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.

Risk Factors for Hyperbilirubinemia[3]:

1. Exclusive breast-feeding or feeding difficulties.
2. Gestational age <38 weeks
3. History of a previous sibling with hyperbilirubinemia
4. Family history of neonatal jaundice
5. Jaundice occurring in the first 24 hours of life
6. Cephalohematoma and/or significant bruising
7. Ethnicity (East Asian)
8. Large weight loss after birth, dehydration
9. Risk for hemolysis.
10. Maternal age (>25 years)
11. Male gender
12. 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. Although most data is 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. Continue to refer to the AAP Hyperbilirubinemia Guideline's tables and nomograms[3] noted above for risk and when to initiate treatment with phototherapy, or exchange transfusion.
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 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.

Links:

BiliTool: calculates bilirubin risk- https://bilitool.org/

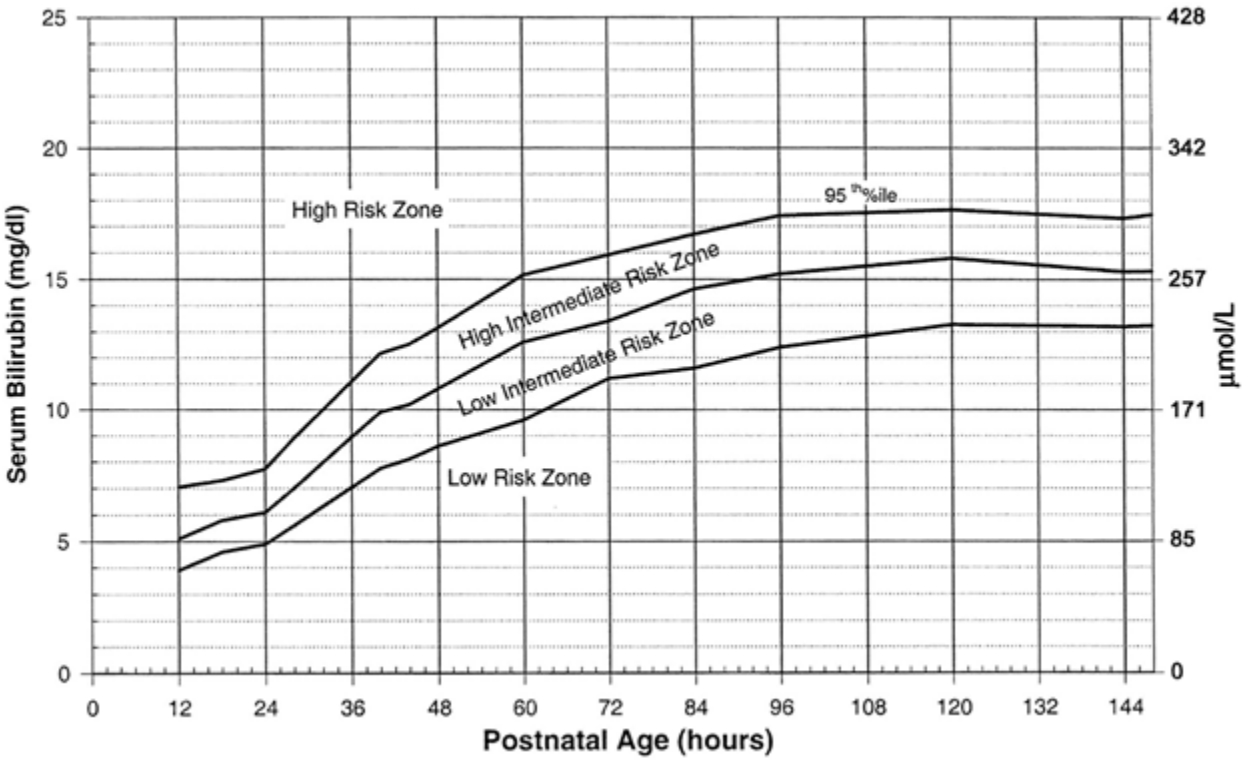
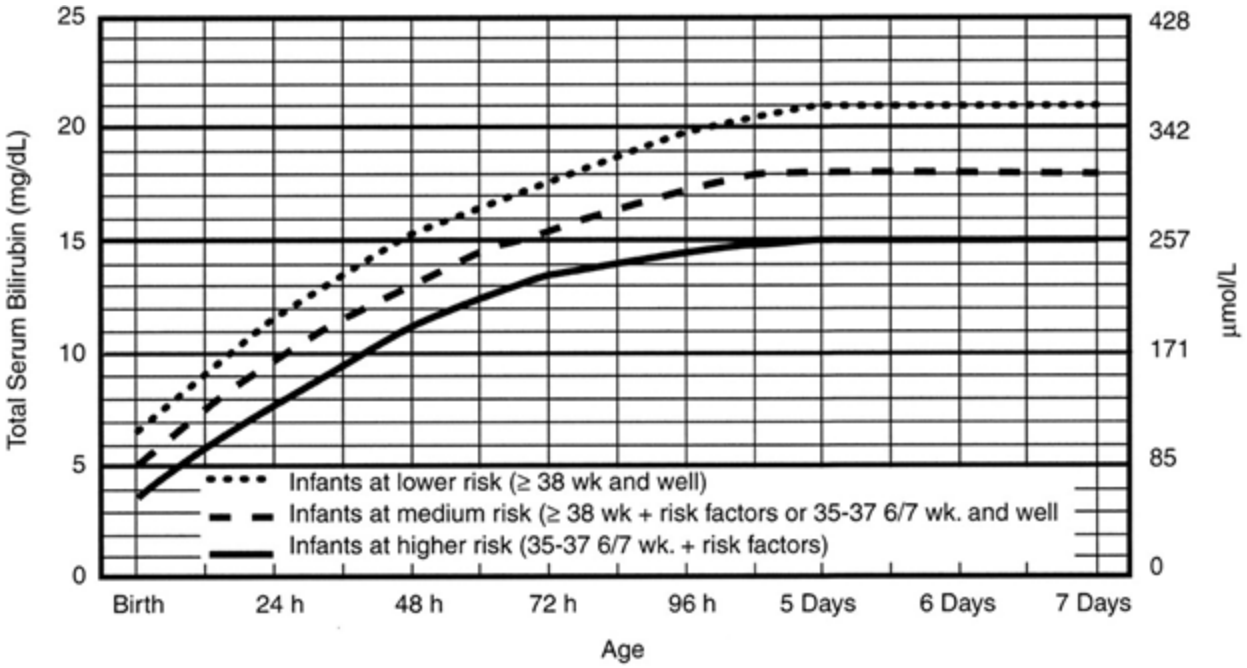


Fig 2.
Nomogram for designation of risk in 2840 well newborns at 36 or more weeks' gestational age with birth weight of 2000 g or more or 35 or more weeks' gestational age and birth weight of 2500 g or more based on the hour-specific serum bilirubin values. The serum bilirubin level was obtained before discharge, and the zone in which the value fell predicted the likelihood of a subsequent bilirubin level exceeding the 95th percentile (high-risk zone) as shown in Appendix 1, Table 4. Used with permission from Bhutani et al.[31] See Appendix 1 for additional information about this nomogram, which should not be used to represent the natural history of neonatal hyperbilirubinemia.



- 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.

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

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