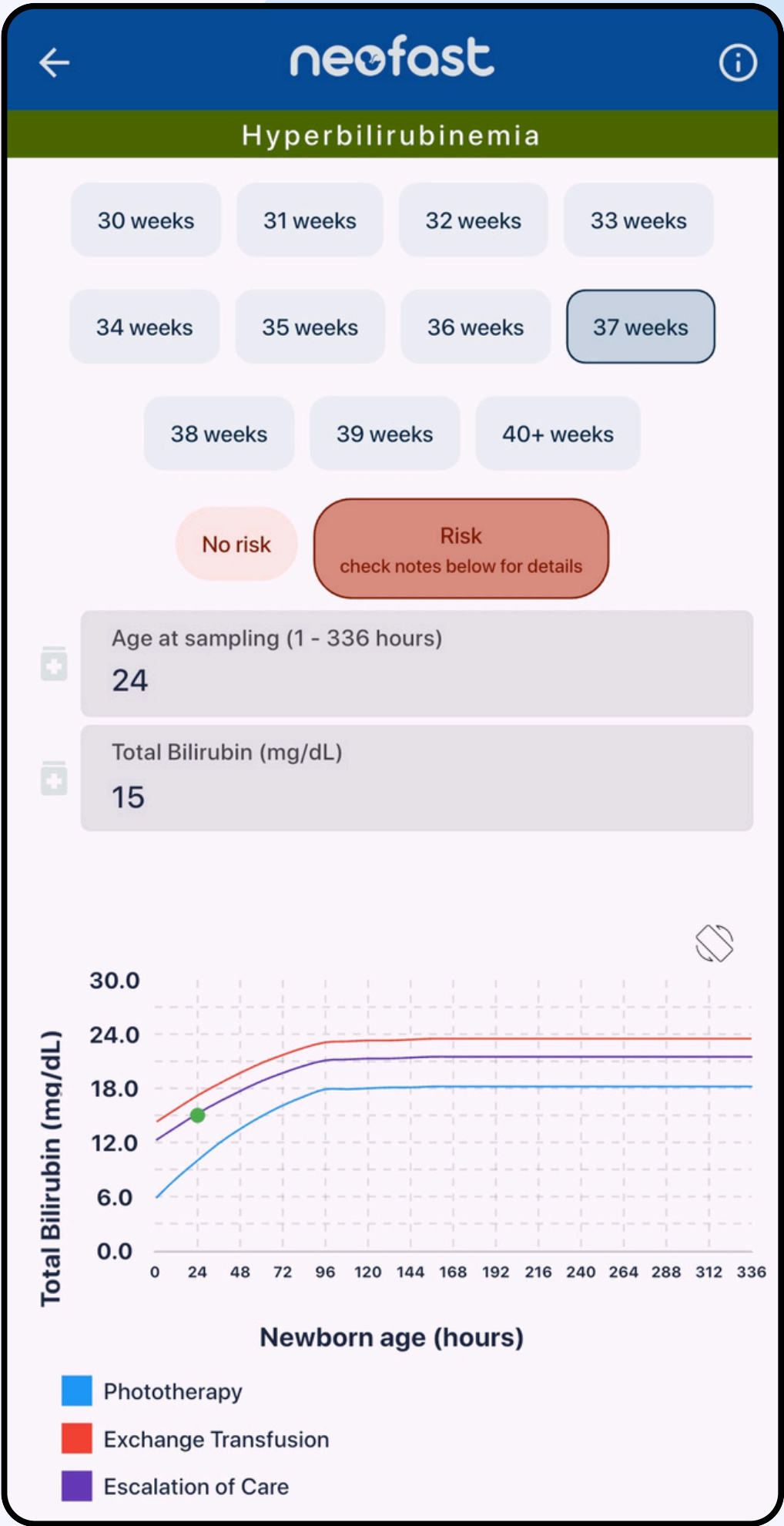


ON-CALL GUIDE • NEONATOLOGY

Neonatal Hyper-bilirubinemia ≥ 35 weeks

Everything that matters from the AAP 2022 guideline — Figures 1 to 7 redrawn for quick bedside use.

- Thresholds by GA week
- Risk factors
- Escalation of care
- Discharge follow-up



REFERENCE

Kemper AR, Newman TB, Slaughter JL, Maisels MJ, Watchko JF, Downs SM, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation. Pediatrics. 2022;150(3):e2022058859. doi:10.1542/peds.2022-058859

American Academy of Pediatrics (AAP) • Figures adapted from the guideline data

WHY IT MATTERS?

What changed in the 2022 guideline

>80% of newborns have some jaundice. Very high bilirubin can cause acute bilirubin encephalopathy and kernicterus: choreoathetoid CP, upward gaze paresis, hearing loss/auditory neuropathy and dental enamel dysplasia.

- **Thresholds by each GA week**

Phototherapy thresholds raised by a narrow, safe margin and set for 35, 36, 37, 38, 39 and ≥ 40 weeks.

- **Two kinds of risk factors**

Risk of developing hyperbilirubinemia (Table 1) vs. risk of bilirubin neurotoxicity (Table 2).

- **New: escalation of care**

Starts when TSB is 2 mg/dL below the exchange transfusion threshold — a medical emergency.

- **Follow-up by distance to threshold**

Post-discharge plan uses (phototherapy threshold – TcB/TSB), Fig 7 — replaces the 2004 nomogram.

- **TSB is the definitive test**

Use total serum bilirubin for treatment; never subtract direct bilirubin.

- **Home LED phototherapy**

An option for selected, already-discharged infants.

TABLES 1 & 2

Know the two kinds of risk factors

Hyperbilirubinemia risk

› monitor more closely

- Lower GA (risk rises each week <40) Jaundice in the first 24 h;
- PredischARGE TcB/TSB close to phototherapy threshold;
- Hemolysis: rise >0.3 mg/dL/h (<24 h) or >0.2 mg/dL/h after;
- Phototherapy before discharge Parent/sibling needed phototherapy or exchange;
- Family history/ancestry of RBC disorders incl. G6PD deficiency;
- Exclusive breastfeeding with suboptimal intake;
- Scalp hematoma or significant bruising Down syndrome;
- Macrosomic infant of a diabetic mother.

