

Hypernatraemia - Clinician Questionnaire

A. Introduction

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.

There are 2 clinician questionnaires for this study. This questionnaire is for patients with HYPERNATRAEMIA.

If the patient did not have hypernatraemia during the admission please contact NCEPOD so the case can be removed from the study

Please telephone NCEPOD on 0207 251 9060 or email sodium@ncepod.org.uk

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.

Impact of NCEPOD

Recommendations from NCEPOD reports have had an impact on many areas of healthcare including: Development of the NICE 'Acutely ill patients in hospital guideline' (CG50) - following publication of the 2005 'An Acute Problem' report.

Appointment of a National Clinical Director for Trauma Care - following publication of 'Trauma: Who Cares?' 2007. Development of NICE Clinical Guidelines for Acute Kidney Injury, published in 2013 - 'Adding Insult to Injury' 2009.

Development of ICS Standards for the care of adult patients with a temporary Tracheostomy, published 2014 - 'On the right trach?' 2014.

Development of guidelines from the British Society of Gastroenterology: diagnosis and Management of acute lower gastrointestinal bleeding, published 2019 - 'Time to Get Control' 2015.

Development of the British Thoracic Society's Quality Standards for NIV, published 2018 - 'Inspiring Change' 2017

Questions or help

Further information regarding this study can be found here: <https://www.ncepod.org.uk/Bloodsodium.html>

If you have any queries about this study or this questionnaire, please contact: sodium@ncepod.org.uk or telephone 0207 251 9060.

About NCEPOD

The National Confidential Enquiry into Patient Outcome and Death (NCEPOD) reviews healthcare practice by undertaking confidential studies, and make recommendations to improve the quality of the delivery of care, for healthcare professionals and policymakers to implement. Data to inform the studies are collected from NHS hospitals and Independent sector hospitals across England, Wales, Northern Ireland and the Offshore Islands. NCEPOD are supported by a wide range of bodies and the Steering Group consists of members from the Medical Royal Colleges and Specialist Associations, as well as observers from The Coroners Society of England and Wales, and the Healthcare Quality Improvement Partnership (HQIP).

This study was commissioned by The Healthcare Quality Improvement Partnership (HQIP) as part of the Clinical Outcome Review Programme into Medical & Surgical care.

This questionnaire is for reviewing patients who had HYPERNATRAEMIA. If the patient did not have hypernatraemia during the admission please contact NCEPOD so the case can be removed from the study

Please telephone NCEPOD on 0207 251 9060 or email sodium@ncepod.org.uk

Case Summary

1. Please use this space to provide a brief overview of the admission to hospital.

To be included in the study the patient must be 18 or over and have an abnormal blood sodium in hospital

2a. Age at presentation to hospital?

 years

Unknown

Value should be no less than 18

2b. Sex

Male Female

2c. 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...

3a. Patient's usual place of residence

Own home Residential home Nursing home Homeless
 Unknown

If not listed above, please specify here...

3b. Was the patient receiving any Social support/care?

Yes No Unknown

4. 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

- | | | |
|---|--|---|
| <input type="radio"/> 1. Very Fit | <input type="radio"/> 2. Well | <input type="radio"/> 3. Managing Well |
| <input type="radio"/> 4. Vulnerable | <input type="radio"/> 5. Mildly Frail | <input type="radio"/> 6. Moderately Frail |
| <input type="radio"/> 7. Severely Frail | <input type="radio"/> 8. Very Severely Frail | <input type="radio"/> 9. Terminally Ill |
| <input type="radio"/> Unable to ascertain | | |

5a. Did the patient have any co-morbidities pre-dating this admission?

- Yes No Unknown

**5b. If answered "Yes" to [5a] then:
Which co-morbidities?**

Please tick all that apply (Charlson Comorbidity Index)

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

Please specify any additional options here...

6a. Did the patient have a documented learning disability or autism?

- Yes No Unknown

**6b. If answered "Yes" to [6a] then:
Please provide details**

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 hypernatraemia?**

- Yes 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 Medical assessment unit
 Same day emergency care service Other medical ward
 Surgical assessment unit Other Surgical ward
 Unknown

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

- | | | |
|--|--|---|
| <input type="checkbox"/> Anticancer agents | <input type="checkbox"/> Antidepressants | <input type="checkbox"/> Antiseizure medication |
| <input type="checkbox"/> Antihypertensive agents | <input type="checkbox"/> Antipsychotic drugs | <input type="checkbox"/> Diuretics |
| <input type="checkbox"/> Rivastigmine | <input type="checkbox"/> Opioid drugs | <input type="checkbox"/> NSAIDs |
| <input type="checkbox"/> Voriconazole | <input type="checkbox"/> Desmopressin | <input type="checkbox"/> 3,4-MDMA |
| <input type="checkbox"/> Steroids - oral | <input type="checkbox"/> Steroids - inhaled | |

Please specify any additional options here...

