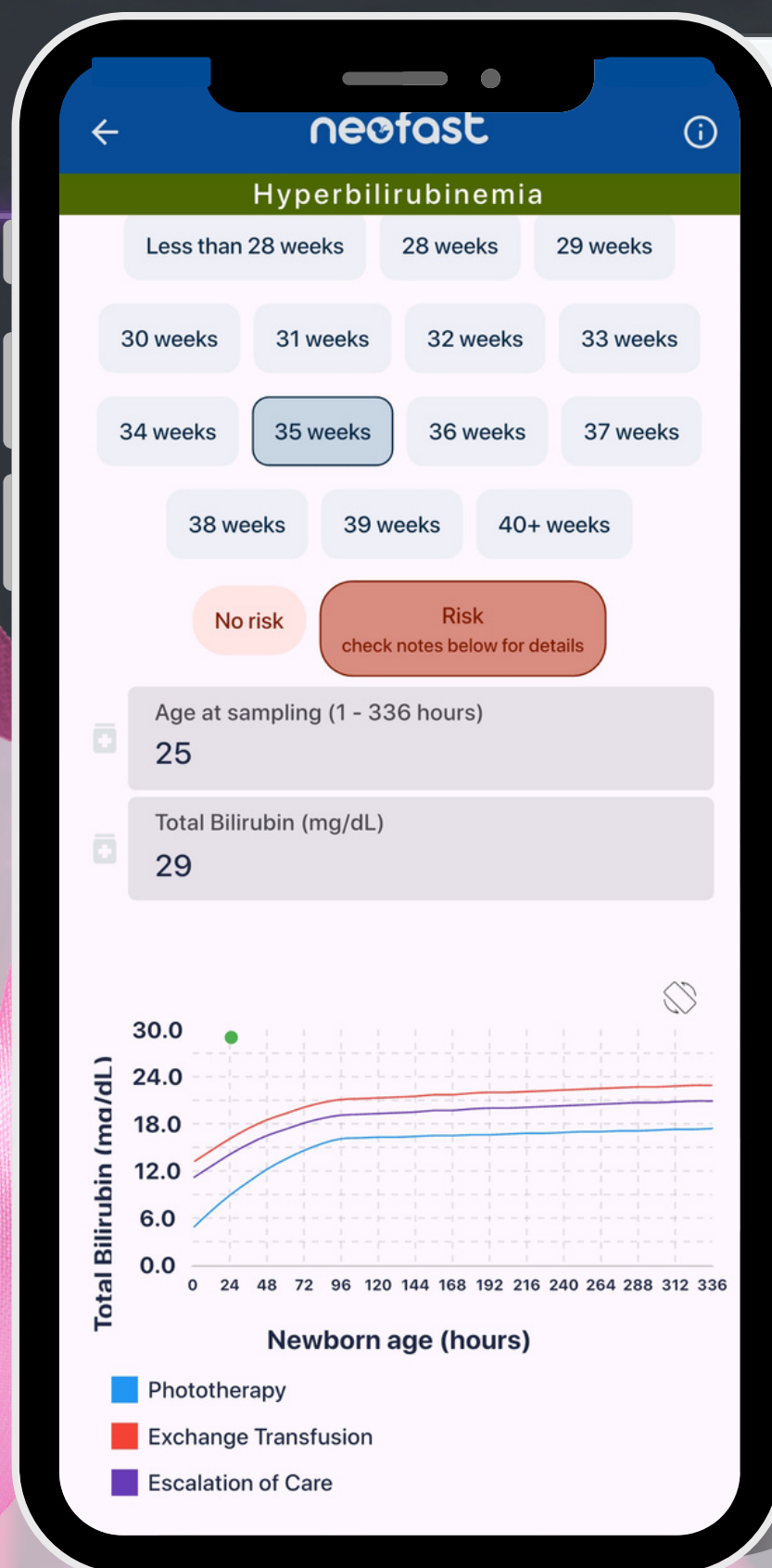
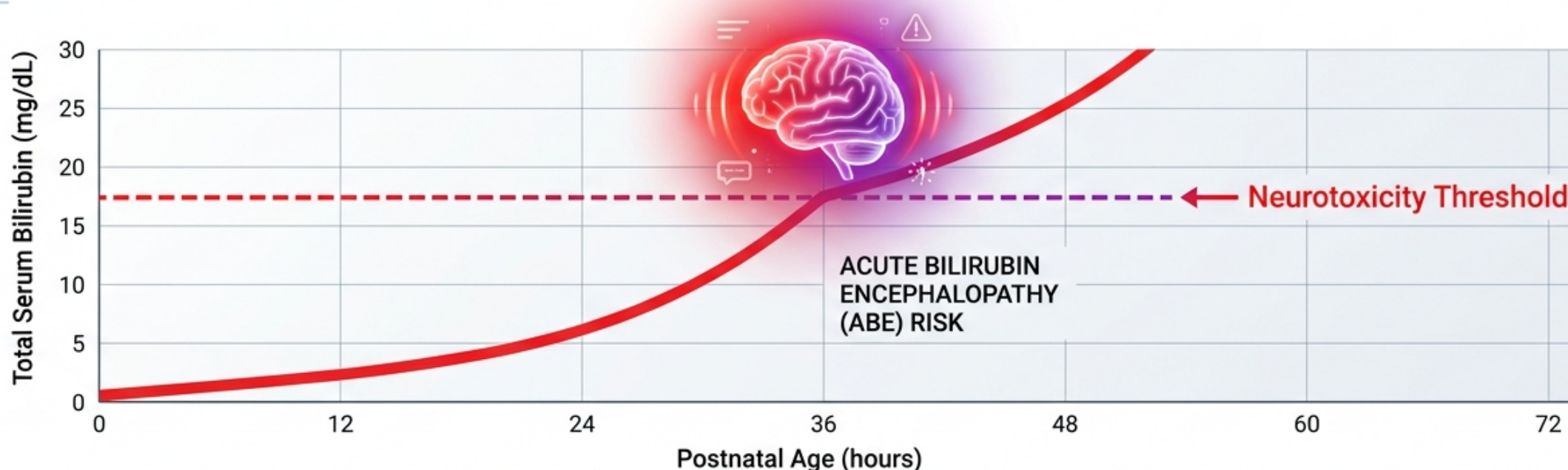


