

Hyperbilirubinemia Care Guidelines for Emergency Department Management

Inclusion Criteria: Previously healthy, age ≤ 14 days, born at ≥ 37 weeks gestational age. Total Serum Bilirubin of ≥ 18 mg/dl, < 23 mg/dl.

Exclusion Criteria: Suspected sepsis or ill-appearing, Signs of acute bilirubin encephalopathy

TRIAGE

- Assign ESI level 2
- Consult ED physician for orders
- Early application of bili light/ blanket
- Point of Care blood glucose

Assessment

Accurate history and physical including:

- Age in hours
- Weight and percent change from birth weight
- Adequacy of intake
- Pattern of voiding and stooling
- Presence of jaundice

Diagnostics if not done in triage

- Serum bili T&D

Consider, if first presentation or hemolysis suspected

- Blood type (ABO, Rh), antibody screen, direct Coombs
- CBC
- Reticulocyte Count

If severe Dehydration suspected

- CMP

Accurate I & O

Recommendations/ Considerations

- **Helpful link:** www.bilitool.org (icon on Summary M)
- **The goals of treatment** are to prevent acute bilirubin encephalopathy and to promote and support successful breastfeeding
- **Risk factors** most frequently associated with severe hyperbilirubinemia are inadequate intake with breastfeeding, gestation < 38 weeks, significant jaundice in a previous sibling, jaundice in the 1st 24 hrs of life, East Asian race
- Serum Albumin may be a helpful adjunct in determining need for exchange transfusion
- CBC and reticulocyte count may be considered if hemolytic process is suspected
- **Intensive phototherapy can decrease the initial bilirubin level 30-40% in the 1st 24 hrs with the most significant decline in the 1st 4-6 hrs**

ED Management

- **Start phototherapy while awaiting results if clinically indicated**
- Encourage feeding (infant should not be removed from bili lights for > 20 minutes in any 3 hr. period. Use bottle if needed. Use maternal expressed breast milk for supplemental feeds, when available)
- Give 20ml/kg NS bolus then maintenance IV fluids for patients that meet NICU criteria or dehydration present
- **DO NOT** interrupt phototherapy for patients nearing exchange transfusion threshold or with rapidly rising bilirubin (exception for blood draw)
- Consider additional labs

Supplemental IV fluids NOT routinely indicated

NICU Admission Criteria

- Signs of acute bilirubin encephalopathy
- Bilirubin ≥ 23 mg/dl
- High risk infants (hemolytic disease, prematurity, sepsis, and late pre-term 36 week infants)

Inpatient Admission

- Bilirubin ≥ 18 and ≤ 23
- Encourage feeding, Use maternal expressed breast milk for supplemental feeds when available

Evaluate for Discharge

- Bilirubin below phototherapy threshold
- Feeding adequately
- No concern for significant hemolysis
- Provide educational materials on Jaundice
- Follow up appointment with PMD in 24 hrs.

Inpatient Hyperbilirubinemia Care Guideline

Inclusion Criteria: Newborn Infant > 37 weeks gestation who is admitted for phototherapy for Total Serum Bilirubin of $\geq 18\text{mg/dL}$, $< 23\text{mg/dL}$.

Exclusion Criteria: NICU status, total bili $> 23\text{mg/dL}$, high risk infants (hemolytic disease, prematurity, sepsis)

Assessment

- Accurate history and physical including:
 - age in hours
 - weight and percent change from birthweight
 - adequacy of intake
 - pattern of voiding and stooling
 - presence of jaundice
- Diagnostics:
 - serum bili T&D
 - blood type (ABO, Rh), antibody screen, Coombs & direct Coombs
 - electrolytes (if dehydration suspected)
- Accurate I&O
- Daily weight

Call Neonatology
if Bili $\geq 23\text{mg/dL}$

Interventions/Treatment

- Intensive phototherapy
- Breastfeed or bottle feed every 2-3 hrs
- Breastfeeding support - Lactation Specialist referral
- If lab results c/w or signs of dehydration, start IV fluids

Continued Considerations

- If TSB $> 25\text{mg/dL}$, repeat serum bili within 2-3 hrs
- If TSB 20-25 mg/dL, repeat within 3-4 hrs, if TSB < 20 , repeat in 4-6 hrs, if serum bili continues to fall, repeat in 8-12 hrs.
- Discontinue phototherapy when serum bili reaches 13-14 mg/dL
- If bilirubin does not decrease with phototherapy, evaluate for other causes of jaundice
- In difficult isoimmune hemolytic disease, consult Neonatology

Discharge Criteria

- Serum bili is 13-14 or lower
- Maintaining or gaining weight
- Infant is taking adequate feeds
- Follow up assessment by primary MD within 24 hours of discharge

