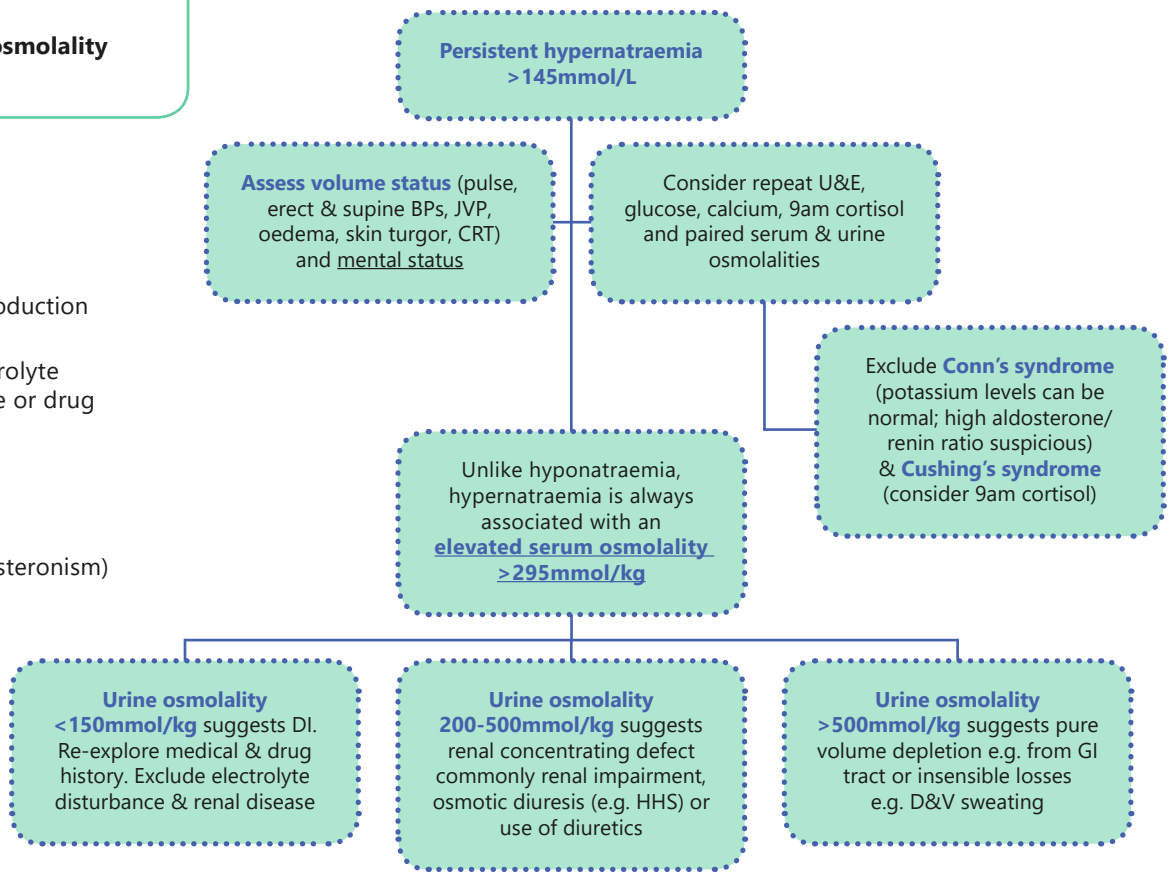
The Investigation of Hypernatraemia in Primary Care

GP notebook Shortcuts

- Hypernatraemia (**Na>145mmol/L**) is rare in primary care; clinical effects depend on **speed of onset, severity** & **underlying cause**
- Hypernatraemia (even mild) is a **potent stimulator of thirst**. It can also present with confusion, headache, N&V, lethargy, irritability, seizures or coma
- Individuals over 65 years, those with dementia or those living in institutions are at increased risk of hypernatraemia
- Hypernatraemia is always associated with an **elevated serum osmolality >295mmol/kg**

Causes of Hypernatraemia:

- **Low fluid intake** or **loss from GI tract** e.g. D&V
- **Diabetes insipidus** (rare, 1:25000)
  - **Central** DI usually from pituitary pathology affecting ADH production e.g. brain tumour or head injury
  - **Nephrogenic** DI which is a renal resistance to ADH e.g. electrolyte disturbance (**hypercalcaemia** or **hypokalaemia**), renal disease or drug toxicity (commonly **lithium**)
- **Hyperosmolar hyperglycaemic state** (HHS, formerly HONK)
  - Life-threatening diabetic emergency characterised by severe hyperglycaemia, high serum osmolality and dehydration
- Other endocrine causes such as **Conn' syndrome** (primary aldosteronism) or **Cushing's syndrome** (pathological hypercortisolism)



Investigations for Hypernatraemia

- **Serum osmolality** is a measure of the concentration of different solutes in plasma and is primarily determined by sodium, glucose & urea. Normal range is usually **275-295mmol/kg** and is tightly maintained by **ADH** which regulates fluid balance. An increase in serum osmolality results in secretion of ADH which increases water reabsorption in the kidneys to return serum osmolality to baseline
- **Urine osmolality** is a measure of urine concentration and whether this is appropriate for the clinical state of the individual. Normal range is usually **300-900mmol/kg water**. After 12-14 hours fluid restriction, urinary osmolality should be >850mmol/kg water
- **Serum urea** is a marker of **extracellular fluid volume**. A raised urea may suggest dehydration
- **Serum creatinine** is useful as an assessment of **renal impairment** as a cause of **hyponatraemia**

Glossary of Abbreviations

ADH: antidiuretic hormone **CKD:** chronic kidney disease **DI:** diabetes insipidus **CRT:** capillary refill time **GI:** gastrointestinal **HONK:** hyperosmolar non-ketotic syndrome **N&V:** nausea & vomiting

References

1. "Diabetes insipidus" BMJ 2019;364:l321
2. "DKA & HHS" BMJ 2019;365:l1114