



California Pacific
Medical Center

A Sutter Health Affiliate
With You. For Life.

Pancreatic Cancer

Overview

Pancreatic cancer—cancer in the gland that produces digestive enzymes and hormones, including insulin—affects more than 37,000 Americans each year, the majority of whom are 65 or older. Smoking, diabetes, age, alcohol, chronic pancreatitis, familial pancreatitis and genetic factors, as well as dietary habits, are common risk factors associated with pancreatic cancer.

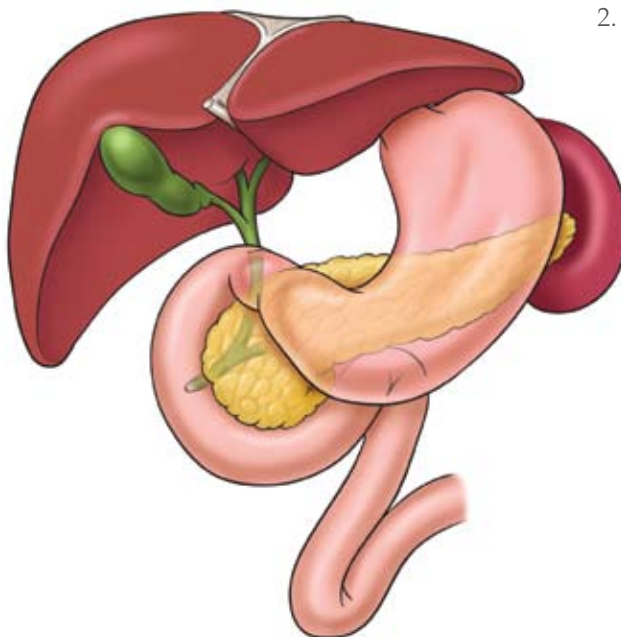
Tumors in the pancreas are classified as exocrine or endocrine tumors. Exocrine tumors (known as adenocarcinoma) originate in the lining of the pancreatic ducts and comprise the majority (80 – 90%) of all pancreatic tumors. Endocrine tumors, which begin in the islet cells of the pancreas, account for 10-20% of cases. At California Pacific, our team has expertise in treatment of both.

Symptoms such as unintentional weight loss, jaundice, new onset of diabetes, or abdominal pain may raise suspicion for pancreatic cancer. However, detecting a pancreatic tumor and establishing a diagnosis can be difficult, due to the gland's location deep within the abdomen.

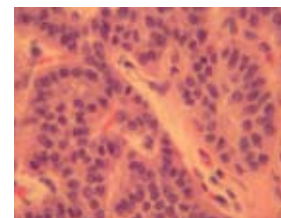
Diagnostic Tools and Staging

Technological advances have changed the approach to evaluating patients with suspected pancreatic tumor(s). State-of-the-art imaging technology now allows physicians to better answer two key questions in the evaluation of patients with suspected pancreatic tumors:

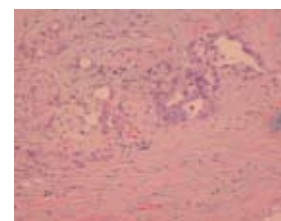
1. Is there really a tumor present?
2. If a tumor is present, can it be removed (and thereby potentially cured) by surgical removal?



The pancreas (in yellow) is located behind the stomach and underneath the liver.



Microscopic view of an endocrine tumor.



Microscopic view of an exocrine tumor (adenocarcinoma).

LIVER DISEASE MANAGEMENT & TRANSPLANT PROGRAM

At California Pacific Medical Center we are committed to bringing new and advanced diagnostic tools, medical treatments and surgical options to the physicians and patients we serve. Through this disease and treatment profile, our physicians illustrate current and emergent treatment options we can provide for the specialized medical management of your patients.

Our promise to our patients is to deliver the highest quality expert care with kindness and compassion. We go beyond medicine to treat the whole person, not just the illness.

Medicine can transform a body. Going beyond medicine can transform a life.