Neurotoxicity risk

› lower treatment thresholds

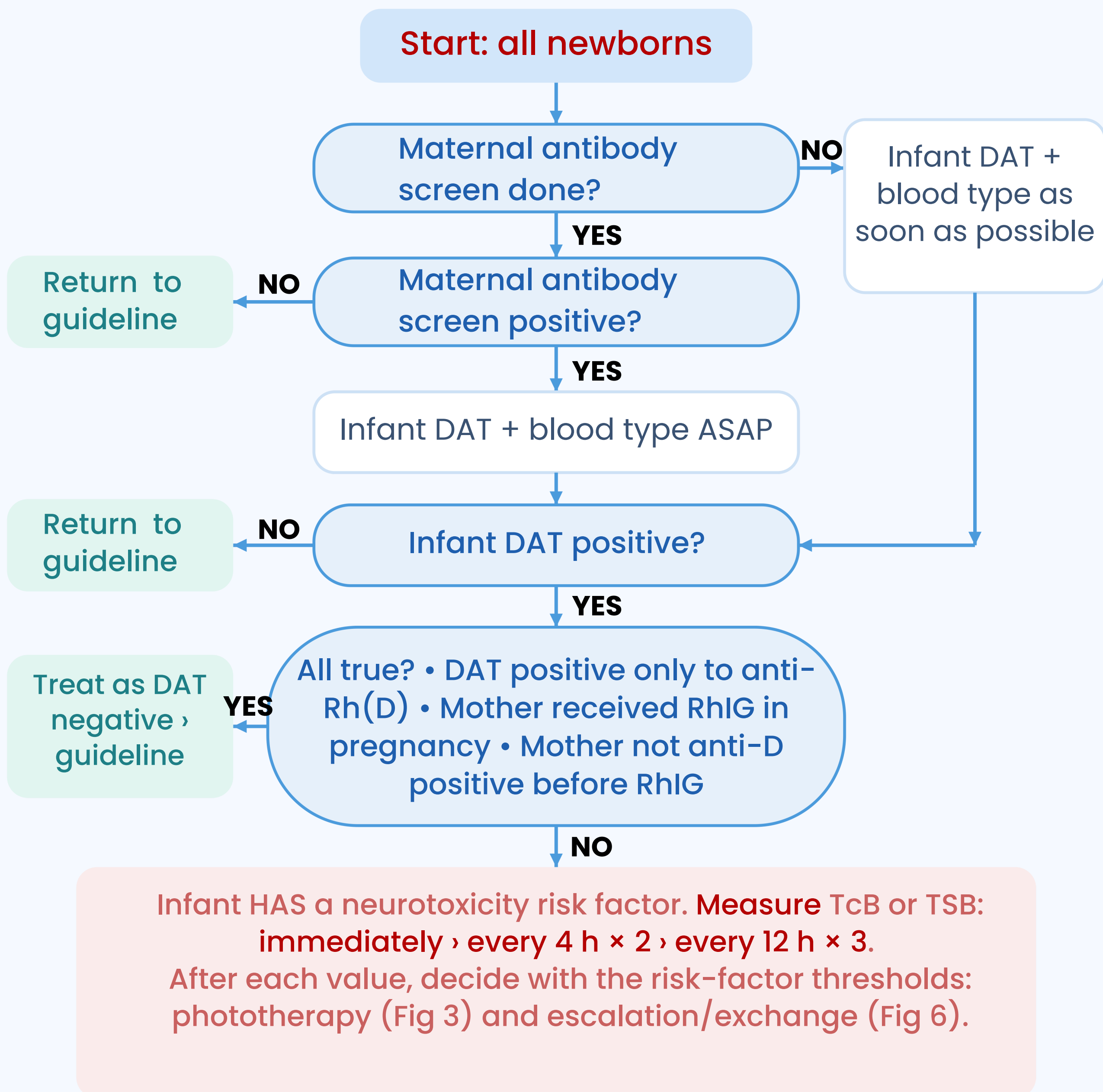
- Gestational age <38 weeks (risk rises with prematurity);
- Albumin <3.0 g/dL;
- Isoimmune hemolytic disease (DAT+), G6PD deficiency or other hemolytic conditions;
- Sepsis;
- Significant clinical instability in the previous 24 h.

Any one present › use Fig 3 (phototherapy) and Fig 6 (exchange).

In **NeoFast**, just tap “Risk”.

FIGURE 1

Maternal anti-erythrocyte antibodies: early approach



ASSESSMENT & MONITORING

Screen every baby — then trust the TSB

- **Look**

Visual check for jaundice at least every 12 h until discharge. Jaundice <24 h › TcB/TSB as soon as possible.

- **Measure all**

TcB or TSB between 24 and 48 h of life, or before discharge if earlier (also for home births).

- **Confirm with TSB**

If TcB is within 3 mg/dL of (or above) the phototherapy threshold, or TcB ≥ 15 mg/dL.

- **Watch the slope**

Rise ≥ 0.3 mg/dL/h in the first 24 h or ≥ 0.2 mg/dL/h after suggests hemolysis › DAT.

- **Feeding**

Breastfeed $\geq 8\times/24$ h. No water or dextrose water to lower bilirubin.

- **Reassurance**

A spontaneous fall over ≥ 6 h means low risk of later hyperbilirubinemia.