# Rapid Response in Neonatal Hyperbilirubinemia

A Didactic Clinical Pathway: Executing 2022 AAP Guidelines via the Neofast Interface



# The Invisible Threat of Unconjugated Bilirubin



## Core Principle

Jaundice in the first 24 hours of life is always abnormal and requires immediate investigation.



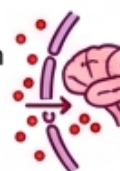
## The Diagnostic Trap

Visual inspection of dermal icterus is highly unreliable for estimating serum bilirubin concentration.



## The Ultimate Risk

Extreme hyperbilirubinemia drives free, unbound bilirubin across the blood-brain barrier, triggering Acute Bilirubin Encephalopathy (ABE) and permanent Kernicterus. Time is brain tissue.



## Didactic Foundation: Stratifying Neurotoxicity Risk

### Gestational Risk



< 38 weeks exponentially increases risk vulnerability.  
(Our case: 35 weeks).

### Pathological Risk Factors (The 2022 AAP Checklist)

- ☒ Albumin < 3.0 g/dL
- ☒ Isoimmune hemolytic disease (positive DAT)
- ☒ G6PD deficiency
- ☒ Sepsis / Clinical instability in previous 24h



**Clinical Mandate:** Treatment thresholds for phototherapy and exchange transfusion are dynamically lowered when any of these neurotoxicity risk factors are present.

