

Can use of the European diagnostic pathway improve diagnosis and management of Hyponatraemia in a District General Hospital?

Alex Asher (1), Mazin Sirelkhathim (1), Stephen Wong (2), Aye Nyunt (2), Glan Clwyd Hospital, North Wales, LL18 5UJ

Background

Hyponatraemia (<135mmol/L) occurs in 15-30% of hospitalised patients (1). Despite this investigation, diagnosis and management of this disorder is often poorly performed. In 2014 a joint European Society guideline was published to aid diagnosis and management for doctors on the frontline (2). This included a diagnostic pathway using urine osmolality and sodium as a first line test. Previous studies have suggested that this algorithm may be superior to traditional diagnostic algorithms reliant on fluid status (3).

Aims

- To assess and improve investigation, diagnosis and management in our centre
- To assess whether using the European diagnostic algorithm can improve diagnosis of hyponatraemia in our centre

Methods

A audit of medical notes and biochemical tests was carried out for 69 patients admitted to the medical assessment unit with serum sodium below 130mmol/L over a 3 month period. Adoption of the European guideline diagnostic pathway, creation of an "investigation set" and educating junior doctors and nurses were used as tools to improve management. Emphasis was placed on use of urine osmolality and sodium as a first line investigation in the diagnostic process. Subsequent re-review of management after change was carried out for 79 patients over a similar timeframe.

Results

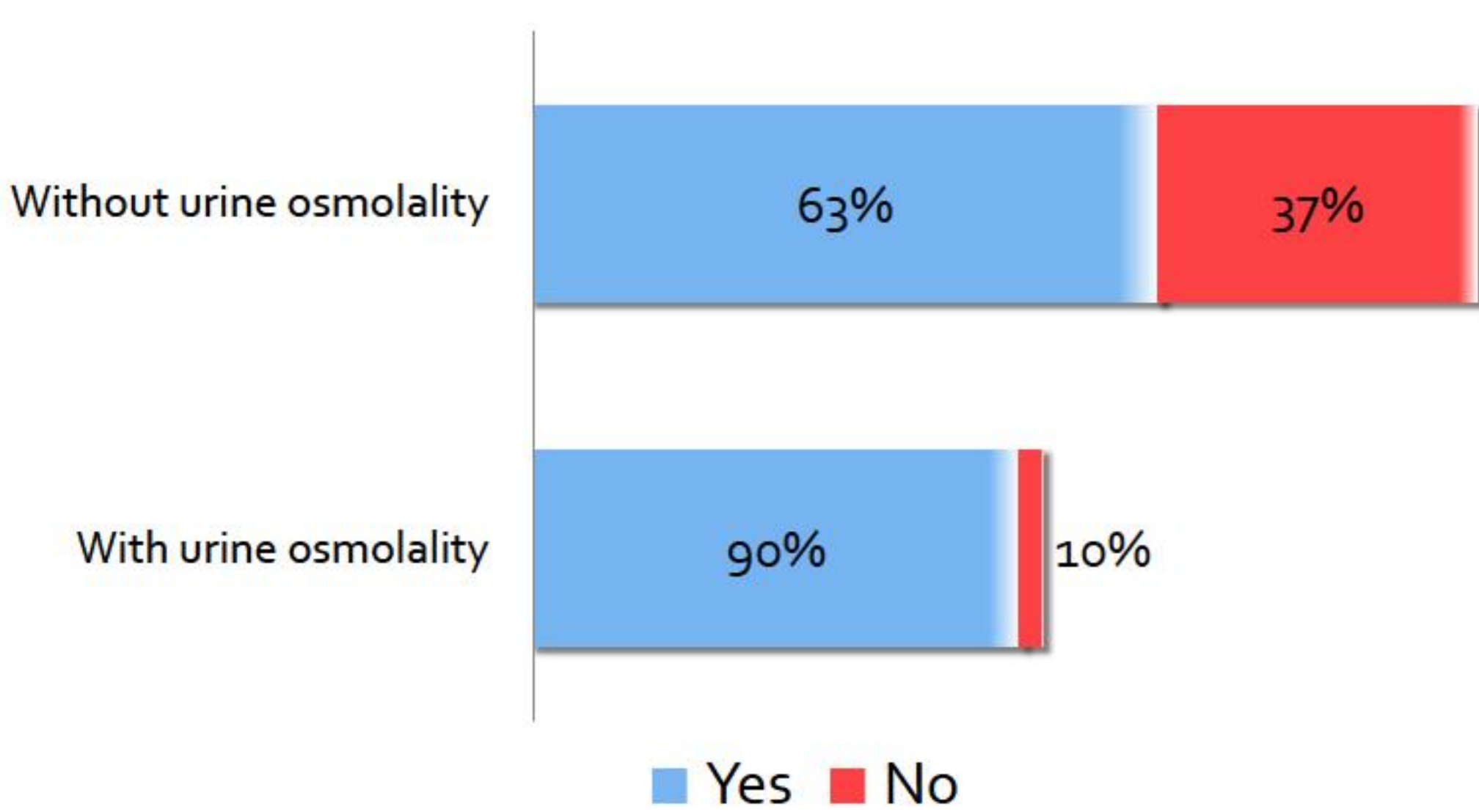
Before change: 69 patients admitted with hyponatraemia (55% Euvolaemic, 29% Hypovolaemic, 16% Hypervolaemic). Of the Euvolaemic patients only 26% of patients had causative medications stopped. Only 18% had a serum osmolality and only 13% had a urine osmolality or sodium performed. 23.6% had a short synacthen test performed during admission. In all patients only 45% had a cause diagnosed for hyponatraemia. 55% of patients were thought to have SIADH and 23.6% were fluid restricted. In Hypovolaemic patients 54% of drugs were stopped and 85% were given appropriate IV fluid replacement

