Queensland Clinical Guidelines

Translating evidence into best clinical practice

Maternity and Neonatal **Clinical Guideline**

Perinatal substance use: neonatal

Queensland Government

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Disclaimer

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The guideline is not a substitute for clinical judgement, knowledge and expertise, or medical advice. Variation from the guideline, taking into account individual circumstances may be appropriate.

This guideline does not address all elements of standard practice and accepts that individual clinicians are responsible for:

- Providing care within the context of locally available resources, expertise, and scope of practice
- Supporting consumer rights and informed decision making in partnership with healthcare practitioners including the right to decline intervention or ongoing management
- Advising consumers of their choices in an environment that is culturally appropriate and which enables comfortable and confidential discussion. This includes the use of interpreter services where necessary
- Ensuring informed consent is obtained prior to delivering care
- Meeting all legislative requirements and professional standards
- Applying standard precautions, and additional precautions as necessary, when delivering care
- Documenting all care in accordance with mandatory and local requirements

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Flow Chart: Management of neonatal abstinence syndrome

Do not administer Naloxone to babies of known or suspected opioid dependent women during resuscitation or in the newborn period

Known or suspected risk of substance withdrawal

Supportive care

- Rooming in
- Encourage breastfeeding
- Respond early to baby cues
- Reduce environmental stimuli
  - Reduce noise and light
- Promote clustering of care
- Avoid over-stimulation
  - Swaddle and nest
- Minimise hunger and high calorie needs
  - Demand breast feeding or frequent small formula feeds

If signs of substance withdrawal

- Perform clinical examination
- Consider/treat concurrent illness
- Review risk factors for sepsis
- Investigate to exclude infection and metabolic disturbances
- Review maternal history for licit/illicit substance use
- Discuss possible undisclosed substance use with woman
- Consider admission to SCN

Finnegan scoring

- Commence within 2 hours of birth
- Every 4–6 hours within 30 minutes after feeds
- Continue for:
  - 5–7 days for opioid exposed baby
  - 3–7 days non-opioid exposed baby

2 consecutive scores ≥12 *OR* 3 consecutive scores average ≥8?

No

Criteria for discharge met?

No

Yes

Yes

Admit to SCN

- Refer to Flowcharts:
  - Withdrawal Management: Morphine
  - Withdrawal Management: Phenobarbitone

Review and confirm

- Discharge plan
- Feeding plan
- Home medication—if appropriate
- Child safety plan & notifications
- Parent education—safe sleeping, smoke free environment, sedating substances
- Immunisations
- Community referrals
- Follow up appointments

Abbreviations: NAS Neonatal Abstinence Syndrome**;**
SCN Special Care Nursery **≥** Greater than or equal to;

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Flow Chart: Morphine dosing and weaning schedule

Do not administer Naloxone to babies of known or suspected opioid dependent women during resuscitation or in the newborn period

Opioid exposure inutero
2 consecutive
Finnegan scores ≥ 12 *OR*
3 consecutive
Finnegan scores average ≥ 8

Morphine schedule

May require dosing interval reduced to 4 hourly

0.5 mg/kg/day in 4 divided doses
(0.125 mg/dose)

If Finnegan score ≥ 8

Increase to
0.7 mg/kg/day in 4 divided doses

If Finnegan score ≥ 8

Increase to
0.9 mg/kg/day in 4 divided doses

If Finnegan score ≥ 8

Increase to
1 mg/kg/day in 4 divided doses

If Finnegan score ≥ 8

Commence Phenobarbitone

Continue Morphine schedule until ready for weaning

Care

Environment:
- Ensure close observation
- Continue supportive care

Medication
- Titrate Morphine dose to control NAS
- Phenobarbitone if:
  - NAS uncontrolled on maximum Morphine dose (1 mg/kg/day) and/or
  - History of polydrug use

Monitoring
- **Apnoea monitor:**
  - When commencing Morphine
- **Cardiorespiratory/O2 saturation**
  - If nursed prone
  - If Morphine ≥ 0.7 mg/kg/day oral

Dose reduction if:
- Finnegan scores < 8 for 48–72 hours

Morphine weaning

Reduce by:
- 0.1–0.2 mg/kg/day no more than every 48 hours
- 4 hourly dose may be reduced to 6 hourly

Discontinue when:
- Morphine dose 0.01–0.12 mg/kg/day

Monitoring:
- Continue until Morphine < 0.5 mg/kg/day
- Safe sleeping
- Continue Finnegan scores for 72 hours after ceasing Morphine

Abbreviations: **<** less than; **≥** Greater than or equal to; **NAS** Neonatal abstinence syndrome

Flow Chart: Phenobarbitone dosing and weaning schedule

Do not administer Naloxone to babies of known or suspected opioid dependent women during resuscitation or in the newborn period

Non-opioid substance exposure inutero
or
Opioid exposure not controlled with Morphine

Phenobarbitone schedule

Loading dose
10–15 mg/kg IV or oral

Maintenance dose
5 mg/kg/day in 2 divided doses
12 hours after loading dose

If Finnegan score ≥ 8

Increase to
8 mg/kg/day in 2 divided doses

If Finnegan score ≥ 8

Increase to
10 mg/kg/day in 2 divided doses

If NAS signs not controlled on maximum dose, re-consider diagnosis and arrange review by paediatrician

Continue Phenobarbitone schedule until ready for weaning

Care

Environment
- Ensure close observation
- Continue supportive care

Phenobarbitone
- Titrate dose to control NAS

Monitoring:
- Cardiorespiratory monitor
  - o If nursed prone
  - o When dose ≥ 10 mg/kg/day

Dose reduction
- When scores < 8 for 72 hours
- Reduce every 48–72 hours

Phenobarbitone weaning

Reduce by:
- 10 to 20% every 72 hours

Discontinue
- Following regular clinical review
- Signs of NAS absent

Continue
- Finnegan scores for 72 hours after ceasing

Abbreviations: NAS Neonatal abstinence syndrome; **≥** Greater than or equal to; **<** less than

Abbreviations

Anti-HBs	Hepatitis B surface antibody
DoCs	Department of Communities Child Safety and Disabilities Services
GP	General practitioner
HBsAg	Hepatitis B surface antigen
HCV	Hepatitis C virus
HIV	Human immunodeficiency virus
IV	Intravenous
mIU/mL	Million international units per millilitre
NAS	Neonatal abstinence syndrome
PCR	Polymerase chain reaction
PSU	Perinatal substance use
RNA	Ribonucleic acid
SCN	Special care nursery
SIDS	Sudden infant death syndrome
SNRI	Serotonin noradrenaline reuptake inhibitors
SSRI	Selective serotonin reuptake inhibitors
SUDI	Sudden unexplained death of an infant

Definitions

Baby	Neonate, newborn, infant
Clinician	Doctor including resident, registrar, fellow, consultant, specialist Nurse including nurse practitioner Midwife
Woman/Women	Patient(s) Client(s) Mother(s)
Pharmacogenomics	The study of how genes affect a person's response to drugs. A combination of pharmacology and genomics
Multidisciplinary	Clinicians (as above), health workers and allied health professionals (including physiotherapy, speech pathology, occupational therapy, social work) from hospital and community services including government and non-government organisations

