

NAS • Neonatal Abstinence Syndrome

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THE STORY IN ONE SENTENCE

A newborn whose mother took opioids during pregnancy can get very sick after birth because the baby's body became used to the drug and now has to adjust without it.

"NAS means the baby was exposed to opioids before birth, built dependence, and now withdraws. Score symptoms with the Finnegan scale and treat with morphine or methadone if the score is high."

Normal anatomy — the body's job

Normally, a newborn's brain and nervous system are balanced without needing any outside drugs. The brain uses its own natural chemicals—like endorphins (the body's own pain relievers) and neurotransmitters such as norepinephrine (a messenger that controls alertness and stress response)—to keep the baby calm, regulate sleep and wake cycles, control muscle tone, and coordinate feeding and digestion.

BODY'S JOB

In a healthy newborn, the brainstem (the lower part of the brain that controls automatic functions like breathing and heart rate) and the limbic system (the middle brain region that handles emotions and stress) work together smoothly. Opioid receptors (special docking sites on brain cells) are normally activated by the body's own endorphins to soothe pain and calm the nervous system. The autonomic nervous system (the automatic control system for heart rate, digestion, and body temperature) stays balanced between the sympathetic branch (the 'speed up' side) and the parasympathetic branch (the 'slow down and rest' side). This balance lets the baby eat well, sleep peacefully, and respond appropriately to the new world outside the womb.

1. The mother's bloodstream delivers oxygen, nutrients, and everything else the baby needs through the placenta.

2. In a drug-free pregnancy, the baby's brain develops its own natural balance of calming and alerting chemicals.
3. The baby's opioid receptors are gently stimulated only by the body's own endorphins, keeping pain and stress at normal levels.
4. After birth, the umbilical cord is cut, and the baby's brain continues using its own internal systems to stay calm, eat, sleep, and grow.
5. The transition from womb to outside world is smooth because the baby's nervous system is not dependent on any outside drug.

What breaks

When a mother takes opioids during pregnancy, those drugs flood the baby's brain and lock onto the opioid receptors much more powerfully than the body's natural endorphins ever would. Over weeks or months, the baby's brain adapts: it turns down its own production of calming chemicals and increases the number of receptors trying to capture more drug. The baby becomes physically dependent—the brain now expects the opioid to be there. At birth, the umbilical cord is cut and the opioid supply stops instantly. The baby's nervous system, tuned to expect constant opioid stimulation, suddenly has none. The result is a surge of norepinephrine and other stress chemicals, throwing the autonomic nervous system into overdrive.

CLINICAL TERM

Chronic intrauterine opioid exposure causes fetal neuroadaptation: upregulation of opioid receptors (especially mu receptors in the brainstem and limbic system), downregulation of endogenous endorphin production, and altered regulation of the locus coeruleus (the brainstem nucleus that releases norepinephrine). At delivery, abrupt cessation of transplacental opioid transfer precipitates withdrawal. The locus coeruleus, no longer suppressed by exogenous opioid, releases excessive norepinephrine, leading to sympathetic hyperactivity. This manifests as tremor, high-pitched cry, irritability, hypertonicity, fast breathing (tachypnea), a fast heart rate (tachycardia), heavy sweating (diaphoresis), sneezing, yawning, feeding intolerance, vomiting, diarrhea, poor sleep, and in severe cases seizures.

How the body compensates

The newborn's body tries to cope with opioid withdrawal by ramping up the stress response and using every available mechanism to signal distress and seek relief. Early on, vital signs may look acceptable because the baby's young cardiovascular and respiratory systems can still keep heart rate, breathing rate, and oxygen levels in a survivable range. But these compensations are exhausting and cannot last. The clinical job is to recognize that a baby who

is trembling, crying inconsolably, sweating, and refusing to eat is already compensating hard—and without intervention, the baby will tip into dehydration, severe weight loss, seizures, and failure to thrive.

