THAMES VALLEY & WESSEX NEONATAL OPERATIONAL DELIVERY NETWORK

THAMES VALLEY & WESSEX NEONATAL ABSTINENCE SYNDROME GUIDELINE	
Presented to / on:	**Thames Valley & Wessex Neonatal ODN Governance Group 26th January 2023**
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Related documents	**References** Cleary BJ, DonnellyJ, Srawbridge J et al. Methadone doses andneonatal abstinence syndrome-systematic review and meta- analysis. Addiction 2010;105:2071-84 Dryden C, YoungD,, Hepburn M, Mactier H. Maternal methadone use in pregnancy: factors associated with the development of neonatal abstinence syndrome and implicationsfor healthcare resources. BJOG 2009; 116:665-71 Hall ES, Wexelblatt SL, CrowleyM et al. A Multicentre cohort study of treatment and hospital outcomes in neonatal abstinencesyndrome. Pediatr. 2014 Aug;134:527-34 Nair V, Soraisham AS, Akierman A. Neonatal withdrawal syndrome due to maternal codeine use. Pediatr Child Health.2012;17(5):e40-41 Osborn DA, Jeffery HE, Cole MJ. Opiate treatment for opiate withdrawal in newborn infants. Cochrane Database Syst Rev 2010:CD002059 Seligman NS, Almario CV, Hayes EJ et al. Relationship betweenmaternal methadone dose at delivery and neonatal abstinence syndrome. J Pediatr 2010:157-428

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Implications of race, equality & otherdiversity duties for this document	**This guideline must be implemented fairly and without prejudice whether on the grounds of race, gender, sexual orientation or religion.**

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List of abbreviations:

CNS:	Central nervous system
IUGR:	Intrauterine growth restriction
HIV:	Human immunodeficiency virus
NAS:	Neonatal abstinence syndrome
PPHN:	Persistent pulmonary hypertension of the newborn
SNRI's:	Serotonin norepinephrine re-uptake inhibitors
SSRI's:	Selective serotonin re-uptake inhibitors
TCA's:	Tricyclic antidepressants

1.0 Aim of Guideline

The purpose of this guideline is to ensure that babies born to mothers who have drug addictions, or who are prescribed medication known to potentially cause withdrawal in neonates, are identified and managed appropriately without unnecessary removal from their mother.

2.0 Scope of Guideline

The guideline applies to all neonates, who are born in neonatal units and maternity units covered by Thames Valley and Wessex Neonatal Operational Delivery Network whose mothers have been known to take illicitor prescribed drugs with potential to cause neonatal abstinence syndrome. This includes the following hospitals:

Thames Valley		
TRUST	**Hospital**	**Designation**
Oxford University Hospitals NHS Foundation Trust	- John Radcliffe Hospital, Oxford	NICU
Buckinghamshire Healthcare NHS Trust	- Stoke Mandeville Hospital, Aylesbury	LNU
Frimley Health NHS Foundation Trust	- Wexham Park Hospital, Slough	LNU
Milton Keynes University Hospital NHS Foundation Trust	- Milton Keynes General Hospital	LNU
Royal Berkshire NHS Foundation Trust	- Reading	LNU

Wessex		
TRUST	**Hospital**	**Designation**
University Hospital Southampton NHS Foundation Trust	- Princess Anne Hospital	NICU
Portsmouth Hospitals University NHS Trust	- Queen Alexandra Hospital	NICU
Dorset County Hospital NHS Foundation Trust	- Dorset County Hospital, Dorchester	SCU
Hampshire Hospitals NHS Foundation Trust	- Basingstoke and North Hampshire Hospital	LNU
Hampshire Hospitals NHS Foundation Trust	- Royal Hampshire County Hospital, Winchester	LNU
Isle of Wight NHS Trust	- St Mary's Hospital	SCU
University Hospitals Dorset NHS Foundation Trust	- Poole Hospital	LNU
Salisbury NHS Foundation Trust	- Salisbury District Hospital	LNU
University Hospitals Sussex NHS Foundation Trust	- St Richard's Hospital, Chichester	SCU

3.0 Guideline Summary

The Thames Valley Network guideline for Neonatal Drug Withdrawal, first published in 2011 has been updated and amalgamated with the Royal Berkshire Hospital Neonatal Abstinence Syndrome Guideline GL384, published in June 2015. In addition, further information regarding mothers prescribed Selective Serotonin Reuptake Inhibitors (SSRI's), Serotonin Norepinephrine Reuptake Inhibitors (SNRI's) and Tricyclic Antidepressants (TCA's) and approach to management has been included.

