



**Management of Hyperbilirubinemia in the Healthy Term Newborn**  
**Clinical Practice Guideline**  
**MedStar Health**  
**Ambulatory Best Practices Committee- Pediatric**  
**2014**

**INTRODUCTION**

Each year approximately 60% of the 4 million newborns in the United States become clinically jaundiced. Many receive various forms of evaluation and treatment. Questions regarding potentially detrimental neurologic effects from elevated serum bilirubin levels prompt continuing concern and debate, particularly with regard to the management of the otherwise healthy term newborn without risk factors for hemolysis. Although most data are based on infants with birth weights >2500 g, "term" is hereafter defined as 37 completed weeks of gestation.

There are no simple solutions to the management of jaundiced neonates. Continuing uncertainties about the relationship between serum bilirubin levels and brain damage as well as differences in patient populations and practice settings contribute to variations in the management of hyperbilirubinemia. Early postpartum discharge from the hospital further complicates the management of jaundiced newborns, because it places additional responsibilities on parents or guardians to recognize and respond to developing jaundice or clinical symptoms.

The exact incidence of chronic bilirubin encephalopathy is not known but is very low; in 1 study, 90 cases were documented in term and near-term infants in 21 states over a period of 17 years.<sup>1</sup> In a recent prospective study in the United Kingdom and Ireland, the incidence of chronic bilirubin encephalopathy was estimated at 0.9 per 100 000 live births.<sup>2</sup> Efforts have been made by clinicians to eliminate this rare but devastating condition by instituting system-level measures to screen for hyperbilirubinemia and by aggressively managing high bilirubin levels.

**Risk Factors for Hyperbilirubinemia:**

- History of a previous sibling with hyperbilirubinemia
- Family history of neonatal jaundice
- Cephalohematoma
- Ethnicity (Asian, black)
- Gestational age <38 weeks
- Exclusive breast-feeding or feeding difficulties.
- Large weight loss after birth
- Risk for hemolysis.
- Significant bruising
- Maternal age (>25 years)
- Male gender
- Glucose-6-phosphate dehydrogenase deficiency

**RECOMMENDATIONS**

The following recommendations were developed to aid in the evaluation and treatment of the healthy term infant with hyperbilirubinemia. Important in the development of these guidelines is the general belief that therapeutic interventions for hyperbilirubinemia in the healthy term infant may carry significant risk relative to the uncertain risk of hyperbilirubinemia in this population. These guidelines apply to infants without signs of illness or apparent hemolytic disease.

**Evaluation**

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1. Maternal prenatal testing should include ABO and Rh(D) typing and a serum screen for unusual isoimmune antibodies.
2. A direct Coombs' test, a blood type, and an Rh(D) type on the infant's (cord) blood are recommended when the mother is Rh-negative, type O, or has not had prenatal blood grouping.
3. Institutions are encouraged to save cord blood for future testing, particularly when the mother's blood type is group O. Appropriate testing may then be performed as needed.
4. When family history, ethnic or geographic origin, or the timing of the appearance of jaundice suggests the possibility of glucose-6-phosphate dehydrogenase deficiency or some other cause of hemolytic disease, appropriate laboratory assessment of the infant should be performed.
5. Follow-up should be provided to all neonates discharged less than 48 hours after birth by a health care professional in an office, clinic, or at home within 2-3 days of discharge.

### Physical Exam

1. A TSB level (total serum bilirubin) needs to be determined in infants noted to be jaundiced in the first 24 hours of life.
2. Screening for hyperbilirubinemia may consist of risk-factor assessment, measurement of bilirubin level (either in serum or by transcutaneous estimation), or a combination of methods
3. In newborn infants, jaundice can be detected by blanching the skin with digital pressure, revealing the underlying color of the skin and subcutaneous tissue. The clinical assessment of jaundice must be done in a well-lit room. Dermal icterus is seen first in the face and progresses caudally to the trunk and extremities. As the TSB level rises, the extent of cephalocaudal progression may be helpful in quantifying the degree of jaundice; use of an icterometer or transcutaneous jaundice meter may also be helpful.
4. Evaluation of newborn infants who develop abnormal signs such as feeding difficulty, behavior changes, apnea, or temperature instability is recommended regardless of whether jaundice has been detected to rule out underlying illness.
5. Approximately one third of healthy breast-fed infants have persistent jaundice after 2 weeks of age. A report of dark urine or light stools should prompt a measurement of direct serum bilirubin. If the history (particularly the appearance of the urine and stool) and physical examination results are normal, continued observation is appropriate. If jaundice persists beyond 3 weeks, a urine sample should be tested for bilirubin, and a measurement of total and direct serum bilirubin obtained.

