MedStar Health

Management of Hyperbilirubinemia in the Healthy Term Newborn

Clinical Practice Guideline
MedStar Health

"*These guidelines are provided to assist physicians and other clinicians in making decisions regarding the care of their patients. They are not a substitute for individual judgment brought to each clinical situation by the patient's primary care provider in collaboration with the family of the patient. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication but should be used with the clear understanding that continued research may result in new knowledge and recommendations".*

Introduction: Neonatal jaundice is a common phenomenon. Most infants will have modest increases in serum bilirubin which will clear spontaneously in the first weeks of life. The purpose of this guideline is to review the evaluation process and management of bilirubin levels for newborns in the outpatient setting. The goal of careful evaluation of neonatal jaundice is to avoid pathologic elevations of serum bilirubin which can result in bilirubin toxicity to the central nervous system

Major risk factors
• Predischarge TSB or TcB level in the high-risk zone • Jaundice observed in the first 24 h • Blood group incompatibility with positive direct antiglobulin test, other known hemolytic disease (e.g., G6PD deficiency – tested in DC, but not routinely performed on Maryland newborn screening) • Gestational age 35–36 wk. • Previous sibling received phototherapy • Cephalohematoma or significant bruising • Exclusive breastfeeding, particularly if nursing is not going well and weight loss is excessive • East Asian descent
Minor risk factors
• Predischarge TSB or TcB level in the high intermediate-risk Zone • Gestational age 37–38 wk. • Jaundice observed before discharge • Previous sibling with jaundice • Maternal Diabetes • Macrosomic infant of a diabetic mother • Maternal age ≥25 y • Male gender
Decreased risk (these factors are associated with decreased risk of significant jaundice, listed in order of decreasing importance)
• TSB or TcB level in the low-risk zone • Gestational age ≥41 wk. • Exclusive bottle feeding • Black race • Discharge from hospital after 72 h
Pediatrics. 2004;114(1):297-316

TSB= Total Serum Bilirubin

TcB= Transcutaneous Bilirubin

Recommendations:

The following recommendations were developed to aid in the evaluation and treatment of the healthy term infant with hyperbilirubinemia. Although most data are based on birth weight of > 2500gm, “term” hereafter refers to infants of greater than 37 weeks of completed gestation. These guidelines apply to infants without signs of illness or apparent hemolytic disease.

Evaluation:

1. Maternal prenatal testing should include ABO and Rh (D) typing and a serum screen for unusual isoimmune antibodies.
2. A Blood Type, Rh(D) and Direct Antiglobulin Test (DAT or Direct Coombs’ Test) on the infant's blood are recommended when the mother is Rh-negative, Blood 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 0. Appropriate follow-up 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. Screening for hyperbilirubinemia consists of risk-factor assessment along with the measurement of a transcutaneous bilirubin (TcB) level done before 48 hours of age or discharge of the infant from the hospital of birth, whichever is earlier. Total bilirubin levels, done by transcutaneous or serum measurement, must be done at any time an infant appears clinically jaundiced before 48 hours of age.
6. Elevated transcutaneous bilirubin levels must be verified by a total serum bilirubin (TSB). Noninvasive devices for the measurement of transcutaneous bilirubin levels can provide a valid reflection of serum bilirubin levels up to a certain point.[1] Furthermore, Total Serum Bilirubin levels, not TcB, must be used in the decision to initiate therapeutic intervention for hyperbilirubinemia in the newborn and to follow the response to therapy.
7. For further information on determining risk stratification for bilirubin levels per hour of age, refer to AAP Clinical Practice Guidelines for Management of Hyperbilirubinemia in the Newborn Infant of 35 or More Weeks of Gestation noted in the references.[3] The direct bilirubin measurement should be checked if there is any concern of conjugated hyperbilirubinemia. 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.

Treatment of Hyperbilirubinemia:

1. If the measured Total Bilirubin level (TcB or TSB) for the patient is not in a High-Risk Zone, continued observation may be an appropriate alternative to repeated bilirubin testing. This would include regular follow-up with a medical provider to assess weight, adequacy of feeding, stooling pattern, urine output and general tone and well-being of the infant.
2. Two points to remember: dangerously high bilirubin levels are a **MEDICAL EMERGENCY** and require immediate evaluation at an appropriate facility and **THRESHOLD LEVELS FOR PHOTOTHERAPY AND EXCHANGE TRANSFUSION ARE LOWER FOR PRETERM (< 38 weeks) AND HIGH RISK OR SICK NEWBORNS.**
3. 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.

