Management of the Infant ≥ 35 Weeks Gestation on Phototherapy

Clinical Practice Guideline

Approved by SSM Health Cardinal Glennon Clinical Practice Guideline Committee July 27, 2023

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Inclusion Criteria:
- Infants ≤ 14 days old on high intensity phototherapy
- ≥ 35 weeks gestation
- Well-appearing

Concern for Hemolysis? (*see Box 1*)

YES

Obtain Serum Bilirubin (TSB): Within 6 hours of phototherapy initiation

NO

Obtain Serum bilirubin (TSB):
- Within 12 hours after phototherapy initiation, then
- Every 12-24 hours until phototherapy discontinued

Consult NICU, begin escalation of care

YES

TSB at or exceeds escalation of care threshold? (see Box 2)

NO

CONCERN FOR HEMOLYSIS

NO CONCERN FOR HEMOLYSIS

TSB Rising?

YES

Repeat TSB every 6 hours until stable or falling

NO

TSB STABLE OR FALLING

Repeat TSB every 12-24 hours until discontinuation

TSB decreased to approximately 2mg/dL below phototherapy threshold at initiation (or other acceptable TSB level)

Discontinue Phototherapy

Low Rebound Risk:
- Phototherapy started > 48 hours of age

AND
- No concern for hemolysis (see Box 1)

NO

Consider rebound TSB 6-12 hours after phototherapy discontinuation

YES

Discharge patient, follow up in 1-2 days

TSB ≥ phototherapy threshold?

NO

Discharge patient, obtain serum bilirubin in 1 day

YES

Resume phototherapy, follow algorithm

Box 1: Concern for Hemolysis
- TSB rises or declines very slowly under phototherapy
- Met phototherapy threshold ≤ 24 hours of age
- Rate of rise prior to phototherapy initiation ≥ 0.3mg/dL/hr in the first 24 hours or ≥ 0.2mg/dL/hr thereafter
- Meets escalation of care threshold (see Box 2)

Box 2: Escalation of Care Threshold
< 2mg/dL below exchange transfusion threshold per 2022 AAP Hyperbilirubinemia Guidelines

Box 3: Additional Considerations:
- Remove infant from lights for ad lib feeds unless at escalation of care threshold
- Routine IV fluid use not recommended
- If infant DAT unknown, obtain at phototherapy initiation if maternal antibody screen positive, maternal blood type O or Rh(D) negative, or rapid rate of rise (see Box 1)
- Obtain Hct/CBC if DAT positive or concern for hemolysis (see Box 1)
- Obtain G6PD testing if concern for unexplained hemolysis (e.g. TSB rises while on phototherapy or requires escalation of care) or atypical development of severe hyperbilirubinemia
- Consider direct bilirubin if etiology unclear

SSMHealth Cardinal Glennon
Access Center Transfer Line
888-229-2424

1. SSMHealth Cardinal Glennon CPG Home

2. Resources
a. Kemper AR et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. Pediatrics. 2022; 150(3): e2022058859.
b. Widmer K. Evaluation and Management of Neonatal Jaundice. Internal Department Specific Resource, Children's Hospital Colorado: unpublished. 2022.
c. American Academy of Pediatrics Value in Inpatient Pediatrics (VIP) and Pediatric Acute Care Network. Learning and Implementing Guidelines for Hyperbilirubinemia Treatment. 2022.

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Approved by SSM Health Cardinal Glennon Clinical Practice Guidelines Committee July 27, 2023
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Appendix 1

Evaluation and Management of Hyperbilirubinemia and Management of Phototherapy in Infants ≥ 35 Weeks Gestation

Clinical Practice Guideline, SSM Cardinal Glennon Children's Hospital

Neurotoxicity Risk Factors

Table 1:

