Flowchart 2: Management of severe symptomatic hyponatraemia

Severe symptoms
- Seizures
- Drowsiness/coma
- Cardio-respiratory arrest

Moderately severe symptoms
- Nausea
- Confusion
- Headache

Does the patient satisfy both of the following criteria:
☑ Serum sodium <130mmol/L

☑ Severe or moderately severe symptoms (see *left*) that the Consultant in charge of the patient agrees is attributable to the patient's hyponatraemia and agrees requires urgent treatment as below

0 - 4 hours. Raise Na^+ by 4-6mmol/L
1. Give **hypertonic sodium chloride 1.8%[#] IV 170ml IV**, or equivalent, **over 20 minutes within the first hour. Ensure it is given through a central line, or via a secure venous access in a large peripheral vein** *(N.B. peripheral administration of sodium chloride 1.8% is an unlicensed route).* If administered via a large peripheral vein, monitor for extravasation.
2. Check serum sodium 1 hour later
3. Repeat as necessary, up to two repeat bolus infusions, to achieve rise of 4-6mmol/L in the first 4 hours

4-24 hours and beyond. Total rise 8-10mmol/L
- Rise not to exceed 8-10mmol/L in first 24 hours
- Start diagnosis-specific treatment
- Monitor sodium every 2 hours until rise is stable, then 6hourly, 12hourly and daily until hyponatraemia has resolved. Not to exceed 8mmol/L daily rise thereafter.

Monitoring
Monitor neurological status and fluid balance closely. Do not exceed maximum rate of sodium correction. All of this is best achieved in a HDU/ITU environment and escalation is advised in most cases.

Overcorrection of hyponatraemia
If the rise in sodium exceeds the limits (see *left*), there is a risk of ODS*. Use a glucose 5% infusion to reverse the excessive rise. Contact Clinical Biochemistry or Endocrinology for further advice.

[#]Administering sodium chloride 1.8%:
A. Administration. 1.8% sodium chloride comes in 500ml bags. For safety, either:
- **Use a volumetric pump** or
- **Remove 330ml prior to administration** so there is no risk of giving an excessive dose.

B. Concentration. In cases of significant hypervolaemia, it may be necessary to use 2.7% sodium chloride or higher – typically through central venous access – in order to reduce administration volume.

C. Supply. Hypertonic sodium chloride can be sourced via the pharmacy dept during working hours. Out-of-hours, can be accessed from the Emergency Drug Cupboards in both UHC and UHA.

Osmotic demyelination syndrome (ODS)*

Over-rapid sodium correction can cause osmotic demyelination syndrome (ODS) resulting in serious neurological disability. Risk factors for ODS include:
- Chronic hyponatraemia
- Initial sodium <105mmol/L
- Concurrent hypokalaemia
- Alcoholism
- Malnutrition
- Liver disease.

Exceeding recommended sodium correction risks permanent neurological impairment. Do not exceed the maximum rate of sodium correction:
- Normal risk patients: 10mmol/L/day
- Patients at high risk of ODS*: 8mmol/L/day

Close monitoring of neurological status, serum sodium concentration and fluid balance is required.