

Placental Abruption

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THE STORY IN ONE SENTENCE

The placenta peels away from the wall of the uterus before the baby is born, cutting off the baby's oxygen and causing dangerous bleeding.

“Placental abruption means the placenta tears away from the uterus before delivery. The baby loses oxygen. The mother can bleed heavily. This is a true emergency.”

Normal anatomy — the body's job

The placenta attaches to the decidua, the thick, blood-rich lining of the uterus that forms during pregnancy. Maternal blood flows into the intervillous space—a lake of blood between the uterine wall and the placenta—and bathes the villi (tiny finger-like branches of the placenta). Oxygen, glucose, and nutrients cross from mom's blood through the villi into the baby's blood, and waste crosses back the other way. The whole system depends on the placenta staying stuck to the uterine wall so that blood flow never stops. Picture it like a sponge pressed against a soaking-wet towel: as long as they touch, fluid passes through; pull them apart, and the transfer stops.

BODY'S JOB

The placenta's job is to be the baby's lungs, gut, and kidneys all in one. It pulls oxygen from the mother's blood and pushes it into the baby's blood, trades glucose and amino acids for fuel and growth, and carries away the baby's carbon dioxide and waste. It stays attached to the decidua (the pregnancy lining of the uterus) through millions of microscopic anchors so that maternal blood can pool around the villi and exchange gases and nutrients every second. If the placenta peels away, the baby loses its only source of oxygen and food, and the mother bleeds into the gap where the placenta used to be.

1. Maternal arteries in the uterine wall pour oxygenated blood into the intervillous space, a lake of blood that surrounds the villi of the placenta.
2. Oxygen and glucose diffuse across the thin membrane of each villus into the fetal capillaries inside, while carbon dioxide and waste diffuse back into the mother's blood.

3. The mother's veins drain the used blood back out of the intervillous space and return it to her circulation to be re-oxygenated in her lungs.
4. The placenta stays anchored to the decidua by cytotrophoblast columns and fibrin, holding the entire exchange surface in place so blood flow never stops.

What breaks

The placenta peels away from the uterine wall before the baby is born. A clot forms in the space behind it and keeps pushing the placenta farther off the wall. The baby loses oxygen. The mother bleeds into her belly and vagina. The uterus becomes rock-hard and painful.

CLINICAL TERM

Placental abruption (also called abruptio placentae) is the premature separation of a normally implanted placenta from the decidua before delivery. A retroplacental a pooled collection of blood (hematoma) (blood clot behind the placenta) forms and dissects the plane between the placenta and the uterine wall, progressively detaching the placenta. Maternal vessels in the decidua tear, causing concealed or revealed bleeding (hemorrhage). The clinical hallmark is painful vaginal bleeding with a firm, tender uterus and fetal distress.

How the body compensates

The pregnant body compensates powerfully for blood loss at first—blood pressure and pulse can stay nearly normal even after losing a liter of blood—so vital signs hide the danger until the mother suddenly crashes. The job is to see the early clues (pain, firm uterus, dark bleeding, fetal distress) and act before shock arrives.

1. {'what': 'The mother's blood volume is 40–50% higher during pregnancy, giving her a large reserve', 'why': 'Pregnancy expands the blood volume by nearly two liters, so early blood loss is absorbed by this cushion without dropping blood pressure or raising pulse much—vital signs look deceptively stable.'}
2. {'what': 'Blood vessels clamp down (vasoconstriction) to keep pressure up', 'why': 'Sensors in the neck arteries detect falling blood volume and trigger the sympathetic nervous system to squeeze blood vessels tight, shunting blood away from skin and gut to keep the brain and heart supplied—hands and feet turn cold and pale.'}
3. {'what': 'The heart beats faster to maintain cardiac output', 'why': 'The heart tries to pump the remaining blood faster to keep oxygen delivery steady, so pulse climbs even while blood pressure holds—a rising pulse with steady pressure is an early warning of hidden blood loss.'}