1. In the first hours after birth, the baby may seem fussy but not yet in full withdrawal. The nervous system is just starting to react to the loss of opioid. Vital signs are often normal, and the baby may still feed a little.
2. Over the next 24 to 72 hours (sometimes up to a week for long-acting opioids like methadone), withdrawal symptoms peak. The baby trembles, cries with a high-pitched sound that is hard to soothe, becomes stiff, sweats, sneezes repeatedly, and struggles to latch or suck during feeding. The body is flooding itself with norepinephrine to try to 'wake up' and cope, but this overdrive state is not sustainable.
3. The baby burns extra calories from constant trembling and crying but cannot take in enough milk because feeding is so disorganized. Weight drops quickly. Vomiting and diarrhea worsen fluid loss. The baby becomes dehydrated (dry mouth, sunken soft spot, fewer wet diapers, dark urine).
4. Sleep becomes nearly impossible because the brain cannot calm down. Exhaustion sets in, but the nervous system is too revved up to allow rest. This vicious cycle—no sleep, no food, constant stress—pushes the baby toward metabolic collapse.
5. In severe cases, uncontrolled withdrawal can trigger seizures. These happen because the brain's balance between excitatory signals (like glutamate) and inhibitory signals (like GABA, the brain's main calming messenger) is disrupted. Without opioid to dampen overactivity, neurons fire chaotically.
6. The danger zone is when the baby stops responding to comfort measures (swaddling, quiet room, skin-to-skin contact, small frequent feedings). At that point, the Finnegan score (a checklist that assigns points for tremor, cry, sleep, feeding, stools, sneezing, sweating, tone, and other signs) climbs above 8 on two consecutive measurements or above 12 once. This signals that compensation is failing and pharmacologic treatment—usually morphine or methadone—is needed to safely bring the nervous system back into balance.
7. A baby whose Finnegan scores are slowly climbing, who is losing weight, and whose family is overwhelmed is not stable—even if heart rate and oxygen saturation look okay in that single moment. The trend matters more than the snapshot. Intervention before the crash is the goal.

Domino effect

1. During pregnancy, the mother's opioid use delivers a steady supply of drug across the placenta into the baby's bloodstream and brain. — Opioids are small molecules that easily cross the placenta. The baby's developing brain is constantly bathed in the drug, and over time the brain's opioid receptors (especially mu receptors in the brainstem, limbic system, and spinal cord) become flooded and overstimulated.
2. The baby's brain adapts by increasing the number of opioid receptors and decreasing its own production of endorphins (the body's natural opioid-like chemicals). — The brain tries to restore balance when it senses too much opioid signal. More receptors mean the existing opioid is spread across more sites, and less endorphin production reduces the total 'opioid-like' activity. This neuroadaptation is the brain's attempt to reach a new normal—but it creates physical dependence.
3. At birth, the umbilical cord is clamped and cut. The opioid supply stops instantly. The baby's brain, now tuned to expect constant opioid, suddenly has none. — There is no gradual taper. The baby goes from a high, steady dose to zero in seconds. The opioid receptors that were occupied and quiet are now empty and screaming for stimulation. The systems that were suppressed by opioid—especially the locus coeruleus in the brainstem—are suddenly unleashed.
4. The locus coeruleus, no longer held in check by opioid, fires rapidly and releases a flood of norepinephrine throughout the brain and body. — Opioids normally inhibit the locus coeruleus, keeping norepinephrine release low and the baby calm. Without that brake, the locus coeruleus becomes hyperactive. Norepinephrine is the body's main 'alarm' chemical—it raises heart rate, increases alertness, tenses muscles, speeds breathing, and revs up the gut. This surge is what drives most withdrawal symptoms.
5. The baby begins to tremble (fine tremors of the hands and feet, sometimes the whole body), cry with a high-pitched, piercing sound, and become extremely irritable and hard to soothe. — The excess norepinephrine and lack of opioid-mediated calming make the nervous system hyperexcitable. Muscles contract too easily (causing tremor and stiffness), and the baby's brainstem and limbic system are stuck in a high-stress state (causing the inconsolable cry and irritability). The baby's sensory threshold is lowered—normal sounds, light, and touch feel overwhelming.

