## Overview

### Useful For

A first-order test for the laboratory diagnosis of myasthenia gravis (MG)

Detecting "subclinical MG" in recipients of D-penicillamine, in patients with thymoma without clinical evidence of MG, and in patients with graft-versus-host disease

Distinguishing acquired disease (90% positive) from congenital disease (negative)

Monitoring disease progression in MG or response to immunotherapy

An adjunct to the test for P/Q-type calcium channel binding antibodies as a diagnostic aid for Lambert-Eaton myasthenic syndrome (LES) or primary lung carcinoma

### Testing Algorithm

This is the primary diagnostic test for myasthenia gravis.

See the following algorithms in Special Instructions:

- [Myasthenia Gravis Evaluation with MuSK Reflex Algorithm](#)
- [Myasthenia Gravis/Lambert Eaton Syndrome Diagnostic Algorithm](#)
- [Myasthenia Gravis: Adult Diagnostic Algorithm](#)
- [Myasthenia Gravis: Pediatric Diagnostic Algorithm](#)
- [Myasthenia Gravis: Thymoma Diagnostic Algorithm](#)

### Special Instructions

- [Myasthenia Gravis: Adult Diagnostic Algorithm](#)
- [Myasthenia Gravis/Lambert Eaton Syndrome Diagnostic Algorithm](#)
- [Myasthenia Gravis: Pediatric Diagnostic Algorithm](#)
- [Myasthenia Gravis: Thymoma Diagnostic Algorithm](#)
- [Myasthenia Gravis Evaluation with MuSK Reflex Algorithm](#)

### Method Name

Radioimmunoassay (RIA)

### NY State Available

Yes

### Specimen

#### Specimen Type

Serum
Specimen Required

Patient Preparation: This test should not be requested in patients who have recently received radioisotopes, therapeutically or diagnostically, because of potential assay interference. The specific waiting period before specimen collection will depend on the isotope administered, the dose given and the clearance rate in the individual patient. Specimens will be screened for radioactivity prior to analysis. Radioactive specimens received in the laboratory will be held 1 week and assayed if sufficiently decayed, or canceled if radioactivity remains.

Container/Tube:

Preferred: Red top

Acceptable: Serum gel

Specimen Volume: 1.5 mL

Forms

If not ordering electronically, complete, print, and send a Neurology Specialty Testing Client Test Request (T732) with the specimen.

Specimen Minimum Volume

1 mL

Reject Due To

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<tr>
<th>Gross hemolysis</th>
<th>Reject</th>
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<tbody>
<tr>
<td>Gross lipemia</td>
<td>Reject</td>
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<tr>
<td>Gross icterus</td>
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Specimen Stability Information

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<th>Time</th>
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Clinical and Interpretive

Clinical Information

Myasthenia gravis (MG) is characterized by weakness and easy fatigability that are relieved by rest and anticholinesterase drugs. The weakness in most cases results from an autoantibody-mediated loss of functional acetylcholine receptors (AChR) in the postsynaptic membrane of skeletal muscle.

Demonstration of muscle AChR autoantibodies in a patient's serum supports the diagnosis of acquired (autoimmune) MG, and quantitation provides a baseline for future comparisons.

Muscle AChR antibodies are not found in congenital forms of MG and are uncommon in neurologic conditions other
than acquired MG, with the exception of patients with paraneoplastic autoimmune neurological disorders, and Lambert-Eaton myasthenic syndrome (LES) with or without cancer (13% of LES patients have positive results for muscle AChR binding or striational antibodies). Patients with autoimmune liver disease are also frequently seropositive.

The assay for muscle AChR binding antibodies is considered a first-order test for the laboratory diagnosis of MG, and for detecting "subclinical MG" in recipients of D-penicillamine, in patients with thymoma without clinical evidence of MG, and in patients with graft-versus-host disease.

**Reference Values**

< or =0.02 nmol/L

**Interpretation**

Values above 0.02 nmol/L are consistent with a diagnosis of acquired myasthenia gravis (MG), provided that clinical and electrophysiological criteria support that diagnosis.

The assay for muscle acetylcholine receptor (AChR) binding antibodies is positive in approximately 90% of nonimmunosuppressed patients with generalized MG.

The frequency of antibody detection is lower in MG patients with weakness clinically restricted to ocular muscles (71%), and antibody titers are generally low in ocular MG (eg, 0.03-1.0 nmol/L).

Results may be negative in the first 12 months after symptoms of MG appear or during immunosuppressant therapy. **Note:** In follow up of seronegative patients with adult-acquired generalized MG, 17.4% seroconvert to positive at 12 months (ie, seronegativity rate at 12 months is 8.4%). Of persistently seronegative patients, 38% have muscle-specific kinase (MuSK) antibody.

Sera of nonmyasthenic subjects bind 0.02 nmol/L or less of muscle AChR complexed with (125)I-labeled-alpha-bungarotoxin.

In general, there is not a close correlation between antibody titer and severity of weakness, but in individual patients, clinical improvement is usually accompanied by a decrease in titer.

**Cautions**

Positive results for muscle acetylcholine receptor (AChR) binding or striational antibodies are found in 13% of patients with Lambert-Eaton myasthenic syndrome (LES). This does not mean that myasthenia gravis (MG) and LES coexist. Antibodies to P/Q type calcium channels are found in 95% of LES patients, but not in MG, except in very rare paraneoplastic cases related to small-cell lung carcinoma.

Positive results are frequently found with autoimmune liver disease.

Magnitude of the result is not useful for predicting severity of MG.

The presence of alpha-bungarotoxin antibodies may interfere with this assay.

**Clinical Reference**


Method Description

Acetylcholine receptors (a mixture of adult and fetal type) are solubilized from human limb muscle in nonionic detergent and complexed with (125)I-labeled alpha-bungarotoxin to provide antigen. After incubation with patient's serum, an excess of goat-antihuman IgG and IgM is added. Acetylcholine receptor-(125)I-alpha-bungarotoxin complexes to which antibodies have bound will coprecipitate with the total human immunoglobulin. The radioactivity of the washed pellet is determined. All positive results are verified by ruling out false-positive binding of immunoglobulin to (125)I-alpha-bungarotoxin, such as might occur in patients with immune complex disorders or subjects exposed to snake venom products. (Griesmann GE, Kryzer TJ, Lennon VA: Autoantibody profiles of myasthenia gravis and Lambert-Eaton myasthenic syndrome. In Manual of Clinical and Laboratory Immunology. Sixth edition. Edited by NR Rose, RG Hamilton, et al. Washington, DC, ASM Press 2002, pp 1005-1012. Waters P, Pettingill P, Lang B: Detection methods for neural autoantibodies. Handb Clin Neurol. 2016;133:147-63)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday through Friday; 11 a.m., 6 p.m., 10 p.m.

Saturday; 6 a.m.

Sunday; 6 a.m., 10 a.m.

Analytic Time

3 days

Maximum Laboratory Time

6 days

Specimen Retention Time

28 days

Performing Laboratory Location

Rochester

Fees and 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 Regional Manager. For assistance, contact Customer Service.

Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with
Test Definition: ARBI
ACh Receptor (Muscle) Binding Ab

CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information
83519

LOINC® Information

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