



## What is Pompe Disease?

Pompe disease is an inherited disorder characterized by muscle weakness, respiratory insufficiency and, in some forms, enlargement of the heart.<sup>1</sup> It involves deficiency of the enzyme acid  $\alpha$ -glucosidase, which normally breaks down glycogen (stored sugar in the body). Symptoms associated with Pompe disease are due to the build-up of toxic levels of glycogen in cells, mainly affecting the heart, skeletal, and respiratory systems. Pompe disease is also known as acid maltase deficiency or glycogen storage disease type II.<sup>2</sup>

## What are the symptoms of Pompe Disease and what treatment is available?

Pompe disease varies in severity and age at presentation, even within families. There are two types of Pompe, based on age at onset and clinical findings.<sup>1</sup>

The infantile (classic) form of Pompe disease is more common. Without treatment, most affected individuals die within the first year of life. Symptoms may include<sup>1</sup>:

- Cardiomegaly (enlargement of the heart), possibly leading to heart failure
- Progressive, debilitating muscle weakness
- Respiratory complications and insufficiency (increased risk of pneumonia, lung collapse, aspiration, respiratory failure)
- Swallowing difficulties
- Hearing loss

The symptoms of late-onset Pompe disease tend to begin after the first year, but these can develop as late as adulthood. Typically, this form of Pompe disease does not involve heart enlargement. In general, the earlier the symptoms begin, the more severe the course of disease and the poorer the prognosis.<sup>1</sup>

There is no cure for Pompe disease. Enzyme replacement therapy (ERT) is available for both types and has been shown to improve muscle function, delay cardiac enlargement, and prolong survival. Additional treatment includes supportive care of symptoms including medications, high protein diet, and physical therapy.<sup>1</sup>

## How is Pompe Disease inherited?

Pompe disease is an autosomal recessive disease caused by mutations in the *GAA* gene.<sup>1</sup> An individual who inherits one mutation in the *GAA* gene is a “carrier” of Pompe disease and is not expected to have related health problems. An individual who inherits two mutations in the *GAA* gene, one from each parent, is expected to be affected with Pompe disease.

If both members of a couple are carriers, the risk for an affected child is 25% in each pregnancy; therefore, it is especially important that the reproductive partner of a carrier be offered testing.

## Who is at risk for Pompe Disease?

Pompe disease can occur in individuals of all races and ethnicities, but it is reported to be more common in individuals of Dutch, African American, and Chinese ancestry. Within the African American and Chinese populations, the infantile form is seen more often; the late-onset form is seen more often in Dutch patients.<sup>2</sup>



**Carrier Frequencies and Incidences for Select Populations<sup>1</sup>**

<b>Ethnicity</b>	<b>Carrier Rate</b>	<b>Incidence</b>
African American	1 in 60	1 in 14,000
Dutch	1 in 100	1 in 40,000
Chinese	1 in 112	1 in 50,000

Having a relative who is a carrier or who is affected can increase an individual's risk of being a carrier. Consultation with a genetics health professional may be helpful in determining carrier risk and appropriate testing.

**What does a positive test result mean?**

If a gene mutation is identified, an individual should speak to a physician or genetics health professional about the implications of the result and appropriate testing for the reproductive partner and at-risk family members.

**What does a negative test result mean?**

A negative result reduces, but does not eliminate, the possibility that an individual carries a gene mutation. The likelihood of being a carrier is also influenced by family history, medical symptoms, and other relevant test results.

**Where can I get more information?**

- International Pompe Association: <http://www.worldpompe.org/>
- United Pompe Foundation: <http://www.unitedpompe.com/>
- Association for Glycogen Storage Diseases: <http://www.agsdus.org/>

**References**

1. Tinkle BT and Leslie N. Glycogen storage disease type II (Pompe disease). *Gene Reviews*. Available at: <http://www.ncbi.nlm.nih.gov/books/NBK1261/>. Accessed February 22, 2012.
2. Kishnani PS *et al.* American College of Medical Genetics Practice Guideline: Pompe disease diagnosis and management guideline. *American College of Medical Genetics*. 2006; 8(5): 267-288.