4. {'what': 'The uterus clamps down hard (tetanic contraction)', 'why': 'Blood leaking into the uterine muscle irritates it and triggers a sustained, rock-hard contraction that compresses the vessels inside the wall to slow bleeding—this is the body's natural tourniquet, but it also cuts off placental blood flow and distresses the baby.'}
5. {'what': 'Once compensation fails, blood pressure drops suddenly and organs shut down (decompensated shock)', 'why': 'When blood loss exceeds the reserve and the vessels can't squeeze any tighter, blood pressure crashes, the brain gets confused, urine output stops, and the skin turns cold and mottled—this is the tipping point, and the window to reverse it is very short.'}
6. {'what': 'Watch the trend, not the snapshot', 'why': 'A single set of normal vital signs means nothing if the pain is worsening, the bleeding continues, or the baby's heart rate is falling—those trends show you are sliding toward the cliff even while the numbers still look okay.'}
7. {'what': 'The crash points to watch for are fetal death, maternal bleeding-driven (hemorrhagic) shock, DIC, and postpartum bleeding (hemorrhage)', 'why': 'If the placenta stays detached, the baby dies from lack of oxygen; if bleeding is not stopped, the mother bleeds into shock; if tissue factor floods her blood, DIC consumes all her clotting factors and she bleeds everywhere; and even after delivery, the damaged uterus may not contract well, causing massive postpartum bleeding.'}

Domino effect

1. A trigger—high blood pressure, preeclampsia, trauma, cocaine, smoking, or rapid fluid loss—damages the decidua or shears the placenta — Chronic high blood pressure or preeclampsia makes the tiny spiral arteries brittle and prone to rupture; a sudden blow to the belly tears the placenta loose by inertia; cocaine makes vessels squeeze and burst; smoking weakens the decidua over time; and a sudden gush of amniotic fluid shrinks the uterus so fast it pulls the wall away from the placenta. Any of these breaks the normal attachment.
2. A blood clot (retroplacental a pooled collection of blood (hematoma)) forms behind the placenta and grows, peeling the placenta farther off the wall — When maternal vessels in the decidua tear, blood pours into the space between the placenta and the uterine wall, clots, and acts like a wedge—pushing the placenta away and tearing more vessels, so the clot keeps growing and the separation spreads.
3. Dark red or maroon blood leaks out of the vagina, and constant, severe abdominal pain begins — Blood from the clot tracks down between the membranes and the uterine wall and drips out the cervix—it looks dark because it has been sitting and clotting. Blood also leaks into the uterine muscle itself (called a Couvelaire uterus), irritating the nerves and causing unrelenting, knife-like pain that does not come and go like contractions.

4. The uterus becomes rock-hard, tender, and does not relax (tetanic contraction) — Blood irritating the muscle wall triggers a sustained, tight squeeze—the uterus tries to clamp down on the bleeding vessels like a natural tourniquet. The uterus stays firm and painful to touch instead of softening between contractions.
5. The baby shows signs of distress—heart rate drops, variability disappears, or late decelerations appear — The detached portion of the placenta can no longer exchange oxygen, and the tetanic uterine contraction squeezes the spiral arteries and sometimes the umbilical cord, starving the baby of oxygen. The baby's brain senses low oxygen (hypoxia) (low oxygen) and slows the heart to conserve energy, producing late decelerations (heart rate drops after each contraction) or a flat, non-reactive tracing.
6. If bleeding continues, the mother's blood pressure drops, pulse races, skin turns cold and pale, and she goes into bleeding-driven (hemorrhagic) shock — Blood loss—either revealed (out the vagina) or concealed (trapped behind the placenta and in the uterine muscle)—shrinks the circulating blood volume. Once the body's compensatory reserve is exhausted, blood pressure falls, organs do not get enough oxygen, and shock begins—confusion, weak pulse, cold extremities, and low urine output.
7. DIC (disseminated intravascular coagulation) develops—clotting factors and platelets are consumed, and the mother bleeds from gums, IV sites, and internal organs — The damaged placenta releases tissue factor, a powerful trigger that activates the clotting cascade everywhere in the bloodstream instead of just at the injury site. Tiny clots form throughout the body, using up all the clotting proteins (fibrinogen, factors V and VIII) and platelets faster than the liver can make new ones. Once they are gone, the blood cannot clot anywhere, and the mother oozes blood from every puncture and mucous membrane.
8. Without immediate delivery and resuscitation, the baby dies from low oxygen (hypoxia) and the mother dies from bleeding-driven (hemorrhagic) shock or DIC — The placenta cannot reattach once it peels away, so the baby's oxygen supply is permanently cut—if not delivered quickly, the baby will suffer brain damage or death. The mother continues to bleed until the uterus is emptied and can contract fully, and until lost blood and clotting factors are replaced with transfusions. Every minute of delay increases the risk of fetal death, maternal hysterectomy to stop bleeding, kidney failure from shock, or death from DIC.

