Transjugular Intrahepatic Portosystemic Shunt (TIPS)

WHY IS THIS TEST DONE:
A transjugular intrahepatic portosystemic shunt (TIPS) is a tract created within the liver using x-ray guidance to connect two veins within the liver. The shunt is kept open by the placement of a small, tubular metal device commonly called a stent.

During a TIPS procedure, interventional radiologists use image guidance to make a tunnel through the liver to connect the portal vein (the vein that carries blood from the digestive organs to the liver) to one of the hepatic veins (three veins that carry blood away from the liver back to the heart). A stent is then placed in this tunnel to keep the pathway open.

Patients who typically need a TIPS have portal hypertension, meaning they have increased