

Fairview Health System

Guideline

# Neonatal Abstinence Syndrome

**Purpose:**

To effectively assess and manage newborns at risk of experiencing withdrawal from maternal substance use.

**Scope:**

NICU, newborn nurseries, and pediatric units.

**Guideline:**

- I. Required monitoring:
  - A. Newborns with withdrawal risk of shorter-acting drugs or agents should be considered for inpatient monitoring for at least 72 hours and discharged with a monitoring plan in place with the outpatient provider.

These shorter-acting substances may include: Codeine, hydrocodone, oxycodone, fentanyl, morphine, heroin, non-opioid substances such as cocaine, methamphetamine, tramadol, benzodiazepines, and others.
  - B. Newborn with withdrawal risk of longer acting drugs or agents may require in-patient monitoring for up to 7 days.

These longer acting substances may include methadone, buprenorphine, others as determined by provider.
  - C. Other drug or substance use may necessitate monitoring of newborn and may be determined by provider.

Examples include ADHD drugs, alcohol, and SSRIs.
- II. Consider consultation with Neonatology if:
  - A. Pharmacologic therapy is being considered.
  - B. Monitoring is indicated for greater than 72 hours.
  - C. Non-pharmacologic interventions are not alleviating symptoms AND scores are indicating medications may be necessary, as clarified by Finnegan Neonatal Abstinence Syndrome Tool procedure below.

**Procedure & General Considerations:**

See also (at the end of this procedure): [Appendix A: Pharmacologic Treatment](#), [Appendix B: Neonatal Abstinence Syndrome: When and How to Assess](#)

- I. Prenatal Screening and Assessment:
  - A. Women expected to deliver and are in labor are screened for prenatal substance use, including an appropriate history and, when appropriate, receive a urine drug test per Fairview System Policy [Substance Abuse: Testing & Reporting of Maternal and/or Newborn/Infant Exposure](#). Positive toxicology results will be reported to local social service agencies per policy.
- II. Neonatal toxicology testing and assessment: See [Substance Exposure: Screening, Testing, & Reporting for Mother and/or Newborn/Infants](#) for newborn testing indication
- III. Neonatal Withdrawal Screening
  - A. Finnegan Neonatal Abstinence Score Tool:

1. The Finnegan is the standardized scoring tool utilized at Fairview and is located in the Epic doc flow sheets (NICU PCS and Newborn PCS)
  2. Initiate scoring
    - a. For newborns who have *known* exposures (maternal use of prescription medications, positive maternal test, known maternal illicit drug use) begin scoring within 2-4 hours of birth
    - b. For newborns that tested positive, initiate scoring at the time the positive result is received.
    - c. On any baby at nurse or provider discretion based on [clinical signs](#) of withdrawal
  3. Ongoing scores to be completed every 3-4 hours with feeding.
  4. Adjust scoring intervals as indicated:
    - a. Increase to every 2 hour if score is equal to or greater than 8 (scoring to coincide with feeding. Do not wake newborn in order to score)
    - b. Resume every 3-4 hours when scores are less than 8 for 24 hours, as long as pharmacologic therapy is not being utilized
    - c. For newborns requiring pharmacotherapy, continue scoring every 3-4 hours with feeding throughout treatment and for up to 4-7 days following discontinuation, if able
  4. Notify provider if three scores are greater than 8 or two are greater than 12 for consideration of Neonatology consultation, possible NICU transfer, and/or pharmacologic treatment
  5. Providers must consider other diagnoses that may mimic neonatal withdrawal including, but not limited to: infection, sepsis, hypoxic ischemic encephalopathy, and hypoglycemia
  6. If no pharmacologic therapy is indicated, discontinue scoring at 72 hours or when scores are consistently less than or equal to 5, whichever is later
- IV. Management of Newborn Withdrawal:
- A. Non-pharmacologic treatment
    1. Initiate on ALL newborns being assessed and at risk for NAS
      - a. Dark/quiet environment
      - b. Frequent, small feedings
      - c. Swaddling
      - d. Cluster cares
      - e. Frequent diaper changes
      - f. Cover hands
      - g. Non-nutritive sucking
      - h. Swaying or rocking
    2. Consider OT/PT consult to teach family and care-givers infant massage and other calming techniques
  - B. Pharmacologic Treatment specific for NICU: See [Appendix A](#)
- V. Breastmilk and Breast Feeding, in the hospital
- A. The newborn will not be fed the mother's breastmilk in the hospital if any of the following conditions are met:
    1. Mother's toxicology testing is positive within 30 days prior to birth for the below substances
    2. Newborn's toxicology testing is positive for any-substances listed below
      - a. Non-prescribed opioids
      - b. Cocaine
      - c. Amphetamines
      - d. PCP