Symptoms · what the patient feels, and why

- Sudden, constant belly pain that does not go away: The placenta (the spongy organ that feeds the baby) tears away from the wall of the uterus (the womb), and the torn edge bleeds into the muscle. Blood trapped inside the uterus stretches and irritates the muscle wall, causing steady pain that does not come and go like a contraction.

- Vaginal bleeding (dark red or bright red): Blood from the torn placenta spills out through the cervix (the opening of the womb) and exits the vagina. The blood may be dark because it took time to leave, or bright red if it flows quickly. Sometimes all the blood stays trapped inside and you see no bleeding at all—called a concealed abruption.
- The uterus feels hard as a board and very tender when you press on it: Blood trapped between the placenta and the uterine muscle irritates the muscle, making it clamp down and stay tight (called tetanic contraction). The constant tightness makes the belly rock-hard instead of soft between contractions.
- The baby's heart rate tracing shows worrying patterns (late decelerations, loss of variability, or a slow heart rate (bradycardia)): The placenta is the baby's only source of oxygen. When part of it tears away, less oxygen reaches the baby through the umbilical cord. Low oxygen stresses the baby's heart, so the heart rate drops after each contraction (late decelerations), stops bouncing up and down (lost variability), or slows dangerously (bradycardia below 110 beats per minute).
- The mother's heart beats fast (tachycardia over 100 beats per minute): When you lose blood, your heart pumps faster to try to keep enough blood flowing to your organs. A fast heart rate (Tachycardia) is the body's first answer to bleeding—it shows up before blood pressure drops.
- The mother's blood pressure drops (hypotension, systolic below 90 mmHg): After losing a large amount of blood—often more than 500 to 1000 mL—the body runs out of tricks to keep pressure normal. Blood vessels have squeezed as tight as they can and the heart is beating as fast as it can, but there is simply not enough blood left in the system to fill the pipes, so pressure falls. This is a late, dangerous sign of severe bleeding.
- Back pain that feels deep and achy: If the placenta is attached to the back wall of the uterus (a posterior placenta), blood irritates nerves that run along the spine, sending pain signals to the lower back. The pain is steady and does not ease between contractions.
- Contractions that come very close together or feel continuous: Blood and clot trapped in the uterine muscle irritate it, triggering the muscle to squeeze. Unlike normal labor contractions that rise, peak, and relax, these contractions may blend together into one long, tight squeeze (hypertonic uterus) because the irritation never stops.

Focused exam

- Vaginal bleeding that is dark red or brown and comes with pain: The placenta has torn away from the wall of the uterus. Blood pools behind the tear or leaks out slowly. Dark blood means it has been sitting there a while. This is the signature finding of placental abruption.

