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## TRUST CLINICAL GUIDELINE

### Hyponatraemia in Labour

#### Prevention, identification and management

#### Overview

Hyponatraemia may be higher in the labouring population due to physiological changes in pregnancy coupled with factors during labour which result in a dilutional hyponatraemia. Non-severe hyponatraemia may be well tolerated and therefore underreported. It is however important to recognise and prevent further progression into severe hyponatraemia which is associated with cerebral oedema and the potential for significant irreversible neurological sequelae in the mother or birthing person and newborn. This guideline outlines the prevention, identification and management of hyponatraemia in labour.

|                                     |   |
|-------------------------------------|---|
| <b>Owner</b>                        | S. Adamson  |
| <b>Author/further information</b>   | Rachael Atkinson, Anaesthetist  |
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# Hyponatraemia in Labour

## 1.0 Introduction

Hyponatraemia during pregnancy and postnatal period is defined as a serum sodium concentration of below 130mmol/L. Outside of pregnancy, hyponatraemia is defined as less than 135mmol/L.

Hyponatraemia occurs in up to 30% of all general inpatients and has been described in up to 13% of marathon runners (Thompson and Hoorn, 2012). Hyponatraemia may be higher in the labouring population due to physiological changes in pregnancy coupled with factors during labour which result in a dilutional (hypervolaemic) hyponatraemia (Demertzidou *et al.*, 2020). Non-severe hyponatraemia may be well tolerated and therefore under-reported. It is, however, important to recognise and prevent further progression into severe hyponatraemia which is associated with cerebral oedema and the potential for significant irreversible neurological sequelae in the mother or birthing person and newborn.

Healthy women and birthing people with a neutral fluid balance during labour are unlikely to develop hyponatraemia. Increased oral and IV fluid input (primarily hypotonic fluids) combined with prolonged physical exertion significantly increases the risk and may be compounded by the use of oxytocin, vomiting and long periods of starvation (Moen *et al.*, 2009). Whilst dilution is the most likely cause of hyponatraemia during labour, other causes should be considered and excluded taking into account volume status, past medical history and medications.

## 2.0 Scope

This guideline applies to:

- Midwives
- Obstetricians
- Anaesthetists

## 3.0 Responsibilities

Midwives, obstetricians and anaesthetists:

- To access, read, understand and follow this guidance.
- To use their professional judgement in application of this guideline.

Management:

- To ensure the guideline is reviewed as required in line with Trust and National recommendations.
- To ensure the guideline is accessible to all relevant staff.

#### 4.0 Definitions and abbreviations used within this guideline

|  |  |
|--|--|
| <b>ABC</b> Airway Breathing Circulation                        | <b>ADH</b> Anti diuretic hormone                 |
| <b>AKI</b> Acute Kidney Injury                                 | <b>BP</b> Blood Pressure                         |
| <b>BadgerNet</b> Maternity information system                  | <b>FBC</b> Full Blood Count                      |
| <b>CCU</b> Critical Care Unit                                  | <b>GCS</b> Glasgow Coma Scale                    |
| <b>EPMA</b> Electronic Prescribing and Medicine Administration | <b>HDU</b> High Dependency Unit                  |
| <b>GBS</b> Group B Streptococcus                               | <b>ICU</b> Intensive Care Unit                   |
| <b>G&amp;S</b> Group and Save                                  | <b>MET</b> Medical Emergency Team                |
| <b>HR</b> Heart Rate   | <b>mOsm/kg</b> Milliosmoles per kilogram         |
| <b>IV</b> Intravenous  | <b>RAAS</b> Renin Angiotensin Aldosterone System |
| <b>RR</b> Respiration Rate                                     | <b>Sats</b> Saturations                          |
| <b>VBG</b> Venous Blood Gas                                    | <b>U&amp;Es</b> Urea and Electrolytes            |

#### 5.0 Physiology

Normal pregnancy results in many physiological changes in the regulation of blood pressure, sodium handling and fluid balance due in part to the requirement to maintain a consistent environment for the fetus via the placenta and amniotic fluid. There is a tendency towards positive water balance increasing significantly in the third trimester and persisting in the immediate post-partum period.

