Coordinated care with a multidisciplinary team of specialists is recommended for the management of Pompe disease[2]

Surgery/anesthesia

- Intensive monitoring during anesthesia, with precautions due to underlying cardiomyopathy
- Avoidance of intubation if possible

Respiratory therapist

- Respiratory assessments, including polysomnography, pulmonary function, gas exchange
- Manage respiratory support and clearance of airway secretions

Speech therapist

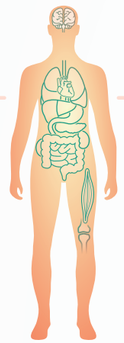
- Support functional use of the respiratory system for sound production
- Assist with signing and use of supportive technology, (eg, voice output systems, computer) to facilitate communication

Gastroenterologist

- Assessment of swallowing via videofluoroscope, laryngeal penetration and aspiration, gastric reflux

Nutritionist

- Provide adequate nutrition with attention to protein, vitamins, and minerals
- Encourage appropriate exercise in consultation with a physical therapist



Led by specialists with expertise in managing Pompe disease

General practitioner

- Routine immunizations, including pneumococcal and influenza vaccinations
- Monitoring of concomitant medications

Social worker/behavioral therapist[23]

- Manage behavioral, social, and emotional functioning
- Monitor academic performance and interactions with peers, teachers, guardians/caregivers

Physical/occupational therapist

- Assessment of musculoskeletal function, strength, disability, pain, and health-related quality of life at regular intervals
- Prevention/minimization of deformity and contractures

Neurologist

- Motor and functional testing
- Performance of electromyography and nerve conduction studies

Geneticist

- Offer genetic counseling to all parents of affected patients and/or to affected adults

Cardiologist

- Periodic chest x-ray, electrocardiogram
- Monitoring for arrhythmia, dehydration, proper cerebrovascular perfusion

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POMPE DISEASE

This Disease Education Brochure is for Healthcare Professionals Only

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POMPE DISEASE

Pompe disease is a progressive, multisystemic, life-threatening disease caused by deficiencies in GAA, a critical enzyme that breaks down glycogen to glucose in lysosomes

Severe life-threatening disease of the muscle

- Pompe disease is a **rare, severe, progressive, metabolic disorder** leading to death in early childhood for those with onset as infants, and progressive ambulatory and respiratory failure in those with later onset[1,2]
- **All muscle groups are affected,** particularly respiratory and skeletal muscles[1,3]

Monogenic disease, caused by mutations in *GAA*[4]

- Pompe disease is a **monogenic disorder caused by mutations in the *GAA* gene** that result in deficiency of the enzyme acid alpha-glucosidase (GAA)[1,4]
- GAA is critical to metabolism of **glycogen** stored in **lysosomes**[1]
- With reduced GAA activity, glycogen accumulates and damages cells, eventually leading to **muscle damage and organ failure**[3,5]

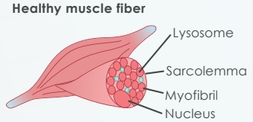
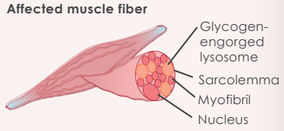
Heterogeneous, progressive clinical presentation manifests as a spectrum[1,2]

- Diaphragm and intercostal muscles are prominently affected, resulting in **progressive worsening of respiratory function**[6,7]
- Up to 50% of late-onset Pompe disease (LOPD) require **ventilator support**[8,9,10]
- **Respiratory failure** is the leading cause of death in patients[11,12]
- Patients develop **severe skeletal muscle weakness**, often requiring assistance, including wheelchairs[2,13]

Progressive muscle disease that may require a multidisciplinary approach

- Management of Pompe disease may require **coordinated care involving a multidisciplinary team** of individuals from a variety of specialties to identify and organize patient needs and to refer the patient to the appropriate specialists, including neuromuscular and respiratory specialists, geneticists, and physical therapists[2,14]

Pompe disease is a severe, life-threatening disease of the muscle, caused by mutations in *GAA*, the gene encoding acid alpha-glucosidase[1,2]

