spreads in the body.
- Cancer may spread from where it began to other parts of the body.
- The grade of the tumor is also used to describe the cancer and plan treatment.
- The following stages are used for squamous cell carcinoma of the esophagus:
    - Stage 0 (High grade Dysplasia)
    - Stage I squamous cell carcinoma of the esophagus
    - Stage II squamous cell carcinoma of the esophagus
    - Stage III squamous cell carcinoma of the esophagus
    - Stage IV squamous cell carcinoma of the esophagus
- The following stages are used for adenocarcinoma of the esophagus:
    - Stage 0 (High grade Dysplasia)
    - Stage I adenocarcinoma of the esophagus
    - Stage II adenocarcinoma of the esophagus
    - Stage III adenocarcinoma of the esophagus
    - Stage IV adenocarcinoma of the esophagus
- Esophageal cancer can recur (come back) after it has been treated.

Staging

The process used to find out if cancer has spread within the esophagus or to other parts of the body is called staging. The following tests may be used in the staging process:

- **Endoscopic ultrasound (EUS):** A procedure in which an endoscope is inserted into the body, usually through the mouth or rectum. For esophageal cancer, the endoscope is inserted through the mouth. An endoscope is a thin, tube like instrument with a light and a lens for viewing. A probe at the end of the endoscope is used to bounce high energy sound waves (ultrasound) off internal tissues or organs and make echoes. The echoes form a picture of body tissues called a sonogram. A biopsy may also be done. This procedure is also called endosonography.
- **CT scan (CAT scan):** A procedure that makes a series of detailed pictures of areas inside the body, such as the chest, abdomen, and pelvis, taken from different angles. The pictures are made by a computer linked to an x ray machine. A dye may be injected into a vein or swallowed to help the organs or tissues show up more clearly. This procedure is also called computed tomography, computerized tomography, or computerized axial tomography.
- **PET scan (positron emission tomography scan):** A procedure to find malignant tumor cells in the body. A small amount of radioactive glucose (sugar) is injected into a vein. The PET scanner rotates around the body and makes a picture of where glucose is being used in the body. Malignant tumor cells show up brighter in the picture because they are more active and take up more glucose than normal cells do. A PET scan and CT scan may be done at the same time. This is called a PET CT.
- **MRI (magnetic resonance imaging):** A procedure that uses a magnet, radio waves, and a computer to make a series of detailed pictures of areas inside the body. This procedure is also called nuclear magnetic resonance imaging (NMRI).
- **Thoracoscopy:** A surgical procedure to look at the organs inside the chest to check for abnormal areas. An incision (cut) is made between two ribs, and a thoracoscope is inserted into the chest. A thoracoscope is a thin, tube like instrument with a light and a lens for viewing. It may also have a tool to remove tissue or lymph node samples which are checked under a microscope for signs of cancer. In some cases, this procedure may be used to remove part of the esophagus or lung.
- **Laparoscopy:** A surgical procedure to look at the organs inside the abdomen to check for signs of disease. Small incisions (cuts) are made in the wall of the abdomen, and a laparoscope (a thin, lighted tube) is inserted into one of the incisions. Other instruments may be inserted through the same or other incisions to perform procedures such as removing organs or taking tissue samples to be checked under a microscope for signs of disease.
- **Ultrasound exam:** A procedure in which high energy sound waves (ultrasound) are bounced off internal tissues or organs such as those in the neck and make echoes. The echoes form a picture of body tissues called a sonogram. The picture can be printed to be looked at later.

Possible Spreading of Cancer

There are three ways that cancer spreads in the body. Cancer can spread through tissue, the lymph system, and the blood.

- **Tissue:** The cancer spreads from where it began by growing into nearby areas.
- **Lymph system:** The cancer spreads from where it began by getting into the lymph system. The cancer travels through the lymph vessels to other parts of the body.
- **Blood:** The cancer spreads from where it began by getting into the blood. The cancer travels through the blood vessels to other parts of the body.

