NRS Clinical Education Series

Hyperbilirubinemia

Tuesday, November 1, 2022

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Outline

- Intro / Background
- Prevention
- Isoimmune Hemolytic Disease
- Assessment and Monitoring
- Treatment
- NRS Cases
- Summary of Changes to NRS Guidelines

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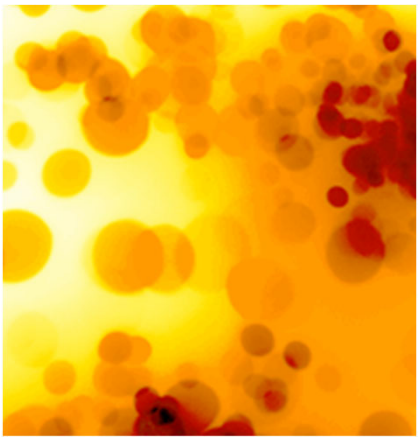
Introduction

- Jaundice is the MOST COMMON problem for newborns
- 80% of healthy newborns
- First documented in 18th century (although probably noted by caregivers for centuries!)
- 1-2% develop "severe hyperbilirubinemia" ≥ 20 mg/dL
- Peak between 72-120 hours



1. FDA Open Briefing Document from the Gastroenterology Drugs Advisory Committee. Potential for new drug therapies in the management of hyperbilirubinemia in newborn infants. March 13, 2012. Available at: http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/Drugs/GastrointestinalDrugsAdvisoryCommittee/UCM295386.pdf. Accessed: 11/15/2016.

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Introduction

- Most infants with jaundice are healthy! Then why do we worry?
  - Potentially toxic to CNS
- Serum bilirubin is determined by
  - Rate of production
  - Rate of clearance[1]

Level of UDPGT in newborn liver is ~1% of adult levels between 30-40 weeks

Will reach adult levels by 6-14 weeks (regardless of gestational age)[2]

1. FDA Open Briefing Document from the Gastroenterology Drugs Advisory Committee. Potential for new drug therapies in the management of hyperbilirubinemia in newborn infants. March 13, 2012. Available at: http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/Drugs/GastrointestinalDrugsAdvisoryCommittee/UCM295386.pdf. Accessed: 11/15/2016.
2. Avery's Neonatology: Pathophysiology & Management of the Newborn; Chapter 35. pgs 768-770

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History

- Jaundice or "icterus," describes yellowing of the skin and sclerae
- Effect of light on jaundice discovered in 1950s at Rochford General Hospital in Essex
- Sister Ward believed in benefits of fresh air and sunshine for babies – found that it was helping the jaundice!

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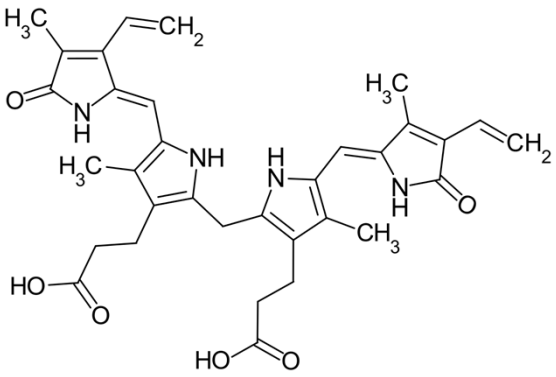
What is bilirubin?



- Bilirubin is produced when RBCs break down
- It is the byproduct of the breakdown of heme
- LIPOPHILIC → insoluble in water, but can cross biologic membranes[2]

2. Avery's Neonatology: Pathophysiology & Management of the Newborn; Chapter 35. pgs 768-770

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Some notes on this CPG:

- Link: Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation | Pediatrics | American Academy of Pediatrics (aap.org)
- Committee worked from 2014 to 2022 – peer-reviewed by experts in neonatal hyperbilirubinemia AND by parents of children with kernicterus
- These CPG were developed for use in the US
- Recommendations are formatted at Key Action Statements (KAS)

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Prevention

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Keys to Prevention

- Identify when there is Isoimmune Hemolytic Disease
  - Mom should have ABO type and Rh type during pregnancy
  - If Rh negative → Rho (D) immune globulin (RhoGAM)

  Note: if Mom received RhoGAM during pregnancy, baby will be DAT positive, and this can usually be ignored
  - DAT negative infants → routine care
  - DAT positive infants → early and frequent bilirubin levels (immediately, then Q4h x2, then Q12h x3)

Alex R. Kemper, et al; Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation. Pediatrics August 2022; 150 (3): e2022058859. 10.1542/peds.2022-058859

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Keys to Prevention

- Provide feeding support for breastfed infants
  - "Breastfeeding jaundice" → SUBOPTIMAL INTAKE
  - Decreased stooling → increased enterohepatic circulation of bilirubin
  - Introduce BF within 1 hour and feed "on demand"
  - "8 or more in 24"
  - Success:
    - Adequate wet diapers, transitional stooling, normal weight loss for age, audible swallowing

