Yorkshire & Humber Pan-Network Neonatal Clinical Guideline

Title: Evidence-based care bundle to reduce intraventricular haemorrhage in preterm neonates < 28 weeks' gestation

Authors: ODN IVH Working Group

Date Written: February 2023

Next Review Date: June 2028

Date Ratified: June 2023 *(Y&H Neonatal Executive Group Meeting)*

This clinical guideline has been developed to ensure appropriate evidence- based standards of care throughout the Yorkshire & Humber Neonatal Operational Delivery Network. The appropriate use and interpretation of this guideline in providing clinical care remains the responsibility of the individual clinician. If there is any doubt discuss with a senior colleague.

A: Guideline Summary

B: Full Guideline and Evidence

A. Guideline Summary

1. Aim:

To provide an evidence-based care bundle to reduce intraventricular haemorrhage in preterm neonates <28 weeks.
The interventions described for management in the first 72 hours of life may also be of benefit for infants born up to 30 weeks gestation. However, the risk-benefit of these should be considered against factors such as maintaining non-invasive ventilation and facilitating kangaroo care. Many of the interventions described will be of developmental benefit to all infants regardless of the risk of IVH.

2. Best Practice Recommendations

A multi-disciplinary team approach is required with staff and family education and training to implement a cost-effective care bundle to reduce IVH in preterm babies <28/40.

Perinatal Recommendations

- Delivery of PERIPrem Care Bundle which includes strategies known to reduce the incidence of IVH:
- Delivery in the right place
- Intrapartum antibiotics
- Antenatal steroids
- DCC

Neonatal Recommendations in the first 72 hours of life, following initial resuscitation and 'golden hour' stabilisation:

- In the first 72 hours the following interventions, when delivered as part of a care bundle can help to reduce the risk of intraventricular haemorrhage.
    - Midline head positioning (does not need to be in supine position)
    - Head elevation
    - Minimal handling
    - Slow and controlled handling to avoid rapid changes in intra-abdominal/intra-thoracic pressure which could alter blood flow to the brain.
    - Minimise stress and pain for example, use of buccal EBM/sucrose, noise reduction, light reduction to avoid fluctuations in blood pressure.
    - Give intermittent bolus infusions and flushes as slowly as possible.
    - Invasive arterial BP monitoring for close monitoring of BP and to reduce painful stimuli as clinically indicated in the Y&H Umbilical lines guidance.
    - Flush and sample arterial lines slowly
    - Maintain paCO2 4.5-8KPa from Day 1-4

NB providing the IVH care bundle should not prevent or delay kangaroo care or planned extubation in the first 72 hours of life.

3. Summary

- Intraventricular haemorrhage (IVH) is a major complication of prematurity associated with increased risk of death or adverse neurodevelopmental outcomes.
- Significant alterations in cerebral perfusion can occur during routine care. Specific interventions can reduce fluctuations. This may reduce the risk of IVH in infants born less than 28 weeks' gestation.
- Implementation of this care bundle is cost effective, requires minimal training and is easy to apply. Current evidence suggests it is unlikely to do harm to infants born prematurely at risk of developing IVH.

B Full guideline and evidence

1. Background:

Intraventricular haemorrhage (IVH) is a frequently occurring and leading cause of brain injury in preterm infants. It is strongly associated with adverse outcomes including disability and death (1-4). Most occur within the first 72 hours of life. As neonatal intensive care continues to improve, with provision of intensive care at greater extremes of prematurity (5); the need to minimise the risk of IVH increases. Numerous studies have reported the incidence of IVH in preterm infants at 20-40% and this has remained stable for several decades. A neonatal care bundle incorporating evidence-based interventions for modifiable factors can reduce the risk of IVH in preterm infants.

IVH originates in the germinal matrix (GM), a vascularised collection of neuronal-glial precursor cells that form part of the developing brain (1,3,6). The pathogenesis is complex and multi-factorial and can occur due to germinal matrix vasculature fragility, impairment of cerebral auto regulation, coagulation disorders, genetic factors, fluctuations in CO2 and oxygen toxicity. This complex aetiology involves weakening of the capillaries in the GM making it vulnerable to anoxia.