Cancer may spread from where it began to other parts of the body. When cancer spreads to another part of the body, it is called metastasis. Cancer cells break away from where they began (the primary tumor) and travel through the lymph system or blood. The metastatic tumor is the same type of cancer as the primary tumor. For example, if esophageal cancer spreads to the lung, the cancer cells in the lung are actually esophageal cancer cells. The disease is metastatic esophageal cancer and not lung cancer.

Grades Used for Esophageal Cancer

The grade of the tumor describes how abnormal the cancer cells look under a microscope and how quickly the tumor is likely to grow and spread. Grades 1 to 3 are used to describe esophageal cancer.

Grade 1

In grade 1, the cancer cells look more like normal cells under a microscope and grow and spread more slowly than grade 2 and 3 cancer cells.

Grade 2

In grade 2, the cancer cells look more abnormal under a microscope and grow and spread more quickly than grade 1 cancer cells.

Grade 3

In grade 3, the cancer cells look more abnormal under a microscope and grow and spread more quickly than grade 1 and 2 cancer cells.

Stages Used for Squamous Cell Carcinoma of the Esophagus

Stage 0 (High-grade Dysplasia)

In stage 0, cancer has formed in the inner lining of the esophagus wall. Stage 0 is also called high grade dysplasia.

Stage I

Stage I cancer is divided into stages IA and IB depending on where the cancer has spread.

Stage IA: Cancer has spread into the mucosa layer or thin muscle layer of the esophagus wall, and the cancer cells are grade 1, or the grade is not known.

Stage IB:

- Cancer has spread into the mucosa layer, thin muscle layer, or submucosa layer of the esophagus wall, and the cancer cells are any grade, or the grade is not known.

OR

- Cancer has spread into the thick muscle layer of the esophagus wall, and the cancer cells are grade 1.

Stage II

Stage II cancer is divided into stages IIA and IIB depending on where the cancer has spread.

Stage IIA:

- Cancer has spread into the thick muscle layer of the esophagus wall. The cancer cells are grade 2 or 3, or the grade is not known.

OR

- Cancer has spread into the connective tissue layer of the esophagus wall. The tumor is in the lower esophagus.

OR

- Cancer has spread into the connective tissue layer of the esophagus wall. The cancer cells are grade 1, and the tumor is in either the upper or middle esophagus.

Stage IIB:

- Cancer has spread into the connective tissue layer of the esophagus wall. The cancer cells are grade 2 or 3. The tumor is in either the upper or middle esophagus.

OR

- Cancer has spread into the connective tissue layer of the esophagus wall. The grade of the cancer cells is not known, or it is not known where the tumor has formed in the esophagus.

OR

- Cancer has spread into the mucosa layer, thin muscle layer, or submucosa layer of the esophagus wall. Cancer is found in 1 or 2 lymph nodes near the tumor.

Stage III

Stage III is divided into stages IIIA and IIIB depending on where the cancer has spread.

- **Stage IIIA:**

  - Cancer has spread into the mucosa layer, thin muscle layer, or submucosa layer of the esophagus wall and is found in 3 to 6 lymph nodes near the tumor.

  OR

  - Cancer has spread into the thick muscle layer of the esophagus wall and is found in 1 or 2 lymph nodes near the tumor.

- **Stage IIIB:**

  - Cancer has spread into the thick muscle layer or the connective tissue layer of the esophagus wall and is found in 1 to 6 lymph nodes near the tumor.

  OR

  - Cancer has spread into the diaphragm, azygos vein, pleura, sac around the heart, or peritoneum and may be found in 0 to 2 lymph nodes near the tumor.. Cancer has also spread to 1 to 6 nearby lymph nodes.

Stage IV

Stage IV is divided into stages IVA and IVB depending on where the cancer has spread.

- **Stage IVA:**
  - Cancer has spread into the diaphragm, azygos vein, pleura, sac around the heart, or peritoneum and is found in 3 to 6 lymph nodes near the tumor.

