Blood Sodium : Reviewer Assessment Form

A. Case Reviewer Details

What is this study about?
To identify and explore avoidable and modifiable factors in the care of adults with abnormal levels of blood sodium in hospital.

Inclusions
Patients aged 18 or over who were admitted to hospital between 1st October 2023 and 31st December 2023 and diagnosed with Hypernatremia or Hyponatraemia. Patients who develop abnormal sodium levels after a surgical procedure during the study period are also included.

Who should complete this questionnaire?
This questionnaire should be completed by the named consultant, or the most appropriate clinician, responsible for the patients care when they were treated for abnormal blood sodium.

1a. Date of Case Reviewer meeting

1b. Case Reviewer Initials

1c. Was a completed clinician questionnaire available at the time of case review?

◯ Yes ◯ No

1d. NCEPOD site ID

B. Patient details

1a. Age at presentation to hospital?

years ☐ Unknown

Value should be no less than 18

1b. Sex

◯ Male ◯ Female ◯ Other ◯ Unknown

1c. Ethnicity

◯ White British/White - other
◯ Black/African/Caribbean/Black British
◯ Asian/Asian British (Indian, Pakistani, Bangladeshi, Chinese, other Asian)
◯ Mixed/Multiple ethnic groups
◯ Unknown

If not listed above, please specify here...

2. Patient's usual place of residence

◯ Own home ◯ Residential home ◯ Nursing home ◯ Homeless
◯ Unknown

If not listed above, please specify here...

3. Please make an estimation of the patient's Rockwood Clinical Frailty score prior to the admission:
https://www.england.nhs.uk/south/wp-content/uploads/sites/6/2022/02/rockwood-frailty-scale_.pdf

◯ 1. Very Fit ◯ 2. Well ◯ 3. Managing Well
◯ 4. Vulnerable ◯ 5. Mildly Frail ◯ 6. Moderately Frail
◯ 7. Severely Frail ◯ 8. Very Severely Frail ◯ 9. Terminally Ill
◯ Unable to ascertain

4a. Did the patient have any co-morbidities pre-dating this admission?

◯ Yes ◯ No ◯ Unknown

4b. If answered "Yes" to [4a] then:
Which co-morbidities?
Please tick all that apply (Charlson Comorbidity Index)

- ☐ AIDS
- ☐ Bronchiectasis
- ☐ Coronary artery disease
- ☐ Congestive cardiac failure
- ☐ Chronic liver disease
- ☐ COPD
- ☐ Cancer (metastatic)
- ☐ Cancer (localised)
- ☐ Connective tissue disease
- ☐ Dementia
- ☐ Diabetes Type 1
- ☐ Diabetes Type 2
- ☐ Hemiplegia
- ☐ Hypertension
- ☐ Leukemia
- ☐ Lymphoma
- ☐ Moderate or severe kidney disease
- ☐ Multiple sclerosis
- ☐ Myocardial infarction
- ☐ Parkinsons
- ☐ Pulmonary fibrosis
- ☐ Previous stroke
- ☐ Peripheral vascular disease
- ☐ Peptic ulcer disease
- ☐ Transient ischaemic attack

Please specify any additional options here...

5a. Did the patient have a documented learning disability or autism?

- ◯ Yes
- ◯ No
- ◯ Unknown

5b. If answered "Yes" to [5a] then:
Please provide details

6a. Was a DNACPR or TEP in place for the patient?

- ◯ Yes - in place prior to admission
- ◯ Yes - during initial clerking
- ◯ Yes - during admission
- ◯ No
- ◯ Unknown

If not listed above, please specify here...

6b. If answered "Yes - in place prior to admission", "Yes - during initial clerking", "Yes - during admission" or "No" to [6a] then:
Raf In your opinion was this appropriate (TEP)?

- ◯ Yes
- ◯ No
- ◯ Unknown

6c. If answered "No" to [6b] then:
Please expand in your answer (TEP)

7a. Did the patient have other risk factors for osmotic demyelination syndrome?

- ◯ Yes
- ◯ No
- ◯ Unknown

7b. If answered "Yes" to [7a] then:
Which risk factors?

- ☐ Alcohol excess
- ☐ Smoking history
- ☐ Nutrition

Please specify any additional options here...

C. Arrival to hospital/initial assessment

1a. Date of arrival to hospital

☐ Unknown

1b. Time of arrival to hospital

☐ Unknown

2a. Type of admission

◯ Emergency ◯ Elective/Planned ◯ Transfer ◯ Unknown

If not listed above, please specify here...

2b. If answered "Elective/Planned" to [2a] then:
Reason for elective/planned admission

2c. Was the patient an inpatient within the last 30 days of this admission?

◯ Yes ◯ No ◯ Unknown

2d. If answered "Yes" to [2c] then:
Was this for abnormal blood sodium?

◯ Yes - hyponatraemia ◯ Yes - hypernatraemia ◯ No
◯ Unknown

2e. If answered "Yes" to [2c] and "No" to [2d] then:
Reason for recent inpatient admission

3a. Location of first hospital review

◯ Emergency department
◯ Same day emergency care service
◯ Surgical assessment unit
◯ Unknown
◯ Medical assessment unit
◯ Other medical ward
◯ Other Surgical ward

If not listed above, please specify here...