After change: 79 patients admitted with hyponatraemia (54% Euvolaemic, 30% Hypovolaemic, 16% Hypervolaemic). In Euvolaemic patients 66% had causative medications stopped. 4 times as many urine osmolality and sodium tests were performed (51%). 30% had a short synacthen test during their admission. 43% of patients were thought to have SIADH and 32% were fluid restricted. 73.4% had a cause diagnosed for hyponatraemia. Hypovolaemic patients had 75% of causative drugs stopped and 100% had appropriate IV fluid replacement. 34% of patients of all volume states had a urine osmolality performed. Of these 90% had a diagnosis found. In those who did not have a urine osmolality or sodium performed only 63% had a diagnosis found.

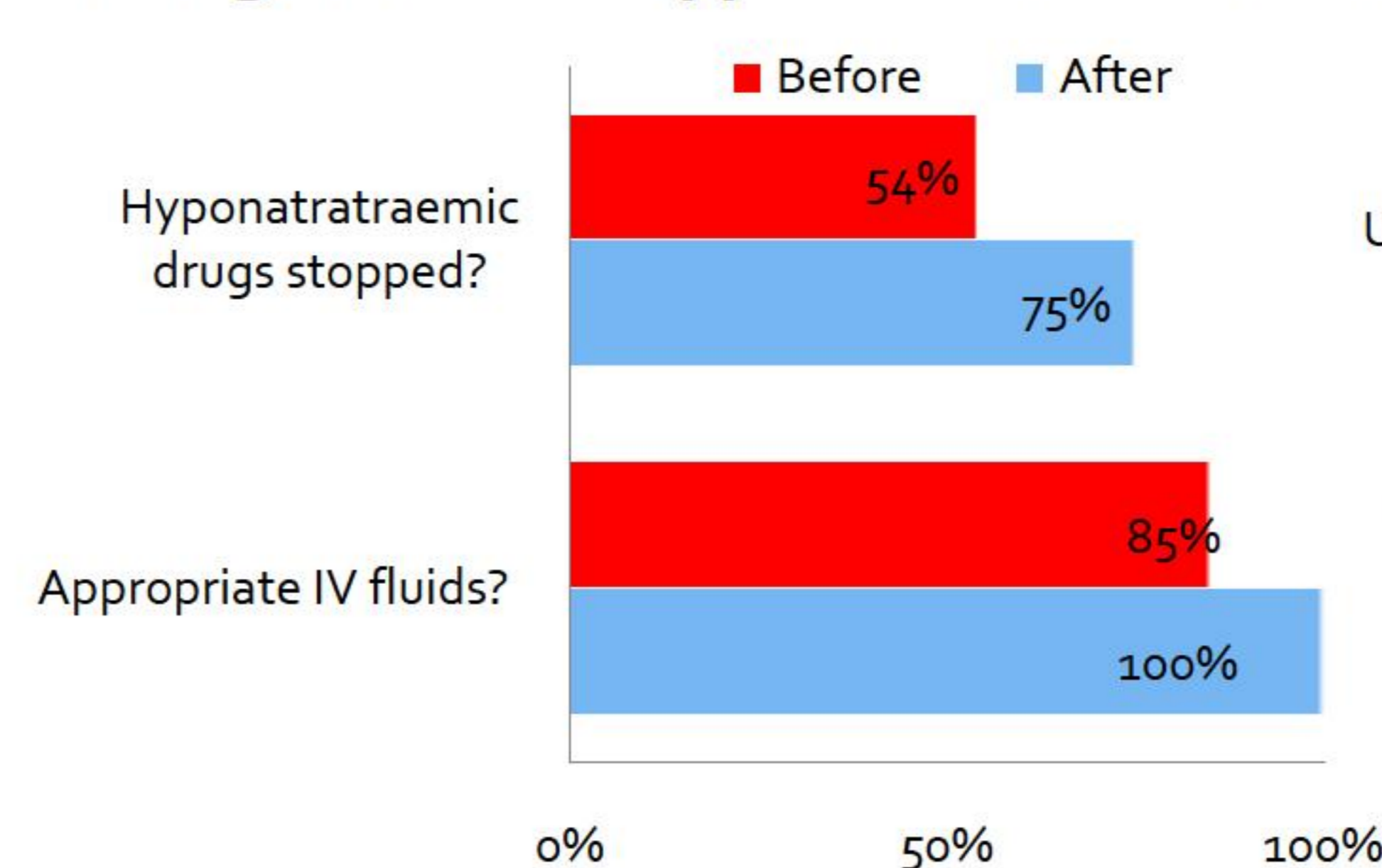
Conclusions:

Our first audit suggests that traditionally investigation and management of hyponatraemia in acute medical patients is often neglected. We found that use of guidelines, education and support tools for junior doctors and nurses can significantly improve investigation and management of patients with Hyponatraemia. Our findings also support the use of the European diagnostic algorithm, using urine osmolality and sodium early in the diagnostic process.

