

An Audit of Inpatient Hyponatremia Investigation and Management

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Abstract

Background: Hyponatremia is a common endocrine disorder associated with prolonged hospital stays and increased morbidity. Accurate diagnosis and management require systematic clinical and biochemical assessments. This study evaluates the current practices in managing inpatient hyponatremia and compares them with international guidelines. **Objectives:** This study aims to (1) compare current hyponatremia management practices with international guidelines, (2) identify areas needing improvement in documentation and service provision, and (3) implement changes and reassess outcomes. **Methods:** A retrospective randomized case note review of 50 inpatients diagnosed with hyponatremia was conducted. Documentation standards were compared with international guidelines. A second audit was performed after implementing a checklist-based documentation system. **Results:** The first audit revealed suboptimal documentation and testing: volume status was recorded in only 8% of cases, paired osmolality in 8%, medication review in 24%, urinary sodium in 28%, urinary osmolality in 36%, serum cortisol in 56%, and thyroid function tests in 72%. After implementing a standardized documentation sticker, documentation rates improved, with notable reductions in hospital stay duration and time to achieve sodium normalization across all severity groups. Mean hospital stay for severe hyponatremia decreased from 11.4 to 7.5 days. **Conclusions:** Implementing a standardized documentation checklist improved hyponatremia management, reduced hospital stay duration, and facilitated early specialist input. Further improvements could be achieved by updating hospital guidelines to align with international standards and introducing electronic alerts and referrals.

Keywords: Inpatient Hyponatremia, Investigation and Management, UAE.

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INTRODUCTION

Hyponatremia is one of the most common electrolyte disturbances encountered in hospitalized patients, with significant implications for morbidity and mortality (Spasovski *et al.*, 2014). It is defined as a serum sodium concentration below 135 mmol/L and is associated with increased hospital stay, cognitive impairment, and higher healthcare costs (Verbalis *et al.*, 2013). Despite its clinical significance, the assessment and management of hyponatremia remain inconsistent across medical institutions, often leading to suboptimal patient outcomes (Miller *et al.*, 2015). This study aims to audit the investigation and management of inpatient hyponatremia against international guidelines to identify areas for improvement.

Accurate assessment of hyponatremia requires a thorough clinical and biochemical evaluation,

including volume status examination, serum osmolality, and urinary electrolyte measurements (Hoorn & Zietse, 2017). However, documentation and adherence to these diagnostic protocols vary significantly among healthcare providers. The European Society of Intensive Care Medicine, European Society of Endocrinology, and the European Renal Association recommend comprehensive diagnostic pathways to optimize hyponatremia management (Spasovski *et al.*, 2014). Failure to adhere to these standards results in delayed treatment, increased length of hospitalization, and potential complications such as osmotic demyelination syndrome (Huang & Ayus, 2020).

This audit seeks to evaluate current hospital practices concerning the investigation and documentation of hyponatremia, comparing them with established international guidelines. By identifying deficiencies in clinical practice, this study aims to

propose targeted interventions, such as the implementation of a standardized documentation checklist, to improve patient care outcomes (Moritz & Ayus, 2017). The retrospective analysis includes a review of 50 randomly selected cases of hyponatremia, assessing key parameters such as volume status assessment, paired osmolality testing, and medication review (Decaux *et al.*, 2017).

The study also includes a follow-up re-audit after implementing a documentation checklist to determine its impact on improving adherence to diagnostic protocols. Previous studies have demonstrated that structured interventions can enhance clinical practice, reduce errors, and facilitate timely specialist involvement (Upadhyay *et al.*, 2015). This research highlights the importance of structured documentation in managing hyponatremia effectively and ensuring patient safety.

METHODS

A retrospective randomized case note review was conducted on 50 patients admitted with hyponatremia. Documentation standards were compared with international guidelines to assess compliance. Data collection included volume status documentation, thyroid function tests, serum and urine osmolality, cortisol levels, medication review, and involvement of the endocrinology team. Following the first audit, a prospective study was conducted involving 50 patients, incorporating a standardized documentation checklist to improve clinical practice. The effectiveness of this intervention was evaluated through comparative analysis.

Study Design

A retrospective review of 50 randomly selected inpatient records of patients diagnosed with hyponatremia was conducted. Documentation standards and investigation rates were compared against international guidelines. Following the initial audit, a documentation checklist sticker was introduced to improve clinical record-keeping.

