NEONATAL ABSTINENCE SYNDROME (NAS) CLINICAL PRACTICE GUIDELINES

TABLE OF CONTENTS

Revised: November 25, 2016

Please note that this guideline is for information purposes only. These recommendations reflect the information available as of the date it was issued/revised. Please use your own clinical judgment when applying any management strategies documented in this resource.

NEONATAL ABSTINENCE SYNDROME (NAS)
CLINICAL PRACTICE GUIDELINES

INTRODUCTION

The impact of drug addiction in a pregnant woman has profound effects, not only on her health and wellbeing, but also on that of her fetus and subsequent newborn baby. Neonatal Abstinence Syndrome (NAS) is a classification for the group of problems that occur in a newborn due to withdrawal from in utero exposure to drugs of addiction. Regular maternal drug use during the last two weeks preceding birth is a risk factor for NAS. Maternal substance use during pregnancy is an important risk factor for negative pregnancy and neonatal outcomes. The infant at risk for NAS is also at increased risk for preterm birth, low birth weight and intrauterine growth restriction. Substance use in pregnancy is a marker for social and environmental risks that contribute to mental, physical and developmental challenges for infants and children.

The focus of the NAS Clinical Practice Guidelines is primarily on NAS resulting from opioid use, and does not address the neonatal management resulting from exposure to selective serotonin reuptake inhibitors (SSRIs), benzodiazepines, barbiturates, ethanol, sedatives, and hypnotics. The Work Group's Recommendations, which have been approved by the Provincial Council for Maternal and Child Health (PCMCH), address the psychosocial and medical needs of opioid dependent women throughout their pregnancy, as well as the needs of the infants born to these women, specifically focusing on the antenatal, intrapartum, postpartum (in-hospital), and hospital discharge stages. The recommendations are evidence-based, and include a Level of Evidence rating that is based on the Quality of Evidence Assessment and the Classification of Recommendations, as defined by the Canadian Task Force on Preventive Health Care (definitions listed in the **Table 1** below).

The NAS Work Group ***(Appendix A, p. 17)*** also recognizes the importance of the preconception period in shaping the perinatal trajectory of women with opioid use disorders. Routine screening by primary health care providers of all women of childbearing age for use of licit and illicit substances, namely opioids, is recommended as part of the routine health history.[1] This can lead to early identification of women at risk for opioid use, and additionally can help normalize the conversation about this important and sensitive topic. Screening should be comprehensive and not restricted to opioid use only, since substance using women often consume more than one substance (polysubstance use). A positive self-report may indicate a risk for substance use disorder, and therefore further assessment using a validated screening tool and/or a more comprehensive evaluation by a specialist may be necessary.[1,2,3] Women who are identified to have an opioid use disorder should be educated about the risks that continued opioid use may have on their reproductive health, including pregnancy. Furthermore, contraception counseling should be a routine part of substance use treatment among women of reproductive age, in order to minimize the risk of unplanned pregnancy, especially whenever a woman changes from using illicit opioids to sustained-release opioid agonist preparations such as methadone or buprenorphine. In addition to direct education and counselling by care providers, broader public health strategies may need to be considered to raise public awareness about the impact of substance use on the pregnancy, fetus and newborn infant.

Table 1 – Levels of Evidence

Key to evidence statements and grading of recommendations, using the ranking of the Canadian Task Force on Preventive Health Care[4]

Quality of Evidence Assessment*		Classification of Recommendations**	
I	Evidence obtained from at least one properly randomized controlled trial	A.	There is good evidence to recommend the clinical preventive action
II-1	Evidence obtained from well-designed controlled trials without randomization	B.	There is fair evidence to recommend the clinical preventive action
II-2	Evidence obtained from well-designed cohort (prospective or retrospective) or cased-control studies, preferably from more than one centre or research group	C.	The existing evidence is conflicting and does not allow a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making
II-3	Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in this category	D.	There is fair evidence to recommend against the clinical preventive action
		E.	There is good evidence to recommend against the clinical preventive action
III	Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees	L.	There is sufficient evidence (in quality or quantity) to make a recommendation; however, other factors may influence decision making

* The quality of evidence reported in these guidelines has been adapted from the Evaluation of Evidence criteria described in the Canadian Task Force on Preventive Health Care.

** Recommendations included in these guidelines have been adapted from the Classification of Recommendations criteria described in the Canadian Task Force on Preventive Health Care.

GLOSSARY OF TERMS

GLOSSARY OF TERMS	
Abbreviations/ Terminology	**Definition**
Antenatal or prenatal	Period of time from conception until birth
BMT	Buprenorphine Maintenance Treatment
Buprenorphine (Subutex, Suboxone)	Long acting drug used to treat opioid addiction
CFSA	Child and Family Services Act
CPS	Child Protection Services
CPSO	College of Physicians and Surgeons of Ontario
Fetus	Unborn baby
Illicit substance	Substances and medications that are non-prescription and not obtained over-the-counter from a pharmacy, and are illegal for use
In utero	In the uterus before birth
Licit substance	Prescription and non-prescription substances that can be used legally
Methadone	Long acting drug used to treat opioid addiction
MMT	Methadone Maintenance Treatment
NAS	Neonatal Abstinence Syndrome
Neonate/ newborn infant	Birth to 28 day old infant
NICU	Neonatal Intensive Care Unit (Level 3)
Opioid or opiate	Type of drug used to relieve pain. These addictive drugs are also called narcotics. Examples include: morphine, codeine, fentanyl, oxycodone, heroin, and hydromorphone. Opiates are naturally occurring narcotics whereas opioids include synthetic narcotics.
PCMCH	Provincial Council for Maternal and Child Health
Polysubstance exposure	Exposure to more than one addictive drug or substance
Postpartum	The 6 week period following the birth of a baby
Preconception	Occurring prior to conception
SCN	Special Care Nursery (Level 2/2+)
SOGC	The Society of Obstetricians and Gynaecologists of Canada
SSRI	Selective serotonin reuptake inhibitor

