JAUNDICE IN THE LATE PRETERM INFANT

Late preterm babies often develop a yellow color to their skin, known as *jaundice*. This happens because of an increased amount of a protein called *bilirubin*. This medical condition is called *hyperbilirubinemia* because "hyper" = increased, "bilirubin" = bilirubin, and "emia" = in the bloodstream. While all newborns have some degree of jaundice, late preterm infants are more likely to require treatment for this condition. If significant jaundice is observed in a late preterm infant in the hospital, the infant may need to stay in the hospital for treatment. Some infants may be able to receive treatment at home. Late preterm infants who are discharged to home after a few days of life may need to be followed very closely by their pediatric provider to determine if they develop jaundice that requires treatment.

Signs of Jaundice

Late preterm infants typically develop jaundice between 3 and 5 days of age. When an infant develops jaundice, a yellow color usually begins in the face (as shown in the picture below) and progresses down the body as the level of bilirubin increases.

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For example, infants with mild jaundice will have a yellow color noted only on their face. Infants with a greater degree of jaundice will have a yellow skin color on their face, trunk, and legs. Many infants may also have yellow *sclera*, which is a yellow color to the part of their eyes that is usually white. This yellow color to the eyes and skin may persist for a few days, even after the infant has been treated for jaundice and has a normal amount of bilirubin in the blood.

Causes of Jaundice

Bilirubin is produced after the body naturally breaks down red blood cells in a process known as *hemolysis*. The bilirubin then travels in the bloodstream through the liver, where it is processed by enzymes, and then enters the intestines. Then the bilirubin is eliminated from the body when an infant passes stool (i.e., has a bowel movement).

Increased bilirubin concentrations in the blood of a preterm infant may be caused by:

- Immaturity of the liver and intestinal tract, and
- A decreased number of bowel movements, often resulting from reduced feeding.

Late preterm infants typically have one or both of these reasons to have increased bilirubin in their blood. If the bilirubin reaches a certain level in the blood, an infant may require treatment until the infant's body is mature enough to easily excrete bilirubin. The amount of bilirubin in an infant's bloodstream can become high if

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a baby produces a large amount of bilirubin or if a baby cannot excrete bilirubin well.

Other possible causes of high bilirubin production in a late preterm infant include:

- Significant skin bruising,
- A blood collection under the scalp, known as a *cephalohematoma*,
- An excessive amount of red blood cells (called *polycythemia*), which may be found in growth-restricted infants and infants born to mothers with diabetes,
- An infection, and
- Certain differences in blood types of a mother and her infant, known as *blood type incompatibility*.

If an infant has increased bilirubin caused by any of these conditions, jaundice may occur early, sometimes within the first few days of life.

Monitoring

Clinicians need to closely monitor late preterm infants for signs of jaundice. If an infant appears jaundiced, a member of the healthcare team will check the baby's bilirubin level. Some hospitals check the amount of bilirubin in all infants by 48 hours of age. If an infant has normal bilirubin levels or mild jaundice that does not require treatment, the baby's pediatric provider will continue to monitor the baby closely for jaundice after discharge.

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The development of jaundice can be related to how well an infant is feeding. When infants become dehydrated, which may happen when late preterm infants do not feed vigorously, they are more likely to develop jaundice and require treatment. Hospital clinicians will closely monitor how well an infant is feeding, the number of wet and soiled diapers, and an infant's weight in order to intervene early if a baby appears to be developing jaundice. In these cases, infants may be encouraged to feed more frequently, and breastfeeding infants may require supplementation with expressed breast milk or formula if they are not latching well at the breast.

There are 2 techniques to measure the amount of bilirubin in a baby. One method involves taking a small amount of blood from an infant's heel or vein. The hospital laboratory then measures the bilirubin level in the blood sample. The results are typically obtained within 1 to 2 hours. Alternatively, a nurse can place a probe on an infant's skin that immediately determines the amount of bilirubin in the infant's blood. This technique is known as *transcutaneous bilirubin testing*. If the bilirubin test is elevated, a blood test is sometimes performed to confirm the skin test results.

Treatment of Jaundice

Once the bilirubin result is known, the healthcare team will determine whether the baby requires treatment. The need for treatment of jaundice depends on several factors, including:

- Age of the infant,
- Weight of the baby,

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- Degree of prematurity,
- Bilirubin level, and
- Other medical conditions.

Treatment for jaundice in a late preterm infant is sometimes started during the first few days of life while the infant is still in the hospital. In other situations, jaundice occurs after an infant is discharged and the baby may either receive treatment at home or more commonly, return to the hospital for care.

