ACMG
American College of Medical Genetics and Genomics
Translating Genes Into Health®

ACT Sheet

Newborn Screening ACT Sheet

[Hemoglobin FEA]

Hemoglobin E/Beta Plus Thalassemia (HbE/β⁺ Thalassemia)

Differential Diagnosis: Hb E trait.

Condition Description: Hemoglobin E/Beta Plus (β⁺) Thalassemia is an inherited type of red blood cell disorder characterized by abnormal hemoglobin production. It is due to genetic changes in the beta hemoglobin chain. Although generally asymptomatic at birth, the clinical presentation is highly variable depending upon the severity of the beta thalassemia variant. Patients can remain asymptomatic or can develop any or all of the following over the first year of life: growth or developmental delays, pallor, splenomegaly, decreased activity, and scleral icterus. If symptomatic, it is unusual to develop symptoms prior to 2-4 months of life.

You Should Take the Following Actions:

- Inform the family of the newborn screening result.
- Ascertain clinical status (newborns are expected to be asymptomatic).
- Evaluate the newborn (newborns are expected to be asymptomatic and have a normal clinical exam. If significant signs or symptoms are identified. It is likely related to a different underlying disorder).
- Consult with a pediatric hematologist with expertise in hemoglobin disorders within the first week of life with follow up typically recommended between 2-4 months of age (it is unusual to have symptoms before 2-4 months of life).
- Coordinate confirmatory diagnostic testing and management as recommended by the specialist.
- Provide family with basic information about Hemoglobin E and Beta Plus (β⁺) Thalassemia.
- Refer for genetic counseling.

- Report the final diagnostic outcome to newborn screening program.

Diagnostic Evaluation: The hemoglobins are listed in order of the amount of hemoglobin present on the newborn screen (F>E>A). Hemoglobin electrophoresis, isoelectric focusing, or high performance liquid chromatography (HPLC): is used to confirm the newborn screening result. Complete blood count (with focus on hemoglobin, mean corpuscular volume, smear, and reticuloctye count): may be normal at birth but may demonstrate a microcytic anemia as early as two months of life. Molecular genetic testing: may be required to identify the beta thalassemia variant.

Clinical Considerations: The specific β⁺ Thalassemia variant determines the prognosis. The typical clinical course includes a moderate microcytic anemia, jaundice, and splenomegaly but treatment is seldom needed. In rare instances, affected individuals may require intermittent transfusions and treatment for iron overload. Iron supplements should be avoided unless iron deficiency is documented.

Additional Information:

How to Communicate Newborn Screening Results
Gene Reviews
Medline Plus
GARD
Condition Information for Families- HRSA Newborn Screening Clearinghouse
Clinicaltrials.gov

Referral (local, state, regional, and national:

Find A Hematologist (Filter By Pediatric Hematology-Oncology)
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://bit.ly/NBSResultsHRSA

Gene Reviews
- https://www.ncbi.nlm.nih.gov/books/NBK1426/

Medline Plus
- https://medlineplus.gov/genetics/condition/beta-thalassemia/

GARD
- https://rarediseases.info.nih.gov/diseases/2641/hemoglobin-e-disease

Condition Information for Families-HRSA Newborn Screening Clearinghouse
- https://newbornscreening.hrsa.gov/conditions/various-other-hemoglobinopathies

Clinicaltrials.gov
- https://clinicaltrials.gov/

Referral (local, state, regional and national)

Find A Hematologist (Pediatric Hematology-Oncology)
- https://www.hematology.org/education/patients/find-a-hematologist

Find a Genetics Clinic Directory
- https://clinics.acmg.net

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