

Positive Result: Blood Spot Screen Result Notification



Elevated Guanidinoacetate (GUAC)

Next Steps

This week, you should take the following recommended actions:

- Call a metabolic specialist for guidance on clinical follow-up within one week. Contact information for the metabolic specialists can be found on the resource list provided.
- Contact family to notify them of the newborn screening result as **MDH has not notified them**. Share the follow-up plan with them.
- Arrange referrals and help family coordinate follow-up.

If you have questions about the newborn screening result or your next steps, an on-call Newborn Screening Program genetic counselor is available at (651) 201-3548.

Differential Diagnosis

Elevated guanidinoacetate (GUAC) and an elevated GUAC to creatine ratio is primarily associated with:

- Guanidinoacetate methyltransferase (GAMT) deficiency—Incidence of around 1 in 250,000 to 1 in 500,000

Other disorders to consider:

- Arginase deficiency—Incidence of around 1 in 300,000 to 1 in 1,000,000

False Positives

Possible. False positives have been seen for babies who have been in the NICU.

GAMT Deficiency

GAMT deficiency is the most severe of three cerebral creatine deficiency syndromes (CCDS). GAMT is an enzyme that normally helps break down GUAC into creatine. Without GAMT, creatine levels are lowered and GUAC builds up. GUAC is toxic in large quantities and can cause damage to the nervous system. Creatine deficiency is associated with brain and muscle issues.

Symptoms typically start before age one but can begin as late as age three. Early findings are often non-specific. Hypotonia and delays in infant milestones like sitting, crawling, walking, and speaking are typically noticed first. If untreated, most children develop intellectual disability, behavioral disorders, and epileptic seizures. Poor growth and abnormal uncontrolled movements (such as tremors or tics) may also occur.

Treatment

GAMT deficiency cannot be cured, but early treatment prevents and reduces symptoms. It is best to start treatment while the individual is pre-symptomatic.

Treatment for GAMT deficiency aims to decrease GUAC build up and increase creatine levels. Treatment typically includes medications (creatine, ornithine, sodium benzoate) and a special diet. Individuals must continue treatment lifelong for full efficacy.

Individuals with GAMT deficiency should follow with a metabolic specialist and their regular doctor for continued monitoring of development.