NEONATAL GUIDELINES

Postnatal General Guidelines

Version 2018.4.1

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Directorate of Child Health

Checklist for Clinical Guidelines being submitted for Approval by SBUHB Perinatal Forum

Title of Guideline:	**Postnatal ward general guidelines**
Name(s) of revising author(s):	Dr Sujoy Banerjee, Dr Geraint Morris, Stephanie Cannell Senior ANNP, Gemma Davies Senior ANNP
Chair of Group or Committee supporting submission:	Perinatal Forum – Sujoy Banerjee
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Brief outline giving reasons for document being submitted for ratification	Only change is removal of Infection, Cardioloyg, Haematology and Jaundice sections to new documents
Name of Pharmacist (mandatory if drugs involved):	Katherine Wilson
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Changes included in the latest revision v2018.4

1. Removal of the infection guidelines for use on the postnatal ward into a separate section
2. Removal of the cardiology guidelines for use on the postnatal ward into a separate section
3. Removal of the Haematology and Jaundice guidelines for use on the postnatal ward into a separate section

Contents

Disclaimer

These guidelines are intended to assist decision making process for common neonatal problems in the postnatal period either in hospital or in the community.. For more complex problems refer to the full neonatal guidelines on the unit or take advice from a senior neonatologist.

The guidelines are frequently updated. You will be informed if there has been a significant change and it is your responsibility to familiarise yourself with the current guidelines.

Guidelines are not meant to replace discussion. If you feel uncertain please ask! Your questions may help us to modify our practices to provide better care for our babies. Don't be afraid to challenge!

For dosage of drugs please refer **initially** to the Northern Neonatal Network Formulary 7th edition. If the information is not available in the formulary then consult the unit drug folder.

These guidelines are intended only for use within Swansea Bay University Health Board and may need to be adapted for different sites. No responsibility or liability is accepted for the use or misuse of these protocols and guidelines outside of this Health Board.

NB: These GUIDELINES are only valid until the date stated at the footer of each section. DO NOT follow protocol if the 'valid until' date has passed; consult an up-to-date version.

Please note that these files are 'read only' copies. Any comments / proposed changes to the guideline must be directed to Dr. Sujoy Banerjee/ Dr. Amit Kandhari. Such changes will be discussed in our team meeting and you will be notified if an amendment is made.

Who needs admission to NNU?

a. Infants less than 35 weeks gestation

b. Infants less than 1800g birth weight

c. Any infant with an episode of apnoea or seizure

d. Tachypnoea, grunting or any oxygen requirement or requirement for CPAP or ventilation.

e. Infants with suspected or confirmed severe congenital abnormalities such as cyanotic congenital heart disease, TOF, exomphalos, gastroschisis

f. Infants with withdrawal signs from maternal drugs

g. Any baby who requires prolonged resuscitation including cardiac compressions or adrenaline or Apgars <5 @5 min, or any baby who is in secondary apnoea

h. Infants with suspected metabolic disease

i. Infants requiring exchange transfusion or with severe jaundice or haemolytic disease

j. Hypoglycemia that has not responded to tube feeds or glucose <1.6 mmol/l

k. Infants who have vomited bile or have abdominal distension

m. Other babies at the discretion of the Paediatrician

No baby should be admitted to the neonatal unit after discharge home except for those with severe hyperbilirubinaemia with potential for exchange transfusion. Always discuss with the neonatal consultant or the sister in charge for NNU if you are not sure (Working draft policy - Changed March 2011).

Hand washing and aseptic technique

Newborn babies are vulnerable to infection. This can be transmitted via improper handwashing. Before examining each baby, please ensure that all your jewellery, e.g. rings, watches etc, are removed, your sleeves are well rolled up and you have carefully and thoroughly washed your hands.

You can only use the gel in order to disinfect hands, which are already clean. Please ensure that everyone on the unit follows this policy at all times

Postnatal examination

After a baby is born parents are naturally anxious to know if their baby is all right. A thorough physical examination of every newborn is accepted as good practice and forms a core item of the child health surveillance programme in the UK. Up to 12% of babies may have some detectable abnormality at birth but not all will impact on health or require action. All newborn babies should be examined within preferably within 24 hours of birth and always within the first 72 hours. They will need to be reviewed again only if any new problems are identified during their stay.

The aims of the newborn examination are:

- Diagnosis of congenital malformations
- Diagnosis of common neonatal problems with advice about management or appropriate reassurance if no intervention is indicated
- Identify babies who should be offered specific intervention e.g. Hepatitis B vaccination
- Health promotion advice (cot death prevention, breast feeding, safe transport in cars)
- General parental reassurance

If a significant problem is identified an experienced paediatrician needs to explain the situation to the parents.

Remember the newborn / postnatal period is an emotional time for parents and for mothers in particular. They are tired and trying to establish feeding and have hormonal changes occurring. At such a time what appears to be a small problem to yourself may be perceived as a big upset for them. This is particularly for procedures that involve separating mothers from their babies eg: going under a phototherapy light or being admitted to the neonatal unit. Please be as positive, supportive and reassuring in your approach as you can.

Midwives & Nursery Nurses

It is important to respect their knowledge and experience of normal newborns. Listen to them, you can learn a lot about aspects of newborns and their care. If there is a disagreement regarding the management of a baby always listen first then explain your viewpoint. If the difference is still not resolved consult your SCBU Registrar/Consultant.

Newborn examination checklist:

The findings of these examinations should be clearly documented in the notes.
Any plans for further screening or investigations should be clearly documented and appropriate follow up arrangement made.

The procedure room on Ward 18 at Singleton Hospital is available for the Newborn Examination to take place, in a well-lit environment on a stable surface and with everything you may need close at hand. The Nursery nurses should also be available to assist you.

Wash hands thoroughly immediately before every examination (3 mins for initial wash).

Introduce yourself and offer congratulations.

Initial Details:

- Obtain any relevant past obstetric history, past medical history, pregnancy details (drugs/illness) and details of the labour, delivery and infant's condition at birth and progress following birth.
- Check feeding and adequacy of intake.
- Note urinary output (Meconium is usually passed in the first 24hrs and in 90-95% of babies and urine is passed in the first 48hrs).
- Verify infant's identification.

Examination (in mother's presence)

- Is the infant well?
- Observe colour (should be uniformly pink but blueness of hands and feet is not abnormal, blueness of face facial petechiae is common from cord around the neck/rapid second stage),
- Look for alertness, appearance, posture, and movements. Note cry
- Any congenital anomalies or unusual facial appearance
- Auscultate heart for heart rate (normal 120-150/min) rhythm, heart sounds and murmurs. Palpate precordium and apex and check pulses (brachial, femoral). **Check oxygen saturation as per specific guidance see page 42.**
- **Undress infant completely at this point**
- Examine Chest: note respiratory rate (normal 40-60/min)? any sternal and/or subcostal recession
- Auscultate the chest **for breath sounds and the heart sounds**
- **"Head to toe technique" Examine head and scalp, measure head circumference** (2-3 measurements & take the largest; microcephaly is < 32.5cm at term). Look at head shape, palpate anterior fontanelle, suture lines and posterior fontanelle (cephalhaematoma is confined to suture lines)
- Inspect ears (shape, size and position), mouth, jaw (micrognathia) and nose.

<u>Examination of the palate</u>

This examination must be done in every baby during the newborn baby check and in every baby on the neonatal unit during the discharge examination. You will need

a. *An assistant, either the baby's parent or a midwife, to gently hold the baby's head still*
b. *A torch or flashlight*
c. *A clean disposable wooden spatula/ tongue depressor.*

Explain to the parent that this is like examining a small child with a sore throat, and that it is the best way to ensure there is no cleft of the palate.

*Directly **visualize** the hard and soft palate as far back as the uvula. You will need to apply gentle pressure with the spatula, to depress the anterior portion of the tongue just enough to allow you to see the whole palate.*

***Palpate** the hard palate to rule out sub mucous clefts*

- Neck (look for branchial & thyroglossal cysts & swellings, neonatal goitre - all rare) palpate clavicles for fractures. Low hairline is seen in Turner Syndrome
- Examine arms (fractures or Erb's palsy) and hands - finger length, clinodactyly {5th finger} and palmar creases, grasp reflex.
- Examine abdomen - shape, umbilical vessels
- Palpate for liver (1-2cm below costal margin), spleen, kidneys and bladder.
- Examine genitalia (boys: testes descended, hypospadias; girls: normal female external genitalia – hymenal skin tags, mucoid vaginal discharge and vaginal bleeding (small amt) are common and regress in the first few days weeks and nothing needs to be done). (Urates in the urine can cause a pinkish-red stain in the nappy which may be confused with haematuria)
- Examine anus (should be patent & normally situated).
- Examine Hips - Observe for symmetry of skin creases and leg length. Abduct hips - abduction should reach 80-90° if not - Is the hip dislocated? Perform the Barlow and Ortolani test as appropriate. See hip examination flow chart later (see "hippy" doll for demonstration and practice). Babies with risk factors for DDH should have a routine USS scan of hips arranged (see section on hips)
- Examine legs and feet (Talipes).
- Examine eyes for pupil size and shape, clearness of cornea and check red reflex (sub conjunctival haemorrhages are not uncommon).
- Pull to sit, observe head control and tone, grasp and moro reflex (presence and symmetry)
- Suspend prone, observe tone and head position, examine back (run finger down the back) and sacral region.
- Examine skin for rashes (E. toxicum, Staph infection) & petechiae

Reassure and advise (parents appreciate being told the examination is normal)

Postnatal follow up

Please arrange follow up only if there is a good indication.

Infants to be booked into the baby clinic of the consultant on for NICU for the week, unless otherwise indicated.

Please ensure a referral letter is dictated or typed and uploaded to the postnatal referral section of SharePoint for the secretaries to archive and send out to the relevant consultant. Copy should be sent to the GP and HV

Parents must be given an explanation of the condition and reason for referral before their baby is discharged.

Please note – postnatal community records are sent home with baby.

Prescription charts:

- Prescribe clearly, IN CAPITALS, and use the approved name of the drug.
- CHECK – the dose, route and frequency:
- Beware of excessive precision! Only prescribe doses which can be measured.
- Always re-check doses
- Beware of the potential for confusion with dosage units – do not abbreviate
- Keep up to date with weight (ensure on chart) and age based dosage.
    - Decimal places should be avoided where possible, e.g. write 500 mg not 0.5 g. If decimal has to be used, write 0.5 mg not .5 mg.
    - Specify details regarding 'PRN' or 'duration of therapy' where appropriate. Do not only write as required. It is important to indicate a maximum cumulative daily (24 hours) dose.
- Write micrograms not mcg.
- SIGN and DATE the prescription.
- Make sure the times are specified.
- CANCELLATIONS – draw a horizontal line through the name of the drug and the date and then date and initial the 'date discontinued' space. Stop dates for short course treatments (such as antibiotics) can often be recorded on the medicine chart when

first prescribed.

- Any mistakes in dosages should be reported immediately to the doctor in charge and recorded on a risk assessment form.

Note writing:

There must be an entry written by the medical staff in baby's notes whenever a baby is examined or management altered. All entries must be signed, followed by a printed name and designation (SHO, Reg., etc.) and GMC number. The nurses and midwives also write in the notes.

Collapse in the postnatal period

Common causes

a) Sepsis
b) Duct dependent congenital heart disease
c) Aspiration / feeding in-coordination
d) Seizures
e) Hypoglycaemia

Rare causes will include

- Congenital adrenal hyperplasia (salt losing type)
- Inborn errors of metabolism

When a baby collapses in the postnatal period, seek help early. Take the baby to the nearest resuscitaire as quickly as possible, if available or a flat surface if in the community

What to do at resuscitation?

Term or Near Term Baby:

Note the time, wrap the baby in a warm, dry towel and place a hat on the baby's head. Ensure that the baby is kept warm.

Listen with a stethoscope for heart rate. It is not necessary to count this exactly but you should note whether the heart rate is absent, slow (<100) or fast (>100/min).
Assess the condition of the infant – tone, colour, breathing and heart rate. If available put a pre-ductal saturation probe

When to start resuscitation?

The indications for positive pressure ventilation include:-

1. Apnoea or ineffective respiratory effort
2. Heart rate less than 100/minute.
3. Persistent central cyanosis in facemask oxygen and a low heart rate

Airway and breathing:

Transfer to a neonatal resuscitaire if available. Otherwise use a firm flat surface for resuscitation. If the baby is not breathing perform airway-opening manoeuvres, place the appropriate size mask on the baby's face over the nose and mouth, and ventilate via the bag or T piece (neopuff). The baby's head should be in the neutral position. In a newborn, give the initial five breathes as inflation breaths (even if the lung does not contain fluids it is likely to be atlectatic), 30/5, each lasting 2-3 seconds in order to expand the alveoli and establish resting lung volume. The circuit must include a pressure relief valve. Start resuscitation in air where available and increase amount of FiO2 guided by improvement in heart rate and saturation monitor if available. If oxygen is the only gas available gas, start resuscitation in 100% oxygen.

Reassess after the inflation breaths by auscultating the heart rate. If the heart rate has improved you can assume that you have inflated the lung and therefore proceed to ventilation breaths. If the heart rate does not respond to inflation breaths the only way to check that the lungs have been inflated successfully is to see chest move in response to your inflation breaths. Therefore if there is no increase in heart rate check for chest movement.

If you do not see a heart rate response and there is no chest movement with the inflation breaths assess the need for the following in a systematic manner –

- Reposition – ensure neutral position of baby's head. It is very easy to over extend the neck during resuscitation!!
- Ensure you have gas flow (at least 6 litres /min).
- Re-evaluate the size of the mask and ensure appropriate seal.
- Apply single or double jaw thrust. If you have help it may be easier to use the two person jaw thrust technique.
- Ensure you have inflation pressure of at least 30cm of water and you are delivering long inspiratory times of 2-3seconds.
- Assess the need for a laryngeal mask airway I-gel
- Assess the need to suction the airway under direct vision.
- Assess the need for an oropharyngeal (Guedel) airway?
- Assess the need for higher pressures? Do you need to use a self-inflating

bag valve mask device?

- At all times evaluate the need for further help.
- Attach the baby to a oxygen saturation monitor if available

If there is good response to these manoeuvres with an increase in HR then proceed to ventilation breaths. A rate of 30 ventilation breaths per minute is sufficient. You may need to reduce your inflation pressures appropriately. Watch for the baby's chest movement, colour, tone, breathing and heart rate and keep on assessing the situation every 30 seconds.

Recently concerns has been expressed that the peak pressure delivered by a Laerdal bag may be far too large and lead to over distension of the lungs, which may contribute to chronic lung disease. Also the PEEP is variable. PEEP is required to establish a functional residual capacity. You will need to watch the expansion of the chest during each ventilation to gage whether or not the pressures are optimal. Ideally we should measure tidal volumes delivered but this is not yet possible on the delivery unit using existing equipment. With experience you should be able to gauge whether the chest movement is optimal.

Discontinue ventilation when baby has adequate respiratory effort and able to maintain colour and heart rate. Evaluate clinical background, degree of resuscitation and response, work of breathing, colour and tone to ascertain the need to admit to neonatal unit.

Absolute indications for endotracheal intubation are:-

i) Failure of effective ventilation with a face mask,

ii) Infant with suspected diaphragmatic hernia

If intubation is required ensure that a good view of the larynx is obtained. The commonest problem is overextension of the neck and deviation from midline. This should be avoided as this gives a distorted view of the upper airway. The baby should be intubated effectively within 30 seconds. If this is not successful you should go back to mask resuscitation until the baby is pink. Do not allow the baby to become hypoxic during an attempt to intubate. In a baby who is preterm and intubated give surfactant as soon as intubation is achieved successfully and tube secured.

If you do not see a good HR response despite good chest movement proceed to chest compression.

Cardiac compression:

Cardiac compressions should be commenced once 5 effective inflation breaths have been given with adequate chest movement but has not resulted in an improvement in the heart rate (i.e. HR still <60/min) and remains slow after 30 seconds of effective ventilation breaths.

Chest compression necessitates the involvement of a second pair of hands. The chest should be encircled in both hands with the thumbs placed on the lower third of the sternum and the fingers over the spine. The land mark to place your thumbs is just below the imaginary line joining the nipples. Alternatively locate the xiphisternum and go 1 cm up centrally on the sternum. The depth of cardiac compression should be about 1/3 of the "depth of the chest". Cardiac massage should be done at about 90/minute along with ventilation breaths of 30/minute at a ratio of 3:1. Allow sufficient relaxation time as the coronary arteries are perfused in diastole. The person doing cardiac massage should give their sole attention to this task.

