Overview

Useful For
Diagnosis of Pompe disease

Genetics Test Information
This test provides diagnostic testing for individuals with decreased alpha-glucosidase activity on newborn screen or clinical signs and symptoms suspicious for Pompe disease.

Testing Algorithm
Additional information is available:
- Newborn Screen Follow-up for Pompe Disease
- Newborn Screening Act Sheet Pompe Disease: Decreased Acid Alpha-Glucosidase

Special Instructions
- Informed Consent for Genetic Testing
- Biochemical Genetics Patient Information
- Newborn Screening Act Sheet Pompe Disease: Decreased Acid Alpha-Glucosidase
- Newborn Screen Follow-up for Pompe Disease
- Informed Consent for Genetic Testing (Spanish)

Method Name
Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)

NY State Available
Yes

Specimen

Specimen Type
Whole Blood ACD

Shipping Instructions
For optimal isolation of leukocytes, it is recommended the specimen arrive refrigerate within 6 days of collection to be stabilized. Collect specimen Monday through Thursday only and not the day before a holiday. Specimen should be collected and packaged as close to shipping time as possible.

Specimen Required

Container/Tube:
Preferred: Yellow top (ACD solution B)
Acceptable: Yellow top (ACD solution A) or lavender top (EDTA)

Specimen Volume: 6 mL
Collection Instructions: Send whole blood specimen in original tube. **Do not aliquot.**

**Forms**
1. **New York Clients-Informed consent is required.** Document on the request form or electronic order that a copy is on file. The following documents are available:
   - Informed Consent for Genetic Testing (T576)
   - Informed Consent for Genetic Testing-Spanish (T826)
2. Biochemical Genetics Patient Information (T602)
3. **If not ordering electronically, complete, print, and send a Biochemical Genetics Test Request** (T798) with the specimen.

Specimen Minimum Volume
2 mL

Reject Due To

| Gross hemolysis | Reject |

Specimen Stability Information

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<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
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**Clinical & Interpretive**

**Clinical Information**

Pompe disease, also known as glycogen storage disease type II, is an autosomal recessive disorder caused by a deficiency of the lysosomal enzyme acid alpha-glucosidase (GAA; acid maltase) due to variants in the GAA gene. The estimated incidence is 1 in 40,000 live births. In Pompe disease, glycogen that is taken up by lysosomes during physiologic cell turnover accumulates, causing lysosomal swelling, cell damage, and organ dysfunction. This leads to progressive muscle weakness, cardiomyopathy, and, eventually, death. Individuals with Pompe disease, especially those with infantile, childhood, and juvenile onset, can have elevations of serum enzymes (eg, creatine kinase) secondary to cellular dysfunction.

The clinical phenotype of Pompe disease lies on a spectrum dependent on age of onset and residual enzyme activity. Complete loss of enzyme activity causes onset in infancy leading to death, typically within the first year of life when left untreated. Juvenile and adult-onset forms, as the names suggest, are characterized by later onset and longer survival. All disease variants are eventually associated with progressive muscle weakness and respiratory insufficiency. Cardiomyopathy is associated almost exclusively with the infantile form. Treatment with enzyme replacement therapy is available, making early diagnosis of Pompe disease desirable, as early initiation of treatment may improve prognosis. Newborn screening can identify individuals with all forms of Pompe disease, even before onset of symptoms. Unaffected individuals with GAA pseudodeficiency alleles and carriers may also be identified by newborn screening.
Determination of GAA enzyme activity in leukocytes can help distinguish between infantile and later onset Pompe disease, but it may also be deficient in individuals with pseudodeficiency alleles and in some carriers. Urine glucotetrasaccharides (HEX4 / Glucotetrasaccharides, Random, Urine) have been shown to be elevated in some individuals, particularly those with infantile onset, and may aid in the initial diagnosis and treatment monitoring.

Molecular genetic analysis of the GAA gene (GAAZ / Pompe Disease, Full Gene Analysis, Varies) is necessary for differentiating alterations from disease-causing variants in affected individuals and for carrier detection in family members.

**Reference Values**

> or =1.50 nmol/hour/mg protein

An interpretive report is provided.

**Interpretation**

When abnormal results are detected, a detailed interpretation is given, including an overview of the results and of their significance, a correlation to available clinical information, elements of differential diagnosis, recommendations for additional biochemical testing and in vitro confirmatory studies (enzyme assay, molecular analysis), and a phone number to reach one of the laboratory directors in case the referring physician has additional questions.

**Cautions**

Pseudodeficiency results in low measured acid alpha-glucosidase activity, but it is not consistent with Pompe disease. Molecular analysis (GAAZ / Pompe Disease, Full Gene Analysis, Varies) should be performed to resolve the clinical question.

Additional biochemical or molecular testing is recommended to confirm a diagnosis if an enzyme deficiency is detected by this screening test.

Enzyme levels may be normal in individuals receiving enzyme replacement therapy.

**Clinical Reference**


Method Description
The specimens are incubated with a mix of substrate and internal standard for acid alpha-glucosidase and alpha-galactosidase (GLA). The reaction is then stopped using acetonitrile, centrifuged, and a portion of the supernatant is prepared for analysis by liquid chromatography-tandem mass spectrometry. GLA is included to verify sample integrity. (Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Preanalytical processing: Monday through Saturday.
Assay performed: Monday, Wednesday

Report Available
5 to 9 days

Specimen Retention Time
WBC homogenate: 1 month

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

CPT Code Information
82657

LOINC® Information

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Acid Alpha-Glucosidase, Leukocytes

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