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1 Introduction

Neonatal abstinence syndrome (NAS) is a syndrome of drug withdrawal with non-specific signs in the baby following chronic inutero exposure to a variety of substances including opioids, benzodiazepines, barbiturates, selective serotonin reuptake inhibitors (SSRI), alcohol and nicotine[1]. It is more common in neonates born to opioid dependent women.[2]

Usually there is a constellation of clinical findings including neurological excitability, gastrointestinal dysfunction and autonomic over reactivity[1,3]. Maternal use of drugs that lead to transient withdrawal or toxicity in the neonatal period may have long term neurodevelopmental effects.[4]

1.1 Incidence

Table 1. Incidence

Aspect	Comment			
Context	• Prevalence reporting and comparison of substance use complicated by: o Different definitions and screening, assessment and diagnostic tools used in different countries o Variety and subtlety of clinical presentations o Different population characteristics[5] • Regional variations to the components of some newer drugs • Generally prevalence of substance use higher: o In non-pregnant women than pregnant women o Young pregnant women higher[6]			
Queensland*	**Neonates diagnosed with NAS[7]**			
	Year	**Percentage**	**Number**	**Total Births**
	2010	0.24	154	62 033
	2014	0.37	232	62 695

Source: Perinatal Data Collection, Department of Health (Extracted 8 July 2015)[7]

1.2 Commonly used substances

Table 2. Overview of substances used or misused

Aspect	Consideration
Context	• Variety of drugs used or misused by pregnant women[8]
Effect	• Many known to cause neonatal behaviour consistent with drug withdrawal • Incidence and severity of NAS is dependent on: o Type of drug o Polydrug exposure[9] • Maternal doses do not correlate with severity of NAS
Major drug classes	• Major classes of drugs which may lead to withdrawal: o CNS depressants: ▪ Opioids (Methadone, Buprenorphine, Heroin) ▪ Alcohol, barbiturates, benzodiazepines o CNS stimulants: ▪ Amphetamines; Cocaine; SSRIs, serotonin noradrenaline reuptake inhibitors(SNRIs) o Hallucinogens: ▪ Glues, paint thinners, petrol • Refer to Queensland Clinical Guideline *Perinatal substance use: maternal* for comprehensive list of drugs[10]

2 Neonatal care

Table 3. General principles

Aspect	Consideration
Context	• NAS may occur even if the woman has stopped drug using in the four weeks prior to birth[2] • Lower risk of NAS if woman not used opioids within one week of birth • Babies of substance using women are at increased risk of harm and poor developmental outcomes due to psychosocial and environmental factors
Care principles	• Admit baby to postnatal ward with mother unless otherwise indicated • Commence NAS clinical pathway[11] • Provide routine postnatal care and monitoring[2] • Assess baby using Finnegan or modified Finnegan score • If baby shows signs of withdrawal, admit to special care nursery (SCN) for clinical assessment and management o If medication is not required, return baby to postnatal ward ▪ Continue observations for signs of withdrawal • Non-pharmacological supportive care is the first line of treatment • Provide pain relief as required as for any other baby
Blood borne viruses	• Delay intramuscular injections until after the baby has been bathed to remove all maternal blood

2.1 Differential diagnosis

Table 4. Differential diagnosis

Aspect	Consideration
Context	• May be difficult to differentiate NAS from other neonatal conditions such as: o Infection[2] o Hypoglycaemia[2] o Hypocalcaemia o Metabolic disorders
Seizures presentation	• May be the initial presenting sign • Consider and exclude other causes
Clinical examination	• Full examination indicated even in case of known maternal substance use • Consider concurrent illness • Review risk factors for neonatal sepsis • Investigate as required to exclude infection or metabolic disturbances • Treat identified illness
Testing	• Routine testing not recommended[2,8,9,12,13] • Urine and meconium analysis can be performed in cases of significant diagnostic uncertainty to determine fetal drug exposure[2] • Fetal opioid exposure can be detected by meconium analysis[14] • Obtain maternal consent[2]

2.2 Diagnosis

Table 5. Identification of NAS

Aspect	Consideration
Diagnosis[2,15]	• Clinical signs may be caused by concurrent illness (e.g. hypoglycaemia and sepsis) o Refer to Table 4. Differential diagnosis • Suspect NAS and investigate to determine diagnosis in any baby who: o Is unsettled o Is irritable o Has a high pitched cry o Has tremors or jitteriness o Does not feed well and/or has diarrhoea • Refer to Table 9. Exposure to opioids and Table 10. Exposure to SSRIs inutero • Toxicological analysis of baby's urine or meconium may assist with diagnosis if maternal drug use unknown and baby showing signs of NAS • NAS is more common in babies of women taking opioids than other drugs • NAS is not dose-response related with maternal Methadone intake • Increased risk if greater than five to seven days of continuous opioids exposure • Many women are polysubstance users
Modulating factors	• Length of exposure • Maternal pharmokinetics • Neonatal pharmokinetics • Pharmacogenomics • Placental metabolism[1] • Gestational age • Gender • Drug related factors[4,16] o Opioid dose, frequency and timing before birth o Concurrent medication[1]
Risk factors associated with maternal substance use	• Lack of antenatal care • Preterm birth • Vertical transmission of human immunodeficiency virus (HIV) • Fetal growth restriction • Poor maternal general health and nutritional status [1]
Risk of developing NAS	• Reduced by: o Lack of polysubstance use exposure o Preterm birth • Pharmacogenomics[1]

2.3 Resuscitation

Table 6. Resuscitation

Aspect	Good practice point
Antagonist agents (Naloxone and Naltrexone)	• Do not use in baby of opioid using woman in neonatal period including for resuscitation • May precipitate severe rapid onset of seizures related to withdrawal[2]
Respiratory depression	• Normal resuscitation: o Assessment o Stimulation and warmth o Mechanical ventilation as required o Refer to Queensland Clinical Guideline *Neonatal resuscitation*[17]

2.4 Preterm babies

Table 7. Preterm babies

Aspect	Consideration
Preterm babies	• Term babies are more likely to develop NAS than preterm babies with earlier and more severe signs[4] • Preterm babies have less severe NAS related to: o Developmental immaturity of specific opiate receptors and neurotransmitter function o Reduced time exposed to opioids inutero • Reduced fatty deposits of drugs[4]

2.5 Assessment of withdrawal

Table 8. NAS assessment

Aspect	Consideration
Context	• Commence detailed assessment using a validated tool[1,2] • Provides objective data about: o When to commence pharmacological treatment o Whether a drug dose requires alteration • Support maternal involvement in observing baby's signs of withdrawal
Validated tools	• Finnegan Neonatal Abstinence Severity Score[2,18] • Lipsitz tool[1,2,19] • Neonatal Withdrawal Inventory[1,2] • Neonatal Withdrawal Index[1]
Finnegan tool	• Most widely used: o Refer to o Appendix A: Finnegan Neonatal Abstinence Severity Score o Appendix B: Finnegan Neonatal Abstinence Severity Score Description • Recognised as the Australian standard designed for assessment of opioid withdrawal in term babies[2] • May be used to assess other substance-use withdrawal: o Benzodiazepines and alcohol o Neonatal stimulant intoxication[2] ▪ Many neurological features are common in sedative withdrawal, stimulant intoxication and opioid withdrawal[2] • Provide staff training in the use of the tool to increase reliability and scoring consistency[4] • Ensure inter-observer and intra-observer validation of scoring
Finnegan scoring	• Assess for signs of withdrawal half to one hour after each feed o Signs from each of the three sections (systems) of the scoring chart will be present in the withdrawing baby • Allowances must be made for babies who are preterm or beyond the initial newborn period • Select only one score per sign being assessed • Do not disturb the baby when assessing signs[20] • Score recorded reflects the behaviour since the previous assessment averaged over three to four hours

