TEXAS Department of State Health Services

Newborn Screening FACT Sheet

2-Methyl-3-Hydroxybutyric Acidemia
(2M3HBA)

What is 2M3HBA?
2-Methyl-3-Hydroxybutyric Acidemia (2M3HBA) is a condition in which the body is unable to break down certain proteins. This condition may also affect the body's ability to break down certain fatty acids and to regulate some activities of the nervous system. 2M3HBA is considered an organic acid condition because it can lead to a harmful amount of certain organic acids and toxins in the body. Early diagnosis and treatment have been shown to be effective in improving the health of individuals affected by 2M3HBA.

What Causes 2M3HBA?
When we eat food, enzymes help break it down. Some enzymes break down proteins into their building blocks, amino acids. Other enzymes break down these amino acids. In the disorder, 2M3HBA, the enzyme 2-methyl-3-hydroxybutyrl is not working correctly. This enzyme's job is to break down the amino acid isoleucine and some fats called branched-chain fatty acids. This enzyme is also involved with hormones. Hormones regulate the body's activities, such as sexual development and nerve signals

If your baby has 2M3HBA, his or her body is missing or making non-working 2-methyl-3-hydroxybutyrl-CoA dehydrogenase enzymes. When this enzyme is not working correctly, your baby's body cannot break down isoleucine, which causes harmful substances to build up in your baby's body. This can be toxic.

What Symptoms or Problems Occur with 2M3HBA?
[Symptoms are something out of the ordinary that a parent notices.]

Children with 2M3HBA start showing signs during infancy, typically between 9 and 14 months. Males and females can have different signs of 2M3HBA.

Males are more severely affected than females. Males might experience:

- difficulty with movements of their muscles
- loss of the developmental milestones met prior to age 5 (also known as regression)
- loss of motor skills.

Females are less severely affected by 2M3HBA. Females affected by this condition may experience:

- mild developmental delays (but no regression)

Both males and females may experience:

- sleeping longer or more often
- tiredness
- loss of appetite
- weak muscle tone (also called hypotonia)
- epilepsy (seizures)

Many of these signs occur when your baby eats foods that his or her body cannot break down. They can be triggered by long periods of time without eating, illnesses, and infections.

If your baby shows any of these signs, contact your baby's doctor immediately.

What is the Treatment for 2M3HBA?
Your baby will need a carefully planned diet to avoid the proteins that your baby's body cannot break down. When your baby eats fats and proteins that he or she cannot break down, it may cause many of the signs mentioned in the "Symptoms or Problems" section. A metabolic doctor or a dietician can help you plan a well-balanced diet for your child.

Your baby will also need to eat often because long periods of time without food can trigger many of the signs mentioned in the signs and symptoms section. Illness and infections can also trigger these signs.

Things to Remember:
Restricted diets have been effective for children who have been treated for 2M3HBA, but we do not know what kinds of long-term effects this treatment could have.

Children with 2M3HBA may develop intellectual disabilities, even if they receive treatment. Males are at risk for severe intellectual disabilities, and females are at risk for mild intellectual disabilities.