



## CLINICAL PRACTICE GUIDELINE FOR BABIES AT RISK OF NEONATAL ABSTINENCE SYNDROME (NAS)

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For further information regarding:

- NAS guideline development process
- Consultation list
- Literature Review to address clinical questions
- Consultation feedback

Contact the Manager, Women’s Alcohol and Drug Service, [wads@thewomens.org.au](mailto:wads@thewomens.org.au) and ask for a copy of the background papers.

## 1. DEFINITIONS

**Blood Born Virus (BBV):** includes Hepatitis B, Hepatitis C and Human Immunodeficiency Virus

**Dependence** is characterised by a strong desire to take a drug. Among the indicators of dependence is impaired control over drug use, a higher priority to drug use than other activities and obligations, increased tolerance, physical withdrawal symptoms, and repeated drug use to suppress withdrawal [1].

**Discontinuation Syndrome** is characterised by rapid development of symptoms unattributable to other causes after abrupt cessation or reduction of antidepressant medication. Symptoms are self-limiting (usually 2-14 days) but may be distressing and, in babies, have been reported to include insomnia, irritability, myoclonus, respiratory distress, hypoglycaemia and seizures [2-5].

**Fetal Alcohol Spectrum Disorder (FASD)** is a term used to indicate the full range of possible effects of fetal exposure to alcohol.

**Fetal Alcohol Syndrome (FAS)** is a term used to indicate the severe effects of alcohol use in pregnancy, characterised by brain damage, facial deformities and growth deficits [1].

**Infant Home Based Withdrawal (IHBW)** is a model of care where babies receiving pharmacological treatment for Neonatal Abstinence Syndrome (NAS) continue treatment at home, subject to satisfactory risk assessments and close domiciliary supervision from a team of health professionals.

**Intrauterine growth restriction (IUGR)** is where the growth of the fetus is abnormally slow. When born, the baby appears too small, considering gestational age (less than 10th percentile). Intrauterine growth restriction is associated with increased risk of medical illness and death in the newborn [6].

**Neonatal Abstinence Syndrome (NAS)** is a syndrome of drug withdrawal observed in babies of women physically dependent [in the 4-6 weeks prior to birth] on drugs manifested by non-specific symptoms and signs in the baby, including neurological excitability, gastrointestinal dysfunction, autonomic signs, poor feeding, sleep-wake abnormalities, vomiting, dehydration, poor weight gain, neuromuscular abnormalities and occasionally seizures [1].

**Substance misuse** is a maladaptive pattern of substance use manifested by recurrent and significant adverse consequences related to the repeated use of substances [7].

A **Teratogen** is a drug or other substance capable of interfering with the development of a fetus, causing birth defects [8].

**WADS** Women's Alcohol & Drug Service, The Royal Women's Hospital.

**Withdrawal** is the development of a substance-specific syndrome due to the cessation of (or reduction in) substance use that has been heavy and prolonged [7].

## 2. PRINCIPLES OF CARE

- 2.1 Privacy and confidentiality must be ensured for all people using health care services (consensus [1]; [9]).
- 2.2 Engagement skills are vital and the aim is to establish a professional, respectful, trusting and empathetic relationship in which clients will feel encouraged to continue engagement with healthcare services (consensus, [1]).
- 2.3 Babies of women dependant on alcohol or drugs are at an increased risk of harm and poor developmental outcomes due to complex interplay of psychosocial and environmental adversity. Assessment of risk of harm or neglect to the baby should occur throughout the pregnancy and postnatally [10].
- 2.4 Health outcomes for mothers and babies can be improved with provision of comprehensive models of care with assertive follow-up (consensus [1]; expert opinion [11]). All women dependant on alcohol or drugs should be offered comprehensive models of care, which includes continuity of carers (care manager) and assertive follow-up within a multidisciplinary healthcare team including specialist drug and alcohol service providers, counsellors, dieticians, and social workers (consensus [1]; expert opinion [11]).
- 2.5 If comprehensive models of care, with appropriate expertise are not available, statewide secondary consultation services should be sought from the Women's Alcohol and Drug Service (WADS) on:  
**03 9344 3631**, or out of hours via the Royal Women's Hospital switchboard on **03 9344 2000**.
- 2.6 There is a high incidence of mental health co-morbidity associated with alcohol and drug dependency, which can lead to poor maternal-infant bonding and adversely impact on infant psychosocial development (expert opinion [12]), in addition to serious mental health consequences for the woman. All women and babies should have ongoing assessment for mental health problems by members of the care team who must be able to recognise mental health problems and refer for specialist mental health care when required (consensus [1]).

### 3. MANAGEMENT OF PREGNANT WOMEN WITH ALCOHOL AND DRUG ISSUES

(see appendix 1 for summary flow chart for Antenatal Assessment of risk of NAS and CPG: Alcohol and Drug Issues in Pregnancy: Management

<http://www.thewomens.org.au/AlcoholDrugIssuesinPregnancyManagement> )

#### 3.1 Detection of risk of Neonatal Abstinence Syndrome

3.1.1 All pregnant women should receive comprehensive information about the risks of alcohol and tobacco use in pregnancy (consensus, [1]).

WADS alcohol and pregnancy brochure:

<http://www.thewomens.org.au/AlcoholDrugsDuringPregnancy>

3.1.2 All pregnant women should be screened for substance use at least twice, at the initial visit and at a visit later in pregnancy. More frequent assessments should be made if concerns exist, for example women presenting after 20 weeks pregnancy, with homelessness or altered mental state (local consensus).

3.1.3 Screening should consist of a series of brief questions to maximise disclosure of substance use and prompt staff to ask about, identify and document substance use and misuse (local consensus).

Example questions [13]:

*Have you ever drunk alcohol? Yes/No*

- *What and how much did you drink per week before you were aware you were pregnant?*
- *What and how much do you drink currently?*

*Have you used or are you using tobacco? Yes/No*

Comments:

*Have you used or are you using drugs such as heroin, cannabis, speed, methamphetamines etc? Yes/No*

Comments:

*Are you taking any prescribed medications or treatment? Yes/No*

- *If yes, where/what?*

*Does your partner use cigarettes, alcohol or drugs?*

Comments:

*Did either of your parents use cigarettes, alcohol or drugs?*

Comments:

3.1.4 Women with identified alcohol or drug misuse should have the appropriate options for care discussed and be referred to the Women's Alcohol and Drug Service (WADS), as per 'Access to Antenatal Care at the Women's' to:

- ascertain whether the woman is or may be drug or alcohol dependent
- inform the woman about known risks in pregnancy
- inform the women about her options for specialist care and drug and alcohol counselling (consensus, [1])

The Antenatal care pathway is described in 'RWH CPG: Alcohol and Drug Issues in Pregnancy: Management' (pdf). See link:

<http://www.thewomens.org.au/AlcoholDrugIssuesinPregnancyManagement#AccessToCare>

3.1.1 There is evidence of NAS in babies born to women dependent on (or intoxicated at time of birth with) opioids (including when use ceased within four weeks of birth), stimulants, some sedatives and alcohol (see table 1). NAS is more common in babies born to opioid-dependent women than in babies born to women dependant on other drugs. There is no dose-response relationship between maternal opioid intake and NAS (Level III-1, [1]).