3b. Date of first review

☐ Unknown

3c. Time of first review

☐ Unknown

4a. GCS on arrival

◯ 15 ◯ 14 ◯ 13
◯ 12 ◯ 11 ◯ 10
◯ 9 ◯ 8 ◯ 7
◯ 6 ◯ 5 ◯ 4
◯ 3 ◯ Not recorded as ACVPU used ◯ Unknown

4b. ACVPU on arrival

- ◯ Alert
- ◯ Confused
- ◯ Verbal
- ◯ Pain
- ◯ Unresponsive
- ◯ Not recorded as GCS recorded
- ◯ Unknown

5a. Prior to admission, was the patient taking any drugs that could contribute to an abnormal blood sodium?
See list below for applicable drugs

- ◯ Yes
- ◯ No
- ◯ Unknown

5b. If answered "Yes" to [5a] then:
Which of the following drugs was the patient taking prior to admission?
Please list others that may be relevant to an abnormal blood sodium

- ☐ Anticancer agents
- ☐ Antidepressants
- ☐ Antiseizure medication
- ☐ Antihypertensive agents
- ☐ Antipsychotic drugs
- ☐ Diuretics
- ☐ Rivastigmine
- ☐ Opioid drugs
- ☐ NSAIDs
- ☐ Voriconazole
- ☐ Desmopressin
- ☐ 3,4-MDMA
- ☐ Steroids - oral
- ☐ Steroids - inhaled
- ☐ Protein Pump Inhibitors
- ☐ Antibiotics

Please specify any additional options here...

5c. If answered "Anticancer agents", "Antidepressants", "Antiseizure medication", "Antihypertensive agents", "Antipsychotic drugs", "Diuretics", "Protein Pump Inhibitors" or "Antibiotics" to [5b] then:
Please specify which drug(s)?
If one of the groups of drugs is selected e.g. anticancer or diuretics, please specify the drug the patient was taking

What were the patient's first blood biochemistry results in hospital?
Please put not applicable if the particular measurement was not done

6a. Date of the first bloods

☐ Unknown

6b. Time of the first bloods

☐ Unknown

6c. Na+

mmol/L ☐ Unknown

6d. K+

mmol/L ☐ Not Applicable ☐ Unknown

6e. Urea

mmol/L ☐ Not Applicable ☐ Unknown

6f. Creatinine

µmol/L ☐ Not Applicable ☐ Unknown

6g. Glucose

mmol/L ☐ Not Applicable ☐ Unknown

6h. Were these ED point of care or laboratory biochemistry results?

- ◯ Point of care
- ◯ Laboratory
- ◯ Unknown

If the above blood biochemistry results were from point of care testing, what were the first laboratory blood biochemistry results?

7a. If answered "Point of care" to [6h] then:
Date of first lab bloods

☐ Unknown

7b. If answered "Point of care" to [6h] then:
Time of first lab bloods

☐ Unknown

7c. If answered "Point of care" to [6h] then:
Na+

mmol/L ☐ Unknown

7d. If answered "Point of care" to [6h] then:
K+

mmol/L ☐ Not Applicable ☐ Unknown

7e. If answered "Point of care" to [6h] then:
Urea

mmol/L ☐ Not Applicable ☐ Unknown

7f. If answered "Point of care" to [6h] then:
Creatinine

µmol/L ☐ Not Applicable ☐ Unknown

7g. If answered "Point of care" to [6h] then:
Glucose

mmol/L ☐ Not Applicable ☐ Unknown

8a. Was an assessment of the patient's fluid status undertaken as part of the initial assessment?

◯ Yes ◯ No ◯ Unknown

8b. If answered "Yes" to [8a] then:
What was done?

☐ Clinical ☐ Point of care

Please specify any additional options here...

8c. Was this adequate (fluid status)?
If not done but not needed then please tick Yes

◯ Yes ◯ No ◯ Unknown

8d. If answered "No" to [8c] then:
Please expand on your answer (fluid status)

Diagnosis - Emergency Admissions

Hyponatraemia or Hypernatraemia

9. If answered "Emergency" to [2a] then:
Hyponatraemia or Hypernatremia (arrival)

◯ Hyponatraemia ◯ Hypernatraemia

Hyponatraemia cases

10a. If answered "Emergency" to [2a] and "Hyponatraemia" to [9] then:
Working diagnoses on admission
Please tick all that apply

- ☐ Acute cerebral event
- ☐ Post neurosurgical procedure
- ☐ Acute or Chronic heart failure
- ☐ Ascites
- ☐ Head injury
- ☐ Subarachnoid haemorrhage
- ☐ Renal disease
- ☐ Syndrome of inappropriate ADH (SIADH)
- ☐ Adrenal insufficiency
- ☐ Polydipsia Anorexia nervosa
- ☐ Beer potomania
- ☐ Exercise excess
- ☐ Diarrhoea and vomiting
- ☐ Third space losses (bowel obstruction, pancreatitis, sepsis , trauma etc)
- ☐ Hyperproteinaemia (including multiple myeloma)
- ☐ Hypertriglyceridaemia
- ☐ Hyperglycaemia
- ☐ Alcohol Abuse
- ☐ Malnutrition
- ☐ Dementia Acute confusional state
- ☐ Vasopressin related polyuria (Diabetes Insipidus)
- ☐ Chronic Lung disease
- ☐ Epilepsy
- ☐ Lung Cancer

Please specify any additional options here...