The severity of IVH is classified based on the amount of blood in the germinal matrix and lateral ventricles as demonstrated by cranial ultrasound. There are slight differences in classifications between professional bodies/texts however the criteria deployed within Badgernet and published by NNAP (Neonatal Audit Programme) are as follows. GM bleeding with no or minimal intraventricular haemorrhage (<10% of ventricular area on parasagittal view) is classified as grade I. Accumulation of blood inside the ventricles with blood seen in 10-50% of ventricular area on parasagittal view represents grades II and grade III is characterised by blood in >50% of the ventricular area on parasagittal view, usually with distension of the lateral ventricle. Haemorrhagic infarction in the periventricular white matter (with or without IVH) is classified as grade IV. Grades I and II are defined as mild IVH, and grade III and grade IV as severe.

Other than the neurosurgical intervention described in the DRIFT study, which is neither widely practiced nor practical, there are no effective treatment options currently for IVH; therefore, prevention forms the main aim of clinical management. A variety of modifiable risk factors have been highlighted in studies which likely contribute towards the incidence of IVH. It has been therefore suggested that by minimising several of these contributory risks, one can reduce the risk of IVH in the preterm infant. There is increasing evidence suggesting that a care bundle can reduce the incidence of IVH in preterm neonates born less than 30 weeks' gestation (4,8,9).

2. Aim:

The aim of this guideline is to establish a standardised, evidence-based care bundle for the care of preterm infants <28 weeks to reduce the rate of IVH.

The interventions described for management in the first 72 hours of life may also be of benefit for infants born up to 30 weeks gestation. However, the risk-benefit of these should be considered against factors such as maintaining non-invasive ventilation, facilitating kangaroo care. Many of the interventions described will be of developmental benefit to all infants regardless of the risk of IVH.

3. Areas outside remit

Infants with congenital abnormalities which would not allow specified positioning.
Infants where a decision is made to move to palliative care.

4. Reducing IVH Care Bundle

The modifiable risk factors which may reduce or contribute to a reduction in the IVH rate can be categorised as perinatal care and care within the first 72 hours of life.

4.1 Perinatal optimisation

Perinatal optimisation is indicated to improve outcomes in all preterm infants. The following interventions are associated with reduced rates of IVH.

4.1.1 Antenatal

- Identification and treatment of maternal chorioamnionitis. Recent meta-analysis suggested chorioamnionitis exposed infants were at greater risk of IVH of all grades (10).
- Use of antenatal corticosteroids (11). Demonstrated to reduce the incidence and severity of IVH likely due to stabilisation of the germinal matric microvasculature and reduced disruption of cerebral blood flow (26, 27).
- Delivery in the right place is associated with a reduction in IVH and severe brain injury in extremely preterm infants (28, 29)

4.1.2 At birth

- Delay umbilical cord clamping by at least one minute (13,14). No strong evidence that this reduces IVH but is part of optimal preterm perinatal care. Reduces need for BP support.
- Maintain thermoregulation.
- Optimise ventilation strategies, use volume guided ventilation when intubated and ventilated,
- and surfactant administration. This is part of optimal early preterm care (24). See section 4.2.5.

These strategies should not prevent delivery room cuddles/parental touch from taking place – see below re: side-lying kangaroo care.

Cord "milking" increases the risk of IVH in preterm infants and should be avoided (16).

4.2 Neonatal care (First 72 hours of life)

The rationale for implementing the care bundle over the first 72 hours is that IVH mostly develops over this time period (6).

The care bundle and interventions describe should not prevent other important aspects of care from continuing such as planned extubation from mechanical ventilation if clinically indicated or kangaroo care.

4.2.1 Midline head positioning

Recommendation: Keep the head in the mid-line position for the first 72 hours of life
The baby can be nursed supine or side-lying with the head supported to maintain a midline position, i.e., in line with the body. Side-lying is preferred to supine, wherever possible, as this position supports infant regulation.

Mid-line head position can also be supported in skin-skin/kangaroo care. Therefore, midline head position should not prevent kangaroo care. (See appendix 4 for images).
An admission examination should take place which includes the back and perineum which is possible with the infant in side-lying (See side-lying nappy change appendix 2 for more information).

