

What Is Prematurity?

Premature infants, known as preemies, come into the world earlier than full-term babies. Prematurity is when a pregnancy lasts less than 37 weeks; full-term infants are born 37 to 42 weeks after the mother's last menstrual period (LMP).

Thanks to recent medical advances, most premature babies survive. Those who are very small, though, are at greater risk for complications.

What Causes Prematurity?

Often, the cause of preterm delivery isn't known and wasn't within a mother's control. Sometimes it's caused by health conditions during pregnancy, such as [gestational diabetes](#), [hypertension](#), heart or kidney problems, an infection (particularly involving the amniotic membranes, or genital or urinary tracts), or bleeding due to abnormal positioning of the placenta.

Other times preterm birth can be caused by a mother's [lifestyle choices](#), such as poor nutrition, smoking, drug use, or excessive [alcohol consumption](#) during pregnancy.

Also, early deliveries can be due to a structural abnormality or overstretching of the uterus from carrying [more than one baby](#) (twins, triplets, or more).

Who Is at Risk for Premature Delivery?

Preterm deliveries are more common in women younger than 19 or older than 40, and those with a previous early delivery. However, any pregnant woman may deliver prematurely and many who do have no known risk factors.

What Care Do Preemies Need?

Preemies have many special needs that make their care different from that of full-term infants, which is why they often begin their lives after delivery in a [neonatal intensive care unit \(NICU\)](#).

The NICU is an atmosphere that limits stress to the infant and meets basic needs of warmth, nutrition, and protection to ensure proper growth and development.

Warmth

Premature babies lack the body fat needed to maintain their body temperature, even when swaddled with blankets. So incubators or radiant warmers keep them warm in the NICU.

Incubators are made of transparent plastic, and completely surround babies to keep them warm, decrease the chance of infection, and limit fluid loss. Radiant warmers are electrically warmed beds open to the air. These are used when the medical staff needs frequent access to the baby for care. A tiny thermometer taped to the baby's skin senses his/her body temperature and regulates the heat.

Nutrition and Growth

Premature babies have special nutritional needs because they grow at a faster rate than full-term babies and their digestive systems are immature. Neonatologists (pediatricians who specialize in the care of sick full-term and preterm infants) measure their weight in grams, not pounds and ounces. Full-term babies usually weigh more than 2,500 grams (about 5 pounds, 8 ounces), whereas premature babies weigh anywhere from about 500 grams (about 1 pound, 1 ounce) to 2,500 grams.

So, what are premature babies fed? Breast milk is an excellent source of nutrition, but premature infants are too immature to feed directly from the breast or bottle at first. Most premature infants have to be fed slowly because of their risk for [necrotizing enterocolitis \(NEC\)](#), an intestinal infection that primarily affects preemies.

Breast milk can be pumped by the mother and fed to the premature baby through a tube that goes from the baby's nose or mouth into the stomach. For women who can't provide breast milk (or can't provide enough of it), doctors may recommend giving the baby pasteurized human breast milk from a milk bank, which is considered a safe alternative. Formula also may be given to babies whose mothers can't provide breast milk and donor breast milk is not available.

Breast milk has an advantage over formula because it contains proteins that help fight infection and promote growth. Special fortifiers may be added to breast milk or formula because premature infants have higher vitamin and mineral needs than full-term infants.

Nearly all premature babies get extra calcium and phosphorus either by adding fortifier to breast milk or directly through special formulas for preemies. The baby's blood chemicals and minerals — such as blood glucose (sugar), salt, potassium, calcium, phosphate, and magnesium — are monitored regularly, and the baby's diet is adjusted to keep these substances within a normal range.

Some preemies who are very small or very sick cannot use their [digestive systems](#) to process food. These babies require intravenous (IV) feedings — called TPN, or total parenteral nutrition — made up of fats, proteins, sugars, and nutrients. TPN is given through a small tube inserted into a large vein through the baby's skin or umbilical stump.

What Health Problems Can Happen?

Premature infants are at risk for a number of problems, mostly because their internal organs aren't completely ready to work on their own. In general, the more premature the infant, the greater the chances of complications.

Anemia

Many preemies don't have enough red blood cells (RBCs) to carry adequate oxygen to the body. This complication, called [anemia](#), is easily diagnosed through lab tests.

Preemies may develop anemia for a number of reasons. In the first few weeks of life, infants don't make many new RBCs. Also, a baby's red blood cells have a shorter life than an adult's. And the frequent blood samples that must be taken for testing make it hard for RBCs to

replenish. Some premature infants, especially very small ones, need red blood cell transfusions.

Apnea

[Apnea](#) is a common health problem among premature babies. During an apnea spell, a baby stops breathing; the heart rate may decrease; and the skin may turn pale or blue. Apnea is usually caused by immaturity in the area of the brain that controls the drive to breathe. Almost all babies born at 30 weeks or less will have apnea. Apnea spells become less frequent with age.

In the NICU, all premature babies are monitored for apnea spells. Treatment can be as simple as gently stimulating the infant to restart breathing. But if apnea happens a lot, a baby may need medicine (most commonly caffeine) and/or a special nasal device that blows a steady stream of air into the airways to keep them open.

