

Hypertensive Emergency

A plain-English guide for you and your family

WHAT IS HAPPENING

Your body has a safety system that keeps blood flowing smoothly to your brain, heart, kidneys, and eyes even when pressure bounces around. Think of small arteries — the tiny pipes that feed organs — as gates with muscles that squeeze tighter or relax wider to keep the right amount of blood flowing through. This is called autoregulation. Over months or years of high blood pressure, those gates reset themselves to a higher normal, so your organs still get fed, but the margin for error shrinks. Now picture what happens when something suddenly pushes pressure sky-high: skipping blood-pressure pills, using cocaine or amphetamines, a tumor on the adrenal gland pumping out adrenaline (called a pheochromocytoma), preeclampsia in pregnancy, sudden kidney failure, or a blocked kidney artery. The pressure slams so hard and fast that even the reset gates cannot hold it back. The small arteries start leaking, swelling, or tearing. The brain swells or bleeds (hypertensive encephalopathy or bleeding-driven (hemorrhagic) stroke). The heart muscle does not get enough oxygen and starts dying (acute coronary syndrome or heart attack). The left side of the heart cannot pump against the high pressure, so fluid backs up into the lungs (acute pulmonary edema (fluid flooding the lungs)). The aorta — the body's biggest artery — can tear open inside its wall (aortic dissection). The kidneys shut down (acute kidney injury). The tiny blood vessels in the back of the eye burst or swell (hypertensive retinopathy). You see the damage as a pounding headache, vision that suddenly gets blurry or goes dark, crushing chest pain, gasping for air, one-sided weakness or confusion, dark urine or no urine at all, or a tearing pain ripping through the chest or back. Your doctor will look in your eyes with a light and may see swelling of the optic nerve (papilledema) (the optic nerve at the back of the eye is swollen and bulging because brain pressure is up), flame-shaped hemorrhages (bleeding), or cotton-wool spots (tiny areas where the retina is starved of oxygen). A blood test will show creatinine climbing — the kidney's waste-removal job is failing. None of this is random. Each finding is an alarm from a specific organ that is being crushed by pressure. The body tried to help by keeping blood flow steady as long as it could, but once that wall breaks, damage snowballs fast. The fix is twofold: bring pressure down carefully with an IV drip medicine in the ICU (you never drop it too fast or the brain and heart can stroke out from too little blood flow), and find the upstream cause so you can stop the cycle. This is not just high blood pressure — this is high pressure breaking things right now, and the window to reverse it is only hours.

What you might feel

- Blood pressure above 180/120 mmHg with signs that an organ is being hurt right now
- Severe headache that feels explosive or the worst of your life
- Blurred vision, seeing double, or sudden loss of part of your sight
- Chest pain or pressure, especially a squeezing or heavy feeling
- Trouble breathing or feeling like you cannot catch your breath
- Confusion, slurred speech, weakness on one side of the body, or trouble moving your face, arm, or leg
- Nausea and vomiting
- Back pain between the shoulder blades that feels tearing or ripping
- Decreased urine output or blood in the urine
- Severe anxiety, restlessness, or feeling like something terrible is about to happen

Call the doctor right away if...

- Blood pressure above 180/120 with any chest pain, shortness of breath, back pain, headache, vision changes, weakness, numbness, or confusion — call 911 immediately
- Signs of stroke: sudden face droop, arm weakness, or slurred speech — every minute counts
- Seizure, loss of consciousness, or severe agitation with sky-high blood pressure
- Chest pain or back pain that feels like tearing or ripping and may move between the chest and back — may be aortic dissection
- Pulmonary edema (fluid flooding the lungs): gasping for air, coughing up pink frothy spit, unable to lie flat

What the care team will do

- Place the patient on continuous BP monitoring with an arterial line or automatic cuff cycling every 5 to 15 minutes
- Start IV access with at least one large-bore IV and prepare titratable BP medicine like nicardipine or labetalol
- Measure urine output every hour with a Foley catheter and monitor for less than 30 mL per hour
- Perform and document a full neurologic exam every hour, checking pupil size, grip strength, speech, and orientation
- Keep the head of the bed at 30 degrees and maintain a quiet, dim environment

- Hold all oral BP medicines until the doctor gives new orders after reviewing the home medication list
- Monitor continuous EKG and watch for ST changes, new T-wave flips, or arrhythmias
- Draw labs including creatinine, BUN, electrolytes, troponin, and urinalysis at admission and recheck creatinine in 6 to 12 hours

Medicines you may be given — and why

Labetalol (IV)

Labetalol blocks two kinds of landing spots in the body. It blocks beta-1 receptors (spots on heart muscle that normally let adrenaline speed up the heart) and alpha-1 receptors (spots on artery walls that normally tell vessels to squeeze tight). By covering both, labetalol slows the heart a bit and relaxes arteries so blood flows through wider pipes, which drops pressure smoothly.