Risk of NAS, and therefore need for a referral of the baby for paediatric care after birth, should be identified in the antenatal documentation. Babies will require assessment for NAS as per table 1.

There is low level evidence of mild delayed withdrawal, not associated with seizures, in babies exposed solely to cannabis in pregnancy. This withdrawal is not usually apparent until at least the second week postnatally (consensus, [1]). Routine NAS assessment in hospital is not required (local consensus).

**Table 1: Summary of effects on baby of in-utero substance exposure and baby assessments recommended**

	Antenatal effects *	Effects on baby in first week **	Sub-acute withdrawal ***	Longer term effects on baby ****	Minimum withdrawal assessments
Alcohol	Teratogen	CNS hyperexcitability, GI symptoms, poor settling, seizures Withdrawal/NAS		FAS, FASD, SIDS risk	NAS scoring for 7 days
Cannabis			Yes	SIDS risk	None
Opiates	Fetal Loss, IUGR, prematurity (greater risk with regular heroin use than with methadone)	Respiratory depression Withdrawal/NAS (seen in up to 66% of exposed babies)	Yes	SIDS risk, Increased risk of strabismus	NAS scoring for 7 days
Sedatives (including Benzodiazepines)	Unconfirmed as a teratogen, case reports of malformations, fetal loss, increased perinatal death	Early onset symptoms associated with hypothermia, poor feeding, respiratory problems, lethargy, hypotonia. Chronic exposure associated with cardiorespiratory, neurological, settling and feeding difficulties	Yes	SIDS risk	Dependent on antenatal medical assessment: - NAS scoring for 7 days - weekly outpatient review until 4 weeks
Stimulants (including amphetamines, cocaine)	Unconfirmed as a teratogen. Case reports of malformations. Placental abruption, IUGR, prematurity, cerebral ischaemic lesions	Agitation, overactivity. Withdrawal/NAS (seen in up to 49% of exposed babies)	Yes		NAS scoring for 7 days. Weekly outpatient review until 4 weeks.
Tobacco	Placental abruption, IUGR, prematurity	Increased motor activity, agitation	Yes	SIDS risk	

\* Maternal lifestyle and health issues associated with all substance dependency may contribute to and compound with substance use, resulting in adverse fetal outcomes

\*\* If Maternal use in last 4-6 weeks of pregnancy or intoxication at the time of birth

\*\*\* Variable muscle tone, agitation, sleep and feeding difficulties reported lasting up to 4-6 months of age

\*\*\*\* Causation of reported long term adverse neurodevelopmental difficulties is controversial due to potential confounding impact of adverse postnatal environmental factors including domestic violence and caregiver mental health issues and frequent polysubstance exposure

### **3.2 Additional antenatal investigations**

- 3.2.1 Pregnant women who are assessed as dependent on benzodiazepines should be offered an antenatal ultrasound at 18 weeks gestation, to detect clefting defects in the fetus (consensus [1]).
- 3.2.2 All pregnant women with a history of intravenous drug use should be offered testing for presence of blood born viruses (BBV), including Hepatitis C. Comprehensive pre and post test counselling should be provided (consensus [1]).
- 3.2.3 All pregnant women with a positive Hepatitis B Virus (HBV) test should be offered a Hepatitis B e-antigen test, as a positive result is associated with a significantly higher rate of mother to child transmission (consensus [14]).
- 3.2.4 All pregnant women with a positive Hepatitis C Virus (HCV) test should be offered a ribonucleic acid polymerase chain reaction (RNA PCR) test to determine if they are viraemic. If positive, women should be referred to a specialist hepatitis clinic to consider treatment options. There is a significantly greater risk of mother to child transmission (2-6%) (consensus [14], expert opinion [15]).
- 3.2.5 Pregnant women with a positive Human Immunodeficiency Virus (HIV) test should be referred to a specialist clinic for treatment and management to reduce the risk of mother to child transmission (consensus [1]).

### **3.3 Antenatal education**

- 3.3.1 Pregnant women who are dependent on alcohol or drugs should be offered routine childbirth education, either individually or with a group. They should also be offered additional antenatal education, including:
- the baby's risk of NAS, assessment and treatment methods, and the need for an extended postnatal stay to monitor the baby (consensus [1])  
WADS NAS parent information brochure:  
<http://www.thewomens.org.au/AlcoholDrugsDuringPregnancy>
  - supportive care techniques for the baby, all babies exposed to maternal substance use are at risk of developing some withdrawal symptoms
  - the increased risk of SIDS and advise not to co-sleep with baby when affected by drugs, alcohol or sedating medication  
WADS SIDS safe sleeping brochure:  
<http://www.thewomens.org.au/AlcoholDrugsDuringPregnancy>
  - CPR training should be offered in the antenatal and postnatal period, due to the increase in risk of SIDS (local consensus)
  - breastfeeding
  - pain management in labour

### **3.4 Assessment for Infant Home Based Withdrawal**

Where infant home based withdrawal (IHBW) services exist, eligibility for providing infant home based withdrawal (IHBW) should be assessed in pregnancy (usually at 36 weeks) by an experienced social worker/counsellor in consultation with pregnancy care providers (local consensus). See appendix 2 for assessment tool.

### **3.5 Timing of birth**

There is no indication for an induction of labour solely because of maternal substance use (consensus [1]). If clinically indicated, induction should preferably be arranged early in the week when experienced midwives and neonatal specialists are more likely to be available to closely monitor the baby (consensus [1]).

### **3.6 Precautions**

If a pregnant woman is BBV antibody positive, care should be taken during birth to minimise the baby's exposure to maternal secretions during birth (eg avoid using fetal scalp electrodes or fetal scalp sampling) (consensus [1]).

#### **4. MANAGEMENT OF BABY AT RISK OF NAS**

(See Appendix 3 for summary flow chart for Assessment and Care of babies at risk of NAS)

##### **4.1 Resuscitation**

- 4.1.1 In the event of respiratory depression in the baby, normal resuscitation methods should be used, including thorough assessment and mechanical ventilation as required (consensus [1], [16]).
- 4.1.2 If there is a history of regular maternal opioid use during pregnancy, use of antagonist agents such as naloxone during resuscitation of the baby is contraindicated, because severe rapid onset seizures associated with withdrawal may be precipitated (consensus [1]).