6. Feeding becomes very difficult. The baby has a disorganized suck, frequent gagging or vomiting, and diarrhea. Weight drops quickly. — The autonomic nervous system controls the gut. With the sympathetic side in overdrive and the parasympathetic side suppressed, the normal rhythmic contractions of the stomach and intestines (peristalsis) become chaotic. The baby cannot coordinate sucking, swallowing, and breathing smoothly. Vomiting and diarrhea occur because the gut is moving too fast and cannot absorb water or nutrients properly. The baby burns extra calories from constant trembling and crying but takes in far less milk than needed.
7. The baby sweats excessively, sneezes repeatedly, yawns frequently, and has a stuffy or runny nose. — These are all autonomic symptoms. The sympathetic surge raises body temperature and activates sweat glands (causing sweating). The nasal mucosa (the lining inside the nose) becomes congested because blood vessels dilate and secrete more mucus. Sneezing and yawning are reflexes triggered by irritation in the nasal passages and changes in arousal state—both are exaggerated when the nervous system is hyperactive.
8. The baby cannot sleep well. Sleep is fragmented—the baby may fall asleep for a few minutes but wakes frequently, startles easily, and never reaches deep, restful sleep. — Sleep requires the brain to shift into a calm, low-arousal state. The flood of norepinephrine and lack of opioid-mediated inhibition prevent this shift. The baby's brainstem cannot quiet down enough to allow normal sleep cycles. Exhaustion builds, but the nervous system remains too revved up to rest.
9. In severe cases, the baby may have seizures—sudden, rhythmic jerking of the arms, legs, or face, staring spells, or stiffening of the whole body. — Opioid withdrawal disrupts the balance between excitatory neurotransmitters (like glutamate, which makes neurons fire) and inhibitory neurotransmitters (like GABA, which calms neurons down). Without opioid's dampening effect, excitatory signals can overwhelm the brain's ability to control them, leading to chaotic electrical activity—a seizure. Seizures are a medical emergency and a sign that withdrawal is severe and uncontrolled.
10. Without treatment, the baby can become severely dehydrated, malnourished, and exhausted. Growth and development stall. The family becomes stressed and overwhelmed, which can harm bonding and long-term outcomes. — The combination of poor feeding, vomiting, diarrhea, excessive sweating, and high metabolic demand (from trembling and crying) creates a negative energy and fluid balance. The baby loses weight and becomes dehydrated. Chronic stress on the developing brain and body, plus the emotional toll on caregivers, can have lasting effects. Early recognition and treatment—comfort care for mild cases, pharmacologic therapy (morphine or methadone taper) for moderate to severe cases—prevent these complications and give the baby the best chance for healthy growth and bonding.

Symptoms · what the patient feels, and why

- **High-pitched, hard-to-stop crying:** When opioids leave the baby's system after birth, the nerves that were calmed by the drug suddenly fire faster. The brain's arousal center (the locus coeruleus) releases too much norepinephrine, a messenger that revs up the nervous system, so the baby becomes jumpy and cries in a sharp, piercing way that's very hard to soothe.
- **Tremors or shaking:** Without the opioid blocking signals, the baby's motor nerves fire too often. Muscles get extra signals to tighten and relax, causing visible shakes in the hands, arms, or legs—even when the baby isn't upset.
- **Poor feeding or trouble latching:** The baby's mouth and throat muscles are jittery and uncoordinated. The sucking reflex is there, but the brain signals are too scattered to organize a smooth suck-swallow rhythm, so the baby takes less milk and loses or doesn't gain weight.
- **Trouble sleeping—wakes often, sleeps very little:** The baby's arousal system stays on high alert because norepinephrine and other stress messengers are flooding the brain. This keeps the baby in a light, restless state instead of the deep sleep newborns usually need.
- **Fast breathing (more than 60 breaths per minute) or stuffed-up nose:** The autonomic nervous system—the part that runs breathing, heart rate, and digestion on autopilot—is out of balance. Blood vessels in the nose swell, making it stuffy, and the breathing center in the brainstem fires faster than normal.
- **Sweating, sneezing, or yawning:** When opioids leave, the autonomic nervous system overshoots. Sweat glands turn on too much, the nose becomes extra sensitive and sneezes, and the brain's oxygen sensors trigger yawns—all signs the body is trying to reset but can't find its balance yet.
- **Loose, watery stools or vomiting:** Opioids slow down the gut. When they're gone, the intestines speed up too much, pushing food and water through before they're fully absorbed. This leads to runny poop and sometimes throwing up, which can dry the baby out (dehydration).
- **Skin breakdown on knees, toes, or nose from rubbing:** The baby is so restless and uncomfortable that they rub against the bed sheet or mattress over and over. Constant friction wears away the top layer of skin, leaving red, raw patches—especially on bony spots like knees and the bridge of the nose.
- **Seizures:** In severe withdrawal, the brain's excitatory signals (driven by glutamate, the main 'go' messenger) overwhelm the calming signals (from GABA, the main 'brake' messenger). This electrical storm can cause a seizure—rhythmic jerking, staring, or stiffness. Seizures are rare but mean the withdrawal is dangerously intense.

