Test Definition: BETA2

Beta-2 Transferrin: Detection of Spinal Fluid in Other Body Fluid

Overview

Useful For
Detection of spinal fluid in body fluids, such as ear or nasal fluid

Method Name
Electrophoresis/Immunofixation

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**.

Necessary Information
Indicate specimen source. Include whether the source is from the right or left side of the body, if applicable.

Specimen Required
Specimen Type: Body fluid
Sources: Nasal, otic, wound, etc
Container/Tube:
Preferred: Sterile container, syringe, test tube, or microtube
Acceptable: Plain cotton swab or gauze
Specimen Volume: 0.5 mL
Collection Instructions:
1. If submitting a syringe, remove needle. Add cap to end of syringe.
2. If direct collection is not feasible, specimen may be collected using a plain cotton swab or gauze.
3. If gauze is used to collect specimen, circle area on the gauze where specimen was collected.
4. Place cotton swab or gauze in as small a container as possible (eg, plain test tube or collection container).
5. **Do not** collect specimen with a culture swab.
6. **Do not** add any liquid to the swab or gauze.
Additional Information:
1. Specimens collected from above the shoulders risk salivary contamination, which can degrade the beta-2 transferrin protein. **These specimens should be frozen immediately** following collection and kept frozen until testing is performed.

2. 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.
3. 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

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Body Fluid	Frozen	14 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.

Transferrin that migrates in the beta-1 electrophoretic fraction (beta-1 transferrin) is found in most body fluids. Beta-2 transferrin is a CSF-specific variant of transferrin and is used as an endogenous marker of CSF leakage. Beta-2 transferrin is formed by loss of sialic acid due to the presence of neuraminidase in the central nervous system. Beta-2 transferrin has also been called CSF-specific transferrin and tau protein.

Prompt diagnosis and localization facilitates appropriate decisions and decreases the risk of meningitis.

Reference Values
Negative, no beta-2 transferrin (spinal fluid) detected

Interpretation
The cerebrospinal fluid (CSF) variant of transferrin is identified by its unique electrophoretic migration. If beta-1 and beta-2 transferrin are detected in drainage fluids, the specimen is presumed to be contaminated with CSF.

The presence of beta-2 transferrin band is detectable with as little as 2.5% spinal fluid contamination of body fluid.

Cautions
Beta-2 transferrin is also found in aqueous humor and in serum of patients with rare metabolic glycoprotein disorders or genetic variants of transferrin.

Specimens stored in storage tubes with TransFix/EDTA (used for analyses in flow cytometry) are **not** acceptable. The contact of cerebrospinal fluid with the stabilization solution contained in these tubes changes the migration and the

result cannot be interpreted.

Clinical Reference

1. Oberascher G. Cerebrospinal fluid otorrhea-new trends in diagnosis. Am J Otol. 1988;9(2):102-108
2. Normansell DE, Stacy EK, Booker CF, et al. Detection of beta-2 transferrin in otorrhea and rhinorrhea in a routine clinical laboratory setting. Clin Diag Lab Immunol. 1994;1(1):68-70. doi:10.1128/cdli.1.1.68-70.1994
3. Sanders EL, Clark RJ, Katzmann JA. Cerebrospinal fluid leakage: agarose gel electrophoresis detection of beta(2)-transferrin and nephelometric quantification of beta-trace protein. Clin Chem. 2004;50(12):2401-2403. doi:10.1373/clinchem.2004.040246
4. McCudden CR, Senior BA, Hainsworth S, et al. Evaluation of high resolution gel beta (2)-transferrin for detection of cerebrospinal fluid leak. Clin Chem Lab Med. 2013;51(2):311-315. doi:10.1515/cclm-2012-0408
5. O'Cearbhaill RM, Kavanagh EC. Beta-2 Transferrin and IR. J Vasc Interv Radiol. 2018;29(3):439. doi:10.1016/j.jvir.2017.10.002
6. Zervos TM, Macki M, Cook B, Schultz LR, Rock JP, Craig JR. Beta-2 transferrin is detectable for 14 days whether refrigerated or stored at room temperature. Int Forum Allergy Rhinol. 2018;8(9):1052-1055. doi:10.1002/alr.22136

Performance

Method Description

Specimens are electrophoresed using a high resolution 1% agarose gel, immunofixed with an antiserum to human transferrin that is conjugated with horseradish peroxidase. The immunoprecipitated transferrin bands are visualized with dimethyl sulfoxide. Although most body fluids contain transferrin, the beta 2 variant of transferrin is found exclusively in cerebrospinal fluid (CSF). If the sample is contaminated with CSF, transferrin will be visualized in the beta 1 and beta 2 zones. This reagent set is provided by Sebia.(Package insert: Hydrogel 6 CSF kit, Sebia; 07/2020; Meurman OH, Irjala K, Suonpaa J, Laurent B. A new method for the identification of cerebrospinal fluid leakage. Acta Otolaryngol. 1979;87(3-4):366-369; Reisinger PW, Hochstrasser K. The diagnosis of CSF fistulae on the basis of detection of beta-2 transferrin by polyacrylamide gel electrophoresis and immunoblotting. J Clin Chem Clin Biochem. 1989;27(3):169-172)

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

86335

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
BETA2	Beta-2 Transferrin, BF	13876-8

Result ID	Test Result Name	Result LOINC® Value
80351	Beta-2 Transferrin, BF	13876-8