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# ELDER CARE

A Resource for Interprofessional Providers

## Hyponatremia in Older Adults: Diagnosis

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### Prevalence

Hyponatremia, defined as serum sodium level less than 135mEq/L, is one of the most common electrolyte abnormalities seen in older adults. In one study, more than 50% of patients in acute geriatric wards were found to have hyponatremia. Chronic hyponatremia has been reported in 18% of nursing home residents.

### Why is the Prevalence Increased in Older Adults?

A number of factors contribute to the high prevalence of hyponatremia in older adults (Table 1.)

**Table 1. Factors Contributing to the Increased Prevalence of Hyponatremia in Older Adults**

- Decreased total body water content
- Decreased urinary concentrating and diluting ability
- Decreased aldosterone levels
- Higher rates of dehydration and malnutrition
- Increased levels of arginine vasopressin
- Lower sensitivity of thirst mechanisms
- Use of medications associated with hyponatremia (some common medications are listed here)
  - ◊ Thiazide diuretics
  - ◊ Selective serotonin reuptake inhibitors (SSRIs)
  - ◊ Neuroleptics (antipsychotic drugs)
  - ◊ Carbamazepine
  - ◊ Amiodarone

### Why is Hyponatremia Important?

Long-standing or slowly developing chronic hyponatremia may be asymptomatic but is associated with increased osteoclastic activity leading to bone demineralization and fractures. Symptoms of acute hyponatremia vary depending on the degree of hyponatremia and rapidity with which it develops (Table 2). Those with severe acute hyponatremia can develop cerebral edema. Less severe cases are associated with confusion, functional and cognitive decline, and gait disturbances that can lead to falls. Patients with hyponatremia also have increased mortality rates and longer hospitalizations.

**Table 2. Common Clinical Manifestations of Acute Hyponatremia**

<i>Mild (Sodium Level 130-134 mEq/L)</i>	<i>Moderate (Sodium Level 125-129 mEq/L)</i>	<i>Severe (Sodium Level &lt;125 mEq/L)</i>
<ul style="list-style-type: none"> <li>• Anorexia</li> <li>• Cramping</li> <li>• Nausea</li> <li>• Vomiting</li> <li>• Headache</li> <li>• Irritability</li> </ul>	<ul style="list-style-type: none"> <li>• Disorientation</li> <li>• Confusion</li> <li>• Weakness</li> <li>• Lethargy</li> </ul>	<ul style="list-style-type: none"> <li>• Seizures</li> <li>• Coma</li> <li>• Respiratory arrest</li> <li>• Brainstem herniation</li> <li>• Permanent brain damage</li> </ul>

### What Causes Hyponatremia?

Depending on a patient's volume status, hyponatremia is classified hypovolemic (low fluid volume status), euvolemic (normal volume status) or hypervolemic (increased volume status). Common causes of each of these forms of hyponatremia are shown in Table 3, but in older adults, the cause is often multifactorial. The algorithm (next page) and the items in Table 4 show the general approach to identifying the cause.

**Table 3. Common Causes of Hyponatremia**

<i>Hypovolemic</i>	<i>Euvolemic</i>	<i>Hypervolemic</i>
<ul style="list-style-type: none"> <li>• Inadequate fluid intake or replacement</li> <li>• Diarrhea</li> <li>• Vomiting</li> <li>• Renal salt wasting</li> <li>• Burns, with skin loss of fluid</li> <li>• Mineralocorticoid deficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Syndrome of inappropriate anti-diuretic hormone secretion</li> <li>• Medications</li> <li>• Hypothyroidism</li> <li>• Fluid loss with inappropriate salt replacement</li> <li>• Glucocorticoid deficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Cardiac failure</li> <li>• Nephrotic syndrome</li> <li>• Chronic kidney disease</li> <li>• Acute kidney injury</li> <li>• Cirrhosis</li> </ul>