10b. If answered "Emergency" to [2a] and "Hyponatraemia" to [9] then:
What type of hyponatraemia did the patient have?

- ◯ Hypotonic (true) hyponatraemia
- ◯ Hypervolaemic (volume overload) hyponatraemia
- ◯ Euvolaemic hyponatraemia
- ◯ Pseudo hyponatraemia
- ◯ Hypertonic (hyperosmolar) hyponatraemia
- ◯ Unknown

If not listed above, please specify here...

10c. If answered "Emergency" to [2a] and "Hyponatraemia" to [9] then:
What was the severity of the patients hyponatraemia?

- ◯ Mild
- ◯ Moderate
- ◯ Severe
- ◯ Unknown

If not listed above, please specify here...

10d. If answered "Emergency" to [2a] and "Hyponatraemia" to [9] then:
Was this acute or chronic hyponatraemia?
Acute - duration of less than 48 hours

- ◯ Acute
- ◯ Chronic
- ◯ Unknown

11a. If answered "Emergency" to [2a] and "Hyponatraemia" to [9] then:
Raf Do you agree with the documented working diagnoses?

- ◯ Yes
- ◯ No
- ◯ Unknown

11b. If answered "No" to [11a] then:
Raf Please expand on your answer (diagnosis)

12a. If answered "Emergency" to [2a] and "Hyponatraemia" to [9] then:
Was a diagnosis of hyponatraemic encephalopathy (neurological symptoms) made on admission?

◯ Yes ◯ No ◯ Unknown

12b. If answered "Yes" to [12a] and "Hyponatraemia" to [9] then:
What symptoms of hyponatraemic encephalopathy did the patient have?
Please tick all that apply

- ☐ Nausea
- ☐ Gait Problems
- ☐ Falls
- ☐ Vomiting
- ☐ Visual disturbance
- ☐ Noncardiogenic pulmonary oedema
- ☐ Respiratory arrest
- ☐ None
- ☐ Fatigue
- ☐ Attention Deficit
- ☐ Bone fractures
- ☐ Headaches
- ☐ Seizures
- ☐ Loss of consciousness
- ☐ Unknown

Please specify any additional options here...

12c. If answered "Yes" or "No" to [12a] then:
Do you agree with this?

◯ Yes ◯ No ◯ Unknown

12d. If answered "No" to [12c] then:
Please expand on your answer (HE)

13a. If answered "Emergency" to [2a] and "Hyponatraemia" to [9] then:
Ward patient first admitted

- ◯ Acute medical unit
- ◯ Neurology
- ◯ Cardiology
- ◯ Orthopaedic
- ◯ General medical
- ◯ Endocrinology
- ◯ General Surgical
- ◯ Critical Care
- ◯ Care of the elderly
- ◯ Renal
- ◯ Upper/lower GI surgery

If not listed above, please specify here...

13b. If answered "Hyponatraemia" to [9] and "Emergency" to [2a] then:
Raf - In your opinion was this appropriate (first ward)

◯ Yes ◯ No ◯ Unknown

13c. If answered "No" to [13b] then:
Please expand on your answer (first ward)

D. Surgery

1a. Did the patient develop hyponatraemia after a procedure/surgery?
If the answer is No, please move to the next section

◯ Yes ◯ No ◯ Unknown

If the patient had more than one surgery/procedure during the admission please answer the following questions in relation to the surgery/procedure closest to the development of hyponatraemia

1b. If answered "Yes" to [1a] then:
What surgery/procedure(s) was undertaken?

1c. If answered "Yes" to [1a] then:
Date of surgery/procedure?

☐ Unknown

1d. If answered "Yes" to [1a] then:
Time of surgery/procedure

☐ Unknown

2. If answered "Yes" to [1a] then:
During the surgery/procedure was goal directed fluid therapy used?

◯ Yes ◯ No ◯ Unknown

3a. If answered "Yes" to [1a] then:
Raf Was the prescribed fluid maintenance regime appropriate?

◯ Yes ◯ No ◯ Unknown

3b. If answered "Yes" to [1a] and "No" to [3a] then:
Raf Please expand on your answer (fluid maintenance)

4. If answered "Yes" to [1a] then:
Is there evidence that an enhanced recovery pathway was being followed?

◯ Yes ◯ No ◯ Unknown

5a. If answered "Yes" to [1a] then:
Was bladder irrigation undertaken?

◯ Yes ◯ No ◯ Unknown

5b. If answered "Yes" to [1a] and "Yes" to [5a] then:
What irrigant was used?

6a. If answered "Yes" to [1a] then:
Date of first low blood sodium measurement

☐ Unknown

6b. If answered "Yes" to [1a] then:
Time of first low blood sodium measurement

☐ Unknown

What was the patient's first low blood sodium measurement post surgery

6c. If answered "Yes" to [1a] then:
Na+

mmol/L ☐ Unknown

Other electrolyte measurements at the time of the low sodium measurement
Please put not applicable if the particular measurement was not done

6d. If answered "Yes" to [1a] then:
K+

mmol/L ☐ Not Applicable ☐ Unknown

6e. If answered "Yes" to [1a] then:
Urea

mmol/L ☐ Not Applicable ☐ Unknown

6f. If answered "Yes" to [1a] then:
Creatinine

µmol/L ☐ Not Applicable ☐ Unknown

6g. If answered "Yes" to [1a] then:
Glucose

mmol/L ☐ Not Applicable ☐ Unknown

6h. If answered "Yes" to [1a] then:
What ward was the patient on when the first low sodium measurement was recorded?