SUMMARY OF CLINICAL PRACTICE RECOMMENDATIONS

SUMMARY OF RECOMMENDATIONS	
NAS Maternal Guidelines: Antenatal, Intrapartum and Postpartum Care	
1	Health care providers should routinely screen all pregnant women for use of opioids and other licit and illicit substances.
2	Every pregnant opioid using woman should be offered comprehensive care, including obstetrical care, addiction care, community care, and psychosocial counselling and support.
3	Every pregnant opioid using woman and her partner and family should receive written material explaining NAS, hospital stay expectations, the role of the parent, and resource contacts, in order to prepare and educate the opioid using woman and her support persons.
4	Methadone Maintenance Treatment (MMT) is the standard of care for the management of opioid use disorders in women during pregnancy.
5	Buprenorphine Maintenance Treatment (BMT) may be considered as an alternative to methadone for the management of opioid use disorders in women during pregnancy.
6	If methadone or buprenorphine are not available, other sustained-release preparations may be considered for the management of opioid use disorders in pregnancy.
7	Referral to Child Protection Services (CPS) should be considered on a case-by-case basis.
8	During labour and delivery, the pregnant woman should continue to take her daily dose of opioid agonist treatment to avoid withdrawal.
9	Additional pain management (i.e. analgesia) may be required for women on opioid agonist treatment.
10	Narcotic antagonists (e.g. Naloxone, Nubain) should be avoided as they are contraindicated for women with opioid use disorder.
11	Implement a partnership plan that focuses on all aspects of infant care, including feeding, handling, skin- to-skin care, rooming-in, and the frequency of follow-up visits after the mother is discharged, in order to enhance communication between care providers and parents, and to support the parents' involvement in the care of their infant.
NAS Neonatal Guidelines: Newborn Screening and Assessment	
12	Identification of infants with NAS should be based on the mother's antenatal history and the care provider's clinical assessment/ suspicion.
13	A Standardized NAS Scoring Tool is recommended to assess suspected or known cases of in utero opioid exposure: a) In cases of exposure to short-acting preparations of opioids, infants should be scored for a minimum of 72 hours. b) In cases of exposure to sustained-release preparations of opioids, infants should be observed for 120 hours, since onset of withdrawal may be delayed. *(Follow-up can occur in hospital for the first 72 hours, with close follow-up in the community for the next 48 hours. If close follow-up in the community is not possible, then the infant should remain in the hospital for the entirety of the observation period.)* c) Infants should be scored with each care interaction, typically every 2-4 hours.
14	Mother-baby dyad care, including rooming-in or care-by-parent, should be promoted.
NAS Neonatal Guidelines: Newborn Treatment • *Non-pharmacological interventions should be utilized for all infants with NAS.* • *Pharmacological interventions should be considered for the treatment of NAS when non-pharmacological measures fail to adequately ameliorate the signs of withdrawal.* ○ *Medication is indicated when 3 consecutive scores are ≥8 on the Standardized NAS Scoring Tool or when the average of 2 scores or the scores for 2 consecutive intervals is ≥12.*	

15	The baby's environment should be modified to reduce sensory stimulation, including limiting visitors, minimizing overhead lighting, and decreasing noise.
16	Soothing behaviours, positional support, swaddling, gentle handling, kangaroo care, and frequent, hypercaloric, smaller volume feedings are beneficial and should be considered in the treatment of newborns with NAS, both in the hospital and the home environment.
17	Breastfeeding should be recommended and supported in methadone/ buprenorphine-maintained mothers, assuming absence of absolute contraindications.
18	Preventive skin care should be initiated at birth to prevent excoriation.
19	Cardio-respiratory monitoring is recommended for all infants started on morphine and continued for 4 days and/or until the dose is reduced. Further monitoring should then be at the discretion of the physician in charge.
20	Morphine should be considered the first line pharmacological treatment of NAS when supportive measures fail to adequately ameliorate the signs of withdrawal.
21	Infants whose signs of withdrawal are difficult to control on morphine may require an additional medication such as clonidine or phenobarbital.
NAS Discharge Planning Guidelines	
22	A primary health care provider who is comfortable following a baby with NAS should be confirmed prior to discharge.
23	Discharging the infant home on morphine should only be undertaken if the clinical team is confident that the social risk is low, the infant is stable, there is a clear and comprehensive plan for weaning the infant, and a designated supervisor of that plan is identified, who will follow the infant with, at minimum, a weekly visit. Following consultation with the clinical team, the final decision to discharge an infant on pharmacological treatment is at the discretion of the physician.
24	Every baby exposed to opioid agonists and other substances should be offered ongoing developmental assessments by a clinical expert.

CLINICAL PRACTICE RECOMMENDATIONS

TABLE 2 – NAS MATERNAL GUIDELINES: ANTENATAL, INTRAPARTUM AND POSTPARTUM CARE				
	RECOMMENDATION	RATIONALE	QUALITY OF EVIDENCE & CLASSIFICATION OF RECOMMENDATIONS	IMPLEMENTATION CONSIDERATIONS
Antenatal				
1	Health care providers should routinely screen all pregnant women for use of opioids and other licit and illicit substances.	Pregnancy is a time when a woman is often highly motivated to make lifestyle changes, therefore assessment and counselling about substance use is important at a time when the woman may be planning to become pregnant and during pregnancy. Often substance using women consume more than one substance (polysubstance use), therefore screening should be comprehensive and include alcohol, tobacco, illicit drugs and prescription medications.	III B	Screening should follow the SOGC Substance Use in Pregnancy Clinical Practice Guidelines.[5] Based on the literature, there is no optimal screening tool for substance use. Screening can be performed by various health care providers (physicians, midwives, nurses), in numerous settings (e.g. addiction services, sexual health clinics, community treatment agencies). Health care providers need to develop their competence and comfort with questioning women and administering various screening tools, in order to create a safe environment for women to report substance use. **Resources:** a) www.sogc.org – SOGC Guidelines on Screening for Alcohol and Substance Use During Pregnancy b) www.who.int - World Health Organization Guidelines on Substance Use in Pregnancy c) http://en.beststart.org - Best Start Resource Centre (Health Nexus) materials are available to teach health care providers how to ask questions about substance use, including a video series about effective interviewing. d) www.ocfp.ca/docs - Antenatal Psychosocial Health Assessment Guide e) http://www.sbirtoregon.org f) https://www.porticonetwork.ca/home

TABLE 2 – NAS MATERNAL GUIDELINES: ANTENATAL, INTRAPARTUM AND POSTPARTUM CARE				
	RECOMMENDATION	**RATIONALE**	**QUALITY OF EVIDENCE & CLASSIFICATION OF RECOMMENDATIONS**	**IMPLEMENTATION CONSIDERATIONS**
2	Every pregnant opioid using woman should be offered comprehensive care, including obstetrical care, addiction care, community care, and psychosocial counselling and support.	Pregnant substance-using women have positive maternal and infant health outcomes when they receive comprehensive care, including antenatal and postnatal medical care, addiction counseling, and assistance with complex psychosocial needs.[6]	III B	A written care plan can help support continuity of care and collaboration, and can help eliminate gaps between different health care providers. An example is the Prenatal Specialized Care Plan produced by St. Joseph's Health Centre in Toronto ***(Appendix B, p. 18)***.
3	Every pregnant opioid using woman and her partner and family should receive written material explaining NAS, hospital stay expectations, the role of the parent, and resource contacts, in order to prepare and educate the opioid using woman and her support persons.	The overall goal is to establish a link between the parents and hospital staff, build a therapeutic relationship and reduce parental anxiety about newborn care. This trust may take time to develop so patience and understanding on behalf of the care providers is important. Also, the frequency of antenatal visits provide many opportunities for follow-up and support.	II-1 B	Urban hospitals may provide antenatal consultations with a pediatric care team. Many smaller hospitals do not have a formal pediatric team, however they can often provide hospital tours and written information. **Resources:** a) St. Joseph's Healthcare (Hamilton) Special Care Nursery booklet – "Neonatal Abstinence Syndrome: A guide for caregivers with a newborn withdrawing from drugs and medication" https://opqc.net/sites/bmidrupalpopqc.chmcres.cchmc.org/files/Resources/Neonatal%20Abstinence%20Syndrome/opqc_nas_parent_guide_092914.pdf
4	Methadone Maintenance Treatment (MMT) is the standard of care for the management of opioid use disorders in women during pregnancy.	MMT is associated with longer adherence to treatment, decreased risk of relapse to opioid use, and better perinatal outcomes.[7,8]	II-1 A	The CPSO established clinical standards and guidelines for methadone maintenance treatment (including initiation and dose adjustments) should be followed.[9] Dosing adjustments, such as higher and/or split dosing, may be necessary to account for increased metabolism and clearance in the third trimester. Methadone tapering is not recommended as it is not often possible due to high risk of maternal relapse to opioid use. Close communication between the woman's