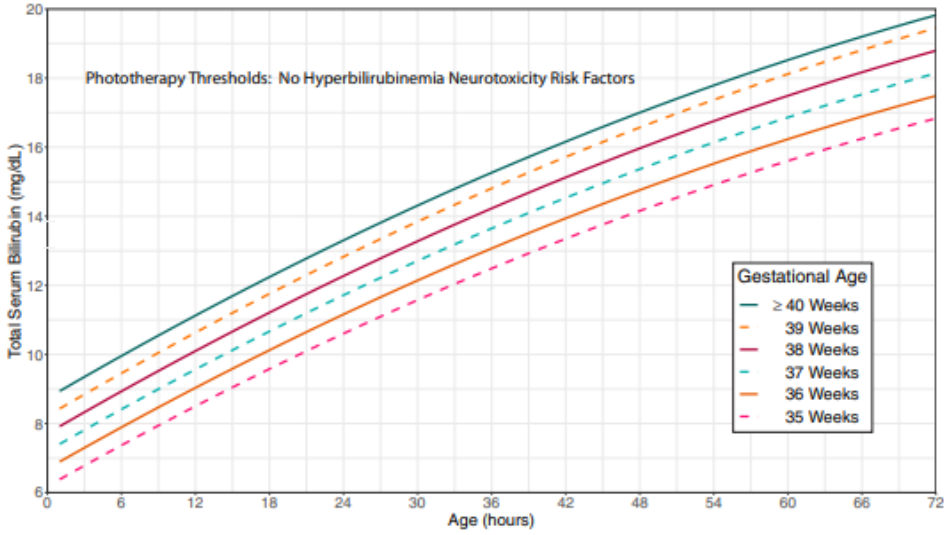
Hyperbilirubinemia Neurotoxicity Risk Factors

Risk Factors
• Gestational age <38 wk and this risk increases with the degree of prematurity[a]
• 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 24 h

Courtesy: Kemper AR, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. *Pediatrics*. 2022; 150(3):e2022058859.

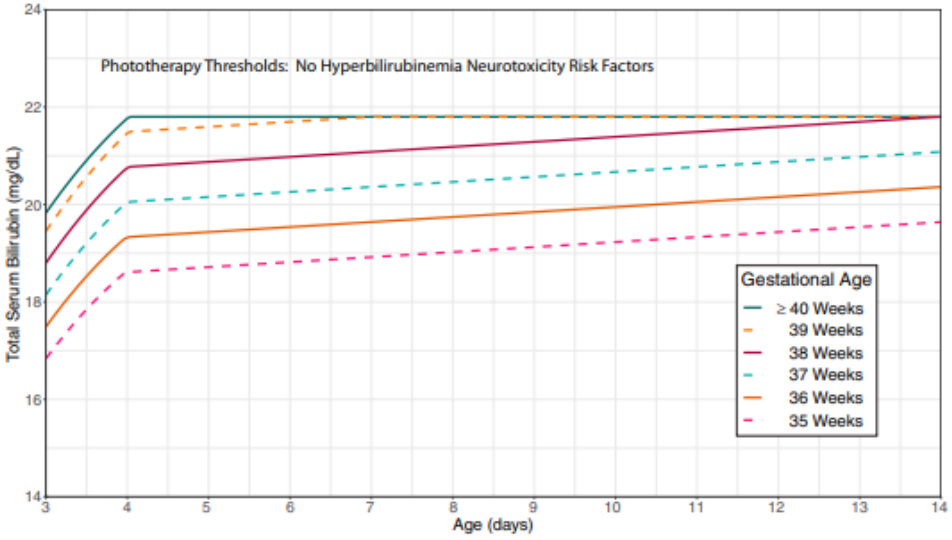
Phototherapy Thresholds:

Figure 1: 0 to 72 Hours of Life, No Neurotoxicity Risk Factors (see Table 1 above)



