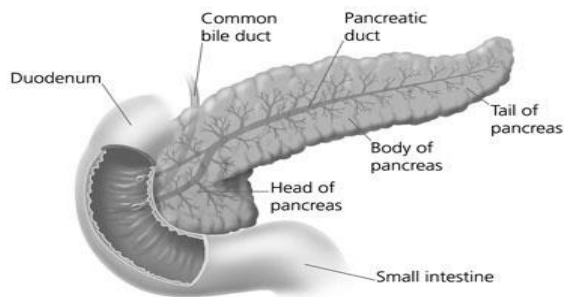


Whipple Procedure

What is a Whipple?

The Whipple procedure, or *pancreaticoduodenectomy*, is the most common surgery for pancreatic cancer, ampullary cancer, duodenal cancer, and bile duct cancer.

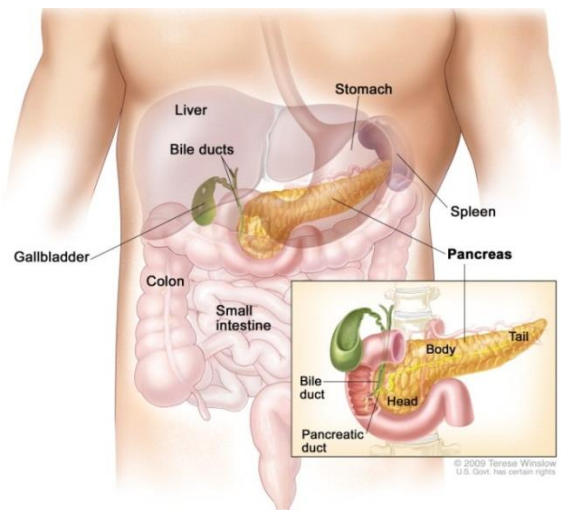
The pancreas is a 7-inch long, flattened, banana-shaped gland located deep in the abdomen between your stomach and your spine. The widest part of the pancreas is the *head*, the middle section is called the *body*, and the thinnest part is the *tail*.



The pancreas makes:

- hormones that help control the level of sugar in your blood (insulin and glucagon)
- pancreatic juices that help break down the foods you eat (digestive enzymes)

During the Whipple procedure, your surgeon removes the head of the pancreas, the upper part of the small intestine (duodenum), the common bile duct, the gallbladder, and the surrounding lymph nodes. Sometimes, the lower part of the stomach and/or more of the pancreas and small intestine need to be removed. In the last part of the surgery, the remaining portions of these organs are reconnected, so normal digestion will return.



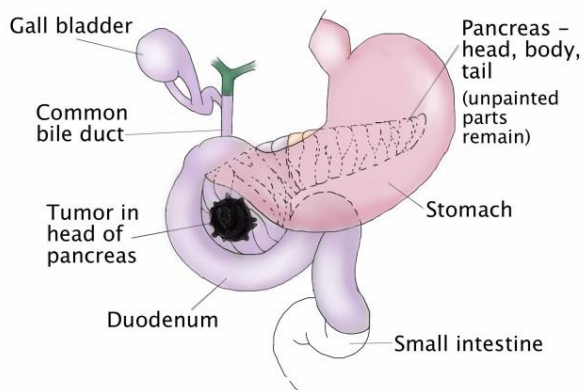
What Happens During a Whipple?

The Whipple procedure can take 6-8 hours. It may be longer if there are blood vessels that need repair or reconstruction. You will have general anesthesia and be asleep for the entire time. The first part of the procedure involves removing the head of the pancreas and other tissues that attach to it.

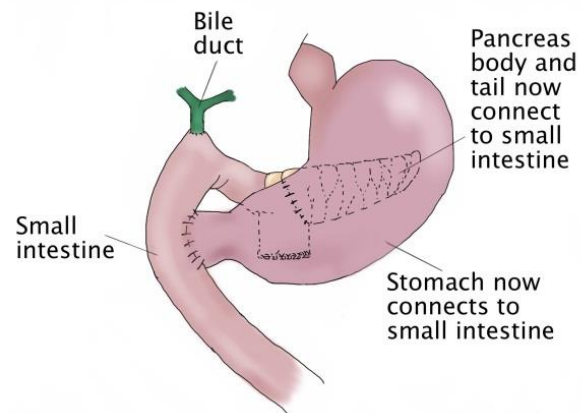
- The bile duct is cut. The gall bladder and the common bile duct are removed.
- The end of the stomach is divided off and detached. This part of the stomach leads to the small intestine, where the pancreas and bile duct attach.
- The neck of the pancreas is cut. The head of the pancreas is detached from the major blood vessels behind the pancreas, leaving it attached to the small intestine.
- Below where the pancreas attaches, the small intestine is divided to free the section that is connected to the pancreas. This section is removed.