TABLE 2 – NAS MATERNAL GUIDELINES: ANTENATAL, INTRAPARTUM AND POSTPARTUM CARE				
	RECOMMENDATION	**RATIONALE**	**QUALITY OF EVIDENCE & CLASSIFICATION OF RECOMMENDATIONS**	**IMPLEMENTATION CONSIDERATIONS**
				methadone prescriber, obstetrical care provider, and other health care providers should be established and maintained throughout pregnancy and the postpartum period.
5	Buprenorphine Maintenance Treatment (BMT) may be considered as an alternative to methadone for the management of opioid use disorders in women during pregnancy.	The MOTHER study reports that buprenorphine was found to be an acceptable alternative to methadone for the treatment of opioid use disorder during pregnancy.[10] In selecting a course of treatment, however, clinicians should take into account the possibility of reduced adherence and the ceiling effect of this medication as compared with methadone.[8]	II-2 B	There is insufficient evidence regarding the safe use of buprenorphine/ naloxone (Suboxone) combination product during pregnancy, therefore, pregnant women should be switched from the buprenorphine/ naloxone combination product to the buprenorphine monoproduct (Subutex) for the duration of pregnancy. Women on buprenorphine/ naloxone combination product should be maintained on this medication until buprenorphine becomes available. Care providers can follow the Buprenorphine/ Naloxone for Opioid Dependence: Clinical Practice Guideline for managing buprenorphine use in pregnancy.[11] Access to buprenorphine may be granted through Health Canada's Special Access Program.
6	If methadone or buprenorphine are not available, other sustained-release preparations may be considered for the management of opioid use disorders in pregnancy.	Some studies have shown that women maintained on single daily doses of morphine had acceptable outcomes, and withdrawal in newborn infants was not different compared to methadone.[12, 13]	III B	
7	Referral to Child Protection Services (CPS) should be considered on a case-by-case basis.	Encouraging the woman's voluntary collaboration with CPS will ensure that a positive relationship between the woman and her care providers is maintained throughout the pregnancy and at birth.	III B	The health care provider can encourage the mother and family to voluntarily collaborate with CPS, if indicated. The professional's duty to report overrides the provisions of any other provincial statute,

TABLE 2 – NAS MATERNAL GUIDELINES: ANTENATAL, INTRAPARTUM AND POSTPARTUM CARE				
	RECOMMENDATION	**RATIONALE**	**QUALITY OF EVIDENCE & CLASSIFICATION OF RECOMMENDATIONS**	**IMPLEMENTATION CONSIDERATIONS**
		Anyone who has reasonable grounds to suspect that a child is or may be in need of protection must promptly report the suspicion and the information upon which it is based to CPS (CFSA Section 72).		specifically, those provisions that would otherwise prevent disclosure by the professional (confidentiality). Solicitor-client privilege is the only exception.
Intrapartum				
8	During labour and delivery, the pregnant woman should continue to take her daily dose of opioid agonist treatment to avoid withdrawal.		II-2 B	Dosing during the intrapartum period should keep the woman stable. The volume of methadone drink may be reduced as necessary.
9	Additional pain management (i.e. analgesia) may be required for women on opioid agonist treatment.	Women are often worried/ concerned that their pain in labour will not be well controlled. Substance using individuals have a lower tolerance to pain and doses of medications required to control pain will be higher.[14] Requests for additional pain relief should not be viewed as inappropriate drug seeking behaviour.	II-2B	An antenatal consultation with an anesthetist to discuss intrapartum pain management options should be considered, especially in cases of polysubstance use. A referral to another provider or center may be required if lacking expertise at the local hospital.
10	Narcotic antagonists (e.g. Naloxone, Nubain) should be avoided as they are contraindicated for women with opioid use disorder.	Naloxone will cause immediate and severe withdrawal symptoms.[15]	III B	
Postpartum				
11	Implement a partnership plan that focuses on all aspects of infant care, including feeding, handling, skin- to-skin care, rooming-in, and the frequency of follow-up visits after the mother is discharged, in order to enhance communication between care providers and parents, and to support the parents' involvement in the care of their infant.	This partnership can help position the family for success. Written and verbal communication is instrumental to gaining commitment and enhancing the relationship of the mother and the infant with NAS throughout the hospital stay.	III B	The parental partnership plan should be developed during the prenatal period and shared with the parents, as it can promote ongoing, open communication between care providers and parents. The plan may need to be adjusted after the birth.

TABLE 3 – NAS NEONATAL GUIDELINES: NEWBORN SCREENING AND ASSESSMENT				
	RECOMMENDATION	**RATIONALE**	**QUALITY OF EVIDENCE & CLASSIFICATION OF RECOMMENDATIONS**	**IMPLEMENTATION CONSIDERATIONS**
12	Identification of infants with NAS should be based on the mother's antenatal history and the care provider's clinical assessment/ suspicion.	Identifying infants with NAS and achieving an accurate diagnosis is critical for timely and effective treatment.	III	***Appendix C – Algorithm for Assessment and Care of Infants at Risk of NAS (p. 20)***
13	A Standardized NAS Scoring Tool is recommended to assess suspected or known cases of in utero opioid exposure: a) In cases of exposure to short-acting preparations of opioids, infants should be scored for a minimum of 72 hours. b) In cases of exposure to sustained-release preparations of opioids, infants should be observed for 120 hours, since onset of withdrawal may be delayed. *(Follow-up can occur in hospital for the first 72 hours, with close follow-up in the community for the next 48 hours. If close follow-up in the community is not possible, then the infant should remain in the hospital for the entirety of the observation period.)* c) Infants should be scored with each care interaction, typically every 2-4 hours.	The purpose of using a scoring tool is to enable a systematic, objective, periodic and thorough evaluation of the infant, to support their care needs, and to identify the need for pharmacological therapy. The Standardized NAS Scoring Tool is designed to quantify the severity of NAS and to guide treatment in full term infants.[16] It is widely used and has a robust cut-off for initiation of treatment.	II-1	***Appendix D – Sample Standardized NAS Scoring Tool (p. 21)*** Training on the use of this tool is recommended for all nurses working in mother-baby units, SCNs, and NICUs. Clustering care is important to ensure that the dyad receives adequate rest. Health care providers should be aware that when scoring for opioid withdrawal, nicotine exposure, maternal use of SSRIs, and certain genetic factors are associated with higher NAS scores.[17,18] **Resources:** a) American Academy of Pediatrics - NAS Scoring Tool[19]
14	Mother-baby dyad care, including rooming-in or care-by-parent, should be promoted.	Rooming-in is associated with a reduced need for pharmacological treatment and shorter length of hospital stay.[20,21] Parents need to learn comfort strategies and signs of withdrawal so that they are well prepared and confident to care for their baby after discharge.	II-2 B	A resource person with extensive knowledge and experience should be identified to support parents' questions on a consultation basis. Consideration for workload on the mother-baby unit will be required when the nurse is caring for an infant with NAS.

