

GASTROINTESTINAL CANCERS (ESOPHAGEAL, GASTRIC, LIVER AND PANCREAS)

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ESOPHAGEAL CANCER (CARCINOMA)

1. What is the esophagus?

The esophagus is a tube that connects the mouth and throat with the stomach ("food pipe"). When a person swallows, the muscular wall of the esophagus contracts to help push food down to the stomach. There are two main types of cancer that can occur in the esophagus. Squamous cell carcinoma occurs more commonly in the upper or middle part of the esophagus. Adenocarcinoma occurs in the lower part of the esophagus.

2. Who gets esophageal cancer?

Studies show that esophageal cancer is more commonly diagnosed in people over the age of 55 years. Men are affected twice as commonly as women. Squamous cell esophageal cancer is more common in African Americans than Caucasians. On the other hand, adenocarcinoma appears to be more common in middle-aged Caucasian men.

The exact cause is unknown; however there are well-recognized risk factors. In the US, alcohol, smoking and obesity are the major risk factors. Stopping drinking and smoking may reduce the chance of getting esophageal cancer as well as other types of cancers. Sometimes adenocarcinoma of the esophagus runs in families.

The risk of cancer of the esophagus is also increased by irritation of the lining of the esophagus. In patients with acid reflux, where contents from the stomach back up into the esophagus, the cells that line the esophagus can change and begin to resemble the cells of the intestine. This condition is known as Barrett's esophagus. Those with Barrett's esophagus have a higher risk of developing esophageal cancer.



Less common causes of irritation can also increase the chance of developing esophageal cancer. For example, people who have swallowed caustic substances like lye can have damage to the esophagus that increases the risk of developing esophageal cancer.

3. What are the symptoms of esophageal cancer?

Very small tumors at an early stage do not generally cause symptoms. Patients commonly experience difficulty swallowing as the tumor gets larger and the width of the esophagus becomes narrowed. At first, most have trouble swallowing solid foods such as meats, breads or raw vegetables. As the tumor grows, the esophagus becomes more narrowed causing difficulty in swallowing even liquids. Cancer of the esophagus can also cause symptoms of indigestion, heartburn, vomiting and choking. Patients may also have coughing and hoarseness of the voice. Involuntary weight loss is also common.

4. How is esophageal cancer diagnosed?

The doctor will generally start by taking a complete history and performing a physical examination. An esophagram, also called a barium swallow, is a series of x-rays of the esophagus. The patient is asked to drink a barium solution, which coats the inside of the esophagus. Multiple x-rays are then taken to look for changes in the shape of the esophagus.

Most patients undergo a test called endoscopy where a thin flexible lighted instrument with a camera at the end is passed through the mouth into the esophagus. This scope allows the doctor to see the inner layer of the esophagus. Biopsies can be taken during this procedure if needed and submitted to the pathologist for examination under a microscope to detect cancer cells.

A CT scan of the neck, chest and abdomen may help to identify if there is any spread of the cancer to other organs in the body so that the doctor can determine appropriate management.

Endoscopic ultrasound is a newer technique that can be used to provide detailed assessment of the depth of the tumor and involvement of adjacent lymph nodes. This instrument is similar to the endoscope above except there is ultrasound embedded at the tip of the scope.

5. What is the treatment for esophageal cancer?

Depending on the stage of esophageal cancer the patient may undergo surgery, radiation and/or chemotherapy. Other measures that may improve symptoms include stretching or dilation, tube prosthesis (stent) and radiation or laser treatment to reduce the size of the cancer.



Doctors are actively looking at new ways of combining various types of treatment to see if they may have a better effect on treating esophageal cancer. Many patients with esophageal cancer undergo some form of combination therapy with surgery, radiation and chemotherapy.

STOMACH CANCER (GASTRIC CANCER)

1. What is the stomach?

The stomach is part of the digestive system and connects the esophagus to the small intestine. Once food enters the stomach the muscles in the stomach help to mix and mash the food using a motion called peristalsis.