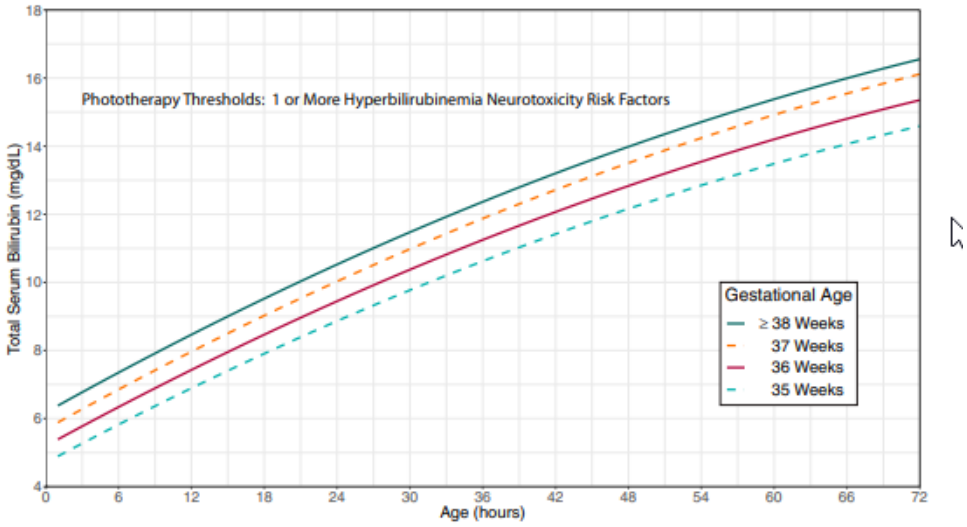
Courtesy: Kemper AR, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. *Pediatrics*. 2022; 150(3):e2022058859.

Figure 2: 3 to 14 Days of Life, No Neurotoxicity Risk Factors (see Table 1 above)



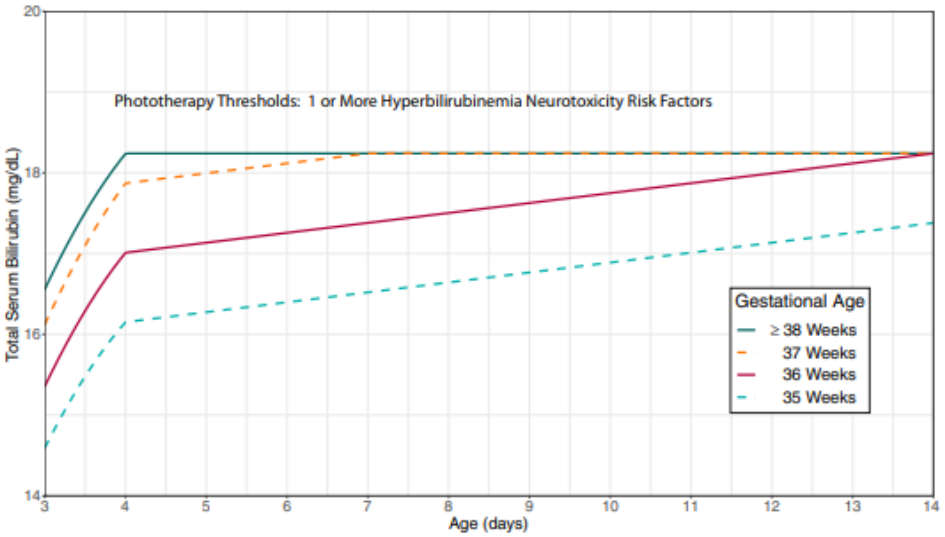
Courtesy: Kemper AR, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. *Pediatrics*. 2022; 150(3):e2022058859.

Figure 3: 0 to 72 Hours of Life with One or More Neurotoxicity Risk Factors (see Table 1 above)



Courtesy: Kemper AR, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. *Pediatrics*. 2022; 150(3):e2022058859.

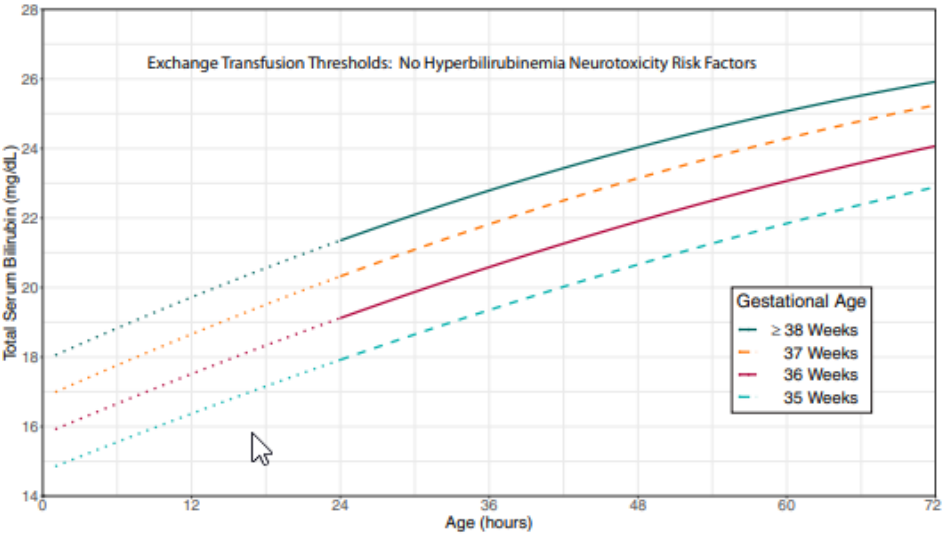
Figure 4: 3 to 14 Days of Life with One or More Neurotoxicity Risk Factors (see Table 1 above)