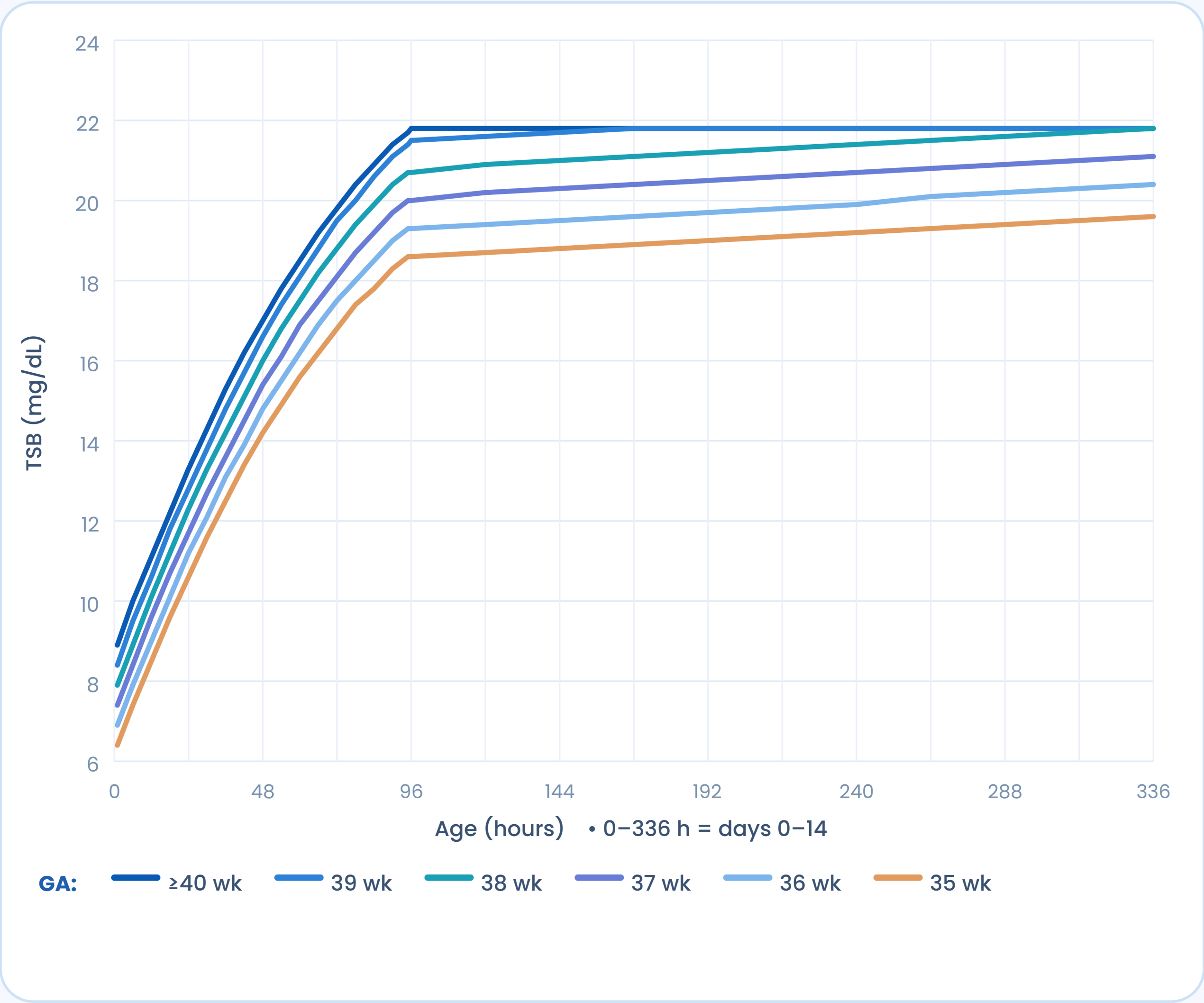
- **Prolonged jaundice**

Still jaundiced at 3–4 wk (breastfed) or 2 wk (formula) › total + direct bilirubin (cholestasis).

TcB and skin tone: BiliChek may underestimate ($\sim 1\text{--}2$ mg/dL) and JM devices may overestimate ($\sim 0.7\text{--}2.5$ mg/dL) in infants with darker skin.

FIGURE 2

Phototherapy thresholds — no neurotoxicity risk factors



At the bedside

Use TSB (do not subtract direct). TSB ≥ threshold before 24 h › suspect hemolysis. The curve flattens at 96 h for ≥40 wk.

Exact hour-by-hour values: **NeoFast** › **Jaundice assessment**.

PHOTOTHERAPY — PART 1

Starting & monitoring phototherapy

- **Make it intensive**

Narrow-band blue LED, $\geq 30 \mu\text{W}/\text{cm}^2/\text{nm}$ around 475 nm (460–490 nm), on as much skin as possible.

- **When**

TSB at/above the Fig 2 or Fig 3 threshold for GA, risk factors and age in hours. Starting slightly below threshold before discharge is an option.

- **Labs at start**

Hb/Hct or CBC. DAT if mother is antibody-positive, group O or Rh(D)–.

- **G6PD activity**

If cause unknown and TSB rises despite intensive phototherapy, rises suddenly or after a fall, or care is escalated.

- **Recheck**

TSB within 12 h of starting; then by age, risk factors, level and trajectory. TcB under the lights underestimates.

