

INDIANA REGIONAL MEDICAL CENTER

Neonatal Abstinence Syndrome in Pennsylvania

What the PA DOH's 2024 surveillance data tell us about incidence, equity, and the shift to Eat, Sleep, Console

Data source: PA Department of Health, Neonatal Abstinence Syndrome (NAS) Surveillance: 2024 Report (published 2026)

SESSION ROADMAP

Learning Objectives

- 1 Review Pennsylvania's 2024 NAS incidence, trends, and regional variation.
- 2 Examine maternal characteristics and equity gaps in MOUD and prenatal care access.
- 3 Compare Finnegan scoring with the Eat, Sleep, Console (ESC) model using PA outcomes data.
- 4 Apply a non-pharmacologic-first, family-centered approach to newborn withdrawal.
- 5 Connect PA DOH recommendations to concrete next steps for our program.

FOUNDATIONS

What Is NAS — and What Is NOWS?

NAS

Neonatal Abstinence Syndrome

PA's reportable, umbrella term: withdrawal signs in a newborn following in-utero exposure to opioids, benzodiazepines, or barbiturates — via prescription, MOUD treatment, or illicit use.

PA Reporting Mandate

28 PA Code §27.3–27.4

All PA hospitals must report NAS cases in residents' newborns (<28 days old) to the PA DOH — enabling rapid case ascertainment more accurate than administrative claims data.

A case requires BOTH: (1) a positive infant/maternal drug screen or documented use, AND (2) an NAS diagnosis, chief complaint, or ≥2 clinically compatible symptoms.

FOUNDATIONS

Key Terms You'll Hear Today

Four acronyms that anchor everything in this talk (1 of 2)

NAS

Neonatal Abstinence Syndrome

Umbrella term for withdrawal signs in a newborn after in-utero exposure to opioids, benzodiazepines, or barbiturates. PA's reportable diagnosis.

NOWS

Neonatal Opioid Withdrawal Syndrome

The more specific term for withdrawal from opioid exposure alone — increasingly preferred in clinical literature since most NAS cases are opioid-driven.

Key Terms You'll Hear Today

Four acronyms that anchor everything in this talk (2 of 2)

MOUD

Medication for Opioid Use Disorder

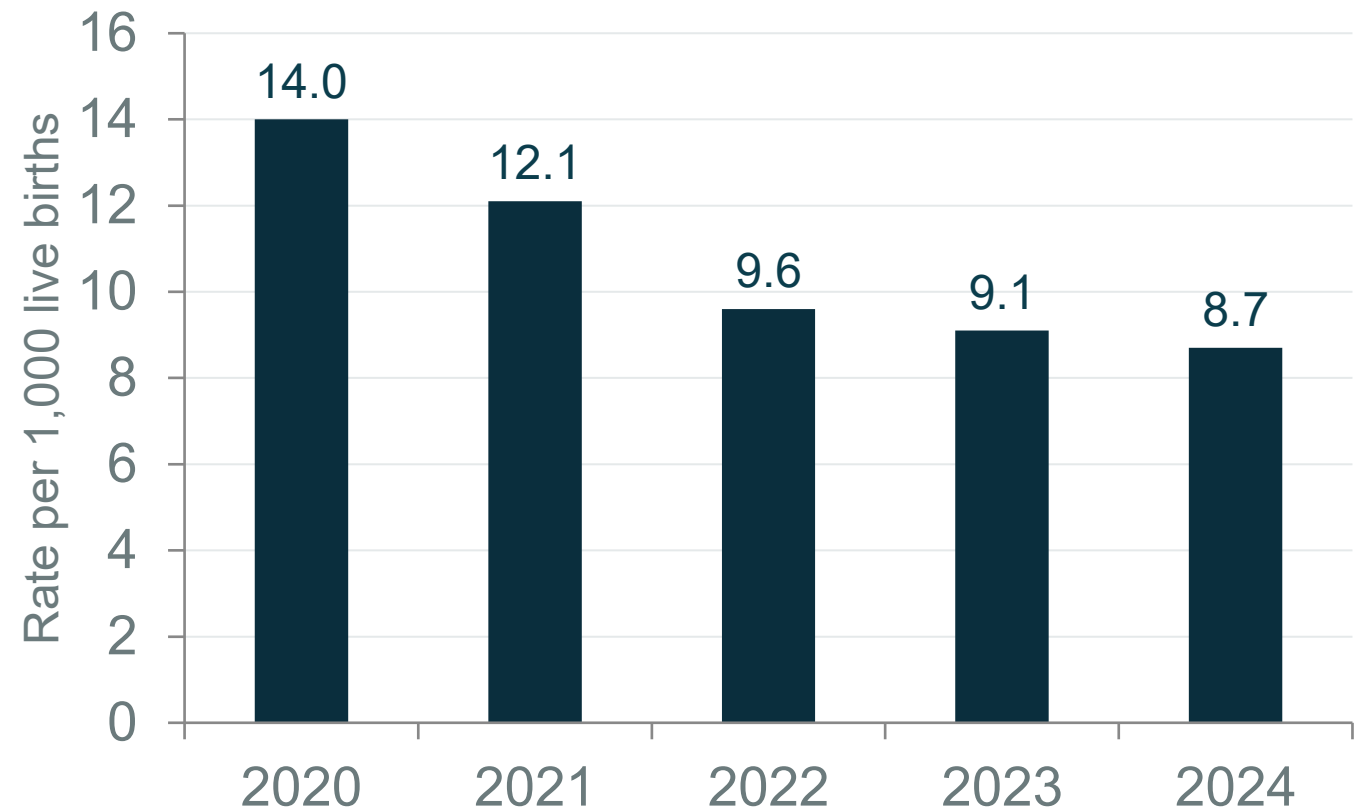
FDA-approved buprenorphine or methadone used to treat maternal opioid use disorder. The recommended standard of care during pregnancy — not a cause to avoid, but a treatment to support.

ESC

Eat, Sleep, Console

A function-based model of infant assessment — can the baby eat, sleep, and be consoled — used to guide non-pharmacologic-first care instead of a symptom-scoring tool.