  OR

  - Cancer has spread into nearby structures such as the aorta, airway, or spine and may be found in 0 to 6 lymph nodes near the tumor or to 7 or more lymph nodes near the tumor.
- **Stage IVB:** Cancer has spread to other parts of the body such as the liver or lung.

Stages Used for Adenocarcinoma of the Esophagus

Stage 0 (High-grade Dysplasia)

In stage 0, cancer has formed in the inner lining of the esophagus wall. Stage 0 is also called high grade dysplasia.

Stage I

Stage I cancer is divided into stages IA, IB, and IC depending on where the cancer has spread.

Stage IA: Cancer has spread into the mucosa layer or thin muscle layer of the esophagus wall. The cancer cells are grade 1, or the grade is not known.

Stage IB:

- Cancer has spread into the mucosa layer or thin muscle layer of the esophagus wall, and the cancer cells are grade 2.

OR

- Cancer has spread into the submucosa layer of the esophagus wall. The cancer cells are grade 1 or 2, or the grade is not known.

Stage IC:

- Cancer has spread into the mucosa layer, thin muscle layer, or submucosa layer of the esophagus wall, and the cancer cells are grade 3.

OR

- Cancer has spread into the thick muscle layer of the esophagus wall, and the cancer cells are grade 1 or 2.

Stage II

Stage II is divided into stages IIA and IIB depending on where the cancer has spread.

Stage IIA: Cancer has spread into the thick muscle layer of the esophagus wall. The cancer cells are grade 3, or the grade is not known.

Stage IIB:

- Cancer has spread into the connective tissue layer of the esophagus wall.

OR

- Cancer has spread into the mucosa layer, thin muscle layer, or submucosa layer of the esophagus wall, and cancer is found in 1 or 2 lymph nodes near the tumor.

Stage III

Stage III is divided into stages IIIA and IIIB depending on where the cancer has spread.

Stage IIIA:

- Cancer has spread into the mucosa layer, thin muscle layer, or submucosa layer of the esophagus wall, and cancer is found in 3 to 6 lymph nodes near the tumor.

OR

- Cancer has spread into the thick muscle layer of the esophagus wall, and cancer is found in 1 or 2 lymph nodes near the tumor.

Stage IIIB:

- Cancer has spread into the thick muscle layer of the esophagus wall, and cancer is found in 3 to 6 lymph nodes near the tumor.

OR

- Cancer has spread into the connective tissue layer of the esophagus wall, and cancer is found in 1 to 6 lymph nodes near the tumor.

OR

- Cancer has spread into the diaphragm, azygos vein, pleura, sac around the heart, or peritoneum, and cancer may be found in 0 to 2 lymph nodes near the tumor.

Stage IV

Stage IV is divided into stages IVA and IVB depending on where the cancer has spread.

Stage IVA:

- Cancer has spread into the diaphragm, azygos vein, pleura, sac around the heart, or peritoneum, and cancer is found in 3 to 6 lymph nodes near the tumor.

OR

- Cancer has spread into nearby structures such as the aorta, airway, or spine, and cancer may be found in 0 to 6 lymph nodes near the tumor.

OR

- Cancer has spread to 7 or more lymph nodes near the tumor.

Stage IVB: Cancer has spread to other parts of the body such as the liver or lung.

Recurrent Esophageal Cancer: Recurrent esophageal cancer is cancer that has recurred (come back) after it has been treated. The cancer may come back in the esophagus or in other parts of the body.

Treatment Option Overview

KEY POINTS

- There are different types of treatments for patients with esophageal cancer.
- Patients have special nutritional needs during treatment for esophageal cancer.
- Six types of standard treatments are used:
    - Surgery
    - Radiation therapy
    - Chemotherapy
    - Chemoradiation therapy
    - Laser therapy
    - Electrocoagulation
- New types of treatments are being tested in clinical trials such as targeted therapy.
- Treatment for esophageal cancer may cause side effects.
- Patients may want to think about taking part in a clinical trial.
- Patients can enter clinical trials before, during, or after starting their cancer treatment.
- Follow up tests may be needed.

