

The Finnegan score in 2026

For neonatologists

How to use it, how to treat, and why practice is moving to **Eat, Sleep, Console (ESC)**.

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Other calculations and scores

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Reference values

Laboratory, vital signs and measurements by age

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Sodium, free water, bicarbonate and osmolality

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Fluid balance

Intake, output and urine output

Recent

Apgar Score

1 and 5 minutes

Expected pCO₂ in metabolic alkalosis

Finnegan score

Plasma osmolality

SOURCES

1. Finnegan LP et al. Neonatal abstinence syndrome: assessment and management. Addict Dis. 1975;2:141-58.
2. Patrick SW et al.; AAP. Neonatal opioid withdrawal syndrome. Pediatrics. 2020;146(5):e2020029074.
3. Hudak ML, Tan RC; AAP. Neonatal drug withdrawal. Pediatrics. 2012;129(2):e540-60.
4. Kocherlakota P. Neonatal abstinence syndrome. Pediatrics. 2014;134(2):e547-61.
5. Young LW et al. Eat, Sleep, Console approach or usual care for neonatal opioid withdrawal. N Engl J Med. 2023;388:2326-37.
6. Grossman MR et al. An initiative to improve the quality of care of infants with NAS. Pediatrics. 2017;139(6):e20163360.
7. Lipsitz PJ. A proposed narcotic withdrawal score for use with newborn infants. Clin Pediatr. 1975;14:592-4.
8. Children's Hospital of Philadelphia. NAS/NOWS clinical pathway: pharmacologic management.
9. Ministry of Health, Labour and Welfare, Japan. Manual for serious adverse drug reactions: neonatal drug withdrawal syndrome. 2010 (rev. 2021).
10. Isohata H et al. Non-opioid psychotropic medications in pregnancy and short-term neonatal outcomes. Sci Rep. 2025;15:30853.

What it is and when to use it

Published in 1975 to quantify withdrawal in newborns exposed in utero to heroin and methadone. Still the most widely used tool.

21 weighted signs in 3 domains

- **Central nervous system:** cry, sleep, Moro, tremors, tone, excoriation, myoclonus, seizures
- **Metabolic / vasomotor / respiratory:** sweating, fever, yawning, mottling, nasal stuffiness, sneezing, tachypnea
- **Gastrointestinal:** excessive sucking, poor feeding, regurgitation, vomiting, loose stools

When to use

- Newborns with **chronic in-utero exposure** to opioids
- Also used for other drugs: benzodiazepines, SSRIs, antipsychotics, anticonvulsants
- Observe chronically exposed infants for **at least 72 h** (AAP 2020)

FINNEGAN SCORE

How to apply it

- Score every **3–4h**, after a feed, with the infant settled;
- Score signs seen **over the whole interval**, not a single moment;
- Score more often (every 2 h) when the total is ≥ 8 ;
- Subtract signs explained by another condition (e.g. tachypnea from lung disease);
- Train the team: inter-observer agreement depends on it.

Finnegan score: filling in the 21 signs

Finnegan result and interpretation

The screenshot shows the 'neofast' app interface for the 'Finnegan score'. At the top, there's a header with the 'neofast' logo and a back arrow. Below the header, the title 'Finnegan score' is displayed. The main area contains two sections: 'Projectile vomiting' and 'Stools'. Each section has three buttons: 'Yes', 'No', and 'Normal'. The 'Yes' button is highlighted in blue, and the 'No' button is highlighted in light blue. The 'Stools' section has three buttons: 'Semi-pasty stools', 'Liquid stool', and 'Normal'. The 'Semi-pasty stools' button is highlighted in light blue. At the bottom, a dark blue box displays the 'Score: 26' and a message: 'If twice in a row: diagnosis of neonatal abstinence. Start pharmacological therapy for treatment.' The bottom of the screen shows a standard Android navigation bar with three icons: a square, a circle, and a triangle.

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Finnegan score

Projectile vomiting

Yes

No

Stools

Semi-pasty stools

Liquid stool

Normal

Score: 26

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

How to interpret it

Below 8

Continue non-pharmacologic care
and keep scoring.

Consider medication

≥ 8 on 3 consecutive scores
or ≥ 12 on 2 consecutive scores

Diagnosis is clinical

Look at the trend, not one number. Rule
out sepsis, hypoglycemia,
hypocalcemia and CNS disorders.

Thresholds vary between institutions. Follow your local protocol.

A watercolor illustration of a mother holding her baby. The mother has long brown hair and is wearing a white shirt. The baby is wrapped in a grey blanket and is being held against the mother's chest. The background is a soft, warm watercolor wash in shades of brown and orange.

TREATMENT

Non-pharmacologic care comes first, for every infant

The AAP considers it the foundation of care for all opioid-exposed newborns, **with or without medication.**

Rooming-in

Keep mother and baby together; parents as care partners

Low stimulation

Quiet, dim room; clustered care

Holding

Skin-to-skin, swaddling, gentle rocking

Feeding on demand

Breastfeeding when there is no active substance use

Oral morphine

Example: newborn 3 kg	
Dose	0.05 mg/kg/dose, every 4 h
Result	0.15 mg /dose
Preparation	0.5 mL of 10 mg/mL + 24.5 mL sterile water = 25 mL (0.2 mg/mL)
Give	0.75 mL PO every 4 h

Titrate by score; wean gradually once controlled.