In a very small pre-term baby cardiac massage can be done with two fingers with the back of the baby well supported. Reassess every 30 seconds or so, stop for 5 seconds and listen for the heart rate. Do not stop cardiac massage until the heart rate is consistently > 60/minute and rising.

Drugs:

If the heart rate fails to improve after 30 seconds of good quality cardiac compression, drugs should be considered. The intravenous route is preferred but if the baby is intubated consider intratracheal adrenaline at the dose of 0.5-1ml/Kg of 1in 10,000 solution.

Obtain central venous promptly by catheterising the umbilical vein if access is still possible. Prime the UVC with saline or hepsal prior to insertion to prevent air embolus. Remember this is an emergency CLEAN procedure but not a sterile procedure – so don't waste time gowning up!! . Take some blood for a gas and blood sugar when you insert the catheter. If umbilical venous access cannot be obtained or fails, intraosseous route is an alternative for drug administration in neonatal resuscitation.

IV Adrenaline can then be given in a dose of 0.1 mls per kilo of 1:10,000 (first dose). If there is no response

give Sodium Bicarbonate 4.2% intravenously in a dose of 2 mmols per Kg (4 mls per Kg) slowly over 1 minute. This should be followed by 0.3 mls/kg 1:10,000 adrenaline IV after 3 minutes or so. After each drug flush the line with 1-2 mls of 0.9%saline.

If hypovolaemia is suspected give volume e.g. 10 mls per kilo of normal saline. Correct hypoglycaemia if blood sugar less than 2.6mmol / litre by giving 2.5mls/kg of 10% dextrose. Avoid giving IV dextrose routinely as hyperglycaemia is known to be associated with poor outcome during a hypoxic ischemic insult.

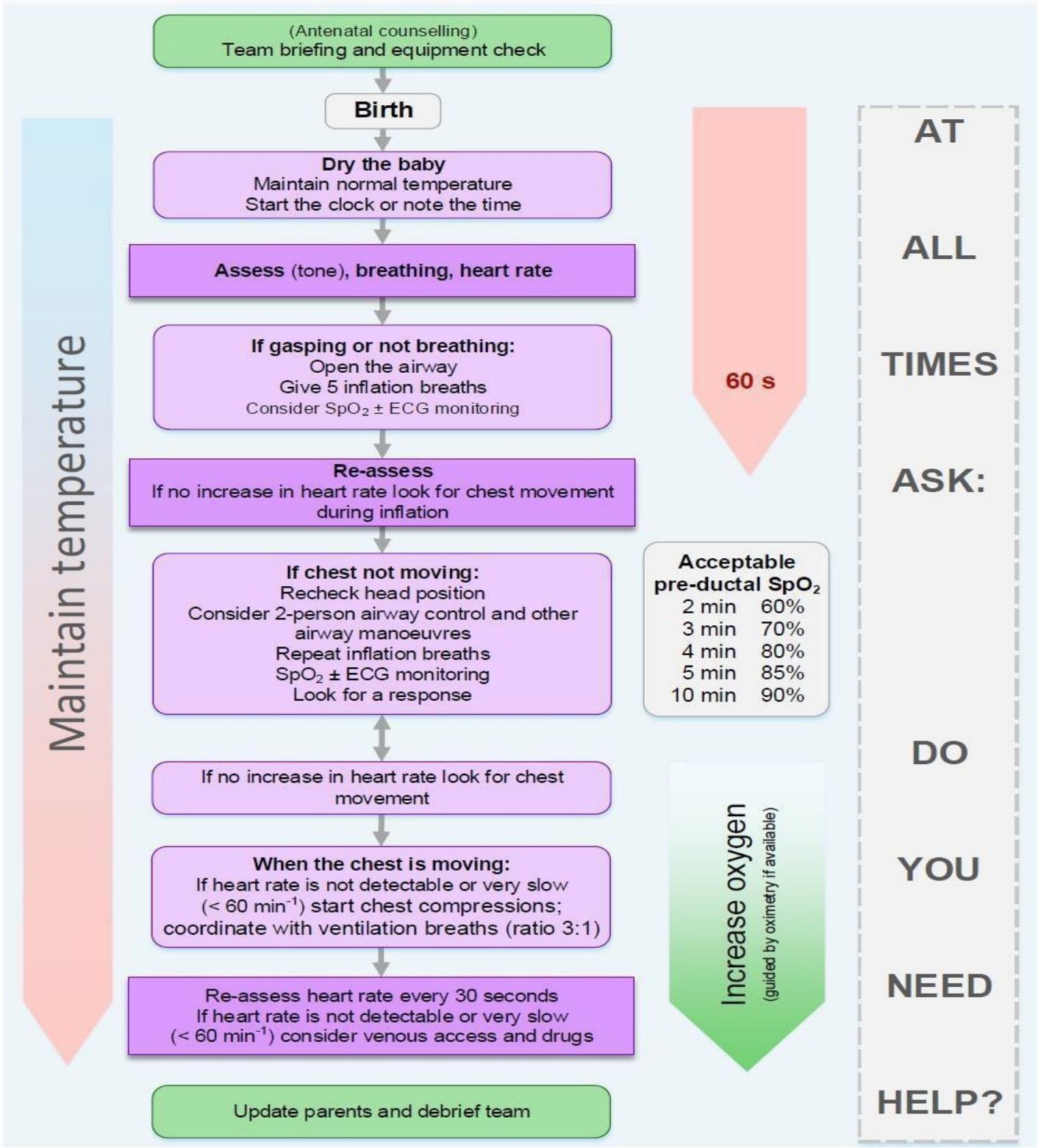
Ensure that adequate ventilation and cardiac massage are continued throughout these procedures and that the baby is kept as warm as possible. Spare a thought and word for the parents who will probably be extremely frightened and listening to everything that is going on.

Any baby who needs unexpected resuscitation on the postnatal ward will need admission to the corresponding newborn unit at Singleton Hospital or POW hospital in Bridgend as appropriate.

Please note that for the birthing centre at NPT, contact 999 ambulance and transfer to Singleton Hospital. The baby should be resuscitated using equipment in the box available at the birthing centre and transported on a transport blanket with the midwife in attendance.

For resuscitation in the community / home, further evaluation should be undertaken in PAU/ Paeds A&E at Morriston Hospital.

Always inform NICU / PAU prior to transfer


(Antenatal counselling)
Team briefing and equipment check
Birth
Dry the baby
Maintain normal temperature
Start the clock or note the time
Assess (tone), breathing, heart rate
If gasping or not breathing:
Open the airway
Give 5 inflation breaths
Consider SpO2 ± ECG monitoring
Re-assess
If no increase in heart rate look for chest movement during inflation
If chest not moving:
Recheck head position
Consider 2-person airway control and other airway manoeuvres
Repeat inflation breaths
SpO2 ± ECG monitoring
Look for a response
If no increase in heart rate look for chest movement
When the chest is moving:
If heart rate is not detectable or very slow (< 60 min-1) start chest compressions; coordinate with ventilation breaths (ratio 3:1)
Re-assess heart rate every 30 seconds
If heart rate is not detectable or very slow (< 60 min-1) consider venous access and drugs
Update parents and debrief team
Maintain temperature
60 s
Acceptable pre-ductal SpO2
2 min 60%
3 min 70%
4 min 80%
5 min 85%
10 min 90%
Increase oxygen
(guided by oximetry if available)
AT
ALL
TIMES
ASK:
DO
YOU
NEED
HELP?

Clinical observations of babies in the postnatal period

Midwives are practitioners in their own right and are able to work autonomously when caring for normal well term babies.

The NEWS observation document has been introduced in 2016 to assist recording of observations and threshold for referral for further medical attention. (See later).

Low-risk term babies born in good condition:

These are babies who are unlikely to have problems based on risk factors.

During the first hour of life:

a. Mother and baby should not beseparated
b. Skin to skin contact should be encouraged
c. Breastfeeding should be initiated

After 1 hour, record baby's head circumference, body temperature and weight

Healthy babies should have normal colour for their ethnicity, maintain a stable body temperature (measure only if clinical concern) and pass urine and stools at regular intervals. They initiate feeds, suck well on the breast (or bottle) and settle between feeds. They are not excessively irritable, tense, sleepy or floppy. They should not breathe fast or demonstrate excessive work of breathing (Respiratory rate 30-60/min, no nasal flaring, grunting or chest recessions).

At every postnatal contact with the mother, general wellbeing of the baby should be assessed and documented along these lines.

When a problem is identified with a baby

a) Observations of respiratory rate, heart rate and temperature should be clearly recorded inthe baby notes using the NEWS observation chart.

b) There should be clear documentation of what the midwives concerns are.

c) The Paediatrician should be asked to review and the time of request clearly documented in the notes.

d) The time that the Paediatrician attends should be clearly documented in the notes.

Paediatric Responsibility:

a) The Paediatrician who has reviewed the baby should clearly document a plan of care.

b) This plan should identify what observations are to be recorded and the frequency and length of time these observations are required.

c) Any further tests need to be documented.

d) When further review is to be undertaken.

High-risk babies:

These are babies who although well at birth are thought to be at higher risk of developing neonatal problems based on risk factors. Skin to skin contact and breastfeeding should be encouraged as normal unless clinical condition demands intervention

These babies will need specific observations. Alert paediatrician if abnormal at any stage

Box 1:

- General well being
- Chest movements and nasal flare
- Skin colour (Test capillary refill - <2sec)
- Feeding
- Muscle tone
- Temperature (normally 36-37C)
- Respiration (normally 30-60/min)
- Heart rate if any of the above abnormal (Normally 100-160/min)

The following are guidelines for more well defined risk factors. However, babies who do not fit in any of these categories should be discussed with the paediatrician and an individualised care plan agreed.

1) **Meconium stained liquor:**

   a) **Light meconium stained liquor**– Hourly observation for first two hours.

b) **Thick meconium stained liquor-** (Dark green or black amniotic fluid that is thick or tenacious, or any meconium stained fluid containing lumps of meconium)

Hourly observations for first two hours and then two hourly until baby 12 hours old. If normal discontinue specific observations.

If observations abnormal at any stage alert paediatrician

2. **Prelabour rupture of membranes at term (PROM) >24 hours – Defined as interval from rupture of membrane to onset of labour (Not birth)**

- **No other risk factors –** No bloods or antibiotics required**.** Need to stay in at least for 12 hours, preferably 24 hours. Hourly observations for 2 hours followed by 2 hourly observations until 12 hours old. Discontinue specific observations if all normal at 12 hours

- **Associated risk factors (see guidelines on PROM) –** These babies will have undergone partial septic screen and started on intravenous antibiotics. They will need similar observations as above for the first 12 hours and then 4 hourly until 24 hours old. Discontinue specific observations if all normal at 24 hours. These babies should be reviewed daily by the paediatrician until antibiotics are stopped.

b. **Known maternal Group B streptococcal guidelines:** Observations will be similar to that of PROM depending on risk factors and if baby is on antibiotics.

c. **Babies on the hypoglycaemia pathway**

These babies should have specific observations at 1 hour and then before every blood sugar measurement until off hypoglycaemia pathway. Alert paediatrician if observation abnormal.

Reference:

1. Intrapartum care: NICE Guideline September 2007
2. Routine Postnatal care of women and their babies: NICE Guideline July 2006

Neonatal Early Warning Tracking and Trigger Score Chart (NEWTTS)

Addressograph/Patient ID

Score	0	1	2	3
Tone	Normal			Stiff/Floppy
Colour	Pink			Blue/Grey/White
Conscious level	Alert			Unrousable/Unconscious
Grunting	Absent	Present		
Recession	Absent	Present		
Nasal Flaring	Absent	Present		

Note the scores from the box above in the columns below

White = Score 0, Yellow = Score 1, Amber = Score 2, Red = Score 3

Date															
Time															
Tone score															
Colour score															
Conscious level score															
Grunting score															
Recession score															
Nasal Flare score															
TEMPERATURE (degrees C) 38.5 or above															
38 - 38.4															
37.5 - 37.9															
37 - 37.4															
36.5 – 36.9															
36 – 36.4															
<36															
Temperature Score															
HEART RATE (Beats/minute) 180 or above															
170 to 179															
160 to 169															
140 to 159															
120 to 139															
100 to 119															
90 to 99															
80 to 89															
<80															
Heart Rate Score															
RESPIRATORY RATE (Breaths/minute) 80 or above															
70 to 79															
60 to 69															
50 to 59															
40 to 49															
30 to 39															
<30															
Respiratory Rate Score															
Total NEWTTS Score															
Initials															

Condition	Frequency of Observations (NICE Guidelines CG37,CG149 and CG55)
Babies born to mothers with one or more risk factors for bacterial infection: • Maternal Group B Streptococcus (GBS) carriage or infection in current pregnancy (with or without intrapartum antibiotic prophylaxis) • Previous child with GBS sepsis • Prelabour rupture of membranes (>24 hours) • Spontaneous preterm labour (<37 weeks) • Intrapartum fever (>38°C) • Chorioamnionitis	These babies should be observed at the following hours after delivery: 1 hour 2 hours 4 hours 6 hours 8 hours 10 hours 12 hours Then 4 hourly until 24 hours of age
Babies receiving antibiotics for proven or suspected infection	As above, also at 0 hours when decision made to observe, then 4 hourly while on antibiotics
Babies at risk of hypoglycaemia – follow hypoglycaemic pathway	As above, also at 0 hours when decision made to observe, then 4 hourly until glucose stable on 3 hourly feeds
Babies showing signs of hypoglycaemia eg jitteriness, sweating, lethargy, seizures	Check blood glucose immediately
Instrumental deliveries	As above for 24 hours
Babies causing any other concerns	Use clinical judgement

The NEWTTS chart is a minimum requirement but is not an alternative for clinical judgement, which should be used in every case.

NEWTTS Scores and Actions:

Score 0 Continue normal care, continue NEWTTS observations for relevant duration

Score 1 Adjust thermal environment, repeat NEWTTS observations hourly until score = 0
If NEWTTS persistently 1 at 4 hours, contact SHO/ANNP to review within 30 minutes

Score 2 Contact SHO/ANNP. Baby should be reviewed within 30 minutes. If not reviewed within 30 minutes, bleep SHO/ANNP to review within 15 minutes. If baby is not admitted to neonatal unit, continue NEWTTS observations hourly until score is 0 again. If NEWTTS score is 2 after 4 hours, admit to NICU. If NEWTTS = 1 at 4 hours, bleep SHO/ANNP for review

Score 3 Urgent review needed within 15 minutes. Complete assessment required - contact neonatal team (SHO/ANNP/Registrar) and consider admission to neonatal unit.
If not admitted to neonatal unit and NEWTTS score still 3 after 2 hours, admission to neonatal unit is necessary.

Adapted from Women's NHS Foundation Trust Observation Chart (with permission) 11/09

Lotus Births

A small number of women are choosing umbilical non-severance, or “lotus birth.” Lotus birth is a practice in which the umbilical cord is not cut after birth. The baby remains attached to the placenta until the umbilical cord dries and eventually detaches from the umbilicus. Detachment generally occurs a few days after birth. No research exists on lotus births and there is currently no medical evidence that it is of benefit to the baby.

Before choosing umbilical non-severance, all women should be fully informed of the potential risks, which may include infection and associated risks to the baby's health.

In 2008 the RCOG released a statement saying:

“If left for a period of time after the birth, there is a risk of infection in the placenta which can consequently spread to the baby. The placenta is particularly prone to infection as it contains blood. Within a short time after birth, once the umbilical cord has stopped pulsating, the placenta has no circulation and is essentially dead tissue.”