##### **4.2 Differential diagnosis and investigations**

- 4.2.1 Part of routine care for every baby is to observe the baby's feeding and behaviour. If a baby shows behaviour consistent with withdrawal (i.e. unsettled, irritable, high pitched cry, tremors/jitteriness, poor feeding and/or diarrhoea) further assessment should be undertaken including consideration that antenatal maternal substance use may have caused withdrawal symptoms and referral made to a paediatrician (local consensus).
- 4.2.2 Differential diagnosis should include consideration of discontinuation syndrome, which may occur in up to 30% of babies born to women who use antidepressants, particularly SSRIs (expert opinion [2;17;18]). Onset of symptoms in babies varies depending on the specific pharmacological properties of the medication but is usually seen within 4 days of birth. If suspected or anticipated:
- refer baby to paediatrician
  - use Finnegan assessment tool to monitor baby's welfare for a minimum of the first three days of life
  - arrange weekly outpatient review until 4 weeks of age
  - consider referral of mother to a psychiatrist for consultation about possible effects of psychotropic medication on the baby and advice about psychotropic medication use in the post-natal period, particularly where mother is intending to breastfeed.
- 4.2.3 Feeding and gastrointestinal disturbances are common in babies withdrawing from maternal substance use. Therefore babies at risk of NAS should be weighed daily to closely monitor caloric intake. If a baby is losing weight with breastfeeding alone, consideration should be given to the use of supplemental expressed breast milk or formula until adequate milk supply is established (consensus [1]).
- 4.2.4 Clinical signs similar to those of NAS may be caused by concurrent illness, such as infection and hypoglycaemia (consensus, [1]). This should be considered when assessing a baby at risk of NAS (consensus [1]).
- 4.2.5 Investigations should be performed as required for diagnosis and not solely on account of a history of maternal drug use (local consensus).
- 4.2.6 Routine urine or meconium drug screening for illicit drugs is not recommended in mothers or babies, unless considered of diagnostic importance to determine which drugs the mother has been using (eg. if the infant has signs of NAS and the drugs used by the mother are unknown). Informed consent for testing should be obtained wherever possible (consensus [1]).
- 4.2.7 Babies of women dependant on alcohol should be assessed after birth by a paediatrician for signs of fetal alcohol syndrome (FAS). Signs of FAS may not be

apparent at birth, therefore parents should be advised that further follow-up will still be required (local consensus).

### **4.3 Settings of care**

4.3.1 In order to promote mother-baby bonding, babies at risk of NAS should be cared for with the mother, unless contraindicated by the medical condition of mother or baby (consensus [1]).

4.3.2 If babies are separated from their mother, efforts should be made to maximise parental involvement in care including assessment and care of NAS. Documentation may be required by child protection services of parental involvement in care (local consensus, legal requirement [10]).

4.3.3 SIDS prevention safe sleeping practices should be practiced in hospital (local consensus).

### **4.4 Breastfeeding**

4.4.1 The benefits of breastfeeding are sufficiently important to support the mother's choice to breastfeed unless there is substantial evidence or reasonable consensus that the drug taken by the woman will be harmful to the infant or there is risk of disease transmission. Contraindications to breastfeeding include:

- Intoxication with alcohol or other drugs
- HIV positive mother
- Hepatitis C positive mother who has cracked and/or bleeding nipples (consensus, [1])

4.4.2 Breastfeeding may be contraindicated for intermittent periods, including after drug or alcohol use. All women who breastfeed should be advised how and when to express and store or discard breast milk (consensus [1]) and to develop a safety plan for feeding the baby (see 4.5.2).

4.4.3 Breastfeeding women who use stimulants (amphetamines, ecstasy, or cocaine) should be informed of risks, and advised not to breastfeed for 24 hours after use (consensus, [1]).

4.4.4 Breastfeeding women who smoke cannabis or tobacco should be advised to breastfeed prior to smoking and smoke outside and away from the baby, to minimise secondary exposure to the baby. Heavy use of cannabis may pose a risk of transmission in breast milk, but this is uncertain (consensus, [1]).

4.4.5 Breastfeeding women should be informed that alcohol passes into breast milk, and that there is no known safe level of alcohol consumption (consensus, [19]). If a breastfeeding mother wants to drink alcohol, she should be advised to breastfeed before drinking alcohol (or express and store breast milk), then wait a minimum of 3-4 hours after the last drink before breastfeeding again. If the woman exceeds the recommended levels of alcohol consumption for non-pregnant women, she should be advised to wait approximately 3 hours per standard drink consumed before breastfeeding again (consensus, [1]).

4.4.6 If women or babies are experiencing breastfeeding problems or have complex needs, consider a referral to a lactation consultant (local consensus).

## 4.5 Artificial feeding

4.5.1 Some women may choose to artificially feed their infants. This may be the primary source of nutrition for the infant or provided in conjunction with breastfeeding. Women who choose to artificially feed their infants will require the same information as all women who choose this feeding method (regularly or occasionally), including:

- preparation and storage of formula
- heating of milk in an appropriate manner
- cleaning and sterilisation of feeding equipment.

4.5.2 Women with ongoing or intermittent substance use need to have a safety or backup plan for the times when they are under the influence of substances. This safety plan should be discussed with women prior to their discharge from the acute setting.

Safety plans should include:

- mother's ability/plans to have baby cared for and fed by another appropriate person if she is substance affected
- making formula up prior to substance use.

## 4.6 Assessment of withdrawal

4.6.1 Babies at risk of NAS should be referred for paediatric care after birth (local consensus).

4.6.2 Babies born to women assessed as dependent (or intoxicated at birth) on **opioids** including women who have ceased use within 4 weeks of birth, **alcohol, sedatives or stimulants**, should be assessed for NAS with the modified **Finnegan neonatal abstinence severity scale (NASS)** (see appendices 4 and 5):

- commenced within 2 hours of birth
- repeated every 4 hours (30-60 minutes after feeds) (consensus [1])
- for a minimum of 7 days (local consensus).

4.6.3 Babies of women dependant solely on **cannabis** may have delayed onset of withdrawal, without NAS (consensus [1]) after 10 days and should be referred for weekly assessment until one month of age with a suitably qualified clinician, GP or paediatrician (local consensus), but do not require assessment with the modified Finnegan NASS.

4.6.4 Babies of women dependent on **alcohol, sedatives or stimulants** may develop symptoms in the first 7 days, thus requiring assessment in hospital (consensus [1]). Although not validated for use in this group of babies, in the absence of any other validated tool and the similarity of symptoms observed with those of opiate dependent mothers, the modified Finnegan NASS should be used. Maternal dependence on these substances may also cause delayed onset of infant withdrawal and babies should be referred for weekly assessment until one month of age with a suitably qualified clinician, GP or paediatrician (local consensus).

4.6.5 Symptoms of NAS in preterm babies are similar to those of term babies. The modified Finnegan NASS should be used for assessment of NAS in preterm infants, with modifications in the sleeping and feeding sections to allow for variations in behaviour due to prematurity, as there is no alternative validated tool (see appendix 5) (consensus [1], expert opinion [20]).

## 4.7 Supportive care

4.7.1 Non-pharmacological care is the first line of treatment for all babies exposed to maternal substance use in pregnancy. This includes supportive care interventions such as:

- a quiet setting
- breastfeeding
- use of a pacifier (if parents give consent)
- small frequent feeds
- cuddling
- swaddling
- close skin contact
- carrying in a sling (consensus [1]).

4.7.2 Pain relief for procedures should be provided based on need as for any baby (local consensus).

## 4.8 Pharmacological treatment

4.8.1 Once the modified Finnegan NASS averages 8 or more for 3 consecutive scores, or averages 12 or more for 2 consecutive scores when scored by a staff member experienced in using the modified Finnegan NASS (level III-1 [1])

- transfer baby to special care nursery and
- commence pharmacological treatment.

4.8.2 Pharmacological treatment dose changes should be calculated using birth weight not current weight (expert opinion [21]).

