

Management of Term Neonatal Hypernatraemic Dehydration

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Executive Summary

This guideline is intended for neonates from 35 weeks gestation in which there is hypernatraemia related to dehydration.

If there is uncertainty as to the cause of hypernatraemia, advice from a senior clinician should be sought.

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1. **Introduction**

- 1.1 It is normal for babies to lose weight in the first few days of life – average loss 5-7%. Breast feeding babies tend to lose more weight than formula fed babies; 15% will lose > 10% of their birth weight.

Babies with a weight loss of $\geq 12.5\%$ should be reviewed by a member of the neonatal team as they are at risk of hypernatraemic dehydration.

2. **Scope**

- 2.1 This guideline is relevant to all staff caring for babies across neonatal intensive care, transitional care and maternity.
- 2.2 See also Maternity Guideline: Weighing babies and well baby clinic pathway

3. **Purpose**

- 3.1 The purpose of the guideline is to provide a clear pathway and operational framework for the management of babies born at Ashford & St. Peter's NHS FT.

4. **Duties and responsibilities**

- 4.1 This guideline aims to facilitate a common approach to the management of babies admitted under neonatal care. At times deviation from the guideline may be necessary, this should be documented and is the responsibility of the attending consultant.
- 4.2 This guideline is subject to regular review to ensure ongoing evidence based practice.

5. **Guideline**

Definition of hypernatraemia:

Mild	146-149 mmol/L
Moderate	150-159 mmol/L
Severe	≥ 160 mmol/L

Babies at risk of hypernatraemic dehydration:

Occurs almost exclusively due to breastfeeding difficulties - associations:

Primiparous mothers

Early discharge from hospital

Caesarean section/instrumental delivery/large PPH

Tongue tie/cleft palate

Complications of hypernatraemia:

Mainly seen in Na >170mmol/L and or in babies where hypernatraemia is corrected too rapidly – includes cerebral oedema, seizures, permanent brain damage, vascular thrombosis and death. The large majority of cases have a good outcome.

Management of babies who have lost $\geq 12.5\%$

- Take a full history including feeding and any risk factors for sepsis
- Full clinical examination including assessment of hydration status (although signs often more subtle in hypertonic dehydration), stools, urine output, perfusion, neurological status, jaundice, inspect the palate and look for tongue tie
- If baby is shocked or there are any neurological concerns, admit to NICU, give 10mls/kg 0.9% Sodium Chloride bolus and seek senior advice
- Check capillary blood gas sample – will give Na⁺, blood sugar level and lactate.
- Consider other investigations – may require lab U+E, FBC, CRP, blood cultures, bilirubin depending on clinical picture
- Mother should be encouraged to continue breastfeeding with support from the midwifery and infant feeding teams
- Enteral rehydration is preferable to intravenous
- Avoid rapid rehydration – aim for a reduction in sodium of $\leq 0.5\text{mmol/L/hour}$
- Management will depend on severity of hypernatraemia

Mild Hypernatraemia (146-149 mmol/L)

- No need to admit to neonatal service (or enter on neonatal Badger)
- Ask midwife/infant feeding team to support mother to continue to breastfeed and offer supplemental feeds as deemed appropriate
- Usually do not require a repeat Na⁺ check
- Midwife to weigh baby in community as appropriate

Moderate Hypernatraemia (150-159 mmol/L)

- Will require admission under the neonatal team – either to TCU if deemed appropriate or to NICU
- Liaise with infant feeding/midwifery teams as Mother will require support and advice
- Baby will need top-up feeds. Mother should be encouraged to breastfeed and then offer top-ups of MEBM if available or formula if there is insufficient. Volume of top up will vary according to success of assessed breastfeed, aiming for enteral intake of 100ml/kg/day total.
- Consider restricting breast feeds to 20 minutes followed by double pump expression.
- Consider ngt feeds if baby continues to have difficulty breastfeeding
- Repeat blood gas to check Na⁺ level after 8 hours
- Reduce top up volumes if Na⁺ falling faster than 0.5mmol/L/hour
- Consider weighing the baby again after 24 hours

Severe Hypernatraemia (≥ 160 mmol/L)

- Baby should be admitted to NICU for close observation – be vigilant for any signs of abnormal neurology (lethargy, irritability, jittery, hyper-reflexia)
- If baby is shocked give 10mls/kg 0.9% Sodium Chloride bolus and seek senior advice
- If not shocked, baby can be rehydrated enterally as above
- Consider ngt feeds if baby continues to have difficulty breastfeeding
- If baby unable to tolerate enteral feeds, will require intravenous fluids (5 % dextrose/0.9% Sodium chloride ready-made bags available from Ash ward) and careful monitoring of blood sugar levels
- Strict input/output measurement
- Repeat blood gas to check Na⁺ level after 6 hours
- Reduce fluid volumes if Na⁺ falling faster than 0.5mmol/L/hour
- Daily weight

6. Approval and Ratification

- 6.1 This guideline will be approved and ratified by the Neonatal Guidelines Group.

7. Dissemination and Implementation

- 7.1 This guideline will be uploaded to the trust intranet 'Neonatal Guidelines' page and thus available for common use.
- 7.2 This guideline will be shared as part of ongoing education within the Neonatal Unit for both medical and nursing staff.
- 7.3 All members of staff are invited to attend and give comments on the guideline as part of the ratification process.

8. Review and Revision Arrangements

- 8.1 This policy will be reviewed on a 5 yearly basis.
- 8.2 If new information comes to light prior to the review date, an earlier review will be prompted.

9. Document Control and Archiving

- 9.1 Amendments to the document shall be clearly marked on the document control sheet and the updated version uploaded to the intranet. Minor amendments will be ratified through the Neonatal Guidelines Group. A minor amendment would consist of no major change in process, and includes but is not limited to, amendments to documents within the appendices.

10. Monitoring compliance with this Policy

Measurable Policy Objective	Monitoring/ Audit method	Frequency of monitoring	Responsibility for performing the monitoring	Monitoring reported to which groups/ committees, inc responsibility for reviewing action plans
Episodes of hypernatraemia	Audit	Annual	NICU staff	Neonatal governance lead
Adherence to guideline and impact	Audit	Annual	NICU staff	Neonatal governance lead

11. Supporting Evidence/Reference Base

1. Laing, I. et al. 2002. Hypernatraemic dehydration in Newborn infants. Acta Pharmacol Sin (23), pp. 48-51.
2. Moritz, M. et al. 2005. Breastfeeding-associated Hypernatraemia. Are we missing the Diagnosis? Paediatrics, 116:3 e343-e347
3. Moritz, M., 2013. Preventing breastfeeding associated hypernatraemia: and argument for supplemental feeding. Arch Dis Child Fetal Neonatal Ed 98(5), F 378-F379
4. Oddie SJ, Craven V, Deakin K, *et al.* 2013. Severe neonatal hypernatraemia: a population based study. Arch Dis Child Fetal Neonatal Ed. doi:10.1136/archdischild-2012-302908