

NOWS Toolkit: Pharmacologic Management

This information is being provided to help hospitals improve care to babies identified with Neonatal Opioid Withdrawal Syndrome (NOWS) formerly known as Neonatal Abstinence Syndrome (NAS). The information should be helpful in exploring various resources and best practices to develop practices best suited to your hospital and its patients. Nothing herein is meant to be legal advice or advice on a standard of care.

Using Pharmacologic Protocols for NOWS

Prior to considering pharmacologic interventions, non-pharmacologic interventions should first be implemented as these interventions may reduce the need for pharmacologic treatment.^{1,2} These interventions are further described in a different section of this toolkit. If started on pharmacotherapy, the use of pharmacotherapy protocols may reduce the length of treatment and hospital stay.³

Choice of Pharmacologic Agent:

There is currently no consensus as to the optimal pharmacologic agent to prescribe for infants with NOWS,⁴ however morphine is the most commonly used treatment followed by methadone.⁵ Morphine has a shorter half-life and requires more frequent dosing compared to methadone. Additionally, infants receiving methadone may have a shorter length of treatment and hospital stay.⁶

Choice of Weaning Protocol

As no randomized trials comparing different methods of starting, weaning, and discontinuing pharmacotherapy have been conducted, there is limited data on the optimal dosing at which to start, wean, and discontinue therapy which has resulted in significant practice variation (e.g. the starting dose for methadone ranges from 0.1 mg/kg/day to 0.2 mg/kg/day to 0.4 mg/kg/day). Below are suggested options for weaning of pharmacotherapy based on pharmacokinetic data and weaning protocols generated by other perinatal collaboratives.^{3,7}

Examples of Weaning Protocols from Other Institutions:

- UAB Methadone Weaning Calculator (requires Excel)
- [Northern New England PQC \(Yale, Boston Medical, Dartmouth\)](#)
- [Boston University](#)
- [Ohio Perinatal Quality Collaborative](#)

