Newborn Screening ACT Sheet

[Elevated C4-OH Acylcarnitine]

Short Chain Hydroxyacyl-CoA Dehydrogenase (SCHAD) Deficiency

(also known as 3-Hydroxyacyl-Coenzyme A Dehydrogenase Deficiency, HADH; and Medium/Short Chain Hydroxyacyl-CoA Deficiency, M/SCHAD).

Differential Diagnosis: none.

Condition Description: SCHAD is a fatty acid oxidation (FAO) disorder. 3-Hydroxyacyl-CoA dehydrogenase deficiency disrupts fatty acid breakdown at the level of short and medium-chain 3-hydroxy-fatty acids. It is associated with elevated C4-hydroxy-acylcarnitine (C4-OH) and a decreased production of energy from fat. Fatty acid oxidation occurs during prolonged fasting and/or periods of increased energy demands (fever, stress) when energy production relies increasingly on fat metabolism. In an FAO disorder, fatty acids and potentially toxic derivatives accumulate because of a deficiency in one of the FAO enzymes. Presentation in the neonatal period is rare.

You Should Take the Following <u>IMMEDIATE</u> Actions:

- Inform family of the newborn screening result.
- Ascertain clinical status (poor feeding, vomiting, lethargy).
- Consult with pediatric metabolic specialist the same day.
- Evaluate infant (poor feeding, vomiting, lethargy, hypoglycemia, metabolic acidosis). If any of these findings are present or if the neonate is ill, immediately treat with IV glucose and transport to the hospital in consultation with metabolic specialist.
- Initiate confirmatory/diagnostic testing and management, as recommended by the specialist.
- Provide family with basic information about SCHAD and its management, including information about the avoidance of fasting in the newborn.

- Report final diagnostic outcome to newborn screening program.

Diagnostic Evaluation: **Plasma acylcarnitines:** C4-OH is typically elevated in SCHAD. **Urine organic acids**: Hydroxy-dicarboxylic acids may be elevated. **Plasma insulin** may also be elevated. **Molecular genetic testing** may be required to establish the diagnosis.

Clinical Considerations: Neonates with SCHAD deficiency are usually asymptomatic, although hypoglycemia and hyperinsulinism may be present. Severe hypoglycemia and severe hyperinsulinism may appear later. Sudden death in infancy has been reported.

Note: Given the limited information available on this specific condition, some links for the similar and more common MCAD (Medium chain Acyl-CoA-Dehydrogenase) deficiency are included.

Additional Information:

How to Communicate Newborn Screening Results
Emergency Protocols (New England Consortium of Metabolic Programs)
GARD
Inform
Gene Reviews
Medline Plus
Condition Information for Families- HRSA Newborn Screening Clearinghouse

Referral (local, state, regional, and national):

[Find a Genetics Clinic Directory](#)
[Genetic Testing Registry](#)

Local Resources *(Insert Local Website Links)*
State Resource Site (Insert Website Information)

Name	
URL	
Comments	

Local Resource Site (Insert Website Information)

Name	
URL	
Comments	

Appendix *(Resources with Full URL Addresses)*

Additional Information
How to Communicate Newborn Screening Results
- https://www.hrsa.gov/sites/default/files/hrsa/advisory-committees/heritable-disorders/Resources/achdnc-communication-guide-newborn.pdf

Emergency Protocols (New England Consortium of Metabolic Programs)
- https://www.newenglandconsortium.org/mcadd

GARD
- https://rarediseases.info.nih.gov/diseases/9870/3-alpha-hydroxyacyl-coa-dehydrogenase-deficiency

Inform
- https://informnetwork.org/mchad-schad/

Gene Reviews
- https://www.ncbi.nlm.nih.gov/books/NBK1424/

Medline Plus
- https://medlineplus.gov/genetics/condition/medium-chain-acyl-coa-dehydrogenase-deficiency/

Condition Information for Families-HRSA Newborn Screening Clearinghouse
- https://newbornscreening.hrsa.gov/conditions/medium-chain-acyl-coa-dehydrogenase-deficiency

Referral (local, state, regional and national)
Find a Genetics Clinic Directory
- https://clinics.acmg.net

Genetic Testing Registry
- https://www.ncbi.nlm.nih.gov/gtr/