  Note: "breast milk jaundice syndrome" is prolonged unconjugated hyperbilirubinemia and can last up to 3 months → almost always NON-PATHOLOGIC

Alex R. Kemper, et al; Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation. Pediatrics August 2022; 150 (3): e2022058859. 10.1542/peds.2022-058859

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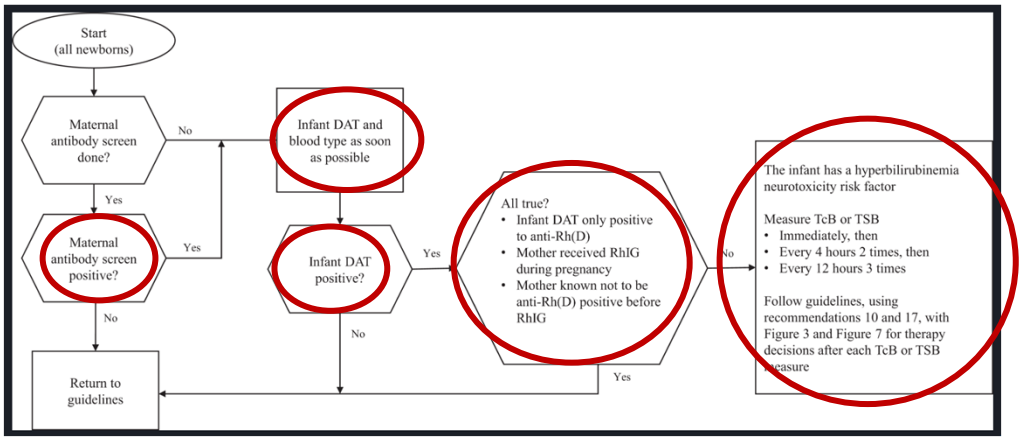
Approach to identify newborns with maternal anti-erythrocyte antibodies and guide to early management



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Key Action Statements for Prevention

- **KAS 1: If the maternal antibody screen is positive or unknown, infant should have direct antiglobulin test (DAT) and blood typing (cord or peripheral) (Grade B, recommendation)**

- **KAS 2: Oral supplementation with water or dextrose water should not be provided to prevent hyperbilirubinemia or decrease bilirubin concentrations (Grade B, strong recommendation)**

Alex R. Kemper, et al; Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation. Pediatrics August 2022; 150 (3): e2022058859. 10.1542/peds.2022-058859

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Isoimmune Hemolytic Disease

Antibody mediated hemolysis

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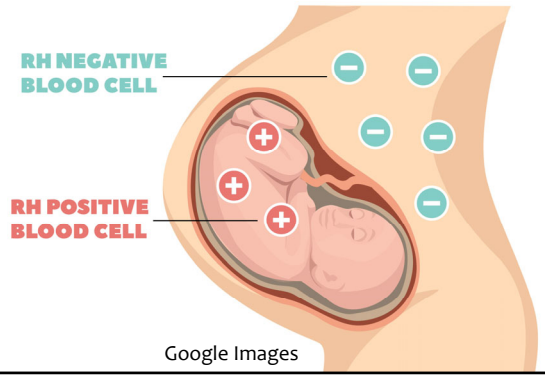
Rh Disease

- Rare now due to RhoGAM (~1968) but is SEVERE
- Hydrops fetalis
- Fatal without aggressive tx



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Rh disease

1. Rh negative mother (example: A-)
2. 1st pregnancy: Rh positive fetus (example A+)
3. Mother does NOT receive RhoGAM → now "Rh sensitized" (i.e. mother has produces Anti-D antibodies)
4. 2nd pregnancy: Rh positive fetus (example A+)
5. Anti-D antibodies (IgG) cross placenta, attach to D antigens on fetus RBC and cause hemolysis

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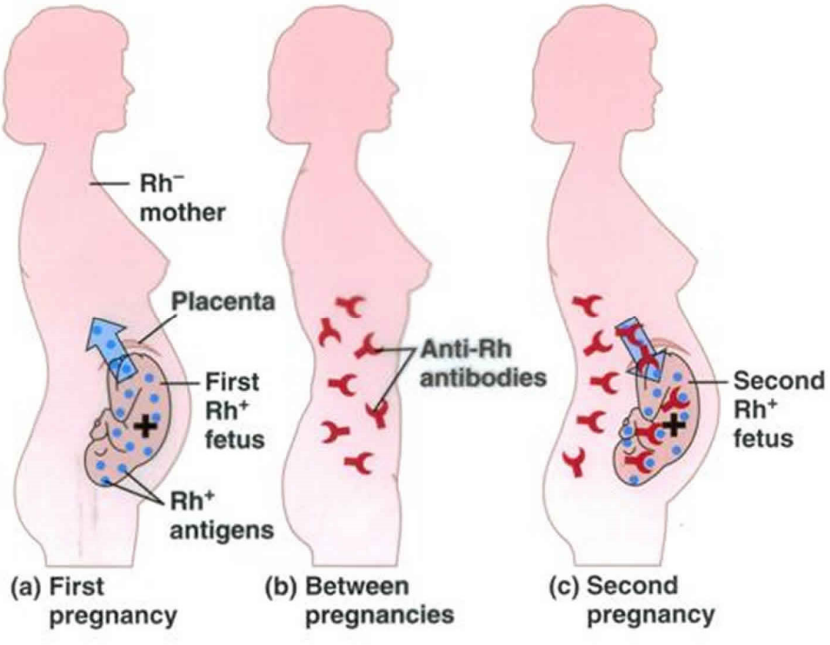

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Brain Break!