More specifically a lowered plasma osmolality threshold results in increased anti diuretic hormone (ADH) and thirst. The body tightly regulates the osmolality of blood maintaining it around 285 mOsm/kg in non-pregnant adults, in pregnancy blood osmolality is lower at around 280 mOsm/kg. Oestrogen and relaxin indirectly potentiate ADH release via vasodilatory effects. ADH causes increased water intake and retention which results in dilution of fluid compartments. Alongside this the renin angiotensin aldosterone system (RAAS) is enhanced to retain sodium. Overall water intake and retention is greater than sodium retention resulting in dilutional hyponatraemia in the peripartum period.

During labour oxytocin and ADH are released, and oxytocin increases the effects of ADH. Exogenous oxytocin/oxytocin analogues will also potentiate the effects of ADH. The overall result is increased water intake and retention, this will further compound existing hyponatraemia. This risk theoretically exists for carbetocin however the *in vitro* affinity of carbetocin for the vasopressin 2 receptor is far less than that of oxytocin (see [Carbetocin to prevent PPH at CS](#)).

Labour is effectively a prolonged period of exercise, the effects on sodium and water balance are well studied. Periods of exercise are associated with sodium and water loss via sweat and urine. There is large variation in sweat rate between individuals but exercise intensity, exercise duration and ambient temperature all contribute, furthermore as exercise duration increases sweat loss

plays an increasing role in water/salt balance (Rehrer and Burke, 1996; Armstrong *et al.*, 2015). By extrapolation it is reasonable to assume that high ambient temperature, long labour duration and use of the birth pool are all likely to be risk factors in the development of hyponatraemia due to increased sodium loss via sweating. Rate of sweating is hard to estimate but is likely to go unnoticed for women and people who labour in the birth pool. There is an increasing body of evidence that use of the birthing pool may contribute to the development of peripartum and therefore neonatal hyponatraemia (Valerio *et al.*, 2015; Vanderlaan and Hall, 2020; Carlson-Hedges and Pillai, 2023).

Excessive rehydration with hypotonic fluid is well acknowledged to lead to exertional hyponatraemia, optimal rehydration for endurance athletes is complex involving calculation of body weight lost and therefore volume of sweat during exercise (Armstrong, 2021). A more pragmatic approach to rehydration during labour is likely needed. Recommendations for endurance athletes include limiting fluid intake (400-800ml/hr) and being aware of physiological cues that discourage drinking such as nausea and bloating (Hew-Butler *et al.*, 2006; American College of Sports Medicine [ACSM], 2007). Modest levels of dehydration are tolerated well (Hew-Butler *et al.*, 2017), suggesting a move away from encouraging women and birthing people in labour to stay well hydrated. Oral sodium supplementation (such as rehydration drinks e.g. Dioralyte®) has a minor influence on serum sodium however is likely to represent a better oral fluid option during labour than water or energy drinks which largely compromise of carbohydrates and very little sodium (ACSM, 2007).

## 5.1 Signs and symptoms of hyponatraemia

Women and birthing people with hyponatraemia may have no signs or symptoms. Early signs can easily be mistaken for a normal presentation secondary to labour stress, dehydration and exhaustion (Demertzidou *et al.*, 2020). The signs and symptoms are below (Rehrer and Burke, 1996; Armstrong *et al.*, 2015).

| Non-Severe Hyponatraemia   | Severe Hyponatraemia   |
|--|--|
| <ul style="list-style-type: none"> <li>• Anorexia</li> <li>• Nausea and vomiting</li> <li>• Lethargy</li> <li>• Apathy</li> <li>• Headache</li> <li>• Muscle cramps</li> </ul> | <ul style="list-style-type: none"> <li>• Disorientation</li> <li>• Agitation</li> <li>• Seizures</li> <li>• Depressed Reflexes</li> <li>• Focal neurological deficits</li> <li>• Cheyne-Stokes respiration/agonal breathing</li> <li>• Coma</li> </ul> |

**Table 1:** Signs and symptoms of hyponatraemia

## 5.2 Risk factors for the development of hyponatraemia in labour

A woman or birthing person in labour with a 1 litre positive fluid balance has a risk of 1% of dilutional hyponatraemia, this rises to 26% in those who have a fluid balance of 2.5 litres or more positive (Demertzidou *et al.*, 2020).