It should be a consultant-led decision to place the infant prone in the first 72 hours of life if required to support respiratory care.

Equipment required:

- Tree to support ventilator/non-invasive ventilation tubing
- Positioning aids to support midline position of head

Rationale: to optimise cerebral venous drainage (17,18). Rotation of the head to either side can cause obstruction to jugular venous drainage on the side towards which the head is rotated (19). It is postulated this could lead to venous congestion and could contribute to the development of IVH.

This should not prevent kangaroo care or planned extubation from mechanical ventilation taking place.

Figure 1 & 2. Supine with head in midline

Transfer to side-lying kangaroo care – video https://youtu.be/_ll0yrEmDLo.

Figure 3 & 4. Side-lying with head in midline position, knees and arms should be in flexed position, hands to mid-line.

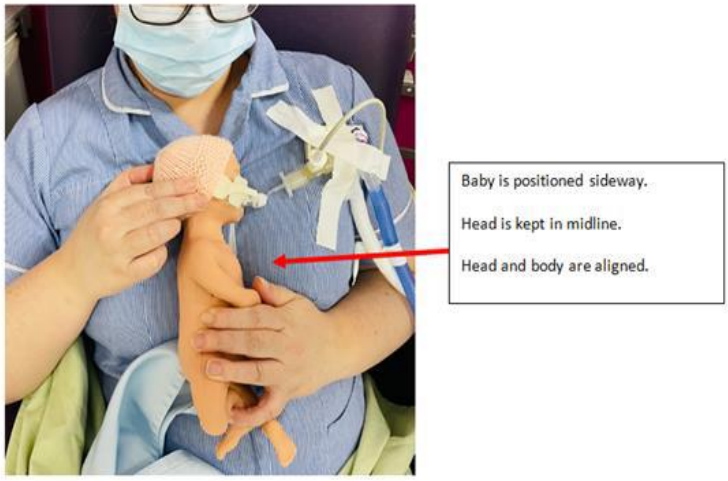


Figure 5 and 6. Midline head position supported in kangaroo care/skin to skin.

4.2.2 Head elevation

Recommendation: maintain head elevation to 12-13 degrees for at least 72 hours (maximal tilt of local incubators)

The incubator should be flattened to support practical procedures such as intubation and line insertion. Ensure the incubator is returned to the tilted position following procedures/x-rays. Head elevation can be continued beyond 72 hours of age with minimal impact on care.

Rationale: to promote cerebral venous outflow by augmenting hydrostatic venous drainage (20,21). Reducing the risk of venous congestion may reduce the risk of IVH. A recent randomized control trial, albeit single centre, with adequate pretrial sample sizing/power, reported that maintaining an elevated head position for the first four postnatal days reduced the risk of IVH (18). Studies report achieving head elevation at 15-30 degrees. However, the practical details of how to achieve this are not reported. Incubators in use in the Yorkshire and Humber ODN, at the time of writing, can only provide 12-13 degrees of head elevation. We do not propose the purchase of additional equipment at the current time.

This should not prevent kangaroo care or planned extubation from mechanical ventilation taking place.

4.2.3 Minimal handling

The frequency of cares and handling should be individualised and based around each baby's autonomic stability (how do they cope with handling?). Some babies respond better to cares being spaced out so they have time to rest and recover between interventions. For some babies clustering of interventions, both medical and nursing, can reduce the impact on the infant but an awareness of the risk of overwhelm and fatigue must be maintained and responded to by the care giver. Babies need at least an hour between interventions/handling for a full sleep cycle to occur.

Recommendations:

a) Two-person care giving is the gold-standard, involving parents wherever possible. Individualised frequency/timing of cares which support minimal handling but is tailored to the baby's needs and where possible their sleep/wake cycles. Turns should be slow and with the head maintained in the mid-line. Avoid sudden movements. (Video link to follow)

b) Nappy changes should be performed with minimal raising of the legs. Best practice is to perform nappy changes in the side-lying position. The side-lying position can also be used for clinical examination, in particular first examination to assess for patent anus/spinal anomalies. Evidence suggests that lifting legs during nappy cares increases venous return which will increase cardiac preload and possibly cause a sudden increase in blood flow to the brain increasing the risk of IVH. (22)
   See Appendix 2 for how to guide for nappy changes.
c) Weigh babies on incubator scales

In the first 72 hours, kangaroo care/skin-skin should be provided following individual patient assessment by the medical and nursing professionals and in conjunction with parents. It should be clearly communicated to parents and carers that handling involved in providing skin is of a different nature to medical and nursing procedures. In general, skin to skin should be actively encouraged due to the wide-ranging benefits but feasibility needs to be considered alongside other procedures/cares etc. clinically indicated.

