

Portal Hypertension and Varices

A plain-English guide for you and your family

WHAT IS HAPPENING

Normally, blood from your intestines and spleen flows through the portal vein into the liver, gets cleaned, and then drains out through the hepatic veins to the heart. When the liver gets scarred — usually from years of alcohol, hepatitis, or fatty liver disease — that scar tissue acts like speed bumps inside the liver's tiny blood channels. Blood starts backing up, and pressure in the portal vein climbs. The body tries to find detours, so blood reroutes through small veins in the esophagus, stomach, and belly wall. These veins were never meant to carry that much blood, so they swell into fragile balloons called varices. One day a varix can tear open, and you vomit bright red blood or pass jet-black, tarry stool. At the same time, the high pressure pushes fluid out into your belly (ascites) and lets toxins reach your brain (causing confusion called hepatic encephalopathy), and your spleen gets huge because blood pools there. All of this flows from one upstream problem: scarred liver blocking flow and raising portal pressure. The fix is to lower that pressure with medicine or a shunt, stop any active bleeding with a scope, and replace lost blood before shock sets in.

What you might feel

- Swollen belly (ascites)
- Vomiting blood or black tarry stools (melena)
- Swollen veins visible on the belly skin (caput medusae)
- Swollen legs and ankles (edema)
- Confusion or sleepiness (hepatic encephalopathy)
- Yellow skin and eyes (jaundice)
- Easy bruising or bleeding
- Enlarged spleen (splenomegaly)

Call the doctor right away if...

- Vomiting bright red blood or large amounts of blood

- Black, tarry, or bloody stools (signs of bleeding in the gut)
- Sudden confusion, extreme sleepiness, or trouble waking up (brain toxin buildup)
- Fast heart rate, dizziness, or fainting (may mean dangerous blood loss)
- Belly that swells quickly and feels tight or painful (fluid buildup or infection)

What the care team will do

- Start two large-bore IVs (18-gauge or bigger) and prepare to give packed red blood cells if hemoglobin drops below 7 grams per deciliter.
- Give octreotide IV bolus (50 micrograms) then continuous infusion (50 micrograms per hour) as soon as variceal bleeding is suspected.
- Start ceftriaxone 1 gram IV daily for at least 5 to 7 days.
- Keep the patient NPO (nothing by mouth) and place them in left side-lying position if vomiting blood.
- Monitor heart rate and blood pressure every 15 minutes during active bleeding and titrate IV fluids carefully to avoid fluid overload.
- Protect the airway and prepare for intubation (breathing tube) if the patient vomits large amounts of blood or becomes confused.
- Check complete blood count, liver function tests, INR (blood-clotting time), and type-and-crossmatch blood every 4 to 6 hours during active bleeding.
- Teach the patient that beta-blockers like propranolol or nadolol must be taken every day even after bleeding stops.

Medicines you may be given — and why

Propranolol or nadolol (non-selective beta-blockers)

These drugs slow your heart and shrink blood vessels in your gut and esophagus. The portal vein (the big blood vessel bringing blood from your intestines to your liver) is under too much pressure because the scarred liver acts like a dam. These medicines lower the pressure by reducing how much blood flows into that crowded system — like turning down the faucet so the backed-up pipes feel less strain. They help prevent varices (swollen, bulging veins in your esophagus and stomach) from bursting and bleeding.

Octreotide (IV or subcutaneous)

Octreotide is a man-made copy of somatostatin, a hormone your body naturally uses to slow down digestion and constrict (tighten) blood vessels in the gut. When a varix is actively bleeding, octreotide squeezes the splanchnic arteries (the vessels that feed your intestines, stomach, and spleen) so less blood floods into the portal system. Think of it like clamping part

of a garden hose — less water pressure downstream means the bleeding varix has a better chance to clot and stop. It is given by IV or under-the-skin injection during the first 2–5 days of a bleed, alongside endoscopy (the camera procedure that bands or glues the varix).

Ceftriaxone 1 g IV daily (or another third-generation cephalosporin)

When you bleed from varices, bacteria from your gut can sneak into your bloodstream and cause a serious infection called spontaneous bacterial peritonitis (SBP — infection of the fluid in your belly) or bacteremia (bacteria in the blood). People with cirrhosis have weakened immune defenses, so even a small bleed is a doorway for germs. Ceftriaxone is a broad-spectrum antibiotic that kills the most common gut bacteria (especially *E. coli* and other Gram-negative bugs) before they can cause sepsis or make the bleeding worse. Guidelines say to start it as soon as a variceal bleed is suspected, and continue for 5–7 days.

Proton-pump inhibitor (PPI), for example omeprazole or pantoprazole IV

A PPI turns down acid production in your stomach. Stomach acid can dissolve clots and keep a bleeding varix from healing. By raising the pH (making the stomach less acidic), a PPI helps any clot that forms on the varix stay stable. It also protects the esophagus and stomach lining from further acid damage. PPIs are usually given by IV during the acute bleed, then switched to a pill once you can swallow safely.

Lactulose (oral or enema)

Lactulose is a sweet, syrupy liquid that your body cannot digest. It sits in your colon and does two key jobs: it pulls water into your stool (acting like a gentle laxative) and it traps ammonia (a toxic waste product). In cirrhosis, the damaged liver cannot clean ammonia out of the blood, so ammonia builds up and reaches the brain, causing hepatic encephalopathy (confusion, sleepiness, personality changes — 'brain fog'). Lactulose acidifies the colon, which converts ammonia into a form (ammonium) that cannot cross into the blood, and then sweeps it out in bowel movements. The goal is 2–3 soft stools a day to keep ammonia low and your mind clear.

Blood transfusion (packed red blood cells, fresh frozen plasma, platelets as needed)

During a major variceal bleed, you lose both red blood cells (which carry oxygen) and clotting factors. Giving packed red blood cells (PRBCs) replaces the oxygen carriers and keeps your organs alive. Guidelines recommend a restrictive strategy: transfuse to keep hemoglobin around 7 g/dL in stable patients, because over-transfusing can actually raise portal pressure (more blood volume = more pressure in the backed-up portal vein) and increase the risk of re-bleeding. Fresh frozen plasma (FFP) and platelets are given if clotting numbers (INR, platelet count) are dangerously low, but they are used cautiously for the same reason — extra fluid can worsen portal high blood pressure (hypertension).

Where this information comes from

- AASLD Practice Guideline on Portal Hypertension 2016
- Baveno VII Consensus Workshop on Portal Hypertension 2022
- American College of Gastroenterology
- Cochrane Hepato-Biliary Group

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