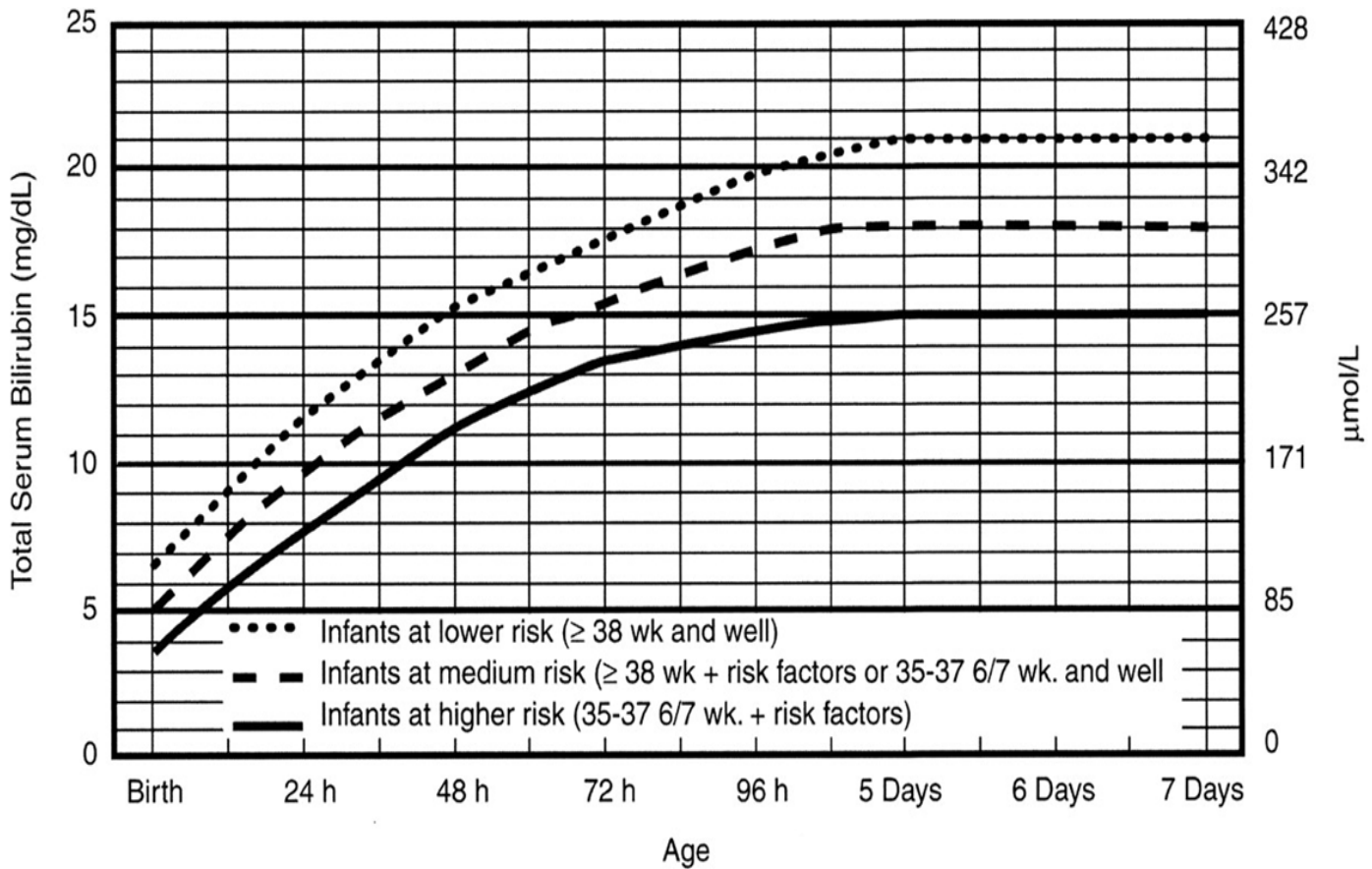
[Link to ED
Guideline](#)

Recommendations/ Considerations

- **Helpful link:** www.bilitool.org (icon on SummaryM)
- The goals of treatment are to prevent acute bilirubin encephalopathy and to promote & support successful breastfeeding
- Risk factors most frequently associated with severe hyperbilirubinemia are inadequate intake with breast-feeding, gestation < 38 wks, significant jaundice in a previous sibling, jaundice in the 1st 24 hrs of life, East Asian race
- Serum albumin may be a helpful adjunct in determining need for exchange transfusion
- CBC and reticulocyte count may be considered if hemolytic process is suspected
- Consider G6PD deficiency in cases of severe hyperbilirubinemia in appropriate ethnic groups
- Intensive phototherapy can decrease the initial bilirubin level 30-40% in the 1st 24 hrs with the most significant decline in the 1st 4-6 hrs
- There is no need to observe for rebound after discontinuing phototherapy except in hemolytic jaundice