4.0 Guideline Framework

This guideline provides guidance on the management of infants born to mothers with drug addictions and mothers on prescribed medications known to cause potential withdrawal in neonates.

It is designed for use in the Maternity Unit and on the Special Care Baby Unit.

4.1 Introduction

Infants exposed to certain drugs during pregnancy may become physically dependent on them and, after birth, suffer withdrawal symptoms, termed the neonatal abstinence syndrome (NAS).

Drugs which may cause withdrawal are:

Opiates – e.g. codeine, diamorphine (heroin), methadone, fentanyl, buprenorphine, tramadol

Benzodiazepines – e.g. diazepam, temazepam, clonazepam

Barbiturates – e.g. phenobarbital Amphetamines

SSRI's – e.g. Sertraline, Citalopram, Fluoxetine, Venlafaxine

Antipsychotic medications e.g. Quetiapine

Drugs which may cause other health concerns in the infant:

Cannabis – growth restriction, long term neuro-behavioural problems

Cocaine – vasoconstrictive effects on developing brain which may lead to neurological abnormalities

Alcohol – fetal alcohol syndrome

Drug use during pregnancy can also be associated with:

Premature labour, placental abruption, stillbirth, neonatal death (especially with cocaine abuse)

Birth defects: cleft lip / palate (heroin/opiates)

Underdeveloped limbs (cocaine)

Intrauterine growth restriction (IUGR)

Meconium staining of liquor

Delayed onset of respirations / respiratory depression

Longer term problems include sudden infant death syndrome, neurodevelopmental delay, behaviour and social problems.

However, unless there are other indications it is not necessary for a paediatrician to be called routinely to attend these deliveries.

Clinical Features of Neonatal Abstinence

Table 1: Clinical Features of the Neonatal Abstinence Syndrome		
Neurologic Excitability	Gastrointestinal Dysfunction	Autonomic signs
Tremors Irritability Increased wakefulness / loss of sleep wake cycle High-pitched crying Increased muscle tone Hyperactive deep tendon reflexes Exaggerated Moro reflex Seizures Frequent yawning and sneezing	Poor or excessive feeding Uncoordinated and constant sucking Vomiting Diarrhoea Dehydration Poor weight gain	Increased sweating Nasal stuffiness Fever Mottling Temperature instability **Other** PPHN – associated with SSRI's Tachycardia Increased blood pressure Apnoea / respiratory depression

Differential Diagnosis:

Sepsis, Birth asphyxia, Hypocalcaemia, Hypoglycaemia, CNS bleeds, hyperthyroidism, hyperviscosity, milk intolerance – these must be considered when evaluating a baby for possible withdrawal.

Onset of symptoms:

This will vary depending on type of drug taken, amount of drug taken, how recently drugs were taken, use of multiple drugs simultaneously and maternal physiology.

Table 2: Time of onset of symptoms			
Name of drug	**Onset of symptoms**	**Comments**	**Recommended observation period***
Heroin	24 - 48 hours	Duration may be 8-10 days	5-7 days
Cocaine	24 - 48 hours	May be 48 – 72 hours	3-5 days
Amphetamines	24 hours	Duration 7- 10 days	3-5 days
Methadone	48 - 72 hours	Duration up to 30 days	5-7 days
Buprenorphine	36 – 60 hours	Duration up to 28 days	5-7 days

Barbiturates	4-7 days	Can be 1-14 days	5-7 days
Benzodiazepines		Can be >10 days	5-7 days
SSRI's & TCA's	1-3 days	Duration 2 – 6 days	24 hrs in hospital, daily community midwifery review x 48 Hours **
Prescription opioid medications	36 – 72 hours	Duration 10 – 30 days	3 – 5 days

*Recommendations are subject to Local Unit and LMNS Guidelines and individual clinical decision making

Table 3: Length of time urine will remain positive	
Drug	**Length of time urine will be positive after last dose**
Benzodiazepines	Up to 30 days
Marijuana	1 – 10 days – depending on amount
Cocaine	72-96 hrs - longer with heavy use
Heroin, morphine, codeine	24-48 hrs
Methadone	2 – 3 days
Amphetamines	1 – 2 days
Barbiturates: short acting Long acting	<2 days 1 – 7 days

Risk factors for increasing severity and/or intensity of NAS symptoms:

Definite:

i. Term
ii. Good birth weight
iii. Polydrug use / abuse
iv. Combination with benzodiazepines
v. Delayed drug metabolism

Probable:

vi. Male gender
vii. Maternal smoking
viii. Maternal methadone use
ix. Combination with SSRI's/SNRI's

Specific drugs:

Opioids:
If more than 1 week between last ingestion and birth, incidence of NAS is relatively low. Incidence and severity of NAS is increased in methadone compared with buprenorphine or heroin. Withdrawal from opioids can be severe and prolonged with subacute signs persisting for up to six months. In the acute phase, seizures have occurred in 2 – 11% of cases of NAS. Seizures are also associated with barbiturates, alcohol and sedative hypnotic withdrawal. There have been a few cases described in the literature of NAS in babies born to mothers who were prescribed codeine in late pregnancy for pain relief. Mothers prescribed codeine in late pregnancy should be warned of this possibility.

Cocaine: (Elke H. Roland et al. Paediatric Neurosciences 2989; 15:88-94)
Cocaine use is increasing in pregnant women. There is no clearly defined abstinence syndrome. Clinical features are similar to narcotic withdrawal. Withdrawal score is higher with both cocaine and heroin. There is an increased risk of hypoxic-ischaemic cerebral injury. Cerebral infarctions and intracranial haemorrhage including subarachnoid bleeds have been reported. Blood pressure measurement must be done prior to discharge. A cranial ultrasound scan should be offered but may not detect abnormalities. Cocaine is teratogenic, therefore examine carefully for congenital anomalies(gastroschisis, genitourinary, gut atresias, limb reduction defects). Abnormal visual fixation and ocularabnormalities (uncertain clinical significance) can also be found. If there are clinical concerns – obtainan ophthalmology opinion.

Selective Serotonin Reuptake Inhibitors (SSRI) & Tricyclic Antidepressants (TCA's):
SSRI's and TCA's are the most commonly used antidepressants in pregnancy and are generally considered to be safe (non-teratogenic) except for a possible relationship between paroxetine and cardiac defects. However, there is a slightly increased risk of developing PPHN in babies of mothers on SSRI's. Whilst babies on SSRI's and SNRI's are also at increased risk of developing toxicity or withdrawal symptoms if exposed in the third trimester, these are generally mild and very seldom require intervention. Symptoms are mainly CNS, gastro-intestinal, respiratory and autonomic. TCA's can produce withdrawal symptoms including irritability, agitation and seizures but there is no association with developmental delay.

1. Do pre- and postductal saturations within 24 hours of birth to exclude PPHN prior to dischargehome.
2. Consider observing babies in hospital for 12 - 24 hours. Babies should be observed at regular intervals (ideally daily by a suitably trained health professional) for the first 72 hours for signs ofwithdrawal. If no community midwifery support available, consider observing in hospital for 72 hours.
3. It is not contra-indicated to breastfeed.
4. If baby develops symptoms, readmit if already discharged home and, additionally, need tomonitor for hypoglycaemia.

5.0 Management

5.1 Antenatal Management

- Check maternal viral serology including Hep B, Hep C, HIV
- Refer to the local rehabilitation group and to Social Services – if required
- Refer to the local Substance Misuse Liaison Midwife
- Discussion between Senior Paediatrician, Substance Abuse Liaison Midwife and Social Services +/- Rehabilitation team to formulate management plan. A Prebirth Case Conference may be necessary in some cases.
- Regular review of management plan with the above team

- Plan of action to be documented in pending birth cases file on Special Care Baby Unit as per local hospital arrangements
- Social worker/midwife to ensure that mother is aware of plan

5.2 Intrapartum Management

At delivery, avoid use of Naloxone as it may precipitate sudden withdrawal and possibly seizures (these seizures are best treated with IV morphine rather than phenobarbitone).

Ensure that Social Services are aware of the birth.

Clinical / Postpartum Management

History required from mother:

- The type of drug(s) taken (multiple drug use is very common, please also ask about prescription and over the counter preparations)
- Frequency of use for each drug
- Duration of maternal drug use
- Most recent drug use prior to delivery
- Any detoxification programmes
- Additional information may be available from the midwives or social worker.
- Review any antenatal birth plans already made – check Pending Deliveries folders

Initial postnatal management:

- Parents should be involved in all care planning and delivery of care to their baby and also given the opportunity to discuss care and concerns with staff.
- The baby may stay with the mother for the immediate postnatal period unless any other medical condition is apparent. If available, admit mother and baby to a Transitional Care Ward / Unit in order to provide closer supervision of babies for withdrawal and also assessment of maternal parenting skills. A daily Paediatric review is necessary.
- Urine for toxicology must be obtained from the baby and sent to the laboratory with a chain of custody form following consent given from mother. If consent from the mother is withheld, discuss with senior paediatrician with a view to involving Social Services especially if mother is already known to them. Ensure you are aware of all prescribed medication recently given to mother before interpreting the results. If available, meconium can also be sent for toxicology screening.
- The baby may remain under the management of the midwife on delivery suite / postnatal ward if required, unless the midwife has particular concerns about the baby's withdrawal state.
- The baby should receive routine postnatal ward observations and if there are concerns about symptoms, the status of withdrawal should be assessed using the Neonatal Drug Withdrawal Score Chart (Appendix A)
- Should baby require treatment for NAS this should ideally take place on a transitional care ward setting with aim of keeping the baby with mother as this has been shown to shorten the treatment duration and length of stay in hospital.
- Pre- and postductal saturations should be carried out within 24 hours of birth for all babies whose mothers have been on SSRI’s.
- Consider performing a cranial ultrasound scan for all babies whose mothers have abused

cocaine, particularly if heavy amounts of cocaine have been used.

- For mothers who are also HIV and/or Hepatitis B/C positive, follow local guidelines in addition to this one for management of these infants.
- For babies who are to become looked after children, Hepatitis B, C, HIV and syphilis status needs to be checked on the baby as soon as practically possible after this decision has been made and baby should be offered accelerated Hepatitis B vaccine.
- Routine Hepatitis B vaccine should be offered to both mother and baby if mother is Hepatitis B negative where narcotic abuse is identified.
- Strict patient/family confidentiality must be maintained

Breastfeeding:

Provided there are no other contraindications (e.g. HIV) – breast feeding is safe in most women on withdrawal programmes. Advise mother to take medication after feeding baby. Withdrawal may in fact be smoother in breast fed babies.

Breast feeding shortly after Cocaine ingestion can cause seizures. If mother is a heavy user and baby is having seizures breast feeding should be discouraged. A minimum 24 hour “washout” period (interval between last known cocaine ingestion and breastmilk feed / expression) is advised if mother keen to breastfeed. Milk expressed within 24 hours of cocaine ingestion must be discarded.

For most babies at risk of neonatal abstinence, breast feeding is safe and not necessarily contraindicated. However it is good practise to check the latest drugs and lactation database for current recommendations and safety profiles.

Using the Neonatal Drug Withdrawal Score Chart (see appendix A):

- Use of the scoring chart should be commenced by any member of the team looking after the baby (midwife or doctor) at the first sign of any symptoms of withdrawal (see table 1).
- If a symptom is present, score 2; If not score 0. (There is no score of 1)
- Record one score for each section (there should only be one number in each box, either 2 or 0, so maximum possible score is 18)
- If possible document the score approximately one hour following a feed.
- Take into account behaviour appropriate for age and gestation.
- Consider symptoms present over the whole scoring period
- Document score 3-4 hourly, after 2 consecutive scores of 6 or more document the score 2 hourly

Following 2 consecutive scores of 8 or above, the Neonatal doctor must be informed and asked to review the infant. The infant will usually be admitted to the Neonatal Unit or Transitional Care if available and treatment should be introduced (see Appendices B & C).

5.3 Non Pharmacological Management

The aim of non-pharmacological measures is to keep baby as calm and quiet as possible by encouraging skin to skin, reducing infant -maternal separation and attending to baby’s needs to avoid baby developing irritability – excessive crying – insomnia cycle.

- Feeding – excessive hunger and sucking is a common symptom of withdrawal and overfeeding

can occur if total daily volume is not monitored. Swaddle and allow responsive, paced feeding as much as possible without overfeeding excessively – to avoid baby becoming distressed.

- Document all feeds and discuss with the neonatal doctor and multidisciplinary feeding team if the infant is demanding more than 220mL/kg/day and cannot be soothed with swaddling and non-nutritive sucking
- Caloric intake may need to be increased because of increased energy expenditure, vomiting and / or loose stools. Therefore, close weight monitoring is required.
- These babies are extremely sensitive to external stimuli. The baby will be fractious and distressed when over stimulated and withdrawal symptoms can increase in severity with environmental and/or physical stimulation. AHP referral should be considered where access to these services exist.
- It is possible to reduce these babies' symptoms of withdrawal with a reduction in environmental and physical stimuli such as a dark quiet environment, avoiding auto-stimulation with, for example, swaddling, use of comforting techniques e.g., swaying, rocking, and responding early to infant cues.
- Nursing care for these babies must be individualised with an awareness of developmental aspects of care. The babies may be full term and remain on the Neonatal Unit for some weeks. Their gestation and post-natal age must be considered when planning care, observing behaviour, signs of withdrawal and responses to treatment.