TABLE 4 – NAS NEONATAL GUIDELINES: NEWBORN TREATMENT				
	RECOMMENDATION	**RATIONALE**	**QUALITY OF EVIDENCE & CLASSIFICATION OF RECOMMENDATIONS**	**IMPLEMENTATION CONSIDERATIONS**
Non-Pharmacological Treatments *Non-pharmacological interventions should be utilized for all infants with NAS. Care providers in both the SCNs/NICUs and mother-baby units should be educated in non-pharmacological treatment techniques.*				
15	The baby's environment should be modified to reduce sensory stimulation, including limiting visitors, minimizing overhead lighting, and decreasing noise.	Care of infants with NAS should generally be provided in a space that has been adapted or modified to decrease sensory stimulation.[22,23,24,25]	III B	
16	Soothing behaviours, positional support, swaddling, gentle handling, kangaroo care, and frequent, hypercaloric, smaller volume feedings are beneficial and should be considered in the treatment of newborns with NAS, both in the hospital and the home environment.	Minimization of excessive handling, respect of newborn infants' sleep state, and using techniques to minimize stimulation will help with regulation of the transition between neonatal behavioural states. Specific holding/constraining techniques (e.g. use of infant slings), proper positioning and gentle firm pressure, gentle vertical rocking, cuddling, skin-to-skin contact (Kangaroo care), and overall gentle handling can all support the newborn infant's self-regulation. Rocking beds or mechanical swings should be used with caution as there is evidence that, for some newborns, this may in fact be over-stimulating during the acute period of withdrawal and may not be appropriate.[22,23,24,25,26] No RCT has specifically studied swaddling in the treatment of infants with NAS but it has been suggested that it may be used as an effective strategy to support infants with NAS. Safe sleeping guidelines do not recommend swaddling for healthy infants at home, however infants with NAS in hospital may benefit from swaddling. Frequent, smaller volume, hypercaloric feeds are	III B	Use of pacifiers, hands-to-mouth, self-clinging, and other self-soothing behaviours should be used in the management of newborn infants with NAS, and their beneficial implications should be taught to the parents. Health care providers should review safe sleep recommendations with parents. Dietician support can be part of the multidisciplinary approach to care of the newborn infant with NAS.

TABLE 4 – NAS NEONATAL GUIDELINES: NEWBORN TREATMENT				
	RECOMMENDATION	RATIONALE	QUALITY OF EVIDENCE & CLASSIFICATION OF RECOMMENDATIONS	IMPLEMENTATION CONSIDERATIONS
		generally recommended for those infants who have feeding difficulties due to regulatory control issues, and/or poor weight gain due to excessive caloric expenditure, gastroesphageal reflux and diarrhea.		
17	Breastfeeding should be recommended and supported in methadone/ buprenorphine-maintained mothers, assuming absence of absolute contraindications.	Some studies indicate that breast milk intake in methadone cases is associated with reduced NAS scores, delayed onset of NAS, and decreased need for pharmacological treatment, length of treatment, and length of hospital stay.[27,28,29,30,31] Short term safety has been confirmed in the small number of studied patients, but long term developmental outcomes have not been adequately studied. Breastfeeding is not recommended for women using illicit drugs until abstinence is reached and maintained. Occasional use of other substances in addition to methadone may be of concern and mothers who use these substances should consider the risks and benefits of breast milk exposure for their infants. Substances of concern include: ecstasy, crystal meth, amphetamines, cocaine and related stimulants, alcohol, opioids, benzodiazepines, and cannabis.[32]	II-2 B	This is a population that has low rates of breastfeeding, and NAS poses additional challenges to breastfeeding, therefore support may be required.[33] This support may include the provision of pumping equipment and supplies to women while in hospital. Health care providers should discuss the benefits of breastfeeding and the risks of breast milk exposure to licit and illicit substances with all mothers/parents.[34,35,36]
18	Preventive skin care should be initiated at birth to prevent excoriation.	Infants experiencing NAS are prone to skin breakdown due to frequent loose stools. To prevent diaper dermatitis, it is important to maintain optimal skin care of the perianal area through frequent diaper changes, the use of a barrier cream, and other interventions.[37]	III	

TABLE 4 – NAS NEONATAL GUIDELINES: NEWBORN TREATMENT				
	RECOMMENDATION	**RATIONALE**	**QUALITY OF EVIDENCE & CLASSIFICATION OF RECOMMENDATIONS**	**IMPLEMENTATION CONSIDERATIONS**
Pharmacological Treatments *Medications should be considered for the treatment of NAS when supportive, non-pharmacological measures fail to adequately ameliorate the signs of withdrawal. (Medication is indicated when three consecutive scores are greater than or equal to 8 on the Standardized NAS Scoring Tool or when the average of two scores or the scores for two consecutive intervals is greater than or equal to 12.)*				
19	Cardio-respiratory monitoring is recommended for all infants started on morphine and continued for 4 days and/or until the dose is reduced. Further monitoring should then be at the discretion of the physician in charge.		III	When pharmacological treatment is necessary the baby with NAS should be admitted to the SCN/NICU or paediatric unit where cardio-respiratory monitoring is available. Local variations may dictate the location of the infant for monitoring. Level I centres should consider transfer to Level II centres.
20	Morphine should be considered the first line pharmacological treatment of NAS when supportive measures fail to adequately ameliorate the signs of withdrawal.	Morphine is the most commonly used medication for the treatment of opioid withdrawal in newborns.[19] Although there is evidence to support symptom dosing, generally accepted standards are for weight and symptom management. Methadone is not currently recommended for use in newborns due to its long half-life, and there is a paucity of research comparing it to morphine.[24,38]	III B	***Appendix E – Sample NAS Pharmacological Treatment Dosing Guidelines (p. 23)***
21	Infants whose signs of withdrawal are difficult to control on morphine may require an additional medication such as clonidine or phenobarbital.	Clonidine has been explored as a possible adjunct with morphine to reduce the duration of pharmacotherapy in infants with NAS.[39] The use of barbiturates as an adjunct to morphine may be indicated, based on limited evidence, in infants with polysubstance exposure. [40,41]	III B	***Appendix E – Sample NAS Pharmacological Treatment Dosing Guidelines (p. 23)*** Slow tapering of clonidine is required to prevent severe rebound hypertension.

TABLE 5 – NAS DISCHARGE PLANNING GUIDELINES				
	RECOMMENDATION	RATIONALE	QUALITY OF EVIDENCE & CLASSIFICATION OF RECOMMENDATIONS	IMPLEMENTATION CONSIDERATIONS
Discharge Planning				
22	A primary health care provider who is comfortable following a baby with NAS should be confirmed prior to discharge.	It is important to ensure that there are no gaps in the care and monitoring of the infant with NAS and their family in transitioning from hospital to community care. It is important to ensure that this provider is comfortable with the required follow-up care, monitoring and support.	III B	Public health nurse home visits are important for identifying child development concerns, and for providing support for breastfeeding, attachment, bonding, and relapse prevention, as well as educating about risks associated with co-sleeping, risk of sudden infant death syndrome, and shaken baby syndrome. All parents (birth, foster, adoptive)/ guardians should be educated and provided with resources (e.g. informational brochures, video links) about the importance of ongoing care and monitoring, specifically how to care for infants with NAS, and how to recognize withdrawal signs in an asymptomatic infant at risk for NAS. They should also be informed that some signs and symptoms of NAS may persist for up to six months. **Resources:** a) Ontario Ministry of Children and Youth Services - Healthy Babies Healthy Children: http://www.children.gov.on.ca/htdocs/English/topics/earlychildhood/health/index.aspx b) Enhancing Best Practices in Assessing Perinatal Families: Healthy Babies Healthy Children Program Webinar: http://www.cmnrp.ca/en/cmnrp/ArchivedEvents_p4166.html
23	Discharging the infant home on morphine should only be undertaken if the clinical team is confident that the social risk is low, the infant is stable,	It is essential to ensure that a safety net has been established to avoid potential risks/harms and to address concerns in a timely manner.	III	When assessing a family for discharge prior to weaning, the following criteria should be met: • Stable supportive home environment • A clearly identified plan for weaning