| Iatrogenic/Situational factors  | Patient factors  |
|---|--|
| <ul style="list-style-type: none"> <li>• Hypotonic IV fluids including a variable rate insulin infusion</li> <li>• Encouraging excessive oral fluid intake to balance perceived dehydration e.g. if vomiting, presence of ketones in urine</li> <li>• Epidural anaesthesia if used with IV fluids without fluid balance monitoring</li> <li>• Prolonged periods of starvation</li> <li>• High ambient temperature including use of birth pool</li> <li>• Oxytocin Infusion</li> <li>• Medications*</li> </ul> | <ul style="list-style-type: none"> <li>• Pre-eclampsia/eclampsia</li> <li>• Nausea and vomiting</li> <li>• Prolonged labour including latent phase</li> <li>• Lower baseline sodium during pregnancy</li> <li>• Increased intake of hypotonic oral fluids</li> </ul> |

**Table 2:** Risk factors for the development of hyponatraemia during labour

*\*In addition to oxytocin, a number of commonly used medications, including proton pump inhibitors (e.g. omeprazole), antidepressants, antipsychotics and antiepileptics are associated with hyponatraemia.*

Risk factors, signs and symptoms should be considered at all times alongside consideration of the clinical scenario, if there is clinical suspicion of hyponatraemia a woman or birthing person in labour should be immediately assessed including a blood test for plasma sodium (U&Es or blood gas).

## 6.0 General prevention of hyponatraemia in labour

### 6.1 Latent phase

Birthing women and people in the latent phase of labour should be given advice on maintaining good fluid balance, the risks of drinking to excess and encouraged to roughly monitor their own input and output including whilst at home (see patient leaflet [Drinking fluids when you are in early labour at home](#)).

### 6.2 Fluid and food intake during established labour

Women and birthing people in labour should not be encouraged to drink beyond their own body's thirst impulse. All labouring women and birthing people should be made aware of the risks of excessive fluid intake and encouraged to engage with fluid balance monitoring by healthcare professionals.

Moderate consumption of rehydration drinks (e.g. Dioralyte® or similar) is preferable to water during labour. Sports drinks (e.g. Lucozade®) are often described as “isotonic” but their osmolality is largely made up of carbohydrates, and they have a low sodium content. Therefore, they can still lead to hyponatraemia if consumed in excess / to the point of a positive fluid balance.

Food and snacks with higher sodium content (such as crisps) can be suggested in labour. Periods of starvation should be avoided if possible.

### 6.3 Bladder care and catheterisation

Good bladder care should be practiced in labour. See maternity [Bladder Care](#) guidance for further information on good bladder care principles.

Women and birthing people in labour may be unaware of a need to empty their bladder, either due to epidural analgesia, and/or the pain associated with labour distracting from the sensation of a full bladder. They should be actively encouraged to void their bladder at least 3-4 hourly.

If women and birthing people in labour are unable to empty their bladder, are only passing small amounts (less than 100ml in 4 hours) or have a palpable bladder, there should be a low threshold for catheterisation. Catheterise using an in/out catheter as first choice, but if an in/out catheter is required a second time consider an indwelling catheter. At a homebirth, if more than 2 in/out catheters are required, there should be a discussion with the woman, midwife and labour ward coordinator, where transfer to the obstetric unit should be discussed and an individualised plan made. U&Es should be taken to assess for hyponatraemia if there has been low urine output (less than 100ml in 4 hours), or transfer to hospital advised if at a homebirth.

It is important to note that urine may appear concentrated in labour due to oxytocin (either endogenous or synthetic) potentiating the action of ADH which prevents water excretion. Therefore, excess water intake should not be encouraged to dilute the appearance of urine.

### 6.4 Urinary ketones

Urinary ketones are common in labour due to physical exertion, reduced carbohydrate metabolism and increased ketone body synthesis in the third trimester. Urinary ketones (in the absence of diabetes) should not be treated with IV fluids or oral water intake (Demertzidou *et al.*, 2020), but with sports drinks plus sugary or salty foods/snacks.

## 7.0 Fluid balance monitoring

A fluid balance chart should be kept for all women and birthing people in labour. Please see [Appendix 1](#) for how to record fluid balance on BadgerNet Maternity.