NAS Incidence in Pennsylvania Is Falling



1,109

born with NAS in PA in 2024
— 8.7 per 1,000 live births

-38%

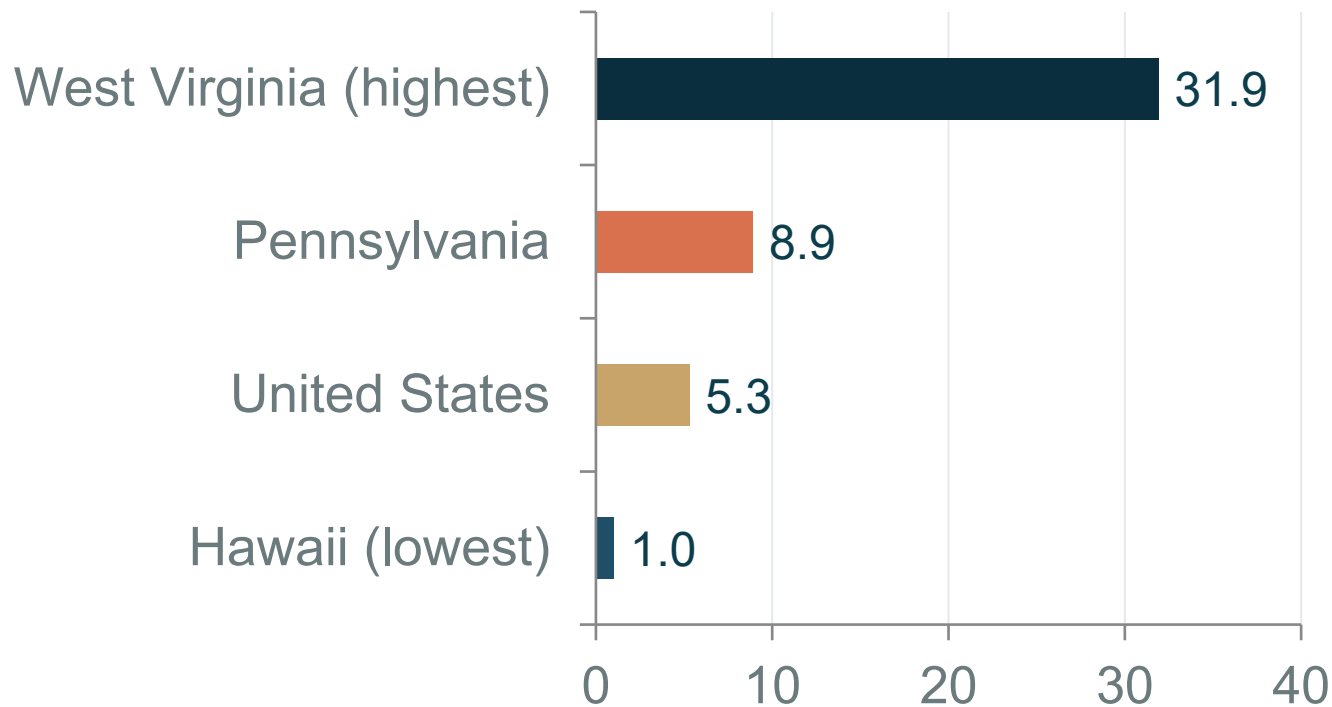
decline in the NAS rate since
2020 — falling every year for
five straight years

Source: PA DOH, NAS Surveillance: 2024 Report — Table 1

NATIONAL CONTEXT

Nationwide, and Where Pennsylvania Stands

AHRQ/HCUP birth-hospitalization data, 2022 (America's Health Rankings)



~19,400

estimated infants born with NAS
nationally in 2022 (3.66M U.S.
births × national rate) — our own
calculation, not an official
published count

NATIONAL CONTEXT

PA's National Ranking

Where Pennsylvania stands among the states, 2022 AHRQ/HCUP data

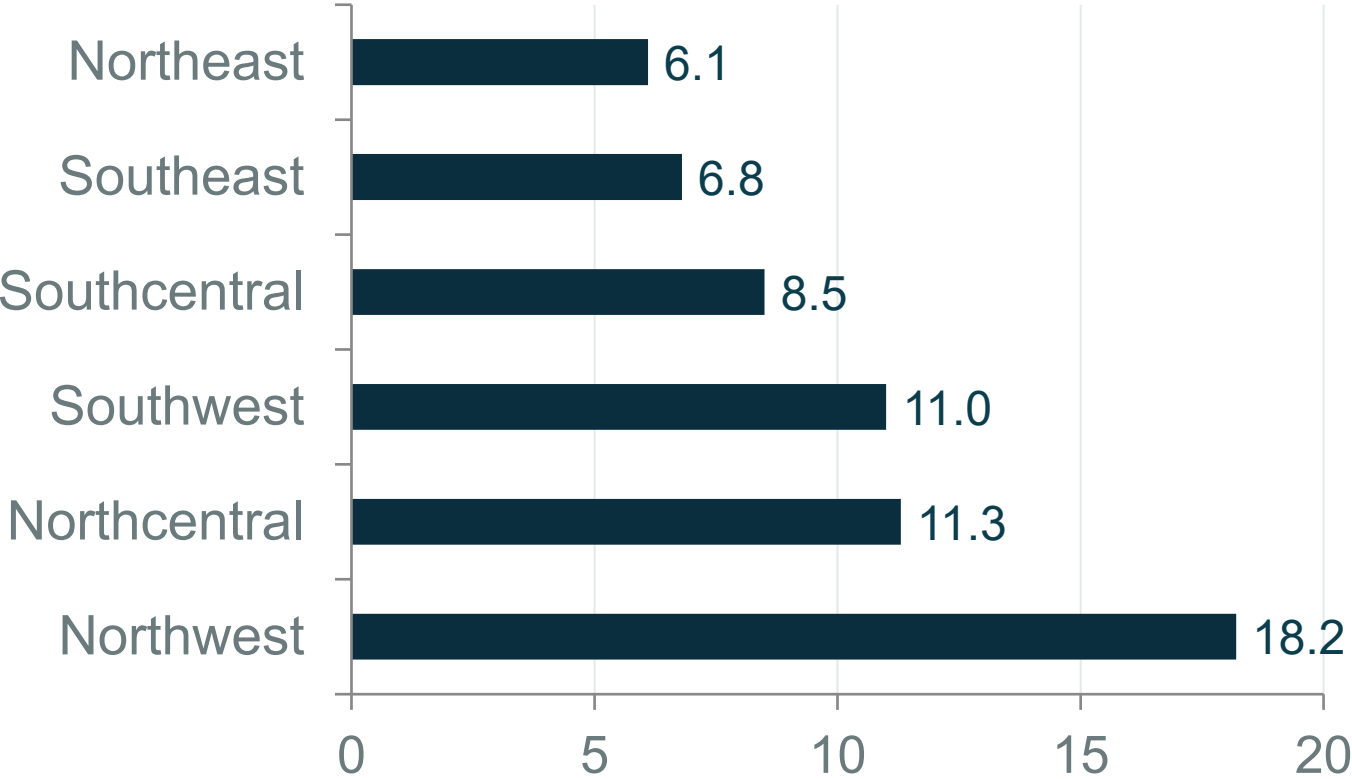
PA ranks 37th of ~48 states

At 8.9 per 1,000 birth hospitalizations, PA's rate runs about 1.7× the national average.

