Neonatal Abstinence Syndrome (NAS)

A Clinical Pathway for Assessment and Management

Didactic Reference Guide for Neonatology Residents

Based on the Toronto Resident's Handbook of Neonatology

Terminology & Systemic Impact

NAS

Neonatal Abstinence Syndrome

The traditional umbrella term for clinical presentation associated with any in utero substance exposure.

NOWS

Neonatal Opioid Withdrawal Syndrome

The modern, preferred terminology when describing specific withdrawal from opioid exposure.

Opioid use in pregnancy elevates the risk for:

- Prematurity
- Low Birth Weight (LBW)
- Spontaneous Abortion
- Sudden Infant Death Syndrome (SIDS)
- Long-term neurodevelopmental/neurobehavioral abnormalities

Maternal History & Risk Identification

Substance History

Identify specific substances used (Opioids, SSRI/SNRI, Alcohol, Cocaine, Cannabis, Cigarettes).

Determine the most recent dose and route of administration.

Note: 30-75% of opioid-exposed infants will require medical treatment.

Associated Health Risks

Hepatitis B

Hepatitis C

HIV

Maternal nutritional deficits

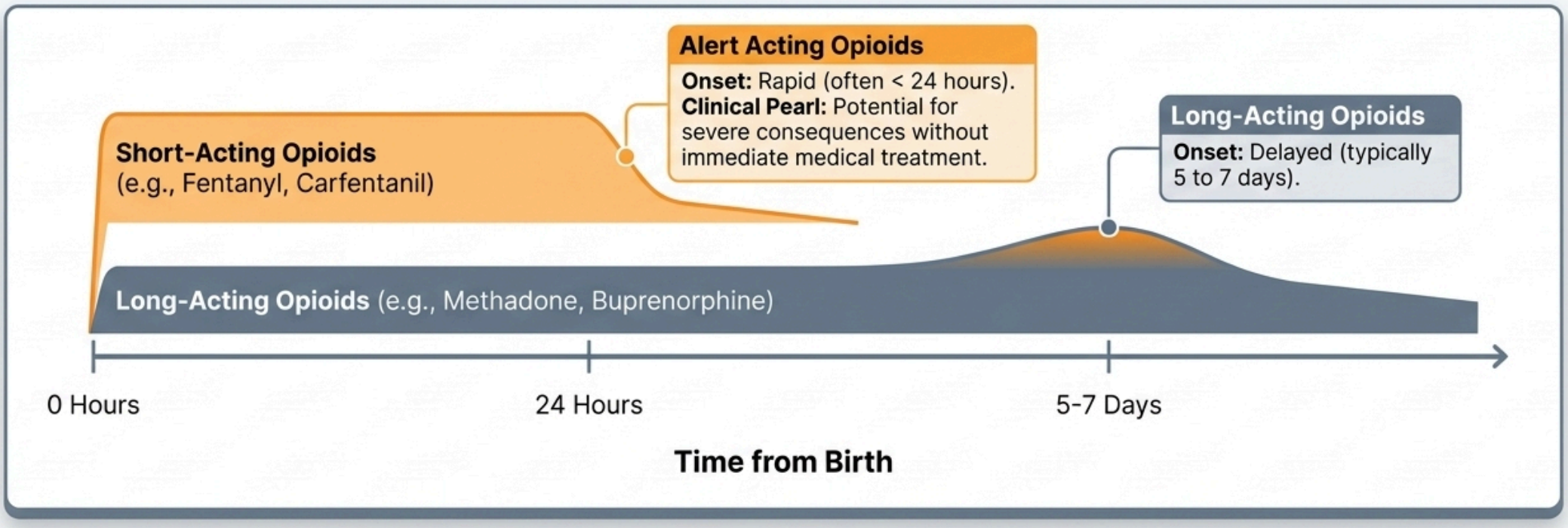
Social Risk Factors

Access to antenatal care

Social support network

Housing/environmental stability

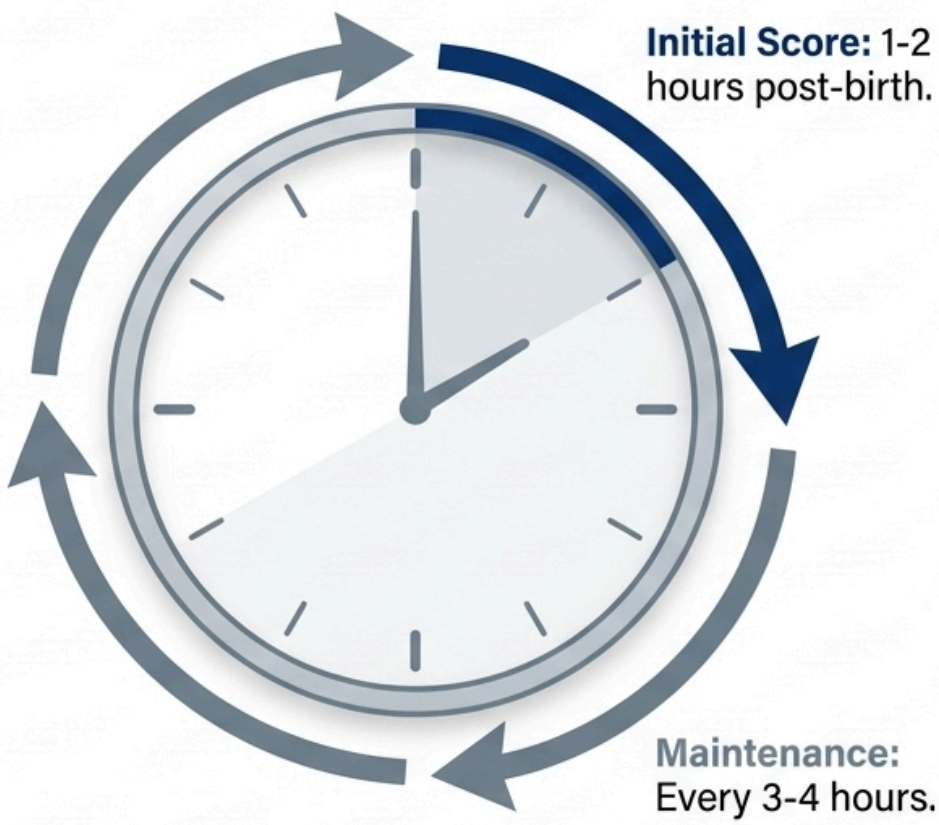
The Timeline of Opioid Withdrawal



Acute Symptoms: Persist for 10-30 days.

Mild Symptoms (Irritability, sleep/feeding issues): Can persist for 4-6 months.

The Assessment Standard: Modified Finnegan Score



Protocol Parameters

- **Standard Duration:** Minimum 72 hours of monitoring.
- **Extended Duration:** Minimum 120 hours for long-acting opioid or polysubstance exposure.

Clinical Caveat: The Finnegan tool was developed specifically for opioid exposure. It is not necessarily a validated guide for treatment options in polysubstance drug exposure, requiring clinical judgment.