◯ General Surgery ◯ General Medicine ◯ Critical Care ◯ Unknown

If not listed above, please specify here...

E. Hyponatraemia - Investigations and treatment

1a. Is this a Hyponatraemia case?

◯ Yes ◯ No

Sodium measurements

1b. If answered "Yes" to [1a] then:
Date of lowest blood sodium measurement during this admission

☐ Unknown

1c. If answered "Yes" to [1a] then:
Time of lowest blood sodium measurement during this admission

☐ Unknown

1d. If answered "Yes" to [1a] then:
What was the lowest blood sodium measurement during the admission?

mmol/L ☐ Unknown

Other electrolyte measurements at the time of the lowest sodium measurement
Please put not applicable if the particular measurement was not done

1e. If answered "Yes" to [1a] then:
K+

mmol/L ☐ Not Applicable ☐ Unknown

1f. If answered "Yes" to [1a] then:
Urea

mmol/L ☐ Not Applicable ☐ Unknown

1g. If answered "Yes" to [1a] then:
Creatinine

µmol/L ☐ Not Applicable ☐ Unknown

1h. If answered "Yes" to [1a] then:
Glucose

mmol/L ☐ Not Applicable ☐ Unknown

Imaging

2a. If answered "Yes" to [1a] then:
Was any imaging undertaken during the admission?

◯ Yes ◯ No ◯ Unknown

2b. If answered "Yes" to [2a] then:
What imaging was undertaken?
Please tick all that apply

☐ CT Head ☐ CT Thorax ☐ CT Abdomen/Pelvis ☐ MRI Head
☐ Chest X ray ☐ Abdomen U/S

Please specify any additional options here...

2c. If answered "Yes" to [2a] then:
Did the imaging alter the hyponatraemia treatment plan?

◯ Yes ◯ No ◯ Unknown

2d. If answered "Yes" to [2c] then:
Please expand on your answer (imaging)

2e. If answered "Yes" to [1a] then:
Raf - In your opinion was the imaging the patient received appropriate?
If the patient didn't receive any imaging and this was appropriate then please mark Yes

◯ Yes ◯ No ◯ Unknown

2f. If answered "Yes" to [1a] and "No" to [2e] then:
Please expand on your answer (imaging appropriateness)

Tests and Investigations

3a. If answered "Yes" to [1a] then:
What other tests were undertaken during this admission?
Please tick all that apply. If none then please indicate this in the other

☐ Liver Function Tests ☐ NT Pro-Beta Naturetic Peptide ☐ Thyroid Function
☐ Cortisol ☐ Urine osmolality ☐ Plasma/serum osmolality
☐ Urine sodium ☐ Bone profile

Please specify any additional options here...

3b. If answered "Urine osmolality" to [3a] then:
Urine osmolality

mOsm/kg ☐ Unknown

3c. If answered "Urine osmolality" to [3a] then:
Time urine osmolality requested

☐ Unknown

3d. If answered "Urine osmolality" to [3a] then:
Date urine osmolality requested

☐ Unknown

3e. If answered "Urine osmolality" to [3a] then:
Date urine osmolality result received

☐ Unknown

3f. If answered "Urine osmolality" to [3a] then:
Time urine osmolality result received

☐ Unknown

3g. If answered "Plasma/serum osmolality" to [3a] then:
Plasma/serum osmolality

mOsm/kg ☐ Unknown

3h. If answered "Plasma/serum osmolality" to [3a] then:
Date plasma/serum osmolality requested

☐ Unknown

3i. If answered "Plasma/serum osmolality" to [3a] then:
Time plasma/serum osmolality requested

☐ Unknown

3j. If answered "Plasma/serum osmolality" to [3a] then:
Date plasma/serum osmolality received

☐ Unknown

3k. If answered "Plasma/serum osmolality" to [3a] then:
Time plasma/serum osmolality received

☐ Unknown

3l. If answered "Cortisol" to [3a] then:
Cortisol

nmol/L ☐ Unknown

3m. If answered "Cortisol" to [3a] then:
Date cortisol sample taken

☐ Unknown

3n. If answered "Cortisol" to [3a] then:
Time cortisol sample taken

☐ Unknown

3o. If answered "Cortisol" to [3a] then:
Date cortisol result received

☐ Unknown

3p. If answered "Cortisol" to [3a] then:
Time cortisol result received

☐ Unknown

4a. If answered "Yes" to [1a] then:
Raf In your opinion should any additional tests/investigations have been undertaken?

◯ Yes ◯ No ◯ Unknown

4b. If answered "Yes" to [1a] and "Yes" to [4a] then:
Raf Which tests/investigations?

☐ Liver Function Tests ☐ NT Pro-Beta Naturetic Peptide ☐ Thyroid Function
☐ Cortisol ☐ Urine osmolality ☐ Plasma/serum osmolality
☐ Urine sodium ☐ Bone profile

Please specify any additional options here...

4c. If answered "Yes" to [1a] and "Yes" to [4a] then:
Raf Please expand on your answer (tests)

5a. If answered "Yes" to [1a] then:
Was the patient reviewed by the critical care outreach team during this admission?