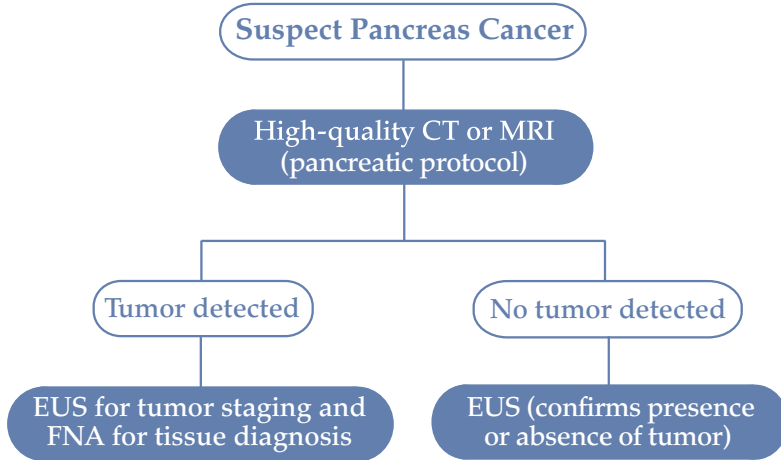
For patient referrals:

1-888-637-2762

www.cpmc.org/liver

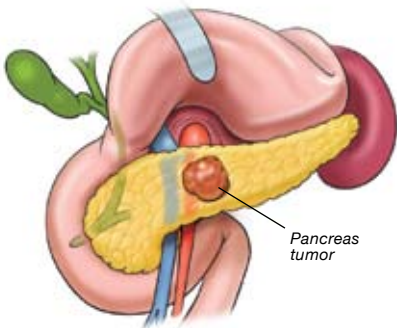
Beyond Medicine.

Algorithm to approaching patients with suspected pancreatic cancer



NON-INVASIVE IMAGING

The first step in evaluating an individual with suspected pancreatic cancer is to determine whether a cancer is truly present. Noninvasive imaging studies such as a computed tomography (CT) or magnetic resonance imaging (MRI) are initial diagnostic tests of choice. Specific CT imaging protocols and MRI sequences that optimize visualization of the pancreas should be used.



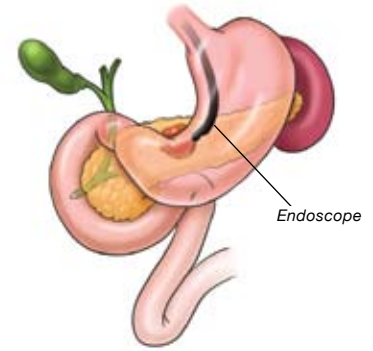
Because of the pancreas' position below the stomach, non-invasive imaging studies are imperative to provide visualization of the pancreas and possible tumor(s).

ENDOSCOPIC ULTRASOUND

Although CT and MRI show many pancreatic cancers, some can be missed, especially when a tumor is small. If one highly suspects the presence of disease, endoscopic ultrasound (EUS) is essential.

EUS is a relatively new endoscopic procedure that uses an ultrasound probe at the tip of an endoscope to provide high-quality, detailed images of structures in and around the gastrointestinal tract. During upper endoscopy, the echoendoscope is placed in the stomach and duodenum to obtain detailed images of the entire pancreas and adjacent structures. Tumors are more accurately detected—or excluded—by EUS as compared to CT or MRI.

EUS also provides a means for tissue diagnosis. Under real-time EUS guidance, a fine needle aspiration (FNA) biopsy can be performed to provide a cytopathologic sample. EUS is a more accurate and safer method to perform biopsies of pancreatic tumors than other methods, including endoscopic retrograde cholangiopancreatography (ERCP) and percutaneous image-guided biopsies.



Physicians guide the endoscope through the stomach to provide visualization of a pancreas tumor(s).

TUMOR STAGING

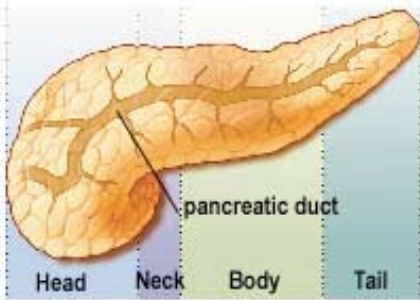
Once the presence of a pancreatic tumor is confirmed, the next major step is to determine surgical resectability. Assessing the spread of the tumor is referred to as tumor staging. Accurate tumor staging is important as it guides the appropriate therapy for an individual with pancreatic cancer. The benefits of surgery to remove and potentially cure a cancer must be balanced with avoiding unnecessary surgical exploration in those with advanced tumors.

A combination of diagnostic tests provides the best assessment of pancreatic tumor stage. These include a noninvasive imaging test (CT or MRI) and EUS. A high-quality, pancreatic protocol CT or MRI excludes distant tumor spread (especially liver metastases), and provides information on the local extent of the tumor, including spread to adjacent structures.