2. Stomach cancer

Stomach cancer can develop in any part of the stomach and can spread throughout the stomach and to other organs such as the small intestines, lymph nodes, liver, pancreas and colon.

3. Who gets stomach cancer?

No one knows the exact reason why a person gets stomach cancer. Researchers have learned that there are certain risk factors associated with the development of stomach cancer. Those over the age of 55 years are more likely to get stomach cancer. Men are affected twice as often as women and African Americans are affected more commonly than Caucasians.

Stomach cancer is more common in some parts of the world such as Japan, Korea, parts of Eastern Europe and Latin America. Some studies do suggest that a type of bacteria known as *Helicobacter pylori*, which can cause inflammation and ulcers in the stomach, can be an important risk factor for developing gastric cancer.

Studies show that people who have had stomach surgery or have a condition such as pernicious anemia, or gastric atrophy (which result in lower than normal production of digestive juices) can be associated with an increased risk of developing gastric cancer.

There is also some evidence that smoking increases the risk of developing gastric cancer.

4. What are the symptoms of gastric cancer?

Patients may not have any symptoms in the early stages and often the diagnosis is made after the cancer has spread. The most common symptoms include:

- Pain or discomfort in the abdomen
- Nausea and vomiting



- Loss of appetite
- Fatigue or weakness
- Bleeding (vomiting blood or passing blood in stools)
- Weight loss
- Early satiety (cannot eat a complete meal because of a “full feeling”)

5. How is gastric cancer diagnosed?

In addition to taking a complete history and performing a physical exam, your doctor may do one or more of the following tests:

Upper GI series- The patient is asked to drink a barium solution. Subsequently x-rays of the stomach are taken. The barium outlines the inside of the stomach helping to reveal any abnormal areas that may be involved with cancer. This test is used less often than it used to be, and patients now often undergo endoscopy (see below) first.

Endoscopy- A lighted, flexible tube with a camera, called an endoscope, is inserted through the mouth into the esophagus and then into the stomach. Sedation is given prior to insertion of the endoscope. If an abnormal area is found, biopsies (tissue samples) can be taken and examined under a microscope to look for cancer cells.

If cancer is found, the doctor may schedule additional staging tests to determine if the cancer has spread. A CT scan may be used to determine if cancer has spread to the liver, pancreas, lungs or other organs near the stomach.

Staging of gastric cancer may also be performed by using endoscopic ultrasound. Endoscopic ultrasound can help to determine the depth of spread of the tumor into the wall of the stomach and involvement of adjacent structures as well as assess for any enlarged lymph nodes that may be invaded with cancer cells.

6. What is the treatment for stomach cancer?

Treatment plans may vary depending on the size, location, extent of tumor and the patient's overall health. Treatments include surgery, chemotherapy and /or radiation therapy.

Surgery is the most common treatment. The surgeon can remove part of the stomach (gastrectomy) or the entire stomach. Lymph nodes near the tumor are generally removed during surgery so that they can be checked for cancer cells.

Researchers are exploring the use of chemotherapy before surgery to help shrink the tumor and after surgery to help kill residual tumor cells. Chemotherapy is given in cycles with intervals of several weeks depending on the drugs used.



Radiation therapy is the use of high-energy rays to damage cancer cells and stop them from growing. Radiation destroys the cancer cells only in the treated area.

Doctors are looking at the combination of surgery, chemotherapy and radiation therapy to see what combination would have the most beneficial effect.

LIVER CANCER (HEPATOCELLULAR CARCINOMA)

1. What is the liver?

The liver is one of the largest organs in the body, located in the upper right portion of the abdomen. The liver has many important functions, including clearing toxins from the blood, metabolizing drugs, making blood proteins, and making bile which assists digestion.

2. What is hepatocellular carcinoma (HCC)?

Hepatocellular carcinoma is a cancer that arises in the liver. It is also known as hepatoma or primary liver cancer.