- For women and birthing people in labour receiving midwifery led care, wherever possible input and output should be measured, but may be estimated. Fluid balance should still be monitored closely.
- For women and birthing people in labour receiving obstetric led care, input and output should be accurately measured and fluid balance monitored.



| Midwifery Led   | Obstetric Led  |
|---|--|
| <ul style="list-style-type: none"> <li>• Homebirth</li> <li>• Water birth</li> <li>• Birth centre</li> <li>• Midwifery led care on obstetric unit.</li> </ul> | <ul style="list-style-type: none"> <li>• Epidural analgesia</li> <li>• Oxytocin infusion</li> <li>• Variable rate insulin infusion (sliding scale).</li> <li>• IV fluids</li> <li>• Pre-eclampsia</li> <li>• Other obstetric or medical risk factors.</li> <li>• Induction of labour requiring oxytocin or repeated prostaglandin administration.</li> <li>• Greater than 1500 ml positive fluid balance.</li> </ul> |

**Table 3:** Midwifery led and Obstetric led criteria

## 7.1 Women and birthing people receiving midwifery-led care

### 7.1.1 Input

All oral intake should be estimated and recorded regularly during labour (at least 4 hourly), for example whenever a bottle or jug is finished.

### 7.1.2 Output

Women and birthing people in labour should be encouraged to empty their bladder every 3-4 hours and bladder care followed (see Maternity [Bladder Care](#) guidance). Wherever possible this should be measured, and in other circumstances may be estimated, for example passing urine down the toilet or in the pool.

Other fluid losses (e.g. vomit) should be estimated and recorded. Insensible losses, such as sweating, are not measurable. If high insensible losses likely through sweating, have a low threshold for considering hyponatraemia and assessing for signs/symptoms.

### 7.1.3 Fluid balance

The fluid balance is updated automatically whenever input/outputs are recorded on BadgerNet Maternity. If a woman or birthing person changes from midwifery led to consultant led at any time (e.g. following commencement of oxytocin or epidural anaesthesia) a more frequent monitoring of fluid balance is required (section 7.2 below).

The fluid balance chart should be reviewed every 4 hours as part of a holistic review of the woman or birthing person and should be part of the SBAR handover if changeover of staff or transfer between clinical areas.

If the fluid balance reaches 1500mL positive, sodium levels should be checked using a venous blood sample and the woman or birthing person in labour assessed for signs/symptoms of hyponatraemia. The Labour Ward Coordinator should be informed.

- If the sodium level result is within normal limits (130 mmol/L and above) the woman or birthing person may stay under midwifery led care. Fluid balance should be reviewed hourly and the Peripartum Sodium Monitoring Pathway should be followed.
- If the sodium level is less than 130 mmol/L or if sodium testing is not readily available, the on call obstetric registrar should be contacted and clinical judgement used, particularly with regard to parity and progress in labour, to decide whether transfer to labour ward is required. If at home, discuss the risks and inform the woman or birthing person in labour that transfer into hospital is indicated.

## 7.2 Women and birthing people receiving obstetric-led care

### 7.2.1 Input

A clinical indication for any IV fluids should be clearly documented and IV fluids should be prescribed as ml/hour.

All IV fluids should be run via a volumetric pump, except in a resuscitation scenario.

Routine IV fluids are not indicated for epidural anaesthesia, but a bag of crystalloid and giving set should be readily available in the labour room after the epidural is sited in case of epidural induced hypotension.

Input from IV fluids should be accurately calculated and recorded on the electronic fluid balance chart **hourly**.

All oral intake should be measured and recorded regularly during labour (at least every 4 hours), for example whenever a bottle or jug is finished.

### 7.2.2 Output

Urine output should be measured and recorded on BadgerNet Maternity, women and birthing people should be encouraged to void their bladder every 3-4 hours and bladder care followed.

If catheterised, urine output should be measured by emptying the catheter bag at least every 4 hours. If strict hourly input/output monitoring is required a urometer should be used.

All other fluid losses (e.g. vomit) should be measured and documented on the electronic fluid balance chart **hourly**. If high insensible losses likely through sweating, have a low threshold for considering hyponatraemia and assessing for signs/symptoms.

### 7.2.3 Fluid balance

The fluid balance is updated automatically whenever input/outputs are recorded on BadgerNet Maternity.

The fluid balance chart should be reviewed every **hour** as part of a holistic review of the woman or birthing person.

If the fluid balance reaches 1500mL positive, sodium levels should be checked using a venous blood sample and the woman or birthing person in labour assessed for signs/symptoms of hyponatraemia. The Labour Ward Coordinator should be informed.