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ABO Incompatibility

- Common and less severe than Rh disease
- Can occur when mother is type O and baby is A, B or AB
- Why?
- Type O mother has naturally-occurring anti-A and anti-B antibodies
- These antibodies (IgG) cross placenta and bind to baby's RBCs antigens

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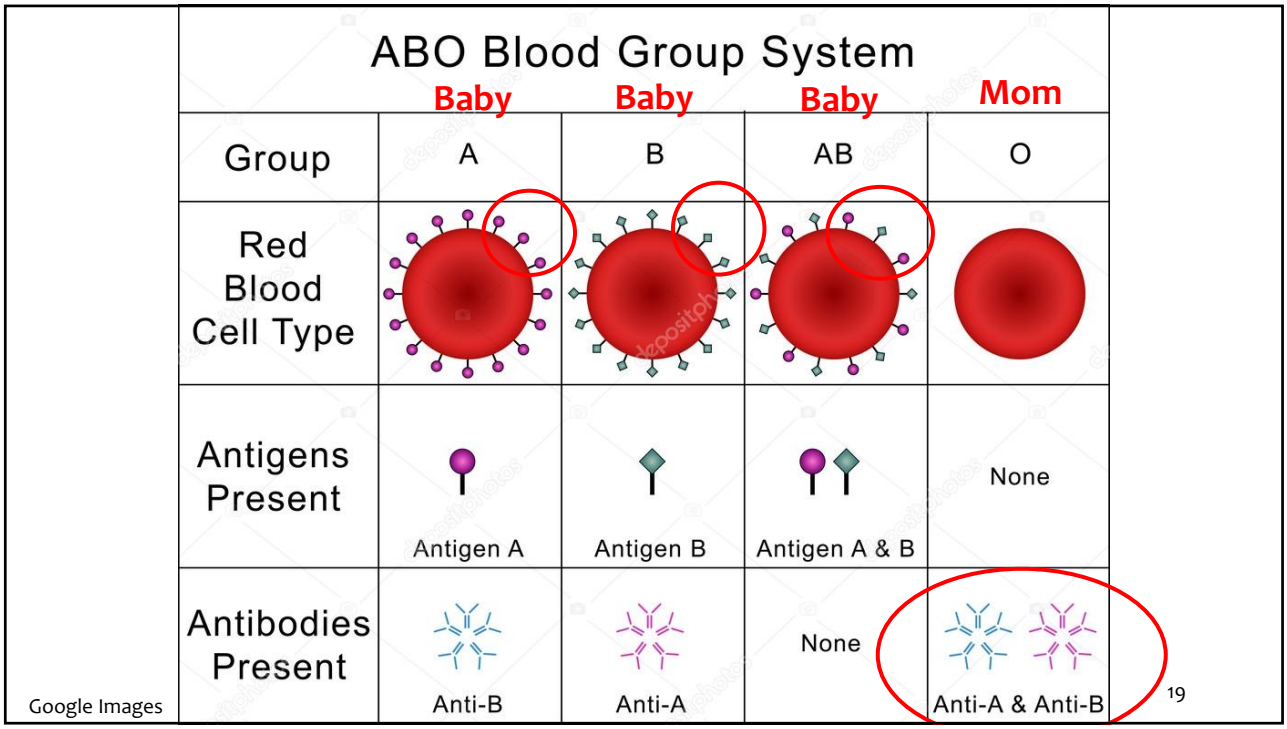

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Antiglobulin tests

Direct Coombs

- Test used to determine if there are "foreign" antibodies adhered to baby RBCs
- Test is done on BABY → take sample of baby RBCs + anti human antibodies → if agglutination (clumping) occurs, then test is POSITIVE
- If no agglutination, it is DAT negative

Indirect Coombs ("antibody screen")

- Test is done on MATERNAL serum to determine if she has circulating antibodies
- Maternal serum + RBC with known antigen + anti human antibodies→ if agglutination (clumping) occurs, test is POSITIVE
- If no agglutination, test is negative ("antibody screen negative")