Dosing interval: the literature accepts every 3 to 4 h (Kocherlakota, Pediatrics 2014; CHOP; MHLW Japan 2021). NeoFast calculates every 4 h; many protocols use every 3 h to match feeds. The same dose per administration every 3 h gives a ~33% higher daily dose. Reference doses: follow your institution's protocol.

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Medicines

Morphine

Intermittent IV

Oral

10mg/mL Solution

Weight (kg)

3

Desired dose (mg/kg)

0.05

Suggested dose: 0.03 to 0.1 mg/kg

Morphine

Oral - 10mg/mL Solution

Dose	0.15mg
Interval	4/4h
Dilution	
Remove from vial	0.5mL
Dilute with D5W, D10W, NS, Ringer, LR, SWFI	24.5mL
Final concentration after dilution	0.2mg/mL
Dose after dilution	0.75mL

Note: the maximum dose for neonatal abstinence syndrome is 0.2 mg/kg.

Continuous Morphine

Additional information

Bibliographical references

Please note: the information presented in this application is taken from bibliographical references and is for information purposes only. The doctor is solely responsible for prescribing, administering and making the necessary adjustments. This app does not replace medical guidelines or clinical judgment.

IV morphine: convert, don't copy

Why the IV dose is lower: part of an oral dose is metabolized by the liver before reaching the circulation (first-pass effect).

Ratio 3 PO : 1 IV (CHOP). Some references use 2:1. Convert the dose for the same interval; if the interval changes, convert the total daily dose.

Example: newborn 3 kg

Dose	0.015 mg/kg/dose, every 4 h
Result	0.045 mg /dose
Presentation	0.1 mg/mL, no dilution
Give	0.45 mL IV over 15–30 min

Check the ampoule: 0.1 mg/mL (IV) vs 10 mg/mL (oral) is a 100-fold difference. Reference doses: follow your institution's protocol.

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Medicines

Morphine

Intermittent IV

Oral

0.1mg/mL Solution

0.2mg/mL Solution

0.5mg/mL Solution

1mg/mL Solution

10mg/mL Solution

25mg/mL Solution

Weight (kg)

3

Desired dose (mg/kg)

0.015

Suggested Loading dose: 0.05 to 0.2 mg/kg/day.

Morphine

Intermittent IV - 0.1mg/mL Solution

Dose

0.045mg

Interval

4/4h

Dose

0.45mL

Infusion rate

15-30 min

Note: the recommended standard concentrations are up to 100 mcg/mL for continuous infusion and 100 to 500 mcg/mL for intermittent infusions. In the case of this presentation, it can be used undiluted.

Continuous Morphine

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PHARMACOLOGIC TREATMENT

Phenobarbital

- **Adjunct** in opioid with drawal not controlled with maximum opioid dose, often with polysubstance exposure
- **Choice** for sedative exposure (benzodiazepines, barbiturates)
- Not first line for opioid-only withdrawal

3 kg · 40 mg/mL	Loading	Maintenance
Dose	20 mg/kg	3 mg/kg/day, q12h
Result	60 mg	4.5 mg/dose
Drug volume	1.5 mL	0.11 mL
Diluent	4.5 mL	0.34 mL
Final	6 mL (10 mg/mL)	0.45 mL (10 mg/mL)
Infusion	15–30 min	15–30 min

Diluents: NS 0.9%, D5W, D10W or lactated Ringer's. Reassess about 24 h after loading (CHOP). Watch for sedation and poor sucking. Volumes for the 40 mg/mL presentation. Reference doses: follow your institution's protocol.

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Medicines

Phenobarbital

IV or IM

Oral

30mg/mL Solution

40mg/mL Solution

65mg/mL Solution

100mg/mL Solution

120mg/mL Solution

130mg/mL Solution

200mg/mL Solution

Loading

Maintenance

Weight (kg)

3

Desired dose (mg/kg/dose)

20

Suggested Loading dose: 15 to 20 mg/kg/dose. Abstinence: 16 mg/kg/dose

Phenobarbital

IV or IM - 40mg/mL Solution

Dose	60mg
Interval	Now
Dose	1.5mL
Dilution	
Dilute the dose in mL with NS, D5W, D10W, Ringer, LR	4.5mL
Final concentration after dilution	10mg/mL
Total volume to be administered	6mL
Infusion rate	15-30 min

Note: dilute to a final concentration of 10 mg/mL and administer the total volume (dose in "mL" + the dilution). The maximum anticonvulsant dose is up to 40 mg/kg, increased every 10 mg/kg/dose for 20 to 30 min. Premature infants < 1,500 g may require Loading doses of less than 15 mg/kg, followed by a single dose of less than 3 mg/kg/dose, 24 hours later. In the case of withdrawal syndrome, weaning can be achieved by reducing the dose by 20% every other day. The intravenous formulation, diluted to 10 mg/mL, has been used orally. For IM administration, administer into the vastus lateralis muscle located in the anterolateral region of the thigh.