5.4 Pharmacological Management

Optimal pharmacological treatment for NAS has not been established. Many drugs have been used to treat NAS. However, few randomised controlled trials have compared the efficacy of the various pharmacological agents. Once medication is commenced, hospital stay is invariably prolonged.

Opioids are currently considered first line treatment, however new studies suggest that buprenorphine **(Ref4)** or methadone (**Ref5)** may be preferable as first line treatment especially for opioid drug withdrawal. For doses see **Appendix(D)**

Phenobarbitone is considered second line treatment and has been effective in treating opioid withdrawal seizures especially in addition to morphine. If maximum morphine dose is not controlling symptoms, consider adding phenobarbitone as second line agent. Clonidine has been shown to be an effective and safe alternative second line treatment for NAS symptoms refractory to opioid therapy. It can also be used in combination with morphine. However, tolerance to clonidine can develop quickly, hence weaning from clonidine needs to be expedited as well.

For infants exposed to polydrug abuse, consider a combination of phenobarbitone and morphine as this has been shown to shorten length of stay compared to morphine alone.

Other drugs which could be considered are: buprenorphine and methadone–especially if the mother was using these drugs during pregnancy.

For NAS secondary to non-opiate drug use (including SSRI's, SNRI's, TCA's, cocaine), phenobarbitone is considered first line treatment.

Naloxone at delivery is to be avoided for treating respiratory depression as it may precipitate abrupt withdrawal symptoms and induce refractory seizures in the neonate.

Seizures – Loading dose of Phenobarbitone in addition to Morphine as above. Phenobarbitone alone may not be effective in treating seizures caused by narcotic withdrawal at withdrawal treatment doses.

If there are seizures then the infant should be admitted to the Neonatal Unit urgently and treated as per local seizure policy - but see above points as well.

5.5.1 Indications for pharmacological treatment:

- Supportive / non-pharmacological measures fail to control baby's symptoms
- Withdrawal scores remain high
- Seizures or other serious symptoms / signs of NAS
- Withdrawal is associated with dehydration due to diarrhoea and / or vomiting

See Appendices B & C for initiating and weaning medication.

6.0 Discharge:

Discharge planning is undertaken according to normal unit procedure, but in addition consideration must be given to the following:

- The family may have been known to supportive agencies and Social Services antenatally in which case a discharge plan should have been made and documented on the maternal notes and/or prenatal birth plan.
- Where disclosure of drug use has not been made during pregnancy or where the mother and/or family is not known to supportive agencies, a Needs Assessment is required and appropriate referrals should be made, including to Social Services. This may be undertaken by medical or nursing/midwifery personnel with parental consent.
- Where concerns have been raised antenatally about the mother's capacity to meet the needs of her baby in the light of her drug misuse a pre-birth planning meeting/case conference has usually taken place and decisions made which may impact on the discharge plan.
- Following delivery, liaison with the allocated Social Worker is necessary. If the baby requires a prolonged hospital stay in the Neonatal Unit for management of withdrawal, a discharge planning meeting is arranged with Social Services, Community Drug Team Worker, Health Professionals and the family to facilitate co-ordination of an appropriate discharge plan.
- For mothers on prescribed medication such as benzodiazepines, SSRI's, referral to Social Services is not required unless other concerns have been identified. However, close liaison with mother's midwife, usually a midwife lead for mental health, is advised. Similarly, mothers who used cannabis early in pregnancy but who gave up following discovery / diagnosis of pregnancy do not necessarily require Social Services involvement unless other concerns have been identified.
- Out Patient follow-up will be arranged where best suits the baby's needs during the discharge planning process. However, long term follow-up is not often necessary.
- If no symptoms of withdrawal – discharge to primary care.
- If baby does show signs of withdrawal – observe in hospital till resolving / drug treatment is commenced.
- Babies needing treatment can be discharged when on a weaning regime (usually after about 2 weeks of hospital treatment) depending on individual circumstances. Individual hospital policy may vary.
- If discharging on treatment – Dispense only 1 week's prescription at a time. Paediatric community Nurse should be involved in addition to Health Visitor. Follow-up reviews to be carried out as per local guidelines.