3 Substance exposure inutero

3.1 Exposure to opioids/opiates inutero

Table 9. Exposure to opioids/opiates inutero

Aspect	Consideration
Clinical presentation	• Equal presentations in both male and female babies[21,22] • Onset of signs of withdrawal: o Heroin: ▪ May be apparent within 24 hours of birth but usually between 24 and 72 hours o Methadone/Buprenorphine : ▪ May be apparent before 72 hours of birth but usually between 72 hours and 7 days
Clinical signs	• Neurologic excitability: o Tremors, irritability, increased muscle tone, frequent yawning or sneezing, seizures • Gastrointestinal dysfunction: o Feeding difficulty, uncoordinated sucking, vomiting, diarrhoea, poor weight gain • Autonomic signs: o Diaphoresis, nasal stuffiness, fever, mottling, temperature instability • Other signs: o Respiratory distress, skin excoriation[1]
Management	• Non-pharmacological supportive care is the first line of treatment o Refer to: ▪ Table 12. Non-pharmacological supportive care ▪ Appendix B: Finnegan Neonatal Abstinence Severity Score Description ▪ Appendix D: Communicating with and comforting baby • Appendix E: Baby stability and stress signals • Pharmacological management o Morphine is the opioid of choice for treatment of opioid NAS[2,15] o Refer to: ▪ Table 13. Pharmacological management ▪ Table 14. Morphine dosing and weaning schedule ▪ Table 15. Phenobarbitone dosing and weaning schedule
Continued hospitalisation	• Five to seven days to provide serial monitoring o Signs of NAS may be delayed up to seven days post exposure • Continue NAS clinical pathway[11] or standardised evaluation and treatment plan

3.2 Exposure to psychostimulants inutero

Table 10. Exposure to SSRIs inutero

Aspect	Consideration
Clinical presentation	• Signs usually mild[23] but may be consistent with a severe NAS (Finnegan score greater than or equal to 8)[24,25] • Timing and intensity of neonatal signs is influenced by maternal dose[24] and duration of treatment • Signs: o Usually present within hours of birth o Mild and usually resolve within two weeks o Unclear whether neonatal withdrawal or neonatal toxicity (serotoninergic) or a combination of both[26] o Serotonergic hyperstimulation (toxicity) and discontinuation syndrome are difficult to differentiate[24]: • Peak of intensity of signs usually on day two[24], but onset may not begin until days five to seven • Mild signs may continue for two to four weeks • Most frequently observed signs include: o Respiratory distress including tachypnoea; temperature instability; gastrointestinal disturbance including feeding difficulties; neurological signs including tremor, jitteriness, irritability, high-pitched cry, floppiness, hypertonicity; hypoglycaemia; jaundice; difficulty settling and sleep disturbance[23,24] o Transient seizures have been reported[24,25] o No neonatal deaths attributable to late-pregnancy SSRI exposure reported
Management	• Provide supportive care similarly to opioid exposed babies[24] • Observe baby for a minimum of 3 days after birth[23,26] for signs of withdrawal o Finnegan score or other validated scoring tool may be used as a guide to withdrawal signs • Significant or prolonged signs of withdrawal may require specialised management including: o Fluid replacement o Sedative (Phenobarbitone)[25]

Table 11. Exposure to Amphetamines/Methamphetamines inutero

Aspect	Consideration
Clinical presentation	• Lower one minute Apgar score[27] • May be excessively somnolent or feed poorly[28] • May develop NAS although may not require medication • Use close to birth may cause baby to be agitated and over-active[2] • May be dose-response relationship resulting in neurotoxic effects o Heavy use is related to lower arousal, more lethargy increased physiologic stress[29]
Management	• Provide supportive care • Observe baby for signs of withdrawal o Finnegan score or other validated scoring tool may be used as a guide to withdrawal signs • Requirement for pharmacological treatment rare[2] • Provide education to woman and family

4 Withdrawal management

Management and treatment includes non-pharmacological supportive care as the first line of treatment[2,9,12,30,31] and pharmacological therapy based on specific assessment criteria.

4.1 Non-pharmacological supportive care

Table 12. Non-pharmacological supportive care

Aspect	Consideration
Feeding	• Encourage breastfeeding unless risks clearly outweighs benefits • Advise and support woman to cease alcohol or drug use[32] rather than not breastfeed • Recommend breastfeeding to women on opiate replacement therapy who are not using illicit drugs[33] (e.g. Amphetamines or Cocaine) • Refer to Section 5 Feeding
Environment	• Rooming-in to enhance bonding and reduce stigma[20,33] o May lead to shorter detoxification period[9] • Respond to baby cues o Provide position and comfort measures (e.g. swaying and rocking[31]) • Avoid overstimulation o Limit exposure to lights and sound o Promote clustering of care o Provide swaddling and holding[20,31,33] • Minimise hunger and high calorie needs o Encourage breastfeeding or frequent small volume of formula feeds[20,31,33] • Refer to: o Appendix C: Supportive care o Appendix D: Communicating with and comforting baby o Appendix E: Baby stability and stress signals
Paediatric review	• Ensure early and daily review by a paediatrician (by teleconference with referral centre if required) when any baby: o Shows signs of NAS o Commences Morphine or Phenobarbitone o Is on maximum doses of medication and continues to show signs of withdrawal • Has signs of NAS where exclusion of alternative causes is not possible

4.2 Pharmacological therapy

Table 13. Pharmacological management

Aspect	Considerations
Indications	• Supportive therapy does not adequately control signs of withdrawal • Finnegan scores: o Three (3) scores average eight (8) or more (e.g. 9–7–9) o Two (2) consecutive scores of 12 or more[2,34]
Care and monitoring	• Consult and discuss with parents • Admit baby to nursery (as per local protocol) for close observation and monitoring Explain positioning and monitoring to parents
Morphine	• Opioid of choice for treatment of opioid NAS[2,15] o Less likely to have seizures o Less likely to require treatment with second line agent o Duration of treatment may be less[2] • Titrate doses to NAS scores to control signs of NAS[2] o Refer to Table 14. Morphine dosing and weaning schedule
Phenobarbitone	• May be used as adjunct to Morphine if signs of NAS not adequately suppressed on maximum Morphine dose[2] • Initial treatment where substance used by woman: o Is unknown o Not usually required if NAS due to tobacco, cannabis, amphetamine or cocaine o Is a sedative such as benzodiazepines o Causes alcohol intoxication at birth[2] o Is a SSRIs and some antidepressants o Includes polysubstances • Loading dose likely to achieve more rapid control of NAS when used as initial therapy[2] • Titrate doses to NAS scores • Refer to Table 15. Phenobarbitone dosing and weaning schedule