Bronchopulmonary Dysplasia

[Bronchopulmonary dysplasia \(BPD\)](#), or chronic lung disease, is a common lung problem among preemies, especially those weighing less than 1,000 grams (2.2 pounds) at birth. Extreme prematurity, severe respiratory distress syndrome, infections before and after birth, and prolonged use of oxygen and/or a ventilator all play a role in the development of BPD.

Preemies are often treated with medicine and oxygen for BPD. Their lungs usually improve over the first 2 years of life, but many of them continue to have asthma-like symptoms.

Hyperbilirubinemia

A common treatable condition is hyperbilirubinemia, which affects 80% of premature infants. Babies with hyperbilirubinemia have high levels of **bilirubin**, which is produced by the normal breakdown of red blood cells. This high bilirubin level leads to [jaundice](#), a yellow discoloration of the skin and whites of the eyes.

Although mild jaundice is fairly common in full-term babies (about 60%), it's much more common in premature babies. Extremely high levels of bilirubin can cause brain damage, so premature infants are monitored for jaundice and treated quickly, before bilirubin reaches dangerous levels. Jaundiced infants are placed under special blue lights that help the body eliminate bilirubin. Rarely, blood exchange transfusions are used to treat severe jaundice.

Infection

Infection is a big threat to preemies because they're less able than full-term infants to fight [germs](#) that can cause serious illness. Some infections can come from the mother before, during, or after birth. Bacterial infections can be treated with antibiotics. Other medicines are prescribed to treat viral and fungal infections.

Low Blood Pressure

Low blood pressure (hypotension) is a relatively common complication. It can be due to infection, blood loss, fluid loss, or medicines given to the mother before delivery. It's treated

with increased fluid intake or medicines. Infants who have low blood pressure due to blood loss may need a [blood transfusion](#).

Necrotizing Enterocolitis

Necrotizing enterocolitis (NEC) is the most common and serious intestinal disease among preemies. It happens when tissue in the small or large intestine is injured or begins to die off. This causes the intestine to become inflamed or, in rare cases, develop a hole.

When this happens, the intestine can no longer hold waste, so bacteria and other waste products pass into a baby's bloodstream or abdominal cavity. This can make a baby very sick, possibly causing a life-threatening infection.

NEC typically affects babies born before 32 weeks gestation, but can happen in full-term infants who have health problems, like a [heart defect](#). Babies with NEC usually develop it within the first 2 to 4 weeks of life. Treatment may involve stopping normal feedings and giving babies intravenous (IV) nutrition, draining the stomach and intestines, and/or giving antibiotics. Sometimes surgery is needed to remove a diseased portion of the intestines.

Most infants who develop NEC recover fully and do not have further feeding problems.

Patent Ductus Arteriosus

The **ductus arteriosus** is a blood vessel that is an essential part of fetal blood circulation, allowing blood to bypass the lungs, because oxygen for the blood comes from the mother and not from breathing air.

In full-term babies, the ductus arteriosus closes shortly after birth, but often stays open in premature babies. When this happens, excess blood flows into the lungs and can cause breathing problems and sometimes heart failure.

[Patent ductus arteriosus \(PDA\)](#) is often treated with medicine, which is successful in closing the ductus arteriosus in more than 80% of infants. If medical therapy fails, surgery may be required to clamp the ductus.

Respiratory Distress Syndrome

Many preemies have breathing problems. Different things can cause them, but the most common is respiratory distress syndrome (RDS).

In RDS, the baby's immature lungs don't make enough of an important substance called **surfactant**. Surfactant allows the inner surface of the lungs to expand properly when the infant goes from the womb to breathing air after birth. Fortunately, RDS is treatable and many infants do quite well.

When premature delivery can't be stopped, most pregnant women can be given medication just before delivery to hasten the production of surfactant in the infant's lungs and help prevent RDS. Then, immediately after birth and several times later, surfactant can be given to the baby if needed.

Most preemies who lack surfactant will need a breathing machine (or ventilator) for a while, but the use of surfactant has greatly decreased the amount of time they spend on the ventilator.

Retinopathy of Prematurity

A preemie's eyes are especially vulnerable to injury after birth. A serious complication is [retinopathy of prematurity \(ROP\)](#), which is abnormal growth of the blood vessels in an infant's eye.

Some cases of ROP are mild and correct themselves, but others can lead to the retina pulling away from the rest of the eye. These cases require surgery to prevent vision loss or blindness.

Looking Ahead

Preemies often need special care after leaving the NICU, sometimes in a high-risk newborn clinic or early intervention program. Besides the regular well-child visits and [immunizations](#) that all infants receive, premature infants have periodic hearing and eye exams.

Careful attention is paid to the development of the [nervous system](#), including motor skills like smiling, sitting, and walking, and the positioning and tone of the muscles.

Speech and behavioral development also are important areas during follow-up. Some premature infants may need [speech therapy](#) or [physical therapy](#) as they grow up. Babies who had [complications in the NICU](#) may need extra care from medical specialists.

Family support is also important. Caring for a premature infant is even more demanding than caring for a full-term baby, so the high-risk clinics pay special attention to the needs of the family as a whole.