

Acute Pancreatitis

A plain-English guide for you and your family

WHAT IS HAPPENING

Your pancreas sits behind your stomach and makes powerful enzymes that break down the food you eat. Normally these enzymes stay locked in an inactive form—like a safety on a power tool—until they flow through a tube (the pancreatic duct) into your small intestine, where a chemical called enterokinase flips the switch and turns them on. In acute pancreatitis, something goes wrong and the enzymes activate too early, while they are still inside the pancreas. The most common trigger is a gallstone that gets stuck and blocks the exit pipe where bile and pancreatic juice meet (the ampulla of Vater). Heavy alcohol use over time, very high fat levels in the blood (triglycerides above 1,000), certain medicines, a procedure called ERCP, high calcium, and autoimmune attacks can also start it. Once those enzymes turn on, they start digesting the pancreas itself. Dying tissue spills alarm chemicals called cytokines into your bloodstream, and those cytokines make the walls of blood vessels everywhere become leaky. Fluid leaks out of your blood into your belly and tissues, which can drop your blood pressure, strain your heart, and—in severe cases—cause your lungs, kidneys, or other organs to fail. Most people recover with rest, intravenous fluids, and pain control in the hospital, but the severe form is a medical emergency. Every number your care team watches—heart rate, blood pressure, urine output, oxygen level—is a window into whether your body is keeping up or starting to lose the fight.

What you might feel

- Sudden, severe pain in the upper-middle belly that shoots straight through to the back
- Nausea and throwing up
- Belly is tender when pressed, especially just below the ribs in the center; muscles tighten up automatically (guarding)
- Belly looks swollen and feels tight; bowel sounds are very quiet or silent (ileus)
- Fast heart rate—over 90 to 100 beats per minute (tachycardia)
- Low blood pressure—top number below 90 (hypotension)—and signs of shock like cold hands and feet, slow color return when you press a fingernail (delayed capillary refill)

- Very little urine or none at all—less than half a milliliter per kilogram of body weight per hour (oliguria or no urine output (anuria))
- Low oxygen in the blood (hypoxemia) and trouble breathing (dyspnea)
- Confusion, being very sleepy, or not knowing where you are (altered mental status)
- Fever—temperature above 38°C (100.4°F)—or, in very sick patients, a dangerously low temperature below 36°C (96.8°F)

Call the doctor right away if...

- Organ failure (lungs, heart, or kidneys not working) that lasts longer than 48 hours—this defines severe acute pancreatitis and raises the risk of dying to 20–30 percent
- Blood pressure stays low even after giving 2 to 3 liters of IV fluid—means the blood vessels are wide open (distributive shock) and the patient likely needs ICU care and drugs to squeeze vessels (vasopressors)
- Little or no urine, or creatinine (kidney waste number) going up despite lots of IV fluid—signals acute kidney injury and the patient may need dialysis to clean the blood
- Oxygen saturation below 90 percent on room air, or needing extra oxygen—early warning of ARDS; the lungs can fail fast and require a breathing tube within hours
- Confusion, a belly so swollen it's rock-hard, or a rigid abdomen—can mean abdominal compartment syndrome (pressure inside the belly is crushing organs), dead bowel, or infected dead pancreas tissue; needs emergency CT scan and possibly surgery

What the care team will do

- Start aggressive intravenous fluid resuscitation with lactated Ringer solution at 250 to 500 mL per hour (or 5 to 10 mL/kg/h) immediately, using a large-bore IV catheter—18-gauge or larger.
- Measure urine output every hour using a Foley catheter (bladder tube), and titrate IV fluids to keep output above 0.5 mL per kilogram per hour (about 30 to 40 mL/h in most adults).
- Monitor vital signs every 1 to 2 hours, targeting heart rate below 120 beats per minute and mean arterial pressure (MAP) between 65 and 85 mmHg—notify the provider immediately if blood pressure stays low after 2 to 3 liters of IV fluid.
- Keep the patient NPO (nothing by mouth)—no food, no liquids—and place a nasogastric tube (NG tube, a tube through the nose into the stomach) if the patient is vomiting repeatedly or the belly is very swollen.
- Give intravenous pain medicine—usually an opioid like fentanyl (a strong synthetic pain medicine) or hydromorphone—on a scheduled basis, not just as needed, and reassess pain every 1 to 2 hours.

- Monitor oxygen saturation continuously with pulse oximetry, keeping it above 92 percent, and listen to lung sounds every 4 hours—notify the provider immediately if the patient becomes short of breath, oxygen drops, or you hear crackles (wet lung sounds).
- Check blood glucose (blood sugar) every 4 to 6 hours, and give insulin as ordered if glucose rises above 180 mg/dL.
- Watch for signs of infection—fever above 100.4°F (38°C), rising white blood cell count, confusion, or worsening abdominal pain after initial improvement—and notify the provider immediately if any appear.

Medicines you may be given — and why

Lactated Ringer's solution (IV fluid)

When the pancreas is inflamed, the blood vessels around it and throughout the body become leaky—fluid escapes from inside the blood vessels into the surrounding tissue spaces, like water leaking out of a cracked pipe. This loss of fluid from the blood causes the blood volume to drop, so less blood reaches vital organs like the kidneys and brain. Lactated Ringer's is a salt-and-water solution given through an IV that refills the blood vessels, restores blood volume, and helps blood flow (perfusion) reach all organs again. It contains electrolytes (salts like sodium, potassium, and chloride) in amounts close to normal blood, plus lactate, which the liver turns into bicarbonate to help balance acid in the blood.

