

Preeclampsia

A plain-English guide for you and your family

WHAT IS HAPPENING

Normally, when a woman is pregnant, the placenta (the organ that feeds the baby inside the womb) grows deep into the wall of the uterus and releases chemicals that keep blood vessels relaxed and wide open, so blood flows smoothly to the baby and the mother's blood pressure stays steady. In preeclampsia, something goes wrong early on: the placenta does not dig in deep enough, so it sits shallow and does not get enough blood. The struggling placenta then dumps too much of two proteins — sFlt-1 and sEng — into the mother's bloodstream, and these proteins poison the inner lining of her blood vessels everywhere in the body. Damaged vessels squeeze tight and leak fluid into tissues. Blood pressure climbs (often over 140/90), kidneys let protein leak into the urine, and swelling puffs up the hands and face. The brain may swell and ache or see spots and flashes of light. The liver can swell and hurt in the right upper belly, and in severe cases (called HELLP), liver enzymes spike and red blood cells break apart. If the brain swells too much, it can misfire and cause a full seizure — that is eclampsia. The only real cure is delivering the baby and placenta, because once the sick placenta is out, the poison chemicals stop, the vessels slowly heal, and blood pressure comes back down over the next few days to weeks. Until then, doctors give magnesium sulfate to calm the brain and prevent seizures, and they watch the mother and baby very closely.

What you might feel

- High blood pressure (140/90 or higher)
- Protein in the urine (proteinuria)
- Swelling of the hands and face (edema)
- Severe headache that does not go away
- Vision changes (blurred vision, seeing spots or flashing lights)
- Pain in the right upper belly (under the ribs)
- Sudden weight gain (more than 2 pounds in a week)
- Nausea or vomiting (especially later in pregnancy)
- Low platelet count (thrombocytopenia)

Call the doctor right away if...

- Blood pressure 160/110 or higher (severe range)
- Severe headache or vision changes (blurry, spots, flashing lights)
- Right upper belly pain or tenderness under the ribs
- Trouble breathing or chest pain
- Seizure (eclampsia) or confusion

What the care team will do

- Check blood pressure every 15 minutes if systolic is 160 or higher or diastolic is 110 or higher, and give IV antihypertensive (blood pressure) medicine as ordered.
- Start magnesium sulfate IV infusion with 4 to 6 grams loading dose over 15 to 20 minutes, then 1 to 2 grams per hour continuous drip as ordered.
- Monitor magnesium levels and check deep tendon reflexes (knee jerk), respiratory rate, and urine output every hour while magnesium is running.
- Place patient on continuous fetal heart monitoring to watch for decelerations (drops in baby heart rate) and reduced variability (less beat-to-beat changes).
- Measure strict intake and output every hour and watch for urine output less than 30 mL per hour or total less than 500 mL in 24 hours.
- Keep the room dim and quiet, limit visitors, and cluster care to reduce stimulation.
- Draw labs for complete blood count (CBC checks red cells, white cells, and platelets), liver enzymes (AST and ALT), creatinine (kidney function test), and platelet count at admission and daily or when condition worsens.
- Prepare for possible emergency cesarean section by maintaining IV access with at least an 18-gauge catheter, keeping patient NPO (nothing by mouth) except ice chips, and notifying the OR and anesthesia teams.

Medicines you may be given — and why

Magnesium sulfate (MgSO₄)

Magnesium sulfate calms overexcited nerve cells in the brain and blocks extra calcium from rushing into brain cells. In preeclampsia, the brain's blood vessels become leaky and swollen because of the high blood pressure and toxic proteins (sFlt-1 and soluble endoglin) released by the sick placenta. These proteins damage the inner lining of blood vessels everywhere, including the brain. When calcium floods into brain cells too quickly, the cells fire uncontrollably and cause a seizure (called eclampsia). Magnesium sits at the gates of nerve

cells and blocks the calcium channels, so the cells cannot fire all at once. It also widens blood vessels a little, which gently lowers pressure and protects the brain.

Labetalol

Labetalol blocks two kinds of receptors—alpha receptors on blood-vessel walls and beta receptors in the heart. Normally, adrenaline (epinephrine) and noradrenaline lock onto these receptors and tell the heart to beat faster and the vessels to squeeze tight. In severe preeclampsia, blood pressure spikes to 160/110 mmHg or higher because the sick placenta's proteins (sFlt-1 and soluble endoglin) damage vessel linings and make them stiff and narrow. Labetalol sits on both receptor types and blocks the adrenaline signals. The heart slows down a little, and the vessels relax, so pressure drops quickly and safely without cutting off blood flow to the placenta.

Hydralazine

Hydralazine works directly on smooth muscle cells in the walls of small arteries (arterioles). It opens potassium channels and blocks calcium channels inside these cells. Normally, calcium rushes in and makes the muscle squeeze, which narrows the vessel and raises pressure. When potassium flows out and calcium is blocked, the muscle cannot contract. The vessel relaxes and widens, so blood flows more easily and pressure drops. In preeclampsia, the toxic placental proteins (sFlt-1 and soluble endoglin) make vessels stiff and narrow; hydralazine forces them open to bring pressure down quickly.

Nifedipine (immediate-release)

Nifedipine blocks L-type calcium channels on smooth muscle cells in blood-vessel walls. Calcium normally flows through these channels and tells the muscle to squeeze, which narrows the vessel and raises pressure. When nifedipine plugs the channel, calcium cannot enter, so the muscle stays relaxed and the vessel widens. In preeclampsia, the sick placenta's proteins (sFlt-1 and soluble endoglin) make vessels tight and stiff. Nifedipine forces them to relax, which lowers blood pressure quickly and safely. It also works a little on the uterus, relaxing contractions, which can be helpful if preterm labor starts.

Betamethasone or Dexamethasone (antenatal corticosteroids)

Betamethasone and dexamethasone are synthetic versions of cortisol, the body's main stress hormone. They cross the placenta and enter the baby's lungs, brain, and gut. In the lungs, they turn on genes that make surfactant, a slippery coating that keeps the tiny air sacs (alveoli) open so the baby can breathe after birth. Without surfactant, the air sacs collapse and the baby cannot get enough oxygen (a condition called respiratory distress syndrome). Steroids also speed up the maturation of the baby's lungs, brain, and blood vessels, which lowers the risk of bleeding in the brain and gut problems. These drugs do NOT treat the mother's preeclampsia; they prepare the baby for early delivery.

Lorazepam

Lorazepam boosts the effect of GABA (gamma-aminobutyric acid), the brain's main calming neurotransmitter. GABA opens chloride channels on nerve cells, and chloride ions flow in, which makes the inside of the cell more negative and stops it from firing. In eclampsia (when preeclampsia causes a seizure), nerve cells in the brain fire together wildly because the blood vessels are leaky and swollen from the placenta's toxic proteins. Lorazepam locks onto GABA-A receptors and holds the chloride channels open longer, so nerve cells stay quiet and the seizure stops. It is used ONLY if magnesium sulfate fails or cannot be given.

Where this information comes from

- ACOG Practice Bulletin No. 222: Gestational Hypertension and Preeclampsia (2020)
- American Heart Association/American College of Cardiology (AHA/ACC) Hypertension Guideline
- CDC Maternal Health: Preeclampsia and High Blood Pressure
- World Health Organization (WHO) Recommendations for Prevention and Treatment of Preeclampsia and Eclampsia

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