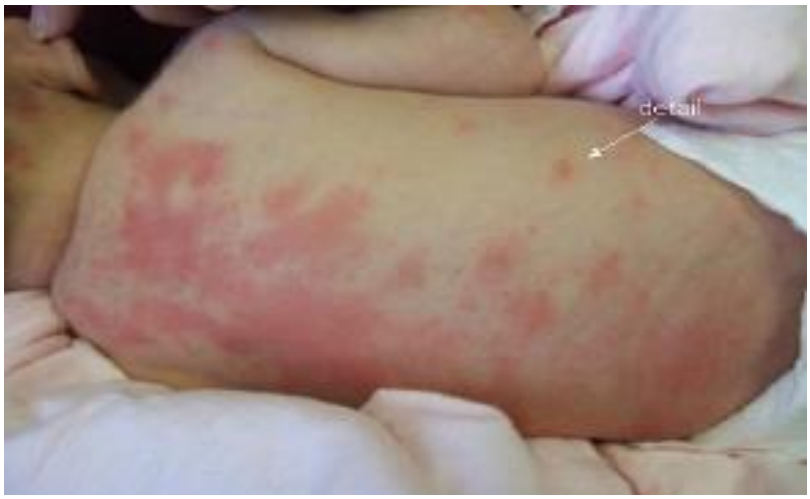
If women do opt for umbilical non-severance, the RCOG strongly recommends that their babies be monitored carefully for any signs of infection. There is no guidance as to the length of time the baby should be monitored for as the time taken for the placenta to detach is very variable.

We should advise that the baby is monitored for the first 24h following which the family could be discharged with detailed information on signs of infection and jaundice (the most significant risks to be aware of). If the mother remains determined to go home before the 24 hour period has elapsed the risks of infection must be explained and this conversation must be documented in the notes.

Common Postnatal Problems

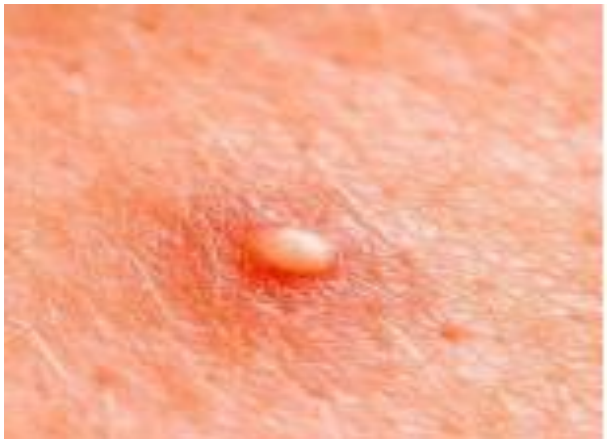
Skin Rashes:

1. **Erythema Toxicum**:



Multiple small yellow spots surrounded by halo of red skin. The yellow spots are firm, the cheesy material contains eosinophils and is not an indication of infection. These spots tend to occur in crops, and have a tendency to "come and go". They can appear upto 14 days of age. It is very common (50% of newborns have it) and requires no treatment. Reassure parents.

2. **Small "white-heads" (not on nose)**



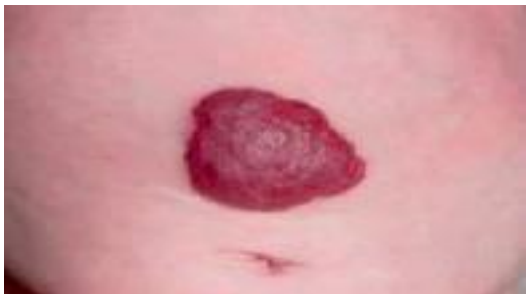
These are usually staphylococcal infection. Unless multiple no treatment required. If decide to treat – oral Flucloxacillin 25mg/kg 12 hourly for 5 days – can be discharged if well infant.

3. **Yellow lax blisters**

Surrounded by inflammation are often staphylococcal. These should be swabbed to confirm organism. Mother and baby should be isolated to prevent cross infection. Perform a partial septic screen and treat systemically with IV Flucloxacillin and gentamicin for at least 48 hours. A 5 day course of treatment could be completed with oral flucloxacillin at home if baby responds to treatment and blood culture results do not indicate a different organism. If baby is unwell, admit to unit and complete a full septic screen

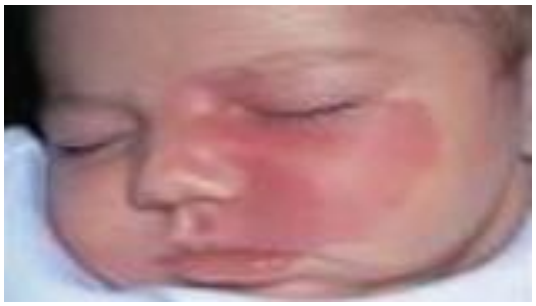
Birthmarks

1. Strawberry naevus



Usually very small and raised. Rarely present at birth and usually appears in the first few weeks. Reassure patients. Explain will gradually increase in size but will then start involuting towards the end of first year and usually disappear before 5 years of age. Lesions obstructing vision will need urgent referral to ophthalmologist. Other lesions which may need referral to a dermatologist and intervention are perioral and perineal lesions that interferes with care and prone to bleeding, infection and ulceration.

2. Port-wine stain



These do not disappear. Parents need reassurance that laser treatment is available.

Refer to Dr Blackford (Dermatology) in Singleton and Dr Jenny Hughes in POW. Facial port- wine stains can be associated with focal fits specially if involving forehead and eyelid (Distribution of the ophthalmic division of the trigeminal nerve (Sturge-Weber). If the lesion involves the eyelid the child has increased risk of glaucoma and needs referral to Consultant Ophthalmologist - Mr. David Laws in Singleton and Mr Mark Freeman in POW. Inform Consultant on for the week in the relevant hospital.

"Unusual facial features"

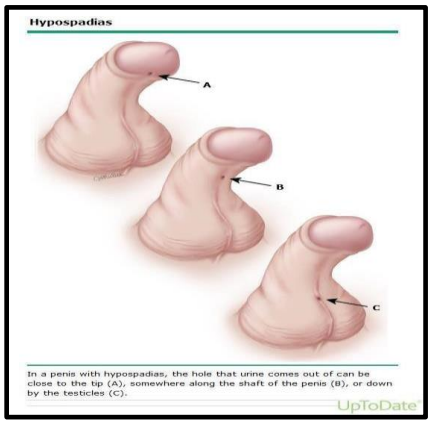
Request an experienced paediatric review, either middle-grade or consultant, before embarking on investigation e.g. chromosomes. Ask if the baby looks like anyone in the family. Explain to parents that a senior paediatrician will be coming but focus on non-specific findings e.g. floppiness in Downs syndrome, clicky hip, etc. Please be careful/sensitive about what you say.

External ear anomalies:

For minor anomalies such as skin tags, preauricular sinuses, misshapen pinna - routine renal ultrasonography is not indicated unless accompanied by other systemic malformation.

Minor auricular deformities could be corrected through remoulding treatment if instituted early. If parents are willing such treatment could be offered by referring to Dr. Nick Wilson Jones, Consultant Plastic Surgeon at Morriston Hospital.

Hypospadias



The site of the meatus, severity of chordee and any accompanying abnormalities e.g. inguinal hernia, cryptorchidism should be identified.

Check the antenatal notes for any renal ultrasound abnormalities. Babies with glandular hypospadias only do not need routine renal ultrasound scan. Babies with more severe forms of hypospadias require a postnatal renal scan, but the timing depends on the antenatal scan result and the severity of the abnormality. Perineal and penoscrotal hypospadias will need a more senior review before discharge.

Advice against circumcision as the prepucial skin may be required for repair. Refer to Mr. Wilson Jones, plastic surgeon at Morriston, as a routine referral with a copy to the GP. They are not usually repaired before 2 years of age and the surgical team will send an appointment at an appropriate time. **Don't forget to consider ambiguous genitalia – bilateral cryptorchidism with hypospadias requires urgent investigation,** and consultant involvement at an early stage as this is a very difficult and complex problem.

Undescended Testis

Unilateral undescended testis

Present in 2-3% of term male infants. The testis can often be palpated just outside the external ring (suprascrotal) or in the inguinal canal (intracanalicular). If it is not palpable it may be still intra-abdominal. Follow-up should be by the GP and referral to surgeons directly (Mr. Paul Jones – Consultant Urologist – Swansea) if the testis has not come down by 1 year of age

Bilateral undescended testes (Cryptorchidism)

Consider ambiguous genitalia and refer for senior Paediatric review within 24 hours (See Endocrine guidance on ambiguous genitalia).

Inguinal Hernias in Newborn Infants or Pre-term Babies

Refer these to paediatric surgeons at Cardiff on the same day, but only after discussing with consultant Paediatrician in Swansea or POW. There may be local arrangements for operating on these infants in future.

Hydroceles

Hydroceles resolve spontaneously over several months – no F/U required.

Single Umbilical Artery

There is a 2-4% associated risk of minor renal abnormalities. If possible send a piece of the cord for histology for confirmation. Check that the antenatal scans showed no abnormalities. In the absence of any additional clinical abnormality no further investigation is required.

Umbilical Hernias

Even large umbilical hernias usually resolve. Reassure mother. No follow-up required.

Tongue-tie

No intervention is required if the baby is feeding well. Reassure and discharge. If there are feeding problems in a breast fed babyrefer to the breast feeding coordinator

Cleft Lip and Palate

- Contact the Cleft Lip & Palate Team on: **01792 703810**. This phone number will be answered either by one of the Cleft Lip & Palate Specialist Nurses or the Team Coordinator; if no one answers **please leave a message**. There is an on-call rota and the messages are picked up several times every day including weekends and bank holidays.
- One of the Specialist Nurses will visit the familyon post-natal ward (PNW), and give advice on feeding and follow up.
- Notify consultant of the week.
- Daily review on PNW, to ensure no concerns with feeding or breathing. Discuss with Specialist Nurses, SpR or consultant if any concerns, as baby may need admission to SCBU.
    - Letter to Dr Maha Mansour for clinic follow-up in 4 – 6 weeks, with copy to Mr. David Drake (Cleft Lip & Palate Surgeon at Morriston). All babies will have cardiovascular assessment in outpatients, but may require this prior to discharge if there are clinical concerns.

- Some babies may require other investigations, especially if there are associated anomalies; these are usually arranged during outpatient follow up.

Sticky Umbilicus

An umbilicus becomes colonised with organisms such as Staphylococcus aureus, epidermidis, and diphtheroids etc within a few days of birth. The umbilical cord separates through a process of aseptic necrosis and can look 'sticky'. This does not usually require any treatment. Treatment with antiseptic agents or antibiotic powders is not indicated.

If pus is present or there is prominent umbilical flare, then after swabbing and partial septic screen intravenous systemic antibiotic treatment with flucloxacillin and gentamicin is indicated. The treatment can then be completed orally with flucloxacillin based on clinical response and culture results.

Natal Teeth:

Usually at site of lower incisors. If loose consider extraction prior to discharge as there is small risk of aspiration. Contact Facio-maxillary team at Morriston

Breast enlargement

Occurs at 7-10 days in both sexes from surge in prolactin / oestrogen following birth

Skin tags and accessory digits:

Do NOT tie off skin tags with silk. Refer to plastic surgeons.

Extra digits

Define as pre-axial (radial side of hand and medial toes) axial (midline) or post-axial (ulnar side of hand and lateral side of toes) There is often a strong family history in post-axial extra digits. Pre-axial extra digits have a higher association with other anomalies

Do NOT tie off extra digits with silk - it is possible to tie off the wrong digit in this way and often leaves unsightly tags. Complications: tender or unacceptable nubbins

Spinal abnormalities

Simple single sacral midline dimples in the skin overlying the coccyx, which have a visible intact base and are less than 0.5 cm in diameter, are typically **benign** with little or no clinical significance. In contrast, sacral dimples that are deep and large (greater than 0.5 cm), fall within the superior portion or above the gluteal crease (>2.5 cm from the anal verge), or are associated with other cutaneous markers for neural tube defects (NTDs) eg, hypertrichosis, and discoloration, are more likely to be associated with an underlying NTD. If a sacral dimple has any of these characteristics, an ultrasound should be performed to screen for a NTD.

If in doubt, ask the consultant on take to review the baby. Cutaneous lesions associated with occult spinal dysraphism (OSD):

Imaging Indicated	Imaging uncertain	Imaging not required
Subcutaneous mass or lipoma	Hyperpigmented patches	Simple dimples (<5 mm, <25 mm from anal verge)
Hairy patch	Deviation of the gluteal fold	Coccygeal pits
Dermal sinus		
Atypical dimples (deep, >5 mm, >25 mm from anal verge)		
Vascular lesion, e.g. haemangioma/ telangiectasia		
Skin appendages or polypoid lesions, e.g. skin tags, tail-like appendages		
Scar like lesions		

- Infants and children with OSD may develop symptoms as they grow due to distortion of the spinal cord and nerve roots. This results in neurological sequelae in the lower limbs, urinary and bowel symptoms.
- A combination of two or more skin lesions is the highest indicator of OSD
- Ultrasound can identify spinal abnormalities but should ideally be performed within the first 3 months of life
- Magnetic resonance imaging is the modality of choice for evaluating the CNS but is expensive and requires sedation or general anaesthesia in young children.

Ref: Helen Williams**.** Spinal sinuses, dimples, pits and patches: what lies beneath? Archives of Disease in Childhood - Education and Practice 2006;91: ep75-ep80

Midline defects

Midline spinal haemangiomas should have a spine X-ray and USS and be referred if any abnormality.

Bilious vomiting

Admit all babies with a history of one bilious vomit. They should be examined thoroughly, kept nil by mouth, started on NG decompression. They should also have a partial septic screen and started on first line antibiotics. Urgent abdominal X-ray should be arranged. If there are any abnormalities on clinical examination and investigation the baby should be transferred to a surgical unit for further evaluation (usually upper GI contrast) principally to rule out malrotation. For stable babies with normal X-ray and examination surgical advice should be taken with regards to further course of management.

Failure to pass urine

98% of babies have passed urine by 48hrs old. Failure to do so may be renal but more often than not it is due to failure to notice urine rather than failure to pass it.

In a well baby, it is much more likely to be post-renal. In boys, the single most important diagnosis to consider is posterior urethral valves. Failure to pass urine or a continual dribble of incontinence in a boy should be considered due to this until proven otherwise.

The underlying cause may be renal / prerenal but most babies with such underlying causes are very ill and already in SCBU. In girls the problems are very rare. Examination and history should establish the following:-

- History ofoligohyramnios (renal dysgenesis)
- History of asphyxia
- Kidneys palpable
- Bladder palpable
- Genitalia normal
- F/H of renal problems

Bloods for U&E should be taken and a urinary catheter can be passed to determine if there is urine in the bladder. In boys failing to pass urine in 48hrs, it is probably best to arrange a renal USS.

Failure to pass meconium within 24 hours:

First check that the baby has not passed meconium at delivery!! (sometimes not recorded). Recheck patency of anus, signs of intestinal obstruction (bilious vomiting, abdominal distension). If a term baby has not passed meconium within 24 hours further investigations such as referral to surgeons for rectal biopsy (rule out Hirschprung's disease) or testing for CF may be required.

Management of Birth Injuries

Section author – Sian Foulkes and Jean Matthes

Examine carefully babies at increased risk of birth injuries

- Macrosomic infants
- Instrumental deliveries
- Shoulder dystocia
- Vaginal breech deliveries
- Any other history of difficult delivery

General principles

- The neonatal consultant should be informed immediately about any baby with significant birth trauma including fractures, brachial plexus palsies, suspected subgaleal haematomas and severe lacerations. The baby should then be put under his/her care and this should be documented in the notes.
- Examination should be thorough and include a detailed neurological examination including recording of the deep tendon reflexes (except in the case of a fractured limb)
- If pain is a possibility, then analgesia should be prescribed. Prescribe analgesia regularly (not PRN) if the injury appears severe e.g. a fracture. Analgesia should be prescribed when the baby goes home if there is an injury expected to result in pain.
- Regular observations should be requested. Specify in the notes if these are to be done more frequently than or beyond our standard times of 1, 2, 4, 8 and 12 hours.
- The baby should be reviewed regularly by the medical team with documentation in notes.
- Medical photography of injuries may be helpful as part of the medical record

Soft tissue injuries

- Babies with extensive bruising are at increased risk of jaundice
- Most lacerations/abrasions are superficial. These require cleaning with sterile saline. A few may require steri-strip closure.
- Petechiae on presenting part occur often and are of no concern if present from birth. Babies with a spreading petechial rash or other signs of bleeding should have

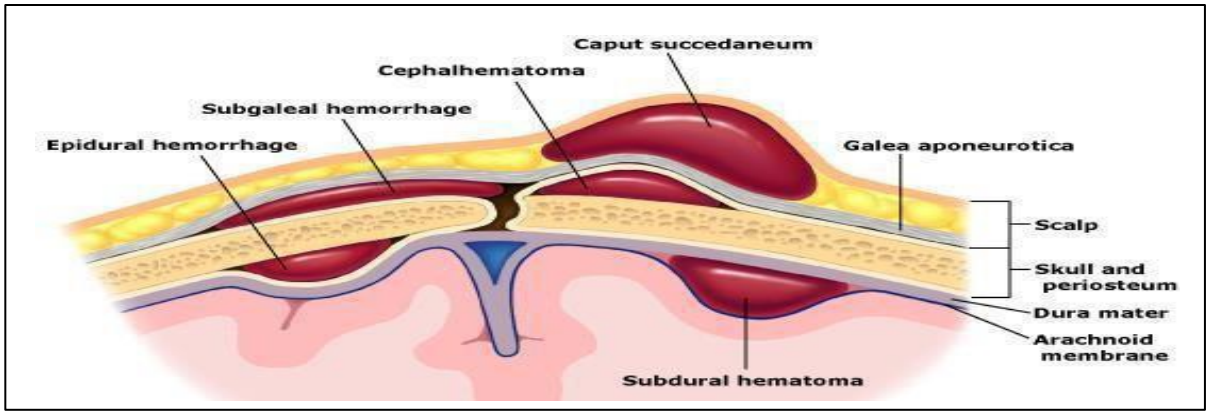
their platelets and coagulation screens checked.