Data Collection

- **Demographics:** Age and gender distribution of patients.
- **Documentation:** Assessment of volume status, thyroid function tests (TFTs), serum cortisol, paired osmolality, urine osmolality, urine sodium, and medication review.
- **Severity Classification:** Mild (130-135 mmol/L), moderate (121-129 mmol/L), severe (≤ 120 mmol/L).
- **Impact Assessment:** Duration of hospital stay and time to sodium normalization were measured before and after implementing documentation improvements.

RESULTS

Demographics

Among the 50 patients reviewed, 38% were male and 38% were female. The age distribution was as follows:

- **Below 55 years:** 2%
- **55-65 years:** 18%
- **65-75 years:** 16%
- **Above 75 years:** 64%

Table 1: Initial Audit Findings

Investigation	Completed (%)	Not Completed (%)
Volume Status	8%	92%
Thyroid Function Test	72%	28%
Serum Cortisol	56%	44%
Paired Osmolality	8%	92%
Urinary Osmolality	36%	64%
Urinary Sodium	28%	72%
Medication Review	24%	76%
Endocrinology Referral	8%	92%

Impact of Documentation Checklist Implementation

Following the implementation of a checklist-based documentation tool, compliance with guideline-

recommended investigations improved significantly. Hospital stays and time taken to achieve sodium normalization were also reduced:

Table 2: Checklist Implementation

Hyponatremia Severity	Mean Time to Sodium Normalization (Days)	Hospital Stay (Days)
Mild (130-135 mmol/L)	6.8 \rightarrow 5.3	Reduced
Moderate (121-129 mmol/L)	7.2 \rightarrow 4.8	Reduced
Severe (≤ 120 mmol/L)	11.4 \rightarrow 7.5	Reduced