- Uterus feels rock-hard, tender, and does not relax between contractions: When the placenta tears, it spills tissue factor (a chemical that triggers clotting) into the mother's blood. The uterus responds by clamping down tight and staying that way. A hard, board-like uterus in placental abruption means the muscle is contracting to squeeze shut bleeding vessels inside the wall.
- Fetal heart tracing shows late decelerations, minimal variability, or prolonged a slow heart rate (bradycardia): The baby is losing its placenta, which is the only source of oxygen. When oxygen drops, the baby's heart slows down or shows distress patterns. These patterns on the monitor tell you the baby is in trouble right now and may not survive much longer.
- Mother's heart rate is above 100 beats per minute, even if blood pressure is still normal: The mother is bleeding, either visibly or hidden behind the placenta inside the uterus. Her body senses the blood loss and makes her heart pump faster to keep blood moving to the brain and heart. A fast heart rate before blood pressure drops is an early warning sign of shock.
- Small amount of visible bleeding on the pad, but mother looks sick or has belly pain that won't stop: In placental abruption, most of the bleeding is concealed behind the placenta inside the uterus. You cannot see it. The mother can lose a liter or more of blood and you only see a small amount on the pad. Concealed bleeding (hemorrhage) is one of the deadliest features of abruption.
- Bruising on the skin, oozing from IV sites, or bleeding from the gums: Placental abruption releases tissue factor into the bloodstream. This activates the entire clotting system all at once throughout the body. Clots form everywhere and use up all the clotting factors and platelets. Now the mother cannot clot anywhere—this cascade is called disseminated intravascular coagulation (DIC, where clotting and bleeding happen at the same time). Bleeding from multiple places means DIC has started.

Diagnostics · every test answers a question

- Complete blood count (CBC) with platelets → How much blood has the mother lost, and are her platelets being consumed by clotting?
- Prothrombin time (PT), partial thromboplastin time (PTT), and fibrinogen level → Is the mother's clotting system failing because tissue factor from the placenta has triggered DIC?
- Type and crossmatch for packed red blood cells → What is the mother's blood type, and do we have compatible blood ready in case she needs transfusion right now?
- Kleihauer-Betke test or flow cytometry for fetal-maternal bleeding (hemorrhage) → Has fetal blood crossed into the mother's circulation through the torn placenta?
- Ultrasound of the uterus and placenta → Can we see a blood clot behind the placenta, or find another cause of bleeding like placenta previa?

- Continuous electronic fetal heart rate monitoring → Is the baby getting enough oxygen right now, or is the heart showing signs of distress from the damaged placenta?

Treatment logic

- Large-bore IV access and rapid infusion of crystalloid (normal saline or lactated Ringer's) followed by packed red blood cells if hemoglobin is low or patient is in shock → Replaces the blood volume lost behind the placenta and into the vagina, restoring blood flow to the mother's brain, heart, and kidneys. Stops shock before organs shut down.
- Immediate delivery—vaginal if cervix is favorable and fetal status allows, or cesarean section if fetal distress or maternal instability → Removes the baby from a failing placenta that can no longer deliver oxygen, and stops the source of maternal bleeding by emptying the uterus so it can contract down and squeeze bleeding vessels shut.
- Transfusion of fresh frozen plasma (FFP), cryoprecipitate, and platelets for documented or suspected DIC → Replaces fibrinogen, clotting factors, and platelets that have been consumed by the runaway clotting triggered by tissue factor from the torn placenta. Stops diffuse bleeding from mucous membranes, IV sites, and surgical incisions.
- Continuous electronic fetal monitoring from admission until delivery → Tracks the baby's heart rate pattern in real time so you can catch signs of worsening low oxygen (hypoxia) (late decelerations, loss of variability, a slow heart rate (bradycardia)) and decide when delivery must happen immediately.
- Antenatal corticosteroids (betamethasone 12 mg IM every 24 hours for two doses, or dexamethasone 6 mg IM every 12 hours for four doses) if gestational age is 24 to 34 weeks and delivery is not immediately necessary → Speeds up maturation of the baby's lungs so they can inflate and exchange oxygen after birth, reducing the risk of respiratory distress syndrome in a premature baby forced out early by abruption.
- Rh immunoglobulin (RhoGAM) 300 mcg IM for Rh-negative mothers (higher dose if Kleihauer-Betke test shows large fetal-maternal bleeding (hemorrhage)) → Prevents the mother's immune system from making antibodies against Rh-positive fetal blood cells that may have crossed into her circulation through the torn placenta. Protects future pregnancies from destroying red blood cells (hemolytic) disease of the newborn.