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Search

Recent

Finnegan score

Fraction of sodium excreted
FENa

Hyperbilirubinemia

Total Exchange Transfusion Time
Continuous technique

Tracheal tube insertion depth

Calculations

Apgar Score

Body surface area
Weight e height

Body surface area
Weight only

Calculation of umbilical catheter fixation

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Finnegan score

Projectile vomiting

Yes

No

Stools

Semi-pasty stools

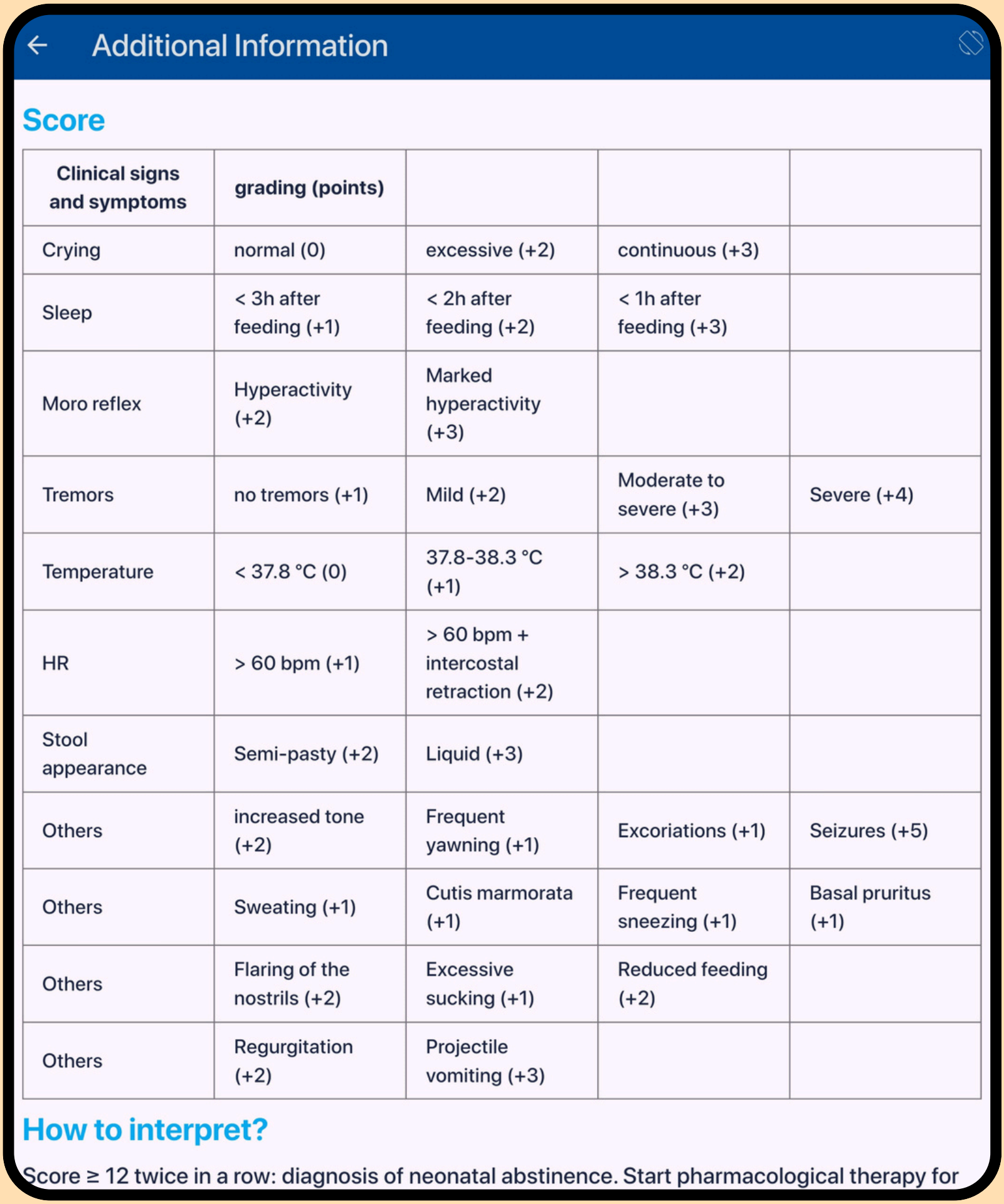
Liquid stool

Normal

Score: 30

If twice in a row: diagnosis of neonatal abstinence. Start pharmacological therapy for treatment.