4.2.1 Morphine schedule

Table 14. Morphine dosing and weaning schedule

Morphine hydrochloride (1 mg/mL) used for opiate withdrawal[34]				
Finnegan score (record every 4 hours)	**Dose**	**Route**	**Frequency**	**Considerations**
3 consecutive Finnegan scores average of 8 or more[2,34] ***OR*** 2 consecutive Finnegan scores of 12 or more[2,34]	**Commence with:** 0.5 mg/kg/day (in four divided doses 0.125 mg/kg/dose)[2,34]	Oral	6 hourly[2]	**Monitoring:** • Apnoea monitor when commencing Morphine • Titrate doses to control signs of NAS according to Finnegan scores[2,12]
Finnegan score greater than or equal to 8 despite Morphine 0.5 mg/kg/day	**Increase dose to:** 0.7 mg/kg/day	Oral	6 hourly	Continue: • Monitoring
Finnegan score greater than or equal to 8 despite Morphine 0.7 mg/kg/day	**Increase dose to:** 0.9 mg/kg/day	Oral	6 hourly	**Monitoring:** • Cardio-respiratory or oxygen saturation monitor when 0.7 mg/kg/day or more[34]
Finnegan score greater than or equal to 8 despite Morphine 0.9 mg/kg/day	**Increase dose to:** 1.0 mg/kg/day	Oral	6 hourly	**Consider:** • Addition of Phenobarbitone if Finnegan scores persist greater than or equal to 8 despite Morphine 1.0 mg/kg/day[34]

- Paediatrician review
  - Prior to commencing medication
  - Daily or more frequently until withdrawal signs controlled (i.e. NAS score less than 8)
  - On maximum dose and schedule and still showing signs of NAS
- Frequency of dose increase:
  - Depends on clinical response and severity of NAS signs
  - May also require reduction in dosing interval to 4 hourly
  - May also require increase in the total daily dose
- Consider the addition of Phenobarbitone:
  - If NAS signs not adequately controlled:
  - Where there has been concurrent use of opioid and non-opioid drugs in pregnancy, particularly Benzodiazepines[2]

Weaning Morphine

- Reduce Morphine dose when Finnegan scores are consistently less than 8 (when scored every 4–6 hours) for 48–72 hours
- A longer period on a particular dose or even an increase in dose may be required if Finnegan scores rebound during the weaning period[2]
- Weaning rate should be modified according to clinical response. Do not reduce dose by more than 0.1 mg/kg/day within 48 hours of a prior reduction unless there are other indications such as over-sedated baby

From 4 hourly dosing schedule	**From 6 hourly dosing schedule**	**Considerations**
• Reduce dose by 0.01–0.2 mg/kg/day no more than every 48 hours until 0.2 mg/kg/day ***then*** • Maintain same daily dose and reduce frequency to 6 hourly (i.e. 4 doses per day)	• Reduce dose by 0.1–0.2 mg/kg/day no more than every 48hours	• Cease respiratory monitoring when dose is less than 0.5 mg/kg/day, if the baby is able to be nursed in accordance with sudden infant death syndrome (SIDS) Guidelines[30] • **Continue** Finnegan scores for 72 hours after ceasing Morphine
• **Discontinue** when daily dose is 0.10–0.12 mg/kg/day based on birth weight or current weight which is ever greater		

Dosing of the vomiting baby

- Reduce the risk of baby vomiting Morphine dose by:
  - Giving the dose before a feed
  - Ensuring the baby is not overfed
- Repeat dose once only if large vomit within 5 minutes of receiving the Morphine dose[34]

4.2.2 Phenobarbitone schedule

Table 15. Phenobarbitone dosing and weaning schedule

<table>
<tr><th colspan="5">Phenobarbitone</th></tr>
<tr><td colspan="5">Phenobarbitone is the preferred treatment for non-opioid related NAS.[12]
Use as an initial treatment if babies with signs of NAS reach treatment threshold and
• Maternal drugs used are unknown
• Maternal drugs used are non-opioid
• Woman was intoxicated with alcohol or non-opioid drugs at the time of birth[2]</td></tr>
<tr><th>Finnegan score (record every 4 hours)</th><th>Dose</th><th>Route</th><th>Frequency</th><th>Considerations</th></tr>
<tr><td>3 consecutive Finnegan scores average of 8 or more[2]

OR

2 consecutive Finnegan scores of 12 or more[2]</td><td>Loading dose:
10–15 mg/kg[34]

THEN

Maintenance dose:
5 mg/kg/day in two divided doses[2]</td><td>Oral or intravenous (IV) if not tolerating oral intake[34]</td><td>Maintenance dose:
12 hours after loading dose[34]

Continue:
12 hourly</td><td>• Loading dose is likely to achieve more rapid control of signs[2]
• Titrate doses to control signs of NAS according to Finnegan scores[2]</td></tr>
<tr><td>Finnegan scores greater than or equal to 8 despite Phenobarbitone dose 5 mg/kg/day</td><td>Increase dose to:
8 mg/kg/day</td><td>Oral or IV</td><td>12 hourly</td><td></td></tr>
<tr><td>Finnegan scores greater than or equal to 8 despite Phenobarbitone dose 8 mg/kg/day</td><td>Increase dose to:
10 mg/kg/day</td><td>Oral or IV</td><td>12 hourly</td><td>Monitoring:
Cardiorespiratory monitor when dose 10 mg/kg/day or more</td></tr>
<tr><td colspan="5">• Paediatrician review
o Prior to commencing medication
o Daily or more frequently until withdrawal signs controlled
o On maximum dose and schedule and still showing signs of NAS
• If NAS signs not controlled on maximum dose reconsider diagnosis</td></tr>
<tr><th colspan="5">Weaning Phenobarbitone</th></tr>
<tr><td colspan="5">• Reduce Phenobarbitone dose by 10 to 20% when Finnegan scores consistently less than 8 (when scored every 4–6 hours) for 72 hours
• Dose reductions should not occur more often than every 72 hours following regular clinical review of withdrawal signs</td></tr>
<tr><th colspan="5">Dosing of the vomiting baby</th></tr>
<tr><td colspan="5">• Reduce the risk of baby vomiting the Phenobarbitone dose by:
o Giving the dose before a feed
o Ensuring baby is not overfed
• Repeat dose if large vomit within 5 minutes of receiving the Phenobarbitone dose[34]</td></tr>
</table>

