

Preterm Newborns (Preemies): An Overview

Who are preterm newborns (preemies)?

- Preterm newborns (preemies) are newborns who are born early. A preterm newborn is one who is born before 37 weeks of gestation (pregnancy); a preemie can be delivered very early (after only 6 months of pregnancy) or later (after 8 months), but newborns in both situations may have problems that result in the need for specialized care.
- Many newborns who are born preterm will need neonatal intensive care after birth, and some continue to face challenges or health issues throughout childhood.

How common are preterm births?

One in 10 babies (9.6%) was born prematurely in the United States in 2016.

What are some common characteristics of preterm newborns?

Some of the most common long-term problems faced by preemies are

■ Lung problems

- The lungs of preterm newborns are often not ready to function and can be damaged during necessary treatment. This form of lung disease is called *bronchopulmonary dysplasia* (BPD). Some very preterm babies with BPD will be discharged from the hospital with supplemental oxygen, often to be used for 6 to 12 months.
- Parents/guardians and child care providers need to learn how to use oxygen tanks and associated monitors as they provide these babies with usual life experiences.
- Long-term treatment of BPD overlaps with asthma treatment. (See Asthma Quick Reference Sheet [page 75] for more details.)

■ Apnea

- When a baby stops breathing, it is called *apnea*. Preterm babies can have apnea because the part of the brain responsible for breathing is immature.
- In most cases, apnea goes away when newborns reach the age when they would have been born (40 weeks after conception). Rarely does this problem continue after hospital discharge, but, in selected cases, babies may be sent home on an apnea monitor, which sounds an alarm warning for changes in breathing or heart rate.

■ Central nervous system problems

- Some babies may have brain injuries associated with preterm birth, including bleeding into the brain, which can lead to hydrocephalus (water on the brain), cerebral palsy, or another developmental disability.



Preterm baby

AAP

- All preterm babies need close monitoring for developmental problems during infancy, and some may need specialized therapies to improve their functional abilities. Please see Cerebral Palsy (CP) Quick Reference Sheet (page 95) and Hydrocephalus and Shunts Quick Reference Sheet (page 151) for more information.
- **Vision problems**
 - An overgrowth of blood vessels in the back of the eye in preterm newborns can pull on the delicate lining of the eye, called the *retina*. The retina is the part of the eye responsible for vision. This condition is called *retinopathy of prematurity* (ROP). Sometimes, this condition resolves on its own, as the baby grows; sometimes, it causes permanent vision loss. Babies may require laser surgery to stabilize the condition. Even preemies who do not require surgery have an increased need for glasses as they get older.
 - Preterm newborns are also at increased risk for eye-muscle disorders, whether or not they have ROP. The eye-muscle imbalance can make one eye or both eyes turn in or out.
 - Preterm babies should have regularly scheduled eye examinations throughout infancy and childhood. (See Visual Impairments Quick Reference Sheet [page 201] for more details.)
- **Hearing problems:** Preterm newborns face multiple risk factors for hearing loss. Most babies have their hearing tested before they leave the neonatal intensive care unit (NICU), but they may need periodic testing as they get older as well. (See Hearing Loss and Deafness/Hard of Hearing Quick Reference Sheet [page 133] for more details.)

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■ Gastrointestinal problems

- Some babies have an intestinal problem called *necrotizing enterocolitis* (NEC) in the NICU that can damage the intestine, and sections of the intestine may need to be surgically removed. This surgery can leave a baby with short gut syndrome, which makes it hard for the baby to digest food properly.
- Babies with short gut syndrome may need small, frequent feedings and a special diet.
- Preterm infants may be more prone to gastroesophageal reflux disease (GERD). See the Gastroesophageal Reflux Disease (GERD) Quick Reference Sheet (page 129).

- **Anemia:** Some preterm newborns develop anemia (low red blood cell count). They may require blood transfusions while in the NICU or may need iron and extra vitamins.

■ Nutritional problems

- Preemies frequently need a special formula or fortified breast milk (human milk) early on to grow properly.
- Some babies continue to have growth and feeding challenges that may require occupational, speech-language, or feeding therapy and, in some cases, use of feeding devices.

- **Infection:** Preterm babies may be vulnerable to infections in the first year after birth. The most serious infections are usually viral such as influenza and respiratory syncytial virus (RSV) infection that attack the lungs. Preterm babies younger than 6 months are too young for the influenza vaccine, so they depend on others to be vaccinated to protect them.

