MANAGING AND MONITORING PEDIATRIC PATIENTS WITH TYPE 1 GAUCHER DISEASE

Type 1 Gaucher disease (GD1) is a rare genetic lysosomal storage disorder in which the enzyme glucocerebrosidase is deficient.[1-3] This leads to an accumulation of the fatty substance glucocerebroside in the affected cells and the formation of 'Gaucher cells'. Over time, Gaucher cells infiltrate various organs including the spleen, liver, and bone marrow, resulting in progressive organ damage.[2,4]

Disease monitoring and management are critical for assessing and slowing the progression of GD1.[5] Current therapeutic goals reflect increased knowledge of potential treatment effects and include early detection of liver and other complications, improvement in mobility, and enhancement of quality-of-life measures such as fatigue and social participation.[5] Key therapeutic goals are highlighted below.

CURRENT AND FUTURE GOALS FOR GD MANAGEMENT

1. Population Screening

Newborn screening programs and high-risk screening, e.g. in Ashkenazi Jewish populations, allow for **early intervention** and prevention of irreversible organ damage.

GD1 affects:

- 1–9 in 100,000 within the overall population[6]
- ~1 in 600 within the Ashkenazi Jewish population[7]
- ~1 in 17 within the Ashkenazi Jewish community that are carriers[8]
- An estimated 6,000 individuals in the United States[7,9]

2. Differential Diagnosis

7 major signs and 2 covariables indicate that GD1 should be included in the differential diagnosis.

Signs include:

- Splenomegaly (unexplained three-fold spleen enlargement)
- Hepatomegaly (mild or moderate deviation)
- Anemia (mild or moderate deviation)
- Thrombocytopenia (mild or moderate deviation)
- Gammopathy
- Bone pain (or more severe bone signs/symptoms)
- Hyperferritinemia (mild or moderate deviation)

Covariables include:

- Jewish ancestry
- Family history of GD

3. Treatment

Regular intravenous infusions with **enzyme-replacement therapy (ERT)** are recommended for all children or adolescents with symptomatic GD1. ERT is currently the only FDA-approved treatment for GD1 in the pediatric population.

4. Therapeutic Goals

Therapeutic goals involve: controlling thrombocytopenia, bleeding, and anemia; improving bone health and mobility; preventing or improving pulmonary and spleen complications; achieving normal growth and improving general well-being.[5]

Adapted from Weinreb et al. 2022

Please see next page for information on monitoring GD1.

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Given the heterogeneity of the disease, individualized approaches to disease monitoring should be considered based on a patient's specific disease course. The following monitoring strategy represents the minimum recommendations to ensure treatment goals are met and the burden of GD1 is minimized.[5]

MINIMUM RECOMMENDATIONS FOR ASSESSMENTS IN CHILDREN WITH GD1

	At baseline	Every 6–12 months	Every 12–24 months	Every 24–36 months	At time of dose change or significant complication
Physical examination Including growth measurements (height and weight)	✓	✓			✓
Hematology — Hemoglobin and platelets	✓	✓			✓
Hematology — PT and PTT in patients with bleeding symptoms	✓	✓			
Visceral Spleen and liver volumes	✓	✓			
Biomarkers Focus on lyso-Gb1	✓	✓			✓
Skeletal — MRI	✓		✓		
Skeletal — DXA	✓			✓	
Pain and QoL QoL assessed by SF-36, PedsQL, or Kidscreen	✓	✓			

Adapted from Weinreb et al. 2022

PT, prothrombin time; PTT, partial thromboplastin time; lyso-Gb1, glucosylsphingosine; MRI, magnetic resonance imaging; DXA, dual-energy X-ray absorptiometry; QoL, quality of life; SF-36, 36-item Short-Form Health Survey; PedsQL, Pediatric Quality of Life Inventory.

To learn more about the signs and symptoms of GD1, and view other useful resources, visit **knowgaucherdisease.com/hcp**

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