

Disease Name	
3-METHYLCROTONYL COENZYME A CARBOXYLASE DEFICIENCY (3MCC)	
<i>(3-MCC; 3-METHYLCROTONYLGLYCINURIA)</i>	
Classification:	Organic aciduria
Genetic Information	
Inheritance:	Autosomal recessive.
Population Incidence:	1:50,000.
Ethnic Incidence:	No known population at increased risk.
Gene & Location:	MCCA 3q25-q27 MCCB 5q12-q13.1
Common Mutation:	No known common mutations.
OMIM #	*210200
Disease Information	
Symptom Onset:	Generally after three months of age but can be variable. Many individuals with no symptoms into adulthood.
Symptoms:	Some infants have presented with a Reye-like illness with hypoketotic hypoglycemia, metabolic acidosis and liver dysfunction often precipitated by an intercurrent illness, which has led to fulminant liver failure and death in some cases. Others present with muscle hypotonia and failure-to-thrive in conjunction with recurrent episodes of vomiting and diarrhea. In general, the earlier the presentation the poorer the prognosis.
Physical Findings:	No specific dysmorphism.
Treatment:	Leucine-restricted diet with glycine, carnitine and biotin supplementation.
Natural History without treatment:	Primary manifestations appear to be muscular hypotonia and atrophy, probably of spinal origin. Individuals with Reye-like illnesses may die or suffer neurologic insult during these episodes. As many individuals remain asymptomatic, the etiology of the symptoms is unknown. Newborn screening has led to the detection of several asymptomatic women whose infants had transiently elevated isovalerylcarnitine.
Natural History with treatment:	It is uncertain whether treatment modifies disease course. Given asymptomatic individuals, treatment is of questionable value.
Metabolic Information	
Missing Enzyme & Location:	MCC is predominantly localized to the inner membrane of the mitochondria and is known to be highly expressed in kidney and liver. The enzyme involved is 3-METHYLCROTONYL-CoA CARBOXYLASE.
MS/MS profile:	C5:1 (tiglyl or 3-methylcrotonyl carnitine) – elevated. C5-OH (3-hydroxy-2-methylbutyryl carnitine) – elevated.
Prenatal testing:	May be possible for at-risk pregnancies.
Miscellaneous Information:	Heterozygotes (obligate carriers) do not have abnormal metabolites in the urine. For definitive diagnosis, exclusion of multiple carboxylase deficiency, enzyme assay must show a deficit of 3-MCC activity and normal activity of at least one other carboxylase enzyme in leukocytes or fibroblasts.
Credit:	<i>Prepared by the North West Regional Newborn Screening Program Judith Tuerck, RN, MS, and Lorinda Paradise at Oregon Health Services University in Portland, Oregon and by Sara Copeland MD, Iowa Neonatal Metabolic Screening Program.</i>

Sites of Reference:	<u>OMIM - 3-Methylcrotonyl-CoA Carboxylase Deficiency</u> http://www3.ncbi.nlm.nih.gov/entrez/dispomim.cgi?id=210200	
Support Groups:	Organic Acidemia Association www.oaaneews.org/ 13210 35th Avenue Plymouth, MN 55441 Contact: Kathy Stagni (763) 559-1797 OAAnews@aol.com	