## 8.0 Peripartum sodium monitoring and management

Routine sodium monitoring is not required for women and birthing people in labour receiving midwifery led care. If a woman or birthing person changes from midwife led to obstetric led at any time, baseline sodium levels should be checked and monitoring to continue as per flow chart in section 9.0 below.

Baseline sodium levels should be taken for women and birthing people in labour receiving obstetric led care (see [table 3](#)).

- U&Es should be taken (alongside FBC and G&S if required) if a cannula is inserted on labour ward (excluding those having IV antibiotics for GBS).
- U&Es should be taken prior to commencement of oxytocin infusions. It is not necessary to await the result prior to starting the infusion.
- All women and birthing requiring intravenous insulin and dextrose infusions during labour should have a blood sodium level checked at least four hourly.
- If there is clinical suspicion of hyponatraemia or fluid balance reaches greater than 1500 mL positive, a venous blood gas should be taken immediately and the woman or birthing person in labour managed accordingly.

Consider checking sodium levels if admitted for long latent phase, or have had multiple triage attendances for suspected labour, high insensible losses/sweating or consumption of large volumes of oral fluid.

It is essential that blood samples are not taken from a limb attached to an intravenous infusion as this may lead to inaccurate results. If both upper limbs have IV fluids, one should be paused for approximately 10 minutes (if possible) before the sample is then taken from that side.

Sodium results should be followed up in a timely manner. Management and frequency of repeat testing should be performed according to the peripartum monitoring pathway.

## 9.0 Peripartum Sodium Monitoring and Management Pathway



## 9.1 Postnatal monitoring

Inform the neonatal team of any babies born to women and birthing people with hyponatraemia.

Sodium levels should continue to be monitored according to the peripartum monitoring pathway until they normalise (130mmol/L or greater). Women and birthing people should remain on labour ward for observation until their sodium levels have normalised. If sodium levels are greater than 125 mmol/L and improving, and the woman and birthing person is clinically well, an individualised plan may be made after senior review for earlier transfer to the postnatal ward. However, if there are any clinical concerns or ongoing requirement for fluid balance monitoring, they should remain on labour ward for observation.

If cord gases are taken after birth and the newborn's sodium is less than 130mmol/L, the woman or birthing person's sodium levels should be checked and managed according to the peripartum monitoring pathway.

## 10.0 Management of severe hyponatraemia (124 mmol/L or less, or symptomatic)

Hyponatraemia should be treated as severe if sodium levels are 124 mmol/L or less, or if the woman and birthing person is symptomatic. The management plan alters depending on the exact sodium level, oxytocin administration and if the woman and birthing person has birthed. See flowchart in [Appendix 2](#). Management of non-severe hyponatraemia can be found in [Appendix 3](#).

Severe hyponatraemia is a **medical emergency**, depending on the time of day/location in the hospital, hospital site and immediate availability of personnel consider requesting an Obstetric Emergency and MET call via 2222 (Labour Ward Anaesthetist will attend 'Obstetric Emergency').

### If the patient is having seizures request an Obstetric emergency and MET call

In cases of ongoing seizures that do not spontaneously resolve, other causes e.g. eclampsia should be considered and treated as per any other seizure in pregnancy/postnatal period.

Rapidly assess the woman or birthing person in labour using an ABC approach including standard observations (HR, BP, RR, sats and temperature) and GCS. Recognise and identify any signs of severe hyponatraemia (see [table 1](#)).

## 10.1 Management of severe hyponatraemia with clinical symptoms

- Intubate and ventilate if GCS less than 8/15 or airway not protected or unresolving seizures.
- Consider siting an arterial line.
- Anaesthetist and/or CCU/ICU Registrar under supervision or guidance of the consultant anaesthetist give 250 mL 1.8% hypertonic sodium chloride (or equivalent dose) over 20 minutes via large bore peripheral cannula if central access is not clinically appropriate. Alternatively, 150 mL 2.7% hypertonic sodium chloride may be given if clinically indicated. It should be noted that hypertonic sodium chloride has a high osmolality and may cause venous irritation and tissue damage in cases of extravasation so clinicians

should observe carefully for signs of extravasation. If there is no improvement in clinical status consider second bolus in consultation with ICU consultant.