4.8.3 Morphine Treatment

**Morphine Hydrochloride (1mg/ml)** should be administered orally for NAS caused by opioid withdrawal (level III-1 [1]).

**Table 2: Recommended Morphine Treatment Regime**

Score	Morphine Dose
3 consecutive scores average 8 or more	0.5mg/kg (birthweight)/day 4-6 hourly*
2 consecutive scores average 12 or more	0.5 - 0.7mg/kg (birthweight)/day 4-6 hourly* (consider higher dosage)

\*If NAS symptoms are not assessed as controlled with 6 hourly medication, change dose frequency to 4 hourly in the first instance before increasing the dosing amount (local consensus).

4.8.4 Monitoring babies receiving morphine treatment

Babies receiving morphine should be closely monitored including use of an apnoea monitor whilst commencing and stabilising on treatment, as morphine is a respiratory depressant (local consensus). Overdosing may result in respiratory depression, abdominal distension, constipation and rarely urinary retention.

#### 4.8.5 Weaning morphine treatment

Once NAS symptoms have been assessed as controlled (three consecutive scores less than 8) the following weaning process should be implemented, subject to satisfactory paediatric assessment of clinical condition including NASS scores at each stage of weaning process:

**Table 3: Weaning off morphine treatment**

<b>If on 6 hourly dosage</b>	<b>If on 4 hourly dosage</b>	
<b>Care in Hospital</b>	<b>Care in Hospital</b>	
<b>Hospital Withdrawal</b>	<b>Hospital Withdrawal</b>	<b>Planned Infant Home Based Withdrawal</b>
<ul style="list-style-type: none"> <li>maintain dose for 72 hours</li> <li>reduce the total daily dose by 10% every 72 hours</li> <li>when daily dosage is 0.10-0.12mg/kg/day, morphine may be discontinued</li> <li>continue assessment of NAS for a further 72 hours</li> </ul>	<ul style="list-style-type: none"> <li>maintain dose for 72 hours</li> <li>reduce the dose by 10% every 72 hours until 0.2mg/kg/day</li> <li>then change dose frequency from 4 hourly to 6 hourly. This means administer the same dosage only 4 times per day (i.e. 1/3 reduction in amount received daily)</li> <li>discontinue treatment after 72 hours</li> <li>continue assessment of NAS for a further 72 hours</li> </ul>	<ul style="list-style-type: none"> <li>maintain dose for 72 hours</li> <li>reduce daily dose by 10%</li> <li>after 72 hours change from 4 hourly to 6 hourly dosage, keeping the total daily dose the same (i.e. amount of medication per dose increases)</li> </ul>
<b>If on 6 hourly dosage</b>	<b>After transfer to HITH for IHBW</b>	
<b>Care in Hospital</b>	<b>After transfer to HITH for IHBW</b>	
<b>Planned Infant Home Based Withdrawal</b>	<b>After transfer to HITH for IHBW</b>	
<ul style="list-style-type: none"> <li>maintain dose for 72 hours</li> <li>reduce the total daily dose by 10%</li> </ul>	<ul style="list-style-type: none"> <li>discontinue use of modified Finnegan tool for NAS assessment once home</li> <li>reduce daily dose by 10% every 72 hours until 0.10 - 0.12mg/kg (birthweight)/day</li> <li>discontinue treatment after 72 hours</li> </ul>	
<b>After transfer to HITH for IHBW</b>	<b>After transfer to HITH for IHBW</b>	
<ul style="list-style-type: none"> <li>discontinue use of modified Finnegan tool for NAS assessment once home</li> <li>continue reduction of daily dose by 10% every 72 hours</li> <li>when daily dosage is 0.10-0.12mg/kg/day, discontinue morphine after 72 hours</li> </ul>	<ul style="list-style-type: none"> <li>discontinue use of modified Finnegan tool for NAS assessment once home</li> <li>reduce daily dose by 10% every 72 hours until 0.10 - 0.12mg/kg (birthweight)/day</li> <li>discontinue treatment after 72 hours</li> </ul>	

#### 4.8.6 Vomiting

To reduce the risk of the baby vomiting the morphine dose:

- give medication before a feed
- ensure the baby is not being overfed

**Table 4: Vomiting**

If baby vomits	Action
Within 10 minutes of morphine dose →	Redose
10-30 minutes after dose →	Give half dose
>30 minutes after dose →	Wait until next scheduled dose

(expert opinion [21])

#### 4.8.7 Phenobarbitone Treatment

Phenobarbitone may be indicated as an **additional therapy** where there has been concurrent use of opioid and non-opioid drugs in pregnancy, particularly benzodiazepines, and the symptoms of NAS are not adequately suppressed by morphine treatment alone (level III-1 [1]).

#### 4.8.8 Phenobarbitone should be used as the **first line treatment** if babies with signs of NAS reach threshold for treatment, and:

- maternal drugs used are unknown
- maternal drugs used are non-opioid drugs
- the mother was intoxicated with alcohol or non-opioid drugs at the time of birth (consensus, [1])

If used as a first line treatment, a loading dose is likely to achieve more rapid control of symptoms (level III-I [1]).

#### 4.8.9

**Table 5: Recommended phenobarbitone treatment regime**

Score	Dose
<b>All threshold scores</b>	<b>Loading dose:</b> 10-15mg/kg orally or parentally if not tolerating oral intake
	<b>Then (maintenance doses):</b>
<b>Average 8 or more for 3 consecutive scores</b>	6mg/kg (birthweight)/day in 2 divided doses
<b>Average 12 or more for 2 consecutive scores</b>	6-8 mg/kg (birthweight)/day in 2 divided doses (consider higher dosage)

(expert opinion [21])

#### 4.8.10 Assays of phenobarbitone levels should be performed if:

- baby is on high dose ( $\geq 5\text{mg/kg/day}$ ), particularly for a prolonged period
- indicated by clinical condition

#### 4.8.11 Weaning phenobarbitone treatment

Once NAS symptoms have been assessed as controlled (three consecutive scores less than 8) for 48 hours, the phenobarbitone dose should be reduced by 2mg per dose every 4th day or longer until less than 2mg/kg/day, depending on paediatric assessment of clinical condition (expert opinion [21]).

### 4.9 Infant Home Based Withdrawal

#### 4.9.1 Before a baby is discharged home on morphine or phenobarbitone, the care management team must ensure (see appendix 6):

- social circumstances and suitability for IHBW have been reassessed as satisfactory after birth by experienced social worker/counsellor, in consultation with the care team who have had involvement with the

woman throughout pregnancy, including the woman's psychiatrist where applicable

- the safety of the home environment
- adequacy of parenting abilities and the parents ability to administer treatment
- baby is stable on 6 hourly medication at least 48 hours prior to transfer
- a care management meeting has been held and the roles and responsibilities of all carers are clearly identified and understood (see appendix 7)
- a clear discharge plan is in place including home visiting and paediatric follow-up

## **4.10 Discharge**

- 4.10.1 Babies of women dependant on alcohol or drugs are at an increased risk of harm or neglect (consensus [22]). Babies should not be discharged if:
- unresolved medical issues requiring hospitalisation are present
  - weight loss is excessive (>10% of birth weight)
  - a court order prevents discharge home
  - further assessment for withdrawal is required (consensus, [1])
  - parent craft ability of primary carer is inadequate or behaviour is erratic
  - problematic drug use is continued within the home
  - home support is inadequate and assistance is not accepted
  - material goods or housing are inadequate
  - there is lack of availability of community support workers (e.g. weekends and public holidays) (local consensus)
- 4.10.2 Babies should not be discharged and child protection authorities should be notified if:
- neglect or abuse of the baby or siblings is suspected
  - home violence is suspected (legislative requirement [10])
- 4.10.3 The home sleeping environment for the infant should be assessed for safety as per SIDS safe sleeping guidelines by all professionals visiting the home, preferably beginning before the baby goes home (consensus [1]).
- 4.10.4 Babies of women dependant on alcohol or drugs should continue to have long term comprehensive care after discharge (expert opinion [11]). At discharge there should be a formal transfer of responsibilities from the hospital to community services, including personal communication (consensus [23]). A care management meeting should be held to ensure referrals and supports are in place and respective roles and responsibilities are clearly understood. The care manager should assertively follow-up women after discharge to ensure they are engaged with community services (consensus [1]).
- 4.10.5 Child protection services may be involved at any stage before or after the birth. If involved, they are the care manager and assume responsibility for organising appropriate community support (consensus [9]).