The on-going benefits of minimal handling described above will persist beyond 72hours of age and should be continued and reviewed on an individualized patient basis taking into their clinical condition/maturity etc.

This should not prevent kangaroo care or planned extubation from mechanical ventilation taking place.

4.2.4 Minimise stress and pain

Recommendations:

a) Monitor pain, stress levels, and respond according to local guidance.
b) When clinically indicated (see Y&H Umbilical Venous and Arterial Lines Guideline), use arterial lines for sampling to reduce the frequency of painful procedures.
c) When clinically indicated (see Y&H Umbilical Venous and Arterial Lines Guideline), use dual lumen umbilical venous catheters to reduce the need for cannulation.
d) Swaddling and comfort holding can reduce stress and pain in infants and can be an active role that parents can participate in. If possible, the baby's hands should be free to support their self-regulation (eg. hands to mouth).
e) Comfort hold provided by parents to reduce stress and pain during procedures.
f) Encourage parents positive touch and voice.
g) Use of buccal EBM/ sucrose prior to painful procedures eg. Cannulation/line insertion
h) Use of appropriate analgesia and sedation (e.g., not all ventilated babies require morphine)
i) Reduce light exposure eg. using eye shields during phototherapy, incubator covers.
j) Reduce noise exposure eg. Reduce environmental noise pollution/use of incubator covers.

Minimal handling should not prevent kangaroo care or planned extubation from mechanical ventilation from taking place.

Silk sheets. It has been suggested this may be beneficial to preterm infants in reducing the risk of IVH. However, there is limited evidence, a significant cost implication as well as concern regarding the ability to safely launder these sheets to avoid infection risk. We therefore do not recommend this as a routine intervention, but units may support parents in facilitating this on a case-by-case basis where parents are made fully aware of the limited evidence and difficulties in laundering.

Rationale: reducing fluctuations in infant blood pressure which may affect cerebral perfusion.

The principles of minimising pain and stress in the infant should continue throughout their neonatal admission. Adaptations will be required as the infant matures.

4.2.5 Respiratory care

Recommendations:

a) Follow Early Care guidelines for respiratory care including NICE guidance for pCO2 levels: 4.5 kPa to 8.5 kPa on days 1 to 3 and 4.5 kPa to 10 kPa from day 4 onwards. (24)
b) When intubated and ventilated, commence volume guided ventilation (24, 30)
c) When possible, make small incremental changes in respiratory support.
d) Consider use of continuous tCO_2 monitoring if available.
e) Endotracheal suction should be performed as clinically indicated rather than routinely.
f) Use in-line suction for mechanically ventilated infants.

Rationale: reduce fluctuations in cerebral blood flow due to rapid changes to pCO2.

Systematic review identifies an associated reduction in risk for IVH when volume-targeted ventilation used when compared to pressure-controlled ventilation. (30)

This should not prevent planned extubation from mechanical ventilation taking place.

4.2.6 Cardiovascular care/arterial lines

Recommendations:

a) Invasive blood pressure monitoring in most extreme preterm/ventilated infants
b) Slow withdrawal and replacement of fluid during arterial line sampling – aim for withdrawal over 1 minute and no faster than 1ml/30 seconds.

Rationale: large fluctuations in blood pressure may increase the risk of IVH. Rapid withdrawal of blood from arterial lines can cause a decrease in cerebral perfusion (23).

4.2.6 Administration of intravenous medications by bolus

There is no evidence from research studies to support slow administration of intravenous boluses in relation to reduction in IVH risk. However, it would seem appropriate to administer larger volume fluid boluses over at least 30 minutes (for example, NaCl 10ml/kg as volume). For other bolus injections it should be remembered to administer the flush at the same, or slower, infusion rate than the drug.