Courtesy: Kemper AR, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. *Pediatrics*. 2022; 150(3):e2022058859.

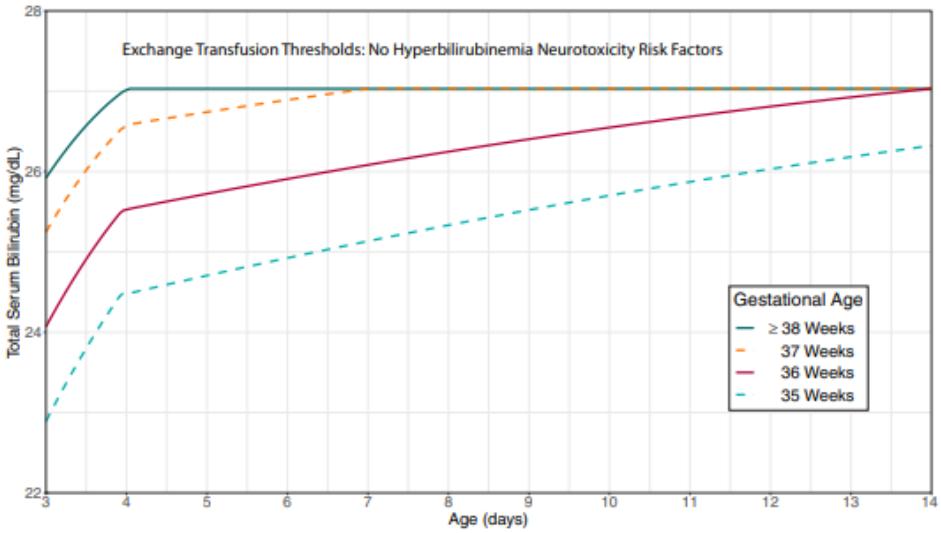
Exchange Transfusion Thresholds:

Figure 5: 0 to 72 Hours of Life, No Neurotoxicity Risk Factors (see Table 1 above)



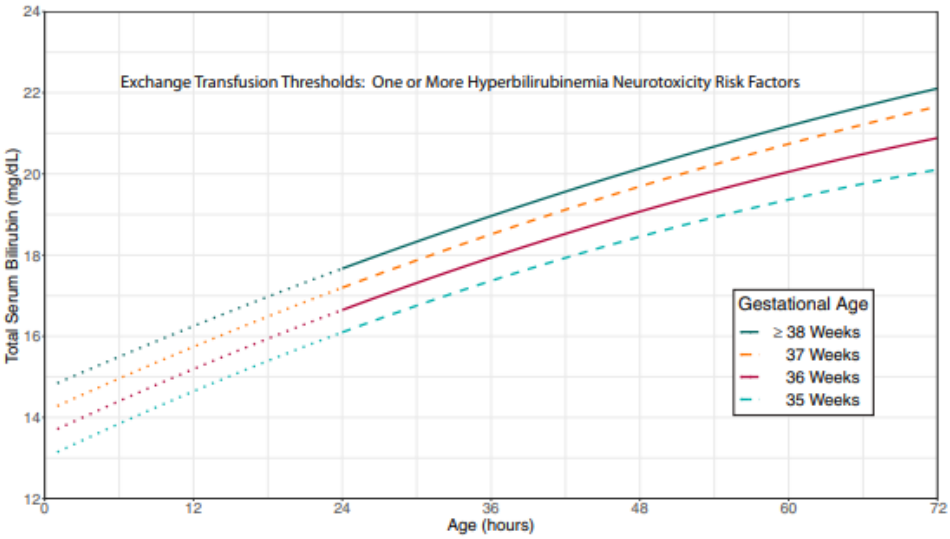
Courtesy: Kemper AR, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. *Pediatrics*. 2022; 150(3):e2022058859.

