MAYO CLINIC LABORATORIES

Test Definition: BTP

Beta-Trace Protein, Body Fluid

Overview

Useful For
Determining the presence of cerebrospinal fluid in body fluids

Method Name
Nephelometry

NY State Available
Yes

Specimen

Specimen Type
Body Fluid

Ordering Guidance
This test should be ordered for evaluation of suspected spinal fluid leak in a body fluid.

For evaluation of central nervous system inflammation and B-cell proliferative diseases, order B2MC / Beta-2-Microglobulin (Beta-2-M), Spinal Fluid.

Additional Testing Requirements
If specimens are collected from multiple sites on the body (ie, left and right), each specimen must be sent under a separate order.

Specimen Required
Specimen Type: Body fluid
Collection Container/Tube:
Preferred: Sterile container, syringe (with needle removed), test tube, or microtube
Acceptable: Plain cotton swab, pledget, gauze, or facial tissue
Specimen Volume: 0.5 mL
Collection Instructions:
1. If submitting a syringe, remove the needle. Add cap to end of syringe.
2. If direct collection is not feasible, specimen may be collected using a plain cotton swab, pledget, gauze or facial tissue.
 a. For gauze or facial tissue: circle area on the gauze where specimen was collected.
 b. For swab, pledget, gauze or facial tissue: place in a small container (plain test tube or sterile container).
3. **Do not** collect specimen with a culture swab.
4. **Do not** add any additional liquid other than source to the swab or gauze.
5. **Do not** collect or send swab or gauze specimens in containers with additional liquids or additives.
Additional Information:

1. Although results may be obtainable on smaller specimens (perhaps as little as 0.05 mL, depending on the protein concentrations and percentage of spinal fluid in the specimen), reliable results are best obtained with an adequate specimen volume.
2.Specimens collected with additives such as microbiology media (eg, Stuart or Amies liquid medium) or TransFix/EDTA (used for analyses in flow cytometry) yield uninterpretable results and will be rejected.

Specimen Minimum Volume

See Specimen Required

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK
Specimens with additives (eg, microbiology transport media, TransFix/EDTA)	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Body Fluid	Refrigerated (preferred)	14 days	
	Ambient	7 days	
	Frozen	30 days	

Clinical & Interpretive

Clinical Information

The diagnosis of cerebrospinal fluid (CSF) rhinorrhea or otorrhea (leakage of CSF into the nose or ear canal, usually as a result of head trauma, tumor, congenital malformation, or surgery) is often difficult to confirm. Traditional chemical analyses (eg, glucose, protein, specific gravity) are unreliable. Radiographic studies, especially those involving the injection of dyes or radiographic compounds, are costly and may introduce additional risks to the patient. Prompt diagnosis and localization facilitates appropriate decisions and decreases the risk of meningitis.

Beta-trace protein (prostaglandin D synthase) is one of the most abundant proteins in CSF and has a very low concentration in other body fluids. Elevated concentrations of beta-trace protein in body fluid or drainage are consistent with CSF leakage.

Reference Values

Beta-trace protein concentration <5 mg/L is negative for cerebrospinal fluid
Beta-trace protein concentration 5-7 mg/L is indeterminate for presence of cerebrospinal fluid
Beta-trace protein concentration >7 mg/L is consistent with the presence of cerebrospinal fluid

Interpretation

Beta-trace protein is produced within the cerebrospinal fluid (CSF) and typically has a greater than 10-fold higher concentration in the CSF versus blood plasma.

Beta-trace protein concentrations above 7 mg/L are 84% sensitive and 97% specific for the presence of CSF.

Cautions

Interferences by rheumatoid factors are generally suppressed by the use of the N BTP (beta trace protein) Supplementary Reagent.

Low volume of cerebrospinal fluid specimens may reduce the beta trace protein recovery.

Clinical Reference

1. Mantur M, Lukaszewicz-Zajac M, Mroczko B, et al. Cerebrospinal fluid leakage-reliable diagnostic methods. Clin Chim Acta. 2011;412(11-12):837-840. doi:10.1016/j.cca.2011.02.017
2. Risch L, Lisec I, Jutzi M, Podvinec M, Landolt H, Huber AR. Rapid, accurate and non-invasive detection of cerebrospinal fluid leakage using combined determination of B-trace protein in secretion and serum. Clin Chim Acta. 2005;351(1-2):169-176. doi:10.1016/j.cccn.2004.09.008
3. Bernasconi L, Potzl T, Steuer C, Dellweg A, Metternich F, Huber AR. Retrospective validation of a B-trace protein interpretation algorithm for the diagnosis of cerebrospinal fluid leakage. Clin Chem Lab Med. 2017;55(4):554-560. doi:10.1515/cclm-2016-0442
4. Phang SY, Whitehouse K, Lee L, Khalil H, McArdle P, Whitfield PC. Management of CSF leak in base of skull fractures in adults. Br J Neurosurg. 2016;30(6):596-604. doi:10.1080/02688697.2016.1229746
5. Lipschitz N, Hazenfield JM, Breen JT, Samy RN. Laboratory testing and imaging in the evaluation of cranial cerebrospinal fluid leaks and encephaloceles. Curr Opin Otolaryngol Head Neck Surg. 2019;27(5):339-343. doi:10.1097/MOO.0000000000000578

Performance

Method Description

Polystyrene particles coated with antibodies to human B-trace protein are agglutinated when mixed with samples containing B-trace protein. The intensity of the scattered light in the nephelometer depends on the concentration of the analyte in the sample and consequently its concentration can be determined by comparison with dilutions of a standard of known concentration.(Package insert: N Latex BTP. Siemens; Rev 06. 10/2022)

PDF Report

No

Day(s) Performed

Monday through Friday

Test Definition: BTP

Beta-Trace Protein, Body Fluid

Report Available
1 to 3 days

Specimen Retention Time
14 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 was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information
83883

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
BTP	Beta-Trace Protein, BF	57733-8

Result ID	Test Result Name	Result LOINC® Value
BTPC	Beta-Trace Protein, BF	57733-8