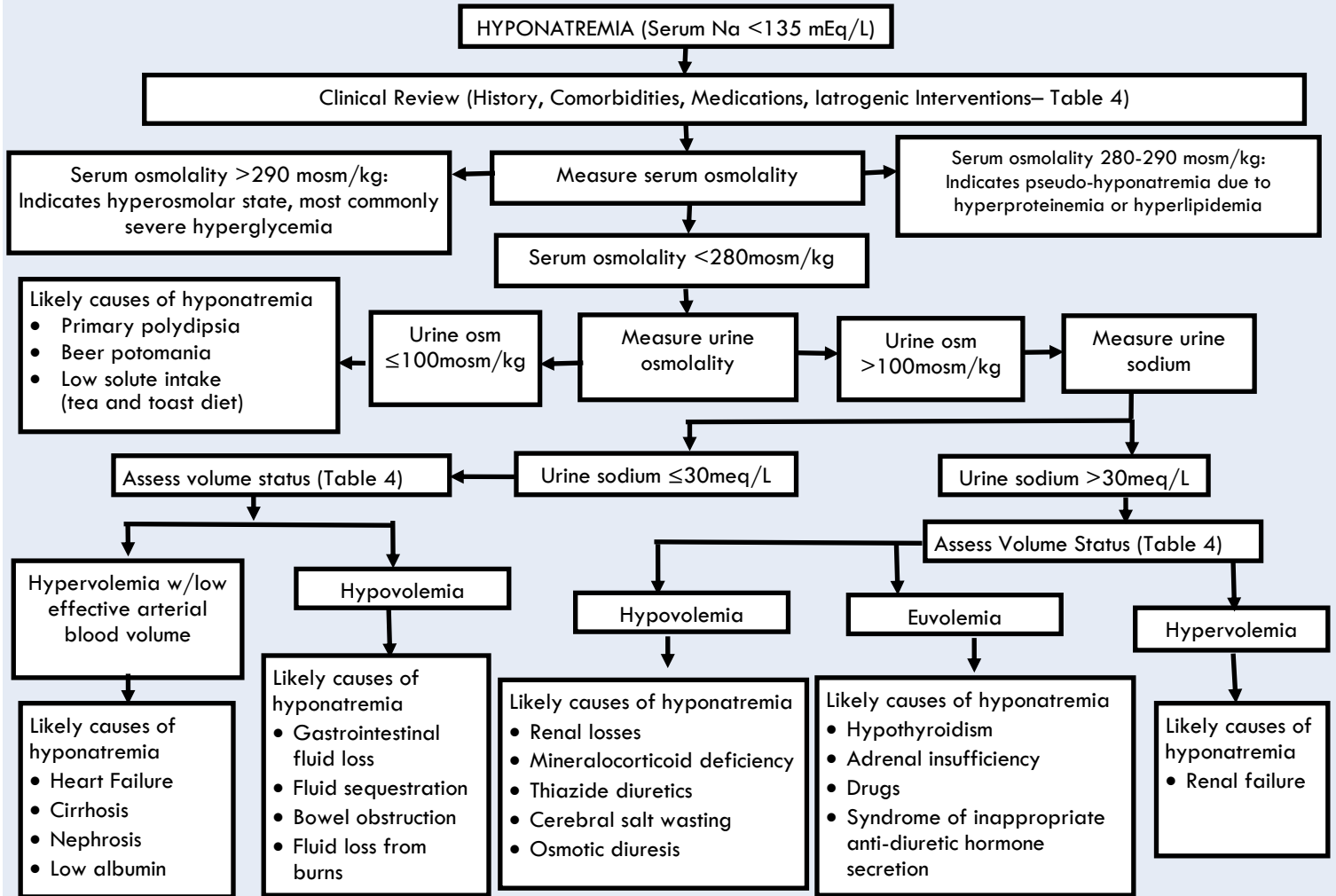
### TIPS ABOUT HYPONATREMIA IN OLDER ADULTS

- Hyponatremia, one of the most common electrolyte abnormalities in older adults, is associated with falls, cognitive decline, osteoporosis, fractures, and increased hospital stays and mortality rates. Acute changes are associated with more severe symptoms; severe acute hyponatremia can cause cerebral edema and brainstem herniation.
- Be sure to ask about whether the patient is taking medications associated with hyponatremia (see Table 1).
- Key factors determining the cause of hyponatremia are a patient's volume status (hypovolemia, euvolemia, or hypervolemia) and measurements of serum osmolality and urine osmolality (see algorithm).

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## Algorithm to Determine The Cause of Hyponatremia in Older Adults



**Table 4. Components of the History and Physical in Older Adults with Hyponatremia to Aid in Identifying the Cause**

<b>Review Hospital Records</b>	Use of hypotonic fluids, medications, surgical history, pain assessment, recent interventions (transurethral resection of prostate, use of hypertonic fluids)
<b>Medical History</b>	Vomiting, diarrhea, heart failure, pulmonary disease, liver disease, renal failure, thyroid, neurological disorders, falls, cognitive impairment, adrenal disorders
<b>Medication Use</b>	Diuretics, SSRIs, neuroleptics (anti-psychotics), carbamazepine, and amiodarone are common causes. But, check prescribing information for all medication a patient is taking to determine potential to cause hyponatremia.
<b>Social History</b>	Living conditions, diet, alcohol
<b>Psychiatric History</b>	Abnormal water intake
<b>Assessment of Volume Status</b>	Signs of hypervolemia = peripheral edema, pulmonary rales Signs of hypovolemia = orthostatic hypotension, tachycardia, dry axillae

### References and Resources

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