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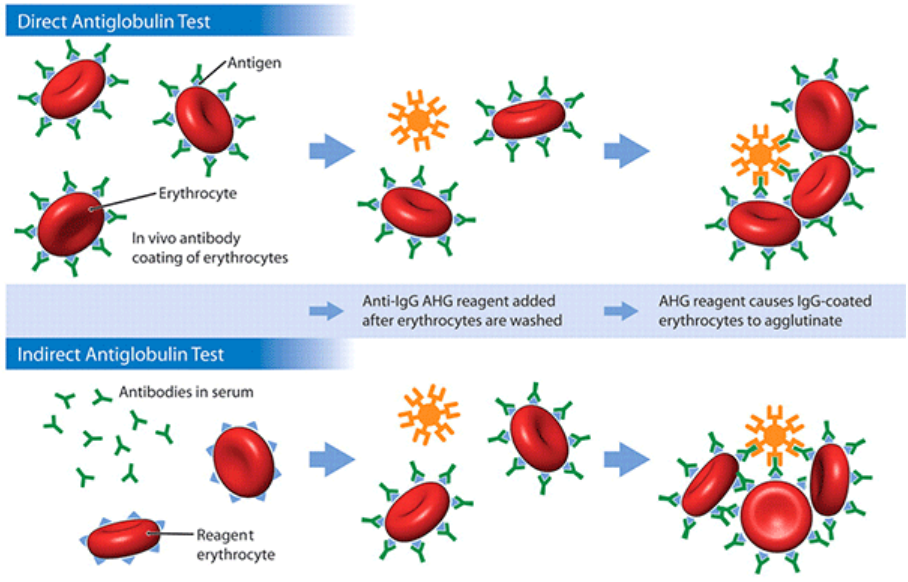
Direct Coomb's Test

vs

Indirect Coomb's Test



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Assessment and Monitoring

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Risk Factors for Hyperbilirubinemia

Risk Factors
• Lower gestational age (ie, risk increases with each additional week less than 40 wk)
• Jaundice in the first 24 h after birth
• Predischarge transcutaneous bilirubin (TcB) or total serum bilirubin (TSB) concentration close to the phototherapy threshold
• Hemolysis from any cause, if known or suspected based on a rapid rate of increase in the TSB or TcB of >0.3 mg/dL per hour in the first 24 h or >0.2 mg/dL per hour thereafter.
• Phototherapy before discharge
• Parent or sibling requiring phototherapy or exchange transfusion
• Family history or genetic ancestry suggestive of inherited red blood cell disorders, including glucose-6-phosphate dehydrogenase (G6PD) deficiency
• Exclusive breastfeeding with suboptimal intake
• Scalp hematoma or significant bruising
• Down syndrome
• Macrosomic infant of a diabetic mother

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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

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Case 1: Risk Factors

- SVD at 11pm at 39.2 weeks and 3780 grams
- Discharged DOL 4 at 39.6 CGA and 3691 g (↓2.3%)
- ABO isoimmunization
- Phototx started DOL 1 for bili 6.6 @ 16 hrs. (LL 9.2)
- Then bili 9.2 @ 22 hours (rate-of-rise 0.43)
- DOL 2 bili levels continue to rise but levels were ~3 BELOW LL
- DOL 3 bili 6am bili was 11.2 at 56 hrs (LL 14.9) AND rate-of-rise down to 0.05
- Phototx discontinued DOL 4

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Using bilitool™

—option two—

Age (hours) at sampling: 16

Total Bilirubin: 6.6 **Units:** mg/dL (US)

Gestational age: 39 weeks

Are there *any* neurotoxicity risk factors other than gestational age present?

No Yes

If using TcB, confirm with TSB?	**Yes**	6.3 mg/dL
Phototherapy?	**No**	9.2 mg/dL
Escalation of Care? (learn more)	**No**	14.8 mg/dL
Exchange Transfusion?	**No**	16.8 mg/dL

Postdischarge Follow Up

For the baby **2.6 mg/dL** below the phototherapy threshold (Δ-TSB) and 16 hours of age:

(During birth hospitalization with no prior phototherapy)

→ **Check TSB or TcB in 4 to 24 hours. Use clinical judgment and shared decision making to determine when to repeat the bilirubin measure within this 4 to 24 hour period.**

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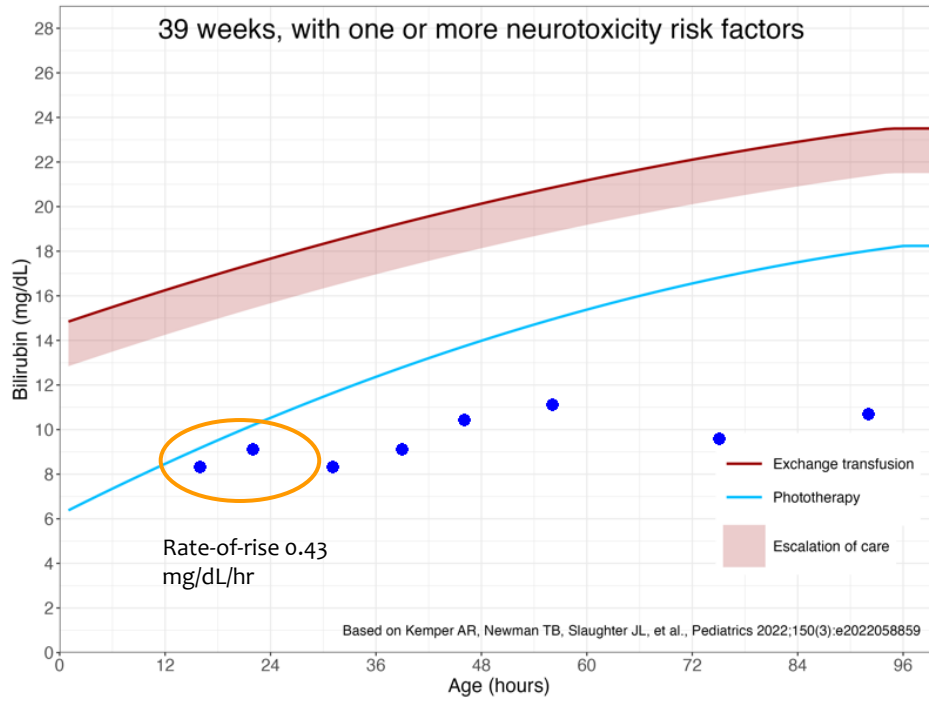