- **Direct fraction >50% of TSB**

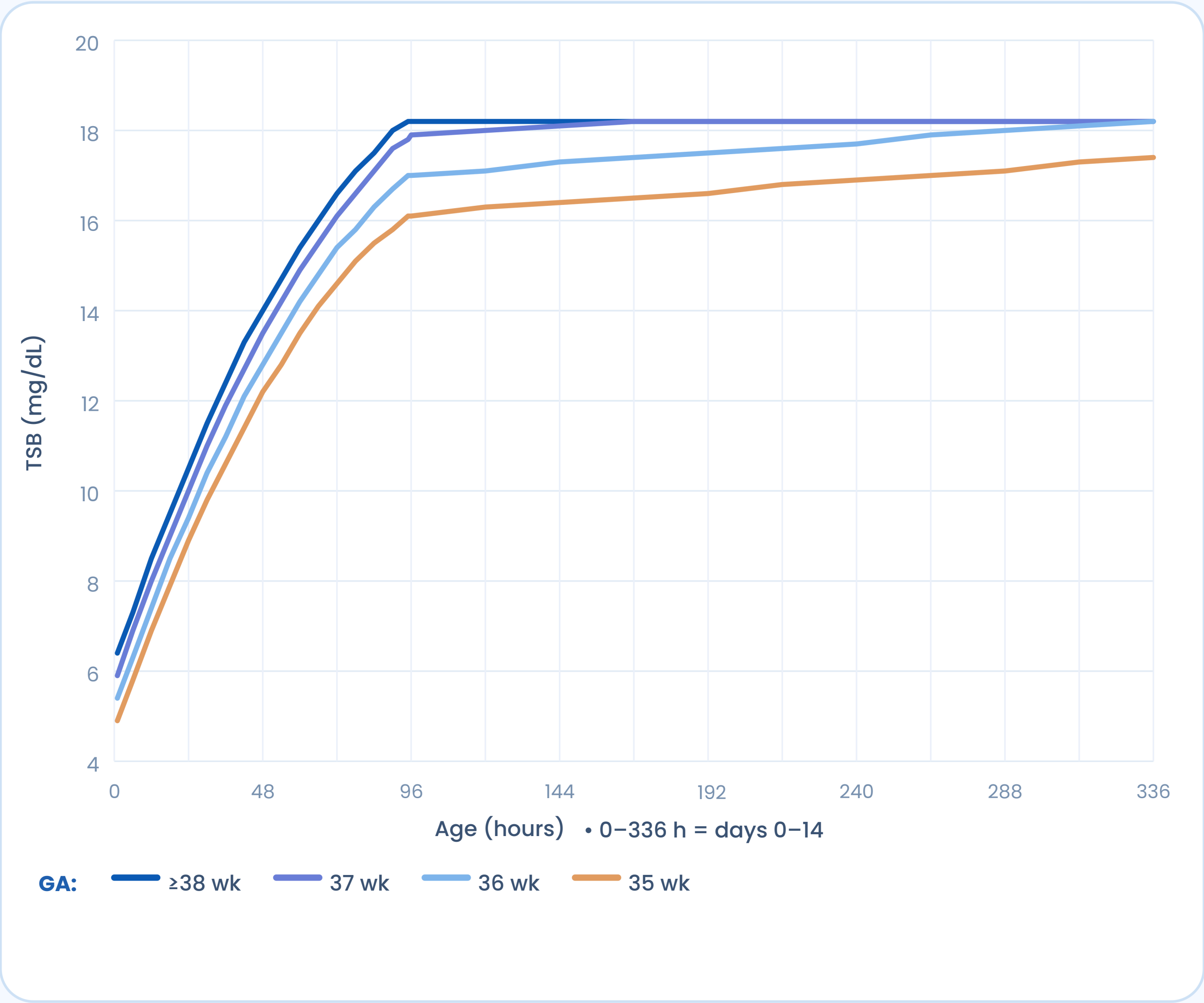
Consult a specialist (neonatology / pediatric GI).

- **Keep feeding**

Breastfeeding pauses are fine; IV fluids only for dehydration or at escalation of care.

FIGURE 3

Phototherapy thresholds — ≥1 neurotoxicity risk factor



Which risk factors?

GA <38 wk counts only through the GA curve; others: albumin <3.0 g/dL, isoimmune hemolysis/G6PD/other hemolysis, sepsis, instability in last 24 h. ≥38 wk are grouped (no lower neurotoxicity risk at 39–40 wk).

PHOTOTHERAPY — PART 2

Stopping, rebound & home phototherapy

STOP

When TSB is ≥ 2 mg/dL below the hour-specific threshold at initiation. Consider longer if GA < 38 wk, start < 48 h, or hemolysis.

Rebound check after stopping

- Treated in birth stay AND (started < 48 h, DAT+, or hemolysis): TSB 6–12 h after stopping + again next day.
- Other infants treated in the birth stay: bilirubin the next day.
- Readmitted / home phototherapy: bilirubin or clinical review in 1–2 days.
- TcB is acceptable if ≥ 24 h since phototherapy ended.

Home LED phototherapy: all must apply

- | | |
|---|--|
| <ul style="list-style-type: none">• GA ≥ 38 weeks• Clinically well, feeding well• No previous phototherapy• LED device at home without delay | <ul style="list-style-type: none">• ≥ 48 hours old;• No neurotoxicity risk factor;• TSB ≤ 1 mg/dL above;• threshold Daily TSB possible. |
|---|--|