This AHRQ/HCUP measure (8.9) uses hospital discharge coding and differs slightly from PA DOH's dedicated surveillance rate (8.7, Table 1) — different methods, consistent story.

Sources: America's Health Rankings, AHRQ/HCUP State Inpatient Database via HRSA MCHB FAD Resource Document, 2022; CDC/NCHS Births: Provisional Data, 2022; Thomas SA, et al. Hosp Pediatr. 2025 (MAT-LINK).

Incidence Varies Widely Across the State



3×

higher NAS rate in the Northwest region (18.2 per 1,000) than in the Northeast (6.1 per 1,000)

Highest-rate counties (2024)

Clinton (39.1), Forest (34.5), Venango (30.8), Elk (30.3), Lawrence (24.8) — per 1,000 live births

Hospital-of-birth counts differ from county-of-residence rates. Source: PA DOH 2024 Report — Table 14, 15, Map 1-2

LOCAL CONTEXT

Closer to Home: Indiana County & IRMC

Indiana Regional Medical Center is Indiana County's sole full-service hospital, serving the whole county

5.4

per 1,000 live births

4 NAS cases among 740 live births to Indiana County residents in 2024 (95% CI: 2.0–14.3)

11.0

per 1,000 live births

Southwest PA region rate (264 cases) — the PA DOH health district that includes Indiana County

Interpret with caution: PA DOH flags county rates based on fewer than 5 cases as statistically unstable. Indiana County's low birth volume means a single case shifts the rate substantially year to year.

Source: PA DOH 2024 Report — Table 14, Table 15

MATERNAL CHARACTERISTICS

Substance Use & MOUD Among PA Mothers

N = 1,103 women who gave birth to an infant with NAS in 2024

80.2%

used an opioid agonist (buprenorphine or methadone) during pregnancy

62.9%

received MOUD during pregnancy

54%

used more than one substance —
polysubstance use is common

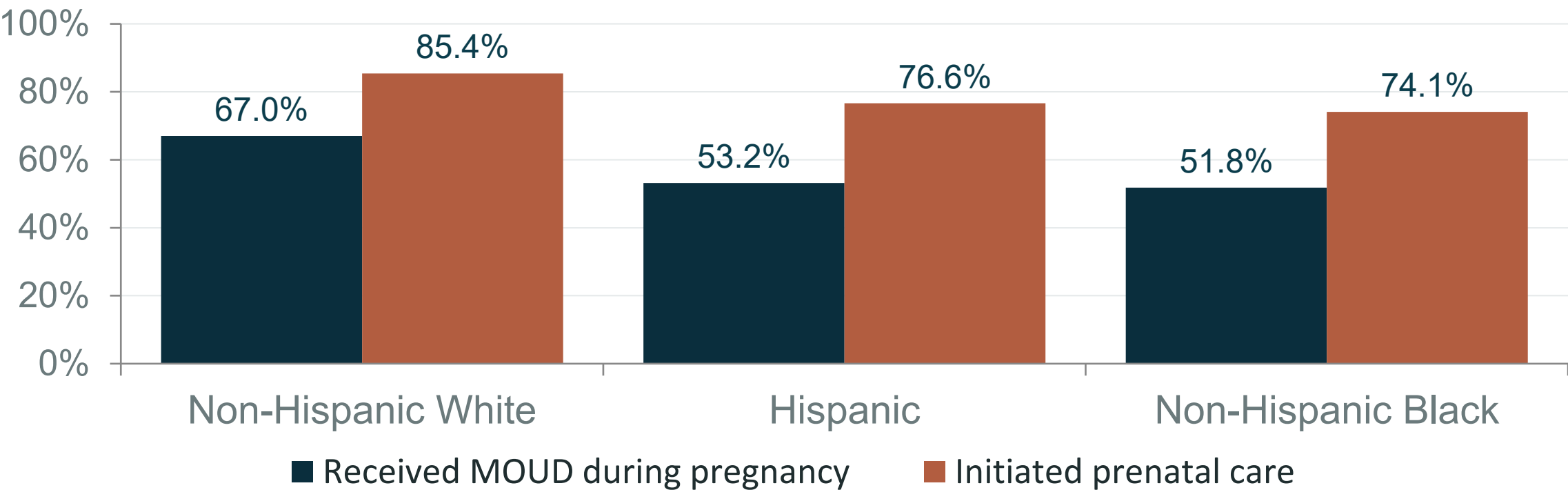
81.1%

were insured by Medicaid at delivery

MATERNAL CHARACTERISTICS

Equity Gaps by Maternal Race & Ethnicity

Access to MOUD and prenatal care is not distributed equally



Source: PA DOH 2024 Report — Table 4

MATERNAL CHARACTERISTICS

Recurrence: More Than One NAS Birth

25.8%

of women who had an infant with NAS in 2024 had also had one in the preceding six years (2018–2023)

2.5×

more likely to have received MOUD in 2024 if they had a prior NAS birth

Source: PA DOH 2024 Report — Executive Summary, Figure 5, Table 5

MECHANISM · STEP 1 OF 3

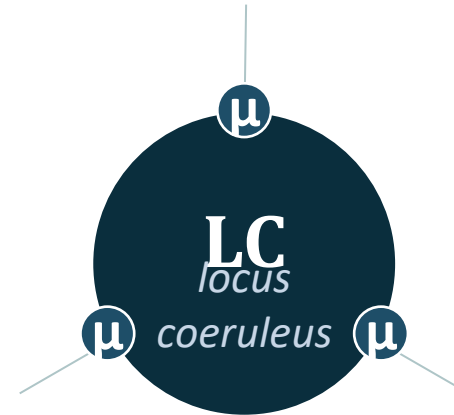
Before Birth: Opioids Quiet the Noradrenaline System

The locus coeruleus (LC) is the brainstem's main noradrenaline hub.

Opioids bind μ -receptors on LC neurons, suppressing noradrenaline release.

The compensation begins

To keep functioning, the LC upregulates its internal signaling machinery — priming it to fire hard once the brake lifts. This is the basis of tolerance.



