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

ACT Sheet

Newborn Screening ACT Sheet
[Hemoglobin FSC]
Hemoglobin S/C

Differential Diagnosis: None.

Condition Description: Hemoglobin S/C 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 asymptomatic at birth, symptoms begin as Hb F decreases and Hb S and Hb C predominate. The clinical course is highly variable, ranging from asymptomatic to infections, splenic sequestration, pain crises, acute chest syndrome, bone damage, retinopathy, and organ damage as the individual ages.

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 (assess for splenomegaly and send CBC).
- Administer prophylactic penicillin.
- Consult with a sickle cell specialist immediately with in-person follow up no later than 12 weeks of age.
- Coordinate confirmatory diagnostic testing and management as recommended by specialist.
- Provide family with basic information about Hemoglobin S/C including the need for urgent evaluation for fever ≥38.5 C (101 F), pallor, unexplained irritability, risks of sepsis, or other signs of illness.
- Refer for genetic counseling.
- Report 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>S>C). Isoelectric focusing, high performance liquid chromatography (HPLC), or capillary zone electrophoresis: are used to confirm the newborn screening result. Complete blood count: the CBC, smear, and reticulocyte count may be normal at birth but over the first months of life demonstrate a worsening anemia, with an increasing reticulocyte count and sickle and other abnormal cells on smear. Molecular genetic testing may be used to confirm the diagnosis.

Clinical Considerations: Newborns with Hemoglobin S/C are generally asymptomatic. Hemolytic anemia and vaso-occlusive complications can develop during infancy or in early childhood. Although patients initially have a milder clinical course and have an increased life expectancy than those with sickle cell anemia (Hb S/S), symptoms can become more severe with age. Without appropriate treatment, complications may include life-threatening infection, splenic sequestration, pneumonia, acute chest syndrome, pain crises, aplastic crises, dactylitis, priapism and osteonecrosis. Comprehensive care including family education, a modified immunization schedule, prompt treatment of infection and of acute vaso-occlusive events, screening for early signs of organ damage, consideration of prophylactic penicillin and disease-modifying therapies reduces morbidity and mortality. Management should be done under the direction of a sickle cell specialist. Solubility testing (Sickledex) should not be used to confirm the diagnosis. Iron supplements should avoided unless iron deficiency is documented.

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

Children's of Alabama
Pediatric Hematology
1600 7th Avenue South, ACC 512
Birmingham, AL 35233
Phone: (205) 638-2390

St. Jude's Clinic at Huntsville Hospital
Pediatric Hematology
910 Adams Street, Suite 310
Huntsville, AL 35801
Phone: (256) 265-5833 or 1-866-595-5449

University of South Alabama Sickle Cell Center
Pediatric Hematology
1504 Springhill Avenue, Suite 5230
Mobile, AL 36604
Phone: (251) 415-5172 or (251) 405-5147

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