■ Developmental problems

- The development of preterm babies can vary.
- Some preemies catch up quickly and do things such as walk and talk at the same time as their peers who were born at term, that is, who were born after a full 9 months. Others may lag behind their peers and catch up around 1, 2, or 3 years (ie, 12 months, 24 months, or 36 months) of age.
- Some preemies have permanent neurologic damage and developmental delays, which are usually apparent early in infancy.
- Other preemies, without clearly defined neurologic injuries, show subtler educational and behavioral problems as they get older. Positive early childhood experiences may lessen the risk of these problems.

- Preemies may be small for their age and have long, narrow heads from the pressure on their soft skull bones.
- Some preemies are poor feeders and grow slowly in weight and height.

Who might be on the treatment team?

- Preterm babies will often be followed by a special neonatal follow-up team at the hospital where they were in the NICU. Neonatal follow-up teams might include neonatologists, developmental specialists, and neonatal nurse practitioners.
- Speech-language, occupational, physical, nutritional, and respiratory therapists might also be involved in the baby's care.
- Social workers are available to help parents/guardians cope with family and social issues.
- These teams may monitor preemies for developmental delays or apnea, or they might give special medications such as those listed in the Medications section later in this Quick Reference Sheet.
- Preemies might need to see subspecialists such as pediatric ophthalmologists (eye doctors), pulmonologists (lung doctors), neurologists (brain doctors), and gastroenterologists (stomach and intestine doctors).
- Audiologists (hearing specialists) may be needed to monitor hearing over time.

What adaptations may be needed?

Medications

- Preterm newborns should receive immunizations on the same schedule as their term peers.
- All children and staff should be fully immunized, including with influenza vaccine.
- In addition, they may receive special injections (palivizumab [Synagis]) during winter months for their first years to strengthen the immune system's ability to fight off RSV infection.
- No other routine medications are given to preterm infants, but those with BPD may receive medications for wheezing, diuretics ("fluid pills"), and supplemental oxygen.
- All staff who will be administering medications should have medication administration training (see Chapter 6).

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Dietary Considerations

- Give preemies extra time to eat and digest their food if necessary.
- Some preemies may be on special infant formulas or breast milk fortifiers.

Physical Environment and Other Considerations

- Find out from parents/guardians what challenges their child had from being born preterm and what challenges still exist.
- Check out the Quick Reference Sheets in this book related to the specific problems that the child still faces, such as GERD, cerebral palsy, and visual impairment or hearing loss.
- Preemies may be more vulnerable to losing body temperature and might need extra hats or bundling.
- Exposure to colds and respiratory illnesses can be a problem for preterm babies with lung disease. Preemies without lung disease will likely do better when faced with respiratory tract infections. With preterm newborns with lung disease, the family may want to consider using a small group care setting to limit the child's exposure to respiratory illnesses in the first year after birth. When this setting is not possible, measures such as placing a small group of infants with a primary caregiver in a separate space could be considered. Evidence for the effectiveness of these measures is lacking, however. Avoid secondary smoke exposure for all infants, but particularly for preterm infants with vulnerable lungs.
- Preterm newborns are at increased risk for sudden unexpected infant death (SUID). Be sure to place babies to sleep on their backs. A preterm baby may be even more susceptible to SUID than a term baby when placed asleep on his or her tummy.

- Remember to adjust developmental expectations to account for the baby's preterm birth (eg, an infant born 2 months early should be acting like a 4-month-old when he or she is 6 months of age).
- Let parents/guardians know whether the program staff has any concerns about a baby's hearing or vision, especially if the baby was born preterm.

What should be considered an emergency?

Preterm babies often have a complex medical history after a long newborn hospitalization. Assessment during an emergency department visit may be difficult if that background information is not readily available. The appropriate program staff should have a copy of pertinent medical history in the event that the child must be taken to the hospital for immediate evaluation.

What types of training or policies are advised?

- Pediatric first-aid training that includes CPR (management of a blocked airway and rescue breathing) with instructional demonstration and return demonstration by participants on a mannequin. *Pediatric First Aid for Caregivers and Teachers* is a course developed and run by the American Academy of Pediatrics to teach these skills as well as how to provide care for children with other problems requiring first aid (www.pedfactsonline.com/about.aspx).
- Specific training related to care, especially apnea-monitor training.

What are some resources?

- American Academy of Pediatrics: www.healthychildren.org, <https://shop.aap.org>, 1-866-843-2271
 - “Premie” (Web page), www.healthychildren.org/English/ages-stages/baby/preemie/Pages/default.aspx
 - *Understanding the NICU: What Parents of Premies and Other Hospitalized Babies Need to Know* (book)
- March of Dimes: www.marchofdimes.org