FIGURE 4

Escalation of care: **step by step**

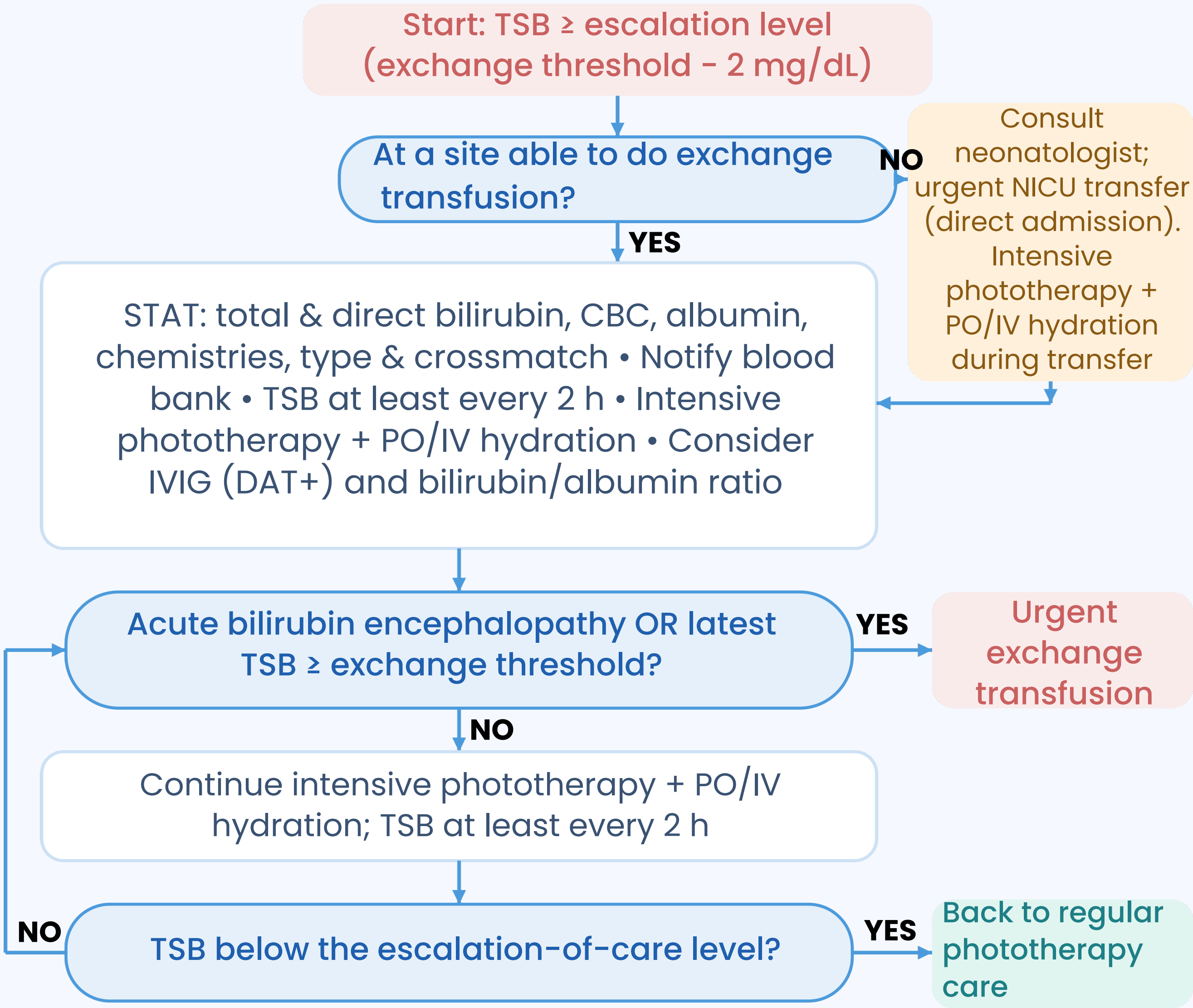
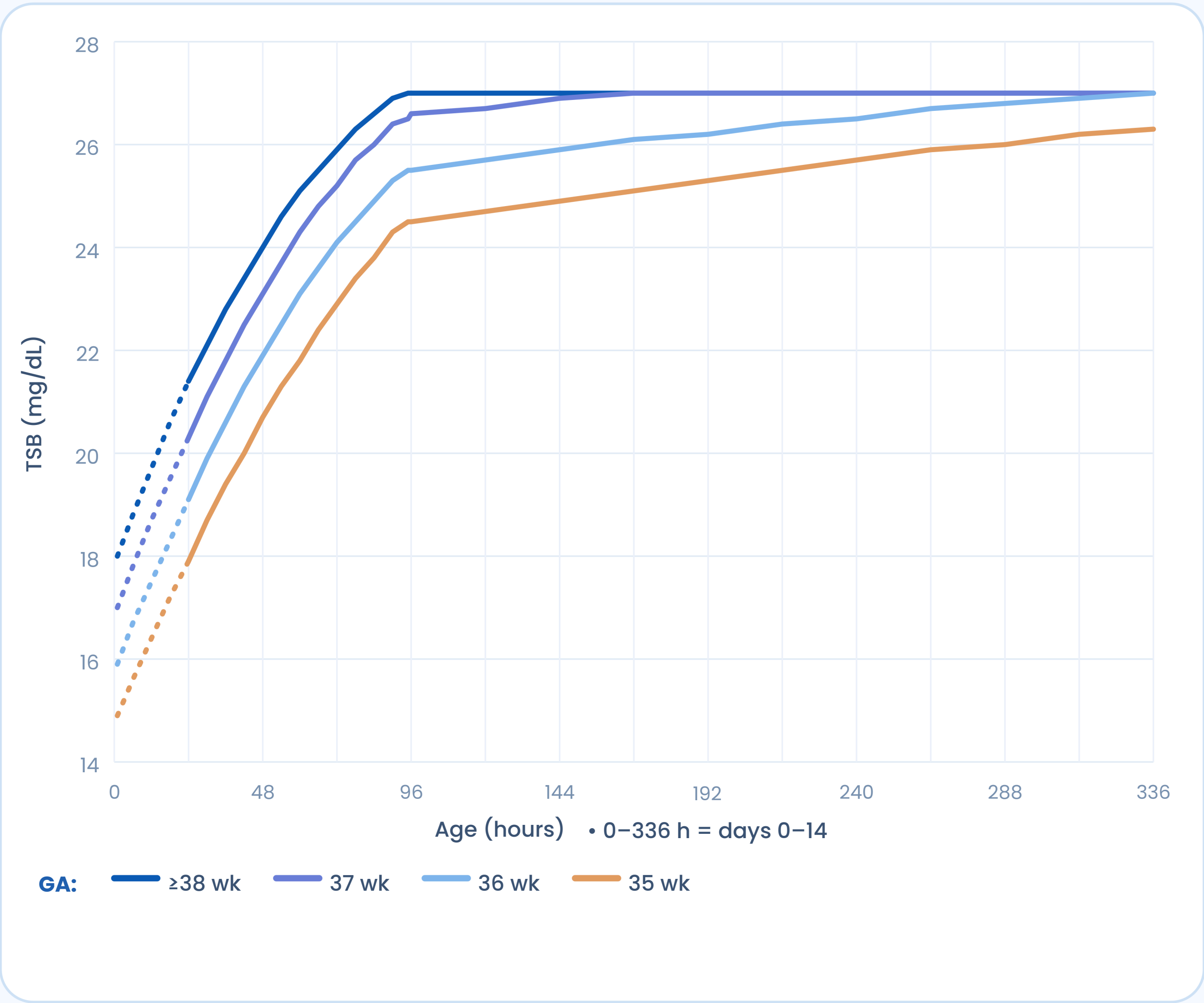