3. How common is liver cancer?

HCC is the fifth most common cancer in the world. Recent data shows that HCC is becoming more common in the US. This rise is thought to be because of chronic hepatitis C, an infection that can cause HCC.

4. Who gets HCC?

It is well established that individuals with the hepatitis B and/or hepatitis C virus infection are at increased risk of developing HCC. Alcohol related liver disease is also a risk factor for the development of HCC.

There are certain chemicals that are associated with liver cancer-aflatoxin B1, vinyl chloride and thorotrast. Aflatoxin is the product of a mold called *Aspergillus flavus* and is found in foods such as peanuts, rice, soybeans, corn and wheat. Also thorotrast is no longer used for radiologic tests, and vinyl chloride, is a compound found in plastics.

Hemochromatosis, a condition in which there is abnormal iron metabolism, is strongly associated with liver cancer.

Individuals with cirrhosis from any cause such as the hepatitis virus, hemochromatosis and alpha-1-antitrypsin deficiency are at increased risk of developing HCC.



5. What are the symptoms of HCC?

Abdominal pain is the most common symptom of HCC and usually is present when the tumor is very large or has spread. Unexplained weight loss or unexplained fevers are warning signs in patients with cirrhosis. Sudden appearance of abdominal swelling (ascites), yellow discoloration of the eyes and skin (jaundice), or muscle wasting suggests the possibility of HCC.

6. How is HCC diagnosed?

The diagnosis of HCC cannot be made by routine blood tests. Screening by a blood test for the tumor marker, alpha-fetoprotein (AFP), and radiological imaging must be performed. Some doctors advocate measurement of AFP and imaging every 6-12 months in patients with cirrhosis in an effort to detect small HCC. Sixty percent of patients with HCC will have an elevated AFP level and the remainder may have normal AFP. Therefore, a normal AFP level does not exclude HCC.

Radiological imaging studies are very important and may include one or more of the following—ultrasound, CT scan (MRI magnetic resonance imaging) and angiography.

Ultrasound examination of the liver is frequently the initial study if HCC is suspected.

CT scan is a very common study used in the USA for the workup of liver tumors. The ideal study is multi-phase CT scan with the use of oral and IV contrast.

MRI can provide sectional views of the body in different planes. MRI can actually reconstruct images of the biliary tree and the arteries and veins of the liver.

Angiography is a study where contrast material is injected into a large artery in the groin. X-ray pictures are then taken to evaluate the arterial blood supply to the liver. If the patient has HCC, a characteristic pattern is seen because of the newly formed abnormal small blood vessels that feed the tumor.

Biopsy may not be needed in patients with a risk factor for HCC and elevated AFP. Biopsy can be performed if there is some question as to the diagnosis of HCC or if the doctor feels the management may be changed by the biopsy results.

7. What is the prognosis of people with HCC?

The prognosis depends on the stage of the tumor and the severity of the associated liver disease. There are some factors that predict poor outcome. These include:

- Demographics: male gender, older age, alcohol consumption
- Symptoms: weight loss, decreased appetite



- Signs of impaired liver function: jaundice, ascites or mental confusion related to liver disease (encephalopathy)
- Blood tests: elevated liver tests, low albumin, high AFP, low sodium, high blood urea nitrogen
- Staging of tumor: tumor over 3 cm, multiple tumors, tumor invasion of local blood vessels, tumor spread outside of liver.

8. What are the treatment options for HCC?

Chemotherapy:

This may include injection of anti-cancer chemicals into the body through a vein or through chemoembolization.

The technique of chemoembolization is a procedure where chemotherapeutic drugs are given directly into the blood vessels that supply the tumor and small blood vessels are blocked so that the drug stays within the area of the tumor. Chemotherapy can provide some relief of symptoms and possibly decrease tumor size (in 50% of patients) but it is not curative.

Ablation:

Ablation (tissue destruction) therapy in the form of using radiofrequency waves, alcohol injection into the tumor or proton beam radiation to the tumor site are other options for treatment. There is no data to indicate that any one of these treatment is better than another.