Patient Education
KidsHealth handout:
Jaundice in healthy newborns (parent version)

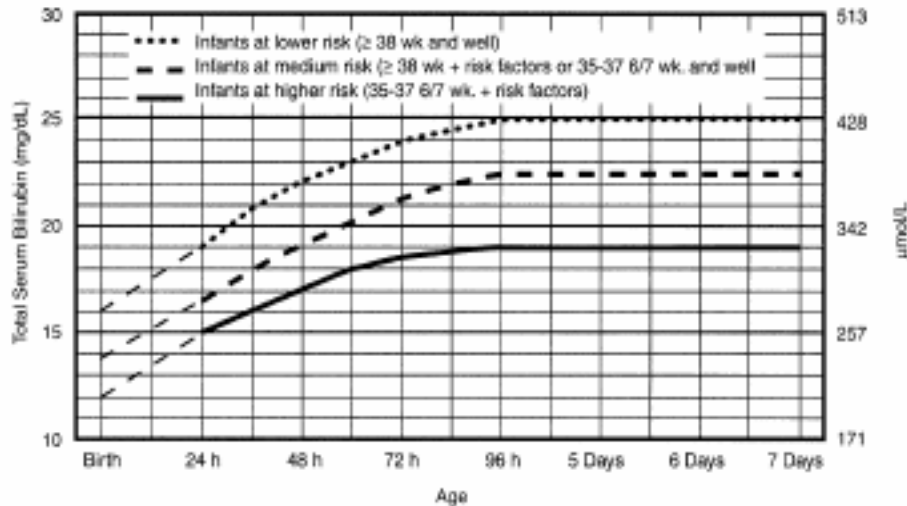
Guidelines for Phototherapy



- 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.

Reference: AAP Subcommittee on Hyperbilirubinemia. Clinical Practice Guideline: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation. PEDIATRICS Vol. 114 No. 1 July 2004, pp. 297-316

Guidelines for Exchange Transfusion



- The dashed lines for the first 24 hours indicate uncertainty due to a wide range of clinical circumstances and a range of responses to phototherapy.
- Immediate exchange transfusion is recommended if infant shows signs of acute bilirubin encephalopathy (hypertonia, arching, retrocollis, opisthotonos, fever, high pitched cry) or if TSB is 25 mg/dL (85 μmol/L) above these lines.
- Risk factors - isoimmune hemolytic disease, G6PD deficiency, asphyxia, significant lethargy, temperature instability, sepsis, acidosis.
- Measure serum albumin and calculate B/A ratio (See legend)
- Use total bilirubin. Do not subtract direct reacting or conjugated bilirubin
- If infant is well and 35-37 6/7 wk (median risk) can individualize TSB levels for exchange based on actual gestational age.

Fig 4. Guidelines for exchange transfusion in infants 35 or more weeks' gestation.

Note that these suggested levels represent a consensus of most of the committee but are based on limited evidence, and the levels shown are approximations. See ref. 3 for risks and complications of exchange transfusion. During birth hospitalization, exchange transfusion is recommended if the TSB rises to these levels despite intensive phototherapy. For readmitted infants, if the TSB level is above the exchange level, repeat TSB measurement every 2 to 3 hours and consider exchange if the TSB remains above the levels indicated after intensive phototherapy for 6 hours.

The following B/A ratios can be used together with but in not in lieu of the TSB level as an additional factor in determining the need for exchange transfusion²²:

Risk Category	B/A Ratio at Which Exchange Transfusion Should be Considered	
	TSB mg/dL/Alb, g/dL	TSB μmol/L/Alb, μmol/L
Infants ≥ 38 0/7 wk	8.0	0.94
Infants 35 0/7-36 6/7 wk and well or ≥ 38 0/7 wk if higher risk or isoimmune hemolytic disease or G6PD deficiency	7.2	0.84
Infants 35 0/7-37 6/7 wk if higher risk or isoimmune hemolytic disease or G6PD deficiency	6.8	0.80

If the TSB is at or approaching the exchange level, send blood for immediate type and crossmatch. Blood for exchange transfusion is modified whole blood (red cells and plasma) crossmatched against the mother and compatible with the infant.²³

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References

Hyperbilirubinemia Care Guideline

American Academy of Pediatrics Subcommittee on Hyperbilirubinemia. Clinical Practice Guideline for the Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation.

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American Academy of Pediatrics. Technical Report: Phototherapy to Prevent severe Neonatal Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation. Pediatrics, 2011; 128: e1046-e1052. <http://pediatrics.aappublications.org/content/128/4/e1046.full.pdf+html>

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