Medications

Intravenous crystalloid fluids (normal saline or lactated Ringer's) · Volume expander

These fluids are poured directly into a vein to quickly refill the blood vessels. When the placenta tears away, the mother loses a lot of blood fast. The body needs enough liquid volume to keep blood pressure up and deliver oxygen to the brain, heart, and kidneys. Crystalloids are

salt-water solutions that match the body's own fluid, so they spread through the bloodstream and prop up blood pressure while the medical team figures out how much blood has been lost.

1. The salt-water solution is given through an IV line, a thin tube placed in a vein.
2. The fluid flows into the bloodstream and increases the total volume of liquid inside the blood vessels.
3. Higher volume inside the vessels pushes up blood pressure, which had dropped because of bleeding.
4. More volume means the heart has enough liquid to pump, so oxygen-carrying blood reaches the brain, kidneys, and other organs.
5. This buys time for the team to give blood products and decide on delivery.

SAFETY WATCH

Too much fluid too fast can overload the lungs, causing pulmonary edema (fluid flooding the lungs) (fluid in the air sacs of the lungs that makes breathing hard). · Monitor urine output and lung sounds to catch fluid overload early. · If the mother already has preeclampsia with high blood pressure, extra fluid must be given carefully to avoid worsening swelling or breathing problems.

Packed red blood cells (PRBCs) · Blood product

These are bags of donated red blood cells—the cells that carry oxygen. When the placenta pulls away, the mother bleeds into her belly or out through the vagina. If she loses too much blood, her red cell count drops and her organs start to starve for oxygen. Giving her packed red cells replaces what was lost, so her blood can once again carry enough oxygen to the brain, heart, and baby.

1. A unit of packed red cells is hung on the IV pole and flows into the mother's vein.
2. The new red cells mix with her own blood and start circulating immediately.
3. Hemoglobin inside these cells picks up oxygen in the lungs.
4. The refreshed blood delivers oxygen to the heart, brain, kidneys, and uterus.
5. The mother's oxygen level and blood pressure stabilize, and the baby gets better oxygen flow across whatever placenta is still attached.

SAFETY WATCH

Blood must be cross-matched (checked to make sure the donor and recipient types match) to avoid a transfusion reaction (the immune system attacking the new cells). · Watch for fever, chills, back pain, or dark urine during the transfusion—all signs of a reaction. · In an emergency, O-negative blood (the universal donor type) can be given without waiting for a full match. · Transfusing many units quickly can drop calcium and body temperature; the team will monitor and warm the blood if needed.

Fresh frozen plasma (FFP) · Blood product (clotting-factor replacement)

Fresh frozen plasma is the liquid part of blood that contains all the clotting factors—the proteins that help blood form a solid clot. When a large abruption happens, the body uses up clotting factors faster than it can make them, and DIC (disseminated intravascular coagulation—tiny clots forming everywhere, which then uses up all the clotting supplies) can start. Giving FFP refills the tank of clotting factors so the blood can clot properly again and stop the bleeding.

1. A unit of FFP is thawed and given through an IV.
2. The clotting factors (including fibrinogen, prothrombin, and factors V, VII, VIII, IX, X, XI, and XIII) enter the circulation.
3. When a blood vessel is torn, these factors line up in a cascade (a chain reaction) to form a clot plug.
4. The clot seals the bleeding site and stops further blood loss.
5. The coagulation tests (PT, PTT, INR) improve, showing that clotting ability is coming back.

SAFETY WATCH

FFP must be ABO-compatible (the donor's plasma type must match the recipient's blood type) to avoid a reaction. · Giving too much plasma too fast can overload the circulation and cause pulmonary edema (fluid flooding the lungs) (fluid in the lungs). · Watch for allergic reactions: hives, itching, wheezing, or a drop in blood pressure. · In massive transfusion (many units of blood products at once), the team will follow a protocol to keep red cells, plasma, and platelets in balance.

