

**Nationwide Children's Hospital
Enteral Morphine Protocol for
Neonatal Abstinence Syndrome (NAS)**

**Protocol should be initiated if an infant has 2 consecutive scores ≥ 8 or 1 scores ≥ 12
within a 24 hour period**

Concentration of Enteral Morphine to be used for ALL doses: 0.2 mg/ml

Starting Dose:

Enteral: 0.05 mg/kg/dose po q3hr

IV: 0.02 mg/kg/dose (IV morphine and enteral morphine doses are not equivalent)

Titration:

Enteral: Increase by **0.025-0.04 mg/kg every 3 hrs** until controlled (NAS < 8)

IV: increase by **0.01 mg/kg every 3 hrs** until controlled (NAS < 8)

***Rescue Dose*:** If infant has 1 score of ≥ 12 , double the previous dose given (enteral or IV) x 1 and then adjust accordingly:

- If NAS score now < 12: make the scheduled maintenance dose (MD) the same as the rescue dose that was just administered. The first higher MD should be given at the next scheduled care/feed.
- If NAS score still ≥ 12 : increase next dose by 50%. Continue to do so until score is < 12. Once < 12, then follow guideline listed above.

Wean: Once stabilized on a dose for 72-96 hours, use this dose as the starting point of the wean

Begin weaning the dose by 10% (of the original dose when the first wean was started) every 24-48 hours. Drug may be discontinued when a single dose is < 0.02 mg/kg/dose. Please see below for example.

***Ad lib infants*:** Given the shorter duration of action of enteral morphine, it is best suited to be dosed on a q3hr schedule. Infants should be allowed to ad lib feed volumes but kept on a q3hr schedule.

***Backslide*:** If infant's NAS scores become consistently elevated (ex: 2 consecutive ≥ 8) during the weaning process, assure that nonpharmacological measures are optimized (ie: swaddling, holding, decreased stimuli, etc) before going back to previous dose at which patient was stable. If infant's scores continue to be elevated (even after physical exam to ensure nothing else is wrong/bothering the infant), either weight adjust medication and/or continue to back up in a stepwise fashion until patient's scores are <8. Once stabilized on new dose for minimum 48 hrs, resume 10% wean but consider weaning at longer intervals.

Discharge: Observe in-house x 48-72 hours off of medication before discharge.

Example:

Infant X (wt: 3.2 kg) required 2 dose increases of his morphine to get his NAS scores consistently < 8. He has now been on the dose of 0.32 mg (0.1 mg/kg/dose) po q3hr for 72 hours. Team would like to begin weaning. As long as his scores remain consistently <8, please decrease by 10% every 24-48 hrs.

Day 1: 0.29 mg q3hr (0.09 mg/kg)

Day 2: 0.26 mg q3hr (0.08 mg/kg)

Day 3: 0.22 mg q3hr (0.07 mg/kg)

Day 4: 0.19 mg q3hr (0.06 mg/kg)

Day 5: 0.16 mg q3hr (0.05 mg/kg)

Day 6: 0.13 mg q3hr (0.04 mg/kg)

Day 7: 0.1 mg q3hr (0.03 mg/kg)

Day 8: 0.06 mg q3hr (0.02 mg/kg) x 24hr
and then stop

Monitor in-house for minimum of 48hrs prior to discharge.

Phenobarbital

Consider starting phenobarbital if **polysubstance exposure** (see below) is suspected/confirmed or if majority of NAS score is due to **CNS disturbances** (tremors, increased muscle tone, etc)

Loading dose: 10 mg/kg/dose po q12hr x 2 doses

- Enteral formulation contains a high percentage of alcohol. Recommend dividing dose to decrease risk of emesis and/or sedation.

Maintenance dose: 5 mg/kg/dose po once daily (do not weight adjust)

Wean: Recommend discharging infant home on phenobarbital with subsequent weaning to be done either in Neo Clinic or by infant's PCP.

- **Polysubstance exposure** in this case would be the use of one or more of the following drug classes in addition to an opiate: benzodiazepines, barbiturates, antipsychotics, antidepressants, other sedatives/hypnotics. Taking two different opiates (ie: Percocet and heroin) should not necessitate the need for the addition of phenobarbital.
- **Phenobarbital levels** should not be needed for this indication unless the infant experiences seizures or seizure-like activity. If suspected, a phenobarb level and/or a neurology consult may be warranted at that time.