Head and face

Injuries to the head are commonly seen following instrumental delivery. Most are benign and self limiting. Diagnosis has important implications regarding management

- Caput Succedaneum: oedematous swelling above periosteum caused by prolonged pressure on presenting part. Resolves spontaneously within 24-48 hours. Reassure parents.
- Cephalhaematoma: bleeding between periosteum and skull – limited by suture lines. This generally resolves spontaneously over a few weeks, but is occasionally complicated by calcification causing bony swelling. Reassure.
- Sub-galeal haematoma: bleeding between the periosteum and aponeurosis. Can be associated with substantial haemorrhage, shock, anaemia, hypotonia, seizures and has a significant mortality. All babies with suspected sub-galeal haematoma should be admitted promptly to the neonatal unit. Ensure vitamin K has been given, arrange cross match, FBC and coagulation screen. To try to identify this problem early it is important that all babies born by ventouse or forceps deliveries have frequent observations for the first 12 hours of life which includes regular inspection of the head for site and size of any swelling

How to differentiate between caput, cephalhaematoma and sub-galeal haematoma



From uptodate.com/contents/neonatal-birth-injuries (originally modified from Volpe JJ) Neurology of the Newborn, 4th ed, WB Saunders, Philadelphia 2001

	Caput	Cephalhaematoma	Sub-galeal haematoma
Associated with instrumental delivery?	No	Yes	Yes
Present at birth?	Yes	Outlined but swelling develops over first few hours	Yes
Expands in size?	No	Rarely	Yes
On palpation	Firm	Soft, not displaceable	Boggy/fluctuant-may move/spread dependent on gravity
Crosse s suture lines?	Yes	No	Yes
Localisation and spread	Poorly defined but localised to scalp	Localised swelling with well defined outline	Poorly defined, may spread, obliterate normal neck contour and cause peri-auricular and peri-orbital oedema. May have crepitus or fluid waves
Pain/Irritable cry	No	Possibly	Yes
Shock	No	No	Possibly severe

Intracranial haemorrhage

Consider intracranial bleeding in any neonate with a history of traumatic delivery and any abnormal neurology, tone, apnoea or lethargy. It may develop in an apparently well neonate hours to days after delivery. Perform a coagulation screen and check the platelets and FBC.

Subarachnoid haemorrhage

These are usually asymptomatic but seizures and other complications rarely occur

Subdural

Presents shortly after birth with stupor, seizures, a full fontanelle, unresponsive pupils and coma

Intracerebral haemorrhage

All the above best diagnosed on CT /MRI scanning when the clinical condition of the baby permits

Skull fractures

Skull fractures can be linear or depressed. They can be associated with instrumental delivery or occur spontaneously. Fractures at the base of the skull can result in shock. Senior review should be sought if skull fracture is suspected. Examine fully including OFC and fontanelle and request regular observations (including neurological). A CT scan is useful to confirm or rule out intracranial haemorrhage.

Injuries to the eyes

- Subconjunctival haemorrhage is commonly seen due to elevated venous pressure in head and neck due to delivery and resolves within 7-10 days. Reassure parents.
- Any other eye injury e.g. corneal damage from forceps blades, hyphema (blood in anterior chamber) orbital fracture, vitreous/orbital haemorrhage (presents with proptosis) requires urgent ophthalmological review.

Nasal septum dislocation

Nasal septum dislocation presents as stridor and / or cyanosis. It requires reduction by ENT specialists. Differentiate from a positional deformity by depressing tip of nose-dislocation present when nares collapse and do not return to normal position with release of pressure

Trunk and Limbs

Fractures

Clavicular fracture: most common fracture seen in the neonate.

- Often asymptomatic if non-displaced. Look for swelling, bruising, asymmetry or lack of movement on one side. Palpate for any swelling/displaced bone or crepitus. Elicit any signs of pain on passive movement of arm.
- Diagnosis confirmed by x-ray (including chest and upper limbs-for other differential diagnosis).
- Most heal spontaneously with no long term sequelae. Reassure parents, advise

gentle handling and analgesia. Immobilisation may also help with pain control by positioning of arm to chest with elbow flexed at 90 degrees e.g. ina sling.

- The most important consideration is to examine carefully for any associated brachial plexus injury (see below).

Fractured humerus is the most common long bone fracture arising from birth trauma

- Look for localised swelling/bruising, decreased movement of arm and decreased Moro reflex on affected side. Observe for any pain on palpation or movement of arm.
- Diagnosis confirmed by x-ray.
- Treat by immobilisation of affected arm with elbow in 90 degrees of flexion. Most heal well-reassure parents.
- Often associated with brachial plexus injuries-examine carefully to exclude.
- Inform paediatric orthopaedic consultant - Mr Paul Williams, or Mr Neil Price (based at Morriston – contact via secretaries)

Fractured femur is less common with risk factors as above plus twin pregnancy and prematurity.

- Examine as above for humeral fracture but may it may be asymptomatic in the immediate postnatal period
- Confirm with x-ray. Often a spiral fracture
- Contact paediatric orthopaedic consultant as above. This will require treatment with a spica cast or Pavlik harness. However outcome is normally good and parents can be reassured.

Rib fractures are exceedingly uncommon but can occur following extremely difficult deliveries. There may be other obvious birth injuries especially fractured clavicles and brachial plexus palsies which co – exist.

If it is suspected that there may have been a fracture caused by the delivery it is best to get the X- ray done as soon as possible after birth.

If the injury is known to be caused at birth because birth was traumatic, the x-ray was done soon after birth confirming the fractures etc then NAI need not be considered.

In all other cases NAI must be considered. These fractures may best be considered as 'unexplained' necessitating social services referral in most cases.

Rib fractures -

- May present with tachypnoea, crepitus, "clicking ribs" or pain on handling.
- X-ray may be performed although fractures may not become apparent until there is callus formation two weeks later. Obtain a report from a paediatric radiologist.
- If there is doubt it can be helpful to perform another CXR exactly 2 weeks after birth. If it was a birth injury callous will have appeared. If there is no callous it probably occurred after birth.
- Resolve spontaneously with no intervention.
- As with all fractures it is important to document the presence carefully as otherwise may be confused with child protection issues later.
- Bear in mind that rib fractures are much more commonly caused by NAI than birth trauma and birth trauma must be severe to cause these.
- (Rib fractures may also be seen in preterm babies with osteopenia of prematurity and chronic lung disease).

Epiphyseal separations

- These can present as a pseudoparalysis of the shoulder or hip caused by injury to the growth plate. The infant does not move the limb because of pain
- They can be missed on X-ray and are best diagnosed by ultrasound.
- Orthopaedic referral is essential

Nerve injuries

Assess by observing movements looking for symmetry, quantity and quality. Most common is brachial plexus injury. You must record in the notes whether the deep tendon reflexes are present or absent, as well as the grasp and Moro reflex

Erb's palsy (upper brachial plexus): damage to nerve roots C5- C6 and occasionally C7 causing weakness of shoulder muscles, elbow flexors and forearm supinators.

- Clinical examination shows the affected arm hanging down, internally rotated, extended and pronated. If C7 is also involved there flexion of the wrist and the fingers curl up i.e. "waiter's tip position". If C4 is involved, the diaphragm will be paralysed onthat side.

- Clinical examination reveals weakened, asymmetric or absent Moro reflex on that side. The grasp reflex is intact, deep tendon reflexes will be absent (biceps C5, supinatorC6, triceps C7)
- Check there are no associated clavicular or humeral fractures, and check respiratory rate (some have phrenic nerve palsy too-see below)
- Reassure parents - most recover to have good function. C5, C6 injury 90% chance of full recovery by 3 months, C5, C6,C7 65 % chance of full recovery

Klumpke's palsy (lower brachial plexus): involves C7- C8 and T1, causing weakness of triceps (C7), forearm supinators and wrist flexors (C8,T1).

- This lesion is rare - 2.5% of brachial plexus injuries
- Clinical examination shows a paralysed "clawed hand" but with retained function of shoulder and elbow.
- Check for associated Horner's syndrome (constricted pupil and ptosis) on affected side secondary to cervical sympathetic nerve injury
- Signs of absent grasp reflex (C8, T1).
- Recovery < 50%, minimal if Horner's syndrome apparent

Complete palsy C5-T1

- Accounts for 20% of brachial plexus palsies
- Arm is flail and paralysed with total sensory and motor deficit and absent reflexes
- No Horner's syndrome - approximately 50% recovery
- With associated Horner syndrome will require surgery.
- Urgent referral to paediatric orthopaedic surgeons in Morriston (?Possible referral to Royal National Orthopaedic Hospital, Stanmore (Mr Carlstedt - leave this to our orthopaedic surgeons to sort out)

General care

- Gentle handling of the limb.
- Full clinical examination including for Horner's, respiration (phrenic nerve palsy), hoarseness (laryngeal nerve palsy), sucking (cranial nerve 12), and other injuries
- X ray of limb and clavicle to rule out associated fractures
- Parent information leaflet www.erbspalsygroup.co.uk
- Ensure baby is seen by the consultant in neonatology
- Refer to physiotherapy
- Refer to paediatric orthopaedic surgeons

Facial palsy: usually caused by compression of facial nerve, usually with forceps/rotation but can occur during delivery or in-uteri

Upper motor neurone lesion:

- Affects the contralateral lower two thirds of the face (sparing the forehead)

Lower motor neurone lesion:

Affects the whole of the ipsilateral side of the face

- LMN lesion - Reassure parents-prognosis is good with some improvement within days and full recovery in most cases within a few weeks or months.
- Protect the open eye. Use a patch and lubricating eye drops if necessary and inform the ophthalmologists. Ensure feeding is effective
- Inform senior for review
- OPD follow-up in 6-8 weeks
- Not to be confused with an asymmetric crying face: This affects mouth only, not eye or nasolabial fold. Demonstrate to parents that it only occurs when crying -reassure, no action is required

Phrenic nerve injury: causing paralysis of diaphragm

- May be temporary or permanent
- Presents at birth with symptoms of tachypnoea, cyanosis and asymmetric chest movement.
- Admit to neonatal unit.

- CXR may show a raised hemi diaphragm. Screen the diaphragm to see its movements

Laryngeal nerve injury:

- May cause vocal cord paralysis and may be unilateral or bilateral
- Presents at birth with stridor, hoarse, faint or absent cry, respiratory distress, dysphagia and aspiration
- Refer to senior neonatologist. Will need ENT referral. If unilateral treatment may be conservative but will need monitoring for aspiration and/or treatment for reflux. SALT may also be helpful. Bilateral cases may require surgical intervention

Spinal cord injury: very rare.

- May occur without fracture of spinal column. Symptoms and presentation depend on level of injury.

Abdominal injuries:

- Are uncommon. Mainly consist of rupture or subcapsular haemorrhage into liver, spleen or adrenal gland
- Non-specific presentation: symptoms of pallor, abdominal distension/mass, unexplained anaemia or shock
- Rupture may present suddenly whilst subcapsular haematoma may have a more insidious onset including poor feeding, lethargy anaemia andjaundice.
- An unusual presentation of adrenal haemorrhage is swelling and/or discolouration of the scrotum if blood has leaked from peritoneal cavity via a patent processus vaginalis. May mimic testicular torsion
- Admit to neonatal unit urgently for fluid resuscitation and further management as appropriate
- Ensure vitamin K was given at birth

References.

1. Adapted from postnatal ward guidelines 2011 v0911
2. www.uptodate.com/contents/neonatal-birth-injuries
3. Leslie A. Parker. Part 1: Early Recognition and Treatment of Birth Trauma: Injuries to the Head and Face. *Advances in Neonatal Care*, Vol 5, no. 6 December 2005 pp288- 297
4. Leslie A. Parker Part 2: Birth Trauma: Injuries to the Intraabdominal Organs, Peripheral Nerves and Skeletal System. *Advances in Neonatal Care*, Vol 6, no.1 February 2006 pp 7- 14
5. Seamus Morris; Noelle Cassidy; Michael Stephens; Damian McCormack and Frank McMAnnus. Birth-associated Femoral Fractures: Incidence and Outcome. *Journal of paediatric orthopaedics*. 22(1)2002;27-30
6. Kathleen Benjamin. Part 2. Distinguishing Physical Characteristics and Management of Brachial Plexus Injuries. *Advances in Neonatal Care,* Vol 5, no. 5 October 2005 pp 240-251
7. Rick R. van Rijn; Rob A. C. Bilo & Simon G. F. Robben. Birth-related mid-posterior rib fractures in neonates: a report of three cases (and a possible fourth case) and a review of the literature. *Pediatr Radiol* (2009) 39:30-34
8. H. Carty. Clicking ribs-a clinical sign of rib fracture. Letter. *Archives of Diseases in Childhood.* (2002)86:67
9. B Bulloch et al Cause and clinical characteristics of rib fractures in infants Pediatrics 2000;105:e48
10. DJ Davis Neonatal subgaleal haemorrhage: diagnosis and management JAMC 2001;164:1452-1453

Meconium Stained Liquor

Well babies with no additional risk factors born through **light meconium stained liquor** and not requiring resuscitation at birth will need **hourly observation (See Box 1) for the first two hours** by midwifes and neonatal review requested if they are abnormal. If the initial observations are normal, there are no contraindications to early discharge.
The management of babies with other risk factors will be guided by that risk factor

Babies born through significant **meconium stained liquor** (Thick and particulate – seek obstetrician's advice) **and requiring significant resuscitation at birth should be admitted to the neonatal unit** and observed closely. These babies are at risk of developing HIE and PPHN.
Babies born in good condition through thick meconium stained liquor should have **hourly observations for the first 2 hours followed by 2 hourly observations until 12 hours old** . In the absence of other risk factors they could be discharged if asymptomatic at 12 hours of age.

Box 1: Observations required in a baby born through any meconium stained liquor

- General well being
- Chest movements and nasal flare
- Skin colour (Test capillary refill)
- Feeding
- Muscle tone
- Temperature
- Heart rate and respiration

If further observations are required there must be a clear plan documented in the notes by the paediatrician.

Neonatal Hip Examination and Screening by Ultrasound

All babies should have a clinical examination of their hips. If the clinical examination suggests developmental dysplasia of hips (DDH), the infant should be referred to an orthopaedic surgeon (see below). Universal ultrasound examination is not recommended, but selective screening ultrasound examination is recommended for babies with one or more of the following risk factors, irrespective of the clinical findings.

1) A first degree **family history** of hip problems in early life as defined by a positive response to the question, **"*Is there anyone in the baby's close family, i.e. mother, father, brother or sister, who has had a hip problem that started when they were a baby or young child that needed treatment with a splint, harness or operation*?"** If the answer to this question is 'yes', an ultrasound examination should be arranged, unless DDH has been definitely excluded in that relative. If there is any doubt, an ultrasound examination should be performed.