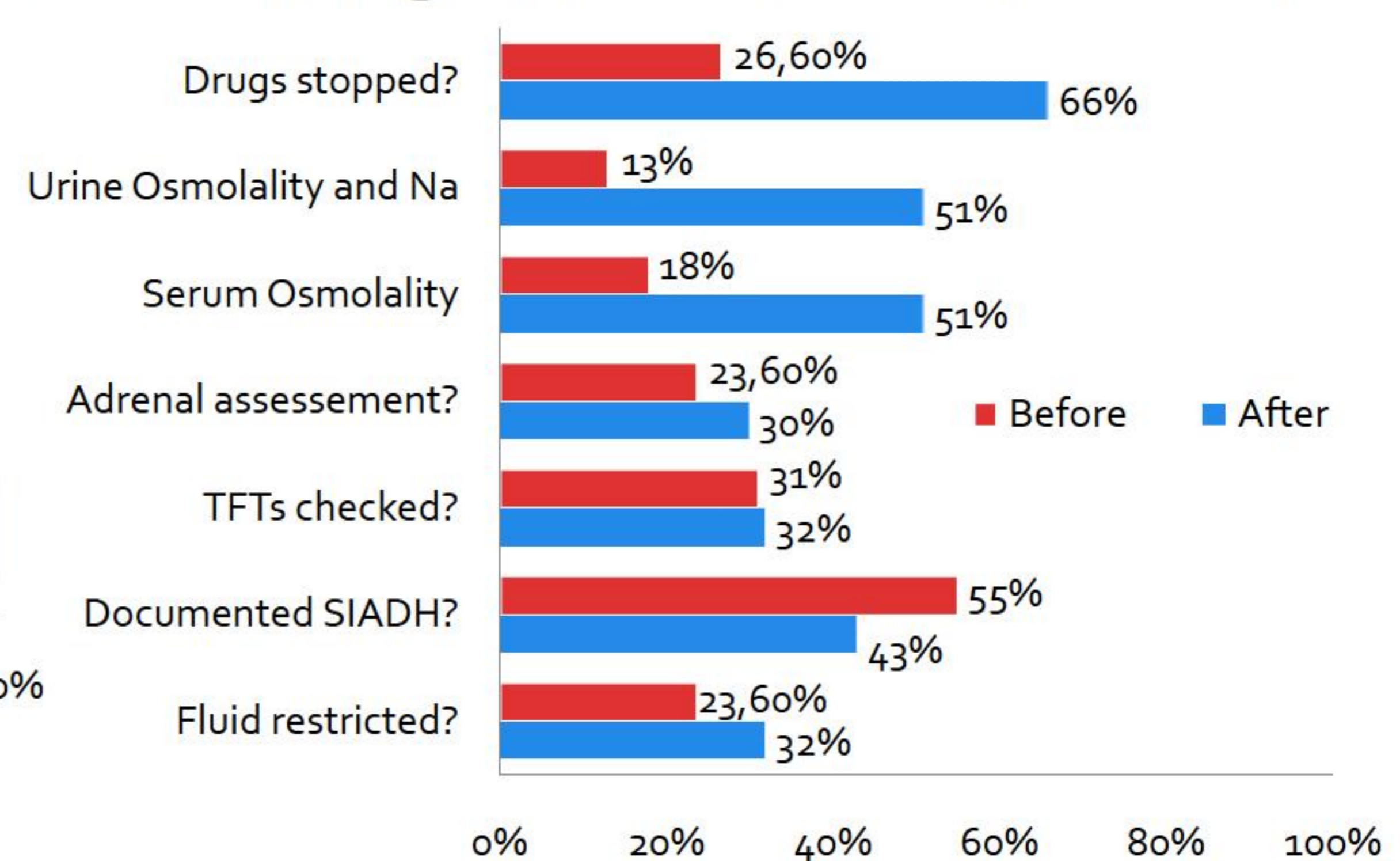
Cause found and urine osmolality



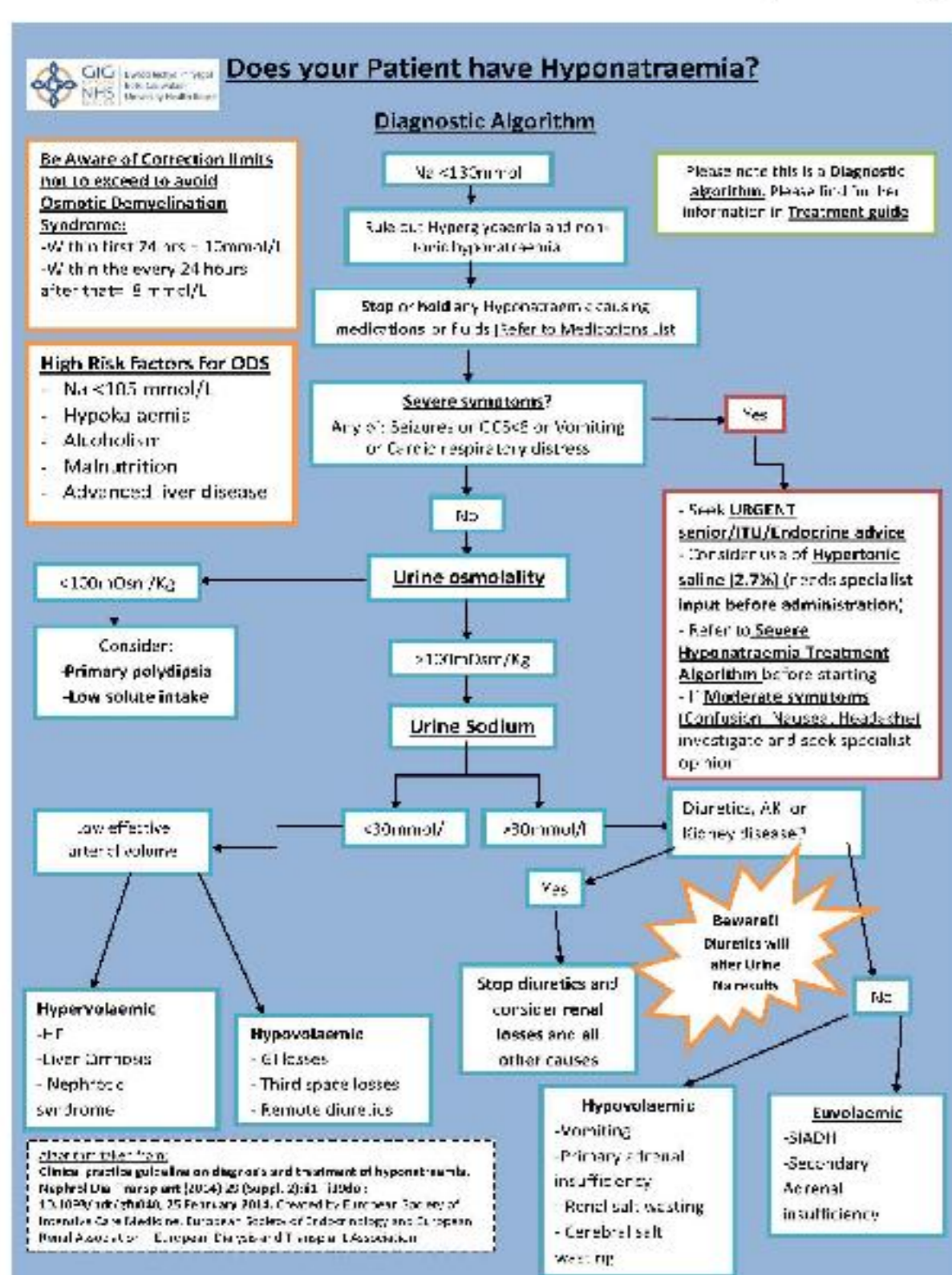
Management of Hypovolaemic Patients



Management of Euvolaemic Patients



Adapted Guidelines and Educational posters



Think Hyponatraemia Think Urine Sodium

Does Your patient have Hyponatraemia? (<130mmol/L)

The first line investigation in ANYBODY with hyponatraemia is a Urine Sodium and Osmolality

Send any urine sample in a White top vacuette

Think Hyponatraemia, Think Urine Sodium!

Urine Osmolality and Urine Sodium are FIRST LINE investigations in ANY PATIENT with hyponatraemia (<130mmol/L)

Investigations for SIADH: 1) Urine Osmolality and Urine Sodium, 2) Serum Osmolality, 3) Random cortisol or short synacthen test, 4) Check TFTs

REMEMBER!!! Diuretics will affect a urine osmolality and sodium results. Stop Diuretics before testing

Main causes causing Hyponatraemia: SIADH, Hypovolaemia, Hypervolaemia

Outcomes measures	Before Change	After Change
Cause Found	45%	73.4%
Mean length of stay	12.5 days	9.8 days
Mortality	19%	21.5%

References: 1. U padhyay A, Jaber BL, Madias NE. Incidence and prevalence of hyponatremia. Am J Med.2006;119:530-535. 2. Clinical practice guideline on diagnosis and treatment of hyponatraemia, Nephrol Dial Transplant (2014) 29 (Suppl. 2):ii1-ii3doi: 10.1093/ndt/gfu040, 25 February 2014. 3. Hoorn EJ, Halperin ML, Zietse R. Diagnostic approach to a patient with hyponatraemia: traditional versus physiology-based options. QJM: Monthly Journal of the Association of Physicians 2005