- Recheck sodium after 30 minutes using VBG, if improving repeat U&Es/VBG 2 hourly until sodium is 125 mmol/L and above and then 4 hourly until sodium is 130mmol/L and above. If no improvement, consider further hypertonic sodium chloride and more frequent monitoring. Rapid increases in blood sodium concentration can cause serious harm including central pontine myelinolysis. Therefore, the level should rise by no more than 12 mmol/L in a 24 hour period.
- Fluid restrict to 30 mL/hr.
- Continue to monitor fluid balance hourly.
- Take paired blood and urine osmolality samples.
- Review EPMA and stop any medications (e.g. omeprazole) that may be causing hyponatraemia.
- STOP any oxytocin infusions running. If still clinically indicated, it must be the Consultant Obstetrician decision to restart.
- Plan to transfer to Labour Ward until baby delivered, if elsewhere in the hospital.
- Consider and exclude alternative causes of hyponatraemia.
- Plan ongoing care for labour and mode of birth.
- At birth alert the neonatal team to maternal or birthing parent hyponatraemia and check cord gas results.
- Consider CCU/HDU/ICU admission postnatally to monitor sodium levels and prevent rapid overcorrection and associated sequelae.

## 10.2 Management of severe hyponatraemia with no clinical symptoms

- If acute drop more than 10 mmol/L in under 24 hours consider hypertonic sodium chloride bolus in consultation with ICU consultant (250mL 1.8% hypertonic sodium chloride over 20 minutes or equivalent dose). It should be noted that hypertonic sodium chloride has a high osmolality and may cause venous irritation and tissue damage in cases of extravasation so clinicians should observe carefully for signs of extravasation
- Recheck sodium after 30 minutes using VBG, if improving repeat U&Es/VBG 2 hourly until sodium is 125mmol/L and above and then 4 hourly until sodium is 130mmol/L and above. If no improvement, consider further hypertonic sodium chloride and more frequent monitoring.
- Consider siting an arterial line.
- Fluid restrict to 30 mL/hr.
- Continue to monitor fluid balance hourly.
- Take paired blood and urine osmolality samples.

- Review EPMA and stop any medications (e.g. omeprazole) that may be causing hyponatraemia.
- STOP any oxytocin infusions running. If still clinically indicated, it must be the Consultant Obstetrician decision to restart.
- Plan to transfer to Labour Ward until baby delivered, if elsewhere in the hospital.
- Consider and exclude alternative causes of hyponatraemia.
- Plan ongoing care for labour and mode of birth.
- At birth alert the neonatal team to maternal or birthing parent hyponatraemia and check cord gas results.
- Consider CCU/HDU/ICU admission postnatally if treatment was required to monitor sodium levels and prevent rapid overcorrection and associated sequelae.

## 11.0 Monitoring

| Issue being monitored  | Monitoring method                              | Responsibility                                    | Frequency           | Reviewed by and actions arising followed up by    |
|------------------------|--|---|---------------------|---|
| Cases of Hyponatraemia | Review of case records through Datix reporting | Patient Safety Midwives, Clinical Governance Team | Ongoing case review | Patient Safety Midwives, Clinical Governance Team |

## **Appendix 1: Fluid balance on BadgerNet Maternity**

- The start time of IV infusions should be recorded on BadgerNet Maternity.
- To enter the volume of fluid inputs or outputs over the last hour, e.g. from 09:00 to 10:00, the time should be recorded as 09:59. This will ensure the volume is displayed in the right column. Other fluids, e.g. spontaneous voiding or finishing a jug of water, should be added for the time they were passed/completed.
- IV infusions given in theatre should be added to the fluid balance chart on BadgerNet Maternity as soon as possible to ensure that the fluid balance chart is accurate. This includes IVAbx, blood products and fluids.
- For IV fluids/medications with small volumes (i.e. less than 50 mL/hr) it is reasonable to wait until the end of the infusion to record the total volume infused. For example, reduced concentration oxytocin regime.
- For a comprehensive guide to recording fluid balance on BadgerNet Maternity, please see <https://imtguides.uhsussex.nhs.uk/Badgernet/Introduction.html>



v.1a Obstetric Anaesthetists' Association 2024. Issued under Creative Commons license CC BY-NC-SA 4.0. See [www.oaa-anaes.ac.uk/qrh](http://www.oaa-anaes.ac.uk/qrh)

Modified to align with associated guideline: Hyponatraemia in Labour v1.0. Approved 22/10/2025