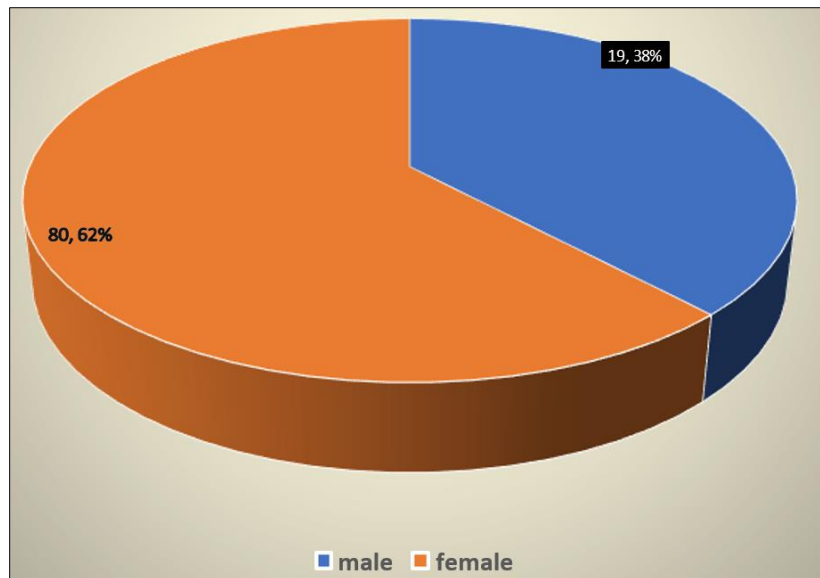


Figure 1: Sex distribution

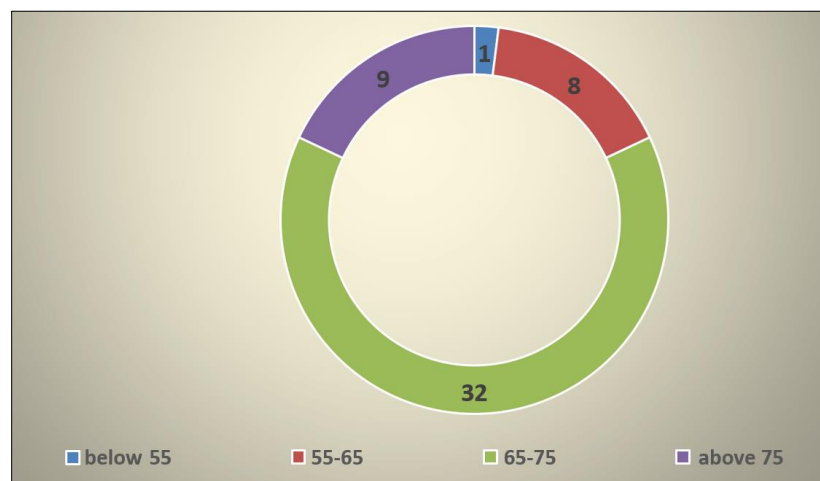


Figure 2: Age distribution

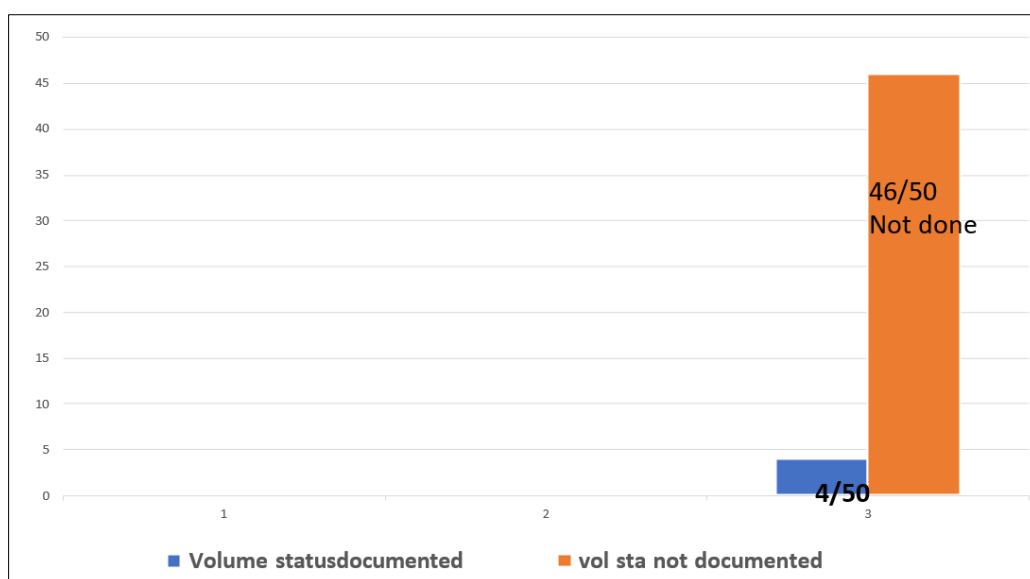


