

# Hyperbilirubinemia Care Guideline for Emergency Department Management



**Inclusion Criteria:** Previously healthy, age  $\leq$  14 days, born at  $\geq$  35 weeks gestation; Appears jaundice

**Exclusion Criteria:** Suspected sepsis or ill-appearing; Signs of acute bilirubin encephalopathy; Elevation of the direct bilirubin

Begin with BiliTool  
<https://bilitool.org/>

## Triage

- Assign ESI level 2
- Consult ED provider or nursing standardized procedures 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 Bilirubin Total & Direct

### 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

- The goal of treatment is to prevent acute bilirubin encephalopathy and to promote/support feeding
- Risk factors most frequently associated with severe hyperbilirubinemia are inadequate intake with breast-feeding, gestation  $<$  40 weeks, significant jaundice in a previous sibling, jaundice in the 1<sup>st</sup> 24 hours of life, genetic ancestry
- Serum albumin ( $<$  3.0g/dL) 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 genetic ancestry
- Intensive phototherapy can decrease the initial bilirubin level 30-40% in the 1<sup>st</sup> 24 hrs with the most significant decline in the 1<sup>st</sup> 4-6 hrs

## ED Management

- **Start phototherapy while awaiting results if clinically indicated**
- Feed per parent preference every 2-3 hrs
  - A minimum of at least 8 feeds in 24 hours is recommended
  - Infant can be off phototherapy for up to 30 minutes every 2-3 hours to feed; consider use of Bili Blanket during feeds
  - If needed, consider supplementation after breastfeeding with EHM and/or formula \*refer to supplemental volume guide on LIGHT Algorithm for breastfeeding infants
- Give 20 mL/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

## Patient and Family Education

- Lexicomp or KidsHealth handout:
- Jaundice Discharge Instructions
  - Infant / Jaundice in Newborns
  - Outpatient Lactation Resources

## NICU Admission Criteria

- Signs of acute bilirubin encephalopathy
- Bilirubin within 2mg/dL of exchange transfusion threshold
- High risk infants (hemolytic disease, prematurity, sepsis, and late pre-term 36 week infants)

## Inpatient Admission

- Bilirubin above phototherapy threshold but  $\leq$  2mg/dL below exchange transfusion threshold
- Encourage feeding; Use maternal expressed breast milk for supplemental feeds when available

## Evaluate for Discharge

- TSB is  $>$  2mg/dL below the hour-specific threshold used to initiate phototherapy
- Feeding adequately
- No concern for significant hemolysis
- Provide Patient Education materials
- Follow up appointment with PMD in 24-48 hrs

**Inclusion Criteria:** Newborn Infant  $\geq$  35 weeks gestation who meets phototherapy threshold based on the AAP 2022 Guidelines  
**Exclusion Criteria:** NICU status, within 2mg/dl of exchange transfusion threshold, high risk infants (hemolytic disease, prematurity, sepsis), elevation of direct bilirubin

**Begin with BiliTool**  
<https://bilitool.org/>

### 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 bilirubin - total & direct
  - blood type (ABO, Rh), antibody screen, Coombs & Direct Coombs
  - electrolytes (if dehydration suspected)
- Accurate I&O

**Call Neonatology if TSB within 2 mg/dL of exchange transfusion threshold**

### Interventions / Treatment

- Intensive triple phototherapy
- Feed per parent preference every 2-3 hrs
  - A minimum of at least 8 feeds in 24 hours is recommended
  - Infant can be off phototherapy for up to 30 minutes every 2-3 hours to feed; consider use of Bili Blanket during feeds
  - If needed, consider supplementation after breastfeeding with EHM and/or formula \*refer to supplemental volume guide on LIGHT Algorithm for breastfeeding infants
- Breastfeeding support - Lactation Specialist referral – see breastfeeding algorithm in addendums
- Consider IV fluids if dehydration can not be corrected by oral feeds

### Considerations

- Recheck bilirubin within the first 12 hours of phototherapy
- If bilirubin does not decrease with phototherapy, evaluate for other causes of jaundice
- In difficult isoimmune hemolytic disease, consult Neonatology
- Rebound bili only in cases of hemolytic anemia 4-6 hours after discontinuation of phototherapy