## **4.11 Community discharge support**

- 4.11.1 Appropriate community support to promote a safe, stimulating, structured and nurturing environment for the baby should be organised prior to discharge, including:
- Maternal Child Health (MCH) enhanced home visiting service
  - parent education about infant/child cues to promote development of appropriate mother-child relationship (consensus [24])
  - consistent long term follow-up (expert opinion [11], consensus [25])
  - referral to parent groups and day care programs to promote positive neurodevelopment, such as:
    - Positive parenting education/'2-step' program
    - Best Start program
    - 'Peek-a-boo' program, RCH infant mental health unit
    - parenting centres such as Tweddle or Queen Elizabeth Centre
    - other specialist support services for women with alcohol and drug dependence (e.g. Odyssey House). See the Parenting Support

#### 4.12 Follow-up for exposure to specific substances in pregnancy

(see table 2 for a summary of minimum follow-up)

Alcohol in pregnancy is a known teratogen and prenatal exposure to alcohol may cause permanent and long term damage to baby's physical development, intellectual development, behaviour and social development, independence, sexuality and mental health (review [26]).

Babies of women who have consumed more than the recommended daily alcohol consumption during pregnancy are at risk of fetal alcohol spectrum disorder (FASD), which has negative consequences for child development, and is associated with intellectual disability and behavioural disorders (consensus [1], review [26]).

- 4.12.1 If paediatric assessment of the baby of an alcohol dependant woman indicates signs of fetal alcohol syndrome (FAS), the baby should have paediatric follow-up and multidisciplinary intensive intervention efforts to ameliorate the effects and promote optimal development, at least until school entry (expert opinion [27]). The infant may be referred to a specialist unit at the Royal Children's Hospital or Monash Medical Centre.
- 4.12.2 Women who have exceeded the recommended daily consumption of alcohol should be advised of the risk of FAS and FASD and referred to the MCH nurse, GP or paediatrician, to monitor the baby through developmental assessments. If an abnormality is detected during these assessments, the baby/child should be provided with appropriate neuro-developmental support (local consensus).
- 4.12.3 The effects of exposure to buprenorphine in pregnancy are still unclear; therefore babies exposed to buprenorphine in pregnancy should have a full developmental assessment with a paediatrician at 2 years of age (consensus [1]).

#### 4.13 Follow-up for babies at risk of vertical transmission of Blood Borne Virus (BBV) (Hepatitis B, Hepatitis C and Human Immunodeficiency Virus)

- 4.13.1 If a baby is shown to be infected with a BBV, they should be referred to an appropriate paediatric specialist for ongoing monitoring, follow-up and treatment (consensus [1]).
- 4.13.2 Babies of women with a **positive HBV** antibody test in pregnancy should receive:
  - hepatitis B immunoglobulin within 1 hour or as soon as practicable after birth, and Hepatitis B vaccine on the day of birth according to the normal immunisation schedule (consensus [1])
  - specialist paediatric follow-up at about 6 months of age for parental counselling about the options for HBV testing for the baby (expert opinions [15],[28]).
- 4.13.3 Women who have had a **positive HCV** antibody test in pregnancy should be referred for consultation with a paediatrician prior to discharge about the options for testing the baby for HCV, and follow-up referrals made on that decision:
  - an RNA PCR test at 4-6 months. A single negative test is likely to be accurate, however, a follow-up HCV antibody test at 18 months (when

maternal antibodies are no longer present) is recommended to be certain (expert opinion [29]).

- a single HCV antibody test at 12-18 months of age (consensus [1]), which will not incur out of pocket expenses.
- if a HCV positive mother is not viraemic, the risk of mother to infant transmission of HCV is extremely low and testing and specialist paediatric follow-up of these babies may not be considered necessary (expert opinion [15]).

4.13.4 Babies of mothers who have had a positive HIV antibody test should be referred to a specialist paediatrician for ongoing management, which includes chemoprophylaxis, monitoring and a revised vaccination schedule (consensus [1]).

**Table 6: Summary of minimum follow-up required for babies at risk of NAS**

AGE	WHO	FOLLOW-UP REQUIRED
Birth	Babies of mothers with positive <b>Hepatitis B</b> test	Hepatitis B immunoglobulin within one hour or as soon as practicable after birth
Day 1	All babies	Hepatitis B vaccine on day of birth according to normal immunization schedule
Discharge	All babies	Referral from hospital, assertive follow-up and engagement with comprehensive community services to provide ongoing support and promote optimal neurodevelopment. Discharge preparation should include: <ul style="list-style-type: none"> <li>• assessment of home environment</li> <li>• SIDS prevention information</li> <li>• education about infant/child cues</li> <li>• offer to parents of infant CPR training</li> </ul>
Discharge	Babies at risk of <b>FAS or FASD</b>	Additional social support as necessary, and referral for monitoring and follow-up.  Paediatric review at 6 months
Discharge to school entry	Babies with <b>FAS</b>	Referral to specialist or comprehensive community neurodevelopment support services
Discharge to 4 weeks of age	Babies exposed in utero to <b>cannabis, stimulants or sedatives</b>	Referral for weekly monitoring and assessment for signs of withdrawal and education about supportive techniques via enhanced home visiting, MCH nurse, GP or paediatrician
Birth-6 weeks	Babies of mothers with positive <b>HIV</b> test	Paediatric monitoring and provision of antiviral prophylaxis as required
4-6 months and/or 12-18 months	Babies of mother who is <b>Hepatitis C</b> positive and viraemic in pregnancy	Paediatric follow-up to offer PCR or antibody test for Hepatitis C
6 months	Babies of mothers who are <b>Hepatitis B</b> positive	Paediatric follow-up to offer test for Hepatitis B antibody status
2 years	Babies exposed to <b>Buprenorphine</b> in utero	Full paediatric assessment

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## **6. APPENDICES**

Appendix 1: Antenatal assessment of risk of Neonatal Abstinence Syndrome (NAS)  
(flowchart)

Appendix 2: Assessment tools for Infant Home Based Withdrawal

Appendix 3: Assessment and care for babies at risk of Neonatal Abstinence Syndrome (NAS)  
(flowchart)

