

Postoperative Hemorrhage

A plain-English guide for you and your family

WHAT IS HAPPENING

After surgery, the surgeon ties off or seals every blood vessel that was cut so that bleeding stops completely. That seal — called hemostasis — is what keeps blood inside where it belongs. But sometimes a knot slips loose, or a clot does not hold, or a hidden vessel that looked fine during surgery starts oozing afterward, or a blood thinner keeps the blood too thin to clot. When any of these happen, blood leaks into the belly, the chest, or the tissues around the surgery site. The body tries to cope: the heart beats faster to push what little blood is left to the brain and kidneys, blood vessels squeeze tight to keep pressure up, and the kidneys hold onto every drop of water and make almost no urine. For a while, vital signs look okay — but underneath, the tank is draining. The red blood cell count starts to fall, the drain tube fills with blood, the belly gets tight and swollen, or a blood pocket shows up on imaging. If the leak is not found and stopped, pressure crashes, organs stop getting oxygen, and the patient tips into shock. The job is to catch the leak early — check the vital signs, the drain output, the belly exam, and the blood count — give blood to replace what was lost, stop any blood thinners, and take the patient back to the operating room to find the vessel and close it for good.

What you might feel

- Bleeding from the surgical cut or drain
- Swelling or a growing bruise near the surgery site
- Blood-soaked bandages that need changing often
- Fast heart rate (tachycardia)
- Low blood pressure (hypotension)
- Pale, cool, or clammy skin
- Dizziness or confusion
- Blood in the urine (hematuria) or stool (melena or bright red blood in the stool (hematochezia)), or vomiting blood (hematemesis)
- Drop in hemoglobin or hematocrit on blood tests
- History of taking blood thinners (anticoagulants or antiplatelet drugs)

Call the doctor right away if...

- Bleeding that soaks through bandages every hour or faster
- Heart rate above 120 beats per minute or blood pressure dropping below 90 systolic (the top number)
- Confusion, extreme sleepiness, or trouble staying awake
- Swelling at the surgery site that grows quickly or feels tight and painful
- Vomiting blood, blood in the urine, or black tarry stools

What the care team will do

- Get large-bore IV access (two 18-gauge or bigger needles) in place right now and start giving crystalloid fluids like normal saline or lactated Ringer solution wide open
- Apply direct pressure to any visible bleeding wound or surgical site with gauze pads
- Measure vital signs every 5 to 15 minutes: blood pressure, heart rate, respiratory rate, oxygen saturation, and temperature
- Draw blood immediately for type and crossmatch, complete blood count, PT/INR, PTT, fibrinogen, and lactate
- Measure and document all visible blood loss from drains, dressings, and wounds every 15 minutes
- Keep the patient flat or in Trendelenburg position (head down, feet up) if blood pressure is dropping
- Prepare for massive transfusion protocol by calling the blood bank and having the rapid infuser machine ready at bedside
- Keep the patient warm with blankets and warming devices on all IV fluids

Medicines you may be given — and why

Packed red blood cells (pRBCs)

Replaces the lost red blood cells that carry oxygen to every part of your body. When you lose a lot of blood after surgery, your body runs low on the cells that deliver oxygen—like losing delivery trucks. Giving packed red cells puts those trucks back on the road so your organs can breathe.

Fresh frozen plasma (FFP)

Supplies all the clotting proteins (factors) that glue a clot together. After big blood loss or if you were on a blood thinner, these factors run low or are blocked—like losing the bricks to build a wall. Fresh frozen plasma delivers a full set of bricks so clots can form and hold.

Platelets

Replaces the tiny cell fragments that form the first plug in a damaged blood vessel. When you lose a lot of blood, platelets drop, or certain blood thinners block them—like running out of sandbags to stop a leak. Transfused platelets rush to injury sites, stick together, and create a temporary seal while clotting factors build the permanent patch.

Tranexamic acid (TXA)

Stops the body from dissolving clots too soon. After injury or surgery, the body activates plasmin—an enzyme that breaks down fibrin threads in clots, like a cleanup crew arriving too early. Tranexamic acid blocks plasmin, so newly formed clots stay in place long enough to seal the bleeding vessel.

Prothrombin complex concentrate (PCC)

Delivers a concentrated dose of clotting factors II, VII, IX, and X—the exact factors blocked by warfarin and partially by some newer blood thinners. Warfarin stops the liver from making active versions of these factors, so clots cannot form properly. PCC bypasses the wait and dumps ready-made factors into the blood, reversing the blood thinner effect in minutes.

Idarucizumab

A lab-made antibody piece that grabs onto dabigatran—a blood thinner that blocks thrombin—and pulls it out of action. Dabigatran normally clamps onto thrombin (the enzyme that turns fibrinogen into fibrin clots), stopping clots from forming. Idarucizumab has an even stronger grip on dabigatran than thrombin does, so it yanks dabigatran away, freeing thrombin to do its job again.

Andexanet alfa

A fake version of factor Xa that acts as a decoy. Factor Xa inhibitors (apixaban, rivaroxaban) normally latch onto real factor Xa and block it, stopping the clotting cascade. Andexanet alfa is a modified factor Xa that still binds the drug but cannot carry out clotting itself—like a sponge soaking up the blood thinner. Once the drug is mopped up, real factor Xa is free to turn on thrombin and build clots.

Protamine sulfate

A positively charged protein that binds to negatively charged heparin and neutralizes it instantly. Heparin works by turbocharging antithrombin—a natural brake on clotting. Protamine grabs heparin and locks it up, so antithrombin returns to normal speed and the clotting cascade can proceed. Think of heparin as a magnet holding clotting factors back; protamine is the opposite magnet that cancels it out.

Cryoprecipitate

Supplies fibrinogen—the protein that forms the final mesh of a clot—and factor VIII, which is needed earlier in the cascade. After massive bleeding or dilution from fluids and transfusions, fibrinogen drops below the level needed to build strong clots (like running out of thread to weave a net). Cryoprecipitate is the frozen part of plasma richest in fibrinogen; it delivers a concentrated dose to restore clotting power quickly.

Calcium gluconate or calcium chloride

Replaces calcium, which is a required helper in almost every step of the clotting cascade. Massive transfusion brings in citrate—a preservative in banked blood that grabs onto calcium and locks it away (chelation), like handcuffing the key player. Without free calcium, clotting factors cannot activate each other, and the heart and muscles struggle because calcium also controls contraction. Giving calcium breaks those handcuffs and restores clotting and muscle function.

Vitamin K (phytonadione)

Restarts the liver's production of clotting factors II, VII, IX, and X. Warfarin blocks an enzyme (vitamin K epoxide reductase) that recycles vitamin K, so the liver runs out of the raw material needed to build active clotting factors. Giving vitamin K bypasses the blockade and refuels the assembly line, but it takes 12–24 hours for new factors to be made and released into the blood.

Where this information comes from

- American College of Surgeons (ACS)
- Society of Thoracic Surgeons (STS) 2011 bleeding guideline
- American Society of Anesthesiologists (ASA) perioperative blood management guideline
- AABB (formerly American Association of Blood Banks) transfusion guideline

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