### Discharge Criteria

- Discontinue phototherapy when serum bili reaches 2mg/dL below threshold at initiation of phototherapy
- Maintaining or gaining weight
- Infant is taking adequate feeds
- Follow up assessment by primary MD within 48 hours of discharge

### Recommendations / Considerations

- Risk factors most frequently associated with severe hyperbilirubinemia are inadequate intake with breast-feeding, gestation < 40 wks, significant jaundice in a previous sibling, jaundice in the 1<sup>st</sup> 24 hrs of life, genetic ancestry
- Serum albumin (< 3.0g/dL) may be a helpful adjunct in determining need for exchange transfusion
- CBC and reticulocyte count should be obtained if hemolytic process is suspected
- Consider G6PD deficiency in cases of severe hyperbilirubinemia in appropriate genetic ancestry
- Intensive phototherapy can decrease the initial bilirubin level 30-40% in the 1<sup>st</sup> 24 hrs with the most significant decline in the 1<sup>st</sup> 4-6 hrs
- If breastfeeding, follow up with outpatient lactation consultant within 2-3 days of discharge to re-evaluate breastfeeding, milk supply and feeding plan of care. Provide resource handout located (hyperlink) (link to choc.org under lactation)

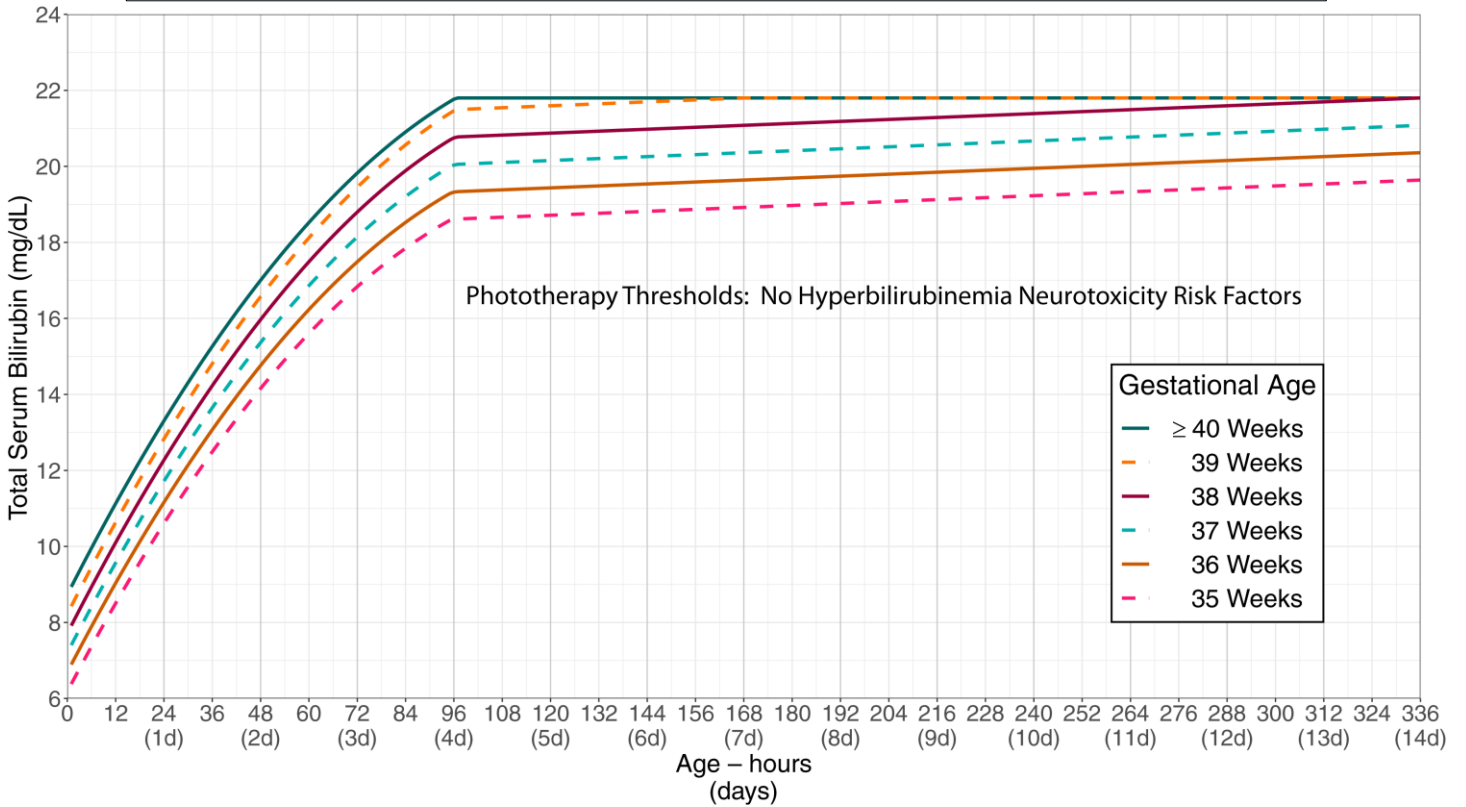
### Neurotoxic Factors

- Gestational age < 38wk and this risk increases with the degree of prematurity
- Albumin < 3.0 g/dL
- Isoimmune hemolytic disease (ie, positive direct antiglobulin test), G6PD deficiency, or other hemolytic conditions
- Sepsis
- Significant clinical instability in the previous 24hrs

### Patient and Family Education

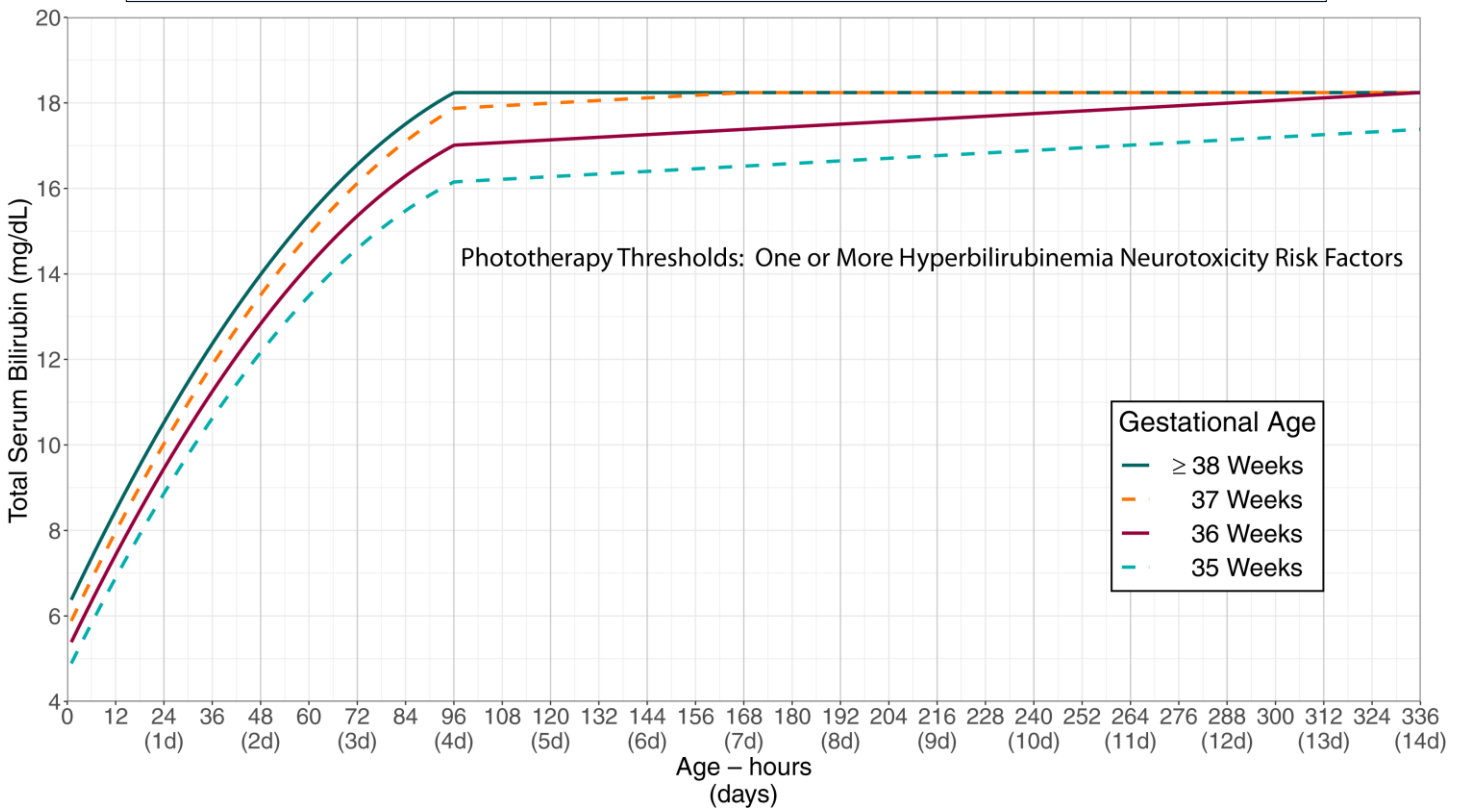
- Lexicomp or KidsHealth handout:
- Jaundice Discharge Instructions
  - Infant / Jaundice in Newborns
  - Outpatient Lactation Resources