# Critical Presentation: The 25-Hour Crisis

 **CRITICAL ALERT**

Patient Chart

Vitals Monitor

Gestational Age: **35 Weeks (Late Preterm)**

Postnatal Age: **25 Hours** 

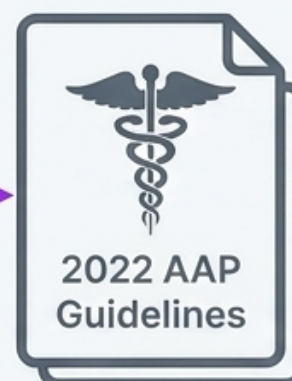
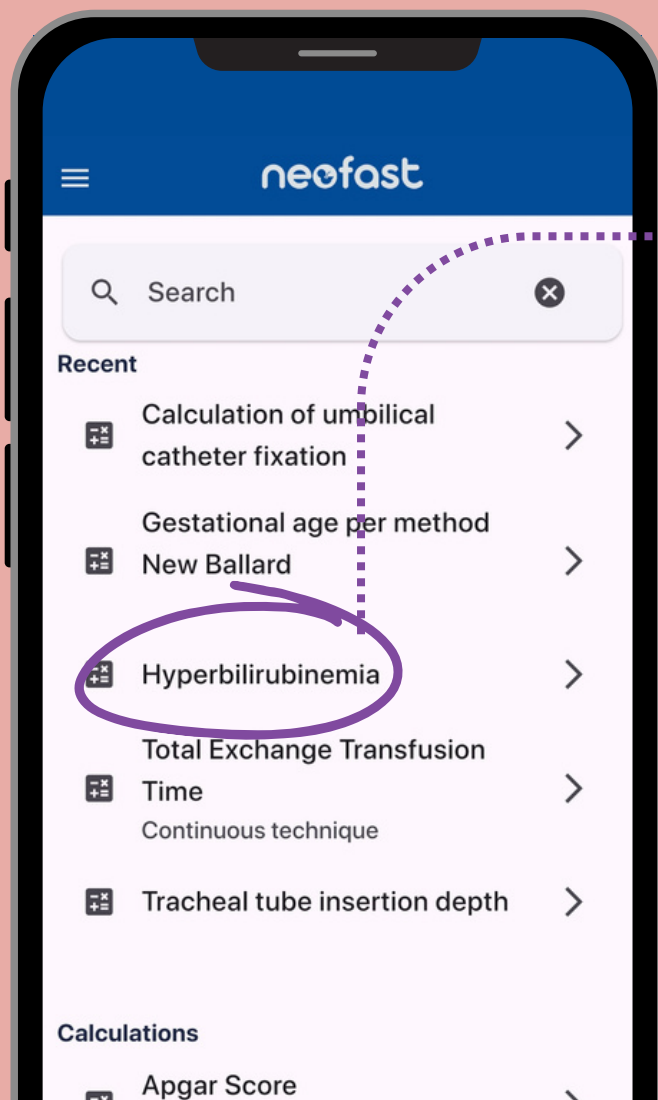
Clinical Presentation

Visibly jaundiced, lethargic, poor feeding.

**Lab Result: Total Serum Bilirubin (TSB) = 29 mg/dL** 

 **The Clinical Dilemma:** At this extreme, catastrophic value, manual calculation and cross-referencing paper nomograms delay critical intervention. We require immediate, protocol-driven action.

## Digitizing the Clinical Protocol



### The Tool: Neofast Rapid Assessment

**The Function:** The Neofast app codifies the complex 2022 AAP Guidelines into an instant bedside tool. It removes the cognitive load of cross-referencing multiple gestational age nomograms and varying risk profiles, ensuring zero delay between lab result and intervention.

# Step 1: Rapid Input and Risk Stratification

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)