- e. alcoholism or frequent binge drinking
  - f. non-prescribed benzodiazepines or barbiturates
- B. Maternal breastmilk from mother's with THC will be considered on an individualized basis with consultation with medical team
- C. Mothers in Medication Assisted Therapy with prescribed opioid replacement will be encouraged to breastfeed and provide expressed breastmilk

**Entity Adoption includes, but is not limited to:**

Fairview Lakes Medical Center  
Fairview Maple Grove Ambulatory Surgery Center  
Fairview Northland Medical Center  
Fairview Range Medical Center  
Fairview Ridges Hospital  
Fairview Southdale Hospital  
University of Minnesota Medical Center

**Policy Owner:**

Fairview System NICU APNLs and Fairview Perinatal Policy Group

**Approved By:**

Perinatal System Operations Leadership, January 10, 2013; July 21, 2016; March 16, 2017

**Date(s):**

**Date Approved:** January 10, 2013

**Date Effective:** January 15, 2013

**Date Revised:** July 21, 2016; March 16, 2017

**Date Reviewed:** July 21, 2016

**Related Information**

**External Reference:**

[www.pediatrics.org/cgi/doi/10.1542/peds.2011-3212](http://www.pediatrics.org/cgi/doi/10.1542/peds.2011-3212), doi:10.1542/peds.2011-3212 PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Hudak, M.L., Tan, R.C. (2012). Neonatal Drug Withdrawal. *Pediatrics* 129, e40.

D'Apolito, K. (2014). Assessing neonates for neonatal abstinence: Are you reliable? *Journal of Perinatal & Neonatal Nursing*. 28(3), p. 220-231. doi: 10.1097/JPN.0000000000000056.

D'Apolito, K & Finnegan, L. (2010). Assessing the signs & symptoms of neonatal abstinence: Using the finnegan scoring tool. An inter-observer reliability program. (2nd Ed.) *Neo Advances*.

Newnam, KM. (2014). The right tool at the right time: Examining the evidence surrounding measurement of neonatal abstinence syndrome. *Advances in Neonatal Care*, 14(3), 181-186. DOI: 10.1097/ANC.0000000000000095

Western Australian Centre for Evidence Based Nursing & Midwifery. (2007). *Neonatal Abstinence Scoring System*.

[Hudak, M.L., Tan, R.C., The Committee on Drugs, & The Committee on Fetus and Newborn. \(2012\). Neonatal Drug Withdrawal. American Academy of Pediatrics, 129, e540.](#)

**Internal Reference:**

[Substance Abuse: Testing & Reporting of Maternal and/or Newborn/Infant Exposure](#)

[http://intranet.fairview.org/Policies/Category/PatientCareClinicalGuidelines/ClinicalGuidelines/Perinatal/S\\_045949](http://intranet.fairview.org/Policies/Category/PatientCareClinicalGuidelines/ClinicalGuidelines/Perinatal/S_045949)

**Appendix A: Pharmacologic Treatment**

- I. If pharmacologic treatment with titration is required, cardiopulmonary monitoring should be considered (for example, pulse oximetry, ECG monitoring).
- II. Initial Medication / Dose:
  - A. Morphine:
    1. Initiate 0.05 mg/kg/dose PO solution every 6 hours
    2. In addition, 0.05mg/kg/dose PO solution every 3 hour PRN for scores  $\geq 8$
    3. Round dose to nearest 0.1mg – 0.1mg, 0.2mg, 0.3mg, 0.4mg, etc.
    4. Dose adjustments determined by daily provider assessment of NAS score trends and PRN use. See algorithm for suggested morphine dose adjustments
  - B. To Titrate up Morphine Dose:
    1. Shorten interval to q4h
    2. Increase dose (Scheduled / PRN) to ~ 0.08 mg/kg/dose
    3. Increase dose (Scheduled / PRN) to ~0.1-0.12 mg/kg/dose
- III. Alternative / Adjunct Medications:
  - A. Methadone: Consider for patients with uncontrolled symptoms after several morphine dose increases
    1. Initiate 0.05 mg/kg/dose PO solution every 6 hours (Round to increments of 0.05mg / 0.05mL)
    2. Continue PRN morphine at most recent dose for scores  $\geq 8$
    3. Titration up: 0.05 mg/kg/dose increments, every 72 hours
  - B. Clonidine: Consider for patients on higher morphine or methadone doses with uncontrolled symptoms
    1. Initiate 0.5-1 mcg/kg/dose PO solution every 6 hours
    2. Dose/frequency may be titrated up to max of 1 mcg/kg PO q3 hours
    3. Requires dilute oral solution – 5 mcg/mL, made by compounding pharmacy
- IV. Tapering Medication Off:
  - A. Morphine / Methadone
    1. Initiate taper when symptoms controlled for 24-48 hours (longer if patient required multiple titrations)
    2. Decrease by ~0.05 mg/kg/dose every 24-48 hours until doses reaches ~0.05 mg/kg or min dose 0.1 mg
    3. Lengthen interval stepwise every 24-48 hours (q6h to q8h to q12h to q24h to discontinuation)
    4. Patients with difficult to control symptoms may require longer (3-5 days) at each taper step
  - B. Clonidine (Patient should be tolerating opioid taper before trying to taper clonidine)