## 2-9a Severe hyponatraemia v.1a

Hyponatraemia is defined as a serum sodium less than 130 mmol/L; **treat as severe if less than 125 mmol/L or symptoms**. The management plan alters depending on the exact sodium level, oxytocin administration and if the woman has delivered. Ensure blood samples are taken from a limb free from IV infusions. Point of care testing e.g., blood gases can provide rapid sodium results. Risk factors for hyponatraemia include excessive water ingestion, oxytocin infusion, insulin/dextrose infusion, pre-eclampsia

### START

**1** Call for help (obstetrician, anaesthetist, consider 2222 Obstetric emergency, MET call)

**2** Check for clinical signs of severe hyponatraemia (Box A)

If no clinical signs → go to **3**

If clinical signs present →

- ▶ Call ICU for help
- ▶ Give 250 ml 1.8% hypertonic saline IV over 20 min
- ▶ Check sodium after 30 minutes

**3** If sodium < 125 mmol/L -and- in labour -or- on IV oxytocin →

- ▶ If acute drop >10 mmol/L in < 24 hours → contact ICU -and- agree need for hypertonic saline infusion
- ▶ Start fluid restriction to 30 ml/hr
- ▶ Stop all drugs causing hyponatraemia
- ▶ Check and record fluid balance hourly
- ▶ Check sodium 2 hourly
- ▶ Take paired blood and urine osmolalities

**4** At birth, alert neonatal team to maternal hyponatraemia

**5** Once delivered -or- IV oxytocin discontinued →

- ▶ Check for signs of severe hyponatraemia (Box A)
- ▶ If signs of severe hyponatraemia present → give 250 ml 1.8% hypertonic saline IV over 20 minutes
- ▶ Start fluid restriction to 30 ml/hr
- ▶ Check and record fluid balance
- ▶ Check sodium 4 hourly

#### Box A: Signs of severe hyponatraemia

- ▶ Disorientation
- ▶ Agitation
- ▶ Seizures
- ▶ Depressed reflexes
- ▶ Focal neurological deficits
- ▶ Cheyne-Stokes respiration
- ▶ Coma

#### Box B: Critical changes

Sodium 125 – 129 mmol/L with no signs of severe hyponatraemia →  
Hyponatraemia (not severe) 2-9b

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Modified to align with associated guideline: Hyponatraemia in Labour v1.0. Approved 22/10/2025

## 2-9b Hyponatraemia (not severe) v.1a

Hyponatraemia is defined as a serum sodium less than 130 mmol/L; treat as non-severe if sodium 125-129 mmol/L with no signs of severe hyponatraemia. The management plan alters depending on the exact sodium level, oxytocin administration and if the woman has delivered. Ensure blood samples are taken from a limb free from IV infusions. Point of care testing e.g., blood gases can provide rapid sodium results. Risk factors include excessive water ingestion, oxytocin infusion, insulin/dextrose infusion, pre-eclampsia

### START

- 1 **Call for help** (obstetrician, anaesthetist; consider 2222 Obstetric Emergency, MET call)
- 2 **Check sodium; if < 125 mmol/L → 2-9a**
- 3 **Check for clinical signs of severe hyponatraemia (Box A); if present → 2-9a**  
If no clinical signs → go to 4
- 4 **If sodium 125-129 mmol/L -and- in labour -or- on IV oxytocin →**
  - ▶ Start fluid restriction to 80 ml/hr
  - ▶ If oxytocin still needed → continue concentrated oxytocin (Box B)
  - ▶ Check and record fluid balance hourly
  - ▶ Check sodium 4 hourly
  - ▶ Take paired blood and urine osmolalities
- 5 **At birth, alert neonatal team to maternal hyponatraemia**
- 6 **Once delivered -or- IV oxytocin discontinued →**
  - ▶ Check for signs of severe hyponatraemia (Box A) if present → 2-9a
  - ▶ Check and record fluid balance
  - ▶ No need to fluid restrict
  - ▶ Check sodium 8 hourly

#### Box A: Signs of hyponatraemia

##### Early signs of hyponatraemia (non-severe)

- ▶ Anorexia
- ▶ Nausea
- ▶ Lethargy
- ▶ Apathy
- ▶ Headache

##### Signs of severe hyponatraemia

- ▶ Disorientation
- ▶ Agitation
- ▶ Seizures
- ▶ Depressed reflexes
- ▶ Focal neurological deficits
- ▶ Cheyne-Stokes respiration
- ▶ Coma

