

Newborn Jaundice

Newborn jaundice, or hyperbilirubinemia, develops when red blood cells (RBCs) are broken down and release bilirubin. The liver helps metabolize bilirubin so it can be excreted in urine or stool, but when the rate of RBC breakdown exceeds the rate of elimination, it results in a buildup of bilirubin in the body.

Jaundice can be the result of excessive numbers of RBCs breaking down (as in Rh or ABO incompatibility), bruising, polycythemia, or a slow rate of metabolism and elimination—as can occur with an infection, lack of enzyme activity, dehydration, or constipation.

Bilirubin buildup can manifest itself as a yellowish color of the sclera and skin of an infant. This skin color progresses in a cephalocaudal pattern (head to toe). Jaundice becomes particularly harmful when the level of the bilirubin in the blood is too high because it can cross the blood-brain barrier and deposit into the cells of the brain and spinal cord, resulting in bilirubin encephalopathy.

The goals of assessment and therapy are to initiate phototherapy and prevent the bilirubin from climbing to dangerous levels. In the event that it rises and approaches critical levels, an exchange transfusion can be done. This process consists of removing small volumes of blood while replacing them with fresh, whole donor blood or normal saline (in the case of polycythemia). Infants of Chinese, Japanese, Korean, Native American, and Greek descent are at higher risk for having hyperbilirubinemia.

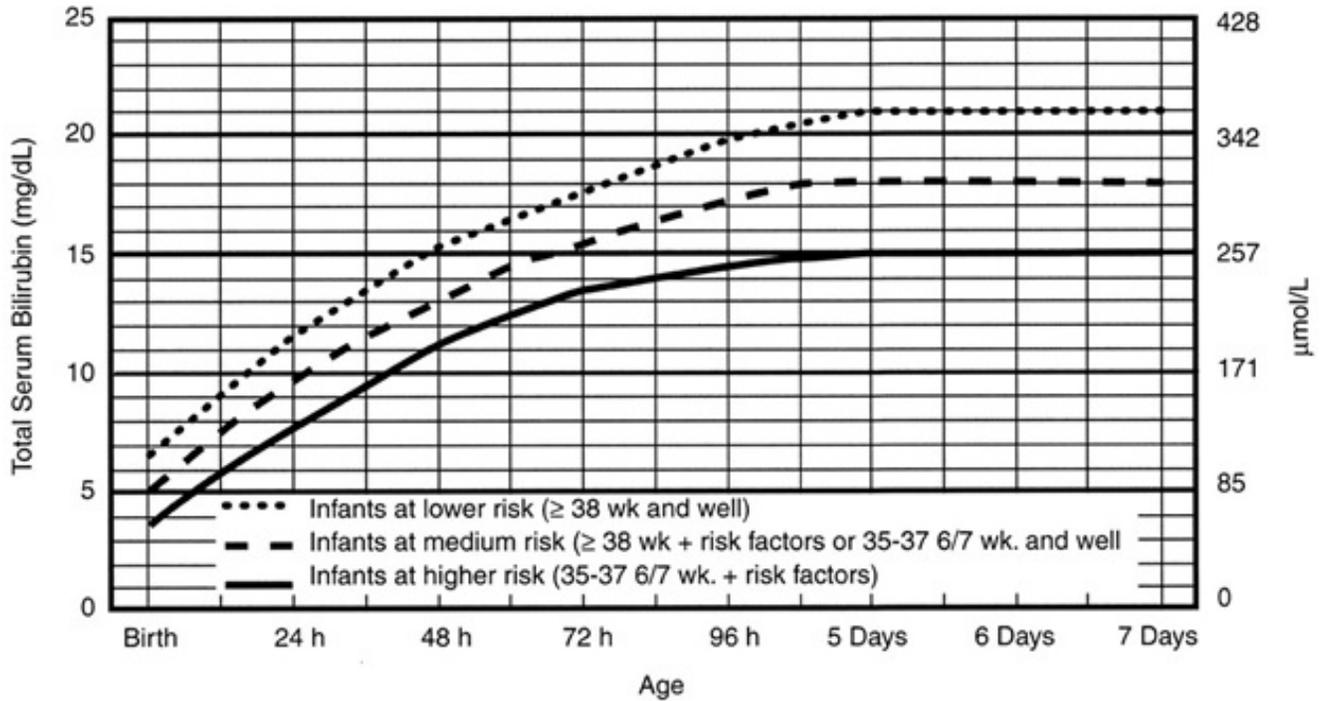
Methods to determine the level of bilirubin present include transcutaneous instruments and sampling the serum. The transcutaneous assessments have not proven reliable beyond a certain level and thus have limitations associated with the instrument. Serum assessment is more reliable when the levels are elevated. Visual inspection alone is not sufficient to determine bilirubin levels. Even if a test is in the normal range, based on the infant's age (in hours) and the rate of increase, the bilirubin level can rise and cross into a dangerous zone (see figure on next page).