	Healthy Physiology (GAA present)	Pompe Disease (GAA deficiency)
❶ GAA is needed by the body to break down glycogen stored in lysosomes (intracellular compartments) into glucose[11,15]	**GAA enables the metabolism of glycogen to glucose** 	**With reduced GAA, glycogen accumulates in lysosomes** 
❷ Lysosomal glycogen accumulation resulting from GAA deficiency causes the lysosomes to expand, damaging muscle cells[3]	**Healthy muscle fiber** 	**Affected muscle fiber** 
❸ Muscle cells specialize in storing glycogen, so all muscle groups—respiratory, cardiac, and skeletal muscles—are vulnerable[1]	**Normal muscle** 	**Impaired muscle** • Muscle weakness and pain • Muscle damage or atrophy • Progressive replacement of skeletal muscle with fat[16] 

Pompe disease is also known as

- Acid maltase deficiency
- Acid alpha-glucosidase deficiency
- Glycogen storage disease type II

Acid alpha-glucosidase (GAA) is also known as

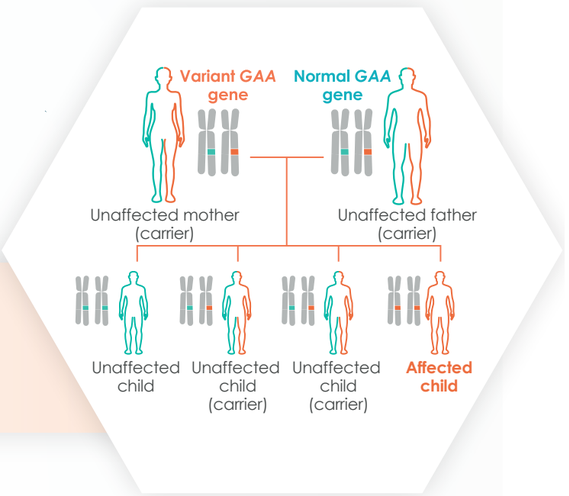
- Acid maltase
- Alpha-1,4-glucosidase

Pompe disease is a monogenic disorder that is inherited in an autosomal recessive pattern[1,4]

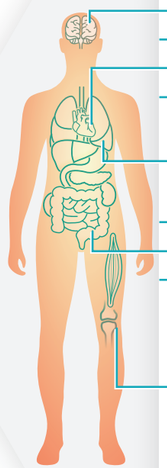
- Presentation of Pompe disease is determined by the type of mutation in the *GAA* gene, which affects the activity of the GAA enzyme[17]
- Diagnosis may be challenging due to similar presentation of other neuromuscular disorders
- While LOPD may present at any age from early childhood to adulthood, median age at diagnosis is approximately 38 years of age, and median survival is approximately 27 years after diagnosis[10]

Both gene copies must be mutated for patients to be affected

While there are many different *GAA* mutations that have been identified in patients with Pompe disease, one healthy copy of *GAA* is sufficient for proper function, regardless of the mutation type or sex of the child[18,19]



Pompe disease often has a heterogeneous clinical presentation, with progressive dysfunction and muscle damage throughout the body, including cardiac, skeletal, and smooth muscles*



Neuronal	• Glycogen accumulation in the CNS/PNS leading to neuronal dysfunction[15,20,21,22] • Cognitive impairment[23]
Cardiac	• Infrequent cardiac involvement in LOPD; however, cerebrovascular events,[22] aneurysms,[24] and dilative arteriopathy[25] have been reported
Respiratory	• Respiratory insufficiency due to diaphragm and intercostal muscle weakness[6,21] • Up to half of patients require ventilator support[8,9,10] • Respiratory failure is leading cause of death in LOPD patients[12] • Sleep disordered breathing/nocturnal hypoventilation[18,21] • Exertional dyspnea[21]
Gastrointestinal	• Poor weight gain[21] • Nausea, vomiting, diarrhea, abdominal pain, dysphagia, reflux[21,22]
Musculoskeletal[14,16,19]	• Progressive weakening of proximal skeletal muscles • Difficulty walking, climbing stairs, rising from chair/floor (eg, Gowers sign) • Frequent falls • Debilitating fatigue, chronic pain, leading to reduced quality of life and ability to perform activities of daily living[1] • Eventual need for wheelchair use • Muscle atrophy (scoliosis, kyphosis, hyperlordosis, scapular winging) • Joint contractures • Decreasing muscle:fat ratio

*Manifestations may vary between patients and over the course of the disease.