Cryoprecipitate · Blood product (concentrated fibrinogen and factor VIII)

Cryoprecipitate is a concentrated dose of fibrinogen (the protein that forms the meshwork of a clot) and factor VIII (another clotting protein). When an abruption causes heavy bleeding and DIC, fibrinogen levels can drop very low—sometimes below 100 mg/dL. Without enough

fibrinogen, the blood cannot form a solid clot even if other factors are present. Cryoprecipitate quickly raises fibrinogen back into the safe zone so clots can form and bleeding can stop.

1. A pooled unit of cryoprecipitate (usually 5–10 individual donor units combined) is thawed and given through an IV.
2. Fibrinogen and factor VIII levels rise quickly in the blood.
3. When the clotting cascade is triggered at a bleeding site, fibrinogen is converted into fibrin threads.
4. These threads weave together into a meshwork that traps platelets and red cells, forming a stable clot.
5. The fibrinogen level climbs back above 100–150 mg/dL, and bleeding slows.

SAFETY WATCH

Cryoprecipitate does not need to be ABO-matched as strictly as red cells, but Rh-negative women of childbearing age should receive Rh-negative product when possible. · Watch for allergic reactions: rash, itching, or trouble breathing. · Giving too much can rarely cause clotting in the wrong places (thrombosis), though this is uncommon in the setting of active bleeding. · Check fibrinogen levels before and after to guide how many units to give.

Platelets (platelet concentrate) · Blood product

Platelets are tiny cell fragments that plug holes in torn blood vessels. When the placenta tears away, bleeding uses up platelets faster than the bone marrow can make them. If the platelet count drops below 50,000 per microliter (and especially below 20,000), the blood loses its ability to form the initial plug that starts a clot. Giving a transfusion of donor platelets raises the count back up so clotting can happen.

1. A unit of platelets (either from one donor by apheresis or pooled from several donors) is given through an IV.
2. The new platelets enter the circulation and start patrolling for breaks in blood vessel walls.
3. When they sense torn collagen fibers at a bleeding site, they stick to the injury and to each other, forming a platelet plug.
4. This plug provides a scaffold for the clotting factors to build a full fibrin clot on top.
5. The platelet count rises, and the bleeding slows or stops.

SAFETY WATCH

Platelets should be ABO-compatible when possible; Rh-negative women should receive Rh-negative platelets to avoid sensitization. · Watch for feverish (febrile) reactions (fever and chills during transfusion), which are more common with platelets than with red cells. · Allergic reactions (hives, itching, wheezing) can occur. · Platelets have a very short shelf life (five days), so they must be used quickly once issued from the blood bank. · In an emergency, platelets can be given without full cross-matching.

Betamethasone or dexamethasone (antenatal corticosteroids) · Corticosteroid (glucocorticoid)

These steroids are hormones that speed up the baby's lung development. Normally, a baby's lungs are not fully ready to breathe air until late in pregnancy. If an abruption happens before 34 weeks and the mother is stable enough to wait 24–48 hours, giving her a shot of betamethasone or dexamethasone crosses the placenta and tells the baby's lungs to start making surfactant (the slippery coating that keeps the air sacs from collapsing). This greatly lowers the baby's risk of respiratory distress syndrome (trouble breathing) and bleeding in the brain after birth.

1. The steroid is injected into the mother's muscle (usually the buttock or thigh).
2. It enters her bloodstream and crosses the placenta into the baby's blood.
3. Inside the baby's lung cells, the steroid binds to receptors (docking sites on the cell's DNA control center).
4. This binding switches on genes that make surfactant, the slippery protein-lipid mix that coats the air sacs.
5. Surfactant prevents the air sacs from sticking shut when the baby exhales, so breathing is easier.
6. The steroid also strengthens blood vessel walls in the brain, lowering the risk of bleeding (hemorrhage) (bleeding).
7. Maximum benefit is reached 24 hours after the first dose and lasts about seven days.