Please note that all the above should not interfere with any emergency management that may be required.

5. Education Resources

A short teaching package covering the IVH Care Bundle is available on the Neonatal Education platform as part of the Family Care Package. In addition to the IVH Care Bundle, it is recommended that you complete the other modules within the Family Care Package as these contain the underpinning knowledge required to support Neurodevelopmental Care practices within your unit.

Create an education platform login using the QR code below or via this link:https://www.yorkshireandhumberodneducation.com/login/index.php.php

6. Audit Criteria
   IVH rates monitored with NNAP.
   Local review of cases of grade 3/ 4 IVH using driver diagram in Appendix 6.

7. Working group members
   Pauline Adiotomre, Jo Adams, Jo Davies, Chris Jackson, Marie-Anne Kelly, Aishin Lok, Lawrence Miall, Ellie Peirce, Catherine Smith, Hazel Talbot, Rebecca Tazzyman, Tamanna Williams, Helen Yates,

8. Acknowledgements
   With thanks to Chris Jackson and Aesha Mohammedi who wrote the first draft of the guideline. The Bradford and Leeds guidelines have been used in production of this document.

9. References
   Bradford guideline and transfer to kangaroo care video
   Leeds guideline
   QI Storyboard | British Association of Perinatal Medicine (bapm.org)

1. Inder TE, Volpe JJ. Mechanisms of perinatal brain injury. In: *Seminars in neonatology*. Saunders Elsevier, 2010: Vol. 5, No. 1, pp. 3-16.
2. Hoekstra RE, Ferrara TB, Couser RJ, Payne NR, Connett JE. Survival and long-term neurodevelopmental outcome of extremely premature infants born at 23–26 weeks' gestational age at a tertiary center. *Pediatrics* 2014;113(1): e1-6.
3. McCrea HJ, Ment LR. The diagnosis, management, and postnatal prevention of intraventricular haemorrhage in the preterm neonate. *Clin Perinatol* 2008; 35:777-92.
4. Mukerji A, Shah V, Shah PS. Periventricular/intraventricular hemorrhage and neurodevelopmental outcomes: a meta-analysis. *Pediatrics* 2015; peds-2015.
5. British Association of Perinatal Medicine. Perinatal Management of Extreme Preterm Birth before 27 weeks of gestation A Framework for Practice. 2019. Accessed November 2021. https://hubble-live-assets.s3.amazonaws.com/bapm/file_asset/file/30/Extreme_Preterm_28-11-19_FINAL.pdf