Nicardipine (IV)

Nicardipine blocks calcium channels in the muscle walls of arteries. Normally calcium rushes into those muscle cells through tiny gates and makes them squeeze tight. When nicardipine closes the gates, calcium stays out, the muscle relaxes, and the artery widens. Wider arteries mean less resistance, so pressure drops smoothly and quickly.

Clevidipine (IV)

Clevidipine works just like nicardipine—it blocks calcium channels in artery muscle so vessels relax and widen. The key difference is that clevidipine breaks down in the blood in about one minute. Enzymes in the blood called esterases chop it apart. So if pressure drops too much, turning off the drip brings pressure back up fast. This makes it very easy to fine-tune.

Esmolol (IV)

Esmolol blocks beta-1 receptors mainly in the heart. These receptors are landing spots for adrenaline and noradrenaline (the body's main fight-or-flight chemicals). When adrenaline lands, the heart beats faster and harder, which raises pressure. Esmolol sits on those spots so adrenaline cannot land. The heart slows down and pumps with less force, and pressure falls. Esmolol breaks down in red blood cells in about 9 minutes, so its effect fades fast when you stop the drip.

Sodium nitroprusside (IV)

Nitroprusside releases nitric oxide inside artery and vein walls. Nitric oxide is a gas molecule that tells smooth muscle to relax. When the muscle relaxes, both arteries and veins widen. This

drops resistance in arteries (lowers pressure) and eases the load on the heart. Nitroprusside works in seconds, so it is very powerful but must be watched closely.

Hydralazine (IV or IM)

Hydralazine relaxes the smooth muscle in artery walls, though the exact way it does this is still not completely clear. It may open potassium channels in the muscle cell membrane, letting potassium leak out. That makes the cell less excitable and the muscle relaxes. It may also release a little nitric oxide. Either way, arteries widen, resistance drops, and pressure falls. Hydralazine is slower and less predictable than nicardipine or labetalol, but it has decades of safety data in pregnancy.

Phentolamine (IV)

Phentolamine blocks alpha receptors on artery walls. Adrenaline, noradrenaline, and similar chemicals (such as those released by cocaine or a pheochromocytoma tumor) normally land on alpha receptors and squeeze vessels tight. Phentolamine covers those receptors so the squeeze signal cannot get through. Vessels relax, resistance drops, and pressure falls. It works fast and is the go-to choice when too much adrenaline-like activity is the problem.

Fenoldopam (IV)

Fenoldopam turns on dopamine-1 (D1) receptors in kidney tubules and artery walls. When these receptors switch on, arteries relax and widen, and the kidneys flush out more salt and water in the urine. Both actions lower pressure. Fenoldopam is especially helpful when you want to protect the kidneys during a with high blood pressure (hypertensive) emergency, because it increases blood flow through the kidney filters (glomeruli) and may help preserve kidney function.

Magnesium sulfate (IV)

Magnesium sulfate has two jobs in a with high blood pressure (hypertensive) emergency caused by preeclampsia or eclampsia. First, it prevents and stops seizures by blocking NMDA receptors in the brain (receptors that normally let nerve cells fire rapidly) and by competing with calcium at nerve and muscle junctions, which calms overactive nerves. Second, it gently lowers blood pressure by relaxing artery walls—magnesium blocks calcium entry into smooth muscle cells, so vessels widen a bit. The seizure-prevention effect is much stronger than the blood-pressure effect, so magnesium is always paired with another drug (such as labetalol or hydralazine) to control pressure.

Where this information comes from

- ACC/AHA Guideline on the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults (2017)

- American Heart Association Scientific Statement on Hypertensive Crisis
- European Society of Cardiology / European Society of Hypertension Guidelines for the Management of Arterial Hypertension
- UpToDate

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