The second part of the surgery involves reconnecting the intestinal tract. First, the small intestine is attached to the pancreas, then the bile duct and finally, the stomach.

Before Surgery



After Surgery



Preparing for Your Surgery

Your doctor and nurse will talk to you about how to prepare for your surgery.

- Practice your breathing exercises for a few days using the incentive spirometer.
- Remove all nail polish.
- Shower and bathe **as instructed**, the night before surgery **and** the morning of surgery. Rinse well and use a clean, dry towel.
- Do not apply body lotions, deodorant, powder, make-up, hairspray, etc. for **at least 24 hours** before surgery.
- Avoid shaving or using topical hair removers anywhere near your operation site.

Managing Your Medications

- If you have diabetes and take insulin, talk to the doctor who manages your diabetes and ask how to take your insulin on the day of the surgery.
- Many over-the-counter and prescription medications can interfere with normal blood clotting and may increase the risk of bleeding. Follow these guidelines about when to stop or start your medications and supplements.
- **If your doctor gives you different instructions, always follow your doctor's instructions.**

7 days (1 week) before your procedure, stop taking:

- Aspirin and products containing aspirin
- herbal supplements and vitamins
- garlic tablets
- clopidogrel (Plavix®) ****Please note: If you had a drug-coated (DES) coronary stent placed within the last year, or a bare-metal stent placed within the last month, please talk to your cardiologist and surgeon before stopping Plavix®.**

5 days before your procedure:

- **Begin** Impact® (Immune-enhancing supplement drink)
- **Stop** taking warfarin (Coumadin® or Jantoven®)

3 days before your procedure, stop taking non-steroidal anti-inflammatory medications (NSAIDs) such as:

| | |
|----------------------------|----------------------|
| ibuprofen (Advil®/Motrin®) | etodolac (Lodine®) |
| naproxen (Aleve®/Anaprox®) | diclofenac (Voltare) |
| meloxicam (Mobic®) | piroxicam (Feldene®) |
| oxaprozin (Daypro®) | diflunisal |
| sulindac (Clinoril®) | ketoprofen |

1 day before your procedure (24 hours):

- stop taking enoxaparin (Lovenox®)

If you take medication to prevent blood clots, talk to your doctor about when, or if, you should stop before surgery.

- apixaban (Eliquis®)
- cilostazol (Pletal®)
- dabigatran (Pradaxa®)
- dalteparin (Fragmin®)
- eptifibatide (Integrilin®)
- fondaparinux (Arixtra®)
- lepirudin (Refludan®)
- prasurgel (Effient®)
- rivaroxaban (Xarelto®)
- ticagrelor (Brilinta®)
- ticlopidine (Ticlid®)
- tinzaparin (Innohep®)
- tirofiban (Aggrastat®)

The Day Before Your Surgery

- After 4:00 p.m., drink only clear liquids (see back cover).
- After 12:00 a.m. (midnight) the night before your surgery, **DO NOT eat or drink anything**. This includes gum, candy, water, coffee, and juice.

The Day of Your Surgery: At Home

- If you need to take medication on the morning of your surgery, take it with a very small sip of water.
- You may brush your teeth and rinse with mouthwash. Be sure **NOT** to swallow any water or mouthwash.
- Dress in freshly washed, loose-fitting clothes.

The Day of Your Surgery: At the Hospital

- When you arrive at the hospital, check in at Patient Access (Registration) on the ground floor.
- The Patient Access staff will direct you to the surgical area, where your nurse will help you settle in and ask you some questions.
- An intravenous catheter (IV) placed in a vein in your arm allows us to give you fluids and medications.
- We will give you medication to help relax you.
- We may give you IV antibiotics, if needed.