◯ Yes ◯ No ◯ Unknown

5b. If answered "Yes" to [1a] then:
Was the patient admitted to a level 2 (HDU) or level 3 (ICU) ward during the admission?

◯ Yes ◯ No ◯ Unknown

5c. If answered "Yes" to [5b] then:
What level ward

◯ Level 2 ◯ Level 3 ◯ Mixed level 2/3 ◯ Unknown

Treatment

6a. If answered "Yes" to [1a] then:
GCS when treatment started

- ◯ 15
- ◯ 14
- ◯ 13
- ◯ 12
- ◯ 11
- ◯ 10
- ◯ 9
- ◯ 8
- ◯ 7
- ◯ 6
- ◯ 5
- ◯ 4
- ◯ 3
- ◯ GCS not recorded as ACVPU used
- ◯ Unknown

6b. If answered "Yes" to [1a] then:
ACVPU when treatment started

- ◯ Alert
- ◯ Confused
- ◯ Verbal
- ◯ Pain
- ◯ Unresponsive
- ◯ Not recorded as GCS recorded
- ◯ Unknown

6c. If answered "Yes" to [1a] then:
What treatments did the patient receive?

- ☐ Diuretics
- ☐ 0.9% sodium chloride solution
- ☐ Enteral urea
- ☐ V2 receptor antagonists (vaptans)
- ☐ Hypertonic saline
- ☐ Other IV fluids
- ☐ Fluid restriction
- ☐ Demeclocycline
- ☐ Oral sodium
- ☐ None

Please specify any additional options here...

6d. If answered "Other IV fluids" to [6c] then:
Type of fluid

Hypertonic saline treatment

6e. If answered "Yes" to [1a] and "Hypertonic saline" to [6c] then:
Raf In your opinion was hypertonic saline solution indicated?

- ◯ Yes
- ◯ No
- ◯ Unknown

6f. If answered "Hypertonic saline" to [6c] and "Yes" to [1a] and "No" to [6e] then:
Raf Please expand on your answer (HTS indicated)

6g. If answered "Hypertonic saline" to [6c] then:
What ward was the patient on when they received hypertonic saline solution?

- ◯ ED Resus
- ◯ Critical care (level 2 or level 3)
- ◯ Endocrinology
- ◯ General medicine
- ◯ Unknown

If not listed above, please specify here...

6h. If answered "Hypertonic saline" to [6c] and "ED Resus", "Endocrinology", "General medicine" or "Unknown" to [6g] then:
Grade of clinician that led the patients treatment?

- ◯ Basic grade (FY1 or 2)
- ◯ Specialist trainee (ST1-2)
- ◯ Specialist trainee (ST3+)
- ◯ Speciality doctor
- ◯ Consultant
- ◯ Unknown

If not listed above, please specify here...

6i. If answered "Hypertonic saline" to [6c] and "ED Resus", "Endocrinology", "General medicine" or "Unknown" to [6g] then:
Specialty of clinician

6j. If answered "Hypertonic saline" to [6c] then:
If yes to hypertonic saline was this by IV infusion or IV boluses?
Answers maybe multiple

☐ IV infusion ☐ IV boluses

6k. If answered "Hypertonic saline" to [6c] then:
What concentration of hypertonic saline solution was used?
If more than one concentration was used please select the 'other' option.

◯ 1.8% ◯ 2.7% ◯ 5% ◯ Unknown

If not listed above, please specify here...

6l. If answered "Hypertonic saline" to [6c] then:
How was hypertonic saline administered?

◯ Peripheral cannula ◯ Mid line ◯ PiCC line
◯ Central/femoral line ◯ Unknown

If not listed above, please specify here...

6m. If answered "Hypertonic saline" to [6c] then:
Were there any local complications of administration?
Such as pain, swelling, skin damage, vascular thrombosis

◯ Yes ◯ No ◯ Unknown

6n. If answered "Yes" to [6m] then:
What were the complications?

6o. If answered "IV infusion" to [6j] then:
Length of time hypertonic saline infused

minutes ☐ Unknown

6p. If answered "IV infusion" to [6j] then:
IV infusion volume

ml ☐ Unknown

6q. If answered "IV boluses" to [6j] then:
Total volume of boluses

ml ☐ Unknown

6r. If answered "Hypertonic saline" to [6c] then:
How long after the hypertonic saline treatment was the blood sodium concentration rechecked?

minutes ☐ Unknown

6s. If answered "Yes" to [1a] and "Hypertonic saline" to [6c] then:
In your opinion was the blood sodium rechecked appropriately?

◯ Yes ◯ No ◯ Unknown

6t. If answered "Yes" to [1a] and "Hypertonic saline" to [6c] and "No" to [6s] then:
Please expand on your answer (Na+ recheck)

6u. If answered "Hypertonic saline" to [6c] then:
Had the patient improved clinically after the initial hypertonic saline treatment?

◯ Yes ◯ No ◯ Unknown

6v. If answered "Hypertonic saline" to [6c] then:
Was further hypertonic saline given?

◯ Yes ◯ No ◯ Unknown

6w. If answered "Yes" to [6v] then:
Please provide details

6x. If answered "Yes" to [1a] and "Hypertonic saline" to [6c] then:
Raf In your opinion was the delivery (volume/rate/duration) of hypertonic saline solution appropriate?