Morphine, hydromorphone, or fentanyl (opioid pain relievers)

Acute pancreatitis causes severe, constant abdominal pain because the inflamed pancreas swells and stretches its outer covering (the capsule), and inflammatory chemicals irritate nearby nerves. Opioids are strong pain medicines that attach to special docking sites called mu-opioid receptors on nerve cells in the brain and spinal cord. When an opioid locks onto a receptor, it blocks the nerve from sending pain signals up to the brain, so the person feels much less pain—like unplugging a fire alarm so the loud noise stops.

Early enteral nutrition (feeding by mouth or tube into the stomach or small intestine)

The gut (intestines) has a lining that acts like a fence, keeping bacteria and toxins inside the intestine and out of the bloodstream. In acute pancreatitis, if the gut is not fed, the lining weakens and bacteria can cross into the blood (bacterial translocation), leading to infection and organ failure. Feeding the gut—even small amounts—keeps the lining strong and the good bacteria healthy. It also lowers inflammation throughout the body. Old teaching said 'rest the gut' (NPO—nothing by mouth), but studies show that actually INCREASES infection and death. Start oral or tube feeding as soon as the patient can tolerate it, usually within 24–48 hours.

ERCP with sphincterotomy and stone extraction (endoscopic procedure, not a drug)

ERCP stands for endoscopic retrograde cholangiopancreatography—a scope procedure where a flexible camera tube goes down the throat, through the stomach, and into the first part of the small intestine (duodenum). The doctor threads a thin tool through the scope into the bile duct and pancreatic duct. If a gallstone is stuck in the bile duct and blocking the flow of bile and pancreatic juice, the doctor cuts the muscle valve at the duct opening (sphincterotomy) and pulls the stone out with a basket or balloon. This relieves the blockage, lets bile and pancreatic juice drain, and stops the backup that caused the pancreatitis. It also prevents bacteria in the bile duct (cholangitis—a life-threatening infection) from spreading.

Cholecystectomy (surgical removal of the gallbladder)

In gallstone pancreatitis, a stone from the gallbladder travels down the bile duct and blocks the pancreatic duct opening, causing pancreatitis. Even after the stone passes or is removed, the gallbladder still contains more stones that can cause another attack. Cholecystectomy (removing the entire gallbladder) eliminates the source of stones and prevents recurrence. For mild pancreatitis, surgery is done during the same hospital admission once the inflammation settles (usually 48–72 hours after admission, when pain improves and labs trend down). For severe pancreatitis with tissue death (necrosis) or organ failure, delay surgery until the patient is stable and inflammation resolves (often 6 weeks or more).

Antibiotics (e.g., carbapenems like meropenem or imipenem, or fluoroquinolone + metronidazole)

Antibiotics kill or stop bacteria from growing. In acute pancreatitis, antibiotics are ONLY used when bacteria invade dead pancreas tissue (infected tissue death (necrosis)) or when there is infection outside the pancreas (like pneumonia or a urinary tract infection). Infected tissue death happens when bacteria from the gut cross into the bloodstream and seed the dead tissue. Carbapenems and fluoroquinolones penetrate (reach) the pancreas well and cover the most common bacteria (*E. coli*, *Klebsiella*, *Enterococcus*, *Bacteroides*). Metronidazole is added to cover anaerobic bacteria (bacteria that live without oxygen) from the gut. Antibiotics do NOT help sterile (no bacteria) pancreatitis and do NOT prevent infection—early studies thought preventive (prophylactic) (preventive) antibiotics might help, but large trials showed no benefit and found antibiotics can select for resistant bacteria and fungal infections.

Insulin (for hypertriglyceridemia-induced pancreatitis)

When blood triglycerides (a type of fat) rise above 1000 mg/dL, they can trigger acute pancreatitis by clogging tiny blood vessels in the pancreas and releasing toxic free fatty acids that damage pancreatic cells. Insulin drives triglycerides down fast by activating an enzyme called lipoprotein lipase (LPL) on the walls of blood vessels. LPL breaks down triglycerides in

the blood into smaller pieces (free fatty acids and glycerol) that cells can use for energy. Insulin also pushes glucose and fat into cells for storage, which lowers the amount of fat circulating in the blood. IV insulin infusion (continuous drip) plus IV dextrose (sugar water, to prevent low blood sugar) can drop triglycerides by hundreds of points within hours, stopping ongoing pancreas damage.

Plasmapheresis (therapeutic plasma exchange)

Plasmapheresis is a procedure where blood is removed from the body, passed through a machine that separates out the liquid part (plasma, which contains the triglycerides), and then the cleaned blood (without the fatty plasma) is returned to the body along with replacement fluid (donor plasma or albumin). This physically removes triglycerides from the blood in 2–4 hours—much faster than insulin alone. It is reserved for SEVERE hypertriglyceridemia (triglycerides >2000–3000 mg/dL) when the patient is critically ill, not responding to insulin, or has organ failure. Plasmapheresis buys time for other treatments (insulin, diet, medications) to take over.

Where this information comes from

- American College of Gastroenterology (ACG) Clinical Guideline: Management of Acute Pancreatitis 2013
- American Gastroenterological Association (AGA) Institute Guideline on Initial Management of Acute Pancreatitis 2018
- International Association of Pancreatology / American Pancreatic Association (IAP/APA) Guidelines 2013
- Cochrane systematic reviews on fluid resuscitation and feeding in acute pancreatitis

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