4.3 Child protection issues

Table 16. Child protection

Aspect	Consideration
Context	• Children being brought up in a substance-using environment are at greater risk of poor health and wellbeing outcomes that can have long term effects including in adulthood[16,35,36] • Exposure to maternal high risk behaviours may occur (e.g. prostitution or criminal activities[37]) • The 2012 Australian Institute of Health and Welfare Report *A picture of children's health* identified that in Australia, of parents with children 0 to14 years, an estimated: o 12% used an illicit or licit substance o 15% drank more than four standard drinks on one occasion at least weekly o 30% drank more than four standard drinks on one occasion at least monthly o 20% drank at risk levels for long-term harm[38] • Baby may be subject to social issues including poor parenting, inadequate attachment, child protection concerns and potential for fostering or adoption[35,37] • Schooling and learning difficulties, and behavioural concerns may develop during childhood[35] • Australian child abuse notification have risen in last decade o Major parental risk factors include drug and alcohol use[36] • Not all children exposed to illicit drugs have involvement of child protection services[37] o Some women are motivated to make behavioural changes for the wellbeing of the baby or concerns the child may be taken into care • Parents may experience greater stress from caring with a child with higher needs • Ability to respond to the child's needs are altered during periods of heavy use, withdrawal or non-use[37]
Antenatal	• Undertake psychosocial screening • Assess short term risk by multidisciplinary team • Complete and submit *Suspected child in need of protection* form to Department of Communities, Child Safety and Disability Services (DoCs)[39] as per local protocol • Follow appropriate direction and advice from DoCs[39] • Involve multidisciplinary team in care and discharge planning • Encourage engagement of the family with appropriate services[37] • Refer to Queensland Clinical Guideline *Perinatal substance use: maternal*[10]
Post birth	• Baby is not removed from maternal care without woman's consent except by court order[40] • Undertake a duty of care report to DoCs where a reasonable suspicion that the child has suffered, is suffering or is at unacceptable risk of suffering significant harm where there is no parent able and willing to protect the child form harm[40] • Complete and submit *Suspected child in need of protection* form to DoCs[39] • Follow relevant guidelines regarding child protection matters[40-42] ensuring parents are kept informed[42]

5 Feeding

Support the woman's choice of feeding and provide guidance and education.

5.1 Breastfeeding

Table 17. Importance of breastfeeding

Aspect	Consideration
Importance	• Optimal for meeting nutritional need of baby[43] • Well known advantages to mother-baby dyad[32,43] • Benefits generally outweigh risks • Reduces the incidence of NAS and length of time pharmacotherapy required[32,44,45] • Breast milk is: o Analgesic for babies o Beneficial for soothing agitated babies[1,46] • Decreased stress response and increased vagal tone in lactating women[32] • Higher caloric requirements in babies with NAS
Management	• Refer to Queensland Clinical Guideline: *Establishing breastfeeding*[47] • Express breast milk baby with disorganised suck or who fails to engage in nutritive sucking for a sufficient length of time • Provide education and support to ensure appropriate feeding • Feed on demand to initiate and establish lactation • Follow baby feeding cues regarding frequency and volume • Supplementary feeds may be required for adequate caloric intake • Weight is an indicator of adequate caloric intake • Pacifier or dummy may be required as part of non-pharmacological care of the withdrawing baby[2] • Refer to lactation support services (e.g. lactation consultant or child health nurse) • Encourage skin to skin contact[32] • Abrupt cessation of breastfeeding may precipitate NAS[13] • Advise gradual weaning of breastfeeding[32] • Avoid breastfeeding for 24 hours after an individual dose of an illicit drug (other than prescribed opiate replacement therapy such as Methadone or Buprenorphine)[44] • Refer to Queensland Clinical Guideline: *Perinatal substance use: maternal* for additional information[10]

5.1.1 Breastfeeding precautions

Table 18. Breastfeeding precautions

Aspect	Consideration
Context	• Substantial rebound rates of alcohol use, binge drinking, tobacco and cannabis use in the postpartum period[32] • Women with postpartum depression are at increased risk of substance use or return to substance use[32] • Maternal psychopathology is more common in substance using women related to: o Poor judgement o Enhanced physical risk to breastfeeding baby[32] • Methadone concentration in breast milk is low[43] and unrelated to maternal dose[33] • No adverse effects to Buprenorphine exposure in breast milk[48] • Amphetamines are transferred into breast milk • Regular intake of 20mg daily results in amphetamine detection in baby[44] • Concentrated in breast milk 2.8–7.5 times maternal plasma[32]
Contraindications	• Not recommended for: o Persistent maternal use of heroin or stimulants such as amphetamines, cocaine and alcohol[44] • Contraindication: o HIV positive mother even if being treated and has low viral load[44,49]
Precautions	• Potential effects of maternal substance use on breastfeeding baby: o Maternal somnolence o Lack of adequate sleep-wake cycling • Risk of injury to baby including accidental smothering[32] o Advise: ▪ Not to breast feed for 24 hours after using amphetamines ▪ To express and discard milk after drug use ▪ To have supplementary feeding plan[2] • Hepatitis C positive mother is **not a** contraindication[2]
Risk assessment and management	• Discuss risks on case by case basis for each woman's situation[44] • Consider: o Risk of exposure to alcohol and drugs in breast milk o HIV status o Specific patterns of substance use by woman o Availability of safe and affordable breast milk substitutes o Access to clean water and equipment o Age of the baby[32] • Reduce risk by: o Altering timing of breastfeeding • Use of temporary alternatives (e.g. frozen expressed breast milk (EBM) or formula)

5.2 Formula feeding

Where the woman chooses or is not available to breastfeed or breastfeeding is not recommended provide education regarding suitable formula preparation, transport and storage of formula; appropriate warming of feeds and cleaning of bottles and other equipment.[50]

6 Discharge

The potential for negative outcome increases in the presence of cumulative risk factors[51]

Table 19. Length of stay

Aspect	Considerations
Length of stay	• Length of stay is influenced by type and degree of antenatal exposure to substances • Opioid exposure o Minimum five to seven days[2] o Observe for five days if: ▪ Usual care is being provided ▪ Appropriate follow up is arranged • SSRI exposure o Minimum of three days is recommended, but longer may be required[23]
Parental preparation	• Assess woman's: o Current drug usage o Psychological stability o Parent crafting abilities o Social situation • Consider and review ongoing needs by multidisciplinary team, including DoCs if relevant • Review antenatal screening, including psychosocial assessment to identify risk factors o Refer to Table 3. General principles • Engage with local and primary care providers for additional psychosocial information and post discharge follow up • Plan for potential relocation of mother post discharge, including contact with local service providers • Provide written formal discharge plan ensure designated case manager ensures implementation and follow up
Parent education	• All routine parental education is indicated • SIDS (increased risk in babies exposed during pregnancy to opioids)[9] and sudden unexplained death in infancy(SUDI)[2,30] • Safe sleeping practices[30] • Sedating substances and sleeping accidents • Apnoea recognition and management • Cardiopulmonary resuscitation • Risk of environmental tobacco smoke • NAS scoring • Medication administration (where appropriate)
Discharge criteria	• Baby is: o Clinically stable o Feeding well and gaining weight • Home environment is considered safe • Care will be provided by responsible adults • Pharmacy has capacity to supply medication (if required) • Parent education provided