*Suppressed noradrenaline (NE)
release*

MECHANISM · STEP 2 OF 3

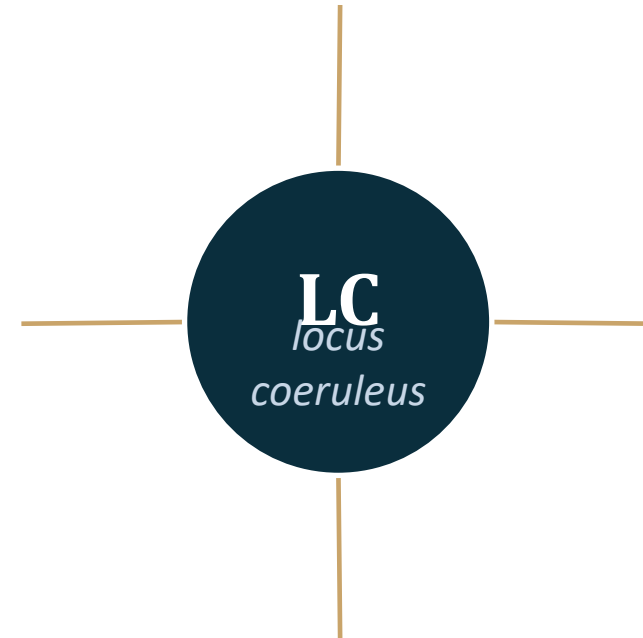
At Birth: The Opioid Signal Disappears

Delivery cuts opioid supply instantly. The μ -receptor brake on the LC is gone within hours.

A dangerous mismatch

Suppression is gone, but the LC's primed cAMP machinery hasn't reset. The nucleus is now unopposed and over-equipped to fire

This is why signs typically emerge within 24–72 hours (later for methadone/buprenorphine) rather than immediately.



Inhibition lifting — signal starting to rise

MECHANISM · STEP 3 OF 3

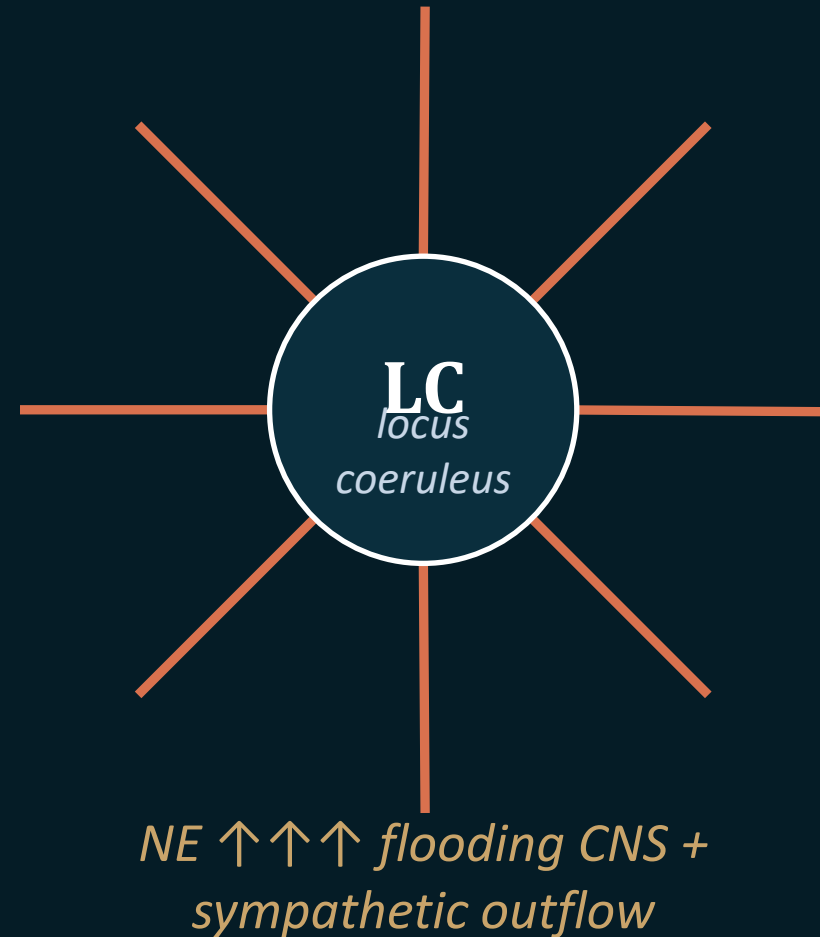
The Rebound: A Surge of Noradrenaline

Unopposed and still primed, the LC fires excessively — flooding the CNS and sympathetic nervous system with norepinephrine.

Related shifts compound it: ↓ serotonin, ↓ dopamine, ↑ acetylcholine, ↑ corticotropin — all via the same cAMP cascade.

Why clonidine works

Clonidine is an alpha-2 agonist — it directly suppresses LC firing, targeting the mechanism itself.



CLINICAL BASICS

From Surge to Symptoms

The noradrenaline surge cascades into signs across four systems

CNS

Irritability,
tremors, high-
pitched cry,
hypertonia,
seizures (rare)