Treatment Options for Patients with Esophageal Cancer

There are different types of treatments for patients with esophageal cancer. Some treatments are standard (the currently used treatment), and some are being tested in clinical trials. A treatment clinical trial is a research study meant to help improve current treatments or obtain information on new treatments for patients with cancer. When clinical trials show that a new treatment is better than the standard treatment, the new treatment may become the standard treatment. Patients may want to think about taking part in a clinical trial. Some clinical trials are open only to patients who have not started treatment.

Patients have special nutritional needs during treatment for esophageal cancer. Many people with esophageal cancer find it hard to eat because they have trouble swallowing. The esophagus may be narrowed by the tumor or as a side effect of treatment. Some patients may receive nutrients directly into a vein. Others may need a feeding tube (a flexible plastic tube that is passed through the nose or mouth into the stomach) until they are able to eat on their own.

Six types of standard treatments are used:

Surgery

Surgery is the most common treatment for cancer of the esophagus. Part of the esophagus may be removed in an operation called an esophagectomy. The doctor will connect the remaining healthy part of the esophagus to the stomach so the patient can still swallow. A plastic tube or part of the intestine may be used to make the connection. Lymph nodes near the esophagus may also be removed and viewed under a microscope to see if they contain cancer. If the esophagus is partly blocked by the tumor, an expandable metal stent (tube) may be placed inside the esophagus to help keep it open.

Small, early stage cancer and high grade dysplasia of the esophagus may be removed by endoscopic resection. An endoscope (a thin, tube like instrument with a light and a lens for viewing) is inserted through a small incision (cut) in the skin or through an opening in the body such as the mouth. A tool attached to the endoscope is used to remove tissue.

Radiation Therapy

Radiation therapy is a cancer treatment that uses high energy x rays or other types of radiation to kill cancer cells or keep them from growing. There are two types of radiation therapy:

- **External radiation therapy:** This type of radiation uses a machine outside the body to send radiation toward the area of the body with cancer.
- **Internal radiation therapy:** This type of radiation uses a radioactive substance sealed in needles, seeds, wires, or catheters that are placed directly into or near the cancer.

The way the radiation therapy is given depends on the type and stage of the cancer being treated. External and internal radiation therapies are used to treat esophageal cancer.

A plastic tube may be inserted into the esophagus to keep it open during radiation therapy. This is called intraluminal intubation and dilation.

Chemotherapy

Chemotherapy is a cancer treatment that uses drugs to stop the growth of cancer cells either by killing the cells or by stopping them from dividing. When chemotherapy is taken by mouth or injected into a vein or muscle, the drugs enter the bloodstream and can reach cancer cells throughout the body (systemic chemotherapy). When chemotherapy is placed directly into the cerebrospinal fluid, an organ, or a body cavity such as the abdomen, the drugs mainly affect cancer cells in those areas (regional chemotherapy). The way the chemotherapy is given depends on the type and stage of the cancer being treated.

Chemoradiation Therapy

Chemoradiation therapy combines chemotherapy and radiation therapy to increase the effects of both.

Laser Therapy

Laser therapy is a cancer treatment that uses a laser beam (a narrow beam of intense light) to kill cancer cells.

Electrocoagulation

Electrocoagulation is a cancer treatment that uses an electric current to kill cancer cells.

Targeted Therapy

Targeted therapy is a type of treatment that uses drugs or other substances to identify and attack specific cancer cells. Targeted therapies usually cause less harm to normal cells than chemotherapy or radiation therapy do.

Types of targeted therapies used in the treatment of esophageal cancer include the following:

- **Monoclonal antibodies:** Monoclonal antibodies are immune system proteins made in the laboratory to treat many diseases including cancer. As a cancer treatment, these antibodies can attach to a specific target on cancer cells or other cells that may help cancer cells grow. The antibodies are able to then kill the cancer cells, block their growth, or keep them from spreading. Monoclonal antibodies are given by infusion. They may be used alone or to carry drugs, toxins, or radioactive material directly to cancer cells.