Surgery:

Surgery is only available to patients with excellent liver function who have tumors less than 3-5 cm that are confined to the liver. If the patient is able to undergo surgery successfully, the five year survival is 30-40%. Many patients may have recurrence of HCC in another part of the liver.

Liver transplantation is a treatment option for patients with end-stage liver disease and small HCC. There is however a severe shortage of donors in the USA.

9. Is liver cancer always HCC?

Actually, in the United States most cancers that are found in the liver are ones that spread or metastasize from other organs. These cancers are not HCC, as HCC cancers begin in the cells of the liver. Cancers that commonly metastasize to the liver include colon, pancreatic, lung and breast cancer.



PANCREATIC CANCER

1. What is the pancreas?

The pancreas makes pancreatic juices, which help digest food in the small intestines, and hormones, including insulin. It is located behind the stomach in the back of the abdomen. The duct of the pancreatic gland opens into the first portion of the small intestine (called the duodenum) through a nipple like opening called the ampulla.

2. What causes pancreatic cancer?

It is not known exactly why certain people get pancreatic cancer. Research shows that there are certain risk factors that increase the chance of getting pancreatic cancer. Smoking is a major risk factor. Alcohol consumption, a diet rich in animal fat and chronic pancreatitis may also be risk factors. People with a condition called hereditary pancreatitis are also at increased risk for getting pancreatic cancer.

3. What are the symptoms of pancreatic cancer?

Early pancreatic cancer usually does not cause symptoms and is therefore known as the "silent" disease. As the tumor gets larger, the patient may have one or more of the following:

- **Jaundice**- If the tumor blocks the bile ducts (the major bile duct passes through the pancreas), the patient may develop jaundice, a condition where the skin and eyes may become yellow and the urine may become dark in color.
- **Abdominal pain**- As the cancer grows, the patient may have pain in the abdomen which may radiate to the back. Pain may increase with eating or lying down.
- **Nausea**
- **Decreased appetite**
- **Weight loss**

4. How is cancer of the pancreas diagnosed?

In addition to taking a complete history and performing a physical examination, the doctor may perform certain endoscopic and radiologic tests such as a CT scan or ultrasound. Endoscopic ultrasound may also be performed. This test may help in finding small tumors that may be less than 2-3 cms (one inch). A biopsy of an abnormal area of the pancreas may be performed in certain cases by inserting a needle into the pancreas under ultrasonic guidance.

ERCP (endoscopic retrograde cholangiopancreatogram), a special x-ray study of the pancreatic duct and the common bile duct may also be used to make the diagnosis. For this test, a flexible tube with a light and a camera at the end is passed through the mouth into the stomach and then the small intestines. Sedation is given. A dye is then injected



into the pancreatic duct and the bile duct to look for abnormal filling or obstruction of these ducts by the tumor. During this procedure, biopsies can be taken using a brush that is inserted into the bile duct. The biopsy specimens are then examined under a microscope to look for cancer cells.

5. What is the treatment for cancer of the pancreas?

Cancer of the pancreas is really only curable if it is found in the early stages. Surgery, radiation and chemotherapy are possible treatment options. Surgery may be done to remove all or part of the pancreas and surrounding tissues if needed. Radiation therapy can be used to damage the cancer cells and prevent them from growing. Radiation may be used in certain trials after surgery to help kill any remaining cancer cells. Chemotherapy will not cure pancreatic cancer but may have some effect on slowing the rate of progression of the tumor or to improve the patient's quality of life. Many new drugs are being investigated for chemotherapy of pancreatic cancer and patients with this disease may have an opportunity to participate in one of the research trials for chemotherapeutic treatment of pancreatic cancer.

Pain control may be a difficult problem in patients with pancreatic cancer. Oral pain medication may be used, or patients may be referred for a nerve block which is performed by injecting alcohol into the bundle of nerves (celiac plexus) near the pancreas to decrease pain signals from the pancreatic cancer to the brain.

GASTROINTESTINAL TRACT IMAGE:

