

Overview

Useful For

Determining the presence of cerebrospinal fluid in body fluids

Method Name

Nephelometry

NY State Available

Yes

Specimen

Specimen Type

Body 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

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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

**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