

MEDIUM CHAIN ACYL-CoA DEHYDROGENASE DEFICIENCY (MCADD)

Target Mutation Detection -Test 2

- Updated 08-10-09 –

DESCRIPTION

Mendelian Inheritance in Man number: [*607008](#)

Click here for [Gene Reviews](#) Clinical Summary.

MCADD is the most common enzyme deficiency in mitochondrial fatty acid β -oxidation. In a typical clinical scenario, a previously healthy child presents with hypoketotic hypoglycemia, vomiting, and lethargy triggered by a common illness such as fasting or infection. Patients with MCADD also may present encephalopathy, hepatomegaly and acute liver disease, skeletal myopathy, and cardiomyopathy. Apparent life threatening events have also been linked to MCADD. Patients are normal at birth and typically present between three and 24 months of age; later presentation, even into adulthood, is possible. About 18-25% patients die during their first episode of illness. The prognosis is excellent once the diagnosis is established and frequent feedings are instituted to avoid any prolonged period of fasting.

Genetics of *ACADM*

ACADM is the only gene known to be associated with MCADD. It consists of 12 exons that span more than 44 kb and encodes a protein of 421 amino acids. The overall frequency of the disease has been estimated to range between 1:4,900 to 1:17,000, depending on the ethnic composition of the population. One mutation located in exon 11, c.985A>G, p.K329E, is present in approximately 80-90% of alleles in patients with MCADD based on newborn screening results in diverse population. The carrier frequency for the p.K329E mutation of the *ACADM* gene is between 1:40 and 1:100.

INDICATIONS FOR DIRECT TESTING

- Carrier testing by sequence analysis of known mutations in the family

TESTING METHODOLOGY

We offer a **targeted detection** of a previously characterized *ACADM* mutation within the family. From a fresh EDTA blood sample, DNA is extracted directly, the target region is amplified and the sequence is analyzed for family-specific mutation(s).

SPECIMEN REQUIREMENTS

We require 1 milliliter of whole blood in EDTA (purple topped) tubes. Blood samples must be collected in EDTA (purple topped) tubes.

TRANSPORT

If specimen is from clinics within UAB or Kirklin Clinic, please call 934-7107 for pick-up. If specimens are being sent from some other location, please ship via UPS or Federal Express.

1. Be sure that the shipping air bill is marked “**Priority**”, either Domestic or International.
2. Specimens must be packaged to prevent breakage and absorbent material must be included in the package to absorb liquids in the event that breakage occurs. Also, the package must be shipped in double watertight containers (e.g. a specimen pouch + the shipping companies Diagnostic Envelope). **You can use our collection kits, which we will send to physicians directly upon request.**

TURN AROUND TIME

1-2 weeks

CPT CODES AND PRICES

Please note that prices listed correspond to institutional rates; please contact the lab for insurance rates.

\$250 per target region analyzed, - USD ([currency converter](#))
83891 (x1), 83894 (x4), 83898 (x4), 83904 (x3), 83912 (x1)

REQUIRED FORMS

General Requisition

Note: Requests for Molecular Genetic testing for MCADD will **not** be accepted for the following reasons:

- No label (patients full name and date of collection) on the specimens
- No referring physician’s or genetic counselor’s names and addresses
- No billing information
- No informed consent

For more information, test requisition forms, or sample collection and mailing kits, please call: 205-934-5562.

REFERENCES

Andresen BS, Dobrowolski SF, O’Reilly L, Muenzer J, McCandless SE, Frazier DM, Udvari S, Bross P, Knudsen I, Banas R, Chace DH, Engel P, Naylor EW, Gregersen N (2001) Medium-chain acyl-CoA dehydrogenase (MCAD) mutations identified by MS/MS-based prospective screening of newborns differ from those observed in patients with clinical symptoms: identification and characterization of a new, prevalent mutation that results in mild MCAD deficiency. Am J Hum Genet 68(6): p. 1408-18. ([pubmed](#))

Gregersen N, Bross P, Andresen BS (2004) Genetic defects in fatty acid beta-oxidation and acyl-CoA dehydrogenases. Molecular pathogenesis and genotype-phenotype relationships. *Eur J Biochem.* 271(3):470-82 ([pubmed](#))

Kozak L, Hrabincova E, Rudolfova J, Vrabelova S, Freiburger T (1999) Screening of the most common medium-chain acyl CoA dehydrogenase (MCAD) deficiency mutation (K329E) in the Czech newborn population. *Southeast Asian J Trop Med Public Health*, 30 Suppl 2: p. 49-50. ([pubmed](#))

Matsubara Y, Narisawa K, Miyabayashi S, Tada K, Coates PM, Bachmann C, Elsas LJ 2nd, Pollitt RJ, Rhead WJ, Roe CR (1990) Identification of a common mutation in patients with medium-chain acyl-CoA dehydrogenase deficiency. *Biochem Biophys Res Commun*, 171(1): p. 498-505. ([pubmed](#))