Figure 3: Documentation of Volume status

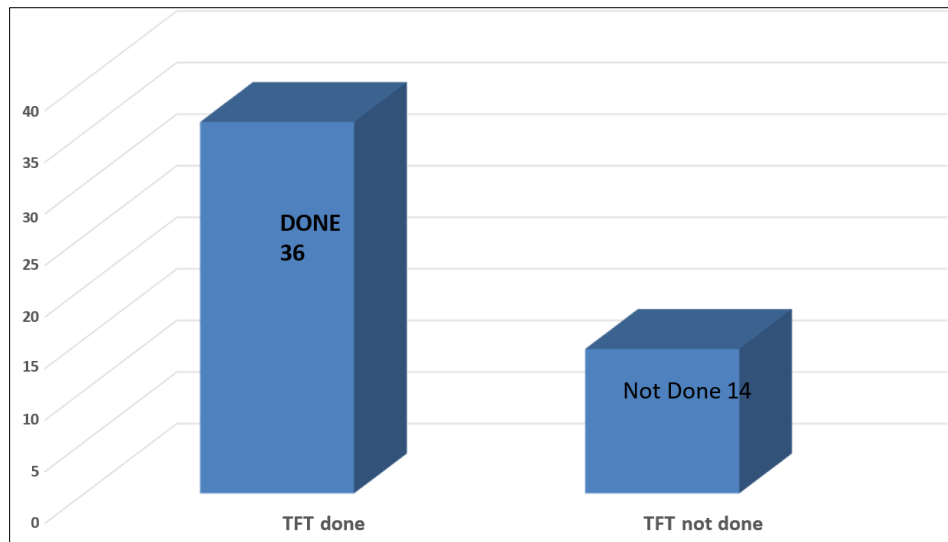


Figure 4: TFT last 8 weeks

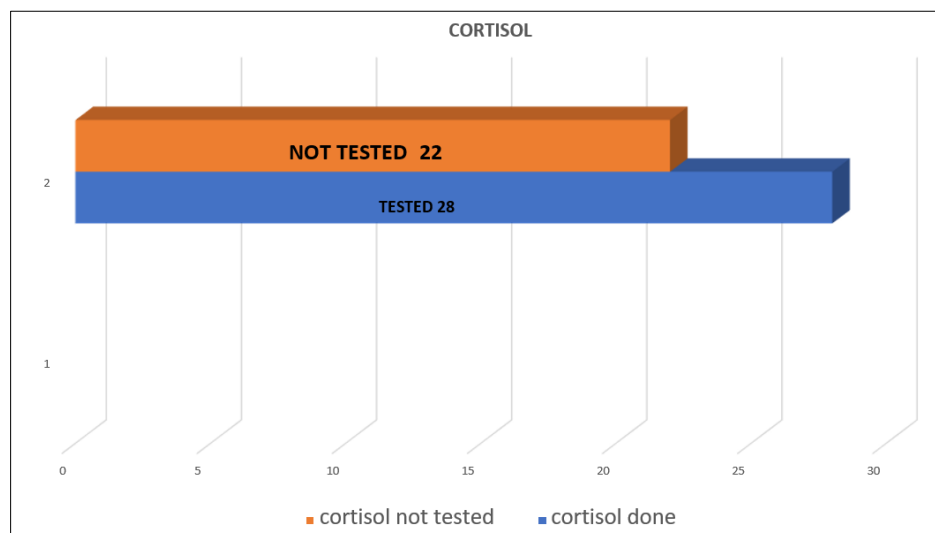


Figure 5: CORTISOL

