Glycogen Storage Disorders: Deletion/Duplication Panel

**Test Code:** MD150  
**Turnaround time:** 2 weeks  
**CPT Codes:** 81228 \( \times 1 \)

## Condition Description

Glycogen storage disorders (GSDs) are a group of inherited genetic defects of glycogen metabolism. Most of them have autosomal recessive inheritance, however there are a few exceptions. There are more than 20 subtypes classified by the specific enzyme deficiency, affected tissue, and disease phenotype. Clinical and biochemical features continue to be used reliably to assign patients to this general disease category. Identification of the precise genetic defect is important, as molecular analysis is likely to expand the clinical spectrum of GSDs, may provide data relevant to prognosis and future therapeutic intervention and is important for carrier testing and early prenatal diagnosis.

The overall incidence of GSDs as a group is estimated to be 1 in 20,000-43,000 births. GSDs primarily affect the liver, the muscle, or both. Although the phenotype range is broad, the majority of clinical manifestations are hepatomegaly, failure to thrive, hypoglycemia, hyperlactatemia, hyperuricemia, and hyperlipidemia. The GSD Comprehensive Sequencing Panel covers genes in which pathogenic variants cause both muscle and liver isoforms of GSD. This panel also includes genes for disorders that have overlapping phenotype with GSDs such as Fanconi-Bickel syndrome, fructose-1,6-biphosphatase deficiency, and glycogen storage disease of heart, lethal congenital.

References:

## Genes

- AGL  
- ENO3  
- FBP1  
- G6PC  
- GAA  
- GBE1  
- GYS1  
- GYS2  
- LAMP2  
- PFKM  
- PGAM2  
- PGM1  
- PHKA2  
- PHKB  
- PHKG2  
- PRKAG2  
- PYGL  
- PYGM  
- SLC2A2  
- SLC37A4

## Indications

This test is indicated for:
- Confirmation of a clinical diagnosis of glycogen storage disorders (GSDs).
- Carrier testing in adults with a family history of glycogen storage disorders (GSDs).

## Methodology

**Deletion/Duplication Analysis:** DNA isolated from peripheral blood is hybridized to a gene-targeted CGH array to detect deletions and duplications. The targeted CGH array has overlapping probes that cover the entire genomic region. Please note that a "backbone" of probes across the entire genome are included on the array for analytical and quality control purposes. Rarely, off-target copy number variants causative of disease may be identified that may or may not be related to the patient's phenotype. Only known pathogenic off-target copy number variants will be reported. Off-target copy number variants of unknown clinical significance will not be reported.

**Detection**

Deletion/Duplication: Detection is limited to duplications and deletions. The CGH array will not detect point or intronic pathogenic variants. Results of molecular analysis must be interpreted in the context of the patient's clinical and/or biochemical phenotype.

## Specimen Requirements

Submit only 1 of the following specimen types

**Type:** Whole Blood

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Specimen Requirements:

In EDTA (purple top) tube:
Infants (2 years): 3-5 ml
Older Children & Adults: 5-10 ml.

Specimen Collection and Shipping: Ship sample at room temperature with overnight delivery.

**Type: Isolated DNA**

Specimen Requirements:

In microtainer: 10 ug

Isolation using the Qiagen™ Puregene kit for DNA extraction is recommended.

Specimen Collection and Shipping: Refrigerate until time of shipment in 100 ng/ul of TE buffer. Ship sample at room temperature with overnight delivery.

**Related Tests**

- Glycogen Storage Disorders: Sequencing Panel
- Pompe (dry blood spot - test code DZ; leukocytes - DW)