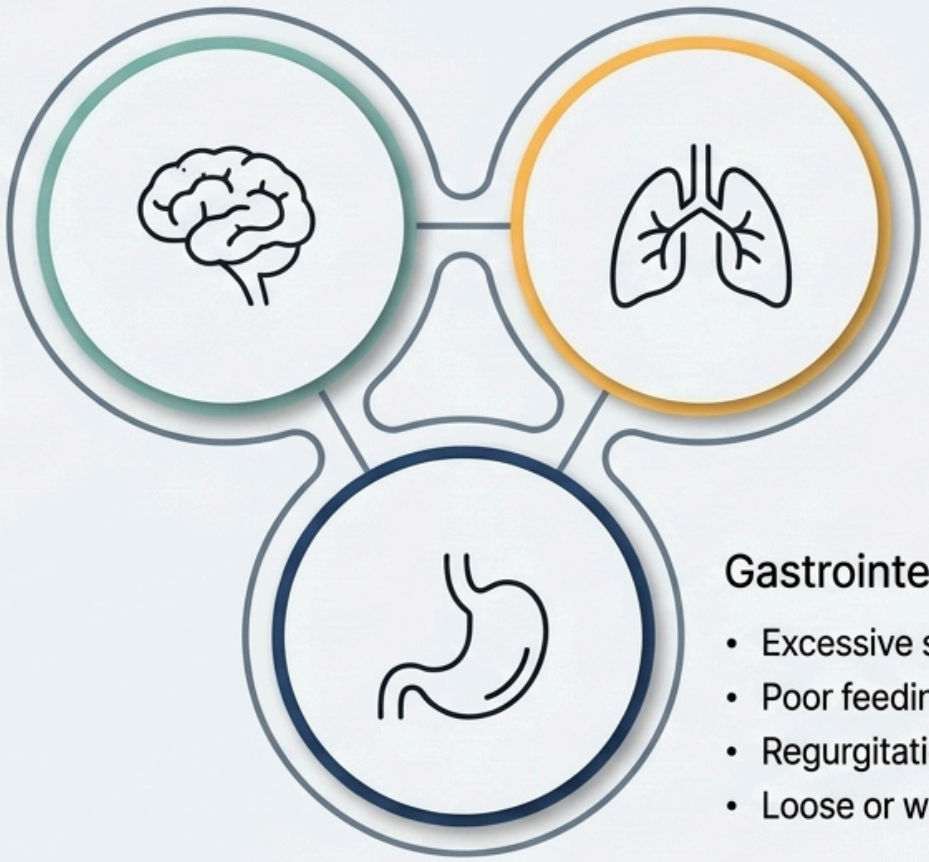
Finnegan Score



Visualizing the Finnegan Score: The Diagnostic Triad

CNS Disturbances

- Excessive high-pitched cry 2-3 pts
- Sleeps < 1-3 hours 1-3 pts
- Hyperactive Moro reflex 2-3 pts
- Tremors 1-4 pts
- Myoclonic jerks (3 pts) / Generalized convulsions (5 pts)



Metabolic, Vasomotor & Respiratory

- Sweating 1 pt
- Fever 38°C -> 38.3°C 1-2 pts
- Frequent yawning / Sneezing 1 pt
- Nasal flaring / RR > 60 1-2 pts
- Mottling 1 pt

Gastrointestinal

- Excessive sucking 1 pt
- Poor feeding 2 pts
- Regurgitation / Projectile vomiting 2-3 pts
- Loose or watery stools 2-3 pts

First-Line Defense: Non-Pharmacological Care

Environment

- Low stimulation environment (dim lighting, quiet).
- Rooming-in with the parent.

Comfort & Contact

- Skin-to-skin contact.
- Firm swaddling.

Initiate immediately alongside scoring.