Treatment of Jaundice Associated with Breast-feeding in the Healthy Term Newborn:[4]

1. Differentiate Suboptimal Intake Jaundice associated with the low volume/relative dehydrated status of a breastfeeding infant as the mother transitions from production of colostrum to breast milk from breast milk jaundice due to currently poorly defined factors in breast milk affecting the efficient metabolism of bilirubin. Suboptimal intake will be reflected in poor weight gain or continued weight loss. Infants with uncomplicated breast milk Jaundice will exhibit persistent elevated unconjugated bilirubin levels in the face of good weight gain, good stool and urine output. Breast milk jaundice typically occurs later, after 1 week when resolution of breast feeding, and physiologic jaundice would occur. Breast milk jaundice may persist for up to 14-21 days and is typically not elevated enough to be harmful to the neonate.
2. To promote successful breastfeeding, initiate breastfeeding as soon as possible within the first hour of life. Encourage breastfeeding 8-12 times in the first 24 hours.
3. Feeding of newborns is compatible with management of hyperbilirubinemia. To augment caloric/fluid intake in the setting of suboptimal Intake Jaundice, supplement with pumped breast milk, donor breast milk or formula. Supplementation may be done with a Supplemental Nursing System (SNS), cup, syringe or bottle feeding. Decisions on which method to use should be patient-specific and include consideration of family and provider preference. Supplementation with water or dextrose water is not recommended as it does not lower the bilirubin level in jaundiced, otherwise healthy, breast-feeding infants. Intravenous fluids are rarely necessary to treat dehydration in an otherwise healthy term newborn.
4. If Total Serum Bilirubin Level rises to a level of concern, continue to manage optimal fluid and caloric intake as noted above with continued breastfeeding and administer phototherapy as recommended by the AAP Guidelines.[3]

- Information available in **Spanish, English, Chinese and Italian**: On the American Academy of Pediatrics webpage
- http://www.aap.org/family/jaundicefaq.htm.

Links:

- **BiliTool**: is designed to help assess the risks toward the development of hyperbilirubinemia or "jaundice" in newborns over 35 weeks gestational age. https://bilitool.org/