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Case 1: Risk Factors

Clinical

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Risk Factors / Considerations

- Discharged 2 days beyond Fed. Mandate
- ONLY risk factor provided was ABO isoimmunization – no feeding info, weight ↓2.3%
- Rate-of-rise from 16 to 22 hours = 0.43 mg/dL per hour
- Was starting phototherapy appropriate?
- Was timing of discharge appropriate?
- What other information may be helpful?

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Key Action Statements for Assessment and Monitoring

- KAS 3: Use TSB as the definitive test to guide phototherapy and escalation-of-care decisions, including exchange transfusion (Grade X, recommendation)
- KAS 4: All infants should be visually assessed for jaundice at least every 12 hours following delivery until discharge. TSB or TcB should be measured as soon as possible for infants noted to be jaundiced <24 hours after birth (Grade X, strong recommendation)
- KAS 5: The TcB or TSB should be measured between 24- and 48 hours after birth or before discharge if that occurs earlier (Grade C, recommendation)
- KAS 6: TSB should be measured if the TcB exceeds or within 3 mg/dL or phototherapy treatment threshold if TcB is ≥15 mg/dL (Grade C, recommendation)
- KAS 7: If more than 1 TcB or TSB measure is available, the ROR may be used to identify infants at higher risk of subsequent hyperbilirubinemia. ROR ≥0.3 mg/dL per hour in first 24 hours or ≥0.2 mg/dL per hour beyond 24 hours is HIGH and suggests hemolysis. Perform DAT if not previously done. (Grade D, option)
- KAS 8: If appropriate follow-up cannot be arranged for an infant recommended to have an outpatient follow-up bilirubin measure, discharge may be delayed (Grade D, Option)
- KAS 9: For breastfed infants who are still jaundiced at 3-4 weeks and formula-fed infants at 2 weeks, total and direct-reacting (or conjugated) bilirubin concentrations should be measured to identify possible pathologic cholestasis (Grade X, recommendation)

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Treatment

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Phototherapy

- Photochemical reaction
  - Blue light change the shape/structure of bilirubin into photoisomers and oxidation products
  - NOT UV light! Blue light has wavelengths of 460 – 490 nm → absorbed into skin to convert bilirubin to a form that can be excreted
- Effectiveness is dependent on INTENSITY and EXPOSED SURFACE AREA
- Purpose: decrease likelihood of reaching EXCHANCE LEVELS
  - What's the downside? Some evidence that phototherapy leads to an increase in risk of childhood epilepsy
  - Separation from mother, interference with bonding/breastfeeding

Benefit of phototherapy outweighs this risk when bilirubin level is at or above threshold

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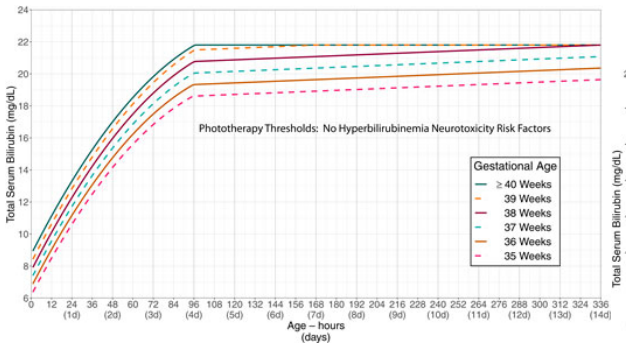
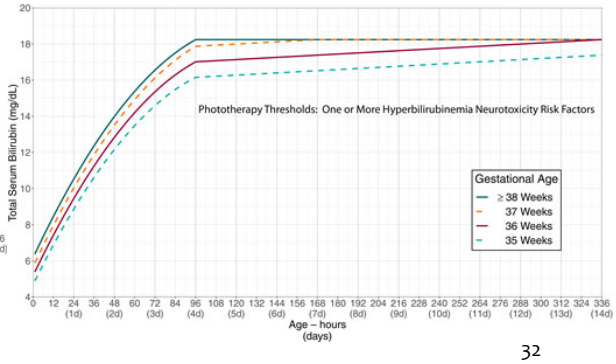
Phototherapy Thresholds