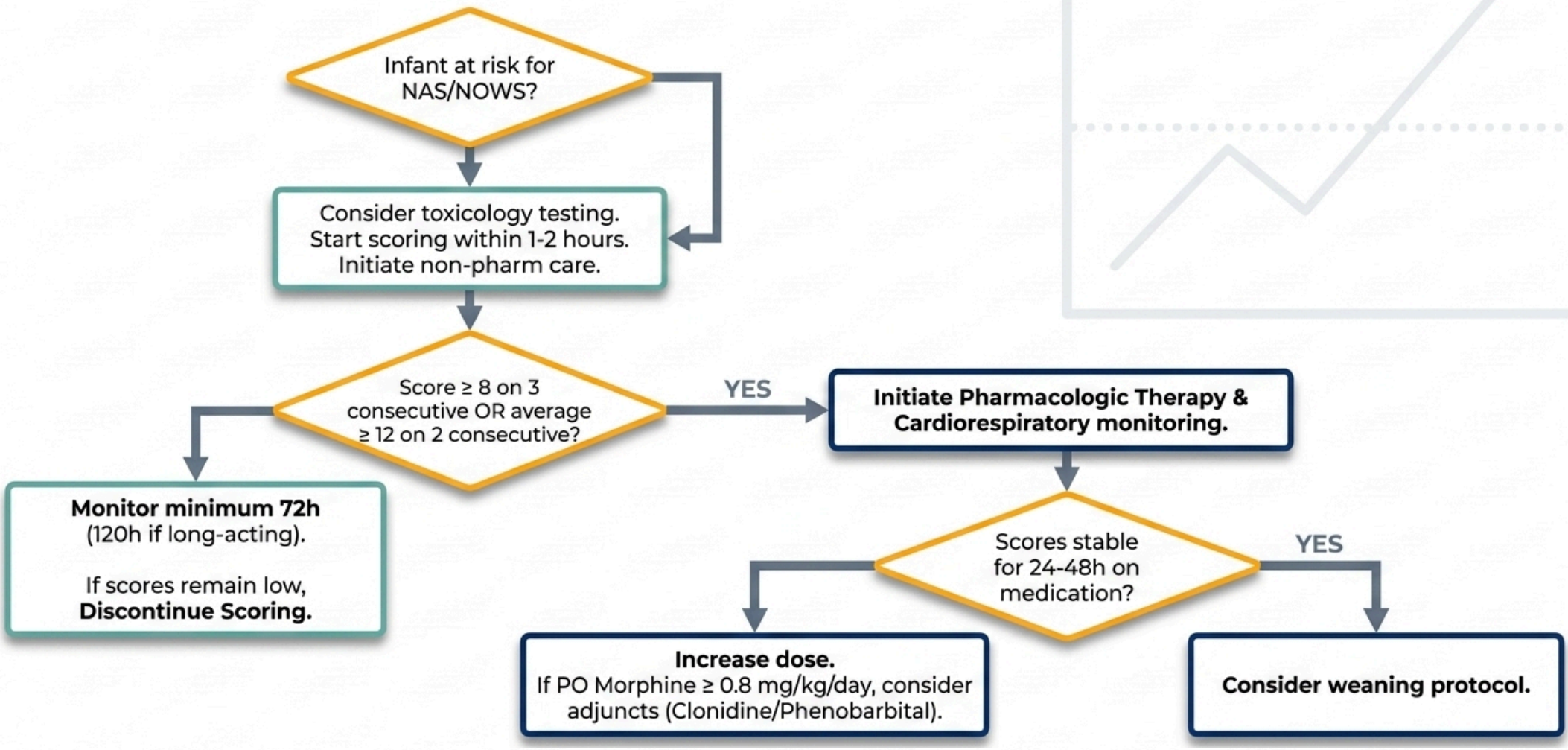
Nutrition & Feeding

- Support breastfeeding (ensure no medical contraindications exist).
- Optimize nutrition for poor feeders.

Maternal Support

- Empathetic, non-stigmatizing care.
- Social work support integration.

The Clinical Decision Algorithm



The Escalation Threshold

Initiate Pharmacologic Treatment IF:

≥ 8

(on 3 consecutive assessments)

OR

≥ 12

(average on 2 consecutive assessments)

STRICT CONTRAINDICATION

Do NOT administer Naloxone to an infant born to an opioid-dependent mother.

Reason: High risk of triggering acute, severe withdrawal and neonatal seizures.

Pharmacological Management Overview

Initiation Triggers

Commenced exclusively when non-pharmacological measures fail and strict Finnegan thresholds are met.

Clinical Goals

- Prevent seizures.
- Restore normal sleep patterns and weight gain.
- Facilitate neurobehavioral organization and feeding.