2) A **breech presentation**:-

a) at or after 36 completed weeks of pregnancy, irrespective of presentation at delivery or mode of delivery, or
b) at delivery if this is earlier than 36 weeks.

In the case of a multiple birth, if any of the babies falls into either of these categories, all babies in this pregnancy should have an ultrasound examination. Unless a history of breech presentation at these times has already been handed over from the midwifery staff, or is evident from the maternal notes, the mother should be asked ***"Was your baby in the breech position after 36 weeks of pregnancy or born in the breech position*?"**

3) Abnormalities suggesting **restriction of fetal movement**/development in utero or neuromuscular disorders. These include torticollis, arthrogryposis and fixed foot deformities.

NB: Many foot "deformities" identified at birth represent "positional" or "physiological" talipes. This is NOT an indication for a screening ultrasound examination. If the foot can be easily moved into the anatomical position on clinical assessment, parents of these babies should be reassured that this is a normal finding and no further action is needed.

Ultrasound should be arranged as an outpatient in all the above categories as long as there are no abnormal clinical signs related to hip examination. ***Please fill in the clinical indication clearly when writing the form, specifying on the request form the exact indication for the scan****.* ***The Estimated Date of Delivery (EDD)*** ***must also be included on the request form to inform the team of the exact age of the baby****. This is to facilitate accurate assessment and audit. Forms with inadequate clinical information may be returned to the referring clinician.*

Clinical Examination of Hips:

1. Note limb length discrepancy by comparing the distance between the anterior superior iliac spine and the medial malleolus on both sides.

2. Galleazzi sign also helps in detecting unilateral dislocation (see below).

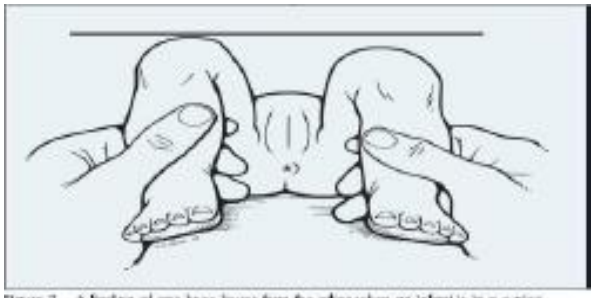


Figure 2 – A finding of one knee lower than the other when an infant is in a supine position, with hips and knees flexed, is known as the Galeazzi sign. The presence of this sign suggests a shortening of the involved limb and possibly developmental hip dysplasia.

3. **Barlow manoeuvre** is easily performed by adducting and flexing the hip (bringing the thigh towards the midline) while applying light pressure on theknee, directing the force posteriorly. If the hip is dislocatable; i.e. if the hip can be popped out of socket with this manoeuvre-the test is considered positive.

4. **Ortolani manoeuvre** is performed by first flexing the hips and knees of a supine infant to 90 degrees, then with the examiner's index fingers placing anterior pressure on the greater trochanters, gently and smoothly abducting the infant's legs using the examiner's thumbs. A positive sign is a distinctive 'clunk' which can be heard and felt as the femoral head relocates anteriorly into the acetabulum. Specifically, this tests for relocation of a posteriorly dislocated hip. It usually becomes negative after 2 months of age.

Hence clinically abnormal hips fall into three basic groups:

1. **Frankly dislocated but relocatable** – i.e. there is a leg length discrepancy with the dislocated side being short. On **Ortolani's test** there is a clunk as the hip re-enters the socket. In this situation the hip is dislocated as the child lies on the couch but relocates with abduction. **These are the hips that should be referred early**. Confirm with an urgent hip scan as soon as possible (preferably as an inpatient) and refer to Mr N. Price or Mr P Williams, Paediatric Orthopaedic Consultants who will try to see the baby immediately.

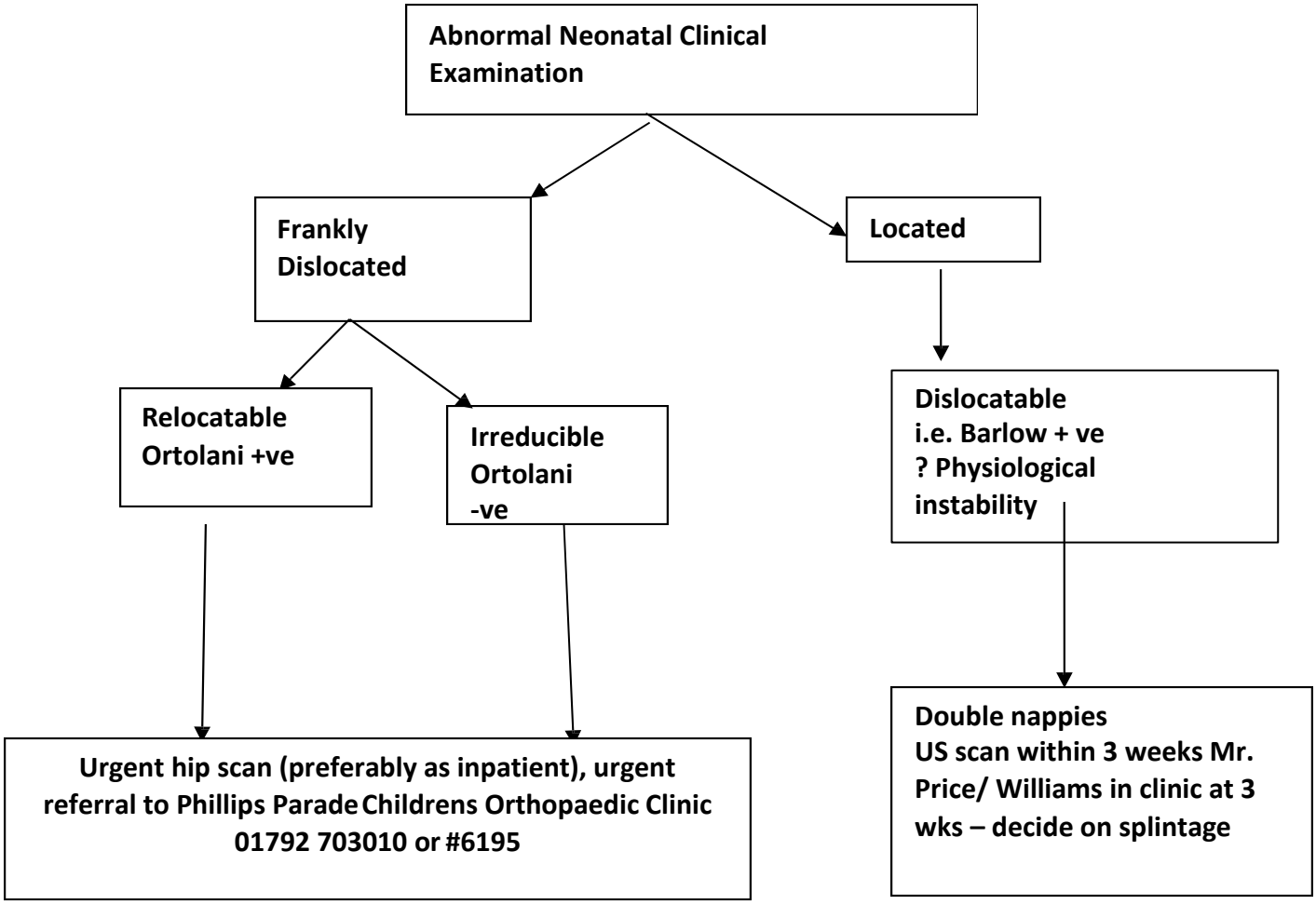
2. **Frankly dislocated hips but irreducible**- Here there is a **leg length discrepancy** but the Ortolani's test is negative, though there is usually restriction of abduction. Arrange an urgent hip scan (preferably as an inpatient) and arrange for the baby to be seen in the next available Paediatric Orthopaedic Clinic by Mr Price or Mr Williams.

3. **Hips which are located but dislocatable** – i.e. leg length equal but **Barlow test** positive. The most likely cause for this situation is physiological instability of the hip rather than frank dislocation. 90% of these cases settle within six weeks. Provided one is happy about the physical signs these babies should be treated in double nappies and an ultrasound scan performed within three weeks. Refer to Mr. Price or Mr Williams who will see them in Paediatric Orthopaedic Clinic and decide about the need for splintage.

Paediatric Orthopaedic Clinics

Mr Neil Price and Mr Paul Williams run a DDH clinic twice per month at Neath Port Talbot Hospital where they will see new and follow up babies (there is ultrasound available at this clinic). They also run general Paediatric Orthopaedic Clinics in Singleton and Morriston Hospitals. Please contact their secretaries to make a referral (ext 3010/3738/3090).

Neonatal Hip Protocol – Clinically Abnormal Hips



What happens after the Ultrasound is performed?

When the ultrasound scan is performed, a report is sent both to the referring consultant and to the orthopaedic DDH clinic.. No further action or involvement from the neonatologist is required, and abnormal hips are managed by the orthopaedic clinic, as in Appendix1.

Appendix 1 (Only relevant for radiologists / ultrasound technicians and orthopaedic team

Most USS will be performed for the first time at around 2 weeks of age.

Result of USS	**Action to be taken**
Grade 1	Discharged with a letter/information leaflet (see Appendix 2) and the report to go back to the referrer.
Grade 2	Repeat scan 4 weeks later: i) If reverted to Grade 1 then currently the plan is that they are seen in the standard Paeds Orthopaedic clinic at around 4-6 months of age for an AP X-Ray of the Pelvis. ii) If remains Type 2 then to be treated with a Pavlik Harness and to have continued USS surveillance in the abnormal USS clinic.
Grades 3 & 4	Treatment in the Pavlik Harness if the hip relocates and will then need serial surveillance in the harness in the abnormal USS clinic until they revert to normal or a change in management is initiated.

Appendix 2:

Dear Parent/Guardian,

RE:

Your baby was examined in the hospital/clinic. An ultrasound examination of the hips was organised, and I am pleased to say that this was normal.

However, you still need to attend the routine baby clinic appointments with your GP and Health Visitor, as DDH can still rarely present at a later age. Please find enclosed an information leaflet for this condition.

Yours

sincerel

y MRS

O.

BIZBY
CLINICAL SPECIALIST/TEAM LEADER

Guidelines for managing newborn weight loss in healthy breast fed term baby

Rationale:

Growth has a long tradition of being used as a measurement of young children's health and wellbeing; weight is one component of this. These guidelines are produce in order to support Health professionals to provide evidence based care that will enhance the health and well being of the newborn baby and develop parent's confidence and ability in their parenting skills.

The Baby is to be weighed at 72 hours **of age** (or as close as reasonable) **and again on day 5-7. If weight loss** < 8% **of birth weight, care should continue as per protocol. However if weight loss is** > 8% **please follow guidelines below. Please document care as per trustpolicy.**

8% - 10% →

1. Check positioning and attachment satisfactory
2. Observe a feed.
3. Note sucking pattern. Is it effective?
4. Baby should demand at least 8 feeds in 24 hours.
5. If baby excessively sleepy, Mum must be encouraged to wake baby.
6. If baby remains uninterested mum to express and offer EBM via cup.
7. Note amount of wet nappies in 24 hrs (6 in 24hrs)
8. Observe stool. Note colour and amount. (2-3in 24hrs. Yellow loose stool by day 5)
9. If 1-8 satisfied, could be discharged to community if follow up ensured
10. Re-weigh in 48 hours in community. If baby has not gained 50g please discuss / refer to Breastfeeding coordinator or Support group (Contact No: ext5697 /6688 or bleep 5223)

10% - 12% →

1. Follow points 1 to 8 above.
2. Reassure mum. It is vital that anxiety is not caused.
3. Do not discharge these babies from postnatal ward
4. Do not encourage mum to feed every 3hrs. As long as the baby demands 8 feeds in 24 hrs it will be sufficient to stimulate and maintain milk supply.
5. Re weigh in24 hrs. Weight increase should be between: -
   - 10% loss: 25 - 100g
   - 12% loss: 90– 200g
6. If expected weight gain achieved discharge with appropriate follow up in community
7. If expected weight gain not achieved, is staticor falls further; the baby needs to be referred immediately to the Pediatrician and the Breastfeeding Coordinator.
8. Supplementation should start withEBM if available (See chart below)
9. If EBM insufficient consider formula milk

Milk Supplementation for poor/slow weight gain in a breast fed baby

All Supplements given should be expressed breast milk. However if insufficient breast milk obtained formula milk should be considered. Please develop care plan with infant feeding coordinator.

INFANT WEIGHT Kg (lb)	TOTAL DAILY INTAKE 150-200 ml/kg/day	DAILY SUPPLEMENT 50 ml/kg/day	FEEDING SUPPLEMENT 6-8 TIMES A DAY ml per feeding
>2.5 Kg	375-500 mls	125 mls	15-20 mls
>3 Kg	450-600 mls	150 mls	20-30 mls
>4 Kg	600-800 mls	200 mls	25-35 mls

Failure of conservative management (weight loss >12% and failure to gain weight on earlier management plan as above)

- *This should prompt an immediate assessment by the paediatrician.*

- Evaluation should include a clinical assessment of hydration and wellbeing of the child particularly for sepsis. These babies will need U&E, blood sugar, bilirubin and sepsis screen if clinically indicated.

- Babies with serum sodium >150mmol/litre will need careful rehydration

- These babies should be rehydrated slowly and preferably by the enteral route (Cup, syringe or NG tube in that order depending on the alertness and ability of the baby)

- In most cases a total intake 150mls/ kg /day of milk will rehydrate the baby over a few days and bring serum sodium to normal gradually. Breast feeding should continue as before and should be encouraged.

- Babies should have daily weight until a trend of steady weight gain is established. If serum sodium is less than 150mmol/litre accompanied by weight gain no further electrolyte measurement is necessary.

- The supplements should be reduced appropriately as breast milk supply increases.

- Involve the breast feeding support group in this process at all times

- Rarely babies who are vomiting and unable to tolerate NG feeds should be admitted to the neonatal unit for IV rehydration.

- IV rehydration should be slow giving only maintenance fluid requirement initially with 10% dextrose with added NaCl concentration of at least 75mmol/litre initially. This may need to be adjusted depending on repeat Serum Na levels.

- Serum Na levels should not fall by more than 5 mmol / litre/day.

- Reintroduce enteral feeds as soon as possible and cut back on IV supplementation

Bibliography

1. Illingworth. R.S. (1996) ***Normal child.*** Churchill Livingston, London.
2. Gwos, et al : Reference data on gains in weight and length during the first two years of life, **J. Pediatrics**, 119:355, 1991.
3. Wright.C. et al: New chart to evaluate weight faltering. ***Archives Diseases inchildhood,*** 78:40, 1998.
4. Hoekelman. R.A., et al (2001) Primary pediatric care, 4th ed. Mosby.London.
5. Mohrbacher.N, Stock. J (2003) ***The Breastfeeding Answer book. 3rd ed.*** La Leche league international. Illinois.
6. Riordan.J.(2005) ***Breastfeeding and Human Lactation 3rd ed.*** Jones and Bartlett Publishers. London

Management of reluctant feeding in healthy infants ≥37 weeks

Policy Statement

This policy is to support mothers to establish feeding when a healthy term baby is assessed as reluctant to breast feed, or when a formula fed baby is reluctant to feed.

Scope of Policy

This policy refers to all staff working within maternity settings who support mothers to establish breastfeeding or formula feeding.

Aim

To identify and safely manage babies who are reluctant to feed.

Objectives

- To identify reluctant feeding in a breast fed or formula fed baby.
- To promote activities which maximise the initiation of lactation in breast fed baby, eg skin to skin, and hand expressing.
- To promote close maternal and infant bonding
- To enable mothers to recognise feeding cues, effective feeding, or reluctant feeding
- To support practitioners to identify abnormal clinical signs that might signify hypoglycaemia.
- To support responsive breastfeeding and or responsive formula feeding when feeding has been established.
- To establish a healthy feeding pattern in the infant to enable optimal growth and development

Definition

This policy is a written statement of intent. It includes a pathway in which to manage reluctant feeding, whether by breast or formula, in Abertawe Bro Morgannwg University Health Board (ABMU HB) maternity and neonatal services.

The guidance is underpinned by BAPM (2017) Identification and Management of Neonatal Hypoglycaemia in the Full Term Infant – A Framework for Practice.

The guidance is mandatory, binding staff working within the Midwifery and neonatal service to follow its contents.