Clinical Trials

For some patients, taking part in a clinical trial may be the best treatment choice. Clinical trials are part of the cancer research process. Clinical trials are done to find out if new cancer treatments are safe and effective or better than the standard treatment.

Many of today's standard treatments for cancer are based on earlier clinical trials. Patients who take part in a clinical trial may receive the standard treatment or be among the first to receive a new treatment.

Patients who take part in clinical trials also help improve the way cancer will be treated in the future. Even when clinical trials do not lead to effective new treatments, they often answer important questions and help move research forward.

Patients can enter clinical trials before, during, or after starting their cancer treatment.

Some clinical trials only include patients who have not yet received treatment. Other trials test treatments for patients whose cancer has not gotten better. There are also clinical trials that test new ways to stop cancer from recurring (coming back) or reduce the side effects of cancer treatment.

Follow-up tests may be needed.

Some of the tests that were done to diagnose the cancer or to find out the stage of the cancer may be repeated. Some tests will be repeated in order to see how well the treatment is working. Decisions about whether to continue, change, or stop treatment may be based on the results of these tests.

Some of the tests will continue to be done from time to time after treatment has ended. The results of these tests can show if your condition has changed or if the cancer has recurred (come back). These tests are sometimes called follow up test or check ups.

Treatment Options by Stage

Stage 0 (High-grade Dysplasia)

Treatment of stage 0 may include the following:

- Surgery.
- Endoscopic resection.

Stage I Esophageal Cancer

Treatment of stage I esophageal squamous cell carcinoma or adenocarcinoma may include the following:

- Chemoradiation therapy followed by surgery.
- Surgery alone.

Stage II Esophageal Cancer

Treatment of stage II esophageal squamous cell carcinoma or adenocarcinoma may include the following:

- Chemoradiation therapy followed by surgery.
- Surgery alone.
- Chemotherapy followed by surgery.
- Chemoradiation therapy alone.

Stage III Esophageal Cancer

Treatment of stage III esophageal squamous cell carcinoma or adenocarcinoma may include the following:

- Chemoradiation therapy followed by surgery.
- Chemotherapy followed by surgery.
- Chemoradiation therapy alone.

Stage IV and Esophageal Cancer

Treatment of stage IV esophageal squamous cell carcinoma or adenocarcinoma may include the following:

- Chemoradiation therapy followed by surgery.
- Chemotherapy.
- Laser surgery or electrocoagulation as palliative therapy to relieve symptoms and improve quality of life.
- An esophageal stent as palliative therapy to relieve symptoms and improve quality of life.
- External or internal radiation therapy as palliative therapy to relieve symptoms and improve quality of life.
- Clinical trials of chemotherapy.
- A clinical trial of targeted therapy combined with chemotherapy.

Recurrent Esophageal Cancer

Treatment of recurrent esophageal cancer may include the following:

- Use of any standard treatments as palliative therapy to relieve symptoms and improve quality of life.
- Clinical trials.

Check the list of NCI supported cancer clinical trials that are now accepting patients with the esophageal cancer stage you are experiencing. For more specific results, refine the search by using other search features such as the location of the trial, the type of treatment, or the name of the drug. Talk with your doctor about clinical trials that may be right for you. General information about clinical trials is available from the following NCI website:

www.cancer.gov/about cancer/treatment/clinical trials

Notes

For more information and related links visit: www.cancer.gov/types/esophageal

Resource: PDQ® Adult Treatment Editorial board. PDQ Esophageal Cancer Treatment. Bethesda, MD: National Cancer Institute. Available at https://www.cancer.gov/types/esophageal/patient/esophageal-treatment-pdq Accessed 08/06/2021.

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Cancer Support Services