## Phototherapy Thresholds: No Hyperbilirubinemia Neurotoxicity Risk Factors



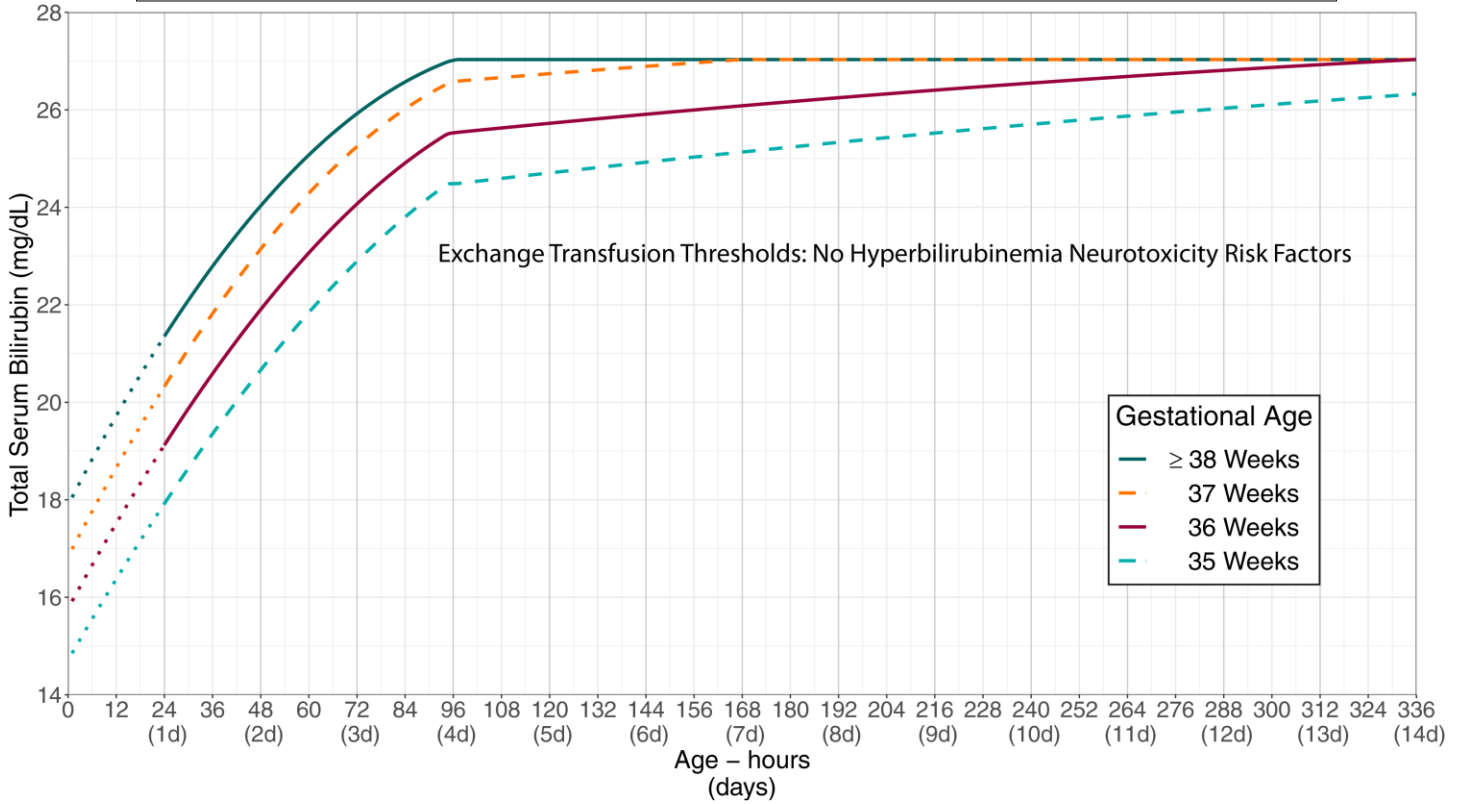
(Kemper, et al., 2022)