Autonomic

Sweating,
temperature
instability,
sneezing,
yawning, mottling

GI

Poor feeding,
uncoordinated
suck, vomiting,
loose stools, poor
weight gain

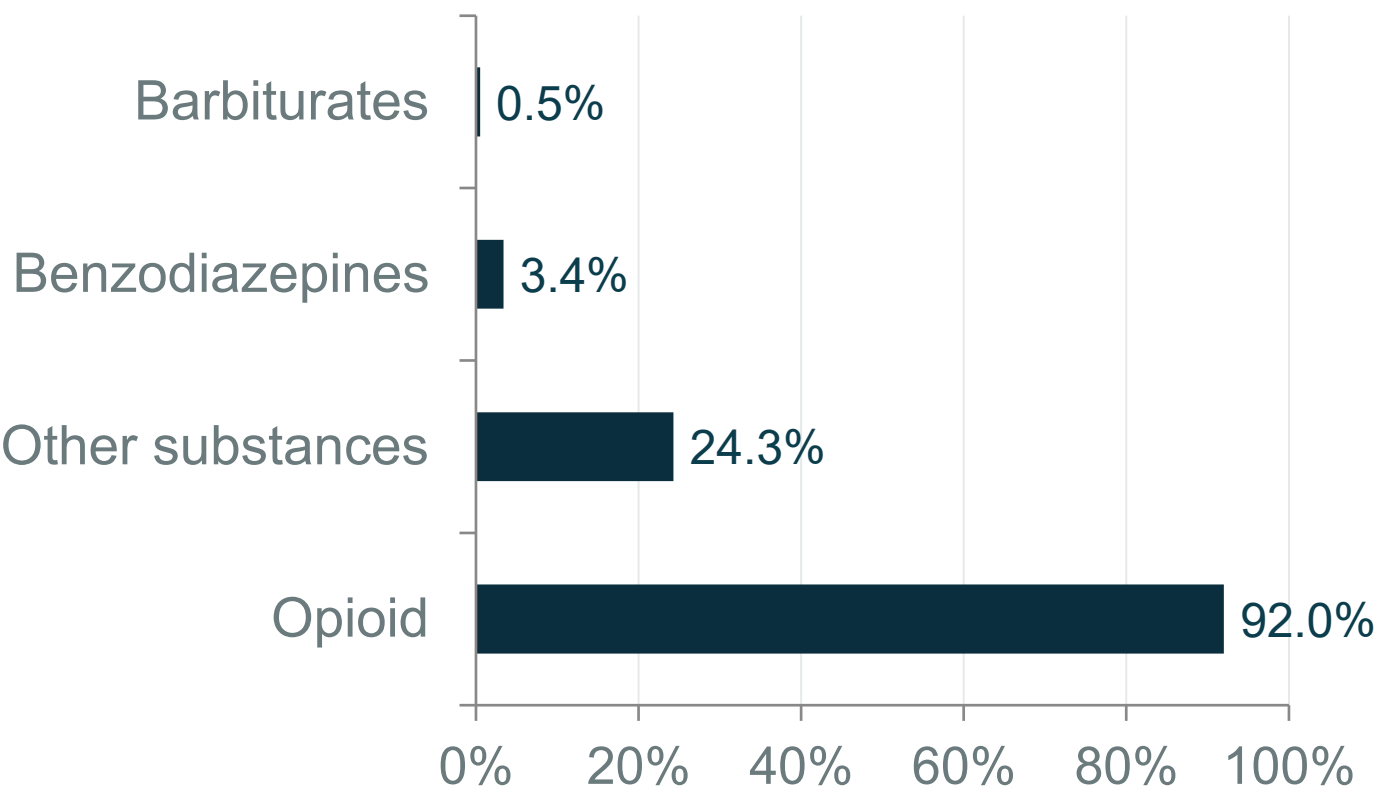
Respiratory

Tachypnea, nasal
stiffness

PA's most frequently reported symptoms in 2024: hypertonia/elevated muscle tone (62.3%), poor feeding (57.3%), and inability to console (47.5%).

CLINICAL BASICS

Testing in Practice: What PA Infants Show



PA is not universal testing

There is no PA mandate for universal drug testing of pregnant women or infants — testing requires consent and results are not comprehensive across all cases.

Source: PA DOH 2024 Report — Figure 1, Figure 6

CLINICAL BASICS

PA's Case Definition Requires Both

1. A positive drug screen (infant or maternal) OR documented maternal use
2. AND an NAS diagnosis, chief complaint, or ≥ 2 clinically compatible symptoms

Both criteria must be met for a case to be reportable to PA DOH.

Source: PA DOH 2024 Report — Figure 1

ASSESSMENT TOOLS

The Historical Standard: Finnegan Scoring

Finnegan Neonatal Abstinence Scoring System (FNASS) — introduced 1975

How it works

- Scores ~21 signs and symptoms across CNS, metabolic/vasomotor/respiratory, and GI categories
- Weighted point system; scored every 3–4 hours
- Medication historically triggered by a numeric threshold
- Still used, alone or combined with ESC, for 56.2% of PA's 2024 NAS cases

Source: PA DOH 2024 Report — Table 7, Table 10, Table 11

ASSESSMENT TOOLS

What PA's Data Show About Finnegan

- Infants assessed by Finnegan alone: 55.3% received medication
- Only 37.6% of Finnegan-only infants had a hospital stay under 7 days
- Symptom-based scoring is more subjective and separates infant from caregiver for assessment
- These gaps are the evidence base driving PA's push toward ESC

Source: PA DOH 2024 Report — Table 7, Table 10, Table 11

ASSESSMENT TOOLS

A Different Question: Eat, Sleep, Console

Developed 2017 (Yale New Haven) — now used, alone or combined, for 59.2% of PA's 2024 NAS cases

Instead of scoring symptoms, ESC asks:

EAT

Can the infant eat well
— breast or bottle —
taking adequate
volume?

SLEEP

Can the infant sleep
undisturbed for at least
1 hour?

CONSOLE

Can the infant be
consoled within 10
minutes, with or
without help?

Defining "Well-Managed" Under ESC

An infant is considered well-managed when they:

- Eat well (breast or $\geq \sim 1$ oz/kg per feed for bottle-fed infants)
- Sleep undisturbed ≥ 1 hour after feeding
- Are consoled within 10 minutes, with or without a caregiver's help

ASSESSMENT TOOLS

What Makes ESC Different in Practice

- Function over symptoms — medication is reserved for infants who cannot eat, sleep, or console despite maximized non-pharmacologic support.
- Parents/caregivers are the primary consolers and assess alongside nursing staff.
- Rooming-in and skin-to-skin contact are foundational, not optional add-ons.
- Emphasis shifts from "treating a number" to supporting the whole dyad.

THE NATIONAL EVIDENCE

Inside the ACT NOW Trial

Young LW, et al. Eat, Sleep, Console Approach or Usual Care for Neonatal Opioid Withdrawal. N Engl J Med. 2023;388(25):2326-2337.

26

U.S. hospitals

Stepped-wedge, cluster-randomized design — each site served as its own control

1,305

infants enrolled

Born ≥ 36 weeks' gestation with neonatal opioid withdrawal syndrome

3 mo.

training transition

Staff trained on ESC at each site before it replaced usual (Finnegan) care

THE NATIONAL EVIDENCE

What the ACT NOW Trial Measured

Primary outcome

Time from birth until medically ready for hospital discharge

Secondary outcomes

Length of stay, need for pharmacologic therapy, and a composite safety outcome (in-hospital safety events, unscheduled care visits, readmission, nonaccidental trauma or death) assessed through 3 months of age

THE NATIONAL EVIDENCE

ACT NOW Results: Faster, Less Medication, Just as Safe

8.2 vs 14.9

**days to discharge
readiness**

ESC vs. usual care —
adjusted difference 6.7
days (95% CI, 4.7–8.8);
rate ratio 0.55 (95% CI,
0.46–0.65; $P < 0.001$)

