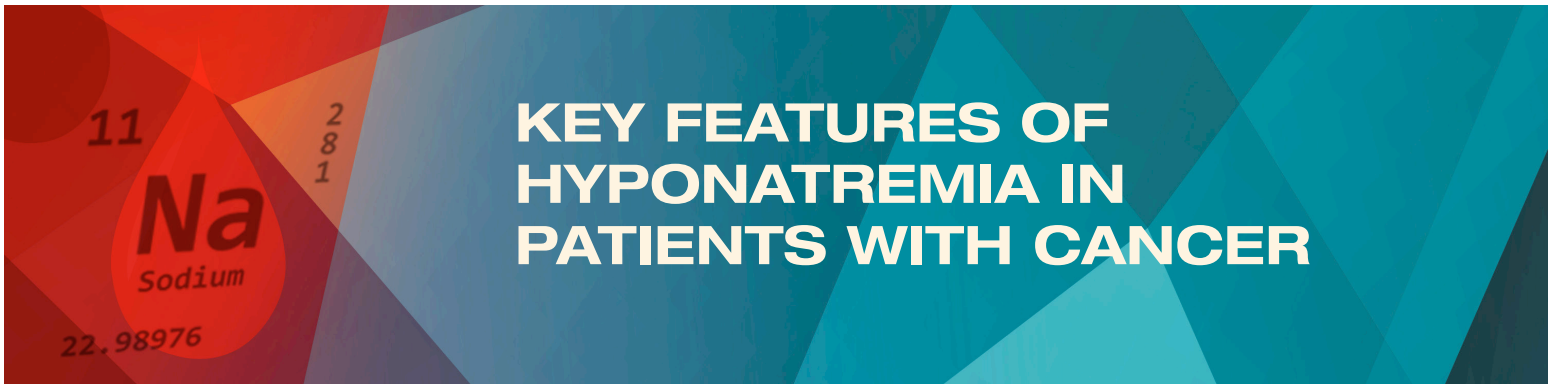



# KEY FEATURES OF HYPONATREMIA IN PATIENTS WITH CANCER

## CLASSIFICATION OF HYPONATREMIA[1,2]

***Tonicity***

- Most important if **hypotonic** (sodium plus plasma osmolality reduced)
- Always obtain a plasma osmolality with plasma sodium level

***Severity of decrease in sodium level***

- **Mild:** 130-134 mEq/L
- **Moderate:** 125-129 mEq/L
- **Severe:** <125 mEq/L

***Neurologic symptoms***

- **Mild:** headache, irritability, depression, decreased mood
- **Moderate:** mental slowing, confusion, delirium, vomiting
- **Severe:** obtundation, coma, seizures, respiratory arrest, potentially death
  - Generally acute hyponatremia (<48 hours duration)

## CAUSES OF HYPONATREMIA[1]

- Often multifactorial
- Syndrome of inappropriate antidiuretic hormone secretion (SIADH)
  - Cancer cells may produce ectopic antidiuretic hormone
- Drugs (chemotherapy and others)
- Dehydration
- Hemodilution
- Renal dysfunction