6.1 Discharge planning

Table 20. Discharge planning

Aspect	Considerations
Delay discharge	• Absolute contraindications: o Weight loss greater than 10% of birth weight o Baby less than five days of age o Suspected neglect or abuse o Suspected home violence o Ongoing assessment of withdrawal required o Commencement of pharmacological therapy o Court order preventing discharge[2] • Relative contraindications: o Poor ability of woman to care for baby including parent crafting and monitoring of baby's wellbeing o Inadequate home support or refusal to accept assistance o Continued problematic drug use or polydrug use o Erratic behaviour, psychological distress or emergent mental health issues o Inadequate housing arrangements o Inability to provide safe monitoring of baby
Child safety	• Raise concerns if: o Continued intravenous or illicit drug use o Suspected baby neglect o Suspected domestic violence o Other issues identified from social work assessment o Issues identified during planning for safe discharge home • Develop safety plan by multidisciplinary team for baby in case of non-compliance or failure to engage with community services by parents • Notify appropriate department (e.g. DoCs) regarding: o Concerns according to legislative and policy requirements[40] o If woman plans to be non-compliant with baby's required length of stay or management of NAS
Immunisation	• Maternal hepatitis B surface antigen (HBsAg) positive or hepatitis B status unknown, urgent serology not available or unable to determine antigen status: o Immunise baby with hepatitis B immunoglobulin (HBIG)100IU immediately after birth (preferably within 12 hours of birth and definitely within 48 hours of birth) **and** o Hepatitis B vaccination concurrently in separate thigh (preferably within 24 hours of birth and definitely within 7 days of birth) o Hepatitis B vaccination subsequently given at 2,4, and 6 months o Anti-hepatitis B surface antibody (anti-HBs) and HBsAg levels are measured in babies of women with chronic hepatitis B infection 3–12 months **after** completing primary vaccination course o Adequate anti-HBs levels (greater than or equal to 10 mIU/mL) and negative HBsAg deems the baby protected o Expert advice is required for babies where anti-HBs level is less than 10 mIU/mL • All other vaccinations are as per the current schedule[52,53] o Refer to The Australian Immunisation Handbook

6.2 Home medications

Table 21. Home medications

Aspect	Considerations
Criteria	• Psychosocial assessment completed and risk assessment regarding safety of baby completed • Term healthy baby with primary reason for hospitalisation NAS • Baby is feeding well and gaining weight • Baby stable on medication and has tolerated a dose reduction with no increase in signs in the following 72 hours • Dose of Morphine (if used) less than 0.5mg/kg/day • Dose of Phenobarbitone (if used) less than 5 mg/kg /day • Parent(s)/carer(s) able to administer withdrawal medication • Safety of home environment and parenting abilities of woman and partner are adequate[2] • Support and follow up arranged including emergency contacts • Pharmacy capacity to dispense medication
Medication specific parent education	• Medication: o Administration o Signs of toxicity and actions required o Storage and safety including distinctively labelled child proof bottle, parental provision of locked box for storage of medication, clear instructions regarding administration and 24 hour contact number for any concerns • Action if baby vomits following dose administration
Support services	• Develop well-coordinated outpatient discharge plan with multidisciplinary team • Provide outpatient appointments • Refer to relevant community health services (e.g. child health and perinatal and infant mental health services) • Prescribe and dispense medication in single dose prepared syringes for time limited period (i.e. next paediatric clinic or general practitioner (GP) appointment) o Ensure formulary consistent to avoid confusion

6.3 Follow up

Table 22. Follow up

Aspect	Consideration
Review	• If baby: o Required monitoring and or medication arrange review one week after discharge from hospital o Discharged home on medication arrange paediatric review weekly until medication ceased
Child health services	• Refer parents to available services for parenting and other ongoing information and advice
Early intervention programs	• Support parents with ways to promote all aspects of baby's development • Optimize developmental outcomes by early interventions addressing: o Specific problem areas o Caregiver's level of stress, mental health functioning and continued substance use o Parenting interactions[54]
Longer term follow up	• Refer for assessment dependent on: o Cumulative risk factors o Domain of developmental difficulty o Quality of the care giving environment • Ophthalmological: for myopia and strabismus • Growth, neurodevelopment[28], emotional[55] and behavioural problems o Developmental follow up is suggested for at least 12 to 24 months[56] • Intervention programs for speech and language, occupational and behavioural issues are beneficial[54] • Refer baby and parents to available infant mental health or child and youth mental health service when: o Significant psychosocial complexity and intensive parent-infant relationship support is required o Baby is at risk of non-organic failure to thrive and emotional neglect
Maternal hepatitis C positive	• Refer to Queensland Clinical Guideline *Perinatal substance use: maternal*[10] • If concerned baby is infected[57] or will be lost to follow up, test baby for infection by polymerase chain reaction (PCR) at two to three weeks • Perform HCV, ribonucleic acid (RNA) test at or after 3 months[49] o If negative consider HCV antibody test at or after 18 months to demonstrate passive maternal antibody clearance[49] o If positive refer to paediatric infectious diseases physician or gastroenterologist • Perform HCV antibody test at 12–18 months o If HCV antibody positive: ▪ Perform HCV, RNA and Liver Function Test and refer to paediatric infectious diseases physician or gastroenterologist if result is positive o If HCV antibody test is negative, then baby is not infected[49,53] • Refer to Appendix F: Management and follow up of baby of hepatitis C infected woman

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Appendix A: Finnegan Neonatal Abstinence Severity Score

- Assess babies at risk of narcotic withdrawal for signs of withdrawal ½ to 1 hour after each feed
- Do not disturb the baby when assessing signs
- The score reflects the behaviour since the previous assessment
- Babies who display signs of withdrawal will have signs from each of the three sections—CNS, GIT and Respiratory/vasomotor disturbance—on the scoring chart
- Choose one score only for each sign
- Make allowances for babies who are preterm or beyond the initial newborn periodAppendix B: Finnegan Neonatal Abstinence Severity Score Description

SYSTEM	SIGN	SCORE								
Central nervous system disturbances	Excessive high pitched cry Continuous high pitched cry	**2** **3**								
	Sleeps < 1 hour after feeding Sleeps < 2 hours after feeding Sleeps < 3 hours after feeding	**3** **2** **1**								
	Hyperactive Moro reflex Markedly hyperactive Moro reflex	**2** **3**								
	Mild tremors disturbed Moderate–severe tremors disturbed Mild tremors undisturbed Moderate–severe tremors undisturbed	**1** **2** **3** **4**								
	Increased muscle tone	**2**								
	Excoriation	**1**								
	Myoclonic jerks	**3**								
	Generalised convulsions	**5**								
Gastrointestinal disturbances	Excessive sucking	**1**								
	Poor feeding	**2**								
	Regurgitation Projectile vomiting	**2** **3**								
	Loose stools Watery stools	**2** **3**								
Respiratory/vasomotor disturbances	Sweating	**1**								
	Fever 37.3 to 38.3 °C Fever 38.4 °C and above	**1** **2**								
	Frequent yawning > 3–4 in half hour	**1**								
	Mottling	**1**								
	Nasal stuffiness	**1**								
	Sneezing > 3–4 in half hour	**1**								
	Nasal flaring	**2**								
	Respiratory rate > 60/minute Respiratory rate > 60/minute and retractions	**1** **2**								
	TOTAL SCORE									
	SCORER'S INITIALS									

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Appendix B: Finnegan Neonatal Abstinence Severity Score Description

