Test Definition: AN1TC

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

Overview

Useful For

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

Serological evaluation of patients who present with a subacute neurological disorder of undetermined etiology, especially those with risk factors for primary lung carcinoma

Directing a focused search for cancer

Investigating neurological symptoms that appear during, or after, cancer therapy, and are not explainable my metastasis

Reporting an end titer result from cerebrospinal fluid specimens

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:
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Indirect Immunofluorescence Assay (IFA)

NY State Available

Yes

Specimen

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Specimen Type
CSF

Ordering Guidance
Both serum and spinal fluid testing are suggested. 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:
DMC2 / Dementia, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
ENC2 / Encephalopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
EPC2 / Epilepsy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
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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	Refrigerated (preferred)	28 days	
	Ambient	72 hours	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information
A spectrum of paraneoplastic neurologic disorders is associated with antineuronal nuclear antibody type1 (ANNA-1), also known as anti-Hu. ANNA-1 autoimmunity often manifests with multifocal neurological presentations. Typical presentations include neuropathies (mixed sensorimotor, sensory neuronopathy, autonomic neuropathy including gastrointestinal dysmotility/pseudo-obstruction or others), limbic encephalitis, cerebellar ataxia, encephalomyelitis, and

myelopathy. Small-cell lung carcinoma (SCLC) or other neuroendocrine tumors are almost always present in older adults, often as limited-stage disease. Extrapulmonary primary small-cell carcinoma, such as tumors of the skin, larynx, tongue, breast, cervix, prostate, endocrine, or pancreas, should be considered, especially in patients who do not smoke. Autopsy sometimes reveals SCLC in patients who lack evidence of tumor in life. In pediatric populations, neuroblastoma is sometimes encountered as the pertinent neoplasm. Other malignancies have also rarely been reported; in 15% of patients with confirmed SCLC, an unrelated and more apparent primary malignancy coexists with SCLC.

Reference Values

Only orderable as a reflex. For more information see:
DMC2 / Dementia, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
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Interpretation

Antineuronal nuclear antibody type 1 (ANNA-1) is highly specific for the presence of a paraneoplastic neurological syndrome and/or cancer. It has been detected in patients with small-cell lung carcinoma (SCLC) without evidence of neurological autoimmunity. It is detected before SCLC is diagnosed in half of the cases, and its presence suggests that the patient's neurological presentation is paraneoplastic. It is specific for the HuD or ELAVL4 antigen.

Cautions

A cancer other than small-cell lung carcinoma (SCLC) may be found first but will coexist with SCLC in 15% of cases. Presence of nonneural specific antibodies in a patient's specimen may hinder interpretation of antineuronal nuclear antibody type 1 (ANNA-1) results by tissue indirect immunofluorescence.

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;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;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;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;20(14):3862-3869
5. Zekeridou A. Paraneoplastic Neurologic Disorders. Continuum (Minneap Minn). 2024;30(4):1021-1051. doi:10.1212/CON.0000000000001449
6. Paramasivan NK, Masoud M, Karsten C, et al. Phenotypic and oncological insights in ANNA1 autoimmunity: Age stratification and biomarker analysis. Ann Clin Transl Neurol. 2025;12(2):280-290. doi:10.1002/acn3.52254

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Performance

Method Description

The patient's specimen is tested by a standardized immunofluorescence assay that uses a composite frozen section of mouse cerebrum, cerebellum, kidney, and gut tissues. After incubation with the specimen and washing, fluorescein-conjugated goat-antihuman IgG is applied. Neuron-specific autoantibodies are identified by their characteristic fluorescence staining patterns. Specimens that are scored positive for any neuronal nuclear or cytoplasmic autoantibody are titrated. Interference by coexisting non-neuron-specific autoantibodies can usually be eliminated by serologic absorption.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

6 to 8 days

Specimen Retention Time

2 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

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

86256

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value

Test Definition: AN1TC

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

AN1TC	ANNA-1 Titer, CSF	94356-3

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