Version Control:

Version	Date	Details	Author(s)	Comments
1	Jan '11	New	Dr Rekha Sanghavi	SCNSG approved
1.2	Jan '16 to 29 Sep '16	Reviewed with the TV Neonatal Clinical Forum with exerts taken from the RBH Neonatal Abstinence Syndrome GL384.	Dr Rekha Sanghavi Dr Zuzanna Gawlowski D Falcus (RBH Guideline)	Checked and updated using elements from the RBH guideline and renamed to TG Guideline for Neonatal Abstinence Syndrome.
1.3	Oct '16	Re-write circulated to TV Neonatal Clinical Forum for comments/feedback.	Dr Rekha Sanghavi and Dr Zuzanna Gawlowski. D Falcus (RBH Guideline)	Re-circulate to TV Neonatal Clinical Forum
1.4	Jan '17	Reviewed with comments received and re-circulated to TV Neonatal Clinical Forum for their approval to go to the TV&W Neonatal ODN Governance Group in May '17.	Dr Rekha Sanghavi and Dr Zuzanna Gawlowski. D Falcus (RBH Guideline)	Re-circulate to TV Neonatal Clinical Forum
2	Apr '17	Reviewed with comments received. Ready for presenting to TV&W Neonatal ODN Governance Group	Dr Rekha Sanghavi and Dr Zuzanna Gawlowski. D Falcus (RBH Guideline)	
2.1	Oct 17	Reviewed at TV CF and minor changes ready for presentation to TV&W Neonatal ODN Governance Group	Dr Zuzanna Gawlowski D Falcus (RBH Guideline) Dr Rekha Sanghavi	Ratified
3	Jan 23	Reviewed with aim to extend TV guideline to cover TV&W. Presented at CF. Changes made ready for ratification	Dr Zuzanna Gawlowski Dr Mushtaq Soomro Dr Lambri Yianni	Zoe Gordon comments received and actioned
Review Date:	***January 2026***			

NEONATAL DRUG WITHDRAWAL SCORE CHART

How to use this chart:

- If a symptom is present score 2; If not score 0
- Record one score for each section (there should be only one number in each box, either 2 or 0 so maximum possible score is 18.
- If possible document the score approximately one hour following a feed.
- Take into account behaviour appropriate for age and gestation.
- Consider symptoms present over the whole scoring period.
- Document score 3-4 hourly, after 2 consecutive scores of 6 or more document the score 2 hourly.

Name ……..

NHS No: ……..……...

DOB: ……..…….