6. Volpe JJ. Intracranial hemorrhage. In: *Neurology of the newborn.* Saunders Elsevier, 2008: 481-588.
7. Lunze K, Bloom DE, Jamison DT, Hamer DH. The global burden of neonatal hypothermia: systematic review of a major challenge for newborn survival. *BMC medicine* 2013;11(1):24.
8. de Bilj-Marcus K, Brouwer AJ, De Vries LS, *et al*. Neonatal care bundles are associated with a reduction in the incidence of intraventricular haemorrhage in preterm infants: a multicentre cohort study. *Arch Dis Fetal Neonatal Ed* 2020; 105: F419-F424.
9. McLendon D, Check J, Carteaux P, *et al.* Implementation of potentially better practices for the prevention of brain hemorrhage and ischaemic brain injury in very low birth weight infants. *Pediatrics* 2003;111: e497-503.
10. Villamor-Martinez E, Fumagalli M, Mohammed Rahim O, Passera S, Cavallaro G, Degraeuwe P, Mosca F and Villamor E. Chorioamnionitis Is a Risk Factor for Intraventricular Hemorrhage in Preterm Infants: A Systematic Review and Meta-Analysis. *Front. Physiol*;2018. 9:1253. Doi: 10.3389/fphys.2018.01253.
11. Roberts D, Brown J, Medley N, Dalziel SR. Antenatal corticosteroids for accelerating fetal lung maturation for women at risk of preterm birth. *Cochrane Database of Systematic Reviews* 2017, Issue 3. Art. No.: CD004454. DOI: 10.1002/14651858.CD004454.pub3.
12. Crowther CA, Middleton PF, Voysey M, Askie L, Duley L, Pryde PG, *et al*. Assessing the neuroprotective benefits for babies of antenatal magnesium sulphate: An individual participant data meta-analysis. *PLoS Med* 2017;14(10): e1002398.
13. Fogarty M, Osborn DA, Askie L, Seidler AL, Hunter K, Lui K, Simes J, Tarnow-Mordi W. Delayed vs early umbilical cord clamping for preterm infants: a systematic review and meta-analysis. *American Journal of Obstetrics and Gynaecology* 2018;218 (1), pp. 1-18.
14. Mercer JS, Vohr BR, McGrath MM, Padbury JF, Wallach M. Delayed cord clamping in very preterm infants reduces the incidence of intraventricular hemorrhage and late-onset sepsis: a randomized, controlled trial. *Pediatrics* 2006;117(4), 1235–1242. doi:10.1542/peds.2005-1706.
15. Christ L, Barber J, Murray A, Dunleavy M, Stoller J, *et al*. Reducing intraventricular hemorrhage in a level III neonatal intensive care unit. *BMJ Qual Saf* 2015;24(11): 731-732.
16. Katheria AC. Umbilical Cord Milking: A Review. *Front. Pediatr*. 2018; 6:335. doi: 10.3389/fped.2018.00335
17. Romantsik O, Calevo MG, Bruschettini M. Head midline position for preventing the occurrence or extension of germinal matrix-intraventricular hemorrhage in preterm infants. *Cochrane Database Syst. Rev* 2017:CD012362.
18. Kochan M, Leonardi B, Firestine A, *et al*. Elevated midline head positioning of extremely low birth weight infants; effects on cardiopulmonary function and the incidence of periventricular-intraventricular haemorrhage. *J Perinatol* 2019; 39:54-62.
19. Watson GH. Effect of head rotation on jugular vein blood flow. *Arch Dis Child* 1974; 49:237-9.
20. De Bijl-Marcus KA, Brouwer AJ, de Vries LS, *et al.* The effect of head positioning and head tilting on the incidence of intraventricular hemorrhage in very preterm infants: a systematic review. *Neonatology* 2017; 111:267-79.
21. Pichler G, van Boetzelar MC, *et al*. Effect of tilting on cerebral hemodynamics in preterm and term infants. *Neonatology* 2001; 80:179-85.
22. Limperopoulos C, Gauvreau KK, O'Leary H, *et al*. Cerebral hemodynamic changes during intensive care of preterm infants. *Pediatrics* 2008; 122: e1006-13.
23. Schulx G, Keller E, Haensse D, *et al*. Slow blood sampling from an umbilical artery catheter prevents a decrease in cerebral oxygenation in the preterm newborn. *Pediatrics* 2003;111:e73-6.

24. National Institute for Clinical Excellence. Specialist neonatal respiratory care for babies born preterm. NICE guideline [NG124] 2019. Accessed November 2021. https://www.nice.org.uk/guidance/ng124
25. Chiriboga N, Cortez J, Pena-Ariet A, *et al.* Successful implementation of an intracranial hemorrhage (ICH) bundle in reducing severe ICH: a quality improvement project. *J Perinatol* 2019; 39:143-151.
26. Roberts. Cochrane Database Syst Rev. 2006 Jul 19;(3):CD004454 Antenatal corticosteroids for accelerating fetal lung maturation for women at risk of preterm birth - PubMed (nih.gov)
27. S Shankaran [1], C R Bauer, R Bain, L L Wright, J Zachary. Am J Obstet Gynecol 1995 Jul;173(1):305-12. doi: 10.1016/0002-9378(95)90219-8. Relationship between antenatal steroid administration and grades III and IV intracranial hemorrhage in low birth weight infants. The NICHD Neonatal Research Network.
28. Mohamed and Ali. A Systematic Review and Meta-analysis of the Timing of Early Intraventricular Hemorrhage in Preterm Neonates: Clinical and Research Implications - PMC (nih.gov) J Clin Neo 2014 Apr-Jun; 3(2); 76-88
29. Helenias K et al. Association of early postnatal transfer and birth outside a tertiary hospital with mortality and severe brain injury in extremely preterm infants: observational cohort study with propensity score matching *BMJ* 2019; 367 doi: https://doi.org/10.1136/bmj.l5678
30. Razak A et al. Interventions to Reduce Severe Brain Injury Risk in Preterm Neonates. A Systematic Review and Meta-analysis. *JAMA Netw Open.* 2023;6(4):e237473. doi:10.1001/jamanetworkopen.2023.7473