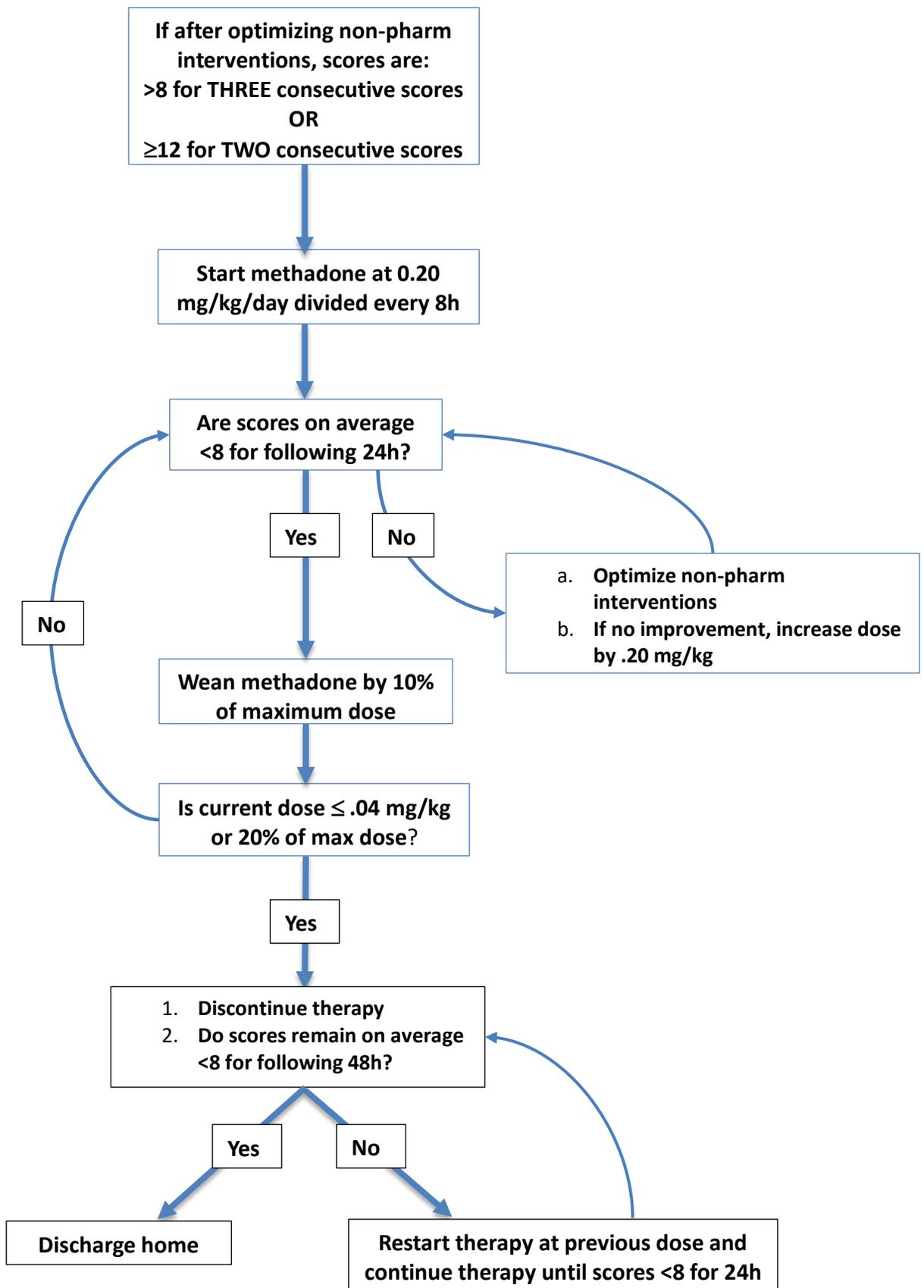
People to involve in this effort

Involvement of a hospital pharmacist and a member of information technology may help facilitate the integration of the following pharmacotherapeutic guidelines into clinical care.

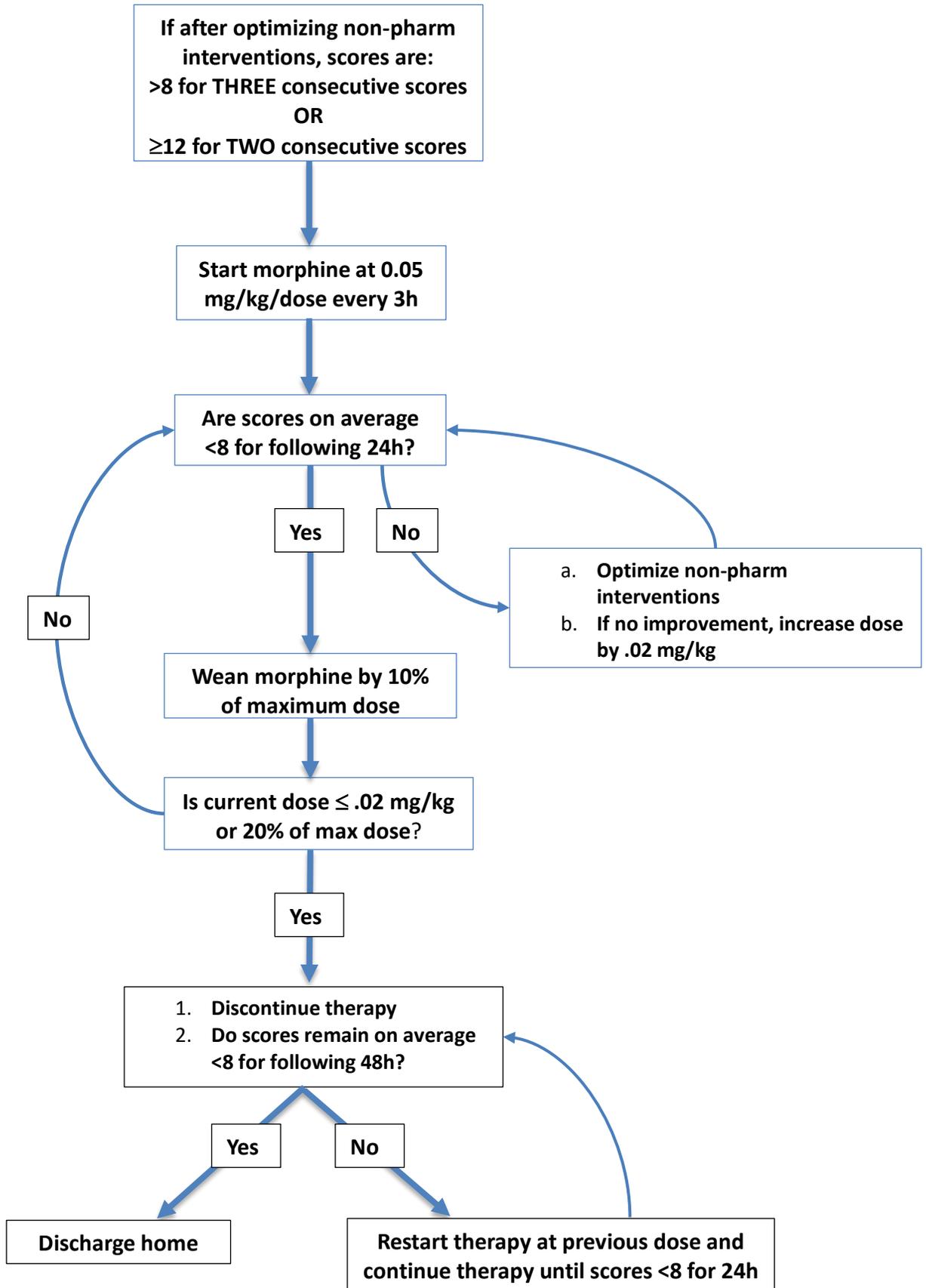
Stages of Pharmacologic Management:

- Initiation:** Prescribe either methadone or morphine if infants score:
 - >8 THREE consecutive times
 - ≥12 TWO consecutive times
 - If scores remain elevated, dosage may need to be further increased using protocol
- Weaning:** After initiation, wean medication every 24h as further described below
- Discontinuation and Observation:** Upon stopping therapy, monitor for 48h before discharge

Methadone Weaning Protocol



Morphine Weaning Protocol



Other Pharmacologic Considerations:

Consider adding phenobarbital as a secondary agent if any of the following:

- 1) on 0.8 mg/kg/day of methadone or 0.3 mg/kg/dose of morphine
- 2) has not weaned by day 7 of treatment
- 3) maternal polypharmacy

Dose: 20 mg/kg loading dose and 5 mg/kg/day maintenance dose weaning by 20% per week

References

1. Grossman MR, Berkwitt AK, Osborn RR, et al. An Initiative to Improve the Quality of Care of Infants With Neonatal Abstinence Syndrome. *Pediatrics*. 2017;139(6).
2. Grossman MR, Lipshaw MJ, Osborn RR, Berkwitt AK. A Novel Approach to Assessing Infants With Neonatal Abstinence Syndrome. *Hosp Pediatr*. 2018;8(1):1-6.
3. Walsh MC, Crowley M, Wexelblatt S, et al. Ohio Perinatal Quality Collaborative Improves Care of Neonatal Narcotic Abstinence Syndrome. *Pediatrics*. 2018;141(4).
4. Patrick SW, Kaplan HC, Passarella M, Davis MM, Lorch SA. Variation in treatment of neonatal abstinence syndrome in US children's hospitals, 2004-2011. *J Perinatol*. 2014;34(11):867-872.
5. Stover MW, Davis JM. Opioids in pregnancy and neonatal abstinence syndrome. *Semin Perinatol*. 2015;39(7):561-565.
6. Davis JM, Shenberger J, Terrin N, et al. Comparison of Safety and Efficacy of Methadone vs Morphine for Treatment of Neonatal Abstinence Syndrome: A Randomized Clinical Trial. *JAMA Pediatr*. 2018;172(8):741-748.
7. Wachman EM, Grossman M, Schiff DM, et al. Quality improvement initiative to improve inpatient outcomes for Neonatal Abstinence Syndrome. *J Perinatol*. 2018;38(8):1114-1122.