5c. If answered "Anticancer agents", "Antidepressants", "Antiseizure medication", "Antihypertensive agents", "Antipsychotic drugs" or "Diuretics" 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. Na+

 mmol/L

- Unknown

6b. K+

 mmol/L

- Not Applicable Unknown

6c. Urea

 mmol/L

- Not Applicable Unknown

6d. Creatinine

 μmol/L

- Not Applicable Unknown

6e. Glucose

 mmol/L

- Not Applicable Unknown

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

- Point of care Laboratory Unknown

6g. Date of the first bloods

- Unknown

6h. Time of the first bloods

- 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 [6f] then:

Na+

Unknown

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

K+

Not Applicable Unknown

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

Urea

Not Applicable Unknown

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

Creatinine

Not Applicable Unknown

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

Glucose

Not Applicable Unknown

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

Date of first lab bloods

Unknown

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

Time of first lab bloods

Unknown

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

Yes

No

Unknown

9. Ward patient first admitted

Acute medical unit

General medical

Care of the elderly

Neurology

Endocrinology

Renal

Cardiology

General Surgical

Upper/lower GI surgery

Orthopaedic

Critical Care

If not listed above, please specify here...

D. Investigations and treatment

1a. Previous diagnosis of vasopressin related polyuria (Diabetes Insipidus)?

- Yes No Unknown

**1b. If answered "Yes" to [1a] then:
Was the patient taking DDAVP?**

- Yes No Unknown

**1c. If answered "Yes" to [1b] then:
If on DDAVP, was it missed/ stopped/ withheld?**

- Yes No Unknown

**1d. If answered "Yes" to [1c] then:
Please provide reasons (DDAVP)**

**1e. If answered "Yes" to [1a] then:
If the patient was taking other medications for vasopressin polyuria please list them here**

2. Other diagnosis of hypernatraemia

- | | |
|---|---|
| <input type="checkbox"/> Recent diarrhoea and/or vomiting - | <input type="checkbox"/> Dementia/cognitive impairment |
| <input type="checkbox"/> Mental health diagnosis | <input type="checkbox"/> Acute kidney injury |
| <input type="checkbox"/> Poor oral intake | <input type="checkbox"/> Hyperglycemic Hyperosmolar State |
| <input type="checkbox"/> Significant brain injury | <input type="checkbox"/> None documented |

Please specify any additional options here...

3a. Was the patient fluid restricted?

- Yes No Unknown

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

3c. Was VTE prophylaxis given?

- Yes No Unknown

Sodium measurements

4a. Date of highest blood sodium measurement during this admission

- Unknown

4b. Time of highest blood sodium measurement during this admission

- Unknown

4c. What was the highest blood sodium measurement during the admission?

 mmol/L

- Unknown

Other electrolyte measurements at the time of the highest sodium measurement

Please put not applicable if the particular measurement was not done

4d. K+

 mmol/L

- Not Applicable Unknown

4e. Urea

Not Applicable Unknown

4f. Creatinine

Not Applicable Unknown

4g. Glucose

Not Applicable Unknown

Imaging

5a. Was any imaging undertaken during the admission?

Yes No Unknown

**5b. If answered "Yes" to [5a] 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...

**5c. If answered "Yes" to [5a] then:
Did the imaging alter the hypernatraemia treatment plan?**

Yes No Unknown

**5d. If answered "Yes" to [5c] then:
Please expand on your answer (imaging)**

Tests and Investigations

6a. 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...