SAFETY WATCH

If the mother has uncontrolled diabetes, steroids will raise blood sugar significantly; monitor glucose closely and adjust insulin. · Steroids can rarely trigger pulmonary edema (fluid flooding the lungs) (fluid in the lungs) in women receiving tocolytics (drugs to stop contractions) or large volumes of IV fluid; use caution in these cases. · Do not delay emergency delivery to give steroids—maternal and fetal safety come first. · A rescue dose may be given if more than 7 days have passed since the first course and delivery has not yet happened, but repeated courses beyond one rescue are not recommended.

Anti-with high blood pressure (hypertensive) medications (labetalol, hydralazine, or nifedipine) · Antihypertensive (varies: beta-blocker + alpha-blocker, vasodilator, or calcium-channel blocker)

High blood pressure is a major trigger for placental abruption, especially in women with preeclampsia. Very high pressures (systolic ≥ 160 or diastolic ≥ 110 mmHg) can cause blood vessels in the placenta to burst or tear further. These medicines lower blood pressure by relaxing the walls of arteries, which makes it easier for blood to flow and takes stress off the placenta. Labetalol blocks adrenaline receptors (the body's gas pedal for heart rate and vessel squeeze). Hydralazine directly relaxes the muscle in artery walls. Nifedipine blocks calcium from entering muscle cells in artery walls, so they cannot squeeze tight. All three reduce the force slamming against vessel walls.

1. The medicine is given by mouth (nifedipine), slow IV push (labetalol or hydralazine), or IV infusion (labetalol).
2. Labetalol: blocks beta receptors in the heart (slowing the rate and squeeze) and alpha receptors in artery walls (preventing them from clamping down).
3. Hydralazine: directly relaxes smooth muscle in artery walls, causing them to widen.
4. Nifedipine: blocks calcium channels in artery muscle cells; without calcium, the muscle cannot contract and stays relaxed.
5. Arteries dilate (open wider), resistance to blood flow drops, and blood pressure falls.
6. Lower pressure reduces the mechanical stress on the placenta and brain, lowering the risk of stroke or further abruption.

SAFETY WATCH

Blood pressure can drop too far, reducing blood flow to the placenta and baby; monitor closely and titrate carefully. · Labetalol should be avoided in women with asthma or heart block; it can make both worse. · Hydralazine can cause reflex a fast heart rate (tachycardia) (the heart races to compensate for lower pressure) and headache. · Nifedipine can cause flushing, dizziness, and rarely can interact with magnesium sulfate to cause dangerous blood pressure drops or muscle weakness. · Never lower blood pressure so fast that the mother feels faint or the baby's heart rate becomes abnormal—slow and steady is the rule.

Magnesium sulfate · Anticonvulsant and neuroprotectant

Magnesium sulfate is given for two reasons in the setting of abruption. First, if the mother has preeclampsia with severe features (very high blood pressure, headache, vision changes), magnesium prevents seizures (eclampsia) by calming overexcited nerve cells in the brain. It works by blocking calcium from entering neurons, which keeps them from firing out of control.

Second, if the baby is less than 32 weeks and delivery is imminent, magnesium crosses the placenta and protects the baby's developing brain from bleeding and cerebral palsy by stabilizing fragile blood vessels and reducing inflammation.

1. Magnesium sulfate is given as a loading dose through an IV (usually 4–6 grams over 15–20 minutes), then a continuous infusion (1–2 grams per hour).
2. Magnesium enters cells and blocks calcium channels (the gates that let calcium trigger nerve signals).
3. In the mother's brain, this reduces neuron excitability and raises the seizure threshold, preventing eclamptic convulsions.
4. Magnesium also crosses the placenta and enters the baby's circulation.
5. In the baby's brain, it stabilizes blood vessel walls and dampens inflammatory signals, lowering the risk of intraventricular bleeding (hemorrhage) (bleeding into the fluid-filled spaces) and periventricular leukomalacia (injury to white matter that can cause cerebral palsy).
6. The drug is cleared by the kidneys; levels must be watched closely.