◯ Yes ◯ No ◯ Unknown

6y. If answered "Yes" to [1a] and "No" to [6x] and "Hypertonic saline" to [6c] then:
Raf Please expand on your answer (HTS delivery)

7a. If answered "Yes" to [1a] then:
Was there overcorrection of blood sodium?

◯ Yes ◯ No ◯ Unknown

7b. If answered "Yes" to [7a] then:
Was there an attempt to re-lower the blood sodium?

◯ Yes ◯ No ◯ Unknown

7c. If answered "Yes" to [7b] then:
What was used

7d. If answered "Yes" to [1a] and "Yes" to [7a] then:
Could this have been avoided?

◯ Yes ◯ No ◯ Unknown

7e. If answered "Yes" to [1a] and "Yes" to [7a] and "Yes" to [7d] then:
Please expand on your answer (overcorrection)

8a. If answered "Yes" to [1a] then:
In your opinion was the choice of treatment(s) for hyponatraemia appropriate?

◯ Yes ◯ No ◯ Unknown

8b. If answered "No" to [8a] then:
Please expand on your answer

9a. If answered "Yes" to [1a] then:
Raf Was fluid balance monitored appropriately?

◯ Yes ◯ No ◯ Unknown

9b. If answered "Yes" to [1a] and "No" to [9a] then:
Raf Please expand on your answer (fluid balance)

10a. If answered "Yes" to [1a] then:
In your opinion did the patient receive appropriate specialist input for the management of their abnormal blood sodium during this admission?

◯ Yes ◯ No ◯ Unknown

10b. If answered "Yes" to [1a] and "No" to [10a] then:
Please expand on your answer (specialist input)

11a. If answered "Yes" to [1a] then:
Raf In your opinion was this frequency of blood sodium checks adequate?

◯ Yes ◯ No ◯ Unknown

11b. If answered "Yes" to [1a] and "No" to [11a] then:
Raf Please expand on your answer (frequency of NA checks)

12a. If answered "Yes" to [1a] then:
Have you identified any delays to investigation or treatment of the patients abnormal blood sodium?

◯ Yes ◯ No ◯ Unknown

12b. If answered "Yes" to [1a] and "Yes" to [12a] then:
Can you attribute any of the delays to 'out of hours'?
Out of hours would typically be outside 8am-6pm Monday-Friday

◯ Yes ◯ No ◯ Unknown

12c. If answered "Yes" to [1a] and "Yes" to [12a] then:
RAF - Please expand on your answer (delays)

F. Hypernatraemia - Diagnosis, Investigation and Treatment

1. Is this a Hypernatraemia case

◯ Yes ◯ No

2a. If answered "Yes" to [1] then:
Previous diagnosis of vasopressin related polyuria (Diabetes Insipidus)?

◯ Yes ◯ No ◯ Unknown

2b. If answered "Yes" to [2a] then:
Was the patient taking DDAVP?

◯ Yes ◯ No ◯ Unknown

2c. If answered "Yes" to [2b] then:
If on DDAVP, was it missed/ stopped/ withheld?

◯ Yes ◯ No ◯ Unknown

2d. If answered "Yes" to [2c] then:
Please provide reasons (DDAVP)

2e. If answered "Yes" to [2a] then:
If the patient was taking other medications for vasopressin polyuria please list them here

3a. If answered "Yes" to [1] then:
Other diagnosis of hypernatraemia

☐ Recent diarrhoea and/or vomiting -
☐ Mental health diagnosis
☐ Poor oral intake
☐ Significant brain injury
☐ Dementia/cognitive impairment
☐ Acute kidney injury
☐ Other cause of low GCS
☐ None documented

Please specify any additional options here...

3b. If answered "Yes" to [1] then:
Was the patient fluid restricted?

◯ Yes ◯ No ◯ Unknown

3c. If answered "Yes" to [3b] then:
Reason for fluid restriction

3d. If answered "Yes" to [1] then:
Was VTE prophylaxis given?

◯ Yes ◯ No ◯ Unknown

4a. If answered "Yes" to [1] then:
Date of highest blood sodium measurement during this admission

☐ Unknown

4b. If answered "Yes" to [1] then:
Time of highest blood sodium measurement during this admission

☐ Unknown

4c. If answered "Yes" to [1] then:
Na+ (high)

mmol/L ☐ Unknown

Other electrolyte measurements at the time of the highest blood sodium measurement

4d. If answered "Yes" to [1] then:
K+ (high)

mmol/L ☐ Not Applicable ☐ Unknown

4e. If answered "Yes" to [1] then:
Urea (high)

mmol/L ☐ Not Applicable ☐ Unknown

4f. If answered "Yes" to [1] then:
Creatinine (high)

µmol/L ☐ Not Applicable ☐ Unknown

4g. If answered "Yes" to [1] then:
Glucose (high)

mmol/L ☐ Not Applicable ☐ Unknown

Imaging

5a. If answered "Yes" to [1] then:
Was any imaging undertaken during the admission (hyper)?

◯ Yes ◯ No ◯ Unknown

5b. If answered "Yes" to [1] and "Yes" to [5a] then:
What imaging (hyper)

☐ CT Head ☐ CT Thorax ☐ CT Abdomen/Pelvis ☐ MRI Head
☐ Chest X ray ☐ Abdomen U/S

Please specify any additional options here...