An infant with significant risk factors and climbing levels is not a candidate for early discharge. When an infant is discharged, it is necessary for parents to keep appointments for jaundice evaluation and further bilirubin tests. It is important to give regular feedings (every 2–3 hours) to promote an active pattern of stooling and to provide adequate hydration and elimination. Parents need to be informed of signs indicating that the bilirubin level is too high, including fussiness, limp or floppy tone, stiffness in arms or legs, arching of the neck or back, high-pitched cries, or sleepiness. Any change in level of response (consciousness) should be reported immediately.

Bibliography

Verkland, M., & Walden, M. (2015). *Core curriculum for neonatal intensive care nursing* (5th ed.). St. Louis, MO: Elsevier Saunders.

Hyperbilirubinemia Levels



- Use total bilirubin. Do not subtract direct reacting or conjugated bilirubin.
- Risk factors = isoimmune hemolytic disease, G6PD deficiency, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, or albumin < 3.0g/dL (if measured)
- For well infants 35-37 6/7 wk can adjust TSB levels for intervention around the medium risk line. It is an option to intervene at lower TSB levels for infants closer to 35 wks and at higher TSB levels for those closer to 37 6/7 wk.
- It is an option to provide conventional phototherapy in hospital or at home at TSB levels 2-3 mg/dL (35-50mmol/L) below those shown but home phototherapy should not be used in any infant with risk factors.

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Newborn Jaundice: Information for Parents

When an infant's skin has a yellowish or orange color, this is known as *jaundice*. Jaundice occurs when red blood cells are broken down, giving the baby's skin a yellowish color. Bilirubin is a pigment that is released from the red blood cells. The liver helps break down the bilirubin so it can be removed from the body in the stool, but when the rate of breakdown exceeds the rate of elimination, it leads to buildup of bilirubin. Sometimes special lights are used on infants whose levels are high. This is called *phototherapy*. These lights work by helping to break down bilirubin in the skin. The infant is placed under artificial light in a crib or isolette and will wear only a diaper and special eye shades to protect the eyes. Treatment can last 1 to 2 days, and further testing called a bilirubin test will be done. Babies who were born early, bruised during delivery, or have a different blood type from their mothers have a higher risk of getting jaundice. Jaundice becomes harmful when the level of bilirubin in the blood is very high.

The only way to know the level of bilirubin in the blood is to test the baby's blood. Even if a test is normal, the bilirubin level can sometimes rise. When a baby is sent home, a follow-up appointment with your baby's provider will be made. This appointment will help decide if an additional bilirubin test is needed.

If your baby is more mature and able to feed normally, it is important to feed your baby every 2–3 hours. Frequent feedings will help your baby poop more often so that the bilirubin is removed from his or her body. You can check for jaundice by pressing a fingertip on your baby's nose, cheek, or forehead. When you remove your fingertip, the pressed area should look lighter for a few seconds before turning pink. If the area is yellow after your fingertip is removed, this shows that your baby has jaundice. This process can be repeated on the upper chest and tummy area. Jaundice starts in the face, moves down to the tummy area, and then spreads to the legs and feet.

Look for signs that show your baby's bilirubin might be too high, including fussiness, stiffness in arms or legs,



arching of the neck or back, high-pitched cries, or sleepiness. Phototherapy is used to prevent your baby's bilirubin from rising. The light waves in phototherapy change the bilirubin in skin to a substance that is easily removed in the urine or stool. If your baby is under the lights, it is important to keep his or her eyes covered (to protect him or her from the light) and have as much skin exposed as possible. Phototherapy is safe and can sometimes be done at home.