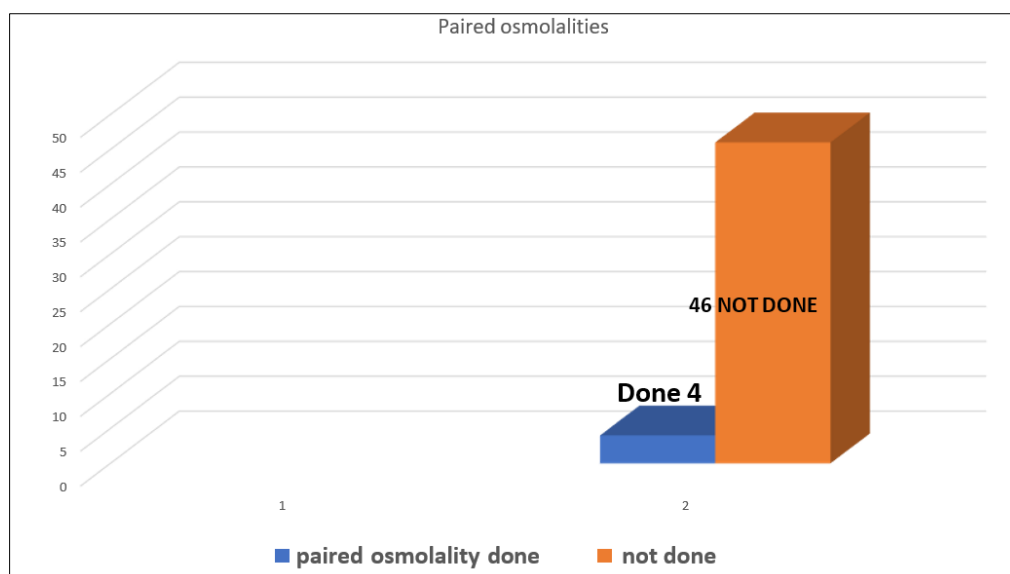
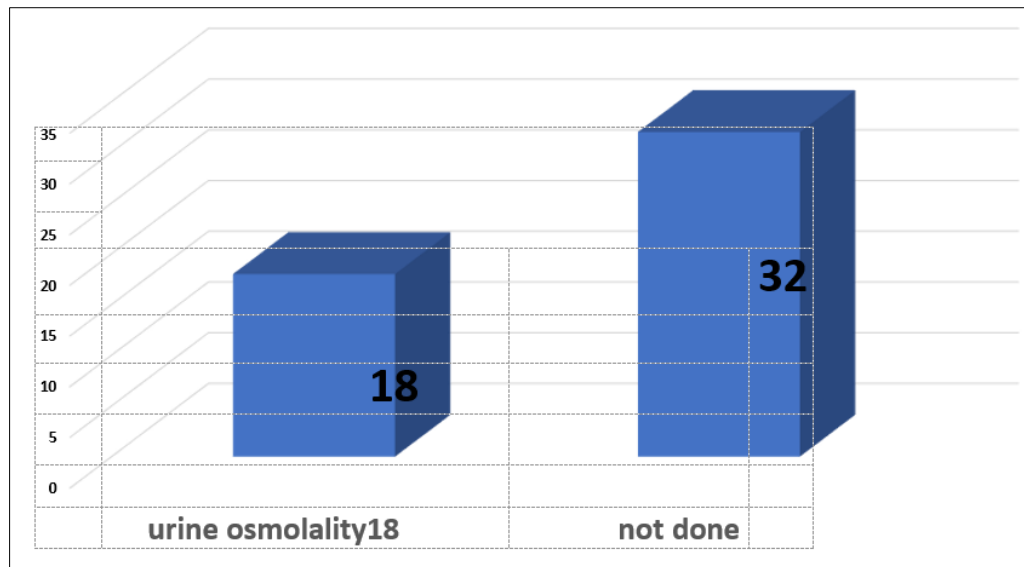
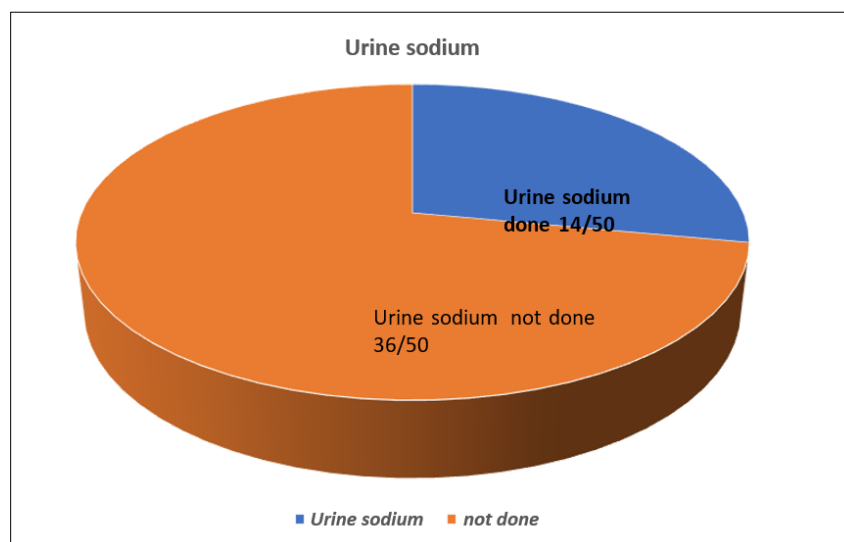
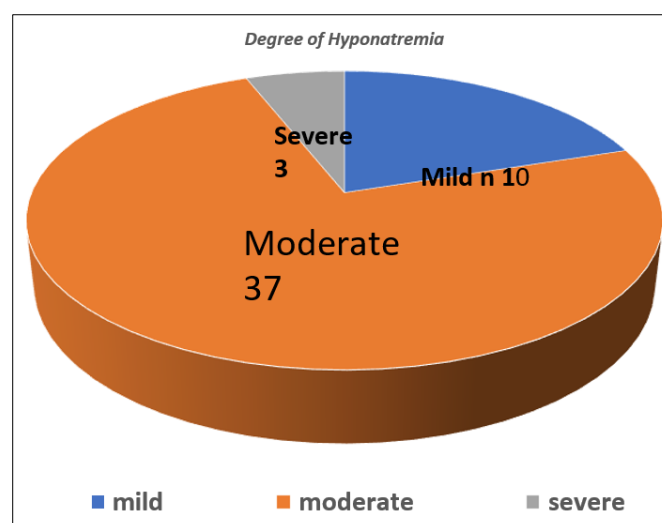


