Newborn Screening ACT Sheet
[Elevated C16-OH +/- C18 and Other Long Chain Acylcarnitines]
Long-chain 3-Hydroxyacyl-CoA Dehydrogenase Deficiency (LCHADD)

Differential Diagnosis: Long-chain 3-hydroxyacyl-CoA dehydrogenase (LCHAD) deficiency; Trifunctional protein (TFP) deficiency.

Condition Description: LCHADD and TFP deficiencies are fatty acid oxidation (FAO) disorders. Fatty acid oxidation occurs during prolonged fasting and/or periods of increased energy demands (fever, stress) after glycogen stores become depleted and energy production relies increasingly on fat metabolism. Fatty acids and potentially toxic derivatives accumulate in FAO disorders which are caused by deficiency in one of the enzymes involved in FAO.

YOU SHOULD TAKE THE FOLLOWING ACTIONS:

- Contact family to inform them of the newborn screening result and ascertain clinical status (poor feeding, vomiting, lethargy).
- Consult with pediatric metabolic specialist.
- Evaluate infant (hepatomegaly, cardiac insufficiency; history of sudden unexpected death in a sibling; maternal liver disease during pregnancy; hypoglycemia). If signs are present or infant is ill, initiate emergency treatment in consultation with metabolic specialist.
- Educate family about need for infant to avoid fasting. Even if the infant becomes mildly ill (poor feeding, vomiting, or lethargy), immediate treatment with IV glucose is needed.
- Report findings to newborn screening program.

Diagnostic Evaluation: Plasma acylcarnitine analysis will show a characteristic pattern consistent with LCHAD or TFP deficiency. Urine organic acid analysis may also show an abnormal profile. Differentiation between both disorders requires further biochemical and molecular genetic testing.

Clinical Considerations: LCHAD and TFP deficiencies may present acutely and are then associated with high mortality unless treated promptly. Hallmark features include hepatomegaly, cardiomyopathy, lethargy, hypoketotic hypoglycemia, elevated liver transaminases, elevated creatine phosphokinase (CPK), lactic acidosis, and failure to thrive. Rhabdomyolysis (a serious and sometimes fatal complication) may occur. Milder variants exist. Consider that cefotaxime treatment in the baby or mother may alter lab results.

Additional Information:

Emergency Treatment Protocol (New England Consortium of Metabolic Programs)

Genetics Home Reference:

LCHAD

TFP

Referral (local, state, regional and national):

Testing

Clinical Services

Find Genetic Services

ACMG
American College of Medical Genetics and Genomics
Translating Genes Into Health®

LOCAL RESOURCES: Insert State newborn screening program web site links

State Resource site *(insert state newborn screening program website information)*

Name	
URL	
Comments	

Local Resource Site *(insert local and regional newborn screening website information)*

Name	
URL	
Comments	

APPENDIX: Resources with Full URL Addresses

Additional Information:

Emergency Treatment Protocol (New England Consortium of Metabolic Programs)
http://newenglandconsortium.org/for-professionals/acute-illness-protocols/fatty-acid-oxidation-disorders/long-chain-hydroxy-acyl-coa-dehydrogenase-deficiency-lchadd/

Genetics Home Reference
LCHAD
http://ghr.nlm.nih.gov/condition=longchain3hydroxyacylcoenzymeadehydrogenasedeficiency
TFP
http://ghr.nlm.nih.gov/condition=mitochondrialtrifunctionalproteindeficiency

Referral (local, state, regional and national):

Testing:
http://www.ncbi.nlm.nih.gov/sites/GeneTests/lab/clinical_disease_id/2927?db=genetests

Clinical Services:
http://www.ncbi.nlm.nih.gov/sites/genetests/clinic?db=genetests

Find Genetic Services
http://www.acmg.net/GIS/Disclaimer.aspx

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