MAYO CLINIC LABORATORIES

Test Definition: UOSMS

Osmolality, Serum

Overview

Useful For
Evaluating acutely ill or comatose patients

Method Name
Freezing Point Depression

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required
Collection Container/Tube:
Preferred: Red top
Acceptable: Serum gel
Submission Container/Tube: Plastic vial
Specimen Volume: 2 mL
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Forms
If not ordering electronically, complete, print, and send a Renal Diagnostics Test Request (T830) with the specimen.

Specimen Minimum Volume
0.25 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Ambient	24 hours	

	Frozen	7 days	

Clinical & Interpretive

Clinical Information

Osmolality is a measure of the number of dissolved solute particles in solution. It is determined by the number and not by the nature of the particles in solution.

Dissolved solutes change the physical properties of solutions, increasing the osmotic pressure and boiling point and decreasing the vapor pressure and freezing point.

Serum osmolality increases with dehydration and decreases with overhydration. The patient receiving intravenous fluids should have a normal osmolality. If the osmolality rises, the fluids contain relatively more electrolytes than water. If the osmolality falls, relatively more water than electrolytes is being administered.

Normally, the ratio of serum sodium, in mEq/L, to serum osmolality, in mOsm/kg, is between 0.43 and 0.5. The ratio may be distorted in drug intoxication.

Generally, the same conditions that decrease or increase the serum sodium concentration affect the osmolality.

A comparison of measured and calculated serum osmolality produces a delta-osmolality. If this is above 40 mOsm/kg H_2O in a critically ill patient, the prognosis is poor.

An easy formula to calculate osmolality is:

$$\text{Osmolality (mOsm/kg } H_2O) = 2\,Na^+ + \frac{\text{Glucose}}{20} + \frac{\text{BUN}}{3}$$

Reference Values

275-295 mOsm/kg

Interpretation

An increased gap between measured and calculated osmolality may indicate ingestion of poison, ethylene glycol, methanol, or isopropanol.

Cautions

No significant cautionary statements

Clinical Reference

1. Murphy JE, Henry JB: Evaluation of renal function, and water, and electrolyte, and acid base balance. In: Henry JB, ed: Todd-Sanford-Davidsohn Clinical Diagnosis and Management by Laboratory Methods. 19th ed. WB Saunders Company; 2006

2. Delaney MP, Lamb EJ: Kidney disease. In: Rifai N, Horvath AR, Wittwer CT, eds: Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:1306

Performance

Method Description
The depression of the freezing point of serum or other fluid is used to measure osmolality in most osmometers. The extent of lowering below 0 degrees C (the freezing point of water) is a function of the concentration of substances dissolved in the serum. By definition, 1 milliosmole per kilogram lowers the freezing point 0.001858 degrees C.(Schindler EI, Brown SM, Scott MG: Electrolytes and blood gases. In: Rifai N, Horvath AR, Wittwer CT, eds: Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:610-612)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
1 day

Specimen Retention Time
7 Days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

Fees & Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification
This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information
83930

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value

UOSMS	Osmolality, S	2692-2

Result ID	Test Result Name	Result LOINC® Value
UOSMS	Osmolality, S	2692-2