When an infant's bilirubin concentration is high for that baby's age, weight, and degree of prematurity, treatment will be started so that the bilirubin does not continue to increase. Extremely high bilirubin levels might be dangerous because they may cause injury to the baby's brain or nervous system.

In most cases, jaundiced infants can be easily treated with *phototherapy*. This light therapy helps to convert the bilirubin in a baby's body to a different type of bilirubin that is more easily excreted in the baby's stool. During treatment, the infant's clothes (except for the diaper) are removed because treatment is most effective when there is a large amount of skin exposed to the light. To prevent a baby from getting cold, the infant may need to be placed in an incubator (see Temperature Control Chapter) even if the baby had previously had stable temperatures in a crib.

There are two ways to provide phototherapy. The picture below shows phototherapy lights that can be placed over a baby in an incubator that emits a blue fluorescent light.

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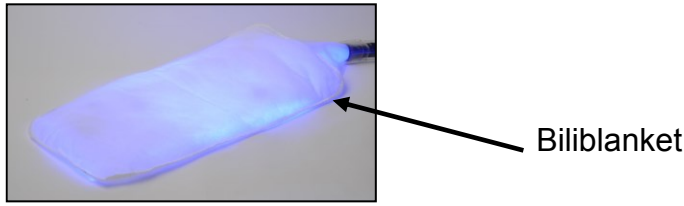
Alternatively, a baby can be placed on a soft blanket, called a *biliblanket*, which also emits a blue light.



When a baby is treated with phototherapy lights, a covering, sometimes referred to as a bilirubin mask, is placed over the baby's eyes to minimize the baby's discomfort from the bright lights.

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In the majority of cases, late preterm infants with significant jaundice will need to stay in the hospital to receive phototherapy. Depending on the degree of jaundice, phototherapy can be provided in the Newborn Nursery, Mother's Room, or SCN/NICU. For some babies with mild jaundice, who are otherwise well, home phototherapy with a biliblanket can be used. Sometimes a baby may not require treatment for jaundice until after discharge from the hospital. In this case, the baby can either receive home phototherapy with a biliblanket or may need to be re-hospitalized for phototherapy and hydration.

Jaundiced infants who are treated with phototherapy often need treatment for a short period of time, usually 1 to 3 days. Once phototherapy is stopped, the infant will have another bilirubin test in 4 to 24 hours. A few babies will have an increase in their bilirubin concentration and may need to receive phototherapy again. Some babies will have a slight increase in their bilirubin level and will not need to be started on phototherapy but will need to see their pediatric care provider the next day to recheck their bilirubin level.

Other Treatments

Rarely, a late preterm infant's bilirubin level will be very high. This most often occurs because the mother has a different blood type from the infant. In this scenario, after small amounts of fetal blood enter into the mother's bloodstream during pregnancy, the mother produces *antibodies* to break down the foreign fetal red blood cells in her body. While this is an appropriate response that

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does not impact the fetus, these antibodies can then cross over into the fetal bloodstream, causing breakdown of fetal red blood cells in the fetal circulation. This may cause a large amount of the infant's red blood cells to be broken down during pregnancy and/or soon after birth, leading to a rapid increase in the amount of bilirubin in the infant's bloodstream. The medical term for this is *ABO incompatibility*.

Infants with ABO incompatibility may require close monitoring of their bilirubin concentrations beginning in the first day of life. Some infants may need to be treated with phototherapy. If an infant still continues to have rising bilirubin concentrations, an intravenous treatment, called *intravenous immune globulin* (*IVIG)*, can be given to the baby to slow down the process of red blood cell breakdown.

In rare cases, the bilirubin concentration may increase very quickly or become extremely high, and an *exchange transfusion* may need to be performed. In this procedure, an infant is given donated blood while some of the baby's blood is removed. By exchanging the infant's blood with different blood, the infant's bilirubin and the antibodies that are destroying the infant's red blood cells can be removed. If a large amount of red blood cells are broken down, some infants may need a transfusion with red blood cells. This transfusion may be done while the infant is in the hospital or in some situations, may be needed after the baby is discharged.

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If the cause of the baby's jaundice is not easily identified, some babies may need follow-up with a specialist called a *hematologist* for further evaluation.

Conclusion

Late preterm infants require close observation for jaundice. Not only are late preterm infants more likely than term infants to develop jaundice, but they are also more likely to require treatment for jaundice. Some late preterm babies need to stay in the hospital for treatment. Other late preterm infants may need to be followed very closely by their pediatric care provider after discharge from the hospital to determine if they need treatment. Families may be concerned if their infant needs to be treated for jaundice but jaundice is usually an easily treatable condition that will resolve over several days.

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