**6b. If answered "Urine osmolality" to [6a] then:
Urine osmolality**

Unknown

**6c. If answered "Urine osmolality" to [6a] then:
Time urine osmolality requested**

Unknown

**6d. If answered "Urine osmolality" to [6a] then:
Date urine osmolality requested**

Unknown

**6e. If answered "Urine osmolality" to [6a] then:
Date urine osmolality result received**

Unknown

**6f. If answered "Urine osmolality" to [6a] then:
Time urine osmolality result received**

Unknown

**6g. If answered "Plasma/serum osmolality" to [6a] then:
Plasma/serum osmolality**

Unknown

**6h. If answered "Plasma/serum osmolality" to [6a] then:
Date plasma/serum osmolality requested**

Unknown

**6i. If answered "Plasma/serum osmolality" to [6a] then:
Time plasma/serum osmolality requested**

Unknown

**6j. If answered "Plasma/serum osmolality" to [6a] then:
Date plasma/serum osmolality received**

Unknown

**6k. If answered "Plasma/serum osmolality" to [6a] then:
Time plasma/serum osmolality received**

Unknown

**6l. If answered "Cortisol" to [6a] then:
Cortisol**

Unknown

**6m. If answered "Cortisol" to [6a] then:
Date cortisol sample taken**

Unknown

**6n. If answered "Cortisol" to [6a] then:
Time cortisol sample taken**

Unknown

**6o. If answered "Cortisol" to [6a] then:
Date cortisol result received**

Unknown

**6p. If answered "Cortisol" to [6a] then:
Time cortisol result received**

Unknown

7a. Was the patient reviewed by the critical care outreach team during this admission?

Yes

No

Unknown

7b. Was the patient admitted to a level 2 (HDU) or level 3 (ICU) ward during the admission?

Yes

No

Unknown

**7c. If answered "Yes" to [7b] then:
What level ward**

Level 2

Level 3

Mixed level 2/3

Unknown

Treatment

8a. GCS when treatment started

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

8b. ACVPU when treatment started

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

8c. How was the hypernatraemia treated?

- Oral water
- IV 0.45% sodium chloride
- Not actively treated
- Nasogastric water
- IV 0.9% sodium chloride
- IV 5% dextrose
- DDAVP

Please specify any additional options here...

**8d. If answered "Not actively treated" to [8c] then:
Please provide reasons for this:**

For example, End of life care

8e. Grade of clinician that led the patients treatment?

If a decision was made to not actively treat the patients hypernatraemia, grade of clinician that made this decision

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

If not listed above, please specify here...

8f. Specialty of clinician

9a. Was there overcorrection of blood sodium?

- Yes
- No
- Unknown

**9b. If answered "Yes" to [9a] then:
Was there an attempt to re-higher the blood sodium?**

- Yes
- No
- Unknown

10a. After retrospectively reviewing this case do you think the choice of treatment for the hypernatraemia was appropriate?

- Yes
- No
- Unknown

**10b. If answered "No" to [10a] then:
Please expand on your answer**

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

Please specify any additional options here...

2a. Discharge destination

Please note, death is one of the options listed

- | | |
|------------------------------------|---|
| <input type="radio"/> Own home | <input type="radio"/> Residential home |
| <input type="radio"/> Nursing home | <input type="radio"/> Transferred to another hospital |
| <input type="radio"/> Death | <input type="radio"/> 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 hypernatraemia?**

- 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

Death and Mortality Review

5a. If answered "Death" to [2a] then:

Was the death directly or indirectly due to hypernatraemia? Answer: directly, indirectly or no

- Yes - directly Yes - indirectly No Unknown

If not listed above, please specify here...

5b. If answered "Death" to [2a] then:

Was the patients case discussed at a morbidity and mortality meeting?

- Yes No Unknown

5c. If answered "Death" to [2a] and "Yes" to [5b] then:

Were remediable factors in the care of this patient identified?

- Yes No Unknown

5d. If answered "Death" to [2a] and "Yes" to [5b] and "Yes" to [5c] then:

What were the remediable factors and what action was taken?

All patients

Please answer the following question irrespective of patient outcome

6a. After retrospectively reviewing this case are there any areas regarding the management of the patients hypernatraemia that you think could have been improved?

- Yes No Unknown

6b. If answered "Yes" to [6a] then:

Please provide details

Please use this space to add any further information about this case/admission you feel relevant

6c. Further information:

End of questionnaire

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS QUESTIONNAIRE

By doing so you have contributed to the dataset that will form the report and recommendations due for release in Autumn 2025

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:
Was a fluid maintenance regime prescribed?**

- Yes No Unknown

**3b. If answered "Yes" to [1a] and "Yes" to [3a] then:
What was the prescribed fluid maintenance regime?**

**3c. If answered "Yes" to [1a] and "Yes" to [3a] then:
Grade of prescriber**

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

If not listed above, please specify here...

**3d. If answered "Yes" to [1a] and "Yes" to [3a] then:
Specialty of prescriber**

**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:
Date of first low blood sodium measurement**

Unknown

**5b. 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

**5c. 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

**5d. If answered "Yes" to [1a] then:
K+**

 mmol/L

Not Applicable Unknown

**5e. If answered "Yes" to [1a] then:
Urea**

 mmol/L

Not Applicable Unknown

**5f. If answered "Yes" to [1a] then:
Creatinine**

 $\mu\text{mol/L}$

Not Applicable Unknown

**5g. If answered "Yes" to [1a] then:
Glucose**

 mmol/L

Not Applicable Unknown