FIGURE 5

Exchange transfusion thresholds — **no** neurotoxicity risk factors

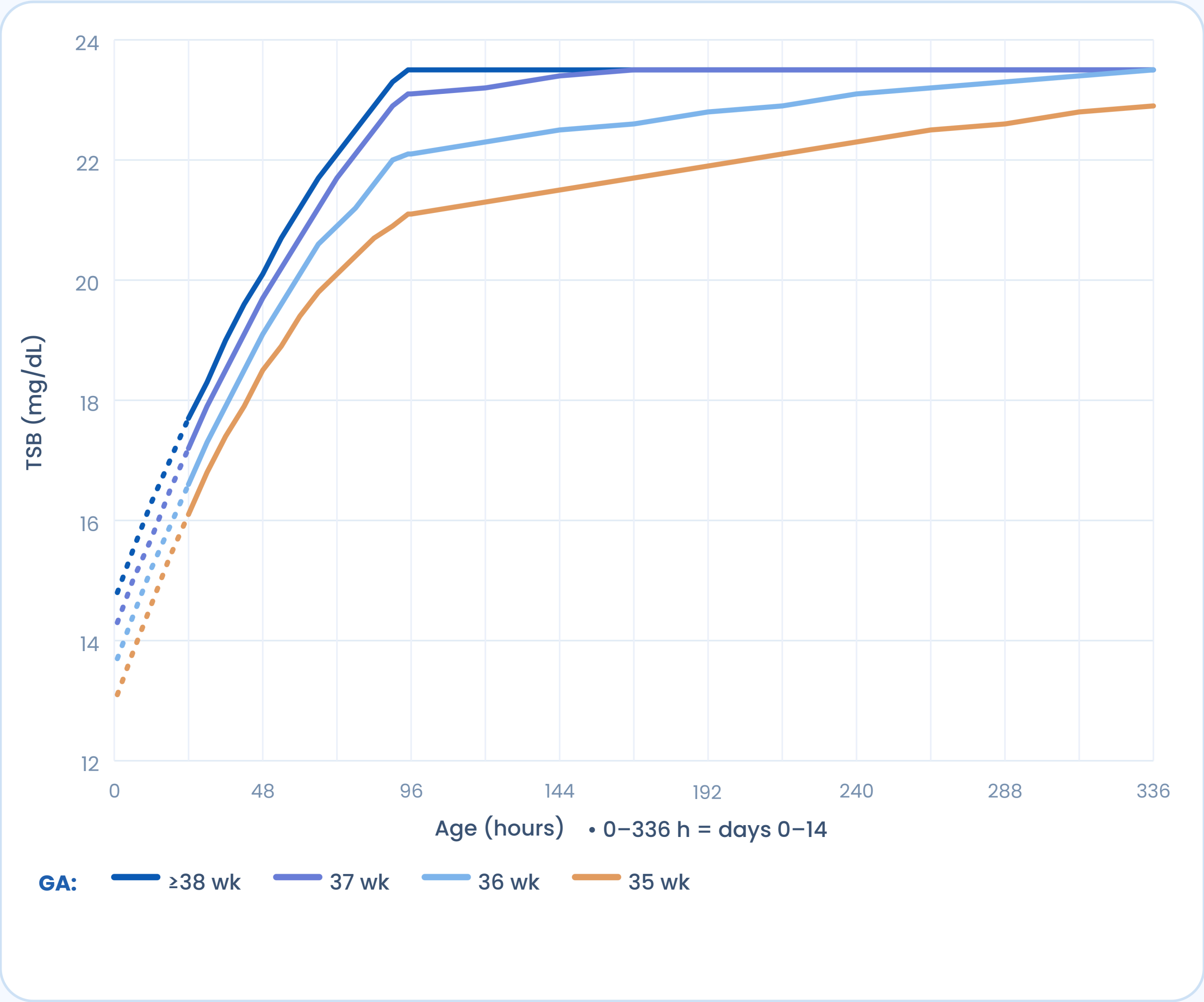


Remember

Escalation of care begins 2 mg/dL BELOW these lines. Dotted first 24 h = uncertainty (wide range of clinical situations and response to intensive phototherapy). Use TSB; do not subtract direct bilirubin.

FIGURE 6

Exchange transfusion thresholds — **≥1**
neurotoxicity risk factor



Also use Fig 6 when...

TSB keeps rising despite phototherapy, or any neurotoxicity risk factor is present (albumin <3.0 g/dL, hemolysis/G6PD, **sepsis**, instability in 24 h). Escalation = 2 mg/dL below.

ESCALATION & EXCHANGE

When TSB is approaching exchange levels

- **Escalation of care = emergency**
TSB $\geq$ exchange threshold - 2 mg/dL. Ideally in a NICU; admit directly, not via the ED.
- **Treat now**
IV hydration + emergent intensive phototherapy; STAT labs; TSB at least every 2 h.
- **IVIg (option)**
0.5–1 g/kg over 2 h if isoimmune hemolysis (DAT+); may repeat in 12 h.
- **Urgent exchange if**
Intermediate/advanced ABE signs (hypertonia, arching, retrocollis, opisthotonos, high-pitched cry, recurrent apnea) OR TSB $\geq$ exchange threshold.
- **Blood**
Crossmatched washed PRBC + thawed adult FFP, hematocrit ~40%.

Bilirubin/albumin ratio (TSB mg/dL ÷ albumin g/dL)

Exchange may be considered at or above:

	No risk factor	≥ 1 risk factor
≥ 38 weeks	≥ 8.0	≥ 7.2
35–37 weeks	≥ 7.2	≥ 6.8

FIGURE 7

Before discharge: **plan the follow-up**

Infants ≥ 12 hold, no phototherapy yet. Find the hour-specific threshold (Fig 2 or 3). TSB $\geq$ threshold $\rightarrow$ begin phototherapy. Otherwise compute: threshold - TcB/TSB.

Threshold – bilirubin	What to do
0.1–1.9 mg/dL	<24 h: delay discharge, consider phototherapy, TSB in 4–8 h. ≥ 24 h: TSB in 4–24 h. Options: delay discharge $\pm$ phototherapy; home phototherapy if criteria met; or discharge with close follow-up.
2.0–3.4 mg/dL	TSB or TcB in 4–24 h (any age or discharge time).
3.5–5.4 mg/dL	TSB or TcB in 1–2 days (any age or discharge time).
5.5–6.9 mg/dL	- Discharge <72 h: follow-up within 2 days; TcB/TSB by clinical judgment. - Discharge ≥ 72 h: clinical judgment.
≥ 7.0 mg/dL	- Discharge <72 h: follow-up within 3 days; TcB/TSB by clinical judgment. - Discharge ≥ 72 h: clinical judgment.

Clinical judgment = exam, Table 1/Table 2 risk factors, feeding, weight trajectory and family support. Give every family written + verbal jaundice education and the follow-up appointment.