TABLE 5 – NAS DISCHARGE PLANNING GUIDELINES				
	RECOMMENDATION	RATIONALE	QUALITY OF EVIDENCE & CLASSIFICATION OF RECOMMENDATIONS	IMPLEMENTATION CONSIDERATIONS
	there is a clear and comprehensive plan for weaning the infant, and a designated supervisor of that plan is identified, who will follow the infant with, at minimum, a weekly visit. Following consultation with the clinical team, the final decision to discharge an infant on pharmacological treatment is at the discretion of the physician.			• Identified physician familiar with NAS and medication weaning for post-discharge care who will follow the infant as often as necessary, but no less frequently than weekly, until withdrawal is complete • Parent/guardian competence in measuring and administering the medication • Parent/guardian education about signs of NAS and the need to contact the physician if problems increase • Plan for post-discharge follow-up with an identified community support worker, such as a public health nurse, CPS, and/or addiction services if required • Pre-discharge case conference to identify and document the discharge plan
24	Every baby exposed to opioid agonists and other substances should be offered ongoing developmental assessments by a clinical expert.		II-3 B	Follow-up resources vary by community, and thus these infants may benefit from follow-up at Regional Neonatal Follow-up Clinics for further developmental assessments.

APPENDIX A – NEONATAL ABSTINENCE SYNDROME WORK GROUP

The NAS Work Group was convened on May 31, 2010. It was composed of experts who provide clinical care and social support to pregnant women, families and infants, where the infant may be at risk of NAS. The group came together for the purpose of developing recommendations regarding both harm reduction and the optimal management of NAS (the original guideline was released in July 2011).

NEONATAL ABSTINENCE SYNDROME WORK GROUP MEMBERSHIP LIST		
Name	**Title**	**Organization**
Tara Baron	Paediatrician	Hopital Regional de Sudbury Regional Hospital
Tony Barozzino	Chief of Paediatrics	St. Michael's Hospital, Toronto
Kim Dow (co-chair)	Neonatologist	Kingston General Hospital
Michelle Gahwiler	Social Worker, Pregnancy & Aftercare Program	Children's Aid Society of Toronto
Louise Gilbert	Family Health Specialist, Healthy Babies Healthy Children Program	Ottawa Public Health
Pam Hill	Manager of Programs and Clinical Services	Addiction Services of Thames Valley
Alan Hudak	Paediatrician	Orillia Soldiers' Memorial Hospital
Kim Kalata	Nurse Practitioner, Neonatal	Credit Valley Hospital
Gideon Koren	Director, The Motherisk Program	The Hospital for Sick Children
Wendy Moulsdale	Nurse Practitioner, Neonatal	Sunnybrook Health Sciences Centre
Jodie Murphy-Oikonen	Coordinator, Maternity Centre	Thunder Bay Medical Centre
Franz Noritz	Supervisor	Children's Aid Society of Toronto
Susan Oley	Foster Parent Support Worker	Children's Aid Society of Toronto
Alice Ordean	Family Physician	St. Joseph's Health Centre, Toronto
Rita Palumbo	Social Worker	William Osler Health Centre
Jodi Pereira (co-chair)	Social Worker	St. Joseph's Healthcare Hamilton
Henry Roukema	Medical Director, NICU	St. Joseph's Health Centre, London
Peter Selby	Clinical Director of Addictions Program; Head, Nicotine Dependence Clinic	Centre for Addiction and Mental Health
Ruth Turner	Senior Project Manager (November 2010 – July 2011)	PCMCH
June Barrette	Senior Project Manager (May-October 2010)	PCMCH
Marilyn Booth	Executive Director	PCMCH

A smaller group of experts was reconvened in May 2016 to update the guideline, including Kim Dow, Alice Ordean, Henry Roukema, and Christina Cantin (RN; Perinatal Consultant, Champlain Maternal Newborn Regional Program; not involved in the development of the original guideline). The revised guidelines have been endorsed by the PCMCH Maternal-Newborn Advisory Committee.

APPENDIX B – SAMPLE PRENATAL SPECIALIZED CARE PLAN

ST. JOSEPH'S HEALTH CENTRE TORONTO **Prenatal Specialized Care Plan** **PAGE 18 of 2**	Patient identification

MRP for intrapartum care:
MRP for antenatal care:

Social Worker:

Expected date of confinement (EDC):

Date of First Visit:
Date Care Plan was discussed with patient:

Patient is on Methadone:
Methadone Physician:
Methadone Pharmacy:

Patient offered orientation of NICU/FBC:
Date completed:

Planned Birth Attendant(s):
1.
2.

Woman's History (Check all that are applicable):

x Obstetrical History

x Medical History

x Prenatal exposure to substance use

x Children protection services (CPS) involvement

x Support Systems (community resources and/or personal support systems)

ST. JOSEPH'S HEALTH CENTRE TORONTO **Prenatal Specialized Care Plan** **PAGE 2 of 2**	Patient identification

During Labour (Intrapartum):

Mark with a √ if applicable	Action	Initial when completed
	This patient is on methadone. As of this date, she is on _____mg of methadone with ____ carries. Please call the pharmacy to confirm dose and date of last dose prior to ordering the methadone dose.	
	Pain management options have been discussed. She has stated that her pain option preference is an epidural.	
	Inform child protection services of admission to hospital.	

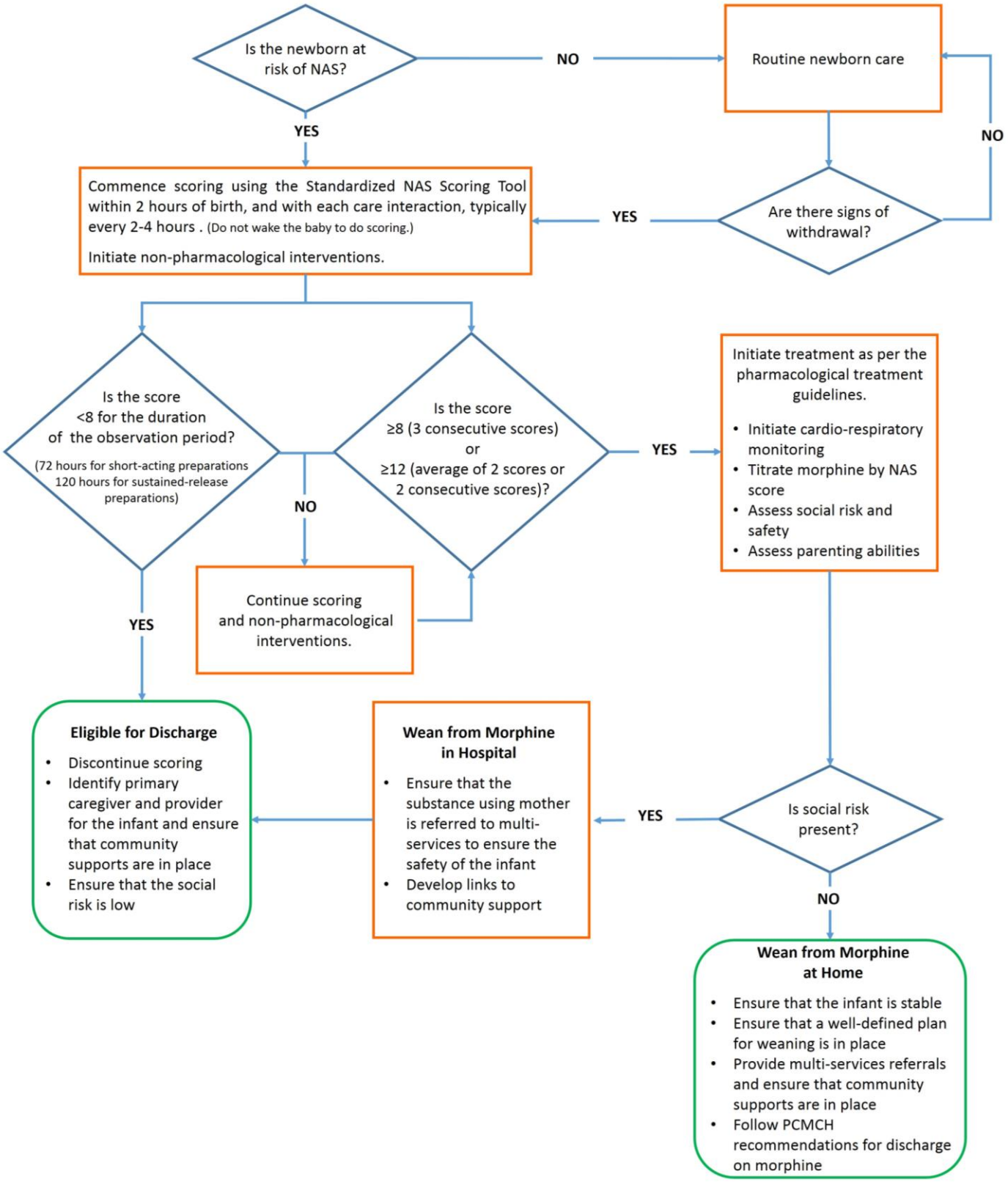
Postpartum:

Mark with a √ if applicable	Action	Initial when completed
	The baby will be rooming-in or admitted to the nursery for □ Monitoring for opiate withdrawal using the NAS (Neonatal Abstinence Syndrome Scoring Tool) and/or □ Child protection concern	
	The mother would like to try breastfeeding.	
	The mother may be seen by the social worker prior to baby's discharge for additional support and to liaise with community services.	

Discharge Plans:

Mark with a √ if applicable	Action	Initial when completed
	Mom and baby need to be seen by their Primary Care Provider within 2-3 days of discharge.	
	Neonates should be offered follow-up in the Neonatal Follow-up Clinic. Please book appointment prior to discharge home.	
	Please confirm discharge plans for baby with appropriate child protection agency.	

APPENDIX C – ALGORITHM FOR ASSESSMENT AND CARE OF INFANTS AT RISK OF NEONATAL ABSTINENCE SYNDROME



APPENDIX D – SAMPLE STANDARDIZED NEONATAL ABSTINENCE SYNDROME SCORING TOOL

DOB _____

Birth Weight _____ **grams (x 10% =** _____**)**

Today's Weight _____ **grams**

Start new scoring sheet daily.

Signs		Score									
Date:	**Time:**										
Excessive Cry Excessive cry (inconsolable)	2 3										
Sleeps <1 hour after feeding Sleeps 1-2 hours after feeding Sleeps 2-3 hours after feeding	3 2 1										
Hyperactive Moro Reflex Markedly hyperactive Moro reflex	1 2										
Mild tremors: disturbed Moderate/severe tremors: disturbed	1 2										
Mild tremors: undisturbed Moderate/severe tremors: undisturbed	1 2										
Increased muscle tone	1 - 2										
Excoriation: skin red, intact Excoriation: skin broken	1 2										
Generalized Seizure	8										
Hyperthermia: axilla temperature ≥ 37.3°C	1										
Frequent yawning (≥ 4 / interval)	1										
Sweating	1										
Nasal stuffiness	1										
Sneezing (≥ 4 / interval)	1										
Tachypnea (rate > 60/minute)	2										
Poor feeding	2										
Vomiting	2										
Loose Stools	2										
Weight loss / Failure to thrive	2										
Excessive irritability	1 - 3										
Total Score											
Initials of Scorer											

Name of Scorer	Initials	Signature/Title	Name of Scorer	Initials	Signature/Title

Instructions

- Designed for use with full term opioid exposed newborns
- Initiate scoring at 2 hours of age and repeat every 2-4 hours prior to a feeding. Do not wake baby to do scoring.
- Total scores for each interval at bottom of column
- Calculate & record 90% of birth weight to use as a reference for weight loss
- Initiate pharmacologic treatment when the average of 3 scores is ≥ 8 or the average of 2 scores, or 2 consecutive scores is ≥ 12
- Score for minimum of 72 hours, 120 hours for methadone exposure. Continue scoring during treatment and weaning.
- Discontinue scoring 48-72 hours after treatment discontinued.

Excessive Cry

- Cry is usually high pitched
- **Score 2:** Infant cries often and is difficult to console
- **Score 3:** Infant is inconsolable, even with a pacifier, swaddling or rocking

Sleeping

- Use the longest continuous sleeping time between feedings and scoring periods
- **Score 0:** Sleeps more than3 hours continuously
- **Score 1:** Sleeps 2-3 hours continuously
- **Score 2:** Sleeps 1-2 hours continuously
- **Score 3:** Sleeps less than 1 hour continuously

Moro Reflex

- Avoid doing while infant is irritable or crying to insure that the jitteriness, if present, is due to withdrawal, not agitation
- **Score 1:** Hyperactive Moro Reflex: hyperactive response with excessive abduction at shoulder and extension at elbow with or without tremors
- **Score 2:** Markedly Hyperactive Moro Reflex: Above response plus marked adduction flexion at elbow with arms crossing to the midline

Tremors

- Involuntary movements that are rhythmical and of equal amplitude.
- Myoclonic jerks are not tremors
- Undisturbed tremors occur in the absence of stimulation
- Disturbed tremors occur with stimulation, i.e. unwrapping a swaddled infant
- **Score 1:** Mild tremors involve hands or feet only & occur frequently in fussy or crying states and occasionally in quiet alert states
- **Score 2:** Moderate - severe tremors involve arms or legs and occur consistently and repeatedly in all states

Increased Muscle Tone

- Elicit by passively extending and releasing the infant's arms and legs to assess recoil
- Assess infant at rest and with gentle handling, in quiet alert and mildly fussy states
- Infants experiencing NAS may have fluctuating tone
- **Score 1:** Increased tone with handling or increased resistance to extension or flexion of limbs with head lag on pull to sit
- **Score 2:** Increased tone without handling or increased resistance to straightening or bending limbs with or without head lag

Excoriation

- Results from excessive and uncontrolled movements, such as tremors, rubbing. Diaper area excoriation is not included
- Score as long as the excoriation is present
- **Score 1:** Skin is red, but intact or healing
- **Score 2:** Skin is broken

Generalized Seizure

- Seizure activity requires notification of the paediatrician immediately
- **Score 8:** The incidence of seizures as a symptom of NAS is low, but if present

Hyperthermia

- If hyperthermia is present, rule out infection
- **Score 1:** Axillla temperature of 37.3°C or higher

Yawning

- **Score 1:** Yawning 4 times or more in a scoring interval

Sweating

- **Score 1:** Dampness of the infant's forehead or upper lip providing the infant is not over dressed

