HYPONATRAEMIA GUIDELINES

For all patients:

- Clinical assessment
- Blood tests to include:
  - Renal function
  - Serum osmolality
  - Glucose
  - Cortisol (9am level)
  - Thyroid function tests
  - Liver function tests
- Urine osmolality and urine Na\(^+\) (must be sent in a white top specimen bottle)
- Review drug charts and stop any contributing medications, if appropriate (see table below)
- Review fluid charts – stop any use of dextrose infusions

### Potential causes of drug induced hyponatraemia (not an exhaustive list)

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticancer agents</td>
<td>Vinca alkaloids (e.g. Vincristine), platinum compounds (e.g. Cisplatin), Alkylating agents (e.g. Cyclophosphamide)</td>
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<tr>
<td>Anti-depressants</td>
<td>Tricyclic antidepressants, SSRIs, MAOI</td>
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<td>Anti-epileptic medications</td>
<td>Carbamazepine, Sodium Valproate</td>
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<td>Anti-hypertensives</td>
<td>ACEi, ARB, Amlodipine</td>
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<td>Anti-psychotic medications</td>
<td>Phenothiazines, Butyrophenones</td>
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<tr>
<td>Diuretics</td>
<td>Thiazides, Indapamide, Amiloride, loop diuretics</td>
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<tr>
<td>Proton pump inhibitors</td>
<td>Omeprazole</td>
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Acute symptomatic hyponatraemia
CNS disturbance
Confusion
Headache
Drowsiness
Reduced GCS
Seizures
Encephalopathic

Discuss with DCC and if appropriate, ideally move to a Level 2 monitored environment

If Na\(^+\) < 120mmol/l AND no other cause for symptoms identified
Administer hypertonic saline*
IV over 20 minutes

Aim is to improve symptoms NOT correct Na\(^+\) back to normal

Repeat VBG after 20 minutes if no clinical improvement. If Na\(^+\) remains the same, a repeat bolus dose of hypertonic saline* can be given

Recheck Na\(^+\) at 6, 12, 24 and 48 hours

Na\(^+\) should not rise > 6 mmol/L in first 6 hours or > 10 mmol/l in first 24 hours

If rapid overcorrection, use IV dextrose or consider desmopressin

*For hypertonic saline use:
167ml of 2.7%
OR
250ml of 1.8%

Should only be used following discussion with a consultant (registrar overnight).

Order hypertonic saline from pharmacy, or out of hours, obtain stock from the pharmacy emergency cupboard in CGH or GRH.
CHRONIC HYPONATRAEMIA GUIDELINES

Chronic hyponatraemia

Assess hydration status

Hypovolaemia
- Treat with 0.9% saline

Euvolaemia
- Check plasma and urine osmolalities

Hypervolaemia
- Treat underlying cause (e.g. CCF, renal failure, liver failure)

Plasma Osm < 275 mOsm/kg AND Urine Osm > 100 mOsm/kg = Hypotonic Hyponatraemia
- Check Urine Na+
  - Urine Na⁺ > 20 Likely SIADH Follow guidance on page 4
  - Urine Na⁺ < 20 Reconsider hypo/hypervolaemia

Plasma Osm > 275 mOsm/kg = Hypertonic Hyponatraemia
- Consider hyperglycaemia (e.g. HHS), mannitol infusion

Urine Osm < 100 = Consider primary polydipsia

If fluid status is unclear
- Therapeutic trial of 0.9% saline (e.g. 1 litre over 12 hours) and recheck Na⁺ after 6 hours. If hypovolaemic, Na⁺ should increase. Patients with SIADH don’t improve or may worsen – discontinue fluids if so
SIADH GUIDELINES

Confirm that
- Clinically euvoalaemic
- Excluded renal failure
- Excluded adrenal insufficiency
- Excluded severe hypothyroidism

- Urine Na⁺ > 20
- Urine Osmolality > 100
- Serum Osmolality < 275

- Consider underlying cause e.g. Malignancy, infection, drug induced

- Stop any drugs that can cause hyponatraemia, if appropriate.

*If thought to be drug induced this may be all that is required. Monitor Na⁺ levels after stopping medications but there is no need to do fluid restriction unless Na⁺ not improving*

SIADH criteria met

Calculate electrolyte free water clearance
\[
\text{Urine Na}^+ + \text{K}^+ - \frac{\text{Serum Na}^+}{0.5}
\]

- < 0.5
  - Start 1 litre fluid restriction

- 0.5 – 1.0
  - 500mls fluid restriction

- > 1.0
  - Fluid restriction not advised

Assess after 24 to 48 hours

Aim for Na⁺ of > 130

Discuss with endocrinology for consideration of Tolvaptan or Demeclocycline

Poor response
Rates of correction
Safe limit – 10 mmol/L in first 24 hours, 8 mmol/L in subsequent 24 hours
Groups at more risk of osmotic demyelination are elderly patients, children < 16, malnourished, alcoholics, CNS disease and post operative patients. May need to consider lowering limits for correction in these groups of patients.

Tolvaptan advice
If using Tolvaptan (ADH antagonist) the following is advised:
• Discuss with endocrinology team before administration. Prescription must be authorised by a consultant
• Remove any fluid restriction
• Allow patient to drink to thirst response
• Initiate at a dose of 15mg
• Prescribe on the STAT section of the drug chart
• Repeat Na+ 6 hours later
• Repeat dose if no improvement after 24 hours (and if no improvement after second dose – reconsider diagnosis)
• May only need one or two doses to correct sodium levels back to normal so do not prescribe on the regular side of the chart

References