## SYNDROME OF INAPPROPRIATE ANTIDIURETIC HORMONE SECRETION (SIADH) CRITERIA[3]

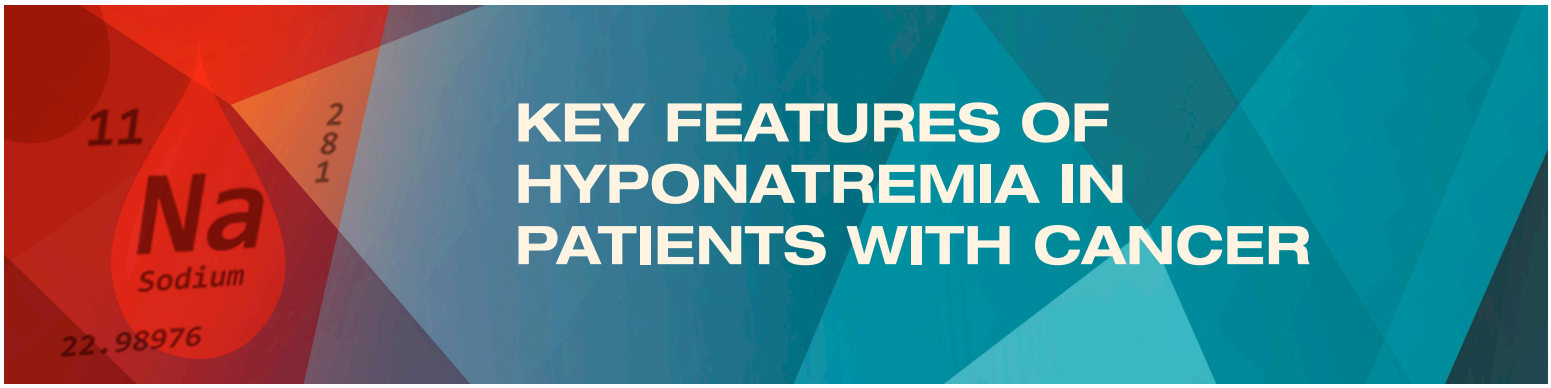
- True plasma hypoosmolality
- Urine concentration inappropriate for plasma osmolality
- ($U_{osm}$ >100 mOsm/kg $H_2O$)
- Clinical euvolemia, no diuretic therapy
- Absent renal sodium conservation ($U_{Na}$ >30 mEq/L)
- Normal thyroid, adrenal, and renal function

## APPROPRIATE INITIAL THERAPY WITH FLUID RESTRICTION[2]

- Restrict all fluid intake, not just water
- Aim for intake that is 500 mL/day below the 24-hour urine volume
- Do not restrict sodium or protein intake unless indicated

***Predictors of the likely failure of fluid restriction***

- High urine osmolality (>500 mOsm/kg $H_2O$)
- Urine $Na^+$ plus $K^+$ concentrations > serum $Na^+$
- 24-hour urine volume <1500 mL/day
- Increase in serum Na+ <2 mEq/L/day in 24-48 hours




# KEY FEATURES OF HYPONATREMIA IN PATIENTS WITH CANCER

## HYPERTONIC SALINE CORRECTION[2]

- Choose desired correction rate of plasma $Na^+$ (eg, 1.0 mEq/L/h)
- Obtain or estimate patient's weight (eg, 70 kg)
- Multiply weight X desired correction rate and infuse as mL/h of 3% NaCl (eg, 70 kg X 1.0 mEq/L/h = 70 mL/h infusion)
  **OR:**
- 100-200 mL bolus infusion (5-10 min) of 3% NaCl; repeat every 30 min until goal reached
- FOR ALL SALINE CORRECTIONS:
  - Monitor serum $Na^+$ and urine output every 2-4 hours during the active correction

## APPROPRIATE USE OF VASOPRESSIN RECEPTOR ANTAGONISTS[2]

- Patients who are not responsive to fluid restriction
- Patients with SIADH
- Patients who have a serum sodium <125 mEq/L or a higher sodium with symptoms of hyponatremia
- Not indicated for patients with depletional hyponatremia or cerebral salt wasting
- Exclude hypovolemic hyponatremia
- A vasopressin receptor antagonist is contraindicated in patients who are severely symptomatic (seizures, obtundation, coma, respiratory distress)
- Hepatic failure is a relative contraindication

## TREATMENT WITH VASOPRESSIN RECEPTOR ANTAGONIST[2]

- Initiate and re-initiate therapy only in a hospital
- During initiation and after titration, frequently monitor for changes in serum electrolytes and volume
- Measure serum sodium every 6 hours for the first 24 hours
- Aim for a correction of 6-8 mEq/L in the first 24 hours; too rapid correction of serum sodium can cause serious neurologic sequelae
- Avoid fluid restriction during first 24 hours of therapy; allow fluids ad lib
- Advise patients that they can and should continue ingestion of fluid in response to thirst

**References**

1. Adrogué HJ, Madias NE. Hyponatremia. *N Engl J Med*. 2000;342(21):1581-1589.
2. Verbalis JG, et al. Diagnosis, evaluation, and treatment of hyponatremia: expert panel recommendations. *Am J Med.* 2013;126(10 Suppl 1):S1-S42.
3. Bartter FC, Schwartz WB. The syndrome of inappropriate secretion of antidiuretic hormone. *Am J Med.* 1967;42(5):790-806.



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