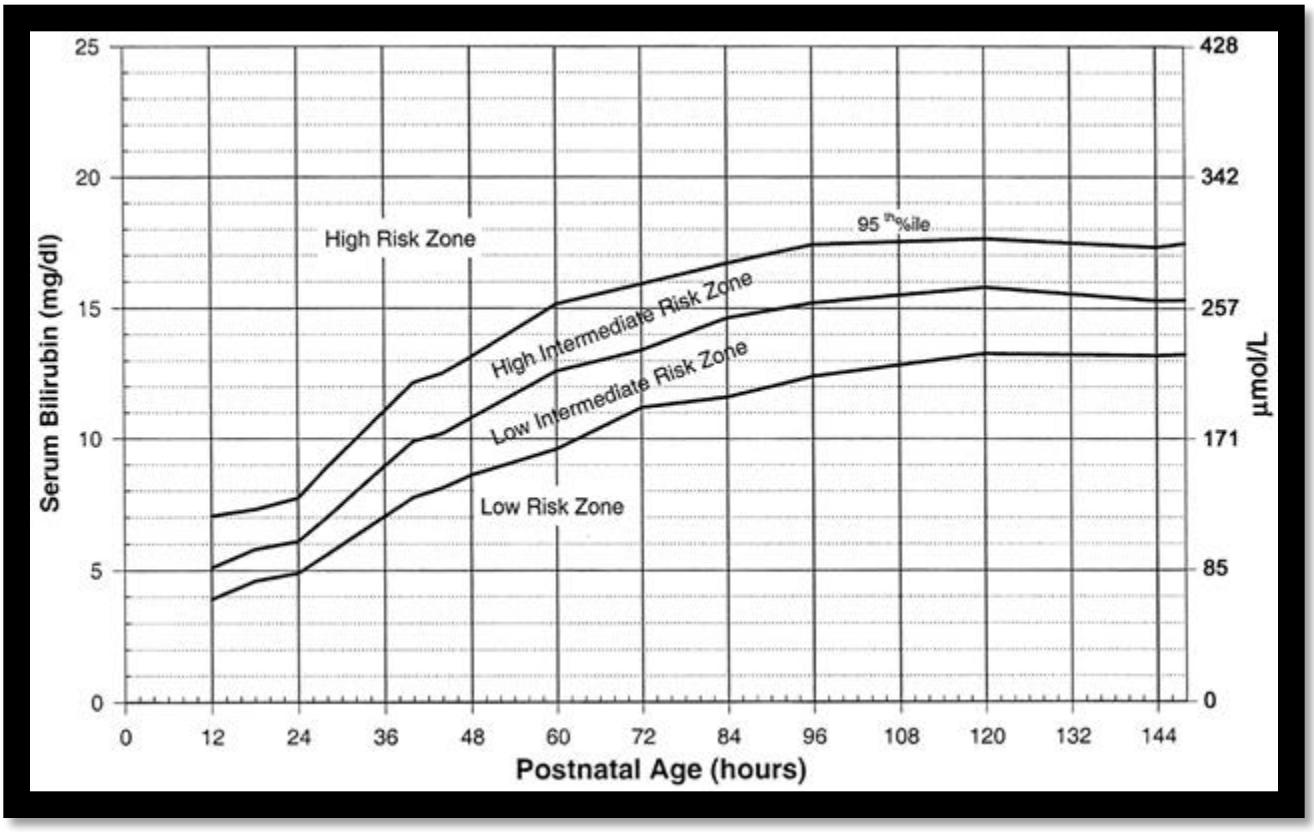


Figure 1.
Nomogram for designation of risk in 2840 well newborns at 36 or more weeks' gestational age with birth weight of 2000 g or more or 35 or more weeks' gestational age and birth weight of 2500 g or more based on the hour-specific serum bilirubin values. The serum bilirubin level was obtained before discharge, and the zone in which the value fell predicted the likelihood of a subsequent bilirubin level exceeding the 95th percentile (high-risk zone) nomogram, which should not be used to represent the natural history of neonatal hyperbilirubinemia.