Nasal Stuffiness

- **Score 1:** Nasal noise with breathing, not associated with illness

Sneezing

- **Score 1** Sneezing 4 times or more in a scoring interval

Tachypnea

- **Score 2:** Respiratory rate greater than 60 breaths per minute at rest and not fussy or crying
- Rule out other medical conditions

Poor Feeding

- **Score 2:** Uncoordinated suck/swallow resulting in:
  - inefficient suck
  - inefficient sucking pattern: short bursts with weak suck despite excessive sucking prior to feeding
  - maladaptive tongue position: tongue thrusting, tongue above nipple, formula loss at sides of mouth
  - gulping or clicking noise with sucking
  - takes frequent breaks from feeding to breathe, burp or spit up

Vomiting

- **Score 2:** Vomits a whole feed. or two or more times during a feed, not associated with burping

Loose Stools

- **Score 2:** ½ liquid ½ solid stool or liquid stool with our without a water ring on diaper

Weight Loss / Failure to Thrive

- Use work space at top of form. Weight infant once a day
- **Score 2:**
  - Current weight loss is greater than 10% of birth weight
  - Failure to regain birth weight by 10 days of age
  - Daily weight gain of less than 20 gms/day after birth weight regained

Irritability

- Infant is irritable or fussy, particularly with light touch or handling despite attempts to console, but may not cry excessively or at all.
- Observe for grimacing, sensitive to touch, light or sound, gaze aversion, etc. with or without crying.
- **Score 2:** Displays 2–3 signs of irritability and is consoled only with intervention after time
- **Score 3:** No amount of consoling reduces the symptoms of irritability

Jansson L, Velez M, Harrow C. The opioid-exposed newborn: assessment and pharmacologic management. J Opioid Manag. 2009 Jan-Feb;5(1):47-55.

APPENDIX E – SAMPLE NEONATAL ABSTINENCE SYNDROME PHARMACOLOGICAL TREATMENT DOSING GUIDELINES

<table>
<tr><th>Medication</th><th colspan="2">Dosing Guidelines</th></tr>
<tr><td colspan="3">Morphine</td></tr>
<tr><td rowspan="5">Morphine is indicated when three consecutive scores are ≥ 8 according to the Standardized NAS Scoring Tool or when the average of two scores or the score for two consecutive intervals is ≥ 12.
If the scores remain ≥ 8 for 3 consecutive scores or ≥ 12 on 2 occasions, the morphine dose is increased to the next range i.e. by 0.16 mg/kg/day. If 0.80 mg/kg/day fails to control signs of withdrawal, morphine may be increased to 0.96 to 1.0 mg/kg/day. Clonidine (see below) should be considered at this point.

Weaning:
Weaning is initiated when scores are <8 for 24 to 48 hours and ordinarily occurs by 10% of the total daily dose with each wean occurring no more frequently than every 48 hours to 72 hours. When the total daily dose is <0.2mg/kg/day, consideration may be given to weaning every 24 hours at the discretion of the physician.

An alternate approach used by some centres is to wean by 0.05mg/kg/day every 48 to 96 hours as tolerated.
In both approaches, morphine is discontinued when scores are stable for 48 to 72 hours on a dose of 0.05 to 0.1 mg/kg/day.</td><td>Score</td><td>Oral Morphine Dose</td></tr>
<tr><td>8-10</td><td>0.32 mg/kg/day divided q4-6h</td></tr>
<tr><td>11-13</td><td>0.48 mg/kg/day divided q4-6h</td></tr>
<tr><td>14-16</td><td>0.64 mg/kg/day divided q4-6h</td></tr>
<tr><td>17 +</td><td>0.80 mg/kg/day divided q4-6h</td></tr>
<tr><td colspan="3">Clonidine</td></tr>
<tr><td>Clonidine has been explored as a possible therapeutic option in combination with morphine. There is Level 1 evidence from one small randomized controlled trial demonstrating that clonidine in addition to standard opioid therapy reduces the duration of pharmacotherapy for neonatal abstinence.[39] Therefore clonidine may be considered as an adjunct to morphine when high doses (see above) fail to control withdrawal symptoms.

Some studies gradually increased doses over 1 to 2 days to begin therapy, and tapered doses by 0.25 mcg/kg every 6 hours to discontinue (or by 25% of the total daily dose every other day).</td><td colspan="2">• 0.5 -1 mcg/kg orally q4-6h
• Much higher doses (0.5 to 3 mcg/kg/h) have been used as a continuous infusion[42]

Please Note:
Adequate clinical trials to establish an efficacious and safe dose still are required</td></tr>
<tr><td colspan="3">Phenobarbital</td></tr>
<tr><td rowspan="5">Phenobarbital may be used in combination with morphine in infants exposed to polysubstance abuse (sedatives, alcohol or barbiturates in addition to opiates).

Phenobarbital 10 mg/kg is given every 12 hours for 3 doses, then 5 mg/kg/day is continued as a maintenance dose. The doses of morphine used in combination with phenobarbital are lower than those given when morphine is used alone.</td><td>Score</td><td>Oral Morphine Dose in combination with Phenobarbital</td></tr>
<tr><td>8-10</td><td>0.16 mg/kg/day divided q4-6h</td></tr>
<tr><td>11-13</td><td>0.32 mg/kg/day divided q4-6h</td></tr>
<tr><td>14-16</td><td>0.48 mg/kg/day divided q4-6h</td></tr>
<tr><td>17 +</td><td>0.62 mg/kg/day divided q4-6h</td></tr>
</table>

REFERENCES

[1] Carson G, Cox LV, Crane J, Croteau P, Graves L, Kluka S, Koren G, Martel MJ, Midmer D, Nulman I, Poole N, Senikas V, Wood R, Society of Obstetricians and Gynaecologists of Canada. Alcohol Use and Pregnancy SOGC Clinical Practice Guidelines. J Obstet Gynaecol Can. 2010 Aug;32(8 Suppl 3):S1-31.

[2] Woicik PA, Stewart, SH, Pihl RO, Conrod PJ. The substance use risk profile scale: A scale measuring traits linked to reinforcement-specific substance use profiles. Addict Behav. 2009 Dec;34(12):1042-55.

[3] Brown RL, Rounds LA. Conjoint screening questionnaires for alcohol and drug abuse. Wis Med J. 1995;94(3):135-40.

[4] Woolf SH, Battista RN, Angerson GM, Logan AG, Eel W. Canadian Task Force on Preventive Health Care. New grades for recommendations from the Canadian Task Force on Preventive Health Care. CMAJ. 2003 Aug 5;169(3):207-8.

[5] Wong S, Ordean A, Kahan M; Maternal Fetal Medicine Committee; Family Physicians Advisory Committee; Medico-Legal Committee; Society of Obstetricians and Gynaecologists of Canada. Substance Use in Pregnancy SOGC Clinical Practice Guidelines. J Obstet Gynaecol Can. 2011 Apr;33(4):367-84.

[6] Ordean A, Kahan M. Comprehensive treatment program for pregnant substance users in a family medicine clinic. Can Fam Physician. Can Fam Physician. 2011 Nov;57(11):e430-5.

[7] Jones HE, Heil SH, Baewert A, Arria AM, Kaltenbach K, Martin PR, Coyle MG, Selby P, Stine SM, Fischer G. Buprenorphine treatment of opioid-dependent pregnant women: a comprehensive review. Addiction. 2012 Nov;107 Suppl 1:5-27.

[8] Finnegan L. Substance abuse in Canada: Licit and illicit drug use during pregnancy - Maternal, neonatal and early childhood consequences. Ottawa, ON: Canadian Centre on Substance Abuse; 2013.