Figure 6: 3 to 14 Days of Life, No Neurotoxicity Risk Factors (see Table 1 above)



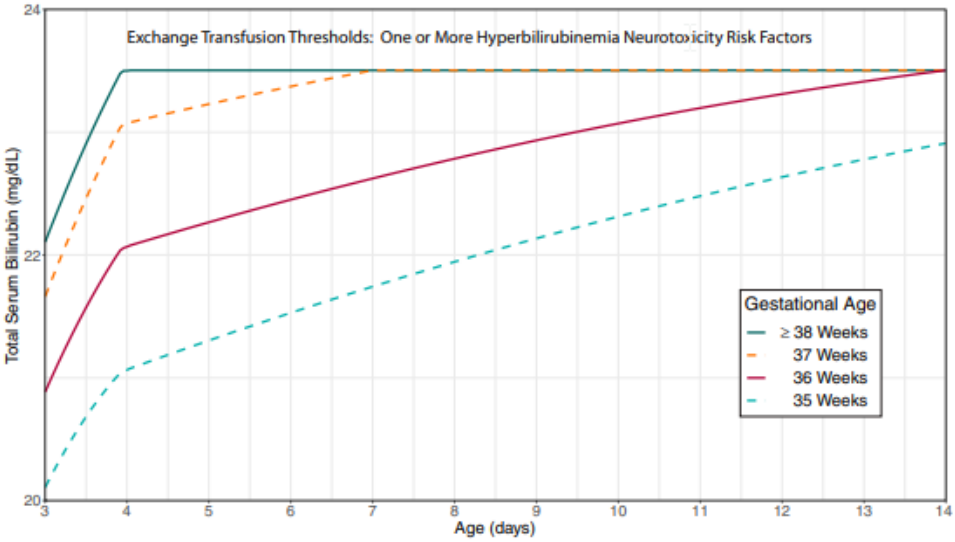
Courtesy: Kemper AR, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. *Pediatrics*. 2022; 150(3):e2022058859.

Figure 7: 0 to 72 Hours of Life with One or More Neurotoxicity Risk Factors (see Table 1 above)



Courtesy: Kemper AR, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. *Pediatrics*. 2022; 150(3):e2022058859.

Figure 8: 3 to 14 Days of Life with One or More Neurotoxicity Risk Factors (see Table 1 above)



Courtesy: Kemper AR, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. *Pediatrics*. 2022; 150(3):e2022058859.

Follow-Up Timing Recommendations:

Table 2:

Phototherapy threshold minus TcB or TSB		Discharge Recommendations
0.1-1.9 mg/dL	Age <24 hours	Delay discharge, consider phototherapy, measure TSB in 4 to 8 hours
	Age≥24 hours	Measure TSB in 4 to 24 hours[a] Options: • Delay discharge and consider phototherapy • Discharge with home phototherapy if all considerations in the guideline are met • Discharge without phototherapy but with close follow-up
2.0-3.4 mg/dL	Regardless of age or discharge time	TSB or TcB in 4 to 24 hours[a]
3.5-5.4 mg/dL	Regardless of age or discharge time	TSB or TcB in 1-2 days
5.5-6.9 mg/dL	Discharging <72 hours	Follow-up within 2 days; TcB or TSB according to clinical judgment[b]
	Discharging ≥72 hours	Clinical judgment[b]
≥7.0 mg/dL	Discharging <72 hours	Follow-up within 3 days; TcB or TSB according to clinical judgment[b]
	Discharging ≥72 hours	Clinical judgment[b]

Courtesy: Kemper AR, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks Gestation. *Pediatrics*. 2022; 150(3):e2022058859.