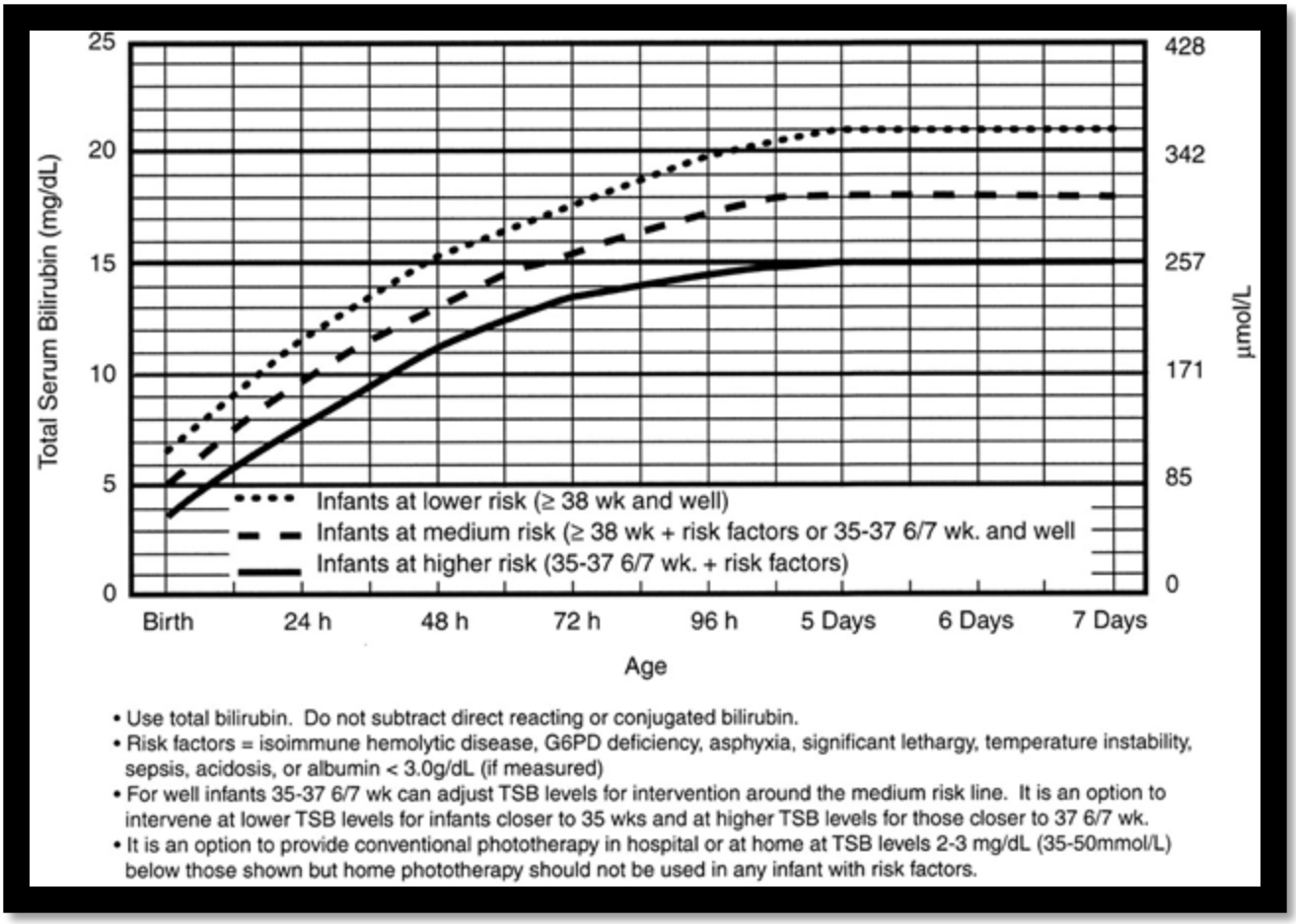
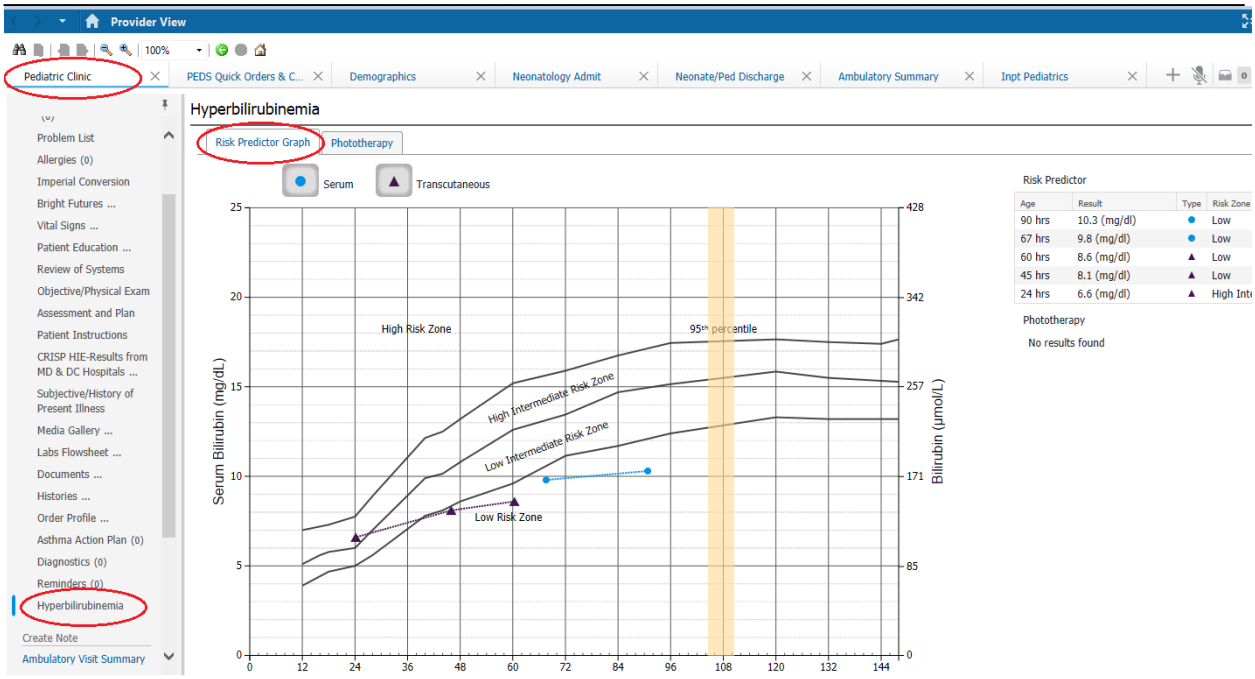
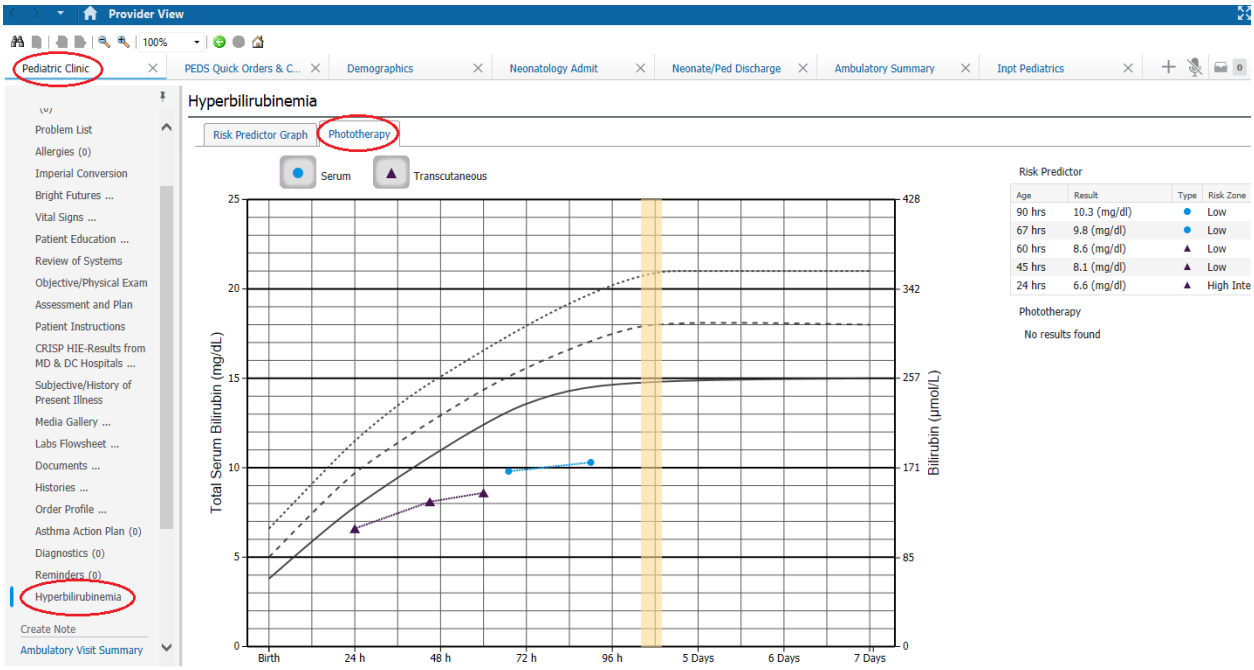