## Phototherapy Thresholds: One or More Hyperbilirubinemia Neurotoxicity Risk Factors



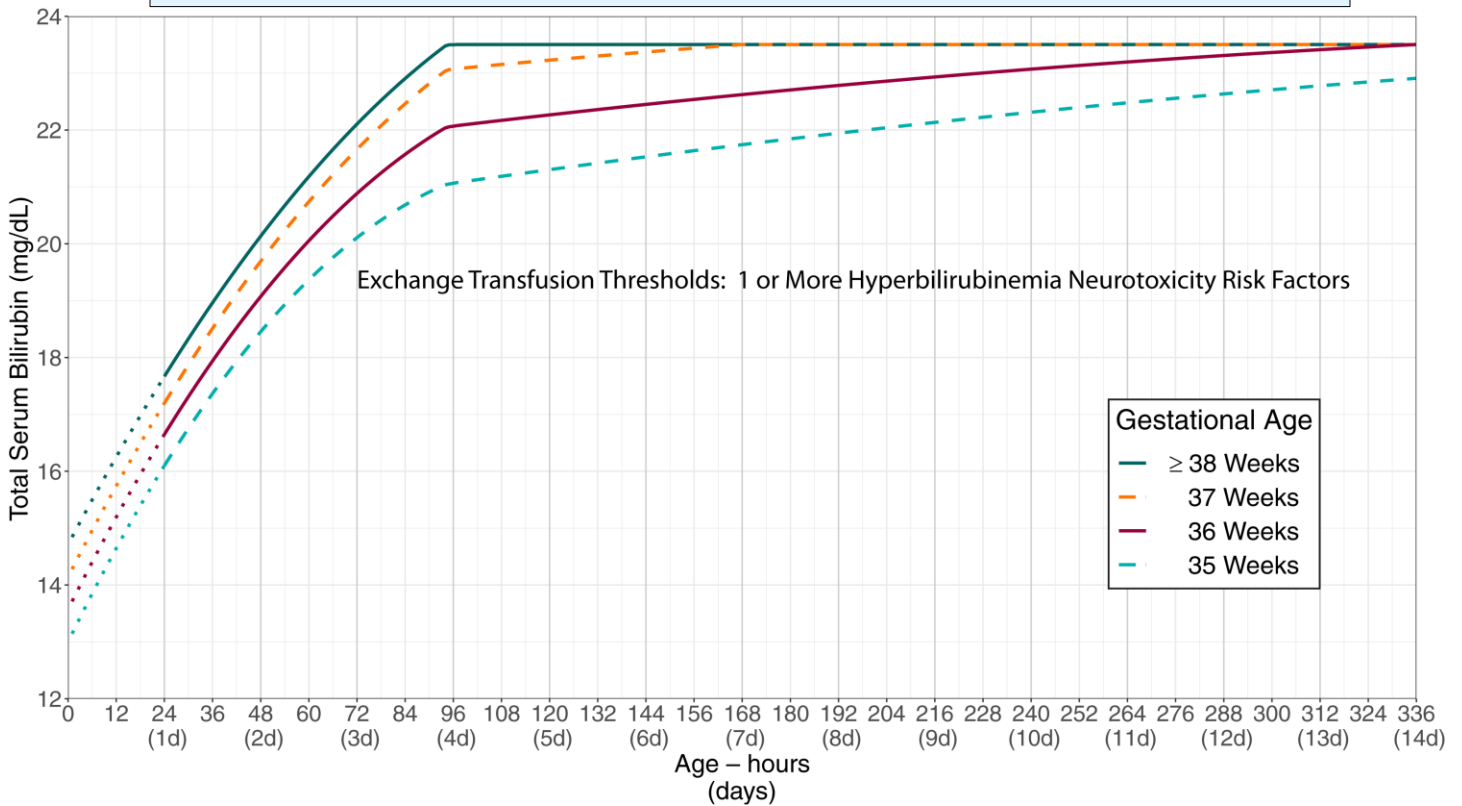
(Kemper, et al., 2022)