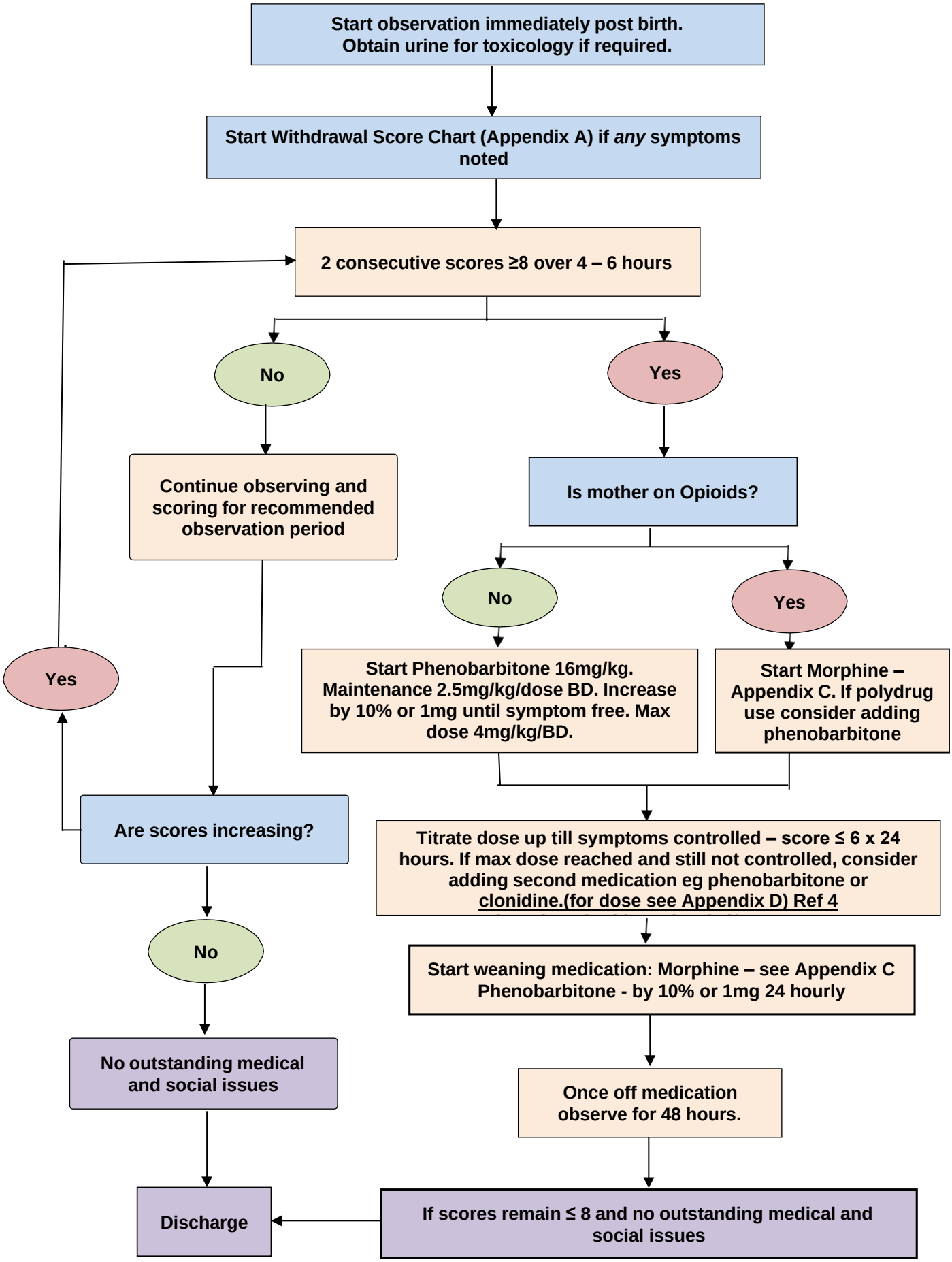
Treatment will be considered after two consecutive scores of 8 or above

DATE											
TIME											
HYPERTONIA (Persistent hypertonic posture, hyperflexion/ hyperextension, extended position)											
HIGH PITCHED CRY (An excessive or persistent high pitched cry that is not resolved by a reduction in stimuli, swaddling or cuddling)											
JITTERINESS/TREMOR When undisturbed											
JITTERINESS/TREMOR When disturbed											
SLEEP/WAKE PATTERN Sleeps<1 hour after a good feed											
PYREXIA>38ºC Of unknown origin (exclude other causes)											
RESPIRATORY SYMPTOMS (exclude other causes) Score if 2 or more present- Tachypnoea>60 breaths per minute, Recession, Nasal flaring											
PROJECTILE VOMITING											
LOOSE WATERY STOOLS											
TOTAL SCORE											
SIGNATURE											

FLOW CHART FOR PHARMACOLOGICAL TREATMENT OF NAS

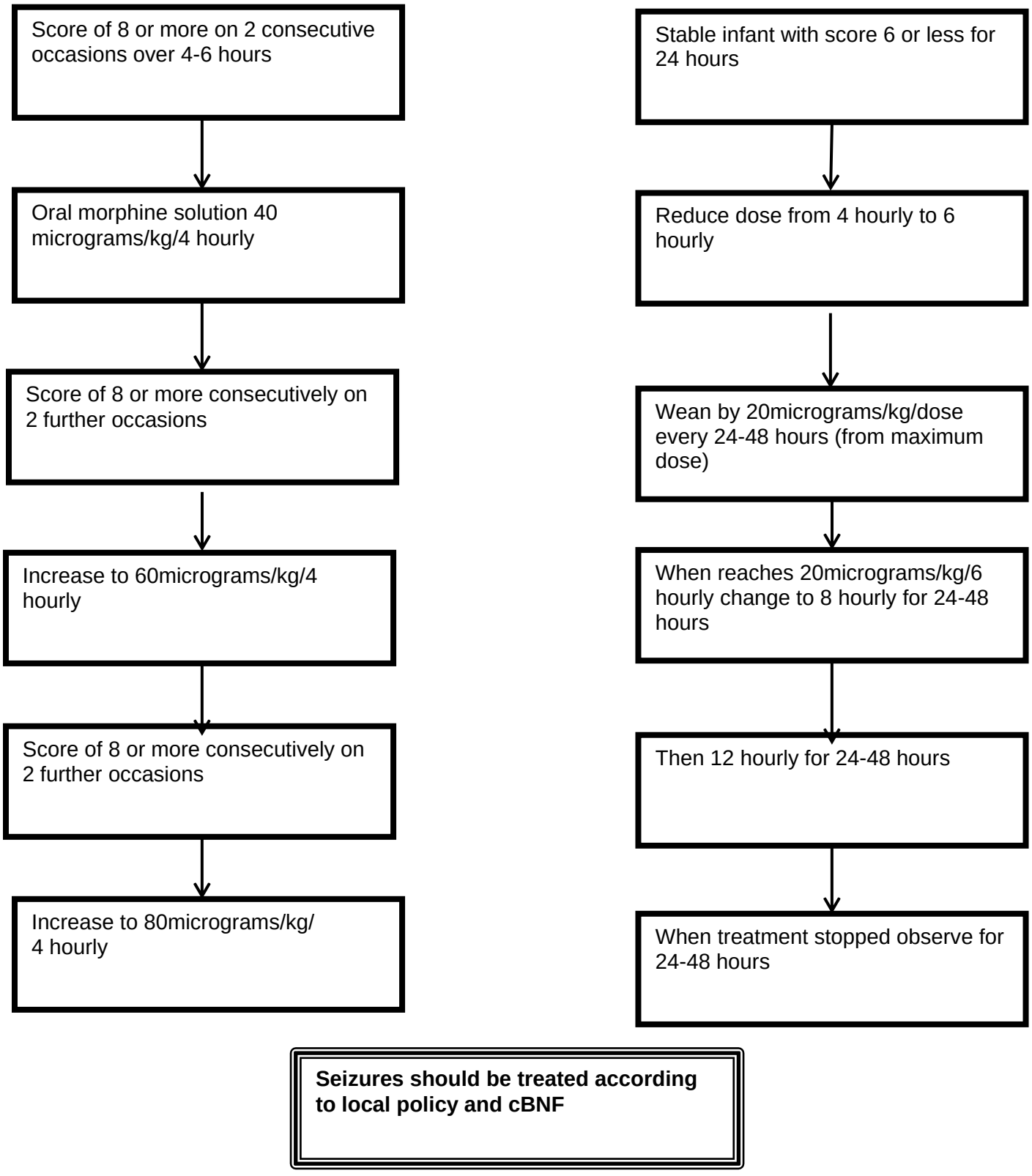
Appendix B

Adapted from: *Kocherlakota P. Neonatal Abstinence Syndrome. Pediatrics 2014 Vol 134 Issue 2.*



THAMES VALLEY MORPHINE TREATMENT FLOWCHART
(Adapted from Royal Berkshire Oral Morphine Treatment Flow Chart)

This is a guide only and may be individualised by the consultant according to the infant's symptoms



Seizures should be treated according to local policy and cBNF

DOSAGE REGIMES FOR METHADONE, CLONIDINE and PHENOBARBITONE

DRUG	DOSAGE
Methadone	0.05 to 0.1 mg/kg 6 hrly orally. Increase the dose if needed by 50 microgram/kg/dose every 6 hours till desired effect achieved. Then give total daily dose that controls symptoms in 2 divided doses per day. (BNFC) Taper the dose by 10-20 % per week. Discontinue when a dose of 0.05 mg/kg per day is reached. **(Ref 5)**
Clonidine	Starting dose: 0.5 mcg/kg/day divided 4-6 hourly. Maintenance dose: 3-5mcg/kg/day 4-6 hourly. Wean by 25% of total daily dose alternate days. **(Ref 4)**
Phenobarbitone	Single loading dose 15-20mg/kg orally, intravenously or intramuscularly. Dose can be repeated if symptoms still severe at 8-12 hours after initial dose (maximum loading dose 40mg/kg). Maintenance dose: 3-4mg/kg/day started 12-24 hours after initial dose. Can be given once daily or in two divided doses 12 hourly. Increase by 1-5mg/kg/day until therapeutic plasma levels achieved. Therapeutic trough plasma level = 86-129 micromol/L 24-48 hours post initiation / change in dosing. Weaning: only start weaning once morphine fully weaned off. Decrease by 10-20% per day. **(ref 5)**
Buprenorphine – not currently recommended treatment due to ethanol content	4-5mcgm/kg/dose every 8 hours Sublingual route, maximum dose 60 microgram /kg /day. Wean after 48 hours stability by 10% per day. (Ref 6)