

### **Newborn Screening ACT Sheet**

# [Absent/Reduced Biotinidase Activity]

## **Biotinidase Deficiency**

Differential Diagnosis: Biotinidase deficiency (profound or partial).

**Condition Description:** Biotinidase deficiency is caused by decreased levels of the enzyme biotinidase, which is responsible for recycling the vitamin biotin. This deficiency leads to decreased biotin levels and disrupts the activity of several biotin-requiring enzymes (carboxylases). Presentation in the neonatal period is rare.

#### You Should Take the Following Actions:

- Inform family of the newborn screening result.
- Ascertain clinical status (typically asymptomatic; rarely poor feeding, lethargy, hypotonia).
- Consult with pediatric metabolic specialist.
- Evaluate the newborn (poor feeding, lethargy, hypotonia).
- Initiate confirmatory/diagnostic testing and management, as recommended by the specialist.
- Provide family with basic information about biotinidase deficiency and its management.
- Report final diagnostic outcome to newborn screening program.

**Diagnostic Evaluation:** Serum biotinidase activity: Biotinidase activity is markedly reduced or absent in profound biotinindase deficiency, and partially reduced in partial biotinidase deficiency. Urine organic acids: may demonstrate increased 3-hydroxyisovaleric acid and 3-methylcrotonylglycine with profound deficiency. Molecular genetic testing may be required to confirm the diagnosis.

Clinical Considerations: The neonate is usually asymptomatic but episodic hypoglycemia, lethargy, hypotonia, can occur at any time from the neonatal period through childhood. Untreated profound biotinidase deficiency leads to developmental delay, seizures, alopecia, and hearing deficits. Patients with partial biotinidase deficiency are typically asymptomatic. Biotin treatment is highly effective.

#### **Additional Information:**

How to Communicate Newborn Screening Results
Gene Reviews
Medline Plus
Condition Information for Families- HRSA Newborn Screening Clearinghouse
ClinGen Actionability Report

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

Find a Genetics Clinic Directory Genetic Testing Registry

This practice resource is designed primarily as an educational resource for medical geneticists and other clinicians to help them provide quality medical services. Adherence to this practice resource is completely voluntary and does not necessarily assure a successful medical outcome. This practice resource should not be considered inclusive of all proper procedures and tests or exclusive of other procedures and tests that are reasonably directed to obtaining the same results. In determining the propriety of any specific procedure or test, the clinician should apply his or her own professional judgment to the specific clinical circumstances presented by the individual patient or specimen. Clinicians are encouraged to document the reasons for the use of a particular procedure or test, whether or not it is in conformance with this practice resource. Clinicians also are advised to take notice of the date this practice resource was adopted, and to consider other medical and scientific information that becomes available after that date. It also would be prudent to consider whether intellectual property interests may restrict the performance of certain tests and other procedures.



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#### State and Other Resources

#### State Newborn Screening Program

Newborn Screening Program, Utah Department of Health and Human Services 801-584-8256, newbornscreening.health.utah.gov/

#### Genetics/Metabolic Consultants

Pediatric Medical Genetics, University of Utah Department of Pediatrics 801-213-3599, healthcare.utah.edu/pediatrics/programs-services/genetics.php

#### Information for Clinicians and Families

Utah Medical Home Portal (see Newborn Disorders and Parents & Families sections) ut.medicalhomeportal.org/newborn/biotinidase-deficiency

#### Parent/Family Support

Metabolic Support UK www.metabolicsupportuk.org

#### National Resources (with web addresses)

#### **Additional Information**

How to Communicate Newborn Screening Results

www.hrsa.gov/sites/default/files/hrsa/advisory-committees/heritable-disorders/Resources/achdnc-communication-guide-newborn.pdf

Gene Reviews

www.ncbi.nlm.nih.gov/books/NBK1322/

Medline Plus

medlineplus.gov/genetics/condition/biotinidase-deficiency/

Condition Information for Families-HRSA Newborn Screening Clearinghouse newbornscreening.hrsa.gov/conditions/biotinidase-deficiency

ClinGen Actionability Report

actionability.clinicalgenome.org/ac/Adult/ui/stg2SummaryRpt?doc=AC098

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

Find a Genetics Clinic Directory clinics.acmg.net

Genetic Testing Registry www.ncbi.nlm.nih.gov/gtr/

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