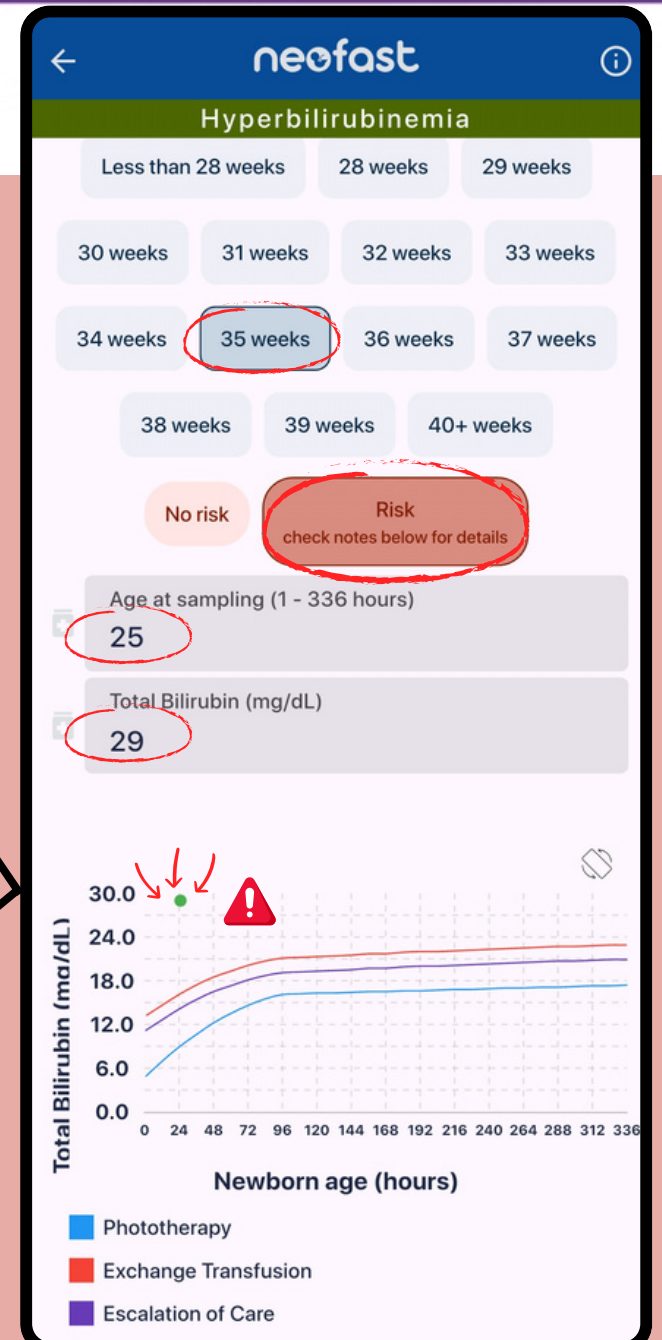
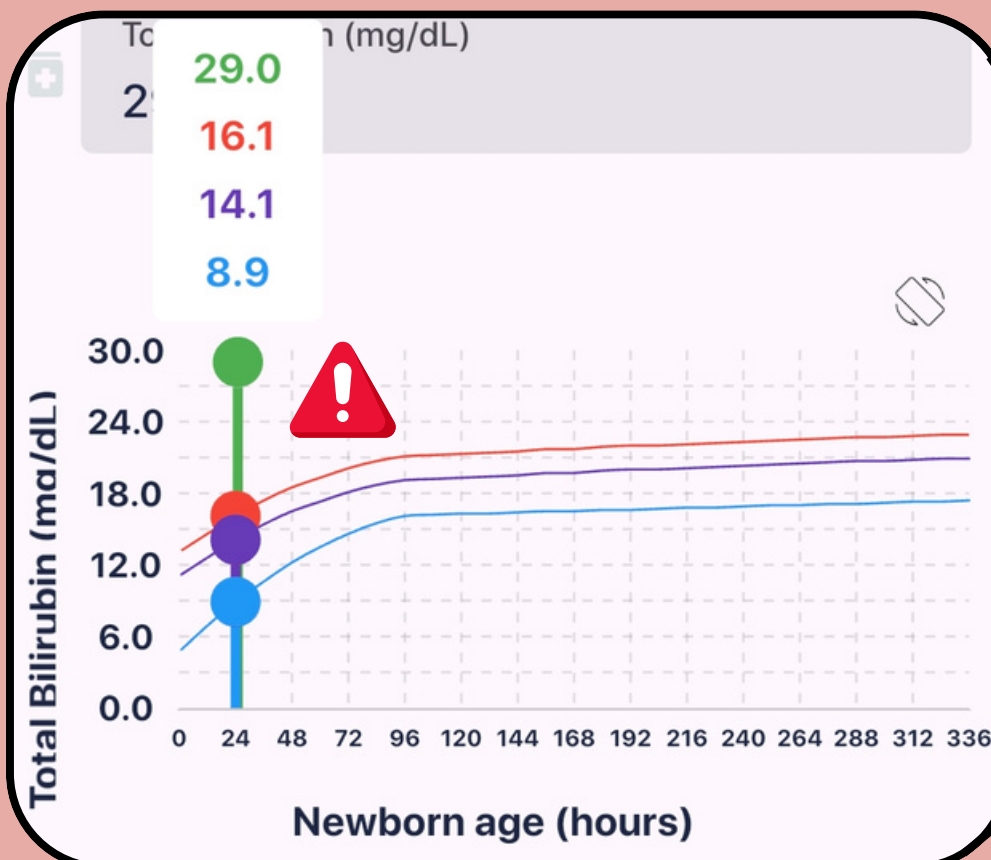
Note: in terms of risks, these include isoimmune (or other) hemolytic disease or G6PD deficiency, sepsis or clinical suspicion of sepsis, albumin < 3.0 g/dL (50 g/L), significant clinical instability in the previous 24 hours. Source: Chart of American Academy of Pediatrics, 2022. For access more information, click on the **i** located at the top of the page