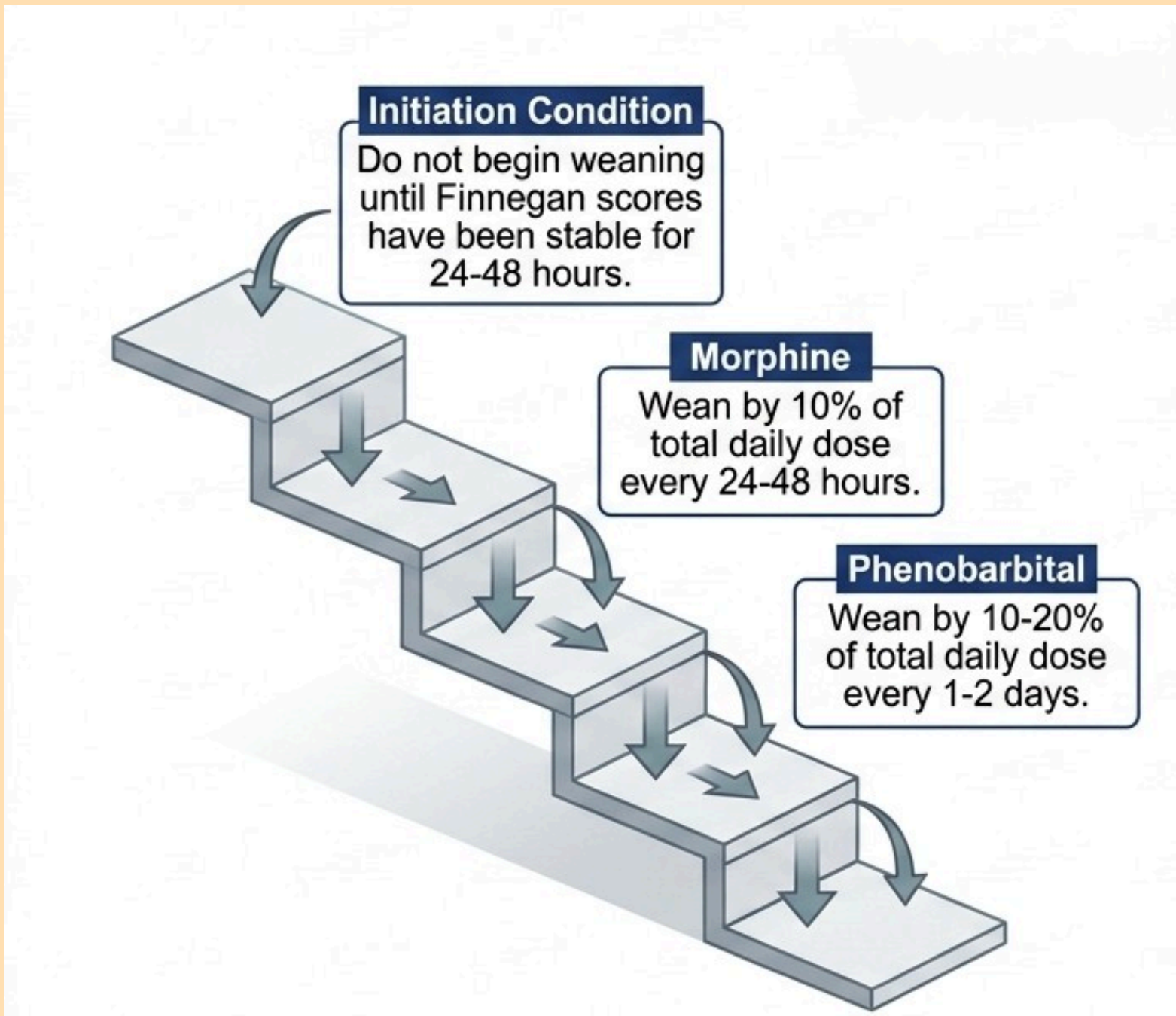
Mandatory Monitoring

- Initiation of medication requires continuous cardiorespiratory monitoring.
- Continue Finnegan scoring q2-4h to guide dose titration.

Pharmacological Comparison Matrix

	Morphine (First-Line)	Phenobarbital (Adjunct)	Methadone (Alternative)	Buprenorphine (Alternative)
Role	Standard primary therapy.	Adjunct for polysubstance use.	Primary alt to morphine.	Sublingual alternative (Not approved in Canada).
Dose	Load 0.05 mg/kg PO q4h. Titrate up by 0.02 mg/kg. Max 0.2 mg/kg/dose.	Load 10mg/kg PO q12h x3. Maint: 5mg/kg/day PO.	0.05-0.1 mg/kg PO q6-12h. Max 1 mg/kg/day.	4-5 mcg/kg SL q8h.
Half-life	9 hours.	45-100 hours.	26 hours.	—
Caveat	Monitor RR and tone. Wean by 10% daily when stable.	Highly sedative; contains 15% alcohol.	—	Contains 30% alcohol.

Weaning & Discharge Criteria



Checkpoint

Untreated Infants

Discharge if treatment thresholds are avoided for **72** hours (or **120 hours** if exposed to long-acting opioids).

Treated Infants

Can be discharged on medication only if adequate outpatient follow-up is available and a strict weaning weaning plan is established.

Summary & Clinical Pearls for the On-Call Resident

1 Anticipate the Onset

Fentanyl crashes fast (<24h). Methadone burns slow (5-7 days). Know your timeline before the first Finnegan score.