19.5% vs 52%

**received opioid
medication**

ESC vs. usual care —
about a 63% relative
reduction in
pharmacologic treatment

No difference

**in composite safety
outcome**

In-hospital safety,
unscheduled visits,
readmission, and
nonaccidental
trauma/death were
similar between groups
through 3 months

The Bottom Line

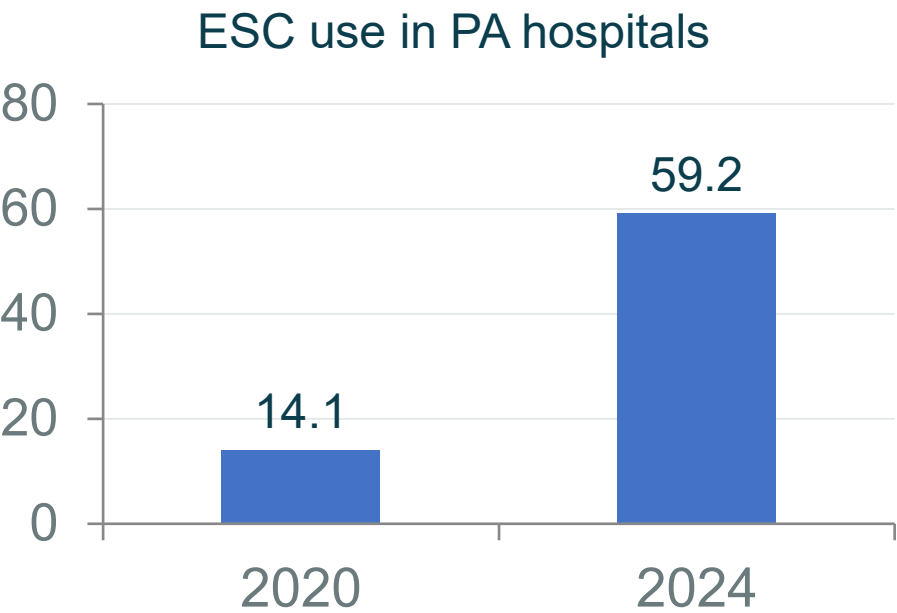
“ESC meaningfully shortened time to hospital discharge for opioid-exposed infants, and short-term follow-up through 3 months showed no signal of added harm.”

At 2 years (2026 follow-up): children cared for with ESC generally scored higher on the Bayley-4 developmental test than those who received usual care.

— Young LW, et al. *N Engl J Med.* 2023;388:2326-37; ESC-NOW 2-year follow-up, 2026.

THE PA EVIDENCE

ESC Adoption Is Rising — and It's Working



Received medication

10.5%
of ESC-assessed
infants

55.3%
of Finnegan-assessed
infants

Discharged within 7
days

68.3%
of ESC-assessed infants

37.6%
of Finnegan-assessed
infants

PA's own data mirror the national evidence (ACT NOW trial, NEJM 2023): ESC-assessed infants need less medication and go home sooner — without evidence of undertreatment.

Source: PA DOH 2024 Report — Table 7, Table 10, Table 11; Recommendations section

MANAGEMENT

Non-Pharmacologic Care: The First-Line Bundle

42.7% of PA's 2024 NAS infants received non-pharmacologic care alone — no medication needed

Rooming-in

Infant stays with parent/caregiver rather than nursery separation

Low stimulation

Dim lighting, reduced noise, swaddling, minimal unnecessary handling

Consistent caregivers

Limiting the number of different handlers per shift

MANAGEMENT

Non-Pharmacologic Care, Continued

Skin-to-skin

Frequent kangaroo care to regulate temperature, heart rate, and stress

On-demand feeding

Smaller, more frequent feeds; high-calorie formula if needed for growth

Breastfeeding support

Encouraged when appropriate and not contraindicated by maternal substance use

Treatment Patterns Across PA in 2024

Treatment Type	N	% of Total
Pharmacological treatment	268	24.2%
Pharmacological and non-pharmacological treatment	102	9.2%
Non-pharmacological treatment	474	42.7%
No treatment	265	23.9%
Total NAS cases	1,109	100.0%

Indicated when the infant cannot eat, sleep, or be consoled despite maximized non-pharmacologic support — not from a symptom score alone.

Medications used in PA hospitals

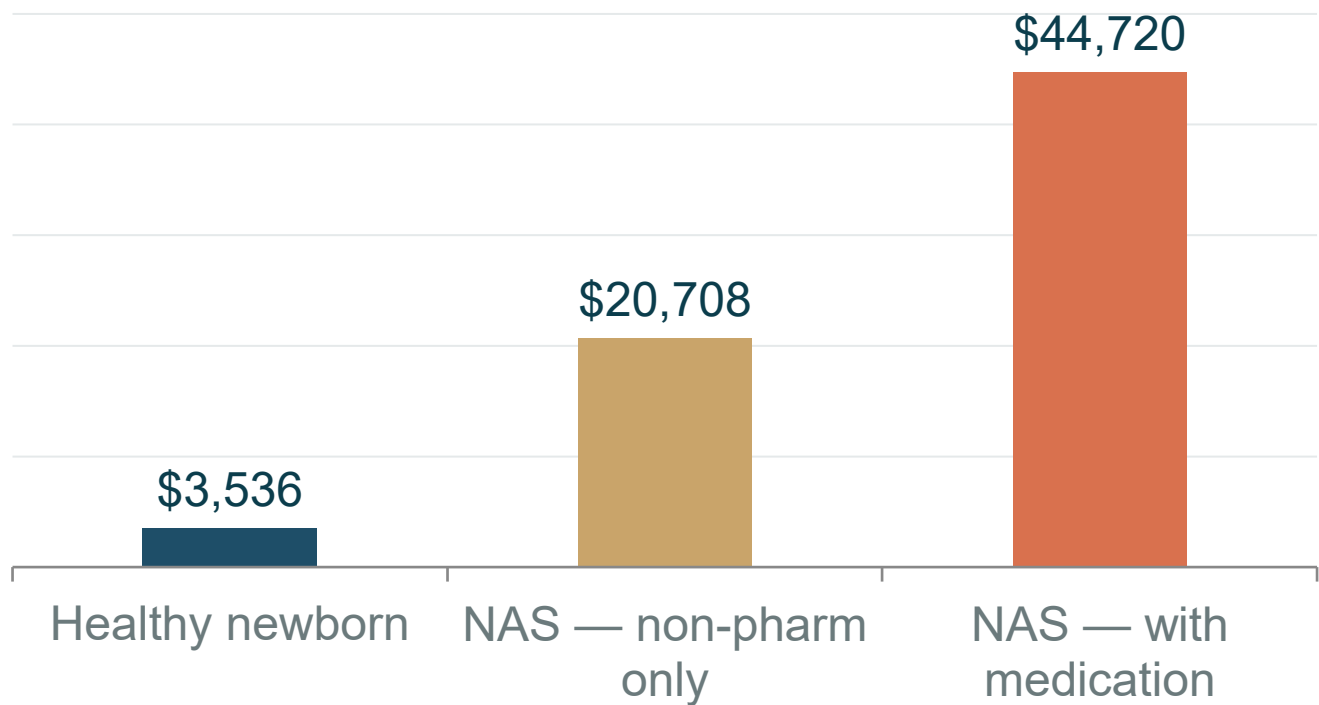
Methadone, morphine, phenobarbital, or clonidine — 33.4% of infants received some form of pharmacologic treatment, alone or combined with non-pharm care.