5c. If answered "Yes" to [1] and "Yes" to [5a] then:
Did the imaging alter the hyponatraemia treatment plan (hyper)?

◯ Yes ◯ No ◯ Unknown

5d. If answered "Yes" to [1] and "Yes" to [5a] and "Yes" to [5c] then:
Please expand on your answer (imaging - hyper)

5e. If answered "Yes" to [1] and "Yes" to [5a] then:
Raf - In your opinion was the imaging the patient received appropriate (hyper)?

◯ Yes ◯ No ◯ Unknown

5f. If answered "Yes" to [1] and "Yes" to [5a] and "No" to [5e] then:
Please expand on your answer (imaging appropriateness - hyper)

Tests and Investigations

6a. If answered "Yes" to [1] then:
What other tests were undertaken during this admission (hyper)?
Please mark all that apply

- ☐ Liver Function Tests
- ☐ NT Pro-Beta Naturetic Peptide
- ☐ Thyroid Function
- ☐ Cortisol
- ☐ Urine osmolality
- ☐ Plasma/serum osmolality
- ☐ Urine sodium
- ☐ Bone profile

Please specify any additional options here...

6b. If answered "Yes" to [1] then:
Were paired samples for urine and serum osmolality sent?

- ◯ Yes
- ◯ No
- ◯ Unknown

6c. If answered "Yes" to [1] then:
Raf In your opinion should any additional tests/investigations have been undertaken (hyper)?

- ◯ Yes
- ◯ No
- ◯ Unknown

6d. If answered "Yes" to [1] and "Yes" to [6c] then:
Raf Which tests/investigations (hyper)?

- ☐ Liver Function Tests
- ☐ NT Pro-Beta Naturetic Peptide
- ☐ Thyroid Function
- ☐ Cortisol
- ☐ Urine osmolality
- ☐ Plasma/serum osmolality
- ☐ Urine sodium
- ☐ Bone profile

Please specify any additional options here...

6e. If answered "Yes" to [1] and "Yes" to [6c] then:
Raf Please expand on your answer (tests - hyper)

Treatment

7a. If answered "Yes" to [1] then:
How was the hypernatraemia treated?

- ☐ Oral water
- ☐ Nasogastric water
- ☐ IV 5% dextrose
- ☐ IV 0.45% sodium chloride
- ☐ IV 0.9% sodium chloride
- ☐ DDAVP

Please specify any additional options here...

7b. If answered "Yes" to [1] then:
Raf In your opinion was the choice of treatment(s) appropriate (hyper)?

- ◯ Yes
- ◯ No
- ◯ Unknown

7c. If answered "Yes" to [1] and "No" to [7b] then:
Please expand on your answer (treatment - hyper)

8a. If answered "Yes" to [1] then:
Raf Was fluid balance monitored appropriately (hyper)?

- ◯ Yes
- ◯ No
- ◯ Unknown

8b. If answered "Yes" to [1] and "No" to [8a] then:
Raf Please expand on your answer (fluid balance - hyper)

8c. If answered "Yes" to [1] and "Yes" to [11a] then:
RAF - Please expand on your answer (delays - hyper))

9a. If answered "Yes" to [1] then:
Raf In your opinion was this frequency of blood sodium checks adequate (hyper)?

◯ Yes ◯ No ◯ Unknown

9b. If answered "Yes" to [1] and "No" to [9a] then:
Raf Please expand on your answer (frequency of NA checks - hyper)

10a. If answered "Yes" to [1] then:
In your opinion did the patient receive appropriate specialist input for the management of their abnormal blood sodium during this admission (hyper)?

◯ Yes ◯ No ◯ Unknown

10b. If answered "Yes" to [1] and "No" to [10a] then:
Please expand on your answer (specialist input - hyper)

11a. If answered "Yes" to [1] then:
Have you identified any delays to investigation or treatment of the patients abnormal blood sodium (hyper)?

◯ Yes ◯ No ◯ Unknown

11b. If answered "Yes" to [1] and "Yes" to [11a] then:
Can you attribute any of the delays to 'out of hours' (hyper)?

◯ Yes ◯ No ◯ Unknown

G. Complications and Discharge

1a. Was there a complication of abnormal blood sodium?

◯ Yes ◯ No ◯ Unknown

1b. If answered "Yes" to [1a] then:
Complications
Please tick all that apply

- ☐ Acute cerebral oedema
- ☐ Cerebral Vasospasm
- ☐ Osmotic demyelination (central pontine myelinolysis)
- ☐ Seizures
- ☐ Prolonged hospital stay

Please specify any additional options here...

1c. If answered "Yes" to [1a] then:
Raf Were any of the complications avoidable?

◯ Yes ◯ Possibly ◯ No ◯ Unknown

1d. If answered "Yes" to [1a] and "Yes" or "Possibly" to [1c] then:
Raf Please expand on your answer (avoidable complications)

1e. If answered "Yes" to [1a] then:
Raf Were any complications managed appropriately?

◯ Yes ◯ No ◯ Unknown

1f. If answered "Yes" to [1a] and "No" to [1e] then:
Raf Please expand on your answer (managed)

2a. Discharge destination
Please note, death is one of the options listed

◯ Own home
◯ Nursing home
◯ Death
◯ Residential home
◯ Transferred to another hospital
◯ Unknown

If not listed above, please specify here...