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Key Action Statement

- **KAS 10: Intensive phototherapy is recommended at the total serum bilirubin thresholds in [threshold curves] on the basis of gestational age, hyperbilirubinemia neurotoxicity risk factors, and age of the infant in hours. (Aggregate Evidence Quality Grade X, Recommendation)**

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Home Phototherapy

- **KAS 11: For newborn infants who have already been discharged and then develop a TSB above the phototherapy threshold, treatment with a home LED-based phototherapy device rather than readmission to the hospital is an option for infants who meet the following criteria. (Aggregate Evidence Quality Grade D, Option)**
  - GA ≥38 weeks
  - ≥48 hours old
  - Clinically well with adequate feeding
  - No hyperbilirubinemia neurotoxicity risk factors
  - No previous phototherapy
  - TSB within 1 mg/dL above phototherapy treatment threshold
  - LED-based phototherapy device is readily available
  - TSB can be measured daily

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Monitoring Infants Receiving Phototherapy

- **KAS 12: In the hospital, measure TSB within 12 hours after starting, frequency should then be based on age, risk factors, TSB level and rate-of-rise**
- **KAS 13: If infant is receiving home phototherapy, they should have DAILY bilirubin checks. If rate-of-rise increases or TSB is ≥1 above threshold, infant should be admitted**
- **KAS 14: Check hemoglobin to assess for anemia and to provide a baseline in case anemia develops. Infant DAT when mother is type O. G6PD activity with jaundice of unknown cause and TSB continues to rise or level increases suddenly, or increases after an initial decline**

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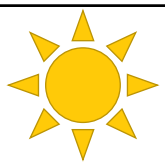
Discontinuing Phototherapy



- Decision based on RISK of continuing phototherapy (continued exposure, separation from mother) vs. BENEFIT to avoid a rebound hyperbilirubinemia
- REBOUND HYPERBILIRUBINEMIA: TSB concentration that reaches treatment threshold within 72-96 hours after discontinuation
- Predictors: <48 hours, hemolytic disease, GA <38 weeks, and higher TSB at time of discontinuation
- KAS 15: Discontinuing phototherapy is an option when TSB has decreased by ≥2 mg/dL BELOW threshold at time of initiation. Longer period of phototherapy is an option if there are risk factors for rebound hyperbilirubinemia

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Follow-up After Phototherapy

- Ideally, at least 12-24 hours for rebound bilirubin level
- **KAS 16: Repeat bilirubin measurement after phototherapy is based on the risk of rebound hyperbilirubinemia.**
- If received phototherapy before 48 hours, positive DAT, hemolytic disease → rebound TSB 6-12 hours AND on the day after phototherapy was discontinued
- TcB can be used IF phototherapy has been off for ≥24 hours

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Escalation of Care

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Escalation of Care

- GOAL: Prevent the need for exchange transfusion
- **KAS 17: Escalation-of-care threshold is 2 mg/dL BELOW exchange threshold**
- MEDICAL EMERGENCY → should be managed in a NICU that can facilitate an exchange transfusion
- IVIG (intravenous immunoglobulin)
  - For isoimmune hemolytic disease
  - Binds to circulating antibodies so they can't bind to the baby's RBCs
- IV fluids, PO supplementation

Google Images
4. American Academy of Pediatrics Subcommittee on Hyperbilirubinemia. Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. Pediatrics. 2004;114(1):297-316

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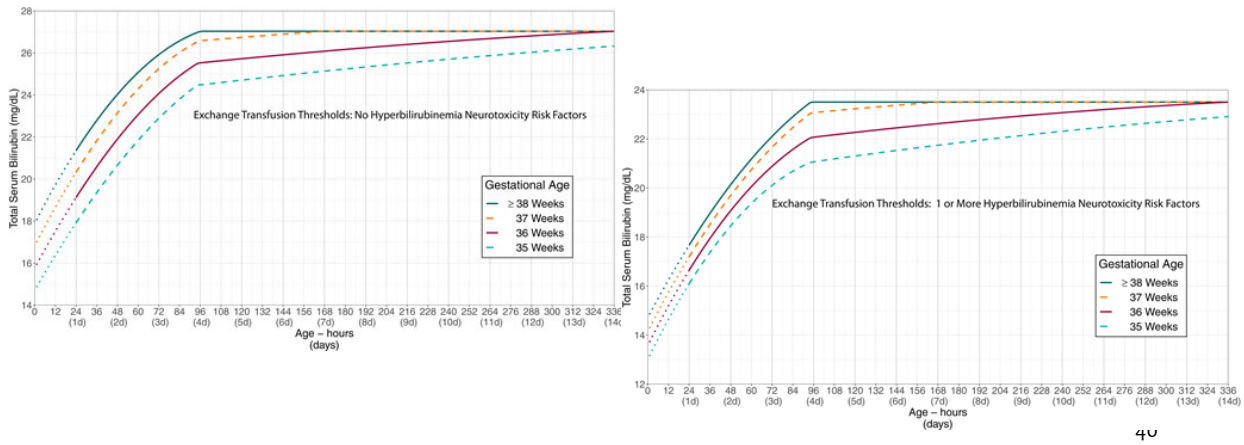
Exchange Transfusion Thresholds



