MAYO CLINIC LABORATORIES

Test Definition: AN1TC

Antineuronal Nuclear Antibody-Type 1 (ANNA-1) Titer, Spinal Fluid

Overview

Useful For

Diagnosis of paraneoplastic autoimmune neuropathies, encephalomyeloradiculopathies, related neurologic disorders, and intestinal pseudo-obstruction/dysmotility associated with small-cell lung carcinoma

Reporting an end titer result from cerebrospinal fluid specimens

This test alone **should not be used as** a general screening test for carcinoma of the lung.

Testing Algorithm

If the indirect immunofluorescence pattern suggests antineuronal nuclear antibody-type 1 (ANNA-1), then this test will be performed at an additional charge.

Method Name

Only orderable as a reflex. For more information see:
-DMC2 / Dementia, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-ENC2 / Encephalopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-EPC2 / Epilepsy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-MDC2 / Movement Disorder, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-MAC1 / Myelopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-PCDEC / Pediatric Autoimmune Encephalopathy/CNS Disorder Evaluation, Spinal Fluid

Indirect Immunofluorescence Assay (IFA)

NY State Available

Yes

Specimen

Specimen Type

CSF

Ordering Guidance

Serum is preferred. Spinal fluid testing is particularly useful if interfering antibodies are present in the serum.

Necessary Information

Provide the ordering physician's name, phone number, mailing address, and e-mail address.

Specimen Required

Only orderable as a reflex. For more information see:
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-MDC2 / Movement Disorder, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
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Container/Tube: Sterile vial
Specimen Volume: 2 mL

Specimen Minimum Volume

1 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
CSF	Ambient	72 hours	
	Refrigerated (preferred)	28 days	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

A spectrum of paraneoplastic neurologic disorders is found with antineuronal nuclear antibody type1 (ANNA-1), also known as anti-Hu. Most frequent are neuropathies: mixed sensorimotor, pure sensory, predominantly autonomic, and least commonly, predominantly motor. Other manifestations include limbic encephalitis, subacute cerebellar degeneration, myelopathy, or radiculopathy.

Small-cell lung carcinoma (SCLC) is almost always present, although difficult to find. Thymoma or neuroblastoma are encountered rarely as the pertinent neoplasm.

ANNA-1 antibody is an extremely valuable marker of paraneoplastic intestinal dysmotilities associated with SCLC, ranging from gastroparesis to pseudo-obstruction.

ANNA-1 antibody is uncommon in patients with SCLC without a neuropathy, including patients with Lambert-Eaton

myasthenic syndrome or pure cerebellar ataxia.

ANNA-1 has been encountered in children with intestinal dysmotility, cerebellar ataxia, brain stem encephalitis, and myeloneuropathy with and without evident cancer (neuroblastoma).

Reference Values

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-DMC2 / Dementia, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
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-MDC2 / Movement Disorder, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
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<1:2
Neuron-restricted patterns of IgG staining that do not fulfill criteria for antineuronal nuclear antibody type 1 may be reported as "unclassified antineuronal IgG." Complex patterns that include nonneuronal elements may be reported as "uninterpretable."

Interpretation

This autoantibody is rarely found in adult patients without asbestos exposure, or a long history of tobacco use or passive exposure. Sixty-six percent of seropositive patients are female; small-cell lung carcinoma (SCLC) has been confirmed in 83% of those with adequate follow-up. In 15% of patients with confirmed SCLC, an unrelated and more obvious primary malignancy coexists with SCLC.

Antineuronal nuclear antibody type 1 is found before SCLC is diagnosed in 55% of cases.

Positron emission tomography (PET) scanning, magnetic resonance imaging of the chest, and transesophageal ultrasound sometimes reveal malignant adenopathy when computed tomography is negative. An extra pulmonary primary small-cell carcinoma (eg, skin, larynx, tongue, breast, cervix, prostate, endocrine, or pancreas) should be considered, especially in nonsmoking patients.

Autopsy sometimes reveals SCLC in patients who lack evidence of tumor in life.

Cautions

A cancer other than small-cell lung carcinoma (SCLC) may be found first but will coexist with SCLC in 15% of cases.

Antineuronal nuclear antibody type 1 (ANNA-1) is only 1 of 7 neuronal (or glial) nuclear or cytoplasmic autoantibodies that are currently recognized as a serological marker of neurologic autoimmunity associated with SCLC. The others are ANNA-2, ANNA-3, amphiphysin, Purkinje cell cytoplasmic autoantibody type 2, collapsin response-mediator protein-5 (CRMP-5-IgG), and antiglial nuclear antibody (AGNA).

Clinical Reference

1. Lucchinetti CF, Kimmel DW, Lennon VA: Paraneoplastic and oncological and profiles of patients seropositive for type 1 antineuronal nuclear autoantibodies. Neurology. 1998 Mar;50(3):652-657

2. Vernino S, Eggenberger ER, Rogers LR, Lennon VA: Paraneoplastic neurological autoimmunity associated with ANNA-1 autoantibody and thymoma. Neurology. 2002 Sep 24;59(6):929-932
3. Pranzatelli MR, McGee NR. Neuroimmunology of OMS and ANNA-1/anti-Hu paraneoplastic syndromes in a child with neuroblastoma. Neurol Neuroimmunol Neuroinflamm. 2017 Dec 22;5(2):e433. doi: 10.1212/NXI.0000000000000433
4. Horta ES, Lennon VA, Lachance DH, et al: Neural autoantibody clusters aid diagnosis of cancer. Clin Cancer Res. 2014 Jul 15;20(14):3862-3869

Performance

Method Description
The patient's sample is tested by a standardized immunofluorescence assay that uses a composite frozen section of mouse cerebellum, kidney, and gut tissues. After incubation with sample and washing, fluorescein-conjugated goat-antihuman IgG is applied. Neuron-specific autoantibodies are identified by their characteristic fluorescence staining patterns. Samples that are scored positive for any neuronal nuclear or cytoplasmic autoantibody are titrated to an endpoint. Interference by coexisting non-neuron-specific autoantibodies can usually be eliminated by serologic absorption.(Honorat JA, Komorowski L, Josephs KA, et al: IgLON5 antibody: neurological accompaniments and outcomes in 20 patients. Neurol Neuroimmunol Neuroinflamm 2017 Jul 18;4(5):e385. doi: 10.1212/NXI.0000000000000385)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
6 to 8 days

Specimen Retention Time
28 days

Performing Laboratory Location
Rochester

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

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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

86256

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
AN1TC	ANNA-1 Titer, CSF	94356-3

Result ID	Test Result Name	Result LOINC® Value
43440	ANNA-1 Titer, CSF	94356-3