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Loading

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Medicines

Phenobarbital

IV or IM

Oral

30mg/mL Solution

40mg/mL Solution

65mg/mL Solution

100mg/mL Solution

120mg/mL Solution

130mg/mL Solution

200mg/mL Solution

Loading

Maintenance

Weight (kg)

3

Desired dose (mg/kg/day)

3

Suggested maintenance dose: 3 to 5 mg/kg/day. Abstinence: 2 to 8 mg/kg/day

Phenobarbital

IV or IM - 40mg/mL Solution

Dose	4.5mg
Interval	12/12h
Dose	0.11mL
Dilution	
Dilute the dose in mL with NS, D5W, D10W, Ringer, LR	0.34mL
Final concentration after dilution	10mg/mL
Total volume to be administered	0.45mL
Infusion rate	15-30 min

Note: dilute to a final concentration of 10 mg/mL and administer the total volume (dose in "mL" + the dilution). The maximum anticonvulsant dose is up to 40 mg/kg, increased every 10 mg/kg/dose for 20 to 30 min. Premature infants < 1,500 g may require Loading doses of less than 15 mg/kg, followed by a single dose of less than 3 mg/kg/dose, 24 hours later. In the case of withdrawal syndrome, weaning can be achieved by reducing the dose by 20% every other day. The intravenous formulation, diluted to 10 mg/mL, has been used orally. For IM administration, administer into the vastus lateralis muscle located in the anterolateral region of the thigh.

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Maintenance

Limitations, and why practice is changing

- **Subjective:** 21 items depend on training and observer.
- **Disturbs the infant:** several items require handling a baby who should be calmed.
- **Designed for** term infants exposed to heroin and methadone.
- **Score-driven treatment** is linked to more opioid exposure and longer stays.

From scoring symptoms to assessing function.

The Finnegan score remains the standard in many units, while services move toward Eat, Sleep, Console (**ESC**).

What ESC is

Proposed by Matthew Grossman at Yale in 2014. It assesses whether withdrawal affects the infant's function, not how many signs are present.

- 1 **Score → function:** can the infant **eat, sleep** and be **consoled**?
- 2 **Medication → non-pharmacologic care** as first-line treatment
- 3 **Physician-led → family-centered:** parents present and part of the assessment

Three questions after each feed

Eat

Feeds $\geq$ 1 oz or
breastfeeds well
($\geq$ 10 min)

Sleep

Sleeps $\geq$ 1 h
undisturbed

Console

Consoled within
10 min



All "yes": infant well managed, continue care



Any "no": maximize non-pharmacologic care and hold a team huddle



Still "no": as-needed oral morphine (0.05 mg/kg in the original ESC report)

Do not mark "no" when the problem is not due to withdrawal (e.g. short sleep for another reason).

Evidence and limits

ESC-NOW · N Engl JMed2023 · cluster-randomized, 26 US hospitals,
1,305 infants $\geq$ 36 weeks

8.2 d

to readiness for discharge
with ESC

14.9 d

with usual care (Finnegan)

19.5%

treated with opioid (ESC)

52.0%

treated with opioid (usual care)

No increase in prespecified adverse outcomes.

Not validated yet for

- Preterm infants **under 36 weeks**
- **Non-opioid exposure** (SSRIs, benzodiazepines, antipsychotics)
- **Long-term neurodevelopmental outcomes**

Finnegan × Lipsitz × ESC

	Finnegan	Lipsitz	ESC
Year	1975	1975	2014
Items	21 weighted signs	11 signs, 0–3	3 functional questions
Approach	Symptom score	Symptom score	Function
Action threshold	$\geq 8 \times 3$ or $\geq 12 \times 2$	> 4	Any "no" → huddle
Strength	Most studied; guides titration	Quick screening	Shorter stay, less opioid
Limit	Subjective, long	Small original sample; not for titration	≥ 36 wk, opioid exposure

A survey cited by the Japanese MHLW manual found Finnegan in 52% of services and Lipsitz in 7%.

SUMMARY

Which tool for which newborn?

Opioid exposure, ≥ 36 weeks	ESC where implemented; Finnegan otherwise
Preterm or NICU infant	Finnegan
Psychotropic exposure (SSRIs, benzodiazepines, antipsychotics, anticonvulsants)	Finnegan and close observation
Maternal use of ≥ 3 psychotropic drugs	Higher risk of adverse outcomes (Japan, 2025)

In Japan, neonatal withdrawal is mostly linked to maternal psychotropic drugs, not opioids: a scenario closer to many Latin American units. Follow your institution's protocol.

Finnegan score and dose calculations in your pocket

Score, interpretation, and morphine and phenobarbital doses with preparation and volume in mL.

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Clinical support tool. It does not replace clinical judgment or institutional protocols.

Out Now!



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