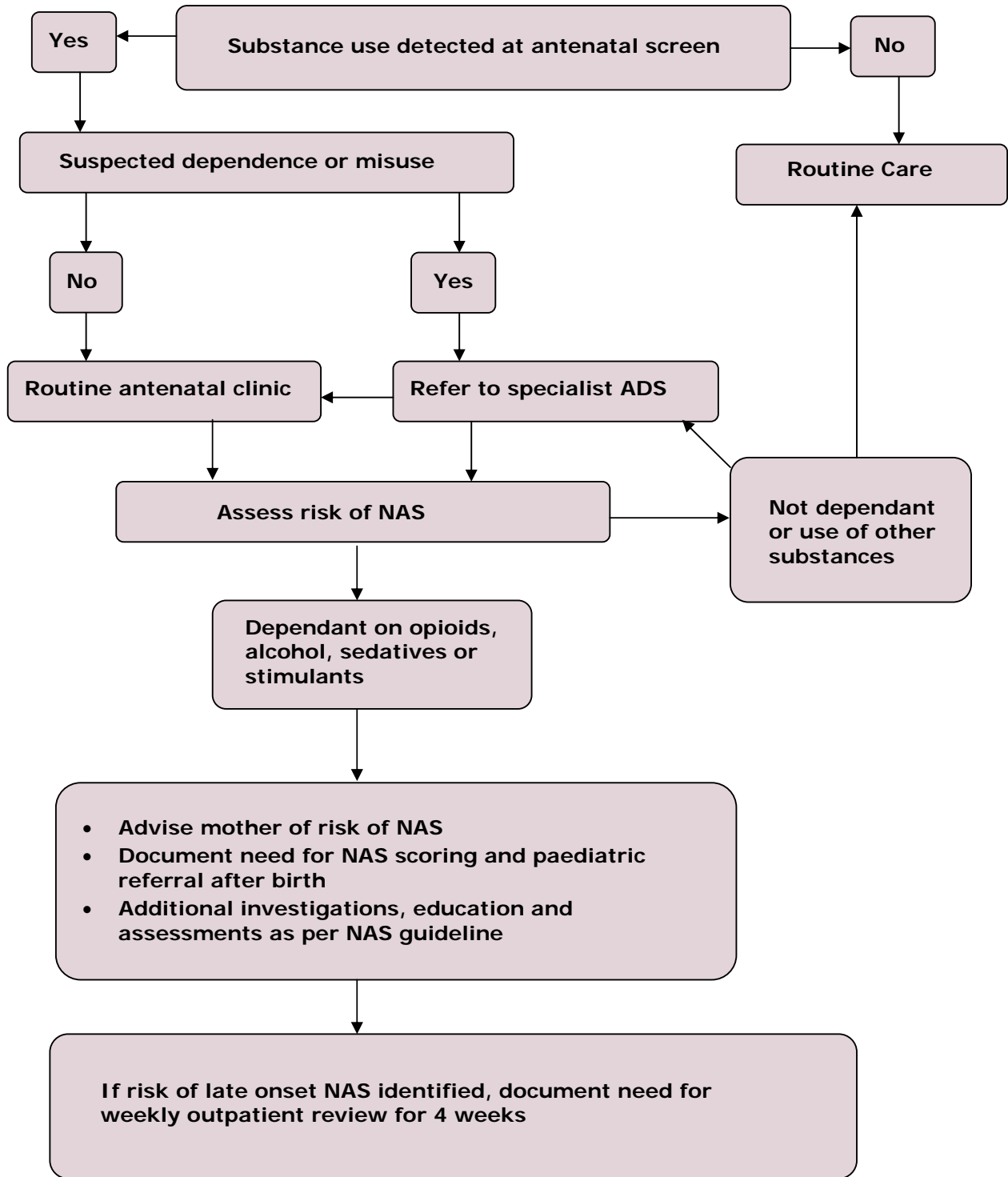
Appendix 4: Neonatal Abstinence Scoring System and Guidelines: Modified Finnegan Tool

Appendix 5: Scoring guide and modification for prematurity

Appendix 6: The Royal Women's Hospital: Neonatal Abstinence Syndrome (NAS) and Infant  
Home Based Withdrawal (IHBW)

Appendix 7: The Royal Women's Hospital, Infant Home Based Withdrawal (IHBW). Roles  
and responsibilities of team members

**Appendix 1: Antenatal assessment of risk of Neonatal Abstinence Syndrome (NAS)**



**Appendix 2: Assessment tools for Infant Home Based Withdrawal**

<p><b>THE ROYAL WOMEN'S HOSPITAL</b></p> <p><b>Assessment for Infant Home Based Withdrawal (IHBW)</b></p>	<p><i>(Affix Label Here)</i></p>		
<p><b>ANTENATAL ASSESSMENT</b></p>			
<p>For completion by social worker at 36/40 weeks gestation EDC: _____</p>			
<p>Name of provider: _____</p>			
<p>Signature: _____ Date: _____</p>			
<p><b>INDICATOR</b></p>	<p><b>NO CONCERN</b></p>	<p><b>CONCERN</b></p>	<p><b>PLAN</b></p>
Mother stable and/or Infant's Primary carer			
Ongoing illicit drug use or alcohol abuse (mother)			
Severe mental illness			
Poor or non-attendance for antenatal care: refused or dropped out of care			
Unstable living arrangements: inadequate or temporary accommodation			
Current history of domestic violence or abuse – physical or emotional			
Unstable drug or alcohol use by others in the household			
Current Child Protection concerns that preclude the infant from IHBW			
Demonstrated absence of commitment to infant			
Non-acceptance of referrals and supports			
Recent history of non-compliance with services			
Unable to access hospital and M&CH or GP service for weekly appointments			
Absence of agreement to home based management			
<p><b>Comments:</b> _____</p> <p>_____</p> <p>_____</p> <p>_____</p>			
<p><b>Original sheet to be retained in mother's medical record</b></p> <p><b>Forward duplicate sheet to the Case Manager, SCN</b></p>			