Identifying the need for a document

ABMU HB believes that breastfeeding is the healthiest option for a woman to feed her baby and recognises the important short, medium and long term physical and emotional health and wellbeing benefits known to exist for the mother and her child (Standing Committee on Nutrition of the British Paediatric Association, 1994, Lancet Breast feeding series January 2016).

This guidance is to ensure that ABMU HB Maternity and Neonatal staff understand their roles and responsibilities in supporting mothers and their partners to safely continue to breastfeed and care for their baby where their baby is reluctant to feed.

This guidance is to ensure that all staff at in the Maternity and Neonatal service of ABMU HB understands their role and responsibilities in supporting mothers and their partners when a formula fed baby is reluctant to feed.

The guidance should be implemented in conjunction with other guidelines that protect, support and promote exclusive breastfeeding, and maximise the amount of breastmilk a baby receives.

This guidance will provide a clear pathway for feeding assessment, care and referral to paediatrics if required when a baby is reluctant to feed.

This guidance will support staff to recognise clinical signs related to hypoglycaemia for either reluctant feeding breastfed or formula fed infants.

Responsibilities

Staff are committed to:

- Provide the highest standard of care to support new mothers and their partners to breastfeed their baby and build strong and loving parent-infant relationships.
- Avoid conflicting advice. It is mandatory that all staff involved with the care of mothers and babies in the Midwifery and Neonatal service adhere to this guidance. Any deviation from the guidance must be justified and recorded in the Neonatal records as appropriate.
- Parent's experiences of care will be listened to and include regular audits, parents' experience surveys, parents' forum meetings.
- All staff will have access to a copy of this guidance.

Management of the reluctant feeder (any baby not feeding effectively

Healthy asymptomatic term infants should not be screened routinely for hypoglycaemia. But reluctant feeders should be monitored for clinical signs of symptomatic hypoglycaemia, which should be clearly documented. If such signs are seen then this must be followed by an immediate blood glucose measurement with appropriate action to be taken if it is low (see hypoglycaemia pathway).

Pro-active support of feeding in the immediate post-partum period for all term infants includes skin contact and support for the first feed as in ABMU's Infant Feeding Policy. This should be followed by an assessment within 6-8 hours to identify whether initiation of feeding has been effective, whether the baby has received a satisfactory second feed, or whether the infant is a reluctant feeder (not showing feeding cues). Practitioners need to be skilled in the clinical assessment of *effective* feeding and *reluctant* feeding, and be able interpret feeding behaviour in the context of a general assessment of well-being. Infants with no risk factors and no abnormal clinical signs, who are reluctant to feed should be given an active feeding plan. It is important to follow the flowchart and for staff to be alert to the clinical signs listed on the reluctant feeding flow chart.
Regular assessment of the baby who is reluctant to feed should be made. The baby should ***be awake to make the assessment.*** Signs to be documented include colour, tone, respiratory rate, heart rate, temperature, level of consciousness, and presence or absence of signs associated with hypoglycaemia.

This should include assessment of feeding behaviours, which if abnormal, may be a presenting sign of hypoglycaemia. Thorough clinical assessment cannot be made effectively during sleep.

Signs that may indicate hypoglycaemia

- Lethargy
- Abnormal feeding behaviour especially after a period of feeding well
- High pitched cry
- Altered level of consciousness
- Hypotonia
- Seizures
- Hypothermia (<36.5^{o}C)
- Cyanosis
- Apnoea

- Reluctant feeding in an otherwise well infant does not require BG measurement
- If there is reluctant feeding after a period of feeding well, BG measurement should be done.
- If there are any abnormal clinical signs suggestive of hypoglycaemia, BG measurement should be undertaken and if it is low, follow the hypoglycaemia pathway
- Cold stress is associated with hypoglycaemia and vice versa. Any temperature less than 36.5 degrees C is abnormal and should be followed by BG and warming measures with re measuring temp promptly.
- Lethargy is defined as excessive sleepiness with or without good tone and mandates BG measurement.

Managing breastfed healthy term infants

Healthy term babies may feed enthusiastically at birth and then sleep for many hours. In order to prevent a potential negative effect on a baby's wellbeing, establishment of feeding and the stimulation of lactation follow the reluctant feeding flow chart birth for all well, term babies.

Skin contact
Support skin to skin and frequent extended access to the breast to support breastfeeding and support the mother with biological nurturing and positioning for breastfeeding.

Responsive Feeding
Promote responsive feeding so that the mother has an understanding of the baby`s behaviour when looking for feeds. This can include moving towards the breast as well as rooting behaviour. Feeding cues indicate the beginning of feeding readiness when babies are more likely to latch on and suck and can occur during periods of light sleep as well as when a baby is awake. Cues include rapid eye movements under the eyelids, mouth and tongue movements, body movements and sounds, sucking on a fist. Crying can be a way of indicating that the feeding cues have been missed. If feeding doesn't occur, support should be provided and documented until effective feeding is established.

Assisted feeding (cup, spoon, oral syringe)
Occasionally it may be helpful to give a baby small amounts of colostrum using a cup, spoon or oral syringe.

To give a cup feed safely, hold baby in an upright position, ensuring that baby's neck and shoulders are well supported. Make sure baby is fully awake, calm and alert. Half-fill the cup and hold it so that it just touches baby's mouth. It should reach the corners of her/his mouth and rest lightly on her/his bottom lip. Allow her/him just a tiny sip, to encourage drinking – do not pour the milk into her/his mouth; tip the cup just enough so that baby can lap up. Keep the cup in this tilted position and allow her/him to start again when she/he is ready.

To give a syringe feed safely, the calm and alert baby should be held in the mother's arms slightly upright, not flat. The oral syringe is gently placed in between the gum and cheek and a little colostrum

gently instilled, no more than 0.2ml at a time. Allow the baby time to taste and enjoy the milk. Stop if the baby starts sucking, allow time to swallow, then give a little more. Move onto cup feeding once you have more than 5ml to give. If there is a clinical indication to provide formula or a mother makes an informed choice to provide formula this can also be given in a cup. A nasogastric tube may be required if the baby shows no cues in response to assisted feeding methods.

Boosting confidence

You can help and support the mother and boost her confidence by teaching her to hand express. Give her a supply of oral feeding syringes and feeding cups, encourage skin contact, especially in the laid-back position and help her to recognize her baby's feeding cues. Encourage the mother to offer her breast to her baby when he/she is ready, and to feed her baby expressed breast milk until he/she is breastfeeding actively and effectively. Mother-led feeding will empower the mother as well as saving you time.

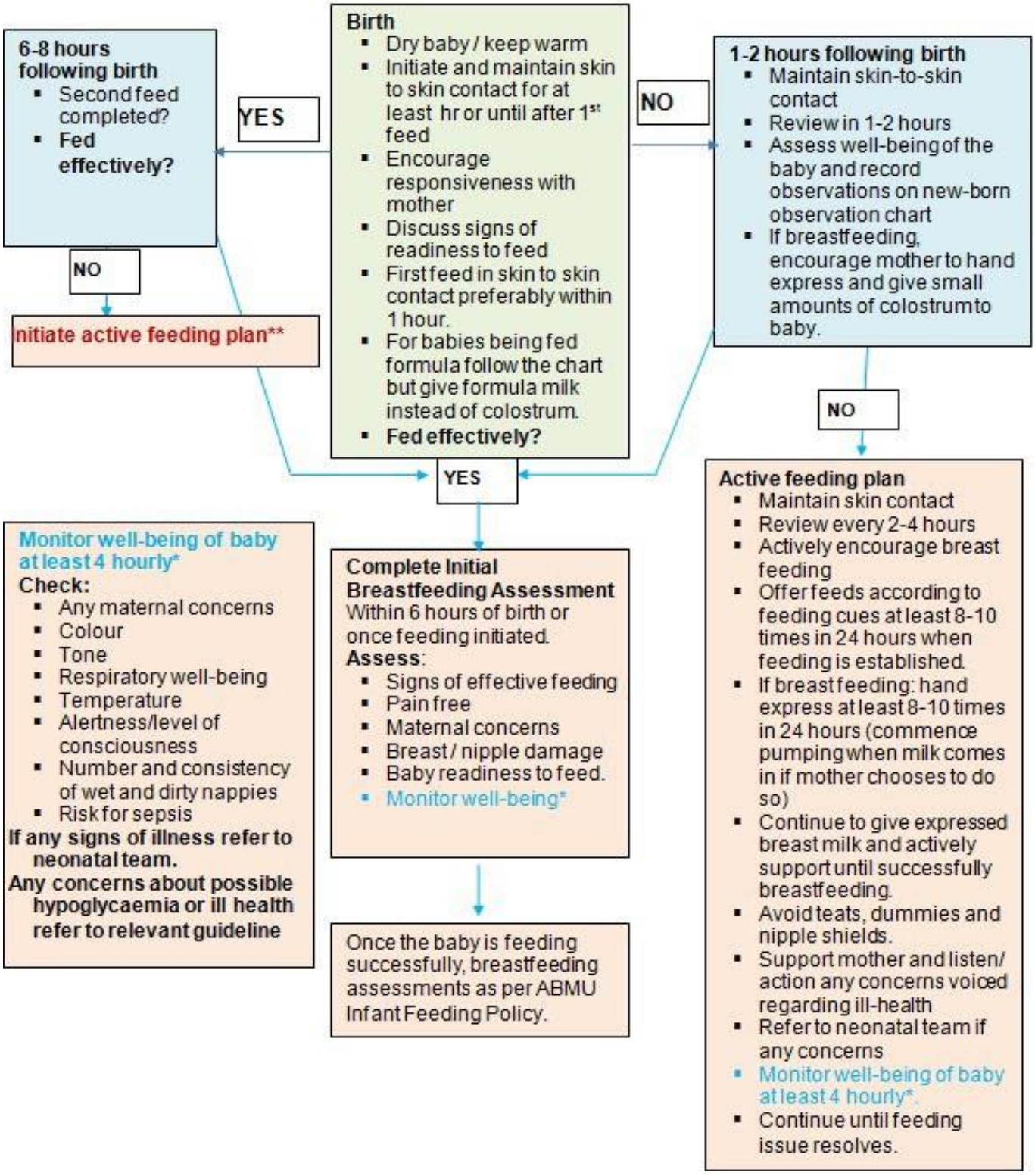
If the mother chooses not to express colostrum. If the mother cannot or chooses not to express her colostrum the mother may want to give some formula. It is the responsibility of the midwife to ensure this is an informed decision based on the understanding of the mother's awareness of how expressing can maximise milk supply, and the benefits of exclusive breastfeeding.

Recognising effective feeding - ensuring mothers and staff are able to identify

The baby should be alert, actively sucking but settled at the breast; s/he should end breastfeeding spontaneously and remain settled for a short period until the next feed. The feed should be pain free and the baby should demonstrate adequate wet and dirty nappies appropriate to age as on the breastfeeding assessment chart.

The mother should have a good understanding of responsive breastfeeding and staff should continue following infant feeding policy ABMU. When mums are discharged they should be able to understand the signs of effective feeding, and know where to find written information to support this (as in the bump to baby and beyond). In all cases a discussion with the mother should be documented on the postnatal notes prior to discharge.

Management of Reluctant Feeding in Healthy Term Infants ≥ 37 Weeks



Audiological screening

All newborn babies should have a routine audiological screening as part of the National Newborn Hearing Screening Programme

Discharge medication

Prescriptions should be done in good time as per the recommendations in the guideline. For vitamin and mineral supplementation follow the guide as outlined below **For preterm infants**

Notes:

- All preterm infants will need to be assessed for consideration of vitamin and mineral supplementation depending on their gestation and type of enteral feeds
- Vitamin and minerals are supplemented in TPN and therefore consider supplementation as soon as the infant is on full enteral feeds
- Routine Iron supplementation starts at 28 days of life
- The guidance is based on an average intake of 180mls/Kg/d of milk at preterm gestation and 150mls/Kg for near term infants
- It ensures an approximate daily intake of at least 400IU of Vit D, 400µg of Vit A & 2mg/Kg/d of elemental iron without reaching toxic levels of other elements.
- For mixed feeding – change supplementation only if > 75% of feed volume on the new allocation
- When this specific guidance ends - consider for all children until their 5th birthday the DoH guidance on multivitamin supplementation (see below).

For details - see flow chart - 'Vitamin and Minerals supplementation policy 2014 for **preterm infants'** (page 21)

Easy to remember guide: The dose of Abidec is 0.3 mls for formula fed babies to be discontinued 1 month post discharge. The dose of Abidec is 0.6 mls for breast fed babies not on fortifiers.

Term Infants:

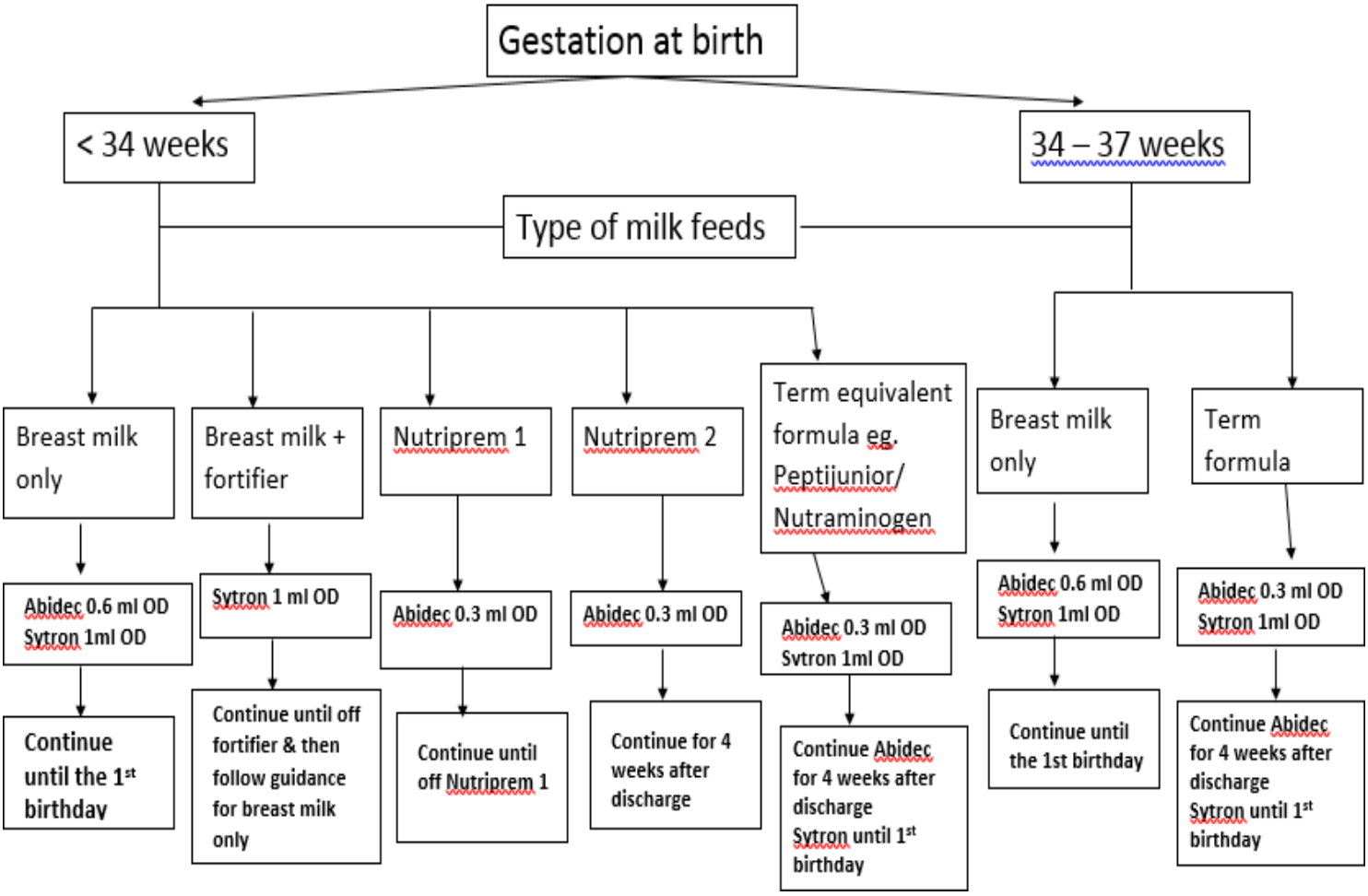
- The Department of Health recommends that all babies and young children aged six months to five years should take a daily supplement containing vitamin D.
- Term formula milkcontains supplemental vitamins and should be sufficient as long as the infant has an average milk intake of 500 mls / day.
- Breast fed infants whose mothers did not receive Vitamin D supplements during pregnancy should also receive multivitamin supplements from 1 months of age. The GP should take care of this during routine check-ups.