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Key Action Statements

- **KAS 18: For infants requiring escalation of care, blood should be sent STAT for total and direct-reacting serum bilirubin, a complete blood count, serum albumin, serum chemistries, and type and crossmatch. (Aggregate Evidence Quality Grade X, Recommendation)**
- **KAS 19: Infants requiring escalation of care should receive intravenous hydration and emergent intensive phototherapy. A neonatologist should be consulted about urgent transfer to a NICU that can perform an exchange transfusion. (Aggregate Evidence Quality Grade C, Recommendation)**
- **KAS 20: TSB should be measured at least every 2 hours from the start of the escalation-of-care period until the escalation-of-care period ends. Once the TSB is lower than the escalation-of-care threshold, management should proceed according to the section "C. Monitoring Infants Receiving Phototherapy." (Aggregate Evidence Quality Grade X, Recommendation)**
- **KAS 21: Intravenous immune globulin (IVIG; 0.5 to 1 g/kg) over 2 hours may be provided to infants with isoimmune hemolytic disease (ie, positive DAT) whose TSB reaches or exceeds escalation of care threshold. The dose can be repeated in 12 hours. (Aggregate Evidence Quality Grade C, Option)**

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Exchange Transfusion

- Double volume exchange
  - Removes circulating antibodies and bilirubin to try to prevent kernicterus
  - Criteria based on risk factors and hours of life
  - **KAS 22: urgent exchange transfusion should be performed in infants with signs of intermediate or advance stages of acute bilirubin encephalopathy**
  - **KAS 23: urgent exchange transfusion should be performed in infants if TSB is at or above exchange threshold.**
  - Bilirubin to albumin ratio can be used along with TSB to determine need for exchange

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Postdischarge Follow-up

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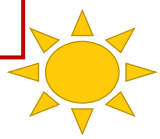
Postdischarge Follow-Up

- **KAS 24: Recommendations are based on difference between bilirubin level and phototherapy threshold**
- Incorporates GA and other risk factors



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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]

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Real case examples

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Baby KP

- Readmission

Initial Readmission Note with InterQual
Readmission Reason: r/o sepsis; hyperbili
Significant Clinical History: DC home from WBN on 10/19 with tsb 11.7 at 35h; sent from Peds office with rectal temp 95.7 and tsb 18.2
Gestational Age at birth: 35.3
CGA: 35.6
Birth Weight: 2705
CW: not provided
Birth History: Vag del; vacuum extraction; DC home with MOB 10/19
Does Patient Meet Clinical Indications for Admission or Procedure? Yes
Current Clinical Status: Former 35.3 weeks/2705g; RA; RW; PIV fluids and EBM/Enfamil PO ad lib; r/o sepsis; cx pending; IV amp and ceftazidime started 10/20. Under photo rx. infant is O+ and MOB is O+., coombs neg. LP unsuccessful; Urine showed 3-5 WBC and mod bacteria, cx pending. Temp on admit 96.3
Medications: Ampicillin and Ceftazidime

- Discharge bilirubin 11.7 mg/dL @ 35 hours (DOL 2)
- DOL 3, bilirubin increased to 18.2 mg/dL @ ~59 hours
- Phototherapy threshold ~15.5 mg/dL and rate-of-rise 0.27 mg/dL/hour

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Baby KP

—option two—

Age (hours) at sampling:

59

Total Bilirubin:

18.2

Units:

mg/dL (US)

Gestational age:

35 weeks

Are there *any* neurotoxicity risk factors other than gestational age present?

No Yes

Recommendations

	Recommendation	Threshold
If using TcB, confirm with TSB?	Yes	12.6 mg/dL
Phototherapy?	Yes	15.5 mg/dL
Escalation of Care? (learn more)	No	19.8 mg/dL
Exchange Transfusion?	No	21.8 mg/dL

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Baby HC - ELOS

Gestational Age at Birth: 37.0
GA at Discharge: 37.4
Birth Weight: 2860
Weight at discharge: not provided.

Maternal drug use: N/A
Delivery type: SVD; time of birth not provided. Admit time on facesheet states 9/23/22 at 1248pm.
Does Patient Meet Clinical Indications for Admission or Procedure? Yes

Reason Admission Required: Hyperbili
Clinical history: >9/23-9/24: Routine Newborn Care. OC, RA, ad lib. Infant: ABO O; Rh Pos; Direct Coombs Neg.
>9/24: TSB 9.5 at 28 HOL, no photo.
>9/25: 2850g. OC, RA. BF + bottle ad lib taking 5-12ml. TSB 12.9 at 41 HOL; double photo.
>9/26: 2705g. OC, RA. BF + bottle ad lib taking 15-20ml. TSB 12.4 at 53 HOL, 11.8 at 63 HOL; DC photo. TSB 10.8 at 71 HOL.
>9/27: Infant discharged home this day.