ASSESSMENT FOR IHBW

MR/90629A

**Assessment for Infant Home Based Withdrawal (IHBW)  
SPECIAL CARE NURSERY ASSESSMENT**

**BABY'S DOB:** \_\_\_\_\_

**Name of provider:** \_\_\_\_\_

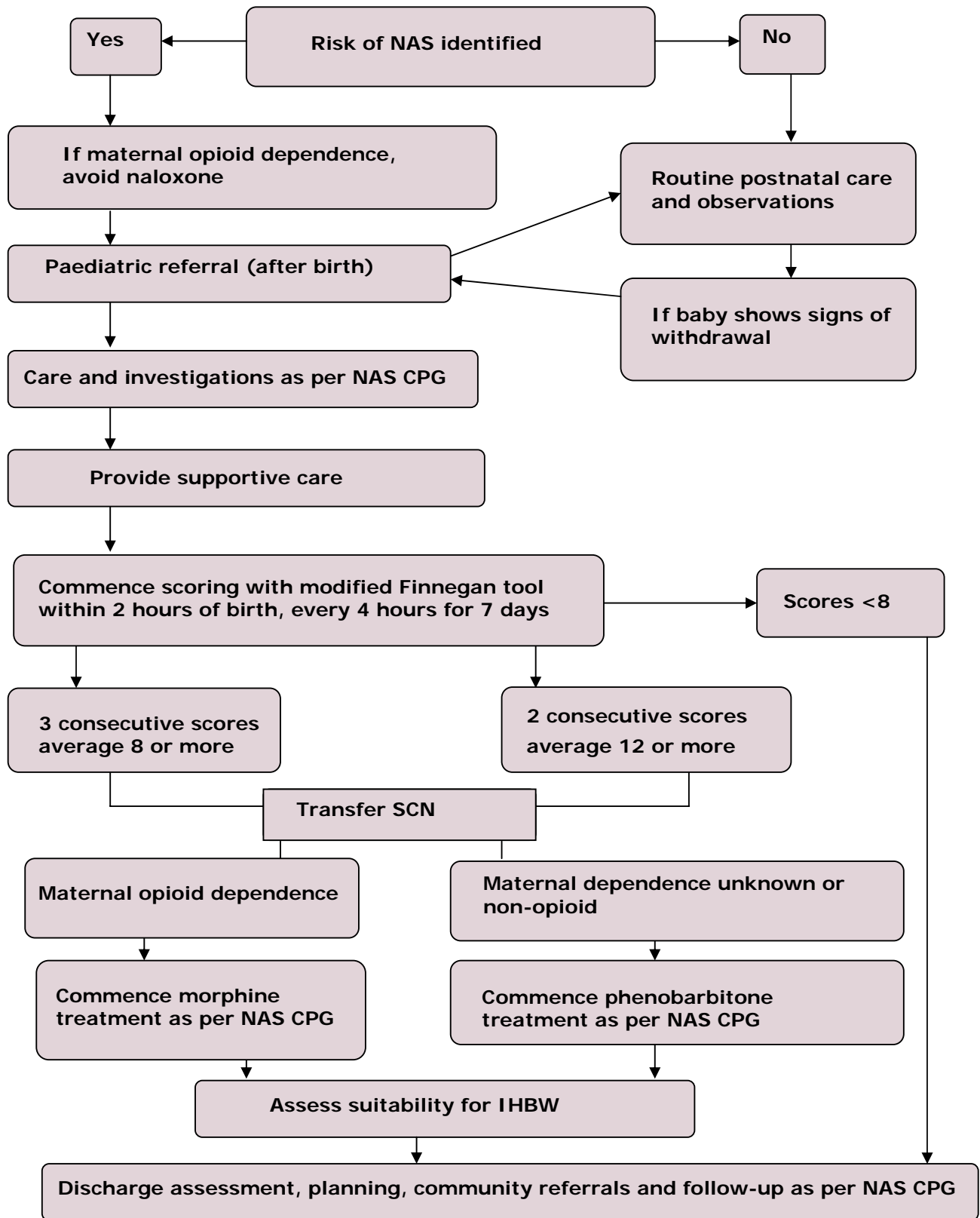
**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

<b>INDICATOR</b>	<b>NO CONCERN</b>	<b>CONCERN</b>	<b>PLAN</b>
Mother stable and/or Infant's Primary carer			
Ongoing illicit drug use or alcohol abuse (mother)			
Severe mental illness			
Poor or non-attendance for antenatal care: refused or dropped out of care			
Unstable living arrangements: inadequate or temporary accommodation			
Current history of domestic violence or abuse – physical or emotional			
Unstable drug or alcohol use by others in the household			
Current Child Protection concerns that preclude the infant from IHBW			
Demonstrated absence of commitment to infant			
Non-acceptance of referrals and supports			
Recent history of non-compliance with services			
Unable to access hospital and M&CH or GP service for weekly appointments			
Absence of agreement to home based management			

**Retain in baby's medical record**

**Appendix 3: Assessment and care for babies at risk of Neonatal Abstinence Syndrome (NAS)**



## Appendix 4: Neonatal Abstinence Scoring System (NASS) and Guidelines

Modified Finnegan Tool: Adapted from L.P Finnegan (1986)

### Patient Label

SYSTEM	SIGNS	Date Time																	
		Score																	
<b>CNS</b>	Excessive high pitched (or other) cry	2																	
	Continuous high pitched (or other) cry	3																	
	Sleeps <1 hour after feeding	3																	
	Sleeps <2 hours after feeding	2																	
	Sleeps <3 hours after feeding	1																	
	Hyperactive Moro reflex	2																	
	Markedly hyperactive Moro reflex	3																	
	*Mild tremors when disturbed	1																	
	*Moderate/severe tremors when disturbed	2																	
	*Mild tremors when undisturbed	3																	
	*Moderate/severe tremors when undisturbed	4																	
	Increased muscle tone	2																	
	*Excoriation (specify area)	1																	
	Myoclonic jerks	3																	
Generalised convulsions	5																		
<b>Metabolic, vasomotor, respiratory</b>	Sweating	1																	
	Fever (37.3 to 38.3 Celsius)	1																	
	Fever (38.4 Celsius & higher)	2																	
	Frequent yawning (>3-4 times in ½ hr)	1																	
	Mottling	1																	
	Nasal stuffiness	1																	
	Sneezing (>3-4 times in ½ hr)	1																	
	Nasal flaring	2																	
	Respiratory rate >60 /min	1																	
	Respiratory rate >60 /min & retraction	2																	
	<b>GIT</b>	Excessive sucking	1																
*Poor feeding		2																	
*Regurgitation		2																	
Projectile vomiting		3																	
Loose stools		2																	
Watery stools		3																	
Total score																			
Initials of Scorer																			

INITIALS OF SCORER.....	INITIALS OF SCORER.....	INITIALS OF SCORER .....
NAME.....	NAME .....	NAME.....
DESIGNATION.....	DESIGNATION.....	DESIGNATION .....
INITIALS OF SCORER .....	INITIALS OF SCORER .....	INITIALS OF SCORER.....
NAME.....	NAME.....	NAME .....
DESIGNATION.....	DESIGNATION.....	DESIGNATION .....

## NEONATAL ABSTINENCE SCORING SYSTEM GUIDELINES

Explanation should be given to parents about Neonatal Abstinence Syndrome and the need to observe the infant using the Finnegan Scoring System. (PN ward)

- Daily paediatrician review required (PN ward)
- Daily weight (PN ward)
- Complimentary bottle feeds are encouraged until lactation is established as:
  - Decreases weight loss of infant
  - Allows accurate scoring, as a hungry infant may have an artificially high score.
- Complimentary feeds should be offered via a bottle, rather than cup. These infants are comforted by sucking; therefore use of a dummy may also be useful.
- Infant to be assessed for signs of withdrawal half to one hour after each feed. The infant will be more settled at this time and a more accurate assessment can be obtained. Scoring interval is inclusive of the time since last score made.
- Ensure mother is involved in the assessment process, as she will be aware of infant's symptoms of withdrawal.
- Infants who exhibit signs of withdrawal will generate scores from criteria in each of the three sections of the scoring chart.

The scoring chart is designed for term infants who are fed 4 hourly. When scoring a pre-term infant, allowance must be made for shorter feeding and sleeping intervals (e.g. 3 hourly) and feeding issues relevant to pre-term infants (e.g. may require gavage feeds) (see appendix 3). Allowances must also be made for older infants and sleeping patterns e.g. infants 6 weeks of age.

