MAYO CLINIC LABORATORIES

Test Definition: TPSF

Protein, Total, CSF

Overview

Useful For
Detecting disruptions of the blood-brain barrier or intrathecal synthesis of immunoglobulins

Method Name
Reflectance Spectrophotometry

NY State Available
Yes

Specimen

Specimen Type
CSF

Specimen Required
Container/Tube: Sterile vial

Specimen Volume: 1 mL

Collection Instructions: Centrifuge specimen to remove any cellular material.

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

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Minimum Volume
0.25 mL

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
CSF	Refrigerated (preferred)		
	Frozen	180 days	

Clinical & Interpretive

Clinical Information
Cerebrospinal fluid (CSF) proteins are those that remain in CSF following the ultrafiltration of plasma through the choroidal capillary wall. Some proteins that are unique to CSF are synthesized in the central nervous system. In general, diseases that interrupt the integrity of the capillary endothelial barrier lead to an increase in the total CSF protein. CSF protein is generally increased in all types of meningitis, cerebral infarction, brain abscess, meningovascular syphilis,

subarachnoid hemorrhage, some brain tumors, trauma to the brain, some cases of multiple sclerosis, encephalomyelitis, and degenerative neurologic diseases. A decreased CSF protein may occur in water intoxication, CSF leak (CSF rhinorrhea or otorrhea), and hyperthyroidism.

Reference Values

> or =12 months: 0-35 mg/dL
Reference values have not been established for patients that are <12 months of age.

Interpretation

Striking elevations of cerebrospinal fluid (CSF) total protein are noted in bacterial meningitis; smaller elevations occur in the other inflammatory diseases and with tumor or hemorrhage. The effect of any of these conditions is that the proportions of specific proteins in CSF increasingly resemble serum.
In order to assess increased permeability or increased intrathecal production of proteins, simultaneous serum specimen and CSF specimens should be taken.

Cautions

Increased cerebrospinal fluid (CSF) total protein is sensitive, but not specific, for detecting disruptions of the blood-brain barrier or intrathecal synthesis of immunoglobulins.
The presence of hemoglobin in CSF will cause an increase in measured total protein by this method. Internal validation studies have been conducted to estimate the contribution of hemolysis to the measured total protein concentration, and are appended to the result as a comment in these situations. Results should be interpreted with caution as hemolysis may be present due to traumatic lumbar puncture or due to a CNS hemorrhagic process.
Specimens should be collected prior to the intrathecal administration of contrast media. Significant positive bias can occur when CSF contains contrast media. Examples of contrast media include Iopamidol, Iohexol, and Metrizamide.
Blood in the CSF specimen invalidates the protein value.

Clinical Reference

1. Tietz Textbook of Clinical Chemistry. Fourth edition. Edited by CA Burtis, ER Ashwood, DE Bruns. Philadelphia, WB Saunders Company, 2006
2. Killingsworth LM: Clinical applications of protein determinations in biological fluids other than blood. Clin Chem 1982;28:1093-1103
3. Henryâ€™s Clinical Diagnosis and Management by Laboratory Methods. Cerebrospinal, synovial, and serous body fluids. Edited by McPherson and Pincus. Philadelphia, WB Saunders Co, 2007, 431-435

Performance

Method Description

Patient sample is deposited on the slide and is evenly distributed by the spreading layer. Protein in the sample forms a complex with cupric ion and results in the dissociation of the cupric ion from the copper-azo dye complex. The decrease of the copper-azo dye complex is measured by the reflectance spectrophotometry and is proportional to the concentration of proteins in the sample.(Package insert: Vitros Chemistry Products Instructions for Use-PROT Slides, Ortho-Clinical Diagnostics, Inc. Rochester, NY 14626)

PDF Report

No

Specimen Retention Time

7 days

Performing Laboratory Location

Rochester

Fees & Codes

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

84157