

Persistent Pulmonary Hypertension in the Newborn



What is persistent pulmonary hypertension (PPHN) in the newborn?

Persistent pulmonary hypertension (PPHN) happens in newborn babies. It occurs when a newborn's circulation continues to flow as it did while in the uterus. When this happens, too much blood flow bypasses the baby's lungs. This is sometimes called persistent fetal circulation.

During pregnancy, a baby's lungs don't exchange oxygen and carbon dioxide. So the baby's lungs need only a small amount of blood to keep the tissues healthy. A baby's circulation sends most of the blood away from the lungs. It sends it through connections in the heart and large blood vessels.

After babies are born, this circulation changes when they start to breathe air. The change in pressure in their lungs helps close those fetal (prebirth) connections. This redirects blood flow so that blood is pumped to their lungs. This helps with the exchange of oxygen and carbon dioxide.

If a newborn has low oxygen levels or trouble breathing, these normal changes may not happen. This causes the baby's circulation to continue to direct the blood away from the lungs. The blood pressure in the baby's lungs stays high. This is PPHN.

What causes PPHN in the newborn?

PPHN can happen because of problems with the blood vessels in the lungs. They can be underdeveloped or abnormally developed. Or the vessels can have trouble adjusting to the outside air after birth. It can be hard to tell right away which of these is the cause.

Who is at risk for PPHN in the newborn?

A baby who has a difficult birth or birth asphyxia may be more likely to get PPHN. Birth asphyxia is a condition caused by too little oxygen.

About 1 in every 500 to 700 babies gets PPHN. It happens most often in full-term babies or babies born after their due dates.

PPHN is more likely in babies whose mothers took certain medicines late in pregnancy. These include nonsteroidal anti-inflammatory drugs (NSAIDs) and selective serotonin receptor inhibitors.

Babies with infections such as pneumonia, or problems with the heart, lungs, or both are also more likely to have PPHN.

What are the symptoms of PPHN in the newborn?

Symptoms can occur a bit differently in each child. They can include:

- Looks sick at birth or in the first hours after birth
- Lips and skin look blue (cyanosis)
- Fast breathing
- Fast heart rate
- Low blood oxygen levels while getting 100% oxygen

The symptoms of PPHN may be similar to symptoms of other conditions. Make sure your child sees their healthcare provider for a diagnosis.

How is PPHN in the newborn diagnosed?

Your baby's healthcare provider will check their health and delivery history. Then the healthcare provider will give your baby an exam. Your child may need these tests to diagnose PPHN:

- **Chest X-ray.** This can show certain problems with the lungs or heart.
- **Blood tests.** These may include arterial blood gas levels, complete blood cell count, electrolytes, and other blood tests.
- **Oxygen level checks.** Your baby's oxygen levels will be checked at different spots on their body. Your child's healthcare provider will compare these levels to check if blood is being circulated to your baby's lungs.
- **Echocardiogram.** This is an ultrasound picture of the heart and blood vessels. The provider uses this to look at different body structures and to measure the blood pressure in different areas.

How is PPHN in the newborn treated?

The goal of treatment for PPHN is to increase the oxygen to all of your baby's body systems. If your baby's body doesn't get enough oxygen, they may have long-term health problems.

Treatment will depend on your child's symptoms, age, and general health. It will also depend on how severe the condition is. Treatments may include the following.

Supplemental oxygen

Your baby gets oxygen through a mask, prongs in the nose, or plastic hood.

Endotracheal (ET) tube

This is the best way to give the most oxygen possible. A tube is put into your baby's windpipe (trachea). It helps them breathe.

Mechanical breathing machine (ventilator)

The machine breathes (moves air in and out of the lungs) for your baby.

Medicine

Some medicines treat infections, which can happen along with PPHN. Other types of medicine can help your baby's muscles and reflexes relax. This helps your baby respond better to the breathing machine. Other medicines can help the baby's heart keep blood pumping to the lungs.

Nitric oxide

Your baby can breathe in this gas. This helps to expand the blood vessels in your baby's lungs.

Extracorporeal membrane oxygenation (ECMO)

This procedure is done if your baby doesn't respond to other care. With ECMO, blood from your baby's veins is pumped through an artificial lung. Then oxygen is added and carbon dioxide is removed. The blood is then returned back to your baby. This procedure is done only in certain specialized neonatal intensive care units.

What are possible complications of PPHN in the newborn?

When blood is directed away from your baby's lungs, it's hard for their lungs to exchange oxygen and carbon dioxide. Babies with PPHN have low blood oxygen levels even when they breathe air that's 100% oxygen. This can cause serious problems. All of your baby's organs need a regular supply of oxygen-rich blood. Your baby's organs can become damaged if they don't get enough oxygen.

Key points about PPHN in the newborn

- PPHN occurs when a newborn's circulation continues to flow as it did in the uterus. When this happens, too much blood flow bypasses the baby's lungs.
- About 1 in every 500 to 700 babies gets PPHN. It happens most often in full-term babies or babies born after their due dates. It often occurs when a baby has a difficult birth.
- Your baby may need tests to check for this condition. These can include a chest X-ray, blood tests, and oxygen level checks.
- The goal of treatment for PPHN is to help move the oxygen to all of your baby's body systems.
- If your baby doesn't get enough oxygen, they may have long-term health problems.

Next steps

Tips to help you get the most from a visit to your child's healthcare provider:

- Know the reason for the visit and what you want to happen.
- Before your visit, write down questions you want answered.
- At the visit, write down the name of a new diagnosis and any new medicines, treatments, or tests. Also write down any new instructions your provider gives you for your child.
- Know why a new medicine or treatment is prescribed and how it will help your child. Also know what the side effects are.
- Ask if your child's condition can be treated in other ways.
- Know why a test or procedure is recommended and what the results could mean.
- Know what to expect if your child does not take the medicine or have the test or procedure.
- If your child has a follow-up appointment, write down the date, time, and purpose for that visit.
- Know how you can contact your child's provider after office hours. This is important if your child becomes ill and you have questions or need advice.

© 2000-2027 The StayWell Company, LLC. All rights reserved. This information is not intended as a substitute for professional medical care. Always follow your healthcare professional's instructions
This information is not intended as a substitute for professional medical care. Always follow your Healthcare professional's instructions. Copyright Krames LLC.