**Gestational Multiplier:** Instantly lock in the 35-week threshold.

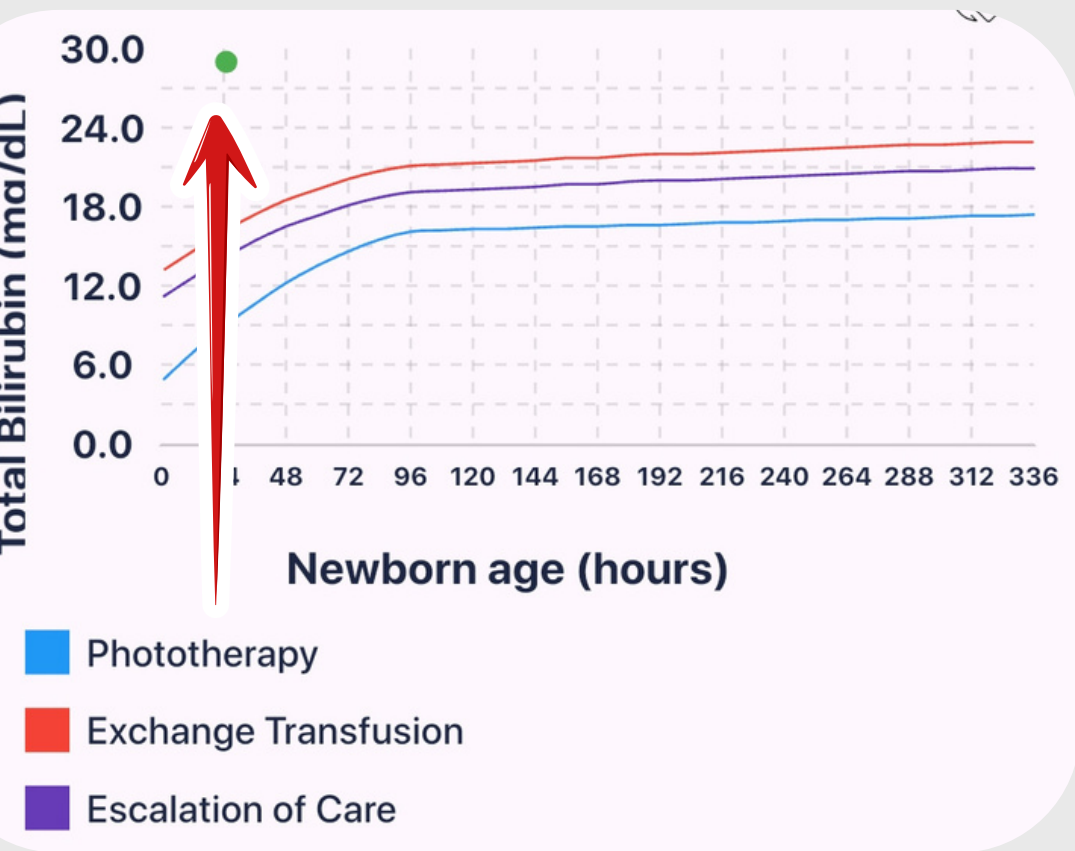
**Risk Definition:** The clinician cross-references the patient's presentation with the app's embedded AAP risk checklist. Selecting 'Risk' instantly and invisibly lowers the intervention thresholds in the background algorithm.

