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**Lab Dept:** Other Fluids

**Test Name:** ENCEPHALOPATHY AA/PARANEOPLASTIC EVALUATION, CSF (>= 18 y.o.)

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**General Information**

**Lab Order Codes:** ENC2

**Synonyms:** Encephalopathy Autoimmune Eval, Spinal Fluid

**CPT Codes:** 86255 x21 – Fluorescent noninfectious agent, antibody screen, each antibody  
86341 – Islet cell antibody

Possible reflex testing (at an additional charge):

84182 x7 – Western blot, with interpretation and report, each  
86255 x7 – Fluorescent noninfectious agent, antibody screen, each antibody  
86256 x 8 – Fluorescent noninfectious agent, titer, each antibody

**Test Includes:**

If the immunofluorescence (IFA) patterns suggest collapsin response-mediator protein-5-IgG (CRMP-5-IgG), then CRMP-5-IgG IFA titer and CRMP-5-IgG Western blot will be performed at an additional charge.

If the IFA patterns suggest amphiphysin antibody, then amphiphysin IFA titer and amphiphysin immunoblot will be performed at an additional charge.

If the IFA pattern suggests antiglial nuclear antibody (AGNA-1), then AGNA-1 IFA titer and AGNA-1 immunoblot will be performed at an additional charge.

If the IFA pattern suggests antineuronal nuclear antibody type 1 (ANNA-1), then ANNA-1 IFA titer, ANNA-1 immunoblot, and ANNA-2 immunoblot will be performed at an additional charge.

If the IFA pattern suggests ANNA-2 antibody, then ANNA-2 IFA titer, ANNA-1 immunoblot, and ANNA-2 immunoblot will be performed at an additional charge.

If the IFA pattern suggests Purkinje cytoplasmic antibody type 1 (PCA-1), then PCA-1 IFA titer and PCA-1 immunoblot will be performed at an additional charge.

If the IFA pattern suggests PCA-2 antibody, then PCA-2 IFA titer will be performed at an additional charge.

If the IFA pattern suggests PCA-Tr antibody, then PCA-Tr IFA titer and PCA-Tr immunoblot will be performed at an additional charge.

If the IFA pattern suggests IgLON5 antibody, then IgLON5 IFA titer and IgLON5 cell-binding assay (CBA) will be performed at an additional charge.

If AMPA (alpha-amino-3-hydroxy-5-methyl-4-isoxazole propionic acid) receptor antibody CBA is positive, then AMPA-receptor antibody IFA titer assay will be performed at an additional charge.

If gamma-aminobutyric acid B (GABA-B) receptor antibody CBA is positive, then GABA-B-receptor antibody IFA titer assay will be performed at an additional charge.

If the IFA pattern suggests glial fibrillary acidic protein (GFAP) antibody, then GFAP IFA titer and GFAP CBA will be performed at an additional charge.

If N-methyl-D-aspartate (NMDA) receptor antibody CBA is positive, then NMDA-receptor antibody IFA titer assay will be performed at an additional charge.

If the IFA pattern suggests dipeptidyl-peptidase-like protein-6 (DPPX) antibody, then DPPX antibody CBA and DPPX IFA titer will be performed at an additional charge.

If the IFA pattern suggests metabotropic glutamate receptor 1 (mGluR1) antibody, then mGluR1 antibody CBA and mGluR1 IFA titer will be performed at an additional charge.

If the IFA pattern suggests neuronal intermediate filament (NIF) antibody, then alpha internexin CBA, NIF heavy chain CBA, NIF light chain CBA, and NIF IFA titer will be performed at an additional charge.

If the IFA pattern suggests neurochondrin antibody, then neurochondrin antibody CBA and neurochondrin IFA titer will be performed at an additional charge.

If the IFA pattern suggests septin-7 antibody, then septin-7 antibody CBA and septin-7 IFA titer will be performed at an additional charge.

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## ***Logistics***

**Test indications:** This test is for patients 18 years of age or older. For patients less than 18 years old, order Peds Autoimmune CNS Disorders Eval, CSF (PCDEC).

Evaluating new onset encephalopathy (non-infectious or metabolic) comprising confusional states, psychosis,, delirium, memory loss, hallucinations, movement disorders, sensory or motor complaints, seizures, dyssomnias, ataxias, nausea, vomiting, inappropriate anti-diruresis, coma, dysautonomias, or hypoventilation in spinal fluid specimens.

The following accompaniments should increase suspicion for autoimmune encephalopathy:

- Headache
- Autoimmune stigmata (personal or family history or signs of diabetes mellitus, thyroid disorder, vitiligo, poliosis [premature graying], myasthenia gravis, rheumatoid arthritis, systemic lupus erythematosus)
- History of cancer
- Smoking history (20+ pack years) or other cancer risk factors
- Inflammatory cerebrospinal fluid (or isolated protein elevation)
- Neuroimaging signs suggest inflammation
- Evaluating limbic encephalitis
- Directing a focused search for cancer
- Investigating encephalopathy appearing in the course or wake of cancer therapy and not explainable by metastasis or drug effect

**Lab Testing Sections:** Other Fluids - Sendouts

**Referred to:** Mayo Clinic Laboratories – (Mayo test: ENC2)

**Phone Numbers:** MIN Lab: 612-813-6280

STP Lab: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** 8-12 days

**Special Instructions:** N/A

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### ***Specimen***

**Specimen Type:** CSF

**Container:** Screw-capped, sterile, plastic vial

**Draw Volume:** 4.0 mL (Minimum: 2.0 mL) CSF

**Processed Volume:** Same as Draw Volume

**Collection:** Routine CSF collection

**Special Processing:** Lab Staff: Use sterile technique to aliquot 4.0 (min: 2.0) mL CSF. Store and ship refrigerated in plastic vial.