NEOFAST IN PRACTICE

The whole AAP 2022 algorithm in 3 taps

neofast

Hyperbilirubinemia

Less than 28 weeks

28 weeks

29 weeks

30 weeks

31 weeks

32 weeks

33 weeks

34 weeks

35 weeks

36 weeks

37 weeks

38 weeks

39 weeks

40+ weeks

No risk

Risk
check notes below for details

Age at sampling (1 - 336 hours)

Total Bilirubin (mg/dL)

Note: in terms of risks, these include isoimmune (or other) hemolytic disease or G6PD deficiency, sepsis or clinical suspicion of sepsis, albumin < 3.0 g/dL (30 g/L), significant clinical instability in the previous 24 hours. Source: Chart of American Academy of Pediatrics, 2022. For access more information, click on the  located at the top of the page

1. Choose GA week + “No risk” or “Risk”

neofast

Hyperbilirubinemia

30 weeks

31 weeks

32 weeks

33 weeks

34 weeks

35 weeks

36 weeks

37 weeks

38 weeks

39 weeks

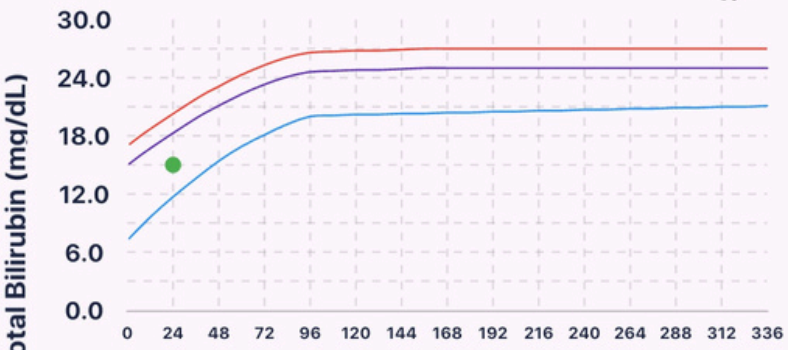
40+ weeks

No risk

Risk
check notes below for details

Age at sampling (1 - 336 hours)
24

Total Bilirubin (mg/dL)
15



Total Bilirubin (mg/dL)

Newborn age (hours)

Phototherapy
Exchange Transfusion
Escalation of Care

2. Enter age (h) and TSB

NO RISK

neofast

Hyperbilirubinemia

30 weeks

31 weeks

32 weeks

33 weeks

34 weeks

35 weeks

36 weeks

37 weeks

38 weeks

39 weeks

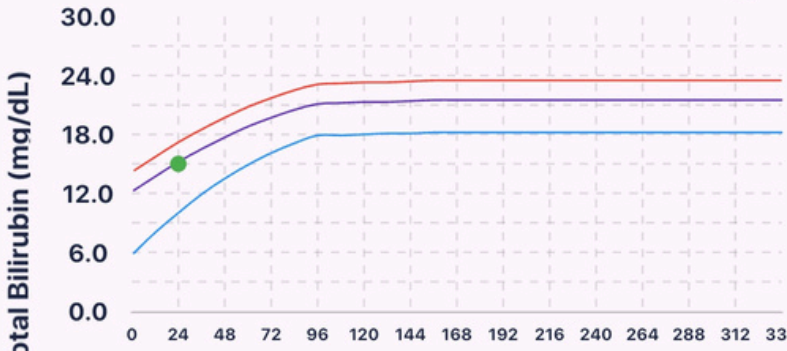
40+ weeks

No risk

Risk
check notes below for details

Age at sampling (1 - 336 hours)
24

Total Bilirubin (mg/dL)
15



Total Bilirubin (mg/dL)

Newborn age (hours)

Phototherapy
Exchange Transfusion
Escalation of Care

3. See the point vs. phototherapy, escalation & exchange

RISK

MADE FOR THE NIGHT SHIFT

Why neonatologists keep NeoFast open on call?

- **Hour-specific thresholds**

Exact AAP 2022 values for every hour, 0–336 h, every GA week.

- **Risk toggle**

Switches to the neurotoxicity-risk curves (Figs 3 & 6) with the full list in the notes.

- **Visual answer**

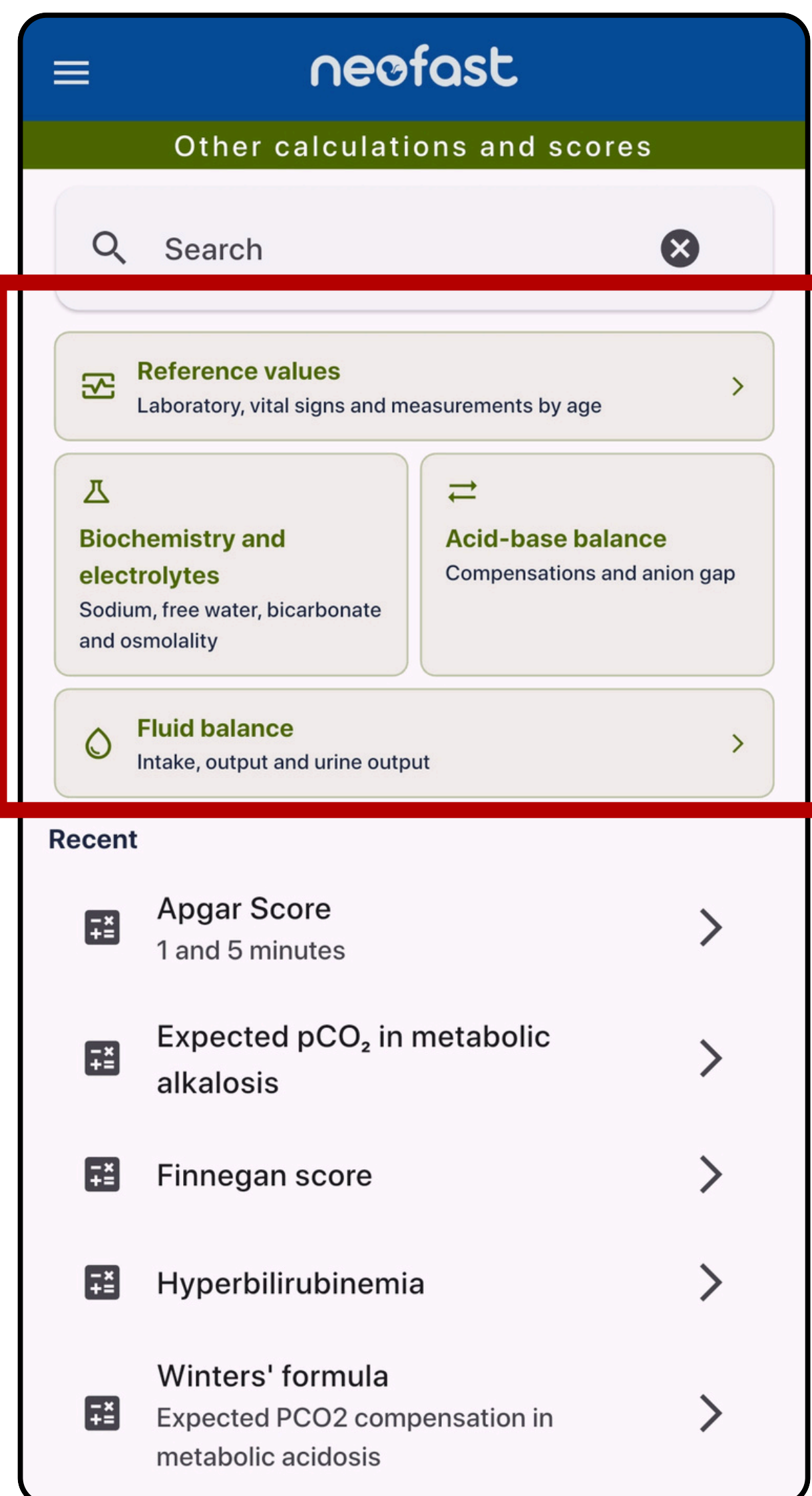
Your patient plotted against phototherapy, escalation and exchange lines.

