

Gestational Diabetes

Pregnancy hormones make the mom's body resist insulin so the baby gets extra sugar to grow. If her pancreas cannot keep up, blood sugar stays high—that is gestational diabetes. Treat it with food changes, movement, and insulin if needed to protect both mom and baby.

THE ONE-LINE TRUTH

Blood sugar shoots up during pregnancy when the pancreas cannot make enough insulin to keep up with the body's new, higher demand.

The chain — how it unfolds

1. Placenta releases human placental lactogen, progesterone, cortisol, and prolactin starting around week 20 and peaking in the third trimester. — why: These hormones make the mother's muscle, fat, and liver cells resist insulin so more glucose stays in her blood and crosses the placenta to fuel the baby's rapid growth—this is the normal, intended physiology of pregnancy.
2. Mother's pancreas tries to compensate by expanding beta-cell mass and doubling or tripling insulin output. — why: Rising blood glucose triggers beta cells to release more insulin and even multiply (hyperplasia). In most pregnancies, this works and glucose stays under 95 mg/dL fasting and under 140 mg/dL after meals.
3. In gestational diabetes, beta cells cannot keep up—either because the woman started with less reserve (genetics, obesity, age over 35, polycystic ovary syndrome) or because insulin resistance becomes too severe—so blood glucose climbs above the safe range. — why: The pancreas hits its ceiling; it cannot make or release enough insulin to match the demand. Blood sugar stays high in both mother and baby because glucose crosses the placenta but insulin does not.
4. High maternal glucose floods the fetus, triggering fetal hyperinsulinemia and macrosomia. — why: The baby's pancreas responds to the extra sugar by making extra insulin, which acts like a growth hormone: it pushes glucose into fat and muscle cells and makes the baby store excess energy as fat, especially around the shoulders and trunk. Birthweight can climb above 4000 grams (8 lb 13 oz), raising the risk of shoulder dystocia (shoulder gets stuck behind the pubic bone during delivery) and birth injury.

5. Excess fetal urine production causes polyhydramnios (too much amniotic fluid). — why: High fetal blood sugar makes the fetal kidneys filter more and pee more to try to get rid of the glucose. Since fetal urine is the main source of amniotic fluid in the second and third trimesters, the amniotic sac swells (fluid index over 25 cm). This stretches the uterus, raises the risk of preterm labor, and can cause the umbilical cord to prolapse (slip out before the baby) if the water breaks.
6. Placenta stress and oxidative damage trigger preeclampsia in some women. — why: The placenta is working overtime to deliver extra glucose and oxygen to an overgrown baby, and that metabolic stress releases inflammatory signals and free radicals that injure the lining of the mother's blood vessels (endothelium). Damaged vessels leak protein into urine, constrict to raise blood pressure ($\geq 140/90$), and cause swelling. Preeclampsia threatens both mother (seizures, stroke, liver rupture) and baby (poor oxygen delivery, placental abruption).
7. After birth, the newborn's insulin stays high even though the glucose supply from mom is suddenly gone, causing neonatal low blood sugar (hypoglycemia) in the first hours of life. — why: The baby's beta cells were working overtime for months and cannot shut off instantly. The baby's blood sugar can drop below 40–45 mg/dL within one to three hours after delivery, risking seizures, brain injury, and poor feeding. This is why babies of mothers with gestational diabetes need blood sugar checks every few hours and early, frequent feeding or IV glucose if levels fall.
8. Long-term, both mother and child face higher risks of type 2 diabetes and metabolic syndrome. — why: Gestational diabetes unmasks the mother's underlying beta-cell weakness and insulin resistance, which do not disappear after pregnancy. About 50% of women with gestational diabetes develop type 2 diabetes within 5–10 years. The baby, programmed in the womb by high glucose and high insulin, is at increased risk for obesity, insulin resistance, and type 2 diabetes later in childhood and adulthood—this is called metabolic programming or the developmental origins of health and disease.