10. Appendices (7)

Appendix 1 - Reducing IVH care bundle staff poster *(*see separate Appendix 1 Document – Y&H Neonatal ODN NHS Networks link here)

Appendix 2 - Nappy Changes:
Video of side lying nappy change https://youtu.be/pms-WYymAT4
Pictorial Guide (see separate Appendix 2 Document – Y&H Neonatal ODN NHS Networks link here)

Appendix 3 - Turns
Video slow controlled turn https://youtu.be/SOYLrwBWT24

Appendix 4 – see next page

Appendix 4 - Kangaroo Care side-lying

Transfer to side-lying kangaroo care: https://youtu.be/_ll0yrEmDLo.

Side-lying Kangaroo Care in Extremely Preterm Infants

What: Side-lying kangaroo care is a method of providing skin to skin contact between baby and parent whilst maintaining neutral (midline) head positioning.

Who: Medically stable extremely preterm infant (< 28 weeks gestation) in the first 72 hours of life.

Why: Prevents venous congestion as a potential contributory cause of intraventricular haemorrhage (IVH).

How:

Figure 1

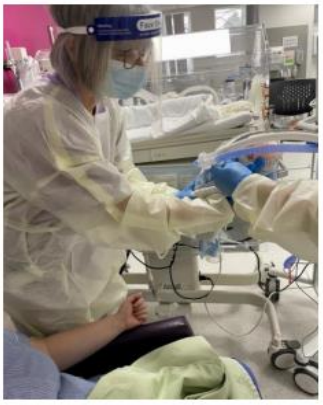


Figure 2

Figure 3

Figures 1 and 2:

- Baby is assessed to be medically stable for skin-to-skin contact.
- Have a second helper when taking baby out from incubator. Do this slowly and keep baby's head in midline (neutral) position.

Figure 3:

- Position baby sideways against parent's chest to keep baby's head in midline (neutral position).

Baby is positioned sideways.

Head is kept in midline.

Head and body are aligned.

Appendix 5 - Incubator Label

I was born at <28 weeks.