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

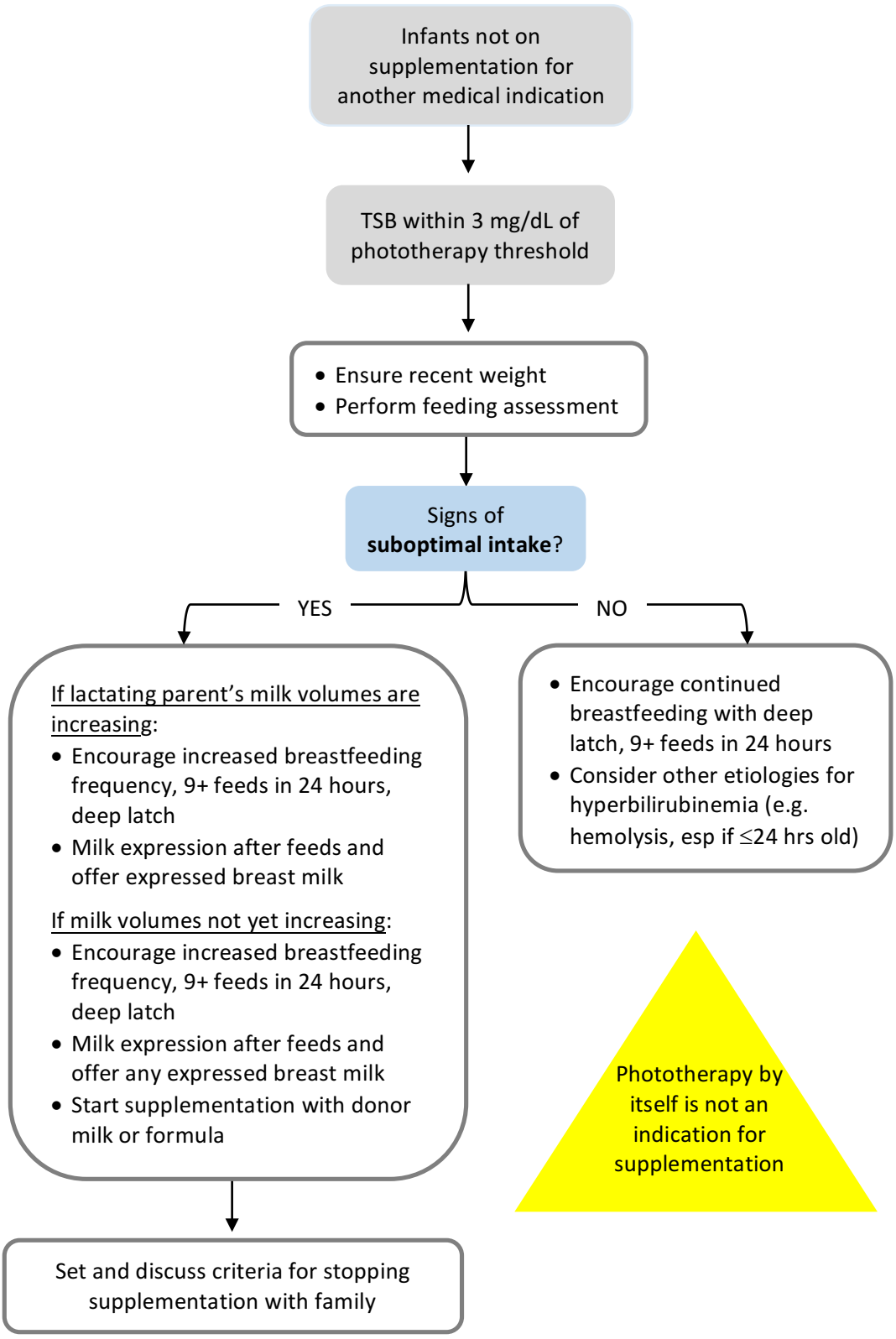
Signs of Suboptimal Intake May Include:

- 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[1,2]

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



[1] 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

[2] 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

Algorithm developed with assistance from E. Hayes Bakken, MD, IBCLC, FAAP and Julie Gallois, MD, FAAP