



## Genetic Fact Sheets for Professionals

# Organic Acid Disorders

Screening, Technology, and Research in Genetics is a multi-state project to improve information about the financial, ethical, legal, and social issues surrounding expanded newborn screening and genetic testing – <http://www.newbornscreening.info>

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<b>Disease name</b>	<b>Glutaric acidemia, type 1</b>
<b>Alternate name(s)</b>	Glutaric aciduria I, Glutaryl-CoA dehydrogenase deficiency
<b>Acronym</b>	GA1, GAI
<b>Disease classification</b>	Organic Acid Disorder
<b>Variants</b>	Yes
<b>Variant name</b>	Riboflavin responsive GA1
<b>Symptom onset</b>	Infancy (typically 2- 37 months)
<b>Symptoms</b>	Macrocephaly may be present at birth, acute encephalitic-like crises; neurodegenerative disorder with spasticity, dystonia, choreoathetosis, ataxia and dyskinesia, seizures, hypotonia, death due to Reye-like syndrome.
<b>Natural history without treatment</b>	Possible developmental delay due to encephalitis-like crisis; neurologic deterioration including spasticity, dystonic cerebral palsy. May have neurologic signs with normal IQ. Some individuals may be asymptomatic.
<b>Natural history with treatment</b>	If instituted before any damage occurs, normal outcome may occur. Risk for neurologic damage is highest in first few years. Some evidence that treatment may slow neurologic deterioration.
<b>Treatment</b>	Lysine and tryptophan restricted diet, riboflavin supplementation, carnitine supplementation. Rapid treatment of intercurrent illness with intravenous glucose, carnitine and appropriate supportive measures.
<b>Other</b>	Profuse sweating has been reported. Neuroradiographic findings of frontotemporal atrophy on CT or MRI with increased CSF containing spaces in the sylvian fissures and anterior to the temporal lobes. Also decreased attenuation in cerebral white matter on CT and increased signal intensity on MRI. Basal ganglia changes.
<b>Physical phenotype</b>	Macrocephaly, cerebral palsy

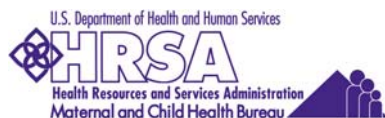
<b>Inheritance</b>	Autosomal recessive
<b>General population incidence</b>	1: 40,000 in Caucasians and 1: 30,000 in Sweden
<b>Ethnic differences</b>	Yes
<b>Population</b>	Old Amish and Ojibway Indians in Canada
<b>Ethnic incidence</b>	1/10 carrier frequency
<b>Enzyme location</b>	Mitochondria; liver, kidney, fibroblasts and leukocytes
<b>Enzyme function</b>	Metabolizes lysine, hydroxylysine and tryptophan
<b>Missing enzyme</b>	Glutaryl-CoA dehydrogenase
<b>Metabolite changes</b>	Increased glutaric acid in urine, increased glutaric acid and 3-hydroxyglutaric acid in plasma, 3-hydroxyglutaric and glutaconic acid in urine.
<b>Gene</b>	GCDH
<b>Gene location</b>	19p13.2
<b>DNA testing available</b>	Yes
<b>DNA testing detail</b>	No common mutations outside of Old Amish (A421V)
<b>Prenatal testing</b>	Enzyme activity in CVS and amniocytes
<b>MS/MS profile</b>	Elevated C5DC – can be missed in some patients
<b>OMIM link</b>	<a href="http://www.ncbi.nlm.nih.gov/entrez/dispomim.cgi?id=231670">www.ncbi.nlm.nih.gov/entrez/dispomim.cgi?id=231670</a>
<b>Genetests link</b>	<a href="http://www.genetests.org/servlet/access?prg=j&amp;db=genestar&amp;site=&amp;fcn=d&amp;id=12600&amp;qry=22682&amp;res=nous&amp;res=nointl&amp;key=Issq6RQIfI8i5&amp;show_flag=c">www.genetests.org/servlet/access?prg=j&amp;db=genestar&amp;site=&amp;fcn=d&amp;id=12600&amp;qry=22682&amp;res=nous&amp;res=nointl&amp;key=Issq6RQIfI8i5&amp;show_flag=c</a>
<b>Support group</b>	Organic Acidemia Association <a href="http://www.oaanews.org">www.oaanews.org</a>  Save Babies through Screening Foundation <a href="http://www.savebabies.org">www.savebabies.org</a>  Genetic Alliance <a href="http://www.geneticalliance.org">www.geneticalliance.org</a>

## Document Info

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