Guideline for the Prevention, Diagnosis and Management of Hyponatraemia in Labour and the Immediate Postpartum Period

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Summary of document:
This guideline provides evidence-based recommendations for the prevention, early identification, and management of peripartum dilutional hyponatraemia. Hyponatraemia during labour most commonly results from excess intake of low-sodium fluids combined with physiological changes of pregnancy, reduced ability to excrete free water in late pregnancy, and the antidiuretic effect of natural and synthetic oxytocin. Acute decreases in sodium can lead to cerebral oedema, maternal morbidity, and serious neonatal complications.

Scope: This guideline applies to all women receiving intrapartum care Hywel Dda University Health Board, and the multidisciplinary teams providing care.
The guidance below uses the term 'woman' (pronouns she or her) to describe individuals whose sex assigned at birth was female, whether they identify as female, male or non-binary. It is important to acknowledge it is not only people who identify as women for whom it is necessary to access women's health and reproductive services. Therefore, this should include people who do not identify themselves as women, but who are pregnant or have recently given birth. Obstetric and Midwifery services and delivery of care must therefore be appropriate, inclusive and sensitive to the needs of those individuals whose gender identity does not align with the sex that they were assigned at birth

To be read in conjunction with:
: https://wisdom.nhs.wales/health-board-guidelines/hywel-dda-file/bladder-care-management-during-intrapartum-and-postnatal-period-1056-hywel-dda-guideline-2022-pdf/ - opens in new tab
https://www.rqia.org.uk/RQIA/files/df/dfd57ddd-ceb3-4c0d-9719-8e33e179d0ff.pdf- opens in new tab

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Keywords
Dilutional hyponatraemia, Fluid Balance, Hyponatremia, Hypotonic hyponatraemia, Oxytocin, Sodium Concentration

Glossary of terms
ADH - Antidiuretic hormone
IV – Intravenous
Mmol/L - Millimoles per litre

Key points:
Management and prevention of peripartum hyponatraemia

Contents

Scope

This guideline applies to all women receiving intrapartum care Hywel Dda University Health Board, and the multidisciplinary teams providing care.

Aim

The aim of this document is to:

- To reduce the risk of peripartum hyponatraemia by promoting awareness, appropriate fluid balance management, timely diagnosis, and prompt treatment.

Background and Evidence

Pregnant women have lower baseline plasma sodium and osmolality. Physiological changes from early pregnancy lead to increased plasma volume, altered water balance, and a reduced threshold for thirst and antidiuretic hormone (ADH) release. By the third trimester, the ability to excrete free water is impaired, increasing susceptibility to dilutional hyponatraemia.

Oxytocin has antidiuretic properties due to its structural similarity to ADH. High natural oxytocin levels during labour, and the use of synthetic oxytocin for induction, augmentation, or management of labour and postpartum haemorrhage, further increase the risk of water retention when sodium-free fluids are administered.

Evidence highlights that peripartum hyponatraemia is likely under-recognised. Studies report incidences ranging from 4% to 8% in women receiving over 2500 ml of fluid in labour. Excessive oral intake, intravenous fluids, and inadequate fluid balance monitoring are notable contributors. There has been a correlation noted between water immersion in labour and peripartum hyponatraemia. However, this should be interpreted with caution as the pool itself is not known to be a causal factor and could be due to clinician encouragement of oral fluid intake due to concerns about dehydration. Peripartum hyponatraemia can lead to neonatal hyponatraemia, which is linked with potentially severe morbidity including seizures, apnoea, and altered mental status.

Signs and symptoms of hyponatraemia

Early symptoms may include headache, nausea, lethargy, anorexia and apathy. These are non-specific and can be misattributed to labour. Severe hyponatraemia can cause agitation, disorientation, depressed reflexes, focal neurological deficits, respiratory abnormalities, seizures and coma.

Diagnosis and prevention

A neutral fluid balance is key to prevention. The risk of hyponatraemia increases with total fluid intake:

- Up to 1 L: ~1% incidence

- 1–2.5 L: ~5% incidence

- >2.5 L: ~26% incidence

To support appropriate fluid balance, treat ketosis with carbohydrate, not fluids, in non-diabetic women.

Sodium monitoring

A serum sodium test is required when :

- Synthetic oxytocin commences (excluding prophylactic use at Planned Caesarean Birth),
- IV insulin and dextrose (Sliding Scale) are administered,
- Blood sodium is below 130mmol/L
- there is a greater than 1500mls positive fluid balance.

Note. Blood should not be drawn from a limb with an active infusion.

Repeat sodium monitoring is required:

- 8-hourly if sodium ≥130 mmol/L
- 4-hourly if sodium changes rapidly (>1 mmol/L/hour)
- Immediately if positive fluid balance exceeds +1500 ml

The neonatal team must be informed when maternal sodium falls <130 mmol/L.

If sodium <125 mmol/L, oxytocin should be stopped and senior obstetric advice sought.

Management guidance -Obstetric intrapartum pathway

- Encourage women to drink to thirst, ideally isotonic fluids.
- Avoid routine encouragement of high fluid intake.
- Oral and IV fluid intake should not usually exceed ~2500 ml in 24 hours during labour.
- Healthy women in neutral fluid balance are at low risk.
- Explain the importance of accurate fluid balance monitoring.
- Record all oral intake at least 4-hourly.
- Record IV fluids hourly; prescribe with clear indication and rate.
- Administer IV fluids via volumetric pumps except in emergencies.
- Avoid routine IV fluids for ketosis in non-diabetic women.
- Measure urine output 2–4 hourly; monitor additional losses.
- Initiate sodium monitoring if on oxytocin, IV insulin/dextrose, sodium <130 mmol/L, or positive fluid balance >1500 ml.

Management Guidance- All-Wales Normal Labour Pathway (Midwifery Led)

- Encourage women to drink to thirst, ideally isotonic fluids.
- Avoid routine encouragement of high fluid intake.
- Oral and IV fluid intake should not usually exceed ~2500 ml in 24 hours during labour.
- Monitor and document urine voids and urinalysis on the Normal Labour Pathway.
- Healthy women in neutral fluid balance are at low risk.

Routine fluid balance monitoring **is not required** unless clinical concerns arise (e.g. excessive fluid intake, inability to void urine 4-hourly, persistent vomiting, or symptoms of hyponatraemia), or there is a

noted positive fluid balance >1500 ml. In these situations, the Normal Labour Pathway should be exited and obstetric review sought.

Postpartum care

- If sodium ≥130 mmol/L, no further monitoring is required unless clinically indicated.
- Sodium <130 mmol/L requires obstetric review to determine cause, clinical significance, and safe discharge planning.

Management of Symptomatic Hyponatraemia

Where symptoms suggest severe hyponatraemia (e.g., seizures, reduced consciousness):

- administer 200 ml 2.7% sodium chloride IV over 30 minutes.
- Consider 20 mg IV furosemide if fluid overload is suspected.
- Sodium levels should then be monitored every 2–4 hours, ensuring correction does not exceed 12 mmol/L in 24 hours.

Further National Research is required on:

- The impact of fluid intake on healthy women and birthing people in spontaneous labour.
- The role of water immersion in hyponatraemia risk.
- Safe thresholds for oral and IV fluid volumes in physiological birth.

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Appendix 1 Monitoring Sodium Pathway