1. Lengthen interval to q6h (stepwise if on q3h)
  2. Decrease by ~0.025 mcg/kg/dose every 24-48h until dose reaches 0.05 mcg/kg or min dose of 1 mcg
  3. Lengthen interval stepwise (q6h to q8h to q12h to discontinuation)
- C. Consider alternating clonidine wean with opioid wean to avoid too many changes at once

## Appendix B: Neonatal Abstinence Syndrome: When and How to Assess

### I. Neonatal Abstinence Syndrome

- A. NAS is a complex disorder noted in infants who are exposed to addictive substances in utero. Signs of withdrawal may or may not require pharmacotherapy
- B. Onset of withdrawal symptoms is usually 2-3 days
- C. Opioid receptors are concentrated in the CNS and GI tract. This causes the prominent symptoms of withdrawal to be concentrated to these body systems.
- D. Term infants will show symptoms of NAS earlier and more severe compared to preterm infants
- E. The timing, duration, severity, and long term effects of NAS will vary based on the substance exposed to the infant

### II. Iatrogenic Withdrawal

- A. New discussions are emerging on the difference between intrauterine exposure (NAS) and acquired, or iatrogenic, withdrawal through direct exposure to narcotics
- B. The Finnegan Scoring Tool focuses on infants with in-utero substance exposure.
- C. The Withdrawal Assessment Tool - Version 1 (WAT-1) has been created for infants and children who experience direct, prolonged exposure to narcotics in the hospital setting. This tool is available in NICU/Newborn PCS flowsheets.

### III. When to Assess

- A. Assessment of NAS with the Finnegan Scoring Tool can begin as early as 2 hours of life
- B. Repeat assessments should be every 3-4 hours
- C. Additional assessments should be completed if an increase in scoring is noted and medication may be indicated
- D. Scores should be followed for a minimum of 72 hours
- E. Infant should be assessed during and after feeding as many signs of hunger can appear similar to withdrawal symptoms

### IV. How to Score

#### A. Excoriation

1. Any reddened or broken skin due to excessive rubbing.
2. Sites of excoriation typically include: nose, chin, cheeks, elbow, toes, or knees.
3. A diaper rash or breakdown related to loose stools or redness in areas other than those listed does not qualify
4. Score 1 = Skin is reddened (not in diaper area), may or may not include breakdown

#### B. Muscle Tone

1. Tone can be assessed two ways:
  - a. The recoil phenomenon: when a muscle is stretched and released, it should spring back to the original position
  - b. The ability of a muscle to resist movement
2. Pull to Sit test:
  - a. Place the infant supine, grasp the hands and slowly pull the infant to a sitting position

- b. As the body is pulled upward, a normal newborn will attempt to raise his or her head in line with the body. Some head lag during the test is normal.
3. Score 2 = Increased muscle tone when the body remains stiff and minimal head lag is assessed

C. Myoclonic Jerks

1. Random, non-repetitive contractions of muscles in extremities, face or trunk (more conspicuous than tremors)
2. Score 3 = if any of these are present

D. Generalized Convulsions

1. Commonly called tonic seizures, convulsions may also include activity involving stiff extensions of all limbs. Sustained symmetric posturing of limbs or neck, may be flexor or extensor, not suppressed by containment-may be apneic.
2. Subtle signs of seizures are not typically seen in infant with NAS, but should be scored here if are seen. Signs can include eye twitching, rowing or bicycling motions, fist clenching, or arching.
3. Score 5 = any convulsion or seizure activity noted

E. Cry

1. A healthy newborn can utilize self-consoling methods and eliminate crying in about 15 seconds
2. Crying that is continuous or intermittent despite self-soothing measures or caregiver intervention qualifies for an elevated score
3. Tone and pitch of cry may vary infant to infant; the presence of a high pitched cry alone does not qualify
4. Score of 2 = inconsolable greater than 15 seconds OR intermittently crying for less than 5 minutes
5. Score of 3 = inconsolable for greater than 15 seconds AND intermittently for greater than 5 min

