

Neonatal Sepsis

A plain-English guide for you and your family

WHAT IS HAPPENING

A newborn's immune system is just learning to work. For the first weeks of life, babies rely on antibodies passed from mom through the placenta and on their skin and mucous membranes as barriers to keep germs out. But if bacteria slip past those defenses — either during birth from mom's birth canal (like Group B Strep, E. coli, or Listeria) or later from the hospital or home (like staph or other germs) — the baby's body cannot mount a strong, fast response the way an older child or adult can. The infection spreads quickly into the blood. You might notice the baby feels too hot or too cold, stops feeding well, seems floppy or very sleepy, breathes fast or grunts with each breath, turns pale or has a yellow tint to the skin, has a low blood sugar, or even has shaking movements. None of these signs is random — each one is the baby's body sounding every alarm it has and trying to survive. The doctor will start antibiotics right away, often before test results come back, because waiting even a few hours can let the infection race ahead. With fast treatment, most babies recover fully. The key is recognizing the subtle early signs and acting immediately.

What you might feel

- Temperature instability — baby is too hot (fever over 100.4°F) or too cold (under 97.7°F)
- Poor feeding or won't suck
- Breathing fast (over 60 breaths per minute) or grunting with each breath
- Floppy or limp body (low muscle tone)
- Irritability or high-pitched cry
- Skin looks pale, mottled (blotchy), or has a blue-gray tint
- Vomiting or belly swelling
- Yellowing of the skin and eyes (Jaundice) (yellow skin and eyes) that appears in the first 24 hours or gets worse fast
- Seizures (jerking movements, staring spells, or cycling motions with the arms and legs)
- Low blood sugar (glucose under 40 mg/dL)

Call the doctor right away if...

- Pauses in breathing (Apnea) (baby stops breathing for more than 20 seconds) or turning blue
- Shock signs: very fast or very slow heart rate, weak pulses, capillary refill over 3 seconds, blood pressure dropping
- Bulging fontanelle (the soft spot on top of the head pushes outward) or stiff neck — signs meningitis may be present
- Pinpoint bleeding spots (Petechiae) or purple bleeding blotches (purpura) (tiny red or purple dots or larger bruises on the skin that don't fade when you press them) — may mean bacteria are causing blood to clot in small vessels

What the care team will do

- Check blood sugar (glucose) every 2 to 4 hours and keep it above 40 to 50 mg/dL with IV dextrose (sugar water)
- Monitor vital signs every 1 to 2 hours including temperature, heart rate, respiratory rate, blood pressure, and oxygen saturation
- Give IV antibiotics within 1 hour of sepsis recognition and before blood culture results come back
- Watch closely for signs of respiratory distress including grunting, nasal flaring, chest retractions, or oxygen saturation below 90 percent
- Assess neurologic status every 2 to 4 hours checking for lethargy, irritability, poor feeding, weak cry, seizures, or a bulging fontanelle (soft spot)
- Monitor urine output every 4 hours and keep it above 1 to 2 mL per kilogram per hour
- Keep the baby warm in an isolette or radiant warmer with skin temperature between 36.5 and 37.5°C (97.7 to 99.5°F)
- Watch for bleeding signs including oozing from IV sites, blood in stool or vomit, pinpoint bleeding spots (petechiae), or bruising and check coagulation labs if present

Medicines you may be given — and why

Ampicillin

Ampicillin punches holes in the outer wall that bacteria need to survive. Without a strong wall, the bacteria burst and die. It works especially well against Group B Streptococcus (GBS, the most common germ passed from mom during birth) and Listeria (a germ that can cross the placenta before birth). It also covers many strains of E. coli, though some are now resistant.

Gentamicin

Gentamicin slips inside bacteria and jams up the ribosome (the factory inside the germ that reads genetic instructions and makes proteins). Without working proteins, the bacteria cannot grow, repair themselves, or survive. It is especially strong against Gram-negative bacteria like *E. coli*, *Klebsiella*, and *Enterobacter*, which are common causes of early-onset and late-onset neonatal sepsis.

Vancomycin

Vancomycin blocks bacteria from building their cell wall by grabbing onto the building blocks (peptides) before they can be glued together. It is the first-choice drug for methicillin-resistant *Staphylococcus aureus* (MRSA) and coagulase-negative Staph (common in babies with central lines or who have been in the NICU for days to weeks). It also covers *Enterococcus* and *Streptococcus* species.

Cefotaxime

Cefotaxime, like ampicillin, attacks the bacterial cell wall, but it is stronger against Gram-negative bacteria like *E. coli*, *Klebsiella*, and *Enterobacter*. It also crosses into the brain and cerebrospinal fluid well, making it a good choice when meningitis is suspected. It is often used instead of gentamicin in babies with meningitis or when kidney toxicity is a concern.

Acyclovir

Acyclovir is used when herpes simplex virus (HSV) is suspected, especially in babies born to mothers with active genital herpes or babies with skin blisters, seizures, or liver inflammation without another clear cause. Acyclovir looks like one of the building blocks of viral DNA. When the virus tries to copy itself, it accidentally uses acyclovir instead of the real building block, and the copying stops. The virus cannot multiply, and the infection is controlled.

Where this information comes from

- AAP Committee on Fetus and Newborn 2018
- CDC group B streptococcus prevention guidelines 2019
- Cochrane neonatal sepsis reviews
- IDSA clinical practice guidelines

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