**What is ChiLDReN?**

The **Childhood Liver Disease Research Network (ChiLDReN)** is a collaborative team of doctors, scientists, nurses, research coordinators, medical facilities, patient support organizations and the National Institutes of Health. The ChiLDReN Network was established by the merging of the Biliary Atresia Research Consortium (BARC) and the Cholestatic Liver Disease Consortium (CLiC), with the addition of studies on cystic fibrosis liver disease (CFLD). The goal of ChiLDReN is to understand the causes of liver disease and to discover new approaches to the diagnosis and treatment of liver diseases in children.

The ChiLDReN Network has clinical sites and research laboratories in the U.S., Canada, and the United Kingdom. These sites are working together to improve the lives of children and families dealing with rare cholestatic liver diseases. ChiLDReN is funded by the National Institutes of Health (NIH), with additional support from the Cystic Fibrosis Foundation (CFF) and the Alpha-1 Foundation.

See the last page of this document for more information on The ChiLDReN Network.
The Liver
The liver is the largest organ in the body and is essential in keeping the body functioning properly. It removes poisons from the blood, produces agents to control infection, and removes germs and bacteria from the blood. It makes proteins that regulate blood clotting and produces bile to help absorb fat and fat-soluble vitamins. We cannot live without a functioning liver.

Infant Liver Disease
In a baby, there can be one or more signs that the liver is not working properly. The skin and eyes may appear yellow (jaundice). Jaundice is caused by a buildup of bilirubin in the blood. The blood might contain higher than normal levels of liver enzymes. The liver may feel large or look large on an x-ray. The abdomen may protrude or look swollen. The urine may be dark yellow or brown. The stools are often grey or white instead of green or yellow. There may also be bleeding or easy bruising.

Jaundice, if it occurs in the first few days after birth and then goes away by the end of baby’s first week, is not harmful. This is called “physiological jaundice.” However, jaundice that remains or increases after the first week may be due to cholestasis (build-up of bile in the liver) and will require further testing. Bile is a fluid made in, and released by, the liver. The gallbladder is an organ which stores bile produced by the liver. The act of eating signals the gallbladder to send bile down the bile ducts and into the small intestine where it is needed for the digestion of fats.

Cholestasis can happen for many different reasons. It can result from a brief illness or injury of the liver, and it will frequently go away on its own. It can also be caused by drugs and often goes away when the drug is discontinued. Cholestasis can also be the result of more serious liver diseases such as idiopathic neonatal hepatitis or biliary atresia.

What Is Idiopathic Neonatal Hepatitis?
Idiopathic neonatal hepatitis due to inflammation of the liver with no known cause. It occurs in newborn babies. Symptoms include jaundice and liver cell changes. It can resemble biliary atresia but is usually a short illness from which children can recover completely. It generally does not lead to cirrhosis or the need for a liver transplant. The
cause of idiopathic neonatal hepatitis does not appear to be related to an infection.

**What Is Biliary Atresia?**

Biliary atresia is a condition in which the ducts that carry bile from the liver to the gallbladder and small intestine are not normal. These ducts can be injured, blocked, or missing. When the ducts that carry bile out of the liver are closed, bile backs up and damages liver tissue. In time, the liver can develop scarring or cirrhosis. The gallbladder may also be abnormal or missing.

The cause of Biliary Atresia is unknown. It occurs once in every 15,000 births. It is a very serious disease which requires immediate treatment. Although it is rare, it is the most common reason for liver transplants in children.

The red X’s indicate structures that don’t form in the infant with biliary atresia

**How Is the Diagnosis Made?**

The doctor will make the diagnosis after completing a number of blood tests and urine tests. In searching for the cause of the liver disease, the doctor might order a scan of the liver and gallbladder, using a radioisotope (a harmless radioactive substance that highlights the liver), or other x-ray tests.

On the basis of the test results, the medical history, and physical examination, the doctor may order a liver biopsy. In a liver biopsy, the physician collects a small sample of liver tissue and examines it under the microscope for signs of injury or disease. Looking at liver tissue itself is the best way to determine the health of the liver and the cause of any damage.
The three most common ways to obtain a liver biopsy in an infant are percutaneous, laparoscopic, or open. A percutaneous liver biopsy is considered minor surgery and the procedure is done at the hospital. After the baby is sedated, the physician will make a small incision in the right side near the rib cage. A biopsy needle is inserted, and a sample of the liver tissue is removed. In some cases, the physician may use an ultrasound image of the liver to help guide the needle to a specific spot.

In a laparoscopic biopsy, the physician inserts a special tube (laparoscope) through an incision in the abdomen. The laparoscope sends images of the liver to a monitor. The physician watches the monitor and uses instruments in the laparoscope to remove tissue samples from one or more parts of the liver. Physicians use this type of biopsy procedure when they need tissue samples from specific parts of the liver.

A surgical or open biopsy is often performed if the abdomen will be opened for surgery. During the surgery, the surgeon will remove a small piece of liver. As this is major surgery, the infant will remain in the hospital for several days. A percutaneous or laparoscopic biopsy may require only a one- day hospital stay.

**What is the Treatment for Idiopathic Neonatal Hepatitis?**

There is no specific treatment to help the liver recover faster; although, a special infant formula which is easier to digest may be recommended. Vitamin supplements may be given if vitamin levels in the blood are low. Frequent blood tests are done to monitor the health of the liver. The doctor may also find it necessary to repeat a liver ultrasound or liver biopsy.
**What is the Treatment for Biliary Atresia?**

There is no cure for biliary atresia. If the diagnosis is made early, a surgery will be performed to allow bile to flow from the liver. This procedure is called a Kasai, or a hepatportoenterostomy.

In a Kasai, the damaged ducts are removed and replaced with some of the infant’s own small intestine, allowing the bile to flow out of the liver. The procedure works well about 50% of the time. When the procedure is successful, jaundice usually goes away in a few weeks. If the bile continues to flow, long-term survival is possible without a liver transplant. When the procedure is not successful, and bile flow is not achieved, the infant will remain jaundiced and the liver will continue to be damaged. In addition, growth is often poor, and a special diet and extra vitamins are necessary. When the liver is no longer able to function, the only treatment available is a liver transplant.
For information on all active ChiLDReN studies and how you may be able to participate, please go to the Clinical Studies page of the ChiLDReN website:

www.childrennetwork.org

You can also contact any of the ChiLDReN clinical centers (see list below) or contact the ChiLDReN Research Administrator (see contact info above) for more information.

ChiLDReN’s Clinical and Research Centers include:

- **Atlanta** - Children’s Healthcare of Atlanta
- **Chicago** - Ann & Robert H. Lurie Children’s Hospital
- **Cincinnati** - Cincinnati Children’s Hospital Medical Center
- **Denver** - Children’s Hospital Colorado
- **Houston** - Texas Children’s Hospital
- **Indianapolis** - Riley Hospital for Children
- **London** - King’s College Hospital (laboratory facility only)
- **Los Angeles** - Children’s Hospital Los Angeles
- **Philadelphia** - Children’s Hospital of Philadelphia
- **Pittsburgh** - Children’s Hospital of Pittsburgh of UPMC
- **Salt Lake City** - Primary Children’s Hospital/University of Utah
- **San Francisco** - UCSF Benioff Children’s Hospital
- **Seattle** - Seattle Children’s Hospital
- **St. Louis** - Saint Louis University / Cardinal Glennon Children’s Medical Center (Alpha One Antitrypsin Deficiency only)
- **Toronto** - The Hospital for Sick Children

The ChiLDReN website and the ChiLDReN Network are supported by the Data Coordinating Center at:

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