## Exchange Transfusion Thresholds: No Hyperbilirubinemia Neurotoxicity Risk Factors



(Kemper, et al., 2022)

## Exchange Transfusion Thresholds: 1 or More Hyperbilirubinemia Neurotoxicity Risk Factors



(Kemper, et al., 2022)

## *References* *Hyperbilirubinemia Care Guideline*

- Flaherman, V. J., & Maisels, M. J. (2022). Appendix I - ABM Clinical Protocol #22: Guidelines for Management of Jaundice in the Breastfeeding Infant 35 Weeks or More of Gestation-Revised 2017. *Breastfeeding*, 950-958. <https://doi.org/10.1016/B978-0-323-68013-4.00059-6> (Level V)
- Kellams, A., Harrel, C., Omage, S., Gregory, C., & Rosen-Carole, C. (2022). Appendix I - ABM Clinical Protocol #3: Supplementary Feedings in the Healthy Term Breastfed Neonate, Revised 2017. *Breastfeeding*, 796-806. <https://doi.org/10.1016/B978-0-323-68013-4.00040-7> (Level V)
- Kemper, A. R., Newman, T. B., Slaughter, J. L., Maisels, M. J., Watchko, J. F., Downs, S. M., . . . Russell, T. L. (2022). Clinical practice guideline revision: Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. *Pediatrics*, 150(3), 1-21. <https://doi.org/10.1542/peds.2022-058859> (Level V)
- Par, E. J., Hughes, C. A., & DeRico, P. (2023). Neonatal hyperbilirubinemia: Evaluation and treatment. *American Family Physician*, 107(5), 525-534. (Level V)
- Refer to CHOC Patient Care Policy NICU 112/F958: Phototherapy

