MAYO CLINIC LABORATORIES

Test Definition: FRUCT

Fructosamine, Serum

Overview

Useful For
Monitoring intermediate (1-3 weeks) glycemic control

Monitoring glycemic control in patients with shortened red blood cell survival

Method Name
Colorimetric

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required
Supplies: Sarstedt 5 mL Aliquot Tube (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions:
1. Serum gel tubes should be centrifuged within 2 hours of collection.
2. Red-top tubes should be centrifuged and the serum aliquoted into a plastic vial within 2 hours of collection.

Forms
If not ordering electronically, complete, print, and send General Request (T239) with the specimen.

Specimen Minimum Volume
0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Ambient	72 hours	
	Frozen	60 days	

Clinical & Interpretive

Clinical Information

Fructosamine is a general term, which applies to any glycated protein. It is formed by the nonenzymatic reaction of glucose with the alpha- and epsilon-amino groups of proteins to form intermediate compounds called aldimines. These aldimines may dissociate or undergo an Amadori rearrangement to form stable ketoamines called fructosamines. This nonenzymatic glycation of specific proteins in vivo is proportional to the prevailing glucose concentration during the lifetime of the protein. Therefore, glycated protein measurement in a patient with diabetes is felt to be a better monitor of long-term glycemic control than individual or sporadic glucose determinations. The best known of these proteins is glycated hemoglobin, which is often measured as hemoglobin A1c, and reflects glycemic control over the past 6 to 8 weeks. In recognition of the need for a measurement that reflects intermediate-term glycemic control and was easily automated, a nonspecific test, termed fructosamine, was developed. Since albumin is the most abundant serum protein, it accounts for 80% of the glycated serum proteins, and thus, a high proportion of the fructosamine. Although a large portion of the color generated in the reaction is contributed by glycated albumin, the method will measure all proteins, each with a different half-life and different levels of glycation.

Reference Values

200-285 mcmol/L

Interpretation

In general, fructosamine reflects glycemic control in diabetic patients over the previous 1 to 3 weeks. High values indicate poor control.

All glycated proteins are measured by this method, with glycated albumin contributing a large portion.

Cautions

Since the assay is nonspecific, color may be generated by compounds other than glycated proteins. Interferences are seen from ascorbic acid (vitamin C) and elevated bilirubin values.

However, the second-generation assays have been shown to be highly specific for glycated proteins.

Fasting blood glucose and hemoglobin A1c are the usual and preferred means of monitoring glycemic control.

Clinical Reference

1. Sacks DB: Diabetes mellitus. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:1194-1197
2. Masharani U, German MS: Pancreatic hormones and diabetes mellitus. In: Gardner DG, Shoback D, eds. Greenspan's Basic and Clinical Endocrinology. 9th ed. McGraw; 2018:46-47

3. Austin GE, Mullins RH, Morin LG: Non-enzymatic glycation of individual plasma proteins in normoglycemic and hyperglycemic patients. Clin Chem. 1987;33:2220-2224
4. Schleicher ED, Mayer R, Wagner EM, Gerbitz KD: Is serum fructosamine assay specific for determination of glycated serum protein? Clin Chem. 1988;34:320-323

Performance

Method Description
Colorimetric test by reaction with nitroblue tetrazolium. The colorimetric test for fructosamine (glycated protein) is based on the ability of ketoamines to reduce nitroblue tetrazolium in alkaline medium. The rate of formation of formazan is directly proportional to the fructosamine concentration and is measured photometrically.(Package insert: Fructosamine reagent. Roche Diagnostics; 06/2023)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
Same day/1 to 2 days

Specimen Retention Time
1 week

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
82985

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
FRUCT	Fructosamine, S	15069-8

Result ID	Test Result Name	Result LOINC® Value
FRUCT	Fructosamine, S	15069-8