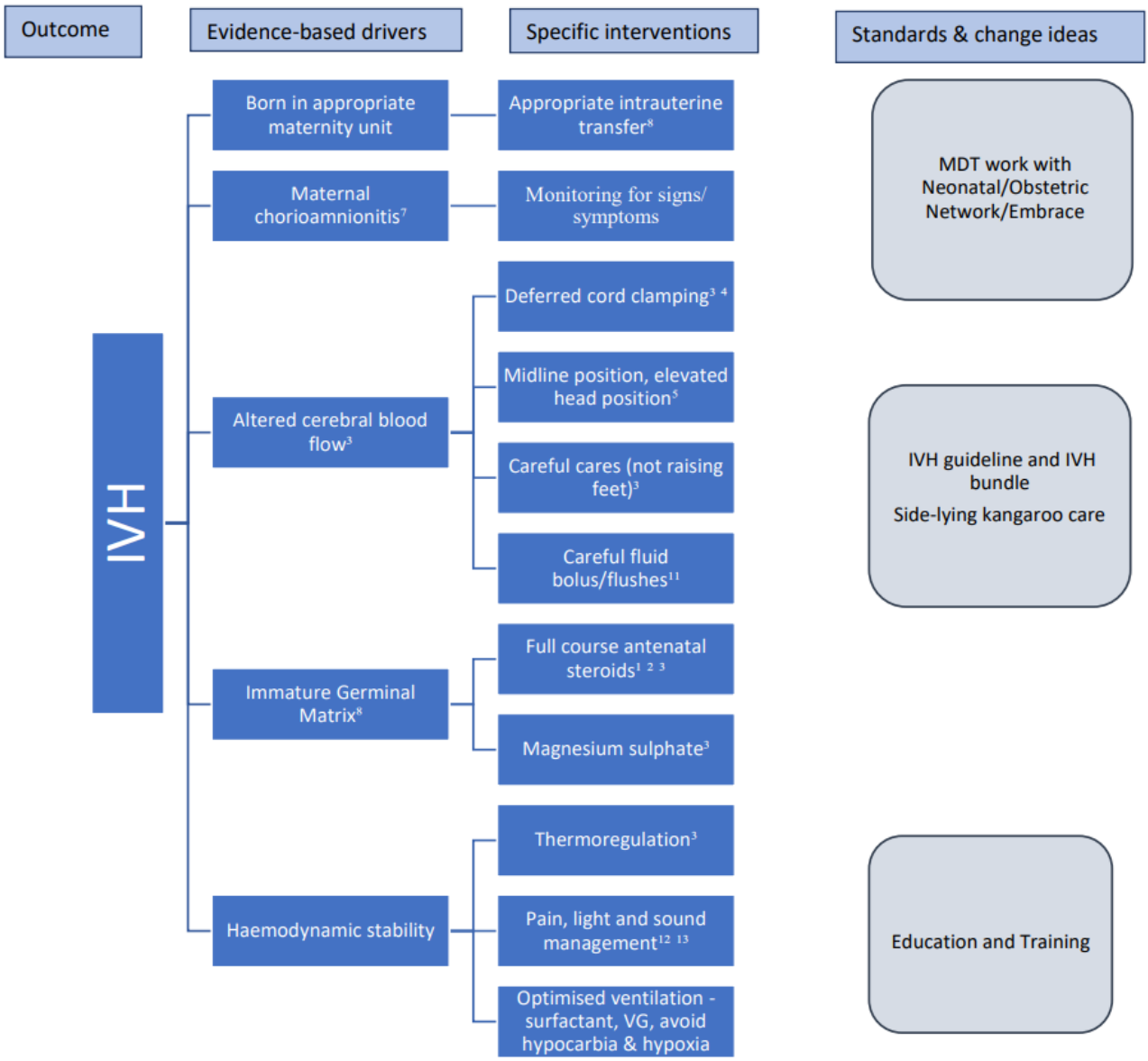
Please move me slowly and carefully.

Until I am 72 hours old please:

Keep my head in the midline position

Keep my incubator at maximum tilt except for procedures.

Appendix 6 - Driver diagram for review of Grade III/IV intraventricular haemorrhage



Appendix 7 – Talking to Parents

Things to consider when communicating information to parents on the neonatal unit

We asked parents on the Yorkshire and Humber Parent Advisory Group (PAG) *'What would be helpful/matter to you in terms of receiving information about your babies care'*

Remember this is all new to parents they won't have been through it before - give them an idea of how common it is - honesty is always best even if it is a little scary.

Be as reassuring as possible – without skirting around the truth.

Talk about anything positive – Hope is important to parents.

Consider the environment – Think about where you are giving parents information and ask for their preference. Some parents want privacy, whereas others may find going to a 'bad news room' triggering or feel like they are standing out to other parents.

Language – Be mindful of the language you use – avoid Jargon and fully explain things to 'demystify' and clarify. Tell them 'If I am using any terms you don't understand, just ask'

Check their understanding of what you have told them. Offer to clarify and ask them 'What do you understand about what I have just explained?' so you can check that they have understood, rather than simply 'Do you understand?'

Give them chance to ask questions – Always offer the opportunity to ask questions and make sure that they know they can ask questions later,
who to ask and how they can do this. It is important they always have the option to follow up with a specific person.

Be clear about parent/carer involvement – Be clear about what parents can do and what role they can play. Is there anything that they can do that is particularly helpful? Or something they need to avoid? Anything they need to look out for or do?

Explain why – if a change needs to be introduced explain why this is necessary
Why is it happening? Is it important? How long is it likely to go on for? When can they expect an update or a change? Is there anything to look out for? - good or bad!

How to find further information - if there is a source of further information (Leaflet/website) share it with them.

Yorkshire and Humber Parent Advisory Group
December 2022