

OTHER GENETIC DISORDERS

Cystic Fibrosis (CF)

Cystic fibrosis (CF) is characterized by pulmonary obstruction often accompanied by exocrine pancreatic dysfunction. A defect in the cystic fibrosis transmembrane conductance regulator (CFTR) gene leads to obstruction of exocrine pancreatic ducts which causes an increase in the pancreatic enzyme immunoreactive trypsinogen (IRT) in blood. CF usually affects the lungs, pancreas, intestine, liver and sweat glands, causing failure to thrive, steatorrhea, intestinal obstruction, salt loss, and progressive obstructive lung disease.

Inheritance:	Autosomal recessive
Estimated Incidence:	1:3900 (varies by ethnic group)
Abnormal Screen Result:	Elevated IRT
Method of Notification:	All abnormal results are mailed to physician of record
Next Steps if Abnormal:	Repeat IRT on filter paper and see infant to ascertain health status as soon as possible. If IRT is still elevated on repeat testing, consult pediatric pulmonologist for further instructions. Diagnosis by sweat testing at a CF Foundation accredited care center and/or DNA testing is necessary for final diagnosis. Initiate treatment as recommended by specialist.
Neonatal Presentation:	Usually none. Meconium ileus or volvulus may occur in 5-10 % of affected infants. Prolonged jaundice without other cause is more common than very early lung disease.
Treatment:	Chest physiotherapy to aid in airway clearance. Antibiotics/other medications to treat lung infections as needed. Pancreatic enzymes if indicated; vitamins; NaCl supplements. Close monitoring of growth parameters and use of nutritional supplements if needed to enhance/maintain appropriate growth/development.

Special Considerations

Premature/Sick Infants—The stress of prematurity and/or illness can lead to falsely elevated IRT test results.

Meconium Ileus—All infants with meconium ileus should be thoroughly evaluated for CF regardless of the IRT result. A normal IRT result does not rule out CF.

Prenatal Screening—The American College of Obstetricians and Gynecologists (ACOG) and the American College of Medical Genetics (ACMG) recommends that CF carrier screening be offered to non-Jewish Caucasians and to Ashkenazi Jews. Persons of other ethnicities should be informed about CF carrier screening. However, negative carrier status in either/both parents does not definitively

rule out the possibility of CF in an infant. Infants may have rare mutations that are not included in a standard CF DNA screening panel.

initiation of penicillin prophylaxis upon receipt of newborn screening report if the hemoglobin pattern is FS.

Hemoglobinopathy trait—Refer family to a sickle cell foundation for counseling. See page 68 to identify the foundation nearest to the family.

Neonatal Presentation: None

Treatment: Sickling disorders—Penicillin/antibiotic prophylaxis beginning in infancy and continuing through early childhood. Prompt evaluation/management of acute illness to lessen development of sickling crisis, particularly if fever is present. Appropriate pain management strategies (such as use of extra fluids, oral analgesics, comfort measure), including rapid triage if home management strategies are not sufficient. Transfusion may be necessary in certain instances. Medications to increase the production of fetal hemoglobin and lower leukocyte counts such as hydroxyurea may be used in certain children.

Special Considerations

Transfusion—Transfusion of red blood cells prior to drawing the newborn screening specimen will affect the hemoglobinopathy result. Repeat screening for hemoglobinopathies should be done two months after the last transfusion. If the date of the last transfusion is unknown, put the date of hospital discharge on the collection form next to the “Transfused Yes” box. **DO NOT MARK THE “TRANSFUSED YES” BOX IF THE TRANSFUSION TOOK PLACE 2 MONTHS BEFORE THE SPECIMEN COLLECTION DATE.**

Specimen Analysis at Reference Laboratory—The initial newborn screening bloodspots for infants with hemoglobinopathy results indicative of disease are sent to the Children’s Hospital Oakland Research Institute (CHORI) for more specific hemoglobinopathy analysis and genetic testing. This includes Hb Barts findings that are 15% or greater. CHORI assists state newborn screening programs under a federal grant provided for this purpose. The result of the CHORI analysis are sent by Women and Children’s Services to the physician of record upon receipt at the Laboratory.

Appendix