

# REJECTION FAQ

## FREQUENTLY ASKED QUESTIONS ABOUT REJECTION



### What is liver rejection?

Rejection is a reaction of the body's immune system, or disease-fighting system, to a foreign object. Typically, when the immune system detects a foreign object, specialized immune cells "attack" the foreign object to defend the body. When a new liver is placed in your child's body, the immune system thinks the transplanted organ is a threat and tries to attack it. The immune system makes antibodies to try to defend against the new organ, not realizing that the transplanted liver is beneficial. To allow the organ to successfully live in a new body, immunosuppressive medicines are used to lower the immune system. These medications help "trick" the immune system, so it accepts the new liver. Rejection occurs when the immune system attacks the transplanted liver.

### What are the different types of rejection?

The 2 most common types of rejection after liver transplantation in children are "acute" and "chronic" rejection. Acute rejection is the most common type of rejection, and describes an immune response occurring at the cell level. Acute rejection may occur as early as days after liver transplant surgery, although can also occur months to years later. Chronic rejection is less common and refers to changes that occur within the liver tissue. Chronic rejection often develops later in the post-transplant period after repeated attacks from the immune system or antibodies that develop over time. In order to determine the type of rejection, a sample of liver cells is obtained through a biopsy and is examined under a microscope by a transplant pathologist. Acute and chronic rejection is treated with different medications. Your transplant team will talk with you about the type of rejection your child has and the appropriate treatment.

### What are the symptoms of rejection after pediatric liver transplant?

It may not always be easy to tell when rejection occurs after liver transplantation. Each child may experience symptoms differently. Symptoms may include: fever, jaundice (yellow skin or eyes), dark urine, itching, abdominal tenderness or swelling, fatigue (tiredness), irritability, and headache. At times, rejection can occur in a patient with no symptoms whatsoever. If your child is experiencing symptoms of rejection, follow the instructions of your child's transplant team on who to call. Rejection is a serious medical concern and you should alert your child's transplant team if you are concerned about possible rejection symptoms. Because rejection can occur without noticeable symptoms, the transplant team will also monitor for rejection by checking liver enzymes and other labs at regular time points.



*This information should not replace medical advice from your doctors or medical team. We encourage our readers to follow their transplant team's medical advice and reach out to their doctors and medical team for further recommendations.*

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### When can rejection occur?

Rejection can occur at any time following transplant. Acute rejection is common in the first several months following transplant, and both acute and chronic rejection can occur even years into the post-transplant period. It is also common to see episodes of rejection during adolescence. Teenagers are at an increased risk for not taking immunosuppressive medications as prescribed (also called nonadherence) as they learn to become independent with their medical care.

### How is rejection diagnosed?

The diagnosis of rejection usually requires a liver biopsy for further evaluation by a pathologist (a special doctor who evaluates tissue under a microscope). Your child's transplant team will decide when this is needed, typically following review of medical history, thorough physical examination, blood work (including complete blood count, liver function tests) and an ultrasound.

### How is rejection treated?

Rejection of the transplanted liver is treated with more immunosuppression medicines. During a rejection episode, the immune system is "attacking" the transplanted liver, so more immunosuppression is needed to stop the attack. Often times, your child will need to be hospitalized to treat rejection to receive immunosuppressive medications given intravenously (through an IV). The most commonly used medicines to treat rejection are steroids (often methylprednisolone or prednisone). Your liver transplant team will let you know how long he/she needs to stay in the hospital, how many days the initial IV steroid (methylprednisolone) therapy is needed before changing to oral steroid (Prednisone), any increase in your child's baseline immunosuppression medication dosage, and the monitoring plan (e.g., how often blood work will be needed in the near term, next liver transplant clinic visit dates).

### How can rejection be prevented?

The main way to prevent rejection is to take anti-rejection medications (immunosuppression) as prescribed by your child's transplant team. Your child needs "anti-rejection" or immunosuppression medicines for the rest of his or her life. Each child is unique, and each transplant team has preferences for different medicines. The most common used anti-rejection medicines include Tacrolimus (also called Prograf® or FK-506 or FK), Cyclosporine (also called Neoral®), Prednisone and Sirolimus (also called Rapamune®). Your child's team will determine the appropriate dosage and level of immunosuppression for your child given his or her medical history and lab values. The doses of these medications may change often, as directed by your transplant team, depending on your child's response and blood work results. It is important to alert your child's transplant team if you run out of these medications or are unable to get them for any reason, as missing doses of these medications may result in rejection.