However, the following infants are at particular risk of vitamin deficiencies and should be prescribed Vitamin supplements from birth with advice given to GP to continue this throughout childhood.

- Infants in Asian households and other non-white ethnic groups are prone to Vitamin D deficiency
- Breast-fed term infants whose mothers are on restricted diets e.g. vegetarians.

These groups should also receive **Abidec 0.6 mls** per day until one year of age or until they are on a well-balanced diet. Infants of vegans who are breast-fed also need Vitamin B12 supplements.

Multivitamins and Mineral Supplementation Policy for preterm infants



- **Consider vitamin and mineral supplementation when infant on full enteral feeds**
- **Start Sytron at 28 days of life**
- **The guidance is based on an average intake of 180mls/Kg/d of milk at preterm gestation and 150mls/Kg at term**
- **Aims to ensure an approximate daily intake of at least 400IU of Vit D, 400µg of Vit A & 2mg/Kg/d of elemental iron without reaching toxic levels of other elements.**
- **For mixed feeding – change supplementation only if > 75% of feed volume on the new allocation**
- **When this specific guidance ends - consider for all children until their 5th birthday - the DoH guidance on multi vitamin supplementation.**

Multivitamin and Mineral Supplementation Policy for preterm infants

Neonatal abstinence syndrome in infants of substance abusing mothers

Definition:

A constellation of signs and symptoms which result from the abrupt cessation of a drug to which the fetus/neonate has become physiologically dependent

The risks to a fetus from maternal drug abuse include:

1. Teratogenic effects of the drug (cocaine, benzodiazepines)
2. Increased complications of pregnancy (abruption etc)
3. Fetal anoxia if there is maternal overdose
4. Poor fetal growth (especially amphetamines, cocaine and opiates)
5. Fetal addiction and withdrawal
6. Preterm labour
7. Increased risk of infection e.g. HIV, hepatitis B, C, syphilis etc

<u>The process of fetal addiction:</u>

Drugs readily cross the placenta. Once inside the fetus the drug may become tissue bound or converted to a metabolite which does not cross the placental barrier as easily as the parent compound (e.g. heroin is converted to morphine, and cocaine is metabolised to norcocaine). These metabolites are pharmacologically active resulting in a greater exposure and risk of addiction for the fetus than for the mother.

<u>Procedure for infants at risk:</u>

Admit the infant to the postnatal ward with the mother, as long as the baby is not actively withdrawing, in which case admit to Neonatal unit. If the mother wishes to breast feed this may be encouraged unless she is on crack cocaine, or is known to be HIV positive. For other drugs please refer to Infant Feeding and Maternal Substance Use Guideline for Professionals.

The baby should be observed carefully for signs of withdrawal by using the modified Finnegan Score (See Table 1 for when and for how long to monitor with individual

substance use). Babies whose mothers have stopped using drugs before pregnancy or used only occasional cannabis or cocaine do not routinely need to be started on withdrawal score but social circumstances need to be evaluated prior to discharge.

Table 1: FINNEGAN SCORING – when to administer and how long?

IN EACH CASE, PLEASE REFER TO THE CARE PLAN IN THE WOMAN'S NOTES

Useful Numbers: Substance Misuse Specialist, **Midwife** Ann Saunders 07891485872 Substance Misuse Specialist Nurse **CDAT** (Swansea) Nicola Cook 01792 654630

Drug/Medication	Effects	Time Scoring Required	Breastfeeding Recommended
Alcohol	Irritability, features of Fetal Alcohol Syndrome	48 hours	No
Cannabis	No physical effects	None	Yes
Cocaine	Irritability, hyper stimulated, Poor feeder	5 days	No
Methadone (Opiate)	Neonatal Abstinence Syndrome (NAS)	5 DAYS	Yes
MCAT Meow Meow Bonsai	See amphetamines	5 days	No
Subutex (Buprenorphine) Opiate	Neonatal Abstinence Syndrome (NAS)	5 days	Yes
Codeine	Delayed onset of NAS when mixed with opiates See effects of cocaine	48 hours	Yes
Heroin	NAS (see methadone)	5 DAYS	No

Withdrawal symptoms may start immediately (e.g. heroin) or infrequently may be delayed for up to two weeks (e.g. methadone or barbiturates). Send urine from the baby for a drug screen as soon as possible after birth (results may take up to two weeks). Always assess social situation early.

A recent audit in our hospital looking at data from 2003-2007 has shown that more than 95% of babies will have their peak withdrawal symptoms by day 5 of life. Therefore babies with opiate use should be **OBSERVED IN HOSPITAL FOR MINIMUM 5 DAYS** but may need to stay longer. Babies **scoring ≥ 4 on the Modified Finnegan score in the preceding 24 hours** should not be sent home but observed longer. In some cases babies could go home earlier after full review of clinical and social circumstances and **only** following joint discussion with the neonatal consultant and Lead Midwife for Vulnerable Adult / Child.

Drugs causing withdrawal (See Appendix 1 for more information on individual drugs)

a) Opiates (heroine, methadone, morphine, fentanyl)
b) Barbiturates
c) Benzodiazepines
d) Alcohol
e) Cocaine has been linked to neuro behaviour problems in the newborn but no withdrawal has been described.
f) SSRI

Signs of Withdrawal – remember the mnemonic *"WITHDRAWAL"*

- **W**akefulness
- **I**rritability
- **T**remulous, Temp unstable, Tachypnoiec
- **H**yperactive, High Pitch Cry, Hypertonic, Hyperacusis
- **D**iarrhoea, Diaphoresis
- **R**hinorrhoea, Rub Marks
- **A**pnoea, Autonomic Dysfunction
- **W**eight Loss
- **A**lkalosis
- **L**acrimation

Also: hiccups, yawning, sneezing, seizures (2-11%)

Management Goals:

- Alleviate signs/ symptoms of withdrawal
- Reduce serious morbidity
- Maintain optimal nutrition and development
- Facilitate positive caregiver-infant interaction &bonding
- Ongoing parental education and support until symptoms are resolved

Initial actions:

a) **No Narcan in the delivery room!** Withdrawal maybe precipitated immediately!

b) Obtain urine and drug screens with first void /elimination

c) Evaluate risk for hepatitis B, C, HIV and syphilis

d) Check maternal notes for reports on cause for concern

e) If signs above (at least 2) are present, use abstinence scoring system

Non pharmacologic Treatment:

- Swaddle
- Quiet, dim lighting
- Gentle handling and holding
- Vertical rocking +swing
- Frequent small volume feeding, high caloric requirement (>+150 kcal/k/d). They often have disorganised suck and prolonged sucking bursts
- Engage and support caregiver

Pharmacologic Treatment:

All babies requiring pharmacologic treatment should be admitted to NNU

- Withdrawal score >8 on three occasions indicate significant withdrawal signs which may require starting or advancing pharmacologic treatment. (Appendix 2)
- While up to 90% of newborns exposed to narcotics in fetal life have some symptoms, only 70-75% requires treatment. Many require no pharmacologic treatment. Infants with confirmed drug exposure who do not have signs of withdrawal do not needtherapy.
- Other potential causes of these symptoms (**infection, hypocalcaemia, hypoglycaemia, CNS haemorrhage and rarely thyrotoxicosis**) should be considered before initiating drug therapy. Jitteriness, hyperreflexia, irritability or sneezing **alone** is not an indication for drug treatment.

General principle of drug treatment[1]

Opiate withdrawal – Best treated with morphine

Non narcotic withdrawal and polydrug use - better treated with phenobarbitone

The general principle with drug treatment is to achieve symptom control by rapidly going up on to the desired dose as required, obtaining stability for 72 hours and then try and wean slowly off the medication. The rate of withdrawal will be guided by duration of treatment and recurrence of symptoms at each step of reduction but could be tried initially every 24-48 hours by 10-20% of the total daily dose.

Maternal Drug	Time to Onset	Primary Rx	Optional Rx
Heroin/Narcotics Methadone	48 -72 hours May be delayed by several weeks	**Morphine Solution PO** Available in 100micrograms /ml solution **Dose:** 0.04mg/kg every 4 hours with feeding. Dose may be increased by 0.04 mg/kg every 4 hours as needed, to control withdrawal symptoms. After withdrawal signs are controlled for 3-5 days, the dosage should be gradually reduced while maintaining the q4hr administration. Do not use PAREGORIC	
Barbiturates	4-7 days	Phenobarbitone Loading dose: 20 mg/kg PO/IV Maintenance dose: 3-5 mg/kg/day po or IV. May need to go up to 10mg/kg/d. Obtain a Phenobarbital level five days after giving starting dose After condition stabilises, dosage may be gradually reduced.	
SSRI (For full details, please check guidelines on Newborn assessment when exposed to psychotropic medications in utero)	Within 48 hours	Phenobarbitone	
Benzodiazepines(For full details please check above mentioned guideline)	May be as late as 12 –21 days	Lorazepam Dosing: Consult clinical pharmacist.	Phenobarbitone
Multiple drugs abuse	Variable	Phenobarbitone Dosing: Same as under 'Barbiturates'.	Morphine

Morphine dosing of the vomiting baby[11]:

Ensure that the infant is not being overfed and that the infant is being appropriately postured during and after feeding. Give the morphine before the feed.

If baby has a **large** vomit after being given morphine:

- if vomits within 10 minutes of dose, re-dose
- if vomits after 10 minutes, give ½ dose
- if baby vomits after feed, do not give further morphine (always err on side of caution)

Withdrawal following neonatal narcotic administration for pain is more common with higher doses, continuous infusion, shorter acting agents (fentanyl) and longer duration of use. This is likely to be less that we have now a restricted policy of using morphine for premature babies

Suggestions for management of neonatal narcotic tapering (Table 2):

Duration of Morphine Use:	Suggested Tapering Approach:
< 7 Day(Taper only required if frequent doses)	Calculate the total daily dose (TDD) of narcotic given over the 24 hours before taper started. Order scheduled (**not PRN**)narcotic = TDD divided into 3-4 doses. Decrease TDD 25-50% of starting TDD each day as tolerated. If withdrawal symptoms occur, return to previous day's TDD and proceed more slowly with taper.
> 7 Days	Calculate the total daily dose (TDD) of narcotic given over the 24 hours before taper started. Order scheduled (**not PRN**) narcotic = TDD divided into 3-4 doses. Reduce TDD 20% of starting TDD over the first 24 hours and then 10% every 24 hours as tolerated. If withdrawal symptoms occur, return to previous day's TDD and proceed more slowly

Once child is off medication, observe NAS scoring until scores <4 for 72 hours

At Home use of Oral Morphine Sulphate for the On-going Treatment of Neonatal Abstinence Syndrome (NAS)

Oral morphine sulphate is a morphine sulphate liquid prescribed for the treatment of withdrawal symptoms in neonates. Neonatal abstinence syndrome (NAS) is a syndrome of drug withdrawal with non-specific signs and symptoms that may occur in babies following in-utero drug exposure. Withdrawal symptoms include agitation, over stimulation, seizures and diarrhoea. NAS is more common in babies born to opioid dependent women particularly methadone, heroin and buprenorphine.

This guideline is intended to prepare for and guide reducing the dosage of oral morphine sulphate in babies who have been treated on the neonatal unit for NAS and who are to be discharged home to foster carers. This will reduce the baby's duration of stay in hospital. Babies will only be discharged once they are stable on 60 micrograms/kg qds or less and taking full bottle feeds.

Contraindications to Going Home on oral morphine

Not all babies will be suitable for discharge home on oral morphine sulphate. Babies should not be discharged home on oral morphine if:

- There is excessive weight loss (more than 10% of birth weight)
- Before 5 days of life if Methadone use is known or suspected
- There is an inability of the multidisciplinary team to regularly monitor the health of the baby

Before Discharge Home on Oral Morphine Sulphate

A well-coordinated outpatient discharge plan is required before discharge on medication is considered. A discharge planning meeting must be undertaken before discharge with all of the relevant health professionals who will be involved in the care of the baby invited to attend. Our neonatal outreach team will coordinate the discharge planning meeting.

Before the discharge the **baby** must be:

- Term and healthy
- Tolerating full bottle feeds
- Gaining weight
- Considered to be stable on medication and has already tolerated a dose reduction i.e. no increase in symptoms in the 72 hours following reduction

- **Discharge should not be considered unless the daily dose is 60 micrograms/kg qds or less**

The **foster carer** must be:

- able to administer medication (give in side of mouth or in a small amount of milk)
- aware of guidance that if the baby vomits after they have been given the dose the dose should not be given before it is next due
- able to recognise NAS withdrawal symptoms
- have received education on cardiopulmonary resuscitation
- aware of emergency contacts

There must be plans in place for the safe storage and safety of the medication in a cupboard out of the reach of children.

Preparation for Going Home on Oral Morphine Sulphate

To facilitate ongoing care we need to ensure the foster carers receive appropriate:

- Information regarding settling techniques and comforting of the baby
- Developmental care of the baby
- Information on safe sleeping and the risks of tobacco smoke exposure (SIDS is more common in babies exposed to opioids in pregnancy)

Settling and comfort techniques

- Do not advise swaddling for the baby when in the cot as this may increase the risk of cot death. Swaddling may be used when holding the baby
- Encourage a quiet atmosphere with dim lighting
- Encourage slow gentle handling and holding
- Ensure carers can use vertical rocking swing techniques

Follow Up Care after Discharge

Close liaison with the health visitor/neonatal outreach team is required to ensure appropriate follow up.

- The baby should be seen in the home during the first week after discharge by the neonatal community team.

- There must be a once weekly visit to OPD clinic for assessment and reduction of dose of morphine sulphate.

- The carer will be able to seek assessment of the baby more urgently if they are concerned about the condition of the baby e.g. the baby starts having increasing signs of withdrawal. They will have contact details for the neonatal community team and open access to the paediatric wards.

The out-patient clinic visits:

A full history of sleeping and feeding patterns and any symptoms of withdrawal should be taken. A full assessment of the baby should be undertaken. If the weight gain is poor despite receiving adequate feeds/calories and has a history of being unsettled it may be advisable to increase the morphine sulphate by 10% to see whether this improves sleeping and feeding patterns and thus improves weight gain.

- The oral morphine sulphate will be prescribed at the OPD clinic.
- Aim to reduce the oral morphine sulphate dose by 10micrograms/kg per dose each week in the OPD clinic.
- Continue to reduce the dose every week, or more often if appropriate, until the baby is receiving 10micrograms/kg/dose qds daily. After this dose has been given for one week the morphine sulphate should be stopped.

Table for dosing of Oral morphine sulphate:

The oral morphine sulphate strength we use is 100 micrograms/ml. It is supplied in 20ml bottles (2mgs morphine).

Dose: micrograms/kg/dose	**Frequency**	**For Oral morphine sulphate strength 100 micrograms/ml (mls/kg/dose)**
60	4 x day	0.6 mls/kg/dose
50	4 x day	0.5 mls/kg/dose
40	4 x day	0.4 mls/kg/dose
30	4 x day	0.3 mls/kg/dose
20	4 x day	0.2 mls/kg/dose
10	4 x day	0.1 mls/kg/dose

Special infection risks:

Scrutinize mother's notes for her VDRL, Hepatitis B, Hepatitis C and HIV status, and record clearly in the baby notes. Please refer to specific guidelines on Hep B and Hep C (later). If mother is hepatitis C positive, send blood from the infant for Hep C PCR.

OTHER ISSUES:

Notify the Lead Midwife for Vulnerable Adult / Child

Please discuss all these infants with the consultant as child protection issues may need to be considered. There should be a discharge plan in place which will have been arranged in the antenatal period according to Substance Misuse Guidelines for Pregnant Women. Sometimes it is necessary to hold a discharge planning meeting involving other health professionals, drug agencies and social services. At discharge, send a summary to the GP and community paediatrician stating clearly if there is a need for further HEP B vaccinations (1, 2 and 12 months) and book appointment for Dr Matthes's Clinic/Registrar Clinic for hepatitis B vaccination. For POW write to the GP requesting this

Cranial USS:

Literature review do not support mandatory cranial USS in babies exposed to cocaine as the pickup rate of abnormalities is small. However, it may be good practice to perform a USS on those with history of heavy use or polydrug use including cocaine, head circumference less than 10th centile, and abnormal neurology.