Source: PA DOH 2024 Report — Table 9

WHY THIS MATTERS

The Cost of NAS: With and Without Medication

National data, tertiary pediatric hospitals, 2013–2016 (23 hospitals, 136,762 encounters)



10×
higher average cost for any NAS admission vs. a healthy newborn (\$37,584 vs. \$3,536 overall)

Length of stay drives the gap

Healthy newborn	2.9 days
NAS — non-pharm	10.9 days
NAS — medication	22.0 days

70% of NAS infants nationally received pharmacologic treatment — the share PA's ESC adoption is shrinking.

Source: Milliren CE, et al. Hosp Pediatr. 2018;8(1):15-20.

WHY THIS MATTERS

What Does This Cost Pennsylvania Each Year?

An estimate, not an official published figure — PA's 2024 case volume and treatment mix applied to national per-case cost benchmarks, in 2024 dollars

~\$33M–\$42M

estimated hospitalization cost for PA's 2024 NAS cases

Upper: 739 without medication × \$27,407 + 370 with medication × \$59,187

Upper end: Milliren et al.'s 2013–2016 per-case costs, inflated with CPI-U (×1.32). Lower end: infants without medication stay ~6 days, not 10.9, as under Eat, Sleep, Console.

Sources: PA DOH 2024 Report (Table 9); Milliren et al., Hosp Pediatr 2018; Young et al., NEJM 2023; BLS CPI-U 2015, 2024.

WHY THIS MATTERS

The National Cost Trajectory

2003	\$61M in actual hospital costs
2012	\$316M in actual hospital costs
2016	\$2.5B in total hospital charges*

**Charges are billed amounts, typically well above actual cost — not directly comparable to the 2003/2012 cost figures.*

This is hospitalization only. It excludes outpatient follow-up, Early Intervention services, extended foster/CYS involvement, and any long-term developmental costs — the true economic burden to PA is higher than shown here.

Sources: PA DOH 2024 Report (Table 9, case counts); Milliren CE, et al. Hosp Pediatr. 2018;8(1):15-20 (per-case costs); Corr TE, Hollenbeak CS. Addiction. 2017;112(9):1590-1599; Ramphul K, et al. Hosp Pediatr. 2020;10(2):181-184.

MANAGEMENT

Morphine Protocol: Starting, Escalating, Weaning

Adapted from the Indiana Perinatal Substance Use Task Force NAS Pharmacologic Therapy Protocol

Start

- 0.05–0.1 mg/kg/dose PO q3–4h
- PRN trigger: 2 consecutive NAS scores ≥ 8 , or any single score ≥ 12
- Scheduled dosing for more severe or Category 4 withdrawal
- >3 PRN doses in 24h $\rightarrow$ consider converting to scheduled dosing

MANAGEMENT

Morphine Protocol: Escalating

- Increase by 0.05 mg/kg/dose for 2 consecutive scores ≥ 8 or any single score ≥ 12
- Rescue dose 0.1 mg/kg for severe breakthrough signs
- 2 rescue doses in 24h $\rightarrow$ increase maintenance dose
- Max 1.6 mg/kg/day before considering adjunct; hard ceiling ~ 2.3 mg/kg/day

MANAGEMENT

Morphine Protocol: Weaning

- Begin once stable 48h on current dose with no rescue doses
- Decrease 10–15% of max daily dose every 24h
- Slower for severe initial signs; faster once scores are 0–3
- Observe 48–72h off all medication before discharge

“Treat the baby, not the number” — dosing thresholds guide clinical judgment; they don't replace it. Confirm exact figures against your institution's current order set.

MANAGEMENT

Adding Clonidine: When and How

When to add clonidine

- Morphine dose exceeds 1.6 mg/kg/day — the infant has failed standard monotherapy and is reclassified as more severe withdrawal
- Infant fails a specific wean attempt 2–3 times, with rising scores
- As primary treatment for withdrawal from non-opioid agents (e.g., isolated benzodiazepine exposure) — clonidine or phenobarbital, not morphine
- Rule: always maximize the opioid dose to its standard ceiling first — add a second agent only after that ceiling is reached

Source: Indiana Perinatal Substance Use Task Force, NAS Pharmacologic Therapy Protocol. Reflects general SAMHSA-aligned guidance — verify exact thresholds against your institution's order set.

MANAGEMENT

Clonidine: Dosing & Weaning

- Start: 1 mcg/kg/dose PO q6h (1.5 mcg/kg/dose in week 2 of life; consider q4h for severe signs)
- Escalate by ~0.05 mcg/kg/dose every 12–24h for scores ≥ 8 (single) or ≥ 12 ; typical maintenance 3–5 mcg/kg/day
- Monitor: blood pressure and heart rate before each dose — hold for hypotension/bradycardia
- Wean: continue clonidine through the opioid wean; once off opioid 48h, taper clonidine ~25% every 48h until discontinued

Source: Indiana Perinatal Substance Use Task Force, NAS Pharmacologic Therapy Protocol. Reflects general SAMHSA-aligned guidance — verify exact thresholds against your institution's order set.

Infant Discharge, Caregivers & Referrals

Primary caregiver at discharge

Parent	80.4%
Children & Youth Services / Foster	11.5%
Other / relationship not specified	6.6%
Unknown at time of report	1.4%

Infant referrals made at discharge

Pediatrician experienced with NAS	54.9%
Early Intervention	30.7%
Developmental assessment clinic	12.2%
Home visiting services	8.8%

PA's Early Intervention program offers, at minimum, ASQ developmental tracking for every infant diagnosed with NAS — parental consent required for referral.

Maternal Referrals & Mandated Reporting

Maternal referrals at discharge

MOUD	50.6%
Care for substance use	12.1%
Community support program	9.3%
Parenting support	6.8%

Only about half of mothers were referred for MOUD at discharge — a clear opportunity for improvement.