# LIGHT Algorithm for Breastfeeding Infants ≤5 Days Old with Hyperbilirubinemia

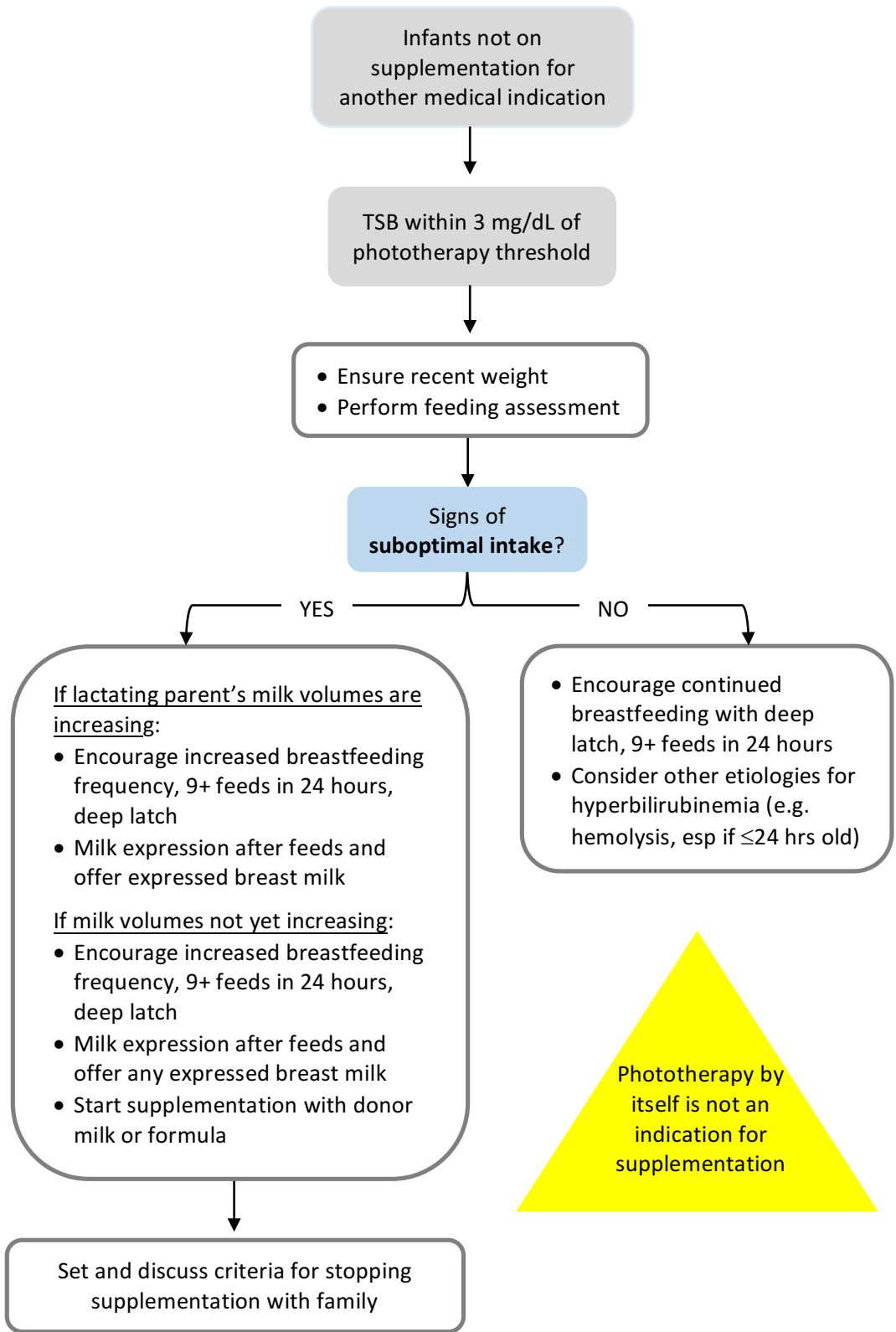
- Feeding Assessment Should Include:**
- Risk factors for delayed lactogenesis
  - Lactation History
  - Maternal breast shape, breast changes
  - LATCH scores
  - Latch depth
  - Feeding frequency
  - Infant transfer at the breast

- Signs of Suboptimal Intake May Include:**
- Ineffective latch and/or suck
  - Sleepy and difficult to wake for feedings
  - Delayed colostrum or milk supply
  - Weight loss >75th %ile on NEWT, esp. after first 24 hrs (<https://newbornweight.org>)
  - Laboratory abnormalities (e.g. hypoglycemia)
  - Ineffective milk transfer
  - Uric acid crystals in urine
  - <4 stools on day 4 or meconium stools on day 5

**Suggested supplementation volumes by ABM<sup>1,2</sup>**

Time (hrs)	mL/feed*
0-24	2-10
24-48	5-15
48-72	15-30
72-96	30-60

\*with expressed breast milk, donor breast milk (if available), or formula



<sup>1</sup> Kellams A, Harrel C, Omage S, Gregory C, Rosen-Carole C. ABM clinical protocol #3: supplementary feedings in the healthy term breastfed neonate, revised 2017. *Breastfeed Med.* 2017;12:188-198. doi:10.1089/bfm.2017.29038.ajk

<sup>2</sup> Flaherman VJ, Maisels MJ; Academy of Breastfeeding Medicine. ABM clinical protocol #22: guidelines for management of jaundice in the breastfeeding infant 35 weeks or more of gestation—revised. *Breastfeed Med.* 2017;12(5): 250–257