\* Asterisk explanations

- **Excoriation** – score when it presents, rescore only if it increases or appears in another area
- **Poor Feeding** – score if allow to feed or baby takes inadequate amounts
- **Regurgitation** – score if it occurs more frequently than usual in a newborn
- **Tremors** – this is a scale of increasing severity and an infant should only get one score from the four options in this category.

## Appendix 5: Scoring guide and modification for prematurity

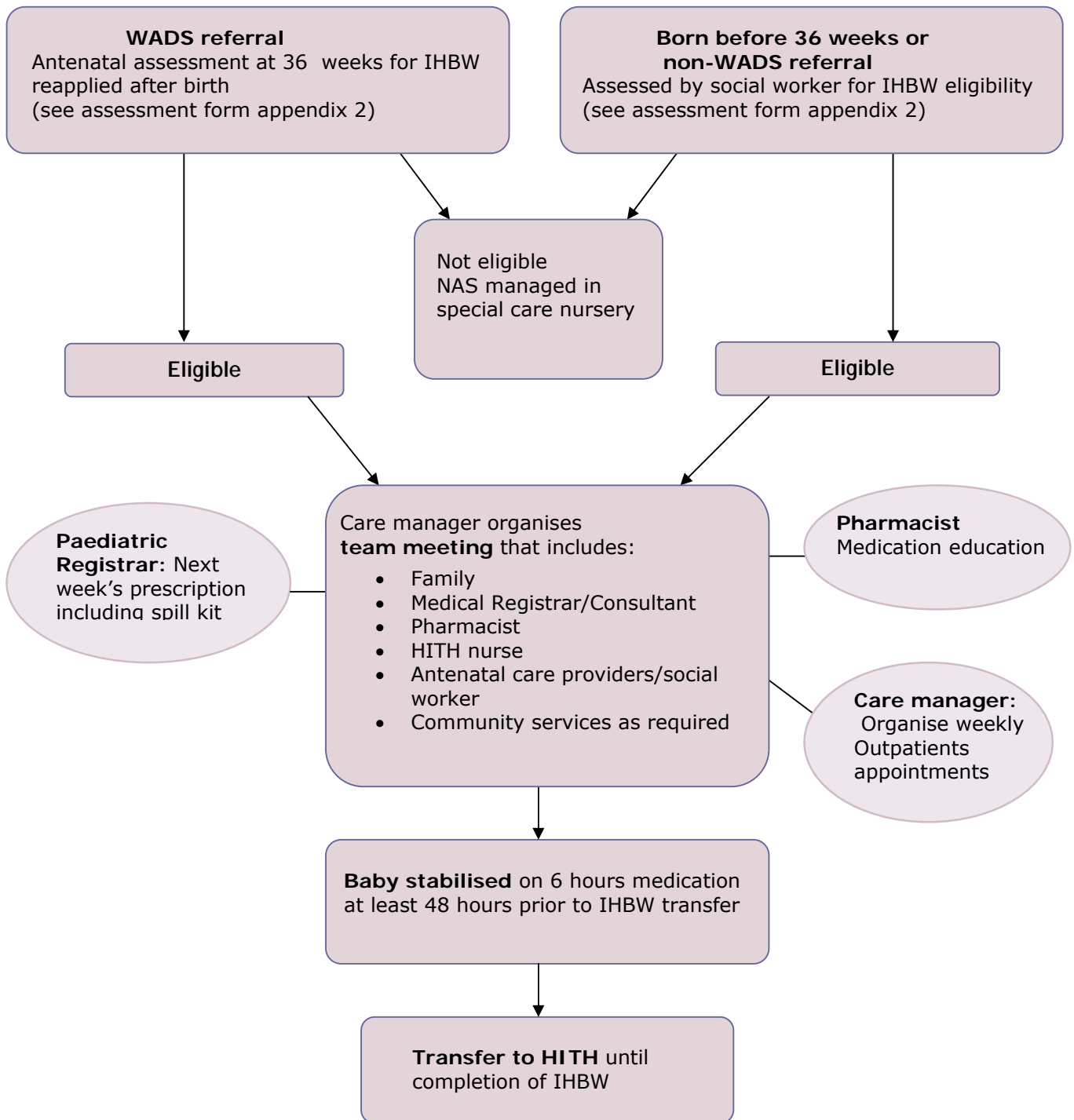
### SIGNS

High pitched cry	Score 2 if high-pitched at its peak, 3 if high-pitched throughout
Tremors	This is a scale of increasing severity and a baby should only receive one score from the four levels of severity. Undisturbed refers to the baby being asleep or at rest in the cot.
Increased muscle tone	Score if the baby has generalised muscle tone greater than the upper limit of normal.
Excoriation	Score only when excoriations first appear, increase or appear in a new area.
Yawning and sneezing	Score if occurs more than 3 to 4 times in 30 minutes.
Nasal flaring/respiratory rate	Score only if present without other evidence of lung or airways disease.
Excessive sucking	Score if more than that of an average hungry baby.
Poor feeding	Score if baby is very slow to feed or takes inadequate amounts.
Regurgitation	Score only if occurring more frequently than would be expected in a newborn baby.

- Modification for prematurity is mainly necessary in the sections on sleeping and feeding.
- A baby on 3 hourly feeds can sleep at most 2 1/2 hours. Scoring should thus be
  - 1 if a baby sleeps less than 2 hours
  - 2 if sleeps less than 1 hour
  - 3 if does not sleep between feeds.
- Many premature babies require tube feeding. Babies should not be scored for poor feeding if tube feeding is expected at their gestation.

Source: Neonatal Handbook. 2006. <http://www.wch.org.au/nets/handbook/>  
Accessed 28/6/07.

**Appendix 6: The Royal Women’s Hospital: Neonatal Abstinence Syndrome (NAS) and Infant Home Based Withdrawal (IHBW)**



**Appendix 7: The Royal Women’s Hospital, Infant Home Based Withdrawal (IHBW). Roles and responsibilities**

BABY	gaining weight stable on 6 hourly medication
PARENTS	demonstrate safe parenting skills able to safely administer and store medication meet criteria for IHBW eligibility consent to IHBW and neonatal HITH program
ANTENATAL CARE PROVIDER(S) eg SOCIAL WORKER	reviews eligibility for IHBW program (assessment form appendix 1)
WARD CONSULTANT	assesses eligibility for transfer to HITH
CARE MANAGER	coordinates team meeting liaises with Maternal Child Health Nurse organizes follow up appointments contacts GP/family doctor and assertively follows up general referrals
PHARMACIST	parent education - medication administration - safe storage - weekly collection of prescriptions and collection of spill kit
REGISTRAR	writes prescription for first week’s medication and spill kit based on baby’s birth weight  writes first week’s continuum of care including medication reductions every 72 hours
HITH NURSE	assesses safety of home parent education regarding IHBW obtains consent for IHBW  discusses <ul style="list-style-type: none"> <li>• plans for home visiting</li> <li>• settling techniques at home</li> <li>• safe sleeping (SIDS guidelines)</li> </ul> provides 24 hour contact numbers views and documents infant’s sleeping arrangements at home attends weekly meetings with families as able
WADS Paediatrician	reviews baby at weekly consultations writes prescription for following week’s medication and spill kit writes continuum of care for following week