SAFETY WATCH

Too much magnesium causes toxicity: first, deep tendon reflexes (like the knee jerk) disappear; then breathing slows; then the heart can stop. Check reflexes, respiratory rate, and oxygen every hour. · If the mother's kidneys are not working well, magnesium builds up quickly; reduce the dose or stop the infusion and check a magnesium level. · Keep calcium gluconate at the bedside—it is the antidote if magnesium toxicity occurs. · Magnesium can cause flushing, nausea, and a feeling of warmth; these are common and not dangerous. · Do not give magnesium if the mother has myasthenia gravis (a muscle weakness disease) or heart block.

Red flags

- Heavy vaginal bleeding that soaks through a pad in less than an hour
- The baby's heart rate stays dangerously low (below 110 beats per minute) or shows late drops after every contraction
- The mother feels dizzy, sweaty, or confused—signs that her brain is not getting enough blood
- Blood pressure falls below 90/60 mmHg or the mother's pulse climbs above 120 beats per minute
- The mother's uterus stays rock-hard and does not soften at all between contractions

Nursing priorities

1. Place the patient on continuous electronic fetal heart rate monitoring immediately and watch for late decelerations, minimal variability, or a slow heart rate (bradycardia) — The baby depends completely on the placenta for oxygen, so when part of it tears away the baby gets less oxygen and the heart rate pattern shows distress before the baby dies, giving you minutes to act
2. Start two large-bore IV lines, 18-gauge or bigger, and infuse normal saline or lactated Ringer's wide open while you wait for the doctor — Abruptio can cause massive bleeding into the uterus and out the vagina, so you need big IV catheters to push fluid and blood fast enough to keep her blood pressure up and her organs perfused with oxygen
3. Draw blood immediately for type and crossmatch, complete blood count, PT, PTT, fibrinogen, and a clot test where you put her blood in a red-top tube and watch if a clot forms in 6 minutes then stays solid — Abruptio releases clotting factors from the damaged placenta into her bloodstream, using up all her clotting ability in a condition called DIC (disseminated intravascular coagulation) where she bleeds from everywhere, and the bedside clot test shows this before lab results return
4. Measure blood pressure and heart rate every 5 to 15 minutes, knowing that her heart will beat fast first to compensate before her blood pressure finally drops — The body responds to blood loss by squeezing blood vessels and speeding up the heart to maintain pressure, so a fast heart rate (tachycardia) (fast heart rate) above 100 is an early warning sign before low blood pressure (hypotension) (low blood pressure) appears and means she has already lost significant blood volume
5. Keep the patient on her left side and give oxygen by face mask at 10 liters per minute to keep her oxygen saturation above 95 percent — Left side positioning moves the heavy uterus off the large vein that returns blood to her heart, improving blood flow back to her heart and out to the placenta, while extra oxygen increases the amount dissolved in her blood to help the baby survive even with reduced placental function
6. Measure and record all vaginal bleeding by weighing pads and underpads, knowing that 1 gram of weight equals 1 milliliter of blood, and watch for blood that will not clot — Estimating blood loss by looking is inaccurate and usually underestimates by half, so weighing gives the care team real numbers to guide transfusion decisions, and blood that stays liquid means DIC has started
7. Keep the patient NPO (nothing by mouth, not even water or ice chips) and notify anesthesia immediately — Most placental abruptions need emergency cesarean delivery within 30 minutes, and having food or liquid in her stomach raises the risk she will vomit and breathe it into her lungs when anesthesia puts her to sleep

- 8.** Monitor urine output every hour with a Foley catheter and report if it drops below 30 milliliters per hour — The kidneys need good blood pressure to filter blood and make urine, so decreasing urine output tells you her organs are not getting enough blood flow and she needs more IV fluid or blood products right now before her kidneys fail

Sources

- ACOG Practice Bulletin No. 207, 2019 (Placental Abruption)
- American Journal of Obstetrics & Gynecology (AJOG) systematic reviews on abruption
- Williams Obstetrics, 26th edition
- Society for Maternal-Fetal Medicine (SMFM) clinical guidelines

Last reviewed: 2026-07-07