### Treatment

Direct bilirubin measurements vary substantially as a function of individual laboratories and their instrumentation. For the purposes of the otherwise healthy appearing jaundiced newborn, it is recommended that the direct bilirubin measurement not be subtracted from the TSB level and that the TSB level be relied on as the relevant criterion. Determination of the rate of rise of TSB and the infant's age may help determine how often to monitor bilirubin levels and whether to begin phototherapy. Continued observation may be an appropriate alternative to repeated TSB testing and phototherapy.

Please access AAP article Hyperbilirubinemia Guideline 2009, Pediatrics. October 1, 2009, Vol. 124, No. 4, pp. 1193-1198, (doi: 10.1542/peds.2009-0329) via link, <http://pediatrics.aappublications.org/content/124/4/1193.short>

1. For Treatment Guidelines for Phototherapy In Hospitalized Infants Of 35 Or More Weeks' Gestation
2. Exchange Transfusion
3. Management of Hyperbilirubinemia in the Healthy Term Newborn by Age (in Hours)

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### **Treatment of Jaundice Associated With Breast-feeding in the Healthy Term Newborn**

In healthy term newborns encouragement of continued and frequent breast-feeding (at least eight to ten times every 24 hours) is recommended. Supplementing nursing with water or dextrose water does not lower the bilirubin level in jaundiced, healthy, breast-feeding infants. Depending on the mother's preference and the physician's judgment, however, a variety of options are presented below for possible implementation beyond observation:

- Observe
- Continue breast-feeding; administer phototherapy
- Supplement breast-feeding with formula with or without phototherapy
- Interrupt breast-feeding; substitute formula
- Interrupt breast-feeding; substitute formula; administer phototherapy

### **Hydration**

To our knowledge, no evidence exists that excess fluid administration affects the serum bilirubin concentration. Some infants who are admitted with high bilirubin levels are also mildly dehydrated and may need supplemental fluid intake to correct their dehydration. As these infants are almost always breast-fed, the best fluid to use in these circumstances is a milk-based formula, because it inhibits the enterohepatic circulation of bilirubin and helps lower the serum bilirubin level. Because the photoproducts responsible for the decline in serum bilirubin are excreted in both urine and bile, maintaining adequate hydration and good urine output should help improve the efficacy of phototherapy. Routine supplementation (with dextrose water) of infants receiving phototherapy is not indicated.

### **Home Phototherapy**

Home phototherapy is a recognized treatment strategy for many newborns, supports maternal and parental bonding, is cost effective, and allows the family to be in the comfort of their home. Infants with bilirubin levels between 10 and 20 may be candidates for home therapy if *Criteria For Home Therapy* are met as listed below.

#### Infant Criteria for Home Phototherapy:

- Infant must be at least 24 hours old
- Gestational age of 36 weeks and above
- Infant is feeding well (Breastfeeding q 1-3 hours, 10-15 minutes/side with good suck, or Bottle feeding q 2-4 hours, 1-3 oz. with good suck)
- Voiding with in normal limits
- Passes first meconium stool and continues to stool
- No signs or symptoms of illness

Infants with Bilirubin levels above 20mg/dl, or those infants who have congenital problems will be evaluated for appropriateness for home phototherapy on an individualized basis by the Home Care Agency prior to accepting of the case.