System	Sign	Description
Central nervous system disturbances	Excessive high pitched cry	Baby cries intermittently or continuously for **up to 5 minutes** despite caregiver intervention Baby is unable to decrease crying within a 15 second period using self-consoling measures
	Continuous high pitched cry	Baby cries intermittently or continuously for **greater than 5 minutes** despite caregiver intervention NB: Since a baby's cry may vary in pitch, this **should not be scored** if high pitched crying is not accompanied by other signs described above
	Sleep	**Longest period** baby sleeps within the entire scoring interval including light and deep sleep **Light**—irregular breathing, brief opening of eyes at intervals, some sucking movements **Deep**—regular breathing, eyes closed, no spontaneous activity
	Hyperactive Moro reflex*	Baby exhibits **pronounced jitteriness of the hands** during or at the end of the test for Moro reflex
	Markedly hyperactive Moro reflex*	Baby exhibits jitteriness and repetitive jerks of the hands and arms during or at the end of the test for the Moro reflex
	Mild tremors when disturbed**	Baby exhibits observable tremors of the **hands or feet** when being handled
	Moderate to severe tremors when disturbed**	Baby exhibits observable tremors of the **arm(s) or leg(s)** with or without tremors of the hands or feet when being handled
	Mild tremors when undisturbed**	Baby exhibits observable tremors of the **hands or feet** whilst undisturbed
	Moderate to severe tremors when undisturbed**	Baby exhibits observable tremors of the **arm/s or leg/s** with or without tremors of the hands or feet whilst undisturbed
	Increased muscle tone when the baby is awake and not crying	Baby has **tight flexion** of the arms and legs that is unable to slightly extend the arms or legs
	Excoriation	**First appearance or increase** on baby's **chin, knees, cheeks, elbow, toes or nose** due to friction burn not nappy area excoriation from loose stools
	Myoclonic jerks	Baby exhibits **twitching movements** of the muscles of the face or extremities or jerking movements of the arms or legs
	Generalised convulsions	Baby has generalised activity involving tonic (rigid) extensions of all limbs (or may be limited to one limb only), or manifested by tonic flexion of all limbs; or generalised jitteriness of extremities that do not stop when the limbs are flexed or held Features of **subtle seizures** may be present including eye staring, rapid eye movements, chewing, fist clenching, back arching and cycling motion of limbs with or without autonomic changes
Gastrointestinal disturbances	Excessive sucking	Baby shows increased >3 times rooting while displaying rapid swiping movements of hand across mouth prior to **or** after a feed
	Poor feeding	Baby either demonstrates **excessive sucking** prior to a feed, yet sucks infrequently during feeding, taking small amounts and/or demonstrates an **uncoordinated sucking** reflex or **continuously gulps** the milk and stops frequently to breathe
	Regurgitation	Baby regurgitates **not associated with burping 2 or more times** during a feed
	Projectile vomiting	Baby has **≥1** projectile vomiting episode occurring during or immediately after a feed
	Loose stools	Scored if stool which may or may not be explosive is curdy or seedy in appearance A liquid stool, **without a water ring on the nappy** should also be scored as loose
	Watery stools	Baby has soft, mushy or hard stools that are accompanied by a **water ring** on the nappy
Respiratory/vasomotor disturbances	Sweating	Baby has perspiration on forehead, upper lip or back of neck **Do not score** if sweating is due to overheating for example from cuddling or swaddling
	Fever	Baby has a **temperature** as per score sheet
	Frequent yawning	Baby yawns **> 3 times** within scoring interval
	Mottling	Baby has mottling on chest, trunk, arms or legs
	Nasal stuffiness	Baby has **noisy respirations** due to the presence of exudate, with or without a runny nose
	Sneezing	Baby sneezes **>3 times** in the scoring interval occurring as individual episodes or may occur serially
	Nasal flaring	Baby has this at **any time** during the scoring interval Score only if present without other evidence of lung or airway disease
	Respiratory rate	Baby must **not be crying** when this is assessed

*Moro reflex: Do not perform when the baby is crying or irritable
**Mild tremors when undisturbed observe for at least 2 undisturbed periods of 60 seconds
Adapted from: D'Apolito K. A scoring system for assessing neonatal abstinence syndrome. Instruction Manual. 1994.

Abbreviations: > Greater than**; ≥** Greater than or equal to

Appendix C: Supportive care

System	Sign	Suggested supportive measure
Central nervous system disturbances	Excessive or high pitched crying	• Soothe baby with swaddling • Talk quietly/sing/hum • Hold baby firmly to body and rock gently • Use a baby sling • Reduce environmental stimuli o Slow movements o Dimmed lighting o Remove from noise exposure
	Sleeplessness	• Reduce environmental stimuli • Minimise handling, swaddle baby, rock gently • Encourage skin to skin cuddles with parent(s)
	Excoriation (chin, knees, elbow, toes, nose)	• Apply protective skin barriers to affected areas to protect skin and prevent damage
	Myoclonic jerks, tremors, jitteriness, irritability	• Minimise handling—be prepared prior to disturbing baby • Use slow movements, reduced lighting, reduced noise levels, soft music, massage and relaxation baths
	Agitation resulting in scratching of the skin	• Keep hands clean and apply mittens
Gastrointestinal disturbances	Excessive sucking	• Keep hands clean and use mittens to minimise sucking of the fists • Offer pacifier with parents' permission
	Poor feeding (infrequent/uncoordinated suck)	• Feed on demand o Frequent small feeds with rest between sucking • Reduce environmental stimuli during feeding • Assess coordination of suck/swallow reflex—support cheeks and jaw if necessary o Refer to Lactation Consultant as required • Monitor weight loss closely during withdrawal as feeding disturbances are common[2] o If caloric intake appears insufficient with breastfeeding alone supplement with expressed breast milk or formula until adequate caloric intake is achieved[2] • Assess hydration o If insufficient fluid intake review by medical staff
	Regurgitation/vomiting	• Wind or burp baby regularly when he/she stops sucking and at end of feed • Do not over feed
	Peri-anal excoriation due to loose stools/diarrhoea	• Change nappy with every feed and use barrier creams • Expose baby's buttocks to air to dry
	Pain	• Provide usual pain relief as for any baby
Respiratory/vasomotor disturbances	Sweating	• Clean skin regularly, dry clean clothing
	Fever	• Ensure adequate hydration • Reduce environmental temperature and nurse in open cot • Dress in light clothing using lightweight, soft cotton fabric to swaddle or nurse skin to skin with mother
	Nasal stuffiness/excessive nasal secretions	• Use gentle suction if nasal secretions present
	Nasal flaring/tachypnoea	• Review by medical staff if cyanosis or mottling present • Avoid swaddling to allow close monitoring of respiratory rate and effort • Nurse supine unless receiving cardiorespiratory monitoring in the nursery

Adapted from: Commonwealth of Australia. National clinical guidelines for the management of drug use during pregnancy, birth and the early development years of the newborn. 2006.
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Appendix D: Communicating with and comforting baby

Aspect	Consideration
Touching and holding	• Prepare baby for touch with a soft voice • Hold baby in such a way that supports their arms and legs tucked close to their body and hands close to their face • Touch baby in a variety of ways including: • Gentle steady pressure • Rhythmic stroking • When moving your hands away from baby, do so gently and slowly without abrupt movements • Burp baby as needed doing so gently without vigorous patting on their back
Positioning	• Support baby's position with their arms and legs close to their body • Repositioning should be performed with slow gentle movements and without sudden changes
Communicating with baby	• Babies communicate from birth. At first their communication signs are quick and hard to see. Some things to look for are: o A quick look for a few seconds o A sudden stillness o Some other little movement • Talk or sing to baby in a soft voice • Share eye contact and let baby look at your face
Prolonged crying	• Hold baby closely wrapped in a sheet or light blanket/wrap • Avoid loud noises, bright lights and excessive handling • Gentle rubbing or rocking and humming
Sleeplessness	• Allow baby to sleep (don't wake unnecessarily) • Check nappy is clean o Clean with water only and use Zinc cream at each change
Excessive sucking	• Offer pacifier (with woman's consent) if not hungry/due feeding
Vomiting	• Hold baby in upright position and burp after each feed
Poor feeding	• Offer small frequent feeds from the breast or slow flow teat • Feed in quiet, calm surrounding with minimal noise and disturbance
Trembling	• Wrap baby in sheet or light blanket/wrap
Fever	• Avoid too many blankets or clothes on baby • Cotton clothes and wraps are suitable

