



Molecular Diagnostic Laboratory
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Medium Chain Acyl-Coenzyme A Dehydrogenase Deficiency

Medium chain acyl-coenzyme A dehydrogenase (*ACADM*) point mutation A985G (Formally MCAD)

Indications for Molecular Testing

- Cardiac or skeletal myopathy
- Fasting hypoglycemia (hypoketotic)
- Reye-Like syndrome
- Family history of sudden, unexplained infant death

Testing Methodology

Screening utilizes polymerase chain reaction (PCR) amplification followed by restriction fragment length polymorphism (RFLP) analysis for detection of a point mutation (A985G) in exon 11 of the medium chain acyl-CoA dehydrogenase (*ACADM*) gene. The base pair change creates a new recognition site for the restriction enzyme Nco I. (PCR is utilized pursuant to a license agreement with Roche Molecular Systems, Inc.)

Interpretation of DNA analysis

Medium chain acyl-coenzyme A dehydrogenase deficiency is a common inherited autosomal recessive disorder of mitochondrial fatty acid oxidation with an incidence of one in 10,000-20,000 Caucasian infants. Approximately 1 in 50 to 70 persons may be carriers. Clinical symptoms in newborns or young children deficient in this enzyme of fatty acid oxidation include cardiomyopathy, skeletal myopathy, fasting hypoglycemia, a Reye-like syndrome, and sudden death (SIDS). Detection of this mutation is important in diagnosis of SIDS, counseling parents of a SIDS child to determine risk of recurrence with regard to medium chain acyl-coenzyme A dehydrogenase deficiency, and determination of appropriate intervention when family history or prenatal diagnosis suggests acyl-coenzyme A dehydrogenase deficiency. Children can survive with appropriate treatment when a precise diagnosis is made expediently. The A985G allele accounts for about 75-89% of mutant alleles in individuals with medium chain acyl-coenzyme A dehydrogenase deficiency in a population of Caucasian origin (see reference below).

Specimen Requirements

Peripheral blood--1 lavender-top (EDTA) tube. Invert several times to mix blood. **Blood Spot Cards**--one 10mm punch from a spotted and dried FTA[®] Card (cat# WB 120208, Whatman[®] Bioscience Ltd.). Forward card, enclosed in envelope or plastic, at ambient temperature. **Buccal Swabs**--Please contact Barnes-Jewish Molecular Diagnostics lab at 314-454-8685 for details. **Prenatal Diagnosis**--1 x 10⁶ nucleated cells in cell medium (amniocytes nor chorionic villi sampling (CVS) is not available) Do not freeze. Forward promptly at ambient temperature to the following address:

Molecular Diagnostic Laboratory
Barnes-Jewish Hospital North, Room 2320
Mail Stop 90-35-709
216 South Kingshighway
St. Louis, MO 63110

Clinical information must be provided with specimen referral in order to correctly interpret test results.

Current Pricing

Contact Lab Customer Service for current pricing 314 362-1470.
CPT codes: 83907, 83890, 83898, 83892, 83894, 83912.

Gregersen N, Andresen B, Bross P, Winter V, Rudiger N, Engst S, et al. Molecular characterization of medium-chain acyl-CoA dehydrogenase (*MCAD*) gene, and expression of inactive mutant enzyme protein in *E. coli*. *Hum Genet* (1991) 86:545-551.

D. Kelly, A. Whelan, M. Ogden, R. Alpers, Z. Zhang, G. Bellus, et al.. Molecular characterization of inherited medium-chain acyl-CoA dehydrogenase deficiency. *Proc. Natl. Acad. Sci., USA* 1990 Dec. (87):9236-9240.