### **When Should Phototherapy Be Stopped?**

A recent study found that, in infants who do not have hemolytic disease, the average bilirubin rebound after phototherapy is less than 1 mg/dL (17 umol/L). Phototherapy may be discontinued when the serum bilirubin level falls below 14 to 15 mg/dL. Discharge from the hospital need not be delayed in order to observe the infant for rebound and, in most cases, no further measurement of bilirubin is necessary. If phototherapy is initiated early and discontinued before the infant is 3 to 4 days old, additional outpatient follow-up may be necessary.

**PARENT EDUCATION: Parent literature can be printed out from Centricity 'Pediatrics- Jaundice of the Newborn'.** Information about jaundice in newborns is also available in Spanish, English, Chinese and Italian: from the American Academy of Pediatrics at <http://www.aap.org/family/jaundicefaq.htm>.

Even though many parents are staying in the hospital for 48 hours after delivery some parents still take advantage of Early Discharge Programs. Due to this all parents should be informed about jaundice of the newborn.

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## A. What is Jaundice

Jaundice is caused by an increased amount of a yellow pigment called bilirubin in the body. This causes the skin and whites of the eyes (the sclera) to be yellow. It is best judged by viewing the baby unclothed in natural light. Bilirubin is produced by the normal breakdown of red blood cells, and accumulates if the liver doesn't excrete it into the intestines at a normal rate.

## B. Causes and Treatment of Jaundice

- ◆ *Physiological (normal) jaundice.* Normal jaundice occurs in over 50% of babies. Immaturity of the liver causes a slower processing of bilirubin. The jaundice first appears at 2 to 3 days of age. It usually disappears by 1 to 2 weeks of age, and the levels of bilirubin are harmless.
- ◆ *Breast-feeding jaundice.* May occur when the baby does not drink enough breast milk. It occurs in 5-10% of newborns. Jaundice symptoms are similar to those of physiological jaundice, just more pronounced. This jaundice indicates a need for help with breast-feeding.  
**Treatment- encourage mother to increase the supply of breast milk. She should nurse every 1-1 ½ to 2 and 2 ½ hours. Since bilirubin is carried out to the body in the stools, passing frequent bowel movements is helpful. If the baby sleeps more than 4 hours at night, she should be instructed to awaken him for a feeding. Frequent weight checks are also important.**
- ◆ *Breast Milk Jaundice.* Occurs in 1-2% of breast-fed babies. It is caused by a special substance that some mothers produce in their milk. This substance (an enzyme) increases the resorption of bilirubin from the intestine. This type of jaundice starts at 4-7 days of age, and may last from 3-10 weeks. It is not harmful.  
**Treatment-Occasionally the bilirubin will not come down with frequent feedings. In this situation the bilirubin level can be reduced by alternating each breast feeding with formula feeding for two to three days. Be sure to encourage the Mom to use a breast pump to keep her milk production flowing whenever she misses a feeding. Once the jaundice clears, breast-feeding can be returned in full.**
- ◆ *Blood Group Incompatibility (Rh or ABO problems)* If a baby and mother have different blood types, sometimes the mother produces antibodies that destroy the newborn's red blood cells. This causes an sudden buildup of bilirubin in the baby's blood. This serous type of jaundice usually begins during the first 24 hours of life. Rh problems formerly caused the most severe form of jaundice, **but are now preventable with an injection of RhoGAM to the mother within 72 hours after delivery. This prevents her forming antibodies that might endanger her subsequent babies.**
- ◆ **Severe Jaundice-Treatment-** High levels of bilirubin (usually above 20mg/dl) can cause deafness, cerebral palsy, or brain damage in some babies. High levels usually occur with blood-type differences, these complications can be prevented by lowering the bilirubin using phototherapy (blue light that breaks down bilirubin in the skin). **In many instances phototherapy can be used in the home. In rare cases where the bilirubin reaches dangerous levels, an exchange transfusion may be used. This technique replaces the baby's blood with fresh blood. Physiologic jaundice does not rise to levels requiring this type of treatment.**

## C. Instruct Parents To Call The Physician Immediately If:

- ◆ Jaundice is noticed during the first 24 hours of life.
- ◆ Baby develops a fever over 100 ° F
- ◆ Baby starts to look or act sick, or develop signs of dehydration

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