- **Fever without infection:** The hypothalamus, the brain's thermostat, resets higher because the autonomic nervous system is in overdrive. The baby's temperature climbs even though there's no germ causing it—a sign the body's stress response is maxed out.

Focused exam

- **Tremor or shaking in the baby's hands, arms, or legs:** The baby's nervous system got used to opioids before birth, which kept everything calm. Now that the drug is gone, the nerves fire too much and the muscles shake. Tremor tells you the baby's nervous system is overstimulated and in withdrawal.
- **High-pitched cry or constant, hard-to-comfort crying:** The baby's brainstem (the part that controls basic drives like crying and hunger) is irritable because the calming opioid is no longer there. This cry is not hunger or a dirty diaper — it is the nervous system stuck in overdrive.
- **Poor feeding, weak suck, or refusing the bottle or breast:** The muscles of the mouth and throat are not coordinating well because the nervous system is too excited. A baby who cannot eat will get dehydrated and lose dangerous amounts of weight fast.
- **Loose, watery stools (diarrhea) or vomiting:** Opioids normally slow down the gut. Without the opioid, the gut muscles fire too much and push everything through too fast. Losing fluids through diarrhea and vomiting is dangerous in a tiny newborn and can lead to dehydration quickly.
- **Sweating, nasal stuffiness, or frequent sneezing:** These are signs the autonomic nervous system (the system that runs things you do not think about, like sweating and breathing) is in overdrive. The body's automatic 'calm down' signal is gone, so everything is stuck in 'go' mode.
- **Very short or jumpy sleep, or muscle stiffness (the baby feels tight when you hold them):** The baby's brain cannot settle into normal sleep because the nervous system is too excited. Stiff muscles mean the nerves are firing signals to tighten up instead of relax. Without rest, the baby cannot heal or grow well.
- **Seizure (a fit with shaking or jerking the baby cannot control):** A seizure means the nervous system overactivity has reached a dangerous level and the brain's electrical signals are misfiring wildly. This is the most serious sign of NAS and needs medicine right away to prevent brain injury.

Diagnostics · every test answers a question

- **Maternal history (interview and chart review for opioid use or medication-assisted treatment during pregnancy) → Did the mother take opioids (pills, heroin, or prescribed methadone or buprenorphine) while pregnant?** This tells you if the baby was exposed.

- Maternal urine drug screen (UDS) → Are opioids or their breakdown products present in the mother's urine at delivery?
- Infant urine or meconium (first stool) drug screen → Did opioids cross the placenta and enter the baby's body during pregnancy?
- Finnegan Neonatal Abstinence Scoring Tool or Eat-Sleep-Console (ESC) scale, measured every 3 to 4 hours → How severe is the baby's withdrawal right now? Does the baby need medicine or just comfort care?
- Serum glucose (blood sugar) → Is the baby's blood sugar too low because poor feeding is starving the brain?
- Basic metabolic panel (sodium, potassium, chloride, bicarbonate, BUN, creatinine) → Is the baby getting dehydrated from diarrhea and vomiting? Are the kidneys still working?