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 (50 g/L), significant clinical instability in the previous 24 hours. **i**

**Data Entry:** Age at sampling (25 hours) and TSB (29 mg/dL) are inputted.



## Step 2: Instant Protocol Activation



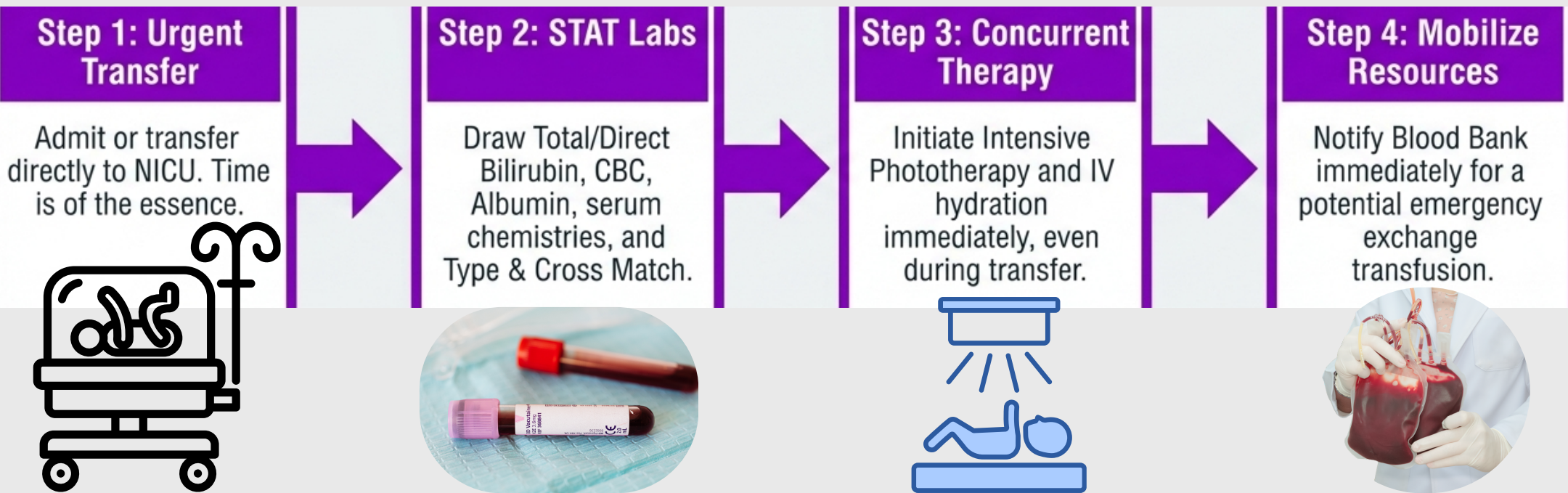
Phototherapy

Exchange Transfusion

Escalation of Care

- **The Output:** The AAP 2022 Nomogram is instantly generated.
- **Visual Triggers:** The patient's plotted TSB (29 mg/dL at 25h) violently breaches the Light Blue and Red lines, landing firmly in the Purple Zone.
- **The Mandate:** The app provides a visual, evidence-based mandate to initiate Escalation of Care within seconds of receiving the lab result.