#### Box B: Drugs

If oxytocin needed, administer concentrated oxytocin infusion, as per local protocol for women on fluid restriction

#### Box C: Critical changes

Sodium < 125 mmol/L and / or symptoms of severe hyponatraemia → 2-9a

**Appendix 4: Guideline version control log**

| Version | Date          | Author   | Status | Comment  |
|---------|---------------|--|--------|--|
| 1.0     | November 2024 | Rachael Atkinson,<br>Anaesthetic<br>Trainee<br>Niamh Maguire,<br>Obstetric<br>Consultant<br>Zamira Brice,<br>Audit and<br>Guidelines Midwife | DRAFT  | New Trust wide guideline<br>replacing: <ul style="list-style-type: none"><li>• MP064 Hyponatraemia in<br/>labour (PRH&amp;RSCH)</li><li>• CG21009 Maternity Fluid<br/>Management as an in-patient<br/>and in labour (SRH&amp;WH)</li></ul> |

## Appendix 5: Due Regard Assessment Tool

To be completed and attached to any guideline when submitted to the appropriate committee for consideration and approval.

|           |   | Yes/No | Comments |
|-----------|---|--------|----------|
| <b>1.</b> | <b>Does the document/guidance affect one group less or more favourably than another on the basis of:</b>  |        |          |
|           | Age   | No     |          |
|           | · Disability  | No     |          |
|           | · Gender (Sex)  | No     |          |
|           | · Gender Identity   | No     |          |
|           | · Marriage and civil partnership  | No     |          |
|           | · Pregnancy and maternity   | No     |          |
|           | · Race (ethnicity, nationality, colour)   | No     |          |
|           | · Religion or Belief  | No     |          |
|           | · Sexual orientation, including lesbian, gay and bisexual people  | No     |          |
| <b>2.</b> | <b>Is there any evidence that some groups are affected differently and what is/are the evidence source(s)?</b>  | No     |          |
| <b>3.</b> | <b>If you have identified potential discrimination, are there any exceptions valid, legal and/or justifiable?</b>   | NA     |          |
| <b>4.</b> | <b>Is the impact of the document likely to be negative?</b>   | No     |          |
| <b>5.</b> | <b>If so, can the impact be avoided?</b>  | NA     |          |
| <b>6.</b> | <b>What alternative is there to achieving the intent of the document without the impact?</b>  | NA     |          |
| <b>7.</b> | <b>Can we reduce the impact by taking different action and, if not, what, if any, are the reasons why the guideline should continue in its current form?</b>  | NA     |          |
| <b>8.</b> | <b>Has the document been assessed to ensure service users, staff and other stakeholders are treated in line with Human Rights FREDA principles (fairness, respect, equality, dignity and autonomy)?</b> | Yes    |          |

If you have identified a potential discriminatory impact of this guideline, please refer it to [Insert Name], together with any suggestions as to the action required to avoid/reduce this impact. For advice in respect of answering the above questions, please contact [uhsussex.equality@nhs.net](mailto:uhsussex.equality@nhs.net) (01273 664685).

## Appendix 6: Template Dissemination, Implementation and Access Plan

To be completed and attached to any guideline when submitted to Corporate Governance for consideration and TMB approval.

|    | Dissemination Plan  | Comments   |
|----|---|--|
| 1. | Identify:   |  |
|    | Which members of staff or staff groups will be affected by this guideline?  | Midwives, obstetricians & anaesthetists.   |
|    | How will you confirm that they have received the guideline and understood its implications?   | Dissemination through the usual communication channels and highlighted at Safety Huddles.                          |
|    | How have you linked the dissemination of the guideline with induction training, continuous professional development, and clinical supervision as appropriate? | All new members of staff are shown where to access Clinical documents that are relevant to their area of practice. |
| 2. | How and where will staff access the document (at operational level)?  | Accessed by staff via Sharepoint.  |

|    |  | Yes/No | Comments  |
|----|--|--------|---|
| 3. | Have you made any plans to remove old versions of the guideline or related documents from circulation? | Yes    | Previous versions will be archived as part of the uploading onto sharepoint process.                  |
| 4. | Have you ensured staff are aware the document is logged on the organisation's register?                | Yes    | Dissemination plan includes notifying staff via email, departmental noticeboards, and safety huddles. |

## Appendix 7: Additional guidance and information

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