Approach to Hyponatremia

RENAL & VOLUME STATUS

≤10

KEY DECISION RULE

Limit to avoid osmotic demyelination[2,4]

mmol/L max in 24 h; ≤8 if Na ≤105, low K, EtOH, poor diet, cirrhosis

Serum Na <135 mmol/L, from no symptoms to seizure or coma

→ Osm ≥275 mOsm/kg = not hypotonic: glucose (Na ↓2.4 per 5.6 mmol/L), lipids, paraprotein, glycine[1,8]

→ Send urine Osm/Na, TSH, AM cortisol (never delay 3%); volume status; drugs[1,9]

→ **Severe symptoms, or acute with symptoms?**

Yes →

Severe symptoms: give 3% NaCl bolus now[1,2,5,9]

- Seizure, coma, or somnolence[1,4]
- Vomiting or cardiorespiratory distress[1,4]
- Acute (<48 h) + symptoms: marathon, MDMA[1]
- Symptoms resolve or Na ↑5: stop 3%[1,9]
- Na rise over limit: relower, D5W ± DDAVP[1,9]

→ 3% NaCl 100–150 mL/10–20 min; Na after each; ≤3×; aim ↑4–6[1,2,9]

If not: volume status + urine Osm/Na?

	Hypovolemic UNa ≤30 if GI	**Euvolemic** UNa >30	**Hypervolemic** UNa ≤30	**Low urine Osm** UOsm ≤100
CAUSES	• Vomiting, diarrhea, third-spacing • Thiazides; cerebral salt wasting • **Primary adrenal insufficiency**	• **SIADH: lung, CNS, cancer** • Drugs: SSRIs, carbamazepine; pain • **Low cortisol; severe hypothyroid**	• Heart failure • Cirrhosis • Nephrotic syndrome; advanced CKD	• Primary polydipsia • Low solute: beer, tea and toast
CLUES	• Orthostatic, dry mucosa, low JVP • UNa ≤30: extrarenal loss[1] • UNa >30: diuretic, adrenal, renal[1]	• UOsm >100, UNa >30, no diuretic[1] • FE urate >12% even on diuretics[7] • Na falls after normal saline[9]	• Edema, ascites, raised JVP • UNa ≤30 unless diuretics or CKD[1]	• UOsm ≤100 mOsm/kg[1] • Psychiatric illness; large intake • Beer, poor diet: high demyelination risk[6]
WORKUP	• Urine Na before giving fluids[1] • AM cortisol, K; ACTH stim if low	• TSH, AM cortisol before SIADH label[1] • CXR; CT head if neuro signs	• BNP, echo; liver tests, albumin • Creatinine, urine protein	• Diet and fluid intake history • UOsm ≈ last 2 digits of SG × 30[9]
MANAGE	• Isotonic saline; stop thiazide[1] • Adrenal crisis: IV hydrocortisone 100 mg[9] • UOP >100 mL/h: DDAVP ± D5W[1,9]	• Fluid restrict 1–1.5 L/d; treat cause[9] • Urea 0.25–0.5 g/kg/d, or NaCl + loop[1,3] • Avoid normal saline in SIADH[9]	• Fluid restriction[1] • Loop diuretic if overloaded[1] • Treat the heart, liver or kidney	• Restrict water; add solute slowly[9] • Corrects fast: watch Na and UOP[6,9] • DDAVP clamp if rising too fast[9]

Stethopedia
stethopedia.ca/approach/hyponatremia

Evidence [1] Spasovski 2014, Eur J Endocrinol [2] Verbalis 2013, Am J Med [3] Hoorn 2017, J Am Soc Nephrol [4] Adrogué 2022, JAMA [5] Baek 2021, JAMA Intern Med [6] George 2018, Clin J Am Soc Nephrol [7] Fenske 2008, J Clin Endocrinol Metab [8] Hillier 1999, Am J Med [9] Manual 2024–25, pp. 104, 107, 182