EUS offers a highly useful complementary test. Tumor extension into vascular structures and tumor involvement of adjacent lymph nodes is well-visualized with EUS. Occasionally, EUS will also identify and allow biopsy of unsuspected, occult metastases. The combination of EUS with CT or MRI provides more accurate assessment of tumor stage than either diagnostic tool alone.

The staging classification by the American Joint Committee on Cancer (AJCC) classifies the spread of pancreatic cancer as follows:

- **T2:** tumor invasion of the bile duct
- **T3:** tumor invasion of the portal vein, superior mesenteric vein and/or splenic vein
- **T4:** tumor invasion of the superior mesenteric artery and/or celiac axis



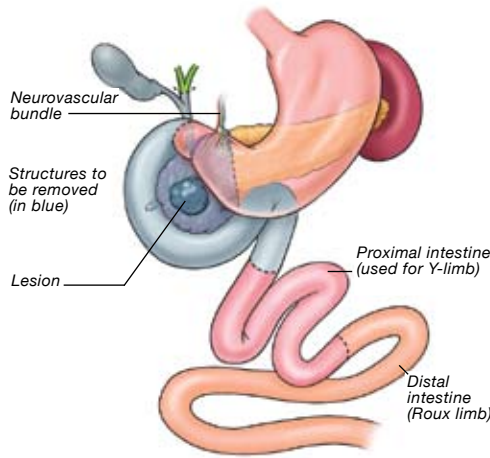
Pancreas sections used in defining tumor(s) location.

Treatment

SURGICAL

Whipple Procedure

When cancers occur in the head portion of the pancreas, surgeons can potentially remove the entire cancer with a Whipple procedure. About 20% of pancreatic cancer cases require a Whipple procedure, or resection of the pancreas head and neck, duodenum and distal bile duct with subsequent reconstruction. At California Pacific Medical Center, surgeons perform more than 50 Whipple procedures annually. In most cases, California Pacific's surgeons perform a Pyloric Sparing Whipple, a relatively new technique which leaves intact the stomach and its opening into the intestine.



Pancreas anatomy prior to a Whipple procedure. The blue represents structures that are removed during surgery.

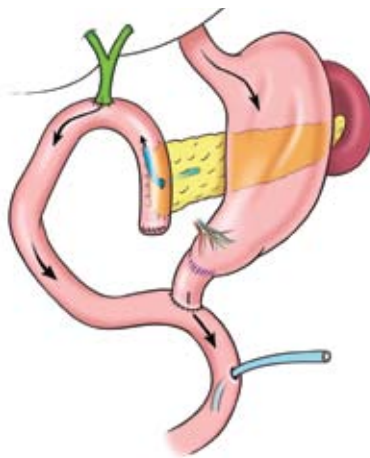


Illustration of a Pyloric Sparing Whipple procedure in which the pancreas head and neck, duodenum, gallbladder and bile duct are resected, followed by one continuous bowel limb for reconstruction.

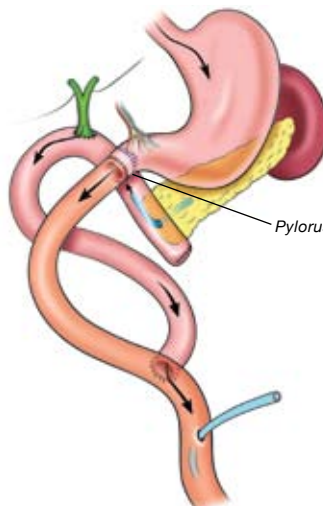
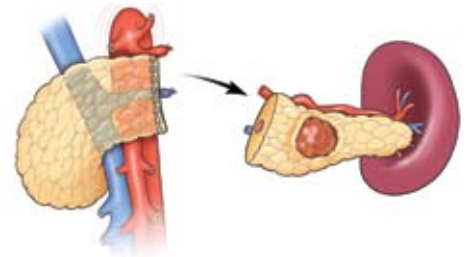


Illustration of a Pyloric Sparing Whipple procedure using R & Y bowel reconstruction.

Cancer in the neck or body of the pancreas (which is less frequent) would be treated with distal removal of the pancreas and splenectomy. Cancer that invades a portion of the liver vein (portal vein) or its tributaries could still be removed surgically and a piece of vein from the neck or leg can be used for reconstruction. However, cancer that invades the artery is not resectable.



