GAA (GLUCOSIDASE, ALPHA, ACID) gene encodes acid α-glucosidase, which is a 952 amino acids peptide essential for the degradation of glycogen to glucose in lysosomes. GAA located at 17q25.3 and encompasses 20 exons. Recessively inherited deficiency of the enzyme leading to abnormal glycogen accumulation in lysosomes causes glycogen storage disease type II, which in its most severe form presents as a rapidly progressive myopathy and cardiomyopathy (Pompe Disease). Cardiomyopathy is a primary heart muscle disorder caused by functional abnormalities in cardiomyocytes and a major cause of cardiac sudden death and progressive heart failure. Patients with GAA mutations usually exhibit cardiac hypertrophy with systemic manifestations. Definitive genotype/phenotype correlations have not been described.

The John Welsh Cardiovascular Diagnostic Laboratory offers molecular genetic testing for GAA mutations. Individuals are tested by automatic fluorescent DNA sequencing of the coding exons of the GAA gene. We strongly recommend initial testing of a clearly affected individual, if available, in order to provide the greatest test sensitivity and clearest interpretation of results for subsequent family members. Genetic counseling is recommended for all individuals.

**REASONS FOR REFERRAL**

Molecular confirmation of the diagnosis of Pompe Disease and hypertrophic cardiomyopathy.

**METHODOLOGY**

Genomic DNA is analyzed for GAA mutations by DNA sequencing of the coding exons of the GAA gene, as well as the exon/intron junctions and a portion of the 5’ and 3’ untranslated region. Patient DNA is sequenced in both the forward and reverse orientations. If a mutation is identified, additional family members are analyzed only for the familial mutation by automatic fluorescent DNA sequencing.

**SERVICE FEES**

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<th>Direct and Institutional Billing</th>
<th>CPT Codes</th>
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<tr>
<td>Index Case (Male or Female)</td>
<td>$1300 per sample</td>
<td>81406</td>
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<tr>
<td>Additional Family Members</td>
<td>$300 per sample; known familial mutation only</td>
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**SENSITIVITY**

DNA Sequencing Analysis: Approximately 99 percent detection of mutations in the coding exons 2-20 of GAA.

**SPECIMEN REQUIREMENTS**

- **Blood** (preferred): EDTA (purple-top) tubes: **Adult**: 5 cc  **Child**: 5 cc  **Infant**: 2-3 cc
- **Tissue**: Frozen (preferred) or RNAlater
- **Other Body Fluids or Formalin-fixed, Paraffin-embedded Tissue**: Call to inquire