Treatment logic

- Ask the mother directly about opioid use (prescription pills, heroin, methadone, buprenorphine) during pregnancy and review her medical and pharmacy records → Confirms the root cause — opioid exposure — so you know what you are treating and can predict when withdrawal will start (usually 24-72 hours after birth for short-acting opioids, longer for methadone). This also guides testing and scoring.
- Use rooming-in (keep baby with mom), skin-to-skin contact, swaddling, low lights and noise, and breastfeeding (if mom is not using illicit drugs or is stable on buprenorphine or methadone) to calm the nervous system → Lowers the baby's stress signals and overstimulation, which quiets the shaking, crying, and poor sleep because the baby's body feels safer and more regulated. These non-drug measures can prevent mild NAS from needing medicine at all.
- Score withdrawal severity using the Finnegan Neonatal Abstinence Scoring Tool or Eat-Sleep-Console (ESC) scale every 3 to 4 hours to decide if medicine is needed → Gives you an objective, number-based measure of how bad the withdrawal is, so you know whether the baby's body can handle it with comfort care alone or truly needs drug treatment. This prevents both over-treating mild cases and under-treating dangerous ones.
- Give morphine solution (0.02-0.1 mg/kg every 3-4 hours) or methadone (0.05-0.1 mg/kg every 12-24 hours) by mouth if Finnegan score is ≥ 8 twice or ≥ 12 once, or if ESC fails; start low and increase slowly until symptoms improve → Replaces the opioid the baby's nervous system depended on before birth, which stops the cascade of shaking, sweating, poor feeding, diarrhea, and seizures by calming the overstimulated nerves and bringing the brain back into balance.

- Taper the opioid medicine slowly over days to weeks (usually reduce dose by 10-20% per day) while watching the baby's score for return of symptoms; do not stop suddenly → Lets the baby's brain and nervous system gradually re-learn to work without the opioid on board, so withdrawal does not roar back when you stop the medicine. A slow taper prevents the baby from crashing back into severe symptoms.
- Add phenobarbital (loading dose 15-20 mg/kg, then 5 mg/kg per day) if opioid medicine alone does not control severe symptoms or if seizures occur → Phenobarbital boosts GABA (the brain's main calming signal), which helps settle the nervous system when morphine or methadone is not enough. It also stops seizures by quieting the brain's electrical misfiring.
- Connect the mother to addiction treatment (medication-assisted therapy with buprenorphine or methadone, counseling, and social support) and refer the baby to early intervention services for developmental monitoring → Stops the cycle upstream — treating the mother's addiction prevents future babies from being exposed, and early help for the baby catches speech, motor, or behavior delays early so they can be fixed. Long-term follow-up gives the baby the best chance to catch up and develop normally.

Medications

Morphine (oral solution) · Opioid agonist

Morphine is a medicine that gently fills the same brain lock that the mother's opioid used to fill, so the baby's body doesn't scream for it all at once. It quiets the withdrawal storm by keeping the mu-opioid receptors (the brain's opioid docking sites) busy enough to calm cravings and shaking, then the dose is slowly lowered day by day so the baby can learn to live without it.

1. Morphine locks onto mu-opioid receptors throughout the brain and body, filling the same spots that the mother's opioid (like heroin, oxycodone, or methadone) used to occupy during pregnancy.
2. This quiets the locus coeruleus, which normally fires wildly during withdrawal and causes tremors, high heart rate, sweating, and irritability.
3. In the gut, morphine slows down the bowel just enough to stop explosive watery stools and ease cramping.
4. The dose is slowly tapered (reduced step by step) over 5 to 10 days or longer, letting the baby's own endorphin system (natural calming chemicals) wake back up without shock.
5. Eventually the baby's brain relearns how to regulate itself without needing an outside opioid.

SAFETY WATCH

Watch breathing closely, especially in the first few days — too much morphine can slow the baby's breathing dangerously. · Monitor for sedation (baby too sleepy to wake for feeds) and make sure weight gain stays on track. · Taper slowly and never stop suddenly, or withdrawal symptoms will roar back. · Use the exact dose the team prescribes — small babies need tiny, precise amounts measured with an oral syringe. · Watch for constipation; morphine slows the gut, so stools may get hard or infrequent even after diarrhea stops.

Methadone (oral solution) · Long-acting opioid agonist

Methadone works just like morphine — it fills the brain's opioid locks — but it stays in the body much longer (12 to 24 hours instead of 4), so the baby gets a steadier, smoother ride with less up-and-down. This makes tapering gentler and can mean fewer doses each day.