## Action Protocol 1: The Purple Zone (Escalation of Care)

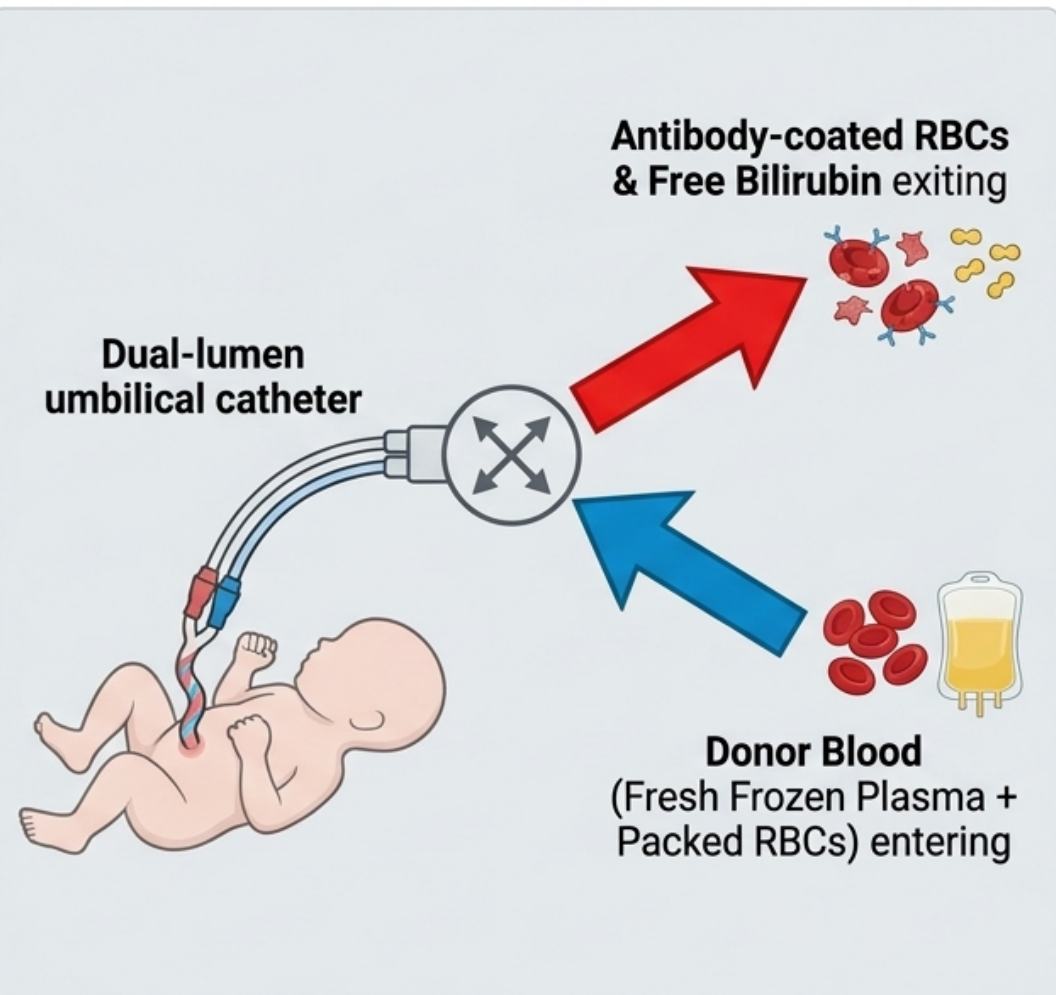


# Action Protocol 2: Intensive Phototherapy Parameters

While preparing for exchange transfusion, Intensive Phototherapy must bridge the gap.

| Standard Phototherapy                                                             | Intensive Phototherapy                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                                                           |
| Standard application.                                                             |  <b>Spectrum:</b> Blue-green spectrum (460-490 nm) where bilirubin absorbs light most strongly.                           |
|                                                                                   |  <b>Irradiance Target:</b> Must deliver $\geq 30 \mu\text{W}/\text{cm}^2/\text{nm}$ .                                    |
|                                                                                   |  <b>Surface Area:</b> Maximize skin exposure. Place lights above and below the infant (fiberoptic pads + overhead LED). |
|                                                                                   |  <b>Clinical Goal:</b> Achieve a 30% – 40% decline in TSB within the first 24 hours.                                    |

# Action Protocol 3: Exchange Transfusion Mechanics



**The Trigger**

TSB  $\geq 29 \text{ mg/dL}$  at 25h, or the appearance of **Acute Bilirubin Encephalopathy** (posturing, retrocollis).

