



## 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>

<b>Disease name</b>	<b>Maple syrup urine disease</b>
<b>Alternate name(s)</b>	Branched chain ketoaciduria, Branched chain alpha-keto dehydrogenase deficiency
<b>Acronym</b>	MSUD type 1A, BCKD deficiency
<b>Disease classification</b>	Organic Acid Disorder
<b>Variants</b>	Yes
<b>Variant name</b>	MSUD type 1B, MSUD Type II, Intermittent branched-chain ketoaciduria, Intermediate branched-chain ketoaciduria, Thiamine responsive MSUD
<b>Symptom onset</b>	Neonatal with some variability
<b>Symptoms</b>	Lethargy progressive to coma and possible death, vomiting, difficulty feeding, opisthotonic posturing, hypoglycemia, possible high pitched cry.
<b>Natural history without treatment</b>	Neurologic abnormalities and profound mental retardation.
<b>Natural history with treatment</b>	Normal IQ and development may be expected if treatment is initiated before first crisis, but development is delayed in the severest cases.
<b>Treatment</b>	Dietary restriction of the branched chain amino acids and supplementation with medical formula. Thiamine supplementation in thiamine responsive patients.
<b>Other</b>	“Maple syrup”-like odor to urine (usually present during crisis)
<b>Physical phenotype</b>	None
<b>Inheritance</b>	Autosomal recessive
<b>General population incidence</b>	1: 200,000

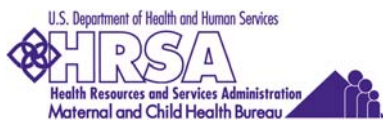
<b>Ethnic differences</b>	Yes
<b>Population</b>	Mennonites, French-Canadians
<b>Ethnic incidence</b>	1/760 (Mennonites)
<b>Enzyme location</b>	Inner mitochondrial membrane; liver, kidney, leukocytes and fibroblasts.
<b>Enzyme function</b>	Catalyzes the decarboxylation of oxoacids.
<b>Missing enzyme</b>	Branched-chain ketoacid dehydrogenase (BCKAD). This enzyme is a multienzyme complex with 3 components – E1, E2 and E3.
<b>Metabolite changes</b>	Increased leucine, isoleucine and valine in plasma and urine, increased organic acids in urine.
<b>Gene</b>	Four genes are involved in formation of multicomplex enzyme.
<b>Gene location</b>	E1alpha = 19q13.1-13.2 E1beta = 6p21-22 E2 = 1p31 E3=7q31-32
<b>DNA testing available</b>	Yes
<b>DNA testing detail</b>	Common mutation present in Mennonites (Y393N-alpha) and comprehensive DNA mutation analysis.
<b>Prenatal testing</b>	Enzyme testing by CVS or amnio. If mutation is known, DNA testing may be available.
<b>MS/MS profile</b>	Leucine elevated, leucine to alanine ratio elevated.
<b>OMIM link</b>	<a href="http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispMim?248600">www.ncbi.nlm.nih.gov/htbin-post/Omim/dispMim?248600</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=22186&amp;res=nous&amp;res=nointl&amp;key=hp5d0Ly2h80eI&amp;show_flag=c">www.genetests.org/servlet/access?prg=j&amp;db=genestar&amp;site=&amp;fcn=d&amp;id=12600&amp;qry=22186&amp;res=nous&amp;res=nointl&amp;key=hp5d0Ly2h80eI&amp;show_flag=c</a>
<b>Support group</b>	The MSUD Family Support Group <a href="http://www.msud-support.org">www.msud-support.org</a>  Children Living with Inherited Metabolic Diseases <a href="http://www.climb.org.uk">www.climb.org.uk</a>  National Coalition for PKU and Allied Disorders <a href="http://www.pku-allieddisorders.org">www.pku-allieddisorders.org</a>

## Document Info

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