MAYO CLINIC LABORATORIES

# Test Definition: SVISC

Viscosity, Serum

## Overview

### Useful For

Detection of increased viscosity

Monitoring patients with hyperviscosity syndrome

This test is **not useful for** patients with small concentrations of monoclonal proteins.

### Method Name

Capillary Measurement

### NY State Available

Yes

## Specimen

### Specimen Type

Serum Red

### Specimen Required

**Collection Container/Tube:** Red top (serum gel/SST are **not acceptable**)
**Submission Container/Tube:** Plastic vial
**Specimen Volume:** 3 mL
**Collection Instructions:**
1. Keep specimen at 37 degrees C (eg, 37 degrees C Thermopak, heat block) until after centrifugation.
2. Centrifuge and aliquot serum into plastic vial.

### Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:
-Benign Hematology Test Request Form (T755)
-Hematopathology/Cytogenetics Test Request (T726)

### Specimen Minimum Volume

0.75 mL

### Reject Due To

| | |
|---|---|
| Gross hemolysis | OK |
| Gross lipemia | OK |
| Gross icterus | OK |

### Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---|---|---|---|
| Serum Red | Refrigerated (preferred) | 28 days | |
| | Ambient | 14 days | |
| | Frozen | 28 days | |

## Clinical & Interpretive

### Clinical Information

Viscosity is the property of fluids to resist flow. Hyperviscosity may be manifested by nasal bleeding, blurred vision, headaches, dizziness, nystagmus, deafness, diplopia, ataxia, paresthesias, or congestive heart failure. Funduscopic examination reveals dilation of retinal veins and flame shaped retinal hemorrhages.

The most common cause of serum hyperviscosity is the presence of large concentrations of IgM monoclonal proteins, and Waldenstrom macroglobulinemia accounts for 80% to 90% of hyperviscosity cases. Hyperviscosity syndrome can also occur in multiple myeloma patients.

Because the ability of a monoclonal protein to cause hyperviscosity is affected by its concentration, molecular weight, and aggregation, sera with concentrations of monoclonal IgM greater than 4 g/dL, IgA greater than 5 g/dL, or IgG greater than 6 g/dL should be tested for hyperviscosity.

Serum viscosity and electrophoresis are recommended before and after plasmapheresis in order to correlate viscosity and M-spike with patient symptoms. This correlation may be useful for anticipating the need for repeat plasmapheresis.

### Reference Values

< or =1.5 centipoises

### Interpretation

Although viscosities greater than 1.5 centipoises (cP) are abnormal, hyperviscosity is rarely present unless the viscosity is greater than 3 cP.

### Cautions

Failure to follow specimen handling instructions may cause false-low results.

Hyperviscosity syndrome may not be present even if the viscosity is greater than 3 centipoises.

### Clinical Reference

1. Gertz MA, Kyle RA: Hyperviscosity syndrome. J Intensive Care Med. 1995;10:128-141
2. Gertz MA: Acute hyperviscosity: syndromes and management. Blood. 2018;132(13):1379-1385
3. Kesmarky G, Kenyeres P, Rabai M, Toth K: Plasma viscosity: a forgotten variable. Clin Hemorheol Microcirc. 2008;39(1-4):243-246
4. Wood AW: Rheology of blood. In: Physiology, Biophysics, and Biomedical Engineering. CRC Press; 2012:217-233

## Performance

### Method Description

The Benson BV200 automated viscometer employs vacuum pressure through a capillary to measure the dynamic viscosity of serum samples. Samples at ambient temperature are aspirated by the sample probe, which is heated to 37 degrees C. Viscosity results are calculated by the instrument at both 25 degrees C and 37 degrees C temperature points. Viscosity units on board the instrument are mPa.s (milli-pascal seconds), which is the International Standard (SI) unit for viscosity. Centipoise (cP) units are named after French physicist Jean Leonard Marie Poiseuille and are used in the centimeter-gram-second (CGS) system of units. 1 mPa.s is equal to 1 cP.(Instruction manual: BV200 Automated Clinical Viscometer User Manual. Benson Viscometers; Ver. 1.5, 02/2020)

### PDF Report

No

### Day(s) Performed

Monday through Friday

### Report Available

1 to 3 days

### Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

## 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 modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

### CPT Code Information

85810

### LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|

| | | |
|---|---|---|
| SVISC | Viscosity, S | 3128-6 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| SVISC | Viscosity, S | 3128-6 |