Source: PA DOH 2024 Report — Figure 11, Table 13, Recommendations

CARE CONTINUUM

PA Legal Requirements at Discharge

- **Notify ChildLine immediately** when any provider identifies a substance-affected infant up to age 1 (PA Act 54 of 2018; federal CAPTA/CARA)
- **Hold a multidisciplinary team meeting before discharge** to start the Plan of Safe Care; within 72 hours if the infant is identified after discharge
- **Not a child abuse report.** Separate abuse or neglect concerns still go to ChildLine as usual
- **Separate from NAS surveillance** reporting to PA DOH, which uses different criteria

Source: PA Act 54 of 2018; PA DHS Plan of Safe Care Guidance, 2019

PA's Safety Net at Discharge: The Plan of Safe Care

Pennsylvania's answer to “what happens to this family after discharge?” — required under Act 54 (2018) and federal CAPTA/CARA

1 Identify

A provider determines an infant was born affected by substance use/withdrawal (NAS/NOWS) or FASD

2 Notify

Notice goes to DHS ChildLine before discharge — a General Protective Services notification, explicitly NOT a child abuse report

3 Convene

A multidisciplinary team meeting is held prior to discharge to assess the needs of both the infant and the parents/caregivers

4 Plan & connect

The team identifies a lead agency and builds a Plan of Safe Care — connecting the family to treatment, home visiting, and follow-up care

CARE CONTINUUM

Plan of Safe Care: Key Details

It's voluntary — but rarely refused entirely

Families can decline the plan itself, but the DHS notification still occurs, and providers should still offer voluntary resources and referrals regardless.

Dual focus: baby AND parent

The plan addresses the infant's care needs and the parent/caregiver's access to substance use treatment and recovery support — not child welfare alone.

STATE GUIDANCE

PA DOH's 2024 Recommendations (1 of 2)

- 1 Improve equitable access to MOUD and prenatal care among pregnant women using substances
- 2 Ensure women on MOUD receive information about NAS and what to expect at delivery
- 3 Facilitate location-appropriate referrals and system-level coordination before and after delivery

STATE GUIDANCE

PA DOH's 2024 Recommendations (2 of 2)

- 4 Encourage use of the Eat, Sleep, Console method during birth hospitalization
- 5 Facilitate coordinated referral to needed services for both mother and infant at discharge
- 6 Support patient-centered postpartum and interpregnancy care for women in long-term recovery

PROGRAM ELEMENTS

It Takes a Team



Bedside RN

Primary ESC assessor;
teaches and coaches
caregivers



Physician / NP

Orders, escalation
decisions, weaning
oversight



Lactation consultant

Feeding support,
breastfeeding guidance

PROGRAM ELEMENTS

It Takes a Team, Continued



Social work

Plan of Safe Care, family support, resource connection



Pharmacy

Dosing, weaning protocol adherence



Family / caregiver

Primary consoler — an active care team member, not a visitor

Key Takeaways (1 of 2)

- 1 PA's NAS rate has fallen 38% since 2020 (14.0 → 8.7 per 1,000 births) but varies 3× by region.
- 2 Equity gaps persist: non-Hispanic Black mothers receive MOUD and prenatal care at lower rates than white mothers.
- 3 One in four PA mothers with an NAS birth in 2024 had a prior one within six years — interpregnancy care matters.

WRAP-UP

Key Takeaways (2 of 2)

- 4 PA's own outcomes confirm the evidence: ESC infants need medication far less often (10.5% vs. 55.3%) and go home sooner.
- 5 PA DOH explicitly recommends encouraging ESC over Finnegan/Modified Finnegan scoring statewide.

REFERENCES

Selected References (1 of 3)

Pennsylvania Department of Health, Bureaus of Family Health and Epidemiology. Neonatal Abstinence Syndrome (NAS) Surveillance: 2024 Report. Published 2026.

Young LW, et al. Eat, Sleep, Console Approach or Usual Care for Neonatal Opioid Withdrawal. N Engl J Med. 2023;388:2326-2337.

Grossman MR, et al. A Novel Approach to Assessing Infants With Neonatal Abstinence Syndrome. Hosp Pediatr. 2018;8(1):1-6.

Blount T, et al. Reduction in Length of Stay and Morphine Use for NAS With the 'Eat, Sleep, Console' Method. Hosp Pediatr. 2019;9:615-623.

Holmes AV, et al. Rooming-in to Treat Neonatal Abstinence Syndrome: Improved Family-Centered Care at Lower Cost. Pediatrics. 2016;137(6).

Council of State and Territorial Epidemiologists. Neonatal Abstinence Syndrome Standardized Case Definition, 2023 (23-MCH-01).

REFERENCES

Selected References (2 of 3)

Peeler M, et al. Racial and Ethnic Disparities in Maternal and Infant Outcomes. Am J Public Health. 2020;110(12):1828-1836.

Hanley GE, et al. Interpregnancy Interval and Adverse Pregnancy Outcomes. Obstet Gynecol. 2017;129(3):408-15.

SAMHSA. Clinical Guidance for Treating Pregnant and Parenting Women with Opioid Use Disorder and Their Infants. Dec 2023.

PA Act 54 of 2018; Comprehensive Addiction and Recovery Act (CARA) of 2016, amending CAPTA §106(b)(2)(B)(ii)-(iii).

Milliren CE, et al. Hospital Variation in Neonatal Abstinence Syndrome Incidence, Treatment Modalities, Resource Use, and Costs. Hosp Pediatr. 2018;8(1):15-20.

REFERENCES

Selected References (3 of 3)

Corr TE, Hollenbeak CS. The Economic Burden of Neonatal Abstinence Syndrome in the United States. *Addiction*. 2017;112(9):1590-1599.

Ramphul K, Mejias SG, Joynauth J. An Update on the Burden of Neonatal Abstinence Syndrome in the United States. *Hosp Pediatr*. 2020;10(2):181-184.

America's Health Rankings. Neonatal Abstinence Syndrome by State. AHRQ/HCUP State Inpatient Database via HRSA MCHB FAD Resource Document, 2022.

Hamilton BE, et al. Births: Provisional Data for 2022. *Vital Statistics Rapid Release*, No. 28. CDC/NCHS, 2023.

Thomas SA, et al. Neonatal Abstinence Syndrome in the MATernal and Infant clinical Network. *Hosp Pediatr*. 2025;15(12):e591-e593.

Discussion

Questions, local protocol considerations, and next steps for our units