1. Methadone binds to mu-opioid receptors, just like morphine, calming withdrawal symptoms like tremors, crying, sweating, and fast breathing.
2. Because it lasts longer in the body, the baby's blood level stays steadier, so there are fewer peaks and valleys that can trigger breakthrough symptoms.
3. The team gives it once or twice a day instead of every 3 to 4 hours, which can be easier for feeding and sleep.
4. The dose is slowly lowered over days to weeks, letting the baby's brain adjust without shock.
5. Eventually the baby is weaned off completely and the brain's natural endorphin system takes over.

SAFETY WATCH

Watch for over-sedation (baby too sleepy, floppy, or hard to wake) — methadone builds up in the body, so the team will check levels carefully. · Monitor breathing and heart rate; too much methadone can slow both dangerously. · Taper very slowly because methadone stays in the system a long time; stopping too fast can cause rebound withdrawal. · Watch for long QT interval on the baby's ECG (a heart rhythm risk) if the baby is on higher doses or has other risk factors. · Constipation is common; stools may need gentle help (glycerin suppository, extra fluids for mom if breastfeeding).

Buprenorphine (sublingual solution, off-label) · Partial opioid agonist

Buprenorphine is a partial opioid agonist, which means it fills the brain's opioid locks only partway — enough to quiet withdrawal but with a built-in ceiling so it's harder to over-sedate

the baby. It holds on tight to the receptor and stays there a long time, giving steady relief with less risk of dangerous breathing slowdown.

1. Buprenorphine binds very tightly to mu-opioid receptors but only turns them on partway, so the baby gets enough relief from tremors, crying, and sweating without the full sedation risk of morphine or methadone.
2. Because it sticks to the receptor so firmly, other opioids can't easily kick it off, which gives stable, long-lasting coverage (up to 24 hours).
3. It blocks kappa-opioid receptors, which may reduce some of the dysphoria (bad mood, restlessness) that babies feel during withdrawal.
4. The ceiling effect means that even if the dose is too high, the baby is less likely to stop breathing compared to full opioid agonists.
5. The dose is tapered over days to weeks, letting the baby's brain adjust gently.

SAFETY WATCH

Use only the liquid formulation prepared for babies (the adult film has naloxone and is NOT safe for newborns). · Watch for sedation, though it's less common than with morphine or methadone. · Monitor breathing and heart rate, especially in the first few doses. · Taper slowly; even though buprenorphine is partial, sudden stops can trigger rebound symptoms. · Limited published data in newborns compared to morphine and methadone, so it's often reserved for cases where first-line agents don't work or aren't available.

Clonidine (oral) · Alpha-2 adrenergic agonist

Clonidine is NOT an opioid. It calms the sympathetic nervous system (the body's fight-or-flight alarm) by turning on alpha-2 receptors in the brainstem, which quiets the storm of tremors, sweating, fast heart rate, and high blood pressure that withdrawal triggers. It's usually added to an opioid medicine when withdrawal is severe and the opioid alone isn't enough.

1. During opioid withdrawal, the locus coeruleus fires wildly, dumping norepinephrine (the body's main alarm chemical) everywhere. This causes tremors, sweating, fast heart rate, high blood pressure, and extreme irritability.
2. Clonidine turns on alpha-2 receptors in the locus coeruleus, which puts the brakes on norepinephrine release and quiets the alarm.
3. Heart rate slows, blood pressure drops back to normal, tremors ease, and the baby is less jittery and more able to rest.
4. Clonidine does NOT fix the opioid receptor problem, so it's used alongside morphine, methadone, or buprenorphine, not instead of them.
5. It's usually tapered and stopped once the opioid taper is nearly done.

SAFETY WATCH

Watch blood pressure and heart rate closely — clonidine can drop both too low, making the baby pale, floppy, or slow to respond. · Never stop clonidine suddenly; rebound high blood pressure and fast heart rate can happen if it's pulled away too fast. · Watch for over-sedation, especially if the baby is also on morphine or methadone. · Use only when an opioid alone isn't controlling symptoms, not as a first-line single agent. · Monitor feeding and weight gain; very sedated babies may not wake well for feeds.

Phenobarbital (oral or IV, second-line or adjunct) · Barbiturate, GABA-A receptor agonist

Phenobarbital is an older sedative that boosts GABA (the brain's main calming signal) and is sometimes added when opioid medicines alone don't control severe tremors, seizures, or extreme irritability. It does NOT treat opioid withdrawal directly, but it can quiet the brain's overall excitability.