Figure 6: Paired Osmolality

**Figure 7: Urine osmolality****Figure 8: Urinary Sodium****Figure 9: Degree of hyponatremia**

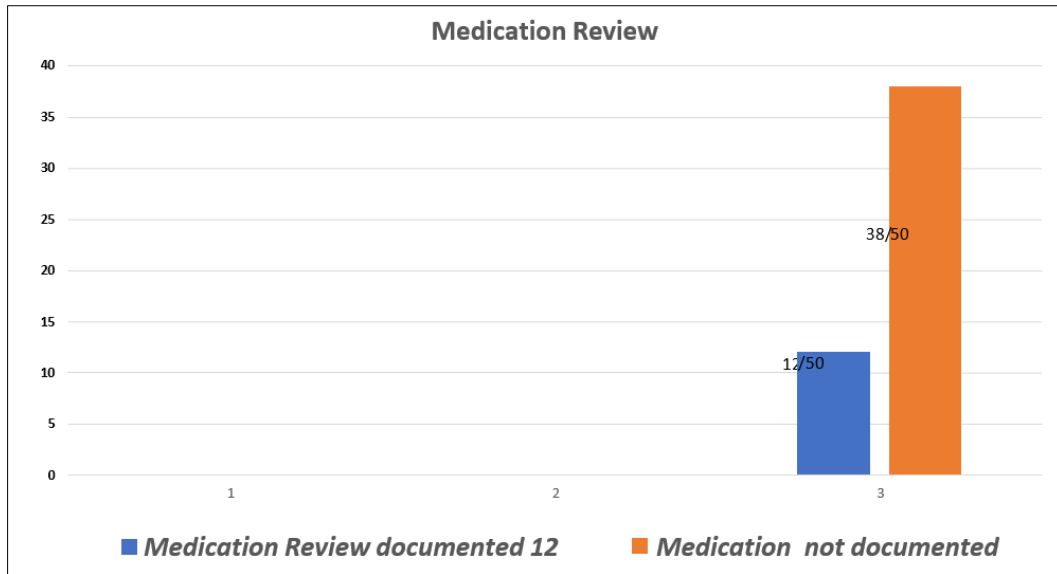


Figure 10: Medication Review

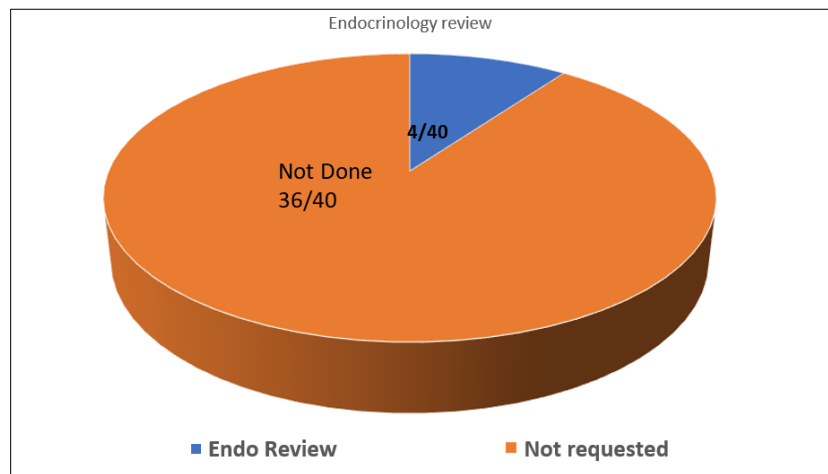


Figure 11: Endocrinology team involved

DISCUSSION

The initial audit highlighted significant gaps in the documentation and management of hyponatremia. The low rates of volume status assessment, paired osmolality testing, and endocrinology referrals indicated the need for systemic improvements. Following the introduction of a structured documentation checklist, documentation compliance improved markedly, reducing unnecessary delays and facilitating timely interventions.

International guidelines recommend comprehensive assessment, including volume status, serum osmolality, urine osmolality, and serum cortisol levels. This study demonstrated that standardizing documentation improves patient outcomes by expediting diagnosis and management.

Further improvements could be made by updating hospital protocols to align with global best practices, introducing automated laboratory alerts for

moderate to severe hyponatremia, and implementing electronic referrals to specialists.

CONCLUSION

This study demonstrates that documentation and investigation of hyponatremia remain suboptimal, with significant gaps in adherence to international guidelines. Initial findings revealed poor documentation of volume status (8%), paired osmolality testing (92% not done), and medication reviews (76% not documented). The implementation of a structured documentation checklist significantly improved adherence, reducing the time required to achieve acceptable sodium levels and shortening hospital stays. These findings align with previous research advocating for structured documentation to improve clinical outcomes (Spasovski *et al.*, 2014; Verbalis *et al.*, 2013). Further hospital guideline updates, electronic alerts for moderate to severe hyponatremia, and electronic referrals for endocrinology consultations are

recommended to sustain these improvements (Gain, 2010).

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