[9] College of Physicians and Surgeons of Ontario. Methadone Program: Methadone Maintenance Treatment Program Standards and Clinical Guidelines, 4th Edition. Toronto, ON; 2011.

[10] Jones HE, Kaltenbach K, Heil SH, Stine SM, Coyle MG, Arria AM, O'Grady KE, Selby P, Martin PR, Fischer G. Neonatal abstinence syndrome after methadone or buprenorphine exposure. N Engl J Med. 2010 Dec 9;363(24):2320-31.

[11] Centre for Addiction and Mental Health. Buprenorphine/ Naloxone for Opioid Dependence: Clinical Practice Guideline. Toronto, ON; 2011.

[12] Lee TS. Slow-release morphine was not more effective than methadone in reducing neonatal abstinence syndrome. West J Med. 2000 Jan;172(1):26.

[13] Fischer G, Jagsch R, Eder H, Gombas W, Etzersdorfer P, Schmidl-Mohl K, Schatten C, Weninger M, Aschauer HN. Comparison of methadone and slow-release morphine maintenance in pregnant addicts. Addiction. 1999 Feb;94(2):231-9.

[14] Young JL, Lockhart EM, Baysinger CL. Anesthetic and obstetric management of the opioid-dependent parturient. Int Anesthesiol Clin. 2014 Spring;52(2):67-85.

[15] Jones HE, Martin PR, Heil SH, Kaltenbach K, Selby P, Coyle MG, Stine SM, O'Grady KE, Arria AM, Fischer G. Treatment of opioid-dependent pregnant women: clinical and research issues. J Subst Abuse Treat. 2008 Oct;35(3):245-59.

[16] Jansson L, Velez M, Harrow C. The opioid-exposed newborn: assessment and pharmacologic management. J Opioid Manag. 2009 Jan-Feb;5(1):47-55.

[17] Choo RE, Huestis MA, Schroeder JR, Shin AS, Jones HE. Neonatal abstinence syndrome in methadone-exposed infants is altered by level of prenatal tobacco exposure. Drug Alcohol Depend. 2004 Sep 6;75(3):253-60.

[18] Kaltenbach K, Holbrook AM, Coyle MG, Heil SH, Salisbury AL, Stine SM, Martin PR, Jones HE. Predicting treatment for neonatal abstinence syndrome in infants born to women maintained on opioid agonist medication. Addiction. 2012 Nov;107 Suppl 1:45-52.

[19] Hudak ML, Tan RC, The Committee on Drugs, The Committee on Fetus and Newborn. Clinical Report – Neonatal Drug Withdrawal. Pediatrics. 2012 Feb;129(2):e540-60.

[20] McKnight S, Coo H, Davies G, Holmes B, Newman A, Newton L, Dow K. Rooming-in for infants at risk for neonatal abstinence syndrome. Am J Perinatol. 2016 Apr;33(5):495-501.

[21] Newman A, Davies GA, Dow K, Holmes B, Macdonald J, McKnight S, Newton L. Rooming-in care for infants of opioid-dependent mothers: Implementation and evaluation at a tertiary care hospital. Can Fam Physician. 2015 Dec;61(12):e555-61.

[22] Velez M, Jansson LM. The opioid dependent mother and newborn dyad: non-pharmacologic care. J Addict Med. 2008 Sep; 1;2(3):113-120.

[23] Marcellus L. Care of substance-exposed infants: the current state of practice in Canadian hospitals. J Perinat Neonatal Nurs. 2002 Dec; 16(3):51-68.

[24] Oei J, Lui K. Management of the newborn infant affected by maternal opiates and other drugs of dependency. J Paediatr Child Health. 2007;43(1-2):9-18.

[25] Beauman SS. Identification and management of neonatal abstinence syndrome. J Infus Nurs. 2005;28(3):159-67.

[26] D'Apolito K. Comparison of a rocking bed and standard bed for decreasing withdrawal symptoms in drug-exposed infants. Am J Matern Child Nurs. 1999 May-Jun;24(3):138-44.

[27] Logan BA, Brown MS, Hayes MJ. Neonatal abstinence syndrome: treatment and pediatric outcomes. Clinical Obstetrics and Gynecology. 2013 Mar;56(1):186-192.

[28] Isemann B, Meinzen-Derr J, Akinbi H. Maternal and neonatal factors impacting response to methadone therapy in infants treated for neonatal abstinence syndrome. J Perinatol. 2011 Jan;31(1):25-9.

[29] Abdel-Latif ME, Pinner J, Clews S, Cooke F, Lui K, Oei J. Effects of breast milk on the severity and outcome of neonatal abstinence syndrome among infants of drug-dependent mothers. Pediatrics. 2006 Jun;117(6):e1163-9.

[30] Jansson LM, Choo R, Velez ML, Harrow C, Schroeder R, Shakleya DM, Huestis MA. Methadone maintenance and breastfeeding in the neonatal period. Pediatrics. 2008 Jan;121(1):106-14.

[31] Welle-Strand GK, Skurtveit S, Jansson LM, et al. Breastfeeding reduces the need for withdrawal treatment in opioid-exposed infants. Acta Paediatr 2013;102: 1060–6.

[32] UNICEF and World Health Organization. Acceptable Medical Reasons for use of Breast Milk Substitutes in Baby Friendly Hospital Initiative. Geneva: World Health Organization; 2009.

[33] Best Start Resource Centre. Populations with lower rates of breastfeeding: A summary of findings. Toronto, ON; 2014.

[34] Rowe H, Baker T, Hale TW. Maternal medication, drug use, and breastfeeding. Pediatr Clin North Am. 2013 Feb;60(1):275-94.

[35] D'Apolito K. Breastfeeding and substance abuse. Clin Obstet Gynecol. 2013 Mar;56(1):202-11.

[36] Sachs HC, The Committee on Drugs. Transfer of drugs and therapeutics into human breast milk: An update on selected topics. Pediatrics. 2013 Sep;132(3):e796-809.

[37] Bagwell GA, Thomas A, Ryshen G. Improving skin integrity in babies diagnosed with neonatal abstinence syndrome. Neonatal Network. 2016;35(1):1-7.

[38] Lainwala S, Brown ER, Weinschenk NP, Blackwell MT, Hagadorn JI. A retrospective study of length of hospital stay n infants treated for neonatal abstinence syndrome with methadone versus oral morphine preparations. Adv Neonatal Care. 2005 Oct;5(5):265-72.

[39] Agthe AG, Kim GR, Mathias KB, Hendrix CW, Chavez-Valdez R, Jansson L, Lewis TR, Yaster M, Gauda EB. Clonidine as an adjunct therapy to opioids for neonatal abstinence syndrome: A randomized, controlled trial. Pediatrics. 2009 May;123(5):e849-56.

[40] Coyle MG, Ferguson A, Lagasse L, Oh W, Lester B. Diluted tincture of opium (DTO) and phenobarbital versus DTO alone for neonatal opiate withdrawal in term infants. J Pediatr. 2002 May;140(5):561-4.

[41] Osborn DA1, Jeffery HE, Cole MJ. Sedatives for opiate withdrawal in newborn infants. Cochrane Database Syst Rev. 2010 Oct 6;(10):CD002053.

[42] Esmaeili A Keinhorst AK, Schuster T, Schlosser R, Bastanier C. Treatment of neonatal abstinence syndrome with clonidine and chloral hydrate. Acta Paediatr. 2010 Feb;99(2):209-14.