Spot it — what you see, and why

- Often no symptoms at all: Blood sugar is high but usually not so high that you feel sick — the body is still making insulin, just not enough to keep up with pregnancy's extra demands.
- Feeling thirsty more than usual: High blood sugar pulls extra water out of cells and into the blood, so the kidneys make more urine and the body signals you to drink more to replace what's being lost.
- Needing to pee more often: The kidneys filter out the extra sugar by dumping it into urine, which means more urine is made and the bladder fills faster.

- Feeling very tired: Cells can't use the sugar in the blood for energy because there isn't enough insulin to unlock the door and let it in, so you feel drained even though fuel is floating around.
- Blurry vision: High blood sugar causes fluid to shift in and out of the lens of the eye, changing its shape and making it harder to focus clearly.
- Baby measuring larger than expected on ultrasound: Extra sugar crosses the placenta to the baby, which triggers the baby's pancreas to make extra insulin — that insulin acts like a growth signal and the baby stores more fat and grows bigger.

Red flags — act now

- Blood sugar over 200 mg/dL at any time — may mean pre-existing diabetes, not just gestational.
- Baby growing much larger than dates suggest — raises the risk of a difficult delivery and low blood sugar in the baby right after birth.
- High blood pressure or protein in urine appearing alongside high blood sugar — may signal preeclampsia, which is dangerous for both mom and baby.
- Sudden severe headache, vision changes, or belly pain in a mom with gestational diabetes — can mean preeclampsia or another urgent complication.

Treat it — in this order

1. Dietary modification: eat three meals and two to three snacks per day, limit carbohydrates to 35–45% of calories (focus on whole grains, vegetables, lean protein), and avoid sugary drinks and simple carbs → Lowers the peak blood sugar after meals so the pancreas does not have to work as hard to make insulin. This buys time and protects the limited beta cell reserve (the storage space for making insulin).
2. Regular exercise: 30 minutes of moderate activity (brisk walking, swimming) most days of the week → Muscles pull glucose out of the blood and burn it for energy without needing insulin. This lowers blood sugar and makes cells more sensitive to insulin. Less work for exhausted beta cells.
3. Self-monitored blood glucose (fingerstick) four or more times daily: fasting and 1 or 2 hours after the start of each meal → Shows whether diet and exercise alone are enough to keep blood sugar in the safe range (fasting <95 mg/dL, 1-hour post-meal <140 mg/dL, 2-hour post-meal <120 mg/dL), or whether insulin is needed. This keeps treatment matched to what the pancreas can actually do.

4. Insulin injection (most commonly NPH or long-acting insulin such as detemir at bedtime for fasting glucose, plus rapid-acting insulin such as lispro or aspart before meals for post-meal glucose if needed) → Replaces the insulin the pancreas cannot make enough of, so blood sugar stays in the safe range. This stops the fetus from getting excess glucose that causes overgrowth (macrosomia), fluid buildup (polyhydramnios), placenta damage (preeclampsia), and newborn low blood sugar (neonatal low blood sugar (hypoglycemia)).
5. Metformin (500–2500 mg daily in divided doses) as second-line if woman refuses insulin or cannot afford it → Lowers blood sugar by making the liver release less glucose and helping cells use insulin better. Some studies show it works as well as insulin for many women with gestational diabetes.

Your top priorities at the bedside

1. Check capillary blood glucose before meals and 1 to 2 hours after the first bite of each meal, recording all values in a logbook with the food eaten. — why: Frequent monitoring catches blood sugar spikes before they harm the baby and shows which foods or meals cause problems so the care team can adjust the meal plan or insulin dose.
2. Teach the patient to count carbohydrates and plan meals with 30 to 45 grams of carbs at breakfast, 45 to 60 grams at lunch and dinner, and 15 grams at snacks, spreading carbs evenly through the day. — why: The placenta makes hormones that block insulin, so spreading carbs prevents big glucose spikes while still giving enough calories for the baby to grow properly.
3. Teach and supervise subcutaneous insulin injection technique if prescribed, emphasizing injection sites in the abdomen or thigh and proper storage of insulin vials. — why: Insulin does not cross the placenta so it safely lowers maternal blood sugar without affecting the baby, but wrong injection technique causes unpredictable absorption and dangerous blood sugar swings.