After Your Procedure

- When you wake, you will have several tubes in place:
 - A **nasogastric tube (NG tube)** will be coming from your nose. The other end sits in your stomach and pulls secretions out of your stomach for 1-2 days after surgery. Usually, you can begin a clear liquid diet about 3-4 days after surgery. Your diet will be increased daily as you get better and can tolerate heavier foods.
 - You may have 1-2 tubes called **Blake or JP drains** to remove any pancreatic juices that may leak from the connection between the pancreas and small intestine.
 - You may have an **epidural catheter or a PCA (patient-controlled anesthesia) pump** connected through your IV to deliver pain medication.
- Your nurses will help you with breathing exercises that help prevent lung problems that can occur after general anesthesia.
- The day after surgery, we will help you get out of bed to sit in a chair. By the second day, we will help you walk in the hall. Walking helps to prevent blood clots and pneumonia, and speeds up your recovery.
- You will likely receive injections of an anticoagulant medication such as enoxaparin (Lovenox®) or heparin. These medications are used after surgery to lower the risk of developing a blood clot. The injections are given into the fatty tissue just under the skin (subcutaneous), usually in the belly area.
- Another way to prevent blood clots is by using compression stockings on your calves. The stockings wrap around your legs and attach to a machine that inflates and deflates them, which keeps the blood circulating through your legs.

How Long Will I Be in the Hospital?

The average hospital stay after Whipple surgery is 8-10 days, but this can vary from 7 to 21 days or more.

When Can I Return to Normal Activities?

This varies depending on your age, level of activity before surgery, other medical problems, and the type of work you do. The Whipple procedure is major surgery, and you will experience some abdominal discomfort, decreased energy, and some degree of weakness (deconditioning) for 4-6 weeks or more. It may take 12 weeks or even longer before you feel back to normal.

Eating and finding the right foods may be difficult for the first few weeks. You may also experience nausea and constipation.

What Are the Risks of a Whipple?

As with any surgery, there are risks of bleeding, infection, or an adverse reaction to anesthesia. Other risks include:

- *Pancreatic fistula leak*: In some cases, pancreatic juices may leak from one of the new connections (anastomoses) made during surgery. Usually, these leaks heal on their own (a catheter drains the leaking fluid) but it can be a serious complication and require further procedures.
- *Gastroparesis* (paralysis of the stomach): Typically, your stomach slowly begins to work about a week after surgery. Sometimes, it takes longer to adapt to the changes made during surgery, and your stomach remains paralyzed for 4-6 weeks. If you have gastroparesis and cannot eat, we will feed you in a way that does not involve the stomach - through a special IV in your arm or through a small feeding tube that was placed into the intestine during your surgery. Stomach function usually returns to normal after 4-6 weeks.
- *Pancreatic enzyme insufficiency*: Some patients may experience bloating, gas, loose stools that float, and difficulty gaining weight back after surgery. These symptoms may be the result of your pancreas' inability to make enough digestive juices. Without enough digestive juices, your intestines cannot absorb the foods you eat. To correct this problem, you will need to take pancreatic enzyme supplements just before meals. This is a prescription medication and you may need to take it long term.
- *Diabetes*: After surgery, your pancreas will not work as effectively and you may develop diabetes. If you had diabetes before surgery, it may get worse. If you were not taking any diabetes medication before surgery, the chance that you will need insulin after surgery is low. If you were taking pills to treat diabetes, especially 2 medications, there is a greater chance you will need insulin after surgery. This also depends on how much of the pancreas remains and its condition. Your doctor will discuss this with you before the surgery.

When Should I Call My Doctor?

Once home, call your doctor right away if you have:

- fever of 100.4°F (38°C) or higher, chills, sweats
- redness or drainage at your incision
- new or worsening abdominal pain, vomiting, or diarrhea
- lightheadedness or fainting
- shortness of breath or chest pain
- inability to urinate or sudden decrease in urine flow; a catheter or drain that is dislodged or doesn't work

Gastrointestinal (GI) Center: **716- 845-4010**. The center is open Mon-Fri: 8:00 a.m. to 5:00 p.m. Your call will be answered even when the center is closed. The GI Service has physicians available 24/7 to answer questions and concerns regarding your recovery after surgery.

Clear Liquid Diet

Liquids that you can see through at room temperature (about 72°-78°) are considered clear liquids.

Avoid all red and purple dyes.

Beverages

- Soft drinks (orange, ginger ale, cola, lemon/lime, etc.)
- Gatorade® or Kool-Aid®
- Strained fruit juice without pulp (apple or lemonade)
- Water, flavored waters, tea or coffee (you can add sugar, but NO milk or creamers)

Soups

- Chicken, beef, vegetable broth or bouillon – no added meats, noodles, or vegetables

Desserts

- Hard candy
- Jell-O® (no fruit toppings or whipped cream)
- Popsicles or lemon ice (no sherbets, sorbets, or fruit bars)