Specimen stable refrigerated (preferred) or frozen for 28 days, ambient for 72 hours

**Patient Preparation:** None

**Sample Rejection:** Mislabeled or unlabeled specimens; gross hemolysis, lipema or icterus

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***Interpretive***

**Reference Range:**

Antibody:	Reference Range:
Encephalopathy, interpretation	N/A
AMPA-R Ab CBA	Negative
Amphiphysin Ab	Negative
Anti-Glial Nuclear Ab Type 1	Negative
Anti-Neuronal Nuclear Ab Type 1	Negative
Anti-Neuronal Nuclear Ab Type 2	Negative
Anti-Neuronal Nuclear Ab Type 3	Negative
CASPR-2 IgG CBA	Negative
CRMP-5-IgG	Negative
DPPX Ab IFA	Negative
GABA-B-R Ab CBA	Negative
GAD65 Ab Assay	< or = 0.02 nmol/L
GFAP IFA	Negative
IgLON5 IFA	Negative
LGI1-IgG CGA	Negative
mGluR1 Ab IFA	Negative

**Reflex Reference Ranges:**

Neurochondrin IFA	Negative
NIF IFA	Negative
NMDA-R Ab CBA	Negative
Purkinje Cell Cytoplasm Ab Type Tr	Negative
Purkinje Cell Cytoplasmic Ab Type 1	Negative
Purkinje Cell Cytoplasmic Ab Type 2	Negative
Septin-7 IFA	Negative
Antibody:	Reference Range:
AGNA-1 Immunoblot	Negative
AGNA-1 Titer	<1:2
Alpha Internexin CBA	Negative
AMPA-R Ab IF Titer Assay	<1:2
Amphiphysin Immunoblot	Negative
Amphiphysin Titer	<1:2
ANNA-1 Immunoblot	Negative
ANNA-1 Titer	<1:2
ANNA-2 Immunoblot	Negative
ANNA-2 Titer	<1:2
ANNA-3 Titer	<1:2
CRMP-5-IgG Titer	<1:2
CRMP-5-IgG Western Blot	Negative
DPPX Ab CBA	Negative
DPPX Ab IFA Titer	<1:2

GABA-B-R Ab IF Titer Assay	<1:2
GFAP CBA	Negative
GFAP IFA Titer	<1:2
IgLON5 CBA	Negative
IgLON5 IFA Titer	<1:2
mGluR1 Ab CBA	Negative
mGluR1 Ab IFA Titer	<1:2
Neurochondrin CBA	Negative
Neurochondrin IFA Titer	<1:2
NIF Light Chain CBA	Negative
NIF IFA Titer	<1:2
NMDA-R Ab IF Titer Assay	<1:2
PCA-1 Immunoblot	Negative
PCA-1 Titer	<1:2
PCA-2 Titer	<1:2
PCA-TR Titer	<1:2
PCA-Tr Immunoblot	Negative
Septin-7 CBA	Negative
Septin-7 IFA Titer	<1:2
<p>Neuron-restricted patterns of IgG staining that do not fulfill criteria for ANNA-1, ANNA-2, ANNA-3, CRMP-5-IgG, PCA-1, PCA-2, or PCA-Tr may be reported as "unclassified anti-neuronal IgG." Complex patterns that include nonneuronal elements may be reported as "uninterpretable."</p> <p>Note: CRMP-5 titers lower than 1:2 are detectable by recombinant CRMP-5 Western Blot analysis. CRMP-5 Western Blot analysis will be done on request on stored spinal fluid (held 4 weeks). This supplemental testing is recommended in cases of chorea, vision loss, cranial neuropathy, and myelopathy.</p>	

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**Limitations:**

Negative results do not exclude autoimmune encephalopathy or cancer. This test does not detect Ma1 or Ma2 antibodies (alias MaTa), which are sometimes associated with brainstem and limbic encephalitis in the context of testicular germ cell neoplasms. Scrotal ultrasound is advised for men who present with unexplained subacute encephalitis.

**Methodology:**

Immunofluorescence assay (IFA)  
Cell-binding assay (CBA)  
Western blot (WB)  
Radioimmunoassay (RIA)  
Immunoblot (IB)

**References:**

[Mayo Clinic Laboratories](#) (April 2023)

**Updates:**

4/28/2022: Name update

2/17/2023: Updated age limits in Test Indications, specimen stability added

4/17/2023: Updated reference ranges and reflex testing