- **Preterm <35 wk**

Dedicated phototherapy/exchange ranges for smaller babies.

- **More calculators**

Apgar, Finnegan, Winters, acid–base, electrolytes, fluid balance, reference values.

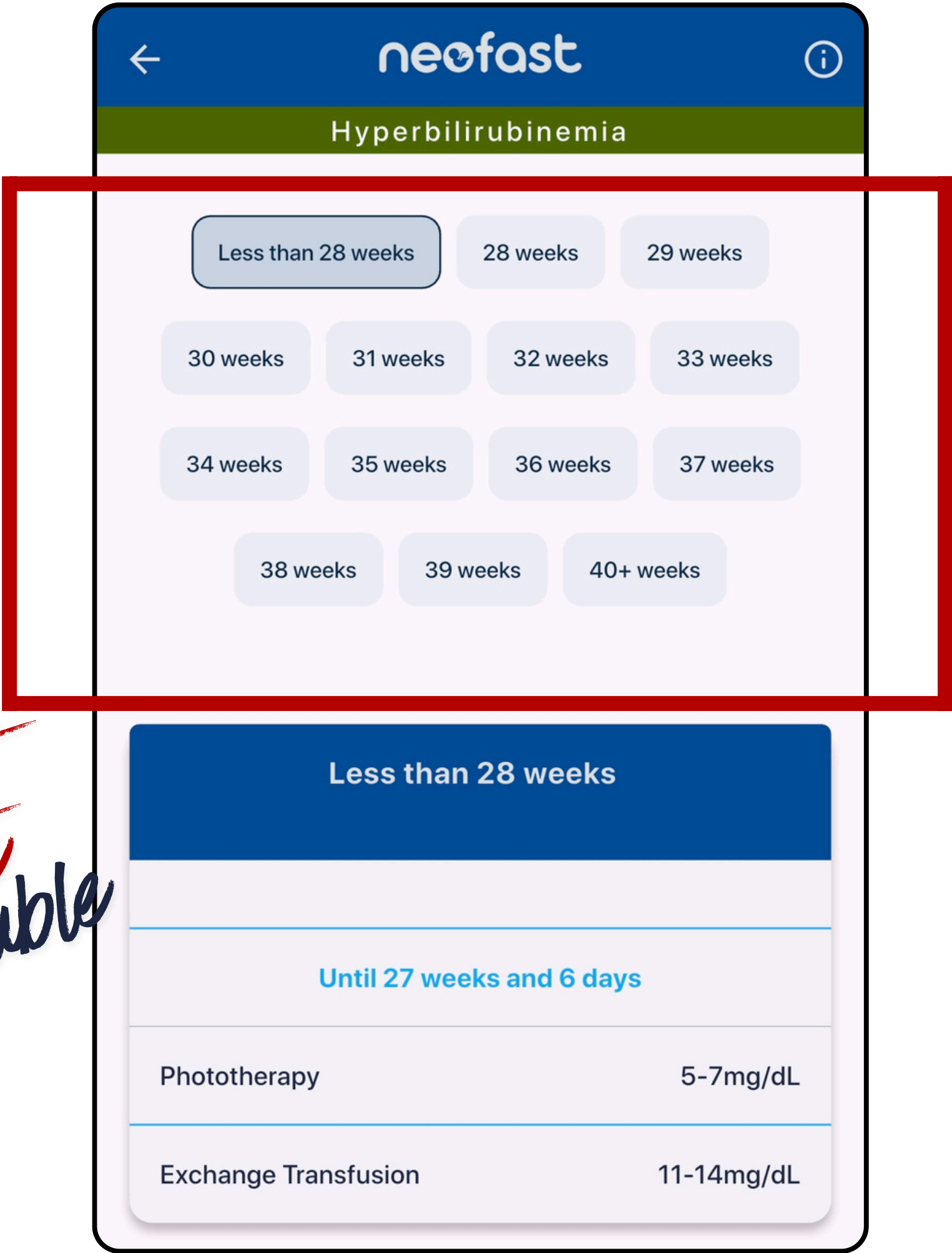


More calculators

MADE FOR THE NIGHT SHIFT

Why neonatologists keep NeoFast open on call?

Preterm and term



The most complete app available

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