MAYO CLINIC LABORATORIES

Test Definition: SFIG

Cerebrospinal Fluid IgG Index Profile, Serum and Spinal Fluid

Overview

Useful For

Aiding in the diagnosis of multiple sclerosis and other central nervous system inflammatory conditions

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
SFINC	IgG Index, CSF	No	Yes
SFIGS	IgG, S	No	Yes
ALBS1	Albumin, S	Yes, (order ALB)	Yes

Method Name

SFINC, SFIGS: Nephelometry
ALBS1: Photometric

NY State Available

Yes

Specimen

Specimen Type

CSF
Serum

Specimen Required

Both serum and spinal fluid are required.
-**Spinal fluid must be obtained within 7 days of serum collection.**
-**Two individual serum samples are required.**

Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: 2 Plastic vials
Specimen Volume: 2 mL Serum in 2 separate plastic vials (see Collection Instructions)
Collection Instructions: Within 2 hours of collection, centrifuge and aliquot serum into 2 plastic vials, each containing 1 mL.

Specimen Type: Spinal fluid

Container/Tube: Sterile vial
Preferred: Collection vial number 2
Specimen Volume: 1 mL
Collection Instructions: Label specimen as SFINC.

Specimen Minimum Volume

Serum: 1 mL in 2 plastic vials, each vial containing 0.5 mL; Spinal fluid: 0.5 mL

Reject Due To

Serum: Gross hemolysis	Reject
Serum: Gross lipemia	Reject
Serum: Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
CSF	Refrigerated (preferred)	28 days	
	Ambient	14 days	
	Frozen	28 days	
Serum	Refrigerated (preferred)	14 days	
	Ambient	7 days	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Elevation of IgG in the cerebrospinal fluid (CSF) of patients with inflammatory diseases of the central nervous system (CNS), such as multiple sclerosis, neurosyphilis, acute inflammatory polyradiculoneuropathy, and subacute sclerosing panencephalitis, may be due to local (intrathecal) synthesis of IgG.

The CSF index is the CSF IgG to CSF albumin ratio compared to the serum IgG to serum albumin ratio. The CSF index is, therefore, an indicator of the relative amount of CSF IgG compared to serum. Any increase in the index reflects IgG production in the CNS. The IgG synthesis rate is a mathematical manipulation of the CSF index data and can also be used as a marker for CNS inflammatory diseases. The test is commonly ordered with oligoclonal banding or immunoglobulin kappa free light chains in CSF to aid in the diagnosis of demyelinating conditions.

Reference Values

CEREBROSPINAL FLUID INDEX
CSF index: 0.00-0.70

CSF IgG: 0.0-8.1 mg/dL
CSF albumin: 0.0-27.0 mg/dL
Reference values have not been established for patients younger than 18 years.

SERUM IGG
0-4 months: 100-334 mg/dL
5-8 months: 164-588 mg/dL
9-14 months: 246-904 mg/dL
15-23 months: 313-1,170 mg/dL
2-3 years: 295-1,156 mg/dL
4-6 years: 386-1,470 mg/dL
7-9 years: 462-1,682 mg/dL
10-12 years: 503-1,719 mg/dL
13-15 years: 509-1,580 mg/dL
16-17 years: 487-1,327 mg/dL
> or =18 years: 767-1,590 mg/dL

SERUM ALBUMIN
> or =12 months: 3,500-5,000 mg/dL
Reference values have not been established for patients younger than 12 months.

CSF IgG/albumin: 0.00-0.21
Reference values have not been established for patients younger than 18 years.

Serum IgG/albumin: 0.0-0.4
CSF IgG synthesis rate: 0-12 mg/24 h
Albumin quotient: <14

Interpretation

Cerebrospinal fluid (CSF) IgG synthesis rate indicates the rate of increase in the daily CSF production of IgG in milligrams per day. A result greater than 12 mg/24 h is elevated.

A CSF IgG index greater than 0.70 is elevated and indicative of increased synthesis of IgG.

Cautions

The cerebrospinal fluid IgG index can be elevated in other inflammatory demyelinating diseases, such as neurosyphilis, acute inflammatory polyradiculoneuropathy, and subacute sclerosing panencephalitis.

Clinical Reference

1. Tourtellotte WW, Walsh MJ, Baumhefner RW, Staugaitis SM, Shapshak P. The current status of multiple sclerosis intra-blood-brain-barrier IgG synthesis. Ann N Y Acad Sci. 1984;436:52-67
2. Bloomer LC, Bray PF. Relative value of three laboratory methods in the diagnosis of multiple sclerosis. Clin Chem. 1981;27(12):2011-2013
3. Hische EA, van der Helm HJ. Rate of synthesis of IgG within the blood-brain barrier and the IgG index compared in the diagnosis of multiple sclerosis. Clin Chem. 1987;33(1):113-114

4. Thompson AJ, Banwell BL, Barkhof F, et al. Diagnosis of multiple sclerosis: 2017 revisions of the McDonald criteria. Lancet Neurol. 2018;17(2):162-173. doi:10.1016/S1474-4422(17)30470-2
5. Gurtner KM, Shosha E, Bryant SC, et al. CSF free light chain identification of demyelinating disease: comparison with oligoclonal banding and other CSF indexes. Clin Chem Lab Med. 2018;56(7):1071-1080. doi:10.1515/cclm-2017-0901
6. Rifai N, Chiu, RWK, Burnham, CD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023
7. Saadeh RS, Ramos PA, Algeciras-Schimnich A, Flanagan EP, Pittock SJ, Willrich MA. An update on laboratory-based diagnostic biomarkers for multiple sclerosis and beyond. Clin Chem. 2022;68(9):1134-1150

Performance

Method Description
Cerebrospinal fluid IgG and albumin, and serum IgG:
Cerebrospinal fluid (CSF) IgG, albumin, and serum IgG are determined by immunonephelometry. The CSF IgG index and synthesis rate are calculated and reported.(Instruction manual: Siemens BN II Nephelometer Operations. Siemens, Inc.; 07/2019)

Serum albumin:
Serum albumin is measured by colorimetry. At a pH value of 4.1, albumin displays a sufficiently cationic character to be able to bind with bromcresol green (BCG), an anionic dye, to form a blue-green complex. The color intensity of the blue-green color is directly proportional to the albumin concentration in the sample and is measured photometrically.(Package insert: Albumin reagent. Roche Diagnostics; 06/2024)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
2 to 5 days

Specimen Retention Time
See Individual Test IDs

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 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

82040
82042
82784 x 2

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
SFIG	CSF IgG Index Profile	14116-8

Result ID	Test Result Name	Result LOINC® Value
INDEX	IgG Index, CSF	14117-6
IGG_C	IgG, CSF	2464-6
ALB_C	Albumin, CSF	1746-7
AIGAC	IgG/Albumin, CSF	2470-3
SRATE	Synthesis Rate, CSF	14116-8
ALB_S	Albumin, S	1751-7
IGG_S	IgG, S	2465-3
AIGAS	IgG/Albumin, S	6782-7
ALBQ	Albumin Quotient, CSF/Serum	1756-6