In a Distal Pancreatectomy procedure with Splenectomy, the tail of the pancreas containing the tumor and the spleen are removed.

ENDOSCOPIC THERAPY

Endoscopic procedures play an important role in managing patients with pancreatic cancer. Tumors that are located in the head of the pancreas often cause blockage of the bile duct and lead to obstructive jaundice. Endoscopic retrograde cholangiopancreatography (ERCP) is a useful technique to relieve the biliary obstruction.

During ERCP a small catheter is inserted into the bile duct through an endoscope and contrast media is injected to provide detailed radiographic images of the biliary system. Either temporary plastic stents (for resectable tumors) or more durable self-expandable metallic stents (for inoperable cancers) can be placed endoscopically across the site of obstruction to provide biliary drainage.

SYSTEMIC THERAPY

Chemotherapy plays an important role in the overall management of pancreatic cancer. At California Pacific, a multidisciplinary team of medical oncologists, hepatologists and/or gastroenterologists, and interventional endoscopists work together with pancreatic cancer patients, evaluat-

ing an individual's ability to tolerate surgery, endoscopic therapy, and/or chemotherapy.

Chemotherapy generally refers to pharmacologic agents, whether they are oral, intramuscular or intravenous, with activity against pancreatic cancer cells. For individuals who undergo surgical resection of their pancreatic cancer, adjuvant chemotherapy has been shown to improve survival according to data from several recent clinical trials. Adjuvant chemotherapy is given for a defined time period following surgery; for some patients a brief period of post-operative radiation therapy is also recommended. Upon completion of adjuvant therapy, patients are considered in remission and undergo routine surveillance.

For individuals who relapse, or those whose disease is considered unresectable due to locally advanced or metastatic cancer, chemotherapy is the prime modality.

Clinical Trials

Due to California Pacific's large volume of pancreatic cancer patients, we are able to offer clinical trials with novel anti-cancer agents. Because pancreatic cancer is considered a poor prognosis cancer, many of our investigators seek to improve upon existing chemotherapeutic agents. In collaboration with California Pacific's Research Institute, the Medical Center maintains an active clinical research group. We are frequently the only center in Northern California to have access to exciting and novel agents via clinical trials available for individuals with pancreatic cancer. Participation in clinical research is always voluntary.

Sadly, many individuals who undergo surgical resection will relapse and many patients present with locally advanced disease that is not amenable to surgical resection. For these patients,

clinical trials with novel agents may offer enhanced efficacy over standard chemotherapy agents. At any one time patients with advanced and/or unresectable disease may have multiple clinical trials available.

Why Choose Us

Hepatobiliary and pancreas diseases—disorders of the liver, bile ducts, gallbladder and pancreas—form a complex set of medical problems whose treatment often requires equally challenging surgical procedures. At California Pacific Medical Center, we have been leaders in hepatobiliary and pancreas surgery since the founding of our liver transplant program in 1988. Our doctors are closely involved in clinical research and surgical innovation. Annually, our physicians provide care to some 4,000 hepatobiliary and pancreas patients, both in San Francisco and at our network of outreach sites in California and Nevada.

For patients requiring hospitalization, we have a dedicated critical care liver unit, hospitalists who specialize in hepatobiliary disease, physician assistants, on-call anesthesia staff and a specialized O.R. nursing team.

CANCER NAVIGATION SERVICE

Our Cancer Care Navigation Service provides individuals and families assistance with appointment scheduling, patient education and support service referral. Call 1-866-975-COPE (2673) or email patientnavigation@sutterhealth.org.

GENETIC RISK ASSESSMENT

The Cancer Genetic Risk Assessment Program at California Pacific offers individuals with a personal or family history pancreatic cancer the opportunity to learn more about the genetic nature of their disease and whether they may be predisposed to other

cancers which they could monitor. Individuals meet with our genetic counselor during which an evaluation of one's medical and family history is performed, as well as a detailed risk assessment and genetic education. If appropriate, genetic testing may be offered and facilitated by the genetic counselor. A genetic risk assessment may assist in medical management decisions such as aggressive cancer screening and preventive measures. For more information, call the Cancer Genetic Risk Assessment Program at 415-600-5961 or visit www.cpmc.org/services/cancer-genetesting/

For more information

Pancreas Disease Management & Transplant Program

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Fax. 415-600-1416

Oncologists

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Fax. 415-928-4840

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