1. Phenobarbital opens GABA-A receptor channels longer and more often, letting chloride ions flood into nerve cells and making them much harder to fire.
2. This widespread calming effect can reduce severe tremors, muscle tension, and irritability that don't respond to opioids alone.
3. If a baby has a seizure (rare, but possible in severe withdrawal), phenobarbital raises the seizure threshold and stops abnormal electrical bursts.
4. It does NOT fix the opioid receptor problem, so it's usually used alongside morphine or methadone, not instead of them.
5. Phenobarbital must be tapered slowly over weeks because stopping it suddenly can trigger rebound seizures.

SAFETY WATCH

Watch for heavy sedation — babies can become too sleepy to feed well, which risks poor weight gain and dehydration. · Monitor breathing closely; too much phenobarbital can slow or stop breathing, especially in tiny or premature babies. · Never stop suddenly; taper very slowly (over weeks) to avoid withdrawal seizures. · Blood levels can be checked to make sure the dose is in a safe range. · Phenobarbital is now used less often than in the past because opioid agonists (morphine, methadone) work better for opioid withdrawal, and phenobarbital can cloud the baby's alertness for a long time.

Red flags

- Seizures—rhythmic jerking, blank staring, or whole-body stiffness that won't stop

- Weight loss more than 10% of birth weight or baby refusing to eat at all
- Very fast breathing (over 80 breaths per minute) or grunting with each breath
- Severe dehydration—dry mouth, no tears, no wet diaper for 8 hours or longer
- Fever above 100.4°F (38°C) with no clear infection

Nursing priorities

1. Score withdrawal symptoms using Finnegan or ESC scale every 3-4 hours and document trends — Objective scoring detects worsening withdrawal before crisis happens; serial scores guide when to start or adjust morphine or methadone dosing per protocol
2. Keep baby in room with mother (rooming-in) and encourage skin-to-skin contact at least 2 hours daily — Maternal contact stabilizes the autonomic nervous system (automatic body controls like heart rate and breathing) and decreases stress hormone release, reducing withdrawal severity by 30-50% in studies
3. Swaddle tightly, dim lights, reduce noise, and cluster care to minimize handling — Overstimulation (too much light, sound, or touch) worsens CNS hyperexcitability (overactive nervous system), increasing tremors, irritability, and high-pitched cry; calm environment lowers scores
4. Support breastfeeding every 2-3 hours if mother is on stable medication-assisted treatment or opioid-free — Breast milk contains small amounts of methadone or buprenorphine that ease withdrawal gradually; frequent feeds also provide comfort and bonding that calms hyperarousal (overly alert, anxious state)
5. Monitor weight daily and track feeding volume to detect poor intake or excessive weight loss — Withdrawal increases metabolic rate (energy burning) and causes uncoordinated suck-swallow; weight loss over 10% of birth weight signals need for pharmacologic intervention or feeding support
6. Give morphine or methadone exactly as ordered and never skip or delay doses once treatment starts — Opioid replacement prevents rebound hyperactivity (sudden return of severe symptoms) and seizures; inconsistent dosing causes erratic drug levels that worsen withdrawal and prolong hospitalization
7. Watch for seizures, respiratory rate below 40 or above 60, temperature instability, or vomiting and diarrhea causing dehydration — Seizures from withdrawal damage developing brain; fast breathing (tachypnea) (fast breathing) and fever increase calorie needs; loose stools and vomiting cause electrolyte loss (salt imbalance) and hypovolemia (low fluid volume)

8. Coordinate with social work for discharge planning, pediatrician follow-up, and safe home environment assessment — Infants often need outpatient weaning (slow medicine reduction) over weeks; ensuring safe follow-up prevents readmission and supports maternal recovery while protecting infant welfare

Sources

- AAP Clinical Report on Neonatal Abstinence Syndrome (2020)
- ACOG Committee Opinion No. 711: Opioid Use and Opioid Use Disorder in Pregnancy
- Cochrane Review: Opioid Treatment for Neonatal Abstinence Syndrome
- CDC: Treating Opioid Use Disorder During Pregnancy

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