Figure 2 Guidelines for Phototherapy in hospitalized infants of 35 or more weeks' gestation.

MedConnect (Cerner) Users have a hyperbilirubinemia Reference table that will plot current values on the Risk and Phototherapy Tables. This hyperbili tool can be found on provider view in the bottom of the menu of Pediatric Clinic, Family Medicine Clinic, and Neonatology Admit.



Medconnect Hyperbilirubinemia Risk Predictor Nomogram.



MedConnect Hyperbilirubinemia Phototherapy Start Nomogram.

References:

1. American Academy of Pediatrics, (2009). Universal bilirubin screening, guidelines, and evidence. Pediatrics. DOI: 10.1542/peds.2009-0412 Retrieved from http://pediatrics.aappublications.org/content/124/4/1199.full.pdf
2. American Academy of Pediatrics, (2006). Bilirubin measurement for neonates: Comparison of 9 frequently used methods. Pediatrics. 2006. DOI: 10.1542/peds.2005-0590 Retrieved from http://pediatrics.aappublications.org/content/117/4/1174.full.pdf
3. American Academy of Pediatrics. Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. *Pediatrics.* 2004;114:297-316. http://pediatrics.aappublications.org/cgi/content/full/114/1/297.
4. Breastfeeding Medicine,(2017). ABM Clinical Protocol #22: Guidelines for Management of Jaundice in the Breastfeeding Infant 35 Weeks or More of Gestation-Revised 2017. Vol 12, Number 5 pp 250-257
5. American Academy of Pediatrics, Hyperbilirubinemia in the Newborn Infant ≥35 Weeks' Gestation: An Update With Clarifications. *Pediatrics.* 2009; 124 (4): 1193–1198. Retrieved from https://publications.aap.org/pediatrics/article/124/4/1193/71857.

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