TEXAS Department of State Health Services

Newborn Screening ACT Sheet

Increased Phenylalanine
Phenylketonuria (PKU)

Differential Diagnosis: Phenylketonuria (Classical PKU); non-PKU mild hyperphenylalaninemia (H-PHE); transient hyperphenylalaninemia; pterin defects (BIOPT-BS, BIOPT-REG).

Condition Description: In PKU the phenylalanine from ingested protein cannot be metabolized to tyrosine because of deficient liver phenylalanine hydroxylase (PAH). This causes elevated phenylalanine. Pterin defects result from deficiency of tetrahydrobiopterin (BH4), the cofactor for PAH and other hydroxylases. This produces not only increased phenylalanine but also neurotransmitter deficiencies.

You Should Take the Following IMMEDIATE Actions

- **Contact family immediately to inform them of the newborn screening result.**
- **Do not change infant's diet on the basis of this filter test. Confirmatory testing needed.**
- **Consult with pediatric metabolic specialist (See attached list.)**
- **Evaluate the newborn and refer as appropriate.**
- **Initiate confirmatory/diagnostic tests in consultation with metabolic specialist.**
- **Initial testing: Plasma quantitative amino acids.**
- **Repeat newborn screen if second screen has not been done.**
- **Provide the family with basic information about PKU and dietary management.**
- **Report findings to newborn screening program.**

Diagnostic Evaluation: Plasma quantitative amino acid analysis which shows increased phenylalanine without increased tyrosine (increased phenylalanine: tyrosine ratio). Urine pterin analysis and red blood cell DHPR assay will identify pterin defects. Consider PAH mutation testing.

Clinical Considerations: Asymptomatic in the neonate. If left untreated, PKU will cause irreversible intellectual disability, hyperactivity, autistic-like features, and seizures. Treatment will usually prevent these symptoms. Pterin defects cause early severe neurologic disease (developmental delay/seizures) and require specific therapy.

Additional Information:

American College of Medical Genetics and Genomics
https://www.acmg.net/StaticContent/ACT/Phenylalanine.pdf

Genetics Home Reference
PKU
http://ghr.nlm.nih.gov/condition=phenylketonuria

Tetrahydrobiopterin Deficiency
http://ghr.nlm.nih.gov/condition=tetrahydrobiopterindeficiency

STAR G FELSI
http://www.newbornscreening.info/Parents/aminoaciddisorders/PKU.html
http://www.newbornscreening.info/Pro/aminoaciddisorders/PKU.html