F. Sleep

A. Score the infant's longest continual period of sleep since last feeding

B. Scores:

- a. 0 = Sleeps more than 3 hours after feeding
- b. 1 = Sleeps 2-3 hours after feeding
- c. 2 = Sleeps 1-2 hours after feeding
- d. 3 = Sleeps less than 1 hour after feeding

G. Moro Reflex

1. Moro reflex, aka startle reflex, is a normal reflex in infants. It occurs when a sudden loud noise causes the infant to stretch out the arms and flex the legs.
2. Score when baby is not fussy as agitation may provide a false positive
3. How to test:
  - a. Place supine and cup infant's head in your hands
  - b. Raise head a couple inches off the mattress and then drop your hands
  - c. The Moro reflex is scored for mild or pronounced jerking or jitteriness following the initial reflex response
4. Score 2 = A hyperactive Moro reflex (arms stay up 3-4 seconds with or without tremors)
5. Score 3 = A markedly hyperactive reflex (arms stay up more than 4 seconds with or

without tremors)

#### H. Tremors

1. Tremors are also known as “jitters”. Tremors are involuntary movements or quivers that are rhythmic (it is normal in newborn babies to have a few jerking movements in extremities when asleep)
2. Mild Tremors = Hands or feet only and lasts up to 3 seconds
  - a. Score 1 = Mild tremors noted as the infant is being disturbed
  - b. Score 3 = Mild tremors noted when the infant is not disturbed
3. Moderate to Severe Tremors = Includes arms or legs, lasts more than 3 seconds
  - a. Score 2 = Moderate/Severe tremors when is being disturbed
  - b. Score 4 = Moderate/Severe tremors when infant is not disturbed

#### I. Sweating

1. Score 1 = Wetness noted on the forehead, upper lip, or back of the neck
2. Sweating in other areas (i.e. the chest) is most likely related to environmental factors, not withdrawal, and does not qualify
  - a. Remove excess clothing or blankets and consider retaking the temperature after 5 minutes to determine if an elevated temperature is environmental or related to withdrawal
  - b. Consider consistent apparel to minimize the risk for environmentally overheating

#### J. Yawning

1. Score 1= An infant has 4 or more yawns noted in the 3-4 hour scoring period
2. Includes any 4 yawns in the scoring interval, they do not need to be noted consecutively

#### K. Mottling

1. A marbled discoloration of the skin, typically seen on the trunk, arms, or legs
2. Score 1 = Mottling is present

#### L. Nasal Stuffiness

1. Noisy respirations related to a partially blocked airway, typically related to secretions. May or may not be associated with a runny nose.
2. Score 1 = Stuffiness is present

#### M. Sneezing

1. Score 1 = an infant sneezes 4 or more times in the 3-4 hour scoring period
2. Includes any 4 sneezes, they do not need to be noted consecutively

#### N. Nasal Flaring

1. Score 2 = an outward spreading of the nostrils during breathing, not related to respiratory disease

#### O. Fever

1. Score 1 = axillary temperature 100-100.9 degrees F
2. Score 2 = axillary temperature greater than 101 degrees F
3. Ensure that any increase in temperature is not related to the environment. Efforts to maintain consistent clothing and caution to not overdress or over-bundle the infant will ensure stable temperatures.

#### P. Respiratory Rate

1. Tachypnea related to any type of respiratory disease does not qualify
2. Infants experiencing withdrawal can have an overstimulation of the respiratory center in the brain leading to tachypnea (count respirations for a full minute)

- a. Score 1 = If rate is greater than 60
- b. Score 2 = If rate is greater than 60 *and* associated with retractions

Q. Feeding

- 1. Excessive Sucking
  - a. Score 1 = Frantic sucking of fists, hands or pacifier (not related to hunger)
- 2. Poor Feeding
  - a. A score of 3 is given for any of the following:
    - i. Excessive sucking noted prior to feeding
    - ii. Small volumes taken despite excessive sucking
    - iii. Uncoordinated sucking reflex
    - iv. Continuous gulping while eating or stops frequently to breathe
    - v. Inability to latch
    - vi. Feeding lasts over 20 minutes
  - b. Premature infants who require gavage due to poor feeding skills related to their gestational age should not be scored in this category (Score = 0)

R. Regurgitation

- 1. Emesis not associated with burping
- 2. Score 2 = Includes 2 or more emesis during a feeding or regurgitating the whole feeding
- 3. Score 3 = one or more projectile emesis

S. Loose stools

- 1. Score 2 = Stool is at least half liquid and appears loose
- 2. Score 3 = Stool with a ring of water noted around it