FATAL INFANTILE CARDIOENCEPHALOMYOPATHY DUE TO CYTOCHROME C OXIDASE DEFICIENCY

SCO2 GENE SEQUENCING

Cytochrome c oxidase (COX), also known as Complex IV, is the terminal enzyme of the mitochondrial respiratory chain. Deficiency of this enzyme can have a wide range of effects, from isolated myopathy to severe multisystem disease, with onset from infancy to adulthood. COX deficiency can be caused by mutations in several nuclear-encoded and mitochondrial-encoded genes. When caused by mutations in the SCO2 gene (OMIM 604272), COX deficiency is associated with fatal infantile cardioencephalomyopathy (OMIM 604377), an autosomal recessive disorder.

Fatal infantile cardioencephalomyopathy is characterized by hypertrophic cardiomyopathy, encephalopathy, lactic acidosis, hypotonia, respiratory distress and/or stridor, developmental delay, spasticity or seizures, and decreased extraocular movements. Muscle biopsy shows COX deficiency and neurogenic changes.

Fatal infantile cardioencephalomyopathy can also present with a phenotype resembling spinal muscular atrophy (SMA), including hypotonia, respiratory distress, and SMA-like changes in the muscle and/or spinal cord (Pronicki, 2010; Salviati, 2002; Tarnopolsky, 2004). Heart involvement is not necessarily present at the onset of the disease.

All patients reported in the literature have been identified as either homozygotes for the common E140K mutation, or compound heterozygotes with E140K and another mutation. Homozygous E140K mutations are reported as having a delayed onset and slower clinical progression (Salviati, 2002).

Testing:
Testing is performed by sequencing the entire coding region (exon 2) and surrounding intronic regions of SCO2. This will detect point mutations, small deletions, and small insertions. It will not detect a partial or whole gene deletion or duplication.

Turnaround time: 7-10 days

CPT codes and cost: 83891 (x1) 83898 (x2) 83904 (x3) 83912 (x1) $ 150

BILLING: We do not bill third party payers (insurance companies) for samples received from external sources. The person or institution (e.g., Clinical Lab; Send-out Lab; Physician Office) sending the sample is responsible for full payment of the invoices within 30 days of receipt of the invoice. If the patient is on Medical assistance, please contact the lab prior to sample submission. Direct patient billing will be accepted only when a valid credit card form is received with the patient sample.
Online Resources

United Mitochondrial Disease Foundation – http://www.umdf.org


References:

Facsimile Verification Form

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Please complete this Facsimile Verification Form and fax back to 302.651.6795.
If you have any questions regarding this form please contact Susan Kirwin, Assistant Director of The Molecular Diagnostics Laboratory, at 302.651.6777.

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# Credit Card Billing Information

<table>
<thead>
<tr>
<th>Patient Name:</th>
<th>Credit Card: MasterCard  Visa  American Express Discover (circle one) Other: ______________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Card holder:</td>
<td>Credit Card Number:</td>
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<tr>
<td>Card holder address:</td>
<td>Expiration Date:</td>
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<td>Security Code: (on back of card)</td>
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<tr>
<td>Home:</td>
<td></td>
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<tr>
<td>Work:</td>
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<td>Card holder signature:</td>
<td>Authorized payment amount:</td>
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**For Direct Patient Billing**

Prepayment for the testing services is required prior to beginning our testing. Please complete this form and include this paperwork with the shipment of the patient sample.

Billing questions can be addressed to: Denise Axsmith  
Senior Budget/Financial Analyst  
Nemours/A.I. duPont Hospital for Children  
[daqsmith@nemours.org](mailto:daqsmith@nemours.org)  
Phone: 302.651.6802  
Fax: 302.651.6881