2b. Date of discharge or death

☐ Unknown

3a. If answered "Own home", "Residential home", "Nursing home", "Transferred to another hospital" or "Unknown" to [2a] then:
What was the patient's last blood sodium measurement before discharge from hospital?

mmol/L ☐ Unknown

3b. If answered "Own home", "Residential home", "Nursing home", "Transferred to another hospital" or "Unknown" to [2a] then:
Date of blood sodium measurement

☐ Unknown

3c. If answered "Own home", "Residential home", "Nursing home", "Transferred to another hospital" or "Unknown" to [2a] then:
Time of blood sodium measurement

☐ Unknown

4a. If answered "Own home", "Residential home" or "Nursing home" to [2a] then:
Were changes made to the patient's medications in relation to their abnormal blood sodium?

◯ Yes ◯ No ◯ Not applicable ◯ Unknown

4b. If answered "Yes" to [4a] then:
What changes were made?

4c. If answered "Yes" to [4a] then:
Were these communicated to the patient's GP in the discharge summary?

◯ Yes ◯ No ◯ Unknown

4d. If answered "No" to [4a] then:
In your opinion should changes have been made?

◯ Yes ◯ No ◯ Unknown

4e. If answered "No" to [4a] and "Yes" to [4d] then:
Please expand on your answer (med changes)

Death

5a. If answered "Death" to [2a] then:
Was the death directly or indirectly due to abnormal blood sodium?

◯ Yes - directly ◯ Yes - indirectly ◯ No ◯ Unknown

If not listed above, please specify here...

5b. If answered "Death" to [2a] and "Yes - directly" or "Yes - indirectly" to [5a] then:
Please provide details

H. Overall quality of care

Please use the following grading to rate the overall quality of care received by this patient
GOOD PRACTICE: A standard that you would accept from yourself, your trainees and your institution
ROOM FOR IMPROVEMENT: Aspects of CLINICAL care that could have been better
ROOM FOR IMPROVEMENT: Aspects of ORGANISATIONAL care that could have been better
ROOM FOR IMPROVEMENT: Aspects of CLINICAL AND ORGANISATIONAL care that could have been better
LESS THAN SATISFACTORY: Several aspects of clinical and/or organisational care that were well below that you would accept from yourself, your trainees and your institution.
INSUFFICIENT DATA: Insufficient information submitted to NCEPOD to assess the quality of care

1a. Please rate the overall quality of care using the grading system provided

- ◯ Good practice
- ◯ Room for improvement in clinical aspects of care
- ◯ Room for improvement in organisational aspects of care
- ◯ Room for improvement in clinical AND organisational aspects of care
- ◯ Less than satisfactory
- ◯ Insufficient data to grade

1b. If answered "Good practice", "Room for improvement in clinical aspects of care", "Room for improvement in organisational aspects of care", "Room for improvement in clinical AND organisational aspects of care" or "Less than satisfactory" to [1a] then:
Please provide reasons for assigning this grade

2a. Are there any themes/ issues from this case you feel should be highlighted in the final report?

- ◯ Yes
- ◯ No

2b. If answered "Yes" to [2a] then:
Please expand on your answer (vignette)

Cause for concern
Occasionally NCEPOD will refer cases that have been identified as 'LESS THAN SATISFACTORY' when it is felt that further feedback to the Trust/ Health Board concerned is warranted. This is usually due to an area of concern to the hospital or clinician involved, and not for issues highlighted across the body of case notes. This process has been agreed by the NCEPOD Steering Group and the GMC. The medical director of the Trust/ Health Board is written to by the Chief Executive of NCEPOD explaining our concerns. This process

has been in operation for 10 years and the responses received have always been positive

3. If answered "Less than satisfactory" to [1a] then:
Do you feel that this case should be considered for such action?

◯ Yes ◯ No

Impact of Health inequalities

4a. During review of this case did you notice any evidence of one or more health inequality or bias that impacted on the care provided?

◯ Yes ◯ No ◯ Unknown

4b. If answered "Yes" to [4a] then:
What health inequalities exist in relation to this patient?
Please tick all that apply

- ☐ Age
- ☐ Disability – learning/cognitive
- ☐ Marriage and civil partnership
- ☐ Race
- ☐ Sex
- ☐ Socioeconomic status
- ☐ Part of a vulnerable or inclusion health group
- ☐ Chronic respiratory disease
- ☐ Hypertension case finding
- ☐ Travel time to hospital
- ☐ Disability – physical
- ☐ Gender reassignment
- ☐ Pregnancy and maternity
- ☐ Religion or belief
- ☐ Sexual orientation
- ☐ Geographic deprivation
- ☐ Severe mental illness
- ☐ Early cancer diagnosis
- ☐ English not first language

Please specify any additional options here...

4c. If answered "Yes" to [4a] and "Part of a vulnerable or inclusion health group" to [4b] then:
If 'part of a vulnerable or inclusion health group' which group?
Please tick all that apply

- ☐ Homelessness
- ☐ Vulnerable migrants
- ☐ Sex workers
- ☐ Victims of modern slavery
- ☐ Drug and alcohol dependence
- ☐ Gypsy, Roma and Traveller communities
- ☐ People in contact with the justice system

Please specify any additional options here...