2 Non-Pharm is Non-Negotiable

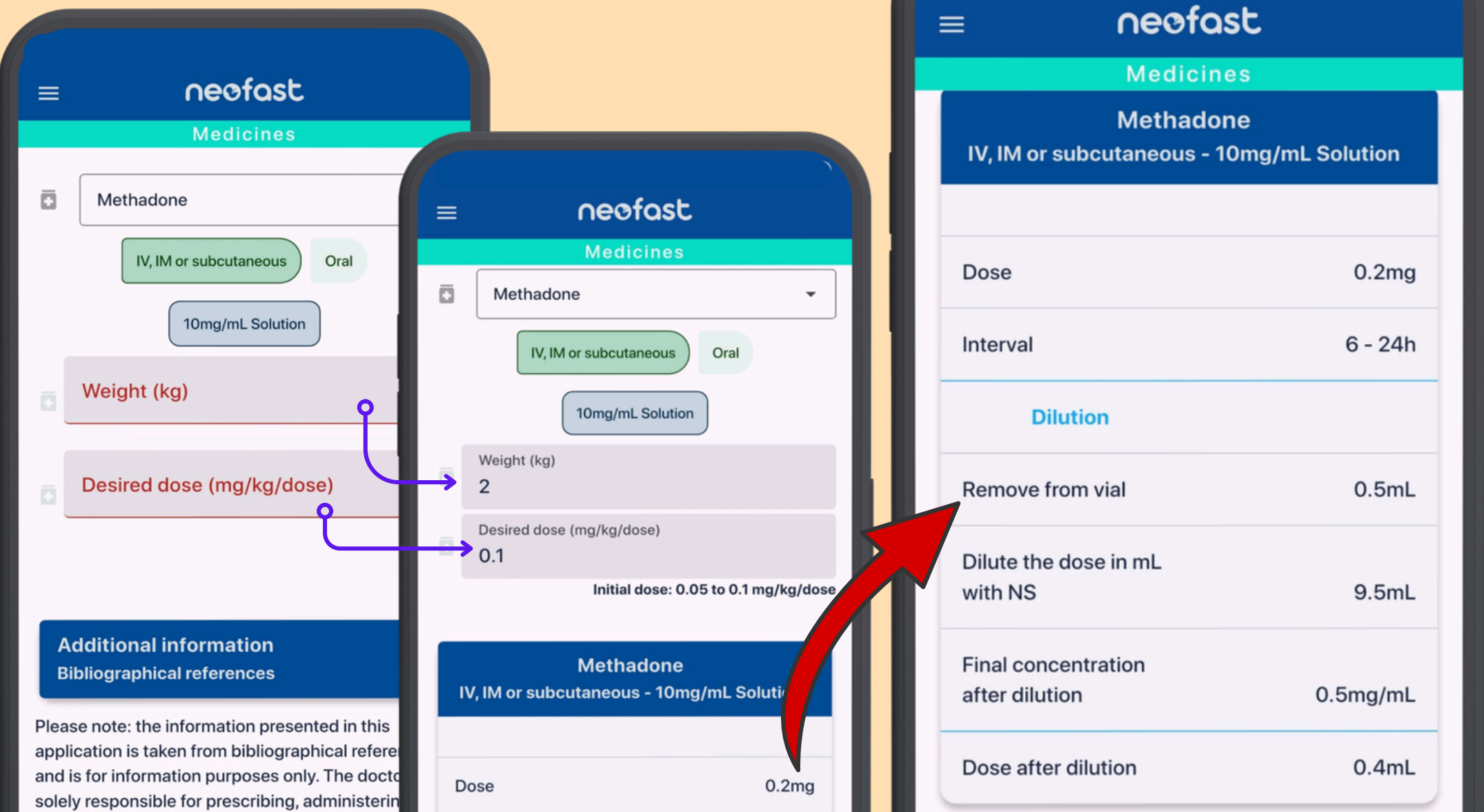
Low stim, **swaddling**, and **skin-to-skin** are active treatments, not just comforts. Optimize these before escalating.

3 Trust the Math (8x3 or 12x2)

Intervene strictly based on Finnegan thresholds. **NEVER use Naloxone** in an opioid-exposed neonate.

4 Wean with Patience

Ensure **24-48 hours** of complete stability before stepping down medication. **Premature weaning** prolongs the overall NICU stay.



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