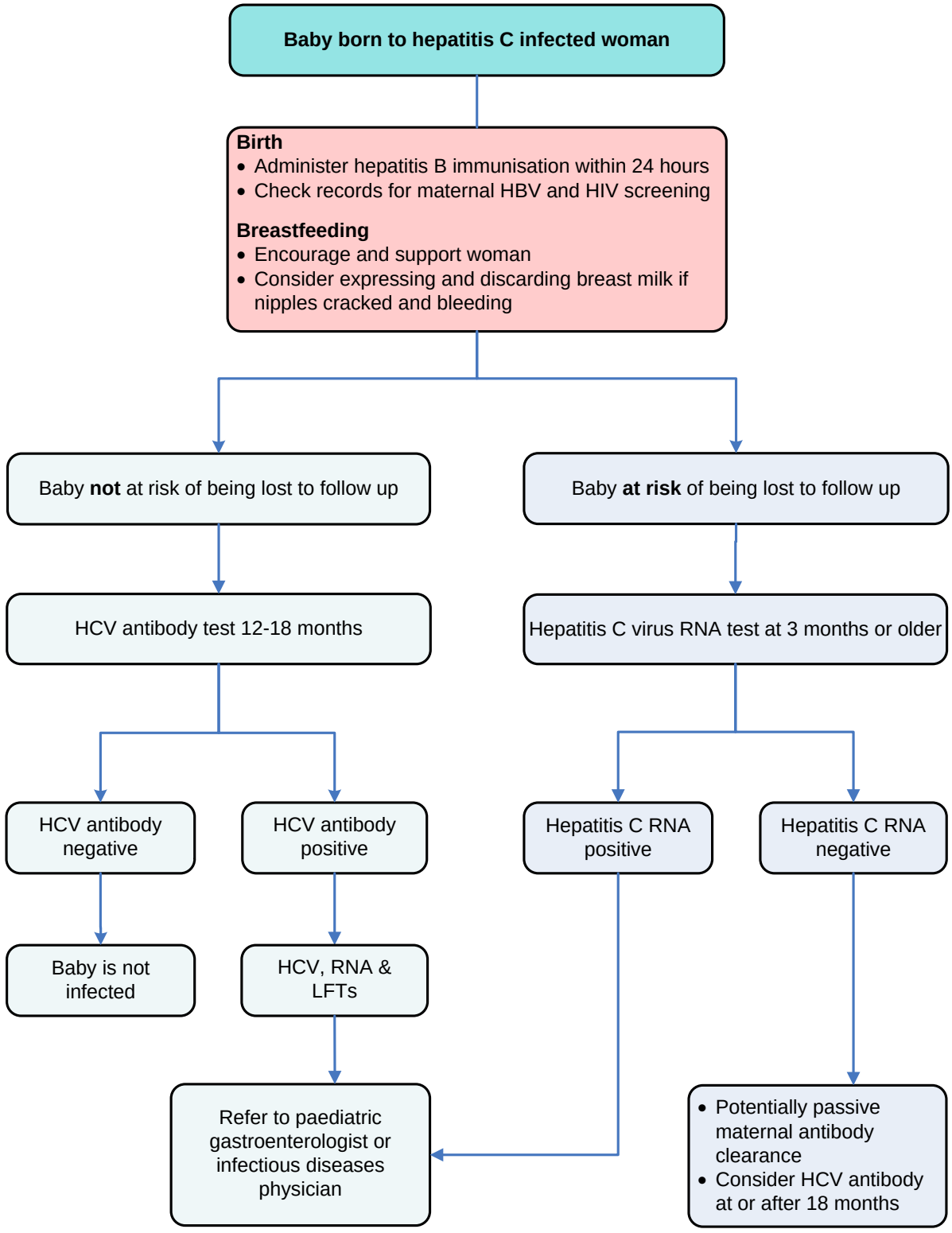
Adapted from: Commonwealth of Australia. National clinical guidelines for the management of drug use during pregnancy, birth and the early development years of the newborn. 2006.
Nelson M. Neonatal abstinence syndrome: The nurse's role. International Journal of Childbirth Education. 2013; 28(1):28-42.
Marcellus L. Neonatal abstinence syndrome: reconstructing the evidence. Neontal Network. 2007; 26(1):33-40.

Appendix E: Baby stability and stress signals

Aspect	Autonomic system	Motoric system	State system
Baby stability signals	• Able to regulate colour and respiration • Reduction of tremors twitches, visceral signals	• Smooth, well-modulated posture and tone • Synchronous smooth movements with: o Hand/foot clasping o Grasping o Hand to mouth activity o Suck/suck searching o Hand holding/tucking	• Clear robust sleep states • Rhythmic robust crying • Self-quieting • Focused shiny eyed alertness with intent or animated facial expression • 'Ooh' face, cooing, attentional smiling
Baby stress signals	• Respiratory pauses, tachypnoea, gasping • Colour changes: o Dusky, pale, mottled, cyanotic • Tremors, startles, twitches • Yawning • Gagging, spitting up • Hiccoughing • Straining • Sneezing, coughing • Sighing	• Flaccidity o Trunk, extremities, face • Hypertonicity with hyperextension of: o Legs, arms, trunk • Finger splays • Facial grimace • Hand on face, fisting • Fetal tuck • Frantic diffuse activity	• Diffuse sleep-wake states • Fussing or irritability • Staring or gaze averting • Panic or worried alertness • Glassy eyed alertness • Rapid state oscillation • Irritability • Diffuse arousal

Reference[58]: Blackburn ST, Vandenberg KA. Assessment and Management of Neonatal Neuro-behavioural Development. In: Kenner C, Lott JW, Flandermeyer AA. *Comprehensive Neonatal Nursing: A physiological Perspective* 3rd ed. USA: Elsevier Science; 1998. [58]

Appendix F: Management and follow up of baby of hepatitis C infected woman



Abbreviations: HBV Hepatitis B virus; **HCV** Hepatitis C virus; **HIV** Human Immunodeficiency virus; **LFTs** Liver function tests; **RNA** Ribonucleic acid

Queensland Clinical Guideline: Perinatal substance use: neonatal F16.38-5-V2-R21

Reference[49,53,59]
Palasanthiran P, Starr M, Jones C, M G. Management of perinatal infections. Australian Society for Infectious Diseases; 2014.
European Paediatric Hepatitis C Virus Network. Effects of mode of delivery and infant feeding on the risk of mother-to-child transmission of hepatitis C virus. British Journal of Obstetrics and Gynaecology. 2001; 1008(April):371-377.
Australian Society for HIV Medicine. Antenatal testing and blood borne viruses 2015

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