**The Mechanism**

A **Double-Volume Exchange** (approximately 170 mL/kg).

**The Result**

Removes **~85%** of the infant's vulnerable red blood cells and **clears >50%** of the total body extravascular bilirubin, replacing it with albumin-rich donor blood.

**Secondary Option**

Targeted **IVIG** administration if isoimmune hemolytic disease is confirmed and TSB is rising despite intensive phototherapy.

## The Accelerated Bedside Workflow

### Anticipate

Recognize that jaundice <24h is pathological. Stratify risk immediately using GA and clinical presentation.

### Digitize

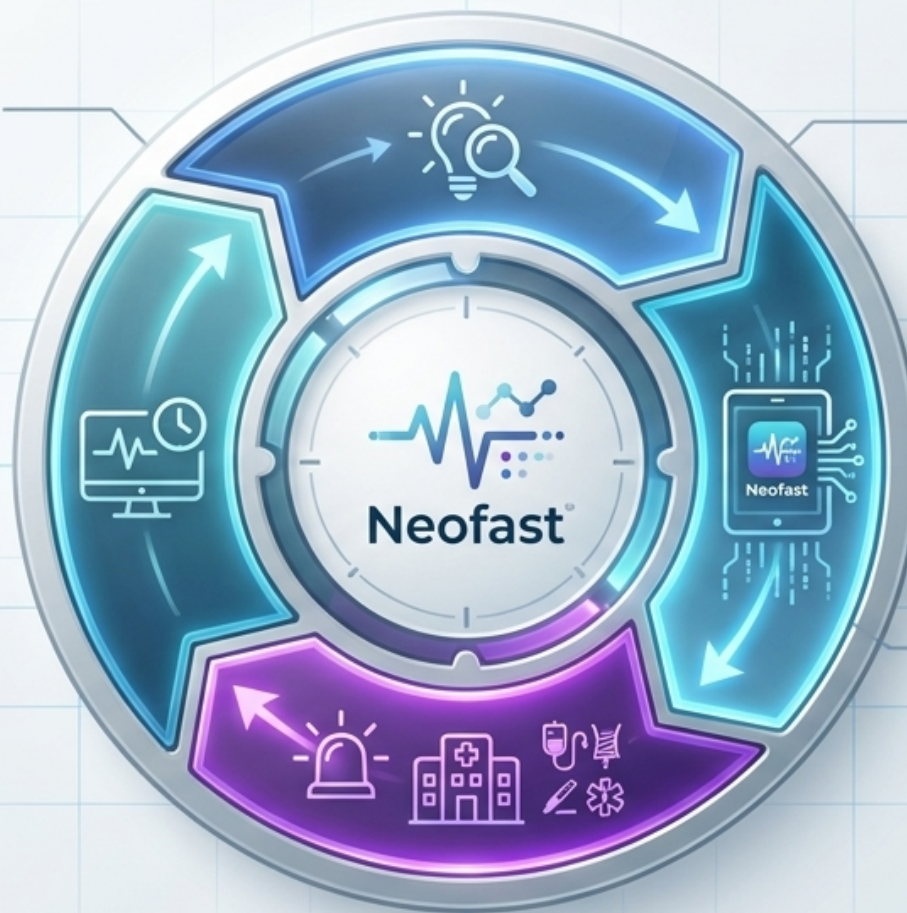
Utilize Neofast to bypass manual nomogram plotting, instantly translating complex AAP 2022 variables into visual thresholds.

### Re-evaluate

Continuous clinical monitoring to close the loop.

### Execute

When extreme values trigger the Purple Zone, launch simultaneous protocols: **NICU transfer, STAT labs, Intensive PT, and Exchange Prep.**



**The Bottom Line: Neofast bridges the dangerous gap between a critical lab result and the initiation of complex NICU protocols, protecting brain tissue when seconds count.**

**Available in over 178 countries!**



**Resolve quickly in critical moments.**