- DOL 1 bilirubin 9.5 @ 28 hours (~5pm)
- DOL 2 bilirubin 12.9 @ 41 hours (~6am) → LL 14.4, ROR 0.26 (photo started) → bili 12.4 @ 53 hours (~6pm)
- DOL 3 bilirubin 11.8 @ 63 hours (~4am) → d/c photo → bili 10.8 @ 71 hours (~12pm)
- DOL 4 discharged home

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Summary of Changes to NRS Clinical Guidelines Hyperbilirubinemia – BACKGROUND

- Additional hyperbilirubinemia risk factors: jaundice in the first 24 hours of life, phototherapy before discharge, Down syndrome, and macrosomia / infant of a diabetic mother (AAP, 2022)
- Additional hyperbilirubinemia neurotoxicity risk factors: GA <38.0 weeks, albumin <3 mg/dL, isoimmune hemolytic disease, sepsis, and significant clinical instability in the previous 24 hours (AAP, 2022)

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Summary of Changes to NRS Clinical Guidelines Hyperbilirubinemia – TREATMENT CRITERIA

- TcB or TSB should be measured between 24 and 48 hours after birth or before discharge, whichever occurs earlier (AAP 2022)
- TSB should be measured if the TcB exceeds or is within 3 mg/dL of the phototherapy treatment threshold or if the TcB is ≥15 mg/dL (AAP 2022)
- It is an option to start phototherapy at a lower threshold (e.g. 2 mg/dL below the phototherapy threshold) to reduce readmission risk

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Summary of Changes to NRS Clinical Guidelines Hyperbilirubinemia – TREATMENT CRITERIA

- Phototherapy may be discontinued when TSB has decreased by at least 2 mg/dL below the hour-specific threshold at the start of phototherapy
- A longer period may be warranted if there are risk factors for rebound hyperbilirubinemia such as a infant with hemolytic disease, GA <38 weeks or the initiation of phototherapy at <48 hours of age (AAP, 2022)

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Summary of Changes to NRS Clinical Guidelines Hyperbilirubinemia – TREATMENT CRITERIA

- A low serum albumin level may elevate the risk of neurotoxicity due to the increased availability of unbound bilirubin. An albumin concentration <3 g/dL can be considered a hyperbilirubinemia neurotoxicity risk factor (AAP, 2022)
- The bilirubin/albumin ratio may be used with the TSB level to determine whether an exchange transfusion is necessary. The TSB (mg/dL) divided by serum albumin (g/dL) may be used to determine the treatment threshold for exchange transfusion (AAP, 2022)
- If appropriate follow-up cannot be arranged for an infant recommended to have an outpatient follow-up bilirubin measure, discharge may be delayed

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Summary of Changes to NRS Clinical Guidelines Hyperbilirubinemia – ESCALATION CRITERIA

- Discontinuing phototherapy is an option with TSB has decreased by at least 2 mg/dL below the hour-specific threshold at the initiation of phototherapy.
- A longer period of phototherapy is an option if there are risk factors for rebound hyperbilirubinemia (e.g. <38 weeks, initiation of phototherapy <48 HOL) (AAP, 2022)
- Any infant ≥35 weeks and ≥72 HOL who remains on phototherapy with a TSB of <13 mg/dL

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Summary of Changes to NRS Clinical Guidelines Hyperbilirubinemia – CLINICAL EVIDENCE

- In order to identify high risk infants EARLY, it is recommended that ALL infants have either TcB or TSB within 24-48 HOL or prior to discharge (whichever is earlier)
- Follow-up should based on difference between pre-discharge bilirubin level and hour-specific phototherapy threshold
- Slightly higher thresholds for phototherapy and exchanged transfusion which take into account GA and other risk factors
- Escalation of care: medical emergency and is defined by a bilirubin level that is within 2 mg/dL of exchange threshold

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Summary of Changes to NRS Clinical Guidelines Hyperbilirubinemia – CLINICAL EVIDENCE

- Discontinuation of phototherapy is an option when the TSB has decreased by at least 2 mg/dL below the hour-specific threshold at the initiation of phototherapy.
- A longer period of phototherapy is an option if there are risk factors for rebound hyperbilirubinemia (e.g. GA <38 weeks, <48 HOL at start of phototherapy) (AAP 2022)
- For infants that are readmitted, phototherapy is generally discontinued when TSB is 12-14 mg/dL (Bhutani and Wong 2016)
- During birth stay, phototherapy is generally discontinued when TSB decreases to 2-4 mg/dL BELOW the level at which phototherapy was started

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Summary of Changes to NRS Clinical Guidelines Hyperbilirubinemia – CLINICAL EVIDENCE

- If there is concern for rebound hyperbilirubinemia, additional TSB can be obtained every 12-24 hours
- A rebound bilirubin level should not delay discharge unless phototherapy is stopped in the evening
- If appropriate outpatient follow-up cannot be arranged, discharge may be delayed (AAP, 2022)
- A new meta-analysis published in 2021 by Gu et al found that use of IVF decreased TSB at 8, 12, 24, and 36 hours AND decreased need for exchange. IVF use did NOT decrease length of phototherapy treatment, but concluded that they may provide additional benefits

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