Infants should not be discharged if:

Absolute:

- Excessive weight loss (>10% of birth weight)
- Before day 5 of life if methadone use is suspected / known
- For SSRI use observe for at least 48 hours
- Suspected infant neglect or abuse
- Suspected home violence

Relative:

- Poor mother craft ability of mother, and inadequate home support or acceptance of assistance
- Erratic behaviours or continued intravenous and illicit drug use
- Polydrug use
- Inability of team to monitor welfare of infant. Mothers on high doses of methadone or other drugs should be discouraged from going home early, since their babies could withdraw at home. If such mothers insist on going home they have a legal right to do so. Inform the Neonatal consultant immediately as this may put the infant at risk and further

Follow up:

Babies requiring pharmacologic treatment should be given a follow up appointment in 4 weeks

Appendix 1: Information on different drugs

Opiates/Narcotics: Neonatal abstinence syndrome from maternal opiate use is present in 42-68% of infants of heroin users, and 68 -85% of methadone exposed newborns. Dihydrocodeine (DF118) is also in common use. A sub-acute withdrawal state from opiates may persist for 4-6 months. Seizures have been documented in8% of infants born to mothers on methadone and 1% of infants born to mothers using heroin.[2] Term babies have more severe symptoms, a higher incidence of withdrawal, and longer duration of NAS than pre-term infants. Seizures occur in 8% of term, and 3%.of preterm infants of mothers on methadone. The risk of Sudden Infant Death Syndrome is higher in babies of mothers who use opiates (X4) and appears highest for those using methadone.

Polydrug use: Users of illicit drugs frequently use more than one drug. Meta-analysis of studies suggests that polydrug users have an increased risk of abnormal pregnancy outcomes and the infants of polydrug users also have an increased risk of SIDS

(Increase in Relative risk - 95% CI: 1-10)[3]

Amphetamines: Infants born to mothers using low dose therapeutic amphetamines usually do not have any abnormalities. IV amphetamine use however appears to be on the increase. Decreased head circumference, length, birth weight, increased rates of abruption, prematurity and growth restriction have been reported in pregnancies of mothers abusing amphetamines.[4] In-utero amphetamine exposure may lead to intracranial lesions including haemorrhage, infarction and cavitatory lesions.[5]

Cocaine and derivatives: The use of cocaine is often associated with the heavy use of other abuse drugs. Adverse pregnancy and neonatal outcomes have been reported in mothers using cocaine during pregnancy.[6] It is clear that women who use cocaine during pregnancy are at significant risk for shorter gestations, premature delivery, spontaneous abortions, placental abruption and death. Bowel atresias have been observed in newborn infants possibly secondary to intrauterine bowel infarctions. A meta-analysis of studies examining the effect of cocaine use in pregnancy on pregnancy outcomes found that the independent effect of cocaine on adverse outcomes was small, and that similar effects were seen in polydrug users whether or not they used cocaine.

Marijuana: Use of marijuana in pregnancy does not appear to increase the risks of obstetric complications.[3] It has been associated with reduced birth length and low birth weight. No consistent morphological abnormality has been found in infants of mothers who use marijuana. Subtle neuro-behavioural abnormalities have been described in infants whose mothers are heavy users of marijuana although the relationship remains unproven.

Methadone: Up to 90% of babies of mothers on methadone experience some withdrawal; only 50-75% will require treatment. Studies have found conflicting results in their ability to relate methadone dose and severity of withdrawal.[8] Withdrawal appears to be greater in infants born to mothers on higher doses of opiates however other factors such as the infant's metabolism may be important [8]. Withdrawal is less severe in infants of mothers taking less than 20mg methadone a day.[9] Withdrawal from heroin usually occurs earlier (within 12-24 hrs of birth – shorter half-life). Methadone causes more severe withdrawal symptoms and usually occurs 2-3 days after birth but can occur on day 1 and up to day 7).[4]

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Patient Label

Modified Finnegan Score

Date:

- Score infants 30 minute s to 1 hour after feeds
- Infants at risk will score from each of the three sections in the scoring sheet
- Designed for term babies who are fed 4 hourly
- Appropriate allowance need to be given to preterm babies *

Record Time

SYSTEM	SIGN	SCORE									
C.N.S.	Excessive cry	2									
	Continuous cry	3									
	Sleeps <1hr after feed	3									
	Sleeps <2hrs after feed	2									
	Sleeps <3hrs after feed	1									
	Over active Moro reflex	2									
	Very over active Moro reflex	3									
	Mild tremors disturbed *	1									
	Mod/severe tremors disturbed *	2									
	Mild tremors undisturbed *	3									
	Mod/severe tremors undisturbed *	4									
	Increased muscle tone	2									
	Excoriation *	1									
	Myoclonic jerks	3									
	Generalised convulsions	5									
G.I.T.	Excessive Sucking	1									
	Poor Feeding *	2									
	Regurgitation *	2									
	Projectile Vomiting	3									
	Loose Stools	2									
	Watery Stools	3									
OTHER	Sweating	1									
	Fever 37.3 to 38.3 C	1									
	Fever 38.4 C and above	2									
	Frequent yawning (>3-4 in 1/2hr)	1									
	Mottling	1									
	Nasal Stuffiness	1									
	Sneezing (>3-4 in 1/2hr)	2									
	Nasal flaring	1									
	Respiratory rate >60/min.	1									
	Respiratory rate >60/min. & retraction	2									
	TOTAL SCORE										

Adapted from L.P.Finnegan (1986)

Explanation of Signs

- Tremors – infants should only get one score from the four options in this category
- Excoriation –score when presents, rescore only if it increases or appears in another area
- Poor Feeding – score if slow to feed or baby takes inadequate amounts
- Regurgitation – score if it occurs more frequently than usual in a newborn

Alert neonatal team if there ar e two sc ores >8 or a single score > 12 in last 24 hours

*** Modification for prematurity** - mainly necessary in the sections on sleeping and feeding. A baby on 3 hourly feeds can sleep at most 2 3/4 hours. Scoring should therefore be 1 if a baby sleeps less than 2 hours, 2 if sleeps less than 1 hour, and 3 if it 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.

Reference:

1. Neonatal Drug Withdrawal. AAP committee on drugs. Pediatrics 1998;101:1079-88
2. Naeye RL, Ladis B, Drage JS. Sudden infant death syndrome. A prospective study. Am J Dis Child. 130: 1207-10, 1976.
3. Briggs G, Freeman R, Yaffe S. Drugs in Pregnancy & Lactation 6th edition Lippincott Williams & Wilkins 2002
4. Bell GL, Lau K. Perinatal and neonatal issues of substance abuse. Pediatr Clin North Am. 1995 Apr; 42(2):261-281.
5. Dixon SD, Bejar RJ. Echoencephalographic findings in neonates associated with maternal cocaine and methamphetamine use: incidence and clinical correlates. Pediatr. 1989; 115(5 Pt 1): 770-778.
6. Oro AS, Dixon SD. Perinatal cocaine and methamphetamine exposure: maternal and neonatal correlates.J Pediatr. 1987; 111(4):571-588.
7. Richardson GA, Day NL, McGauhey PJ. The impact of prenatal marijuana and cocaine use on the infant and child. Clin Obstet Gynecol. 1993; 36(2): 302-318.
8. Malpas TJ. Darlow BA. Lennox R. Horwood LJ. Maternal methadone dosage and neonatal withdrawal. Australian & New Zealand Journal of Obstetrics & Gynaecology. 35(2): 175 -7, 1995
9. Strauss ME, Andresko M, Stryjer J, Wardell JN. Relationship of neonatal withdrawal to maternal methadone. Am J Drug Alcohol Abuse. 1976; 3(2):339-345.
10. Castiel RL, Merlob P, Linder N et al. Neonatal abstinence syndrome after in utero exposure to selective serotonin reuptake inhibitors in term infants
11. Neonatal abstinence syndrome – http:// www.cs.nsw.gov.au/rpa

Guideline for Management of In-hospital Newborn Falls

There is no consensus in the medical literature on how babies who fall in hospital should be managed, so in all cases, clinical judgement should be used to guide assessment and management. When a baby falls, midwifery and neonatal staff should manage the situation jointly, particularly if a "cause for concern" is identified.

The majority of in-hospital falls in the newborn period happen when a baby falls off a bed or a chair in the labour or postnatal ward when the mother inadvertently falls asleep[1]. This is more likely to happen if the mother is sleep deprived, and particularly if she is still experiencing the effects of anaesthesia, analgesia, or substance misuse. The situation may be complicated by pre-existing safeguarding concerns, and safeguarding issues should always be borne in mind when dealing with this situation. Most babies however will have no significant complications from a fall of this nature.

Imaging in Newborn Falls

The radiological investigation of newborn head injuries is not straightforward[2]. Intracranial bleeding may be seen in CT head scans of a significant proportion of all newborn infants[3]. The interpretation of this finding may therefore be difficult. The incidence of intracranial injury in newborn falls is also highly variable in the literature [4,5]. The need for radiological investigations is seldom urgent in stable babies, and whether or not they are performed depends on the clinical presentation of each individual case. The need for neurosurgical intervention in this scenario is rare. Clinical judgement is therefore needed to decide whether further radiological evaluation of babies with a head injury should be considered.

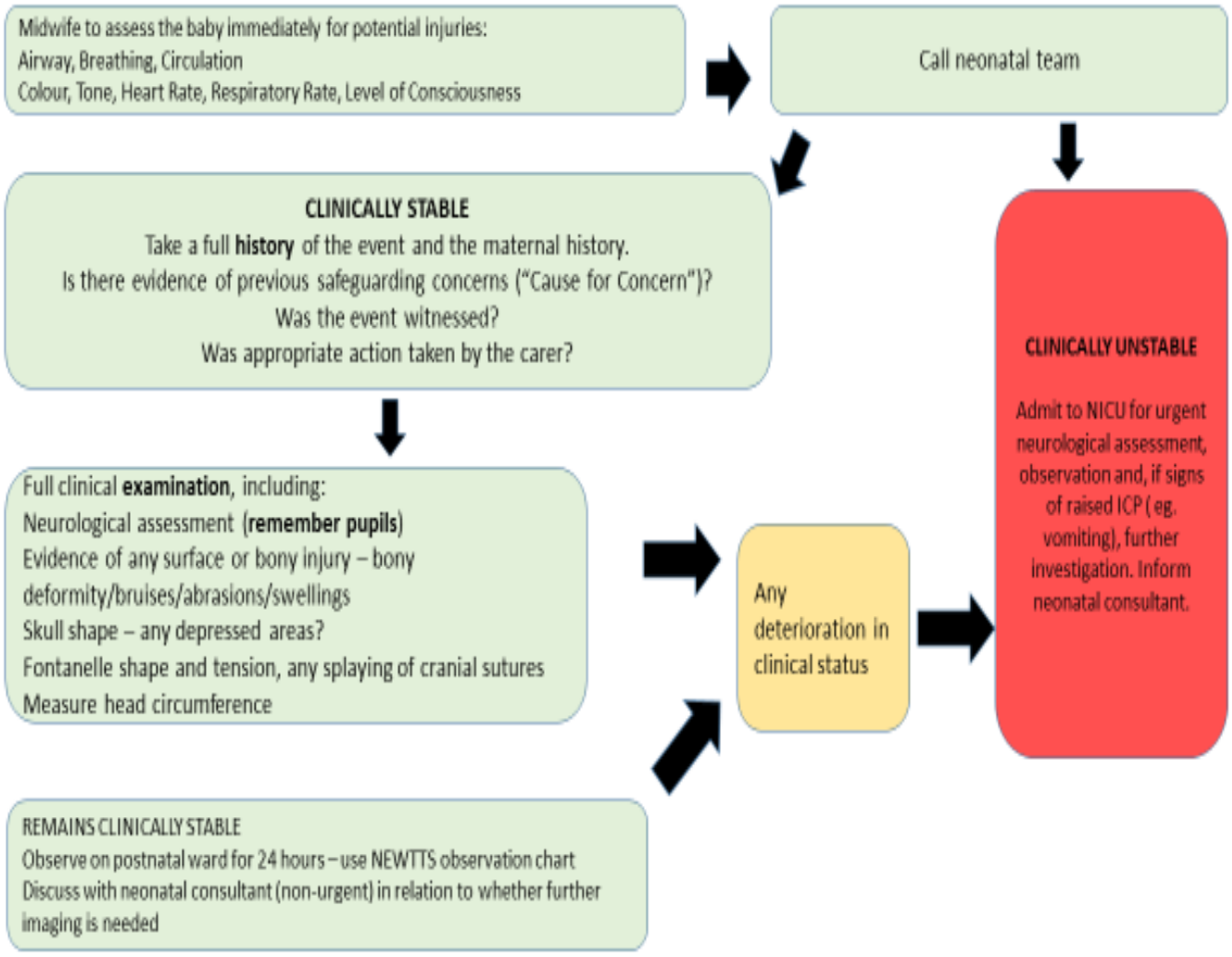
If there are clinical signs of a long bone fracture (including the clavicle), request the relevant X-rays and treat accordingly.

Consider discussing skull X-ray and/or neuroimaging with the duty Radiologist, particularly if the following features are present or develop later:

- any signs of raised intracranial pressure(eg. vomiting) or clinical instability
- any neurological abnormality
- significant swelling or bruising of the scalp or face*
- deformation of skull
- significant safeguarding concerns (discuss with community paediatrician or named doctor)

**if there is bruising that is not consistent with the history of a fall this is suspicious of non-accidental injury*

Newborn baby falls on the Labour or Postnatal Wards:



If Safeguarding Concerns are identified

If there are safeguarding concerns, either pre-existing or in relation to the incident itself, the midwifery team should liaise with the safeguarding midwife and/or social services to inform them of the incident and be guided accordingly. Contact Helen Griffiths, Named Midwife for Safeguarding on extension 42117.

The neonatal consultant should consider discussion with community paediatrician on duty for safeguarding (within office hours); contact community paediatric secretaries in Hafan Y Mor Childrens Centre. Alternatively, consider discussion with SBUHB Named Doctors for Safeguarding[6] , Dr Andrea Warlow as to whether further measures or investigations are advised.

If there are Signs of Raised Intracranial Pressure (ICP)

It the baby has signs of raised intracranial pressure (eg. vomiting) or any signs of clinical instability, admit to the NICU for neurological observations and urgent neuroimaging – discuss with duty Radiologist and if significant intracranial bleeding present discuss with the neurosurgical team at UHW Cardiff.

Documentation and Incident Reporting

All injuries should be carefully documented in the baby's notes and in the child health record book, particularly the appearance and location of injuries. Clinical photographs, if available, can help record injuries in detail.

A Datix Incident report should also be completed for all falls.

Discharge Arrangements

If babies are stable with no clinical concerns identified, they may be discharged home after 24 hours. The midwifery team should discuss safe care of babies with the family, in particular the NICE guidelines on co-sleeping[7], and document that this has been done. When there are safeguarding concerns, discharge arrangements should be led by social services.

References

1. Monson et al "In Hospital Falls of Newborn Infants: Data From a Multihospital Health Care System" Pediatrics 2008; 122:e277
2. Glass et al "The Infant Skull: A Vault of Information" Radiographics 2004; 24:507–522
3. Kahn et al "Variation in Management of In-hospital Newborn Falls: A Single Centre Experience" Journal Of Neurosurgery Paediatrics 2017 20:176-182
4. Warrington et al "Accidents and Resulting Injuries in Premobile Infants: Data From the ALSPAC Study" Arch Dis Child 2001; 85: 104 - 107
5. Ruddick et al "Head Trauma Outcomes of verifiable Falls in Newborn babies" Arch Dis Child 2010; 95: F144-F145
6. All Wales Multi-Agency Policy for Minor Injuries in Babies (http://www.wbsb.co.uk/media/4909/wbscb_minor_injuries_in_babies_policy_dec15.pdf)
7. NICE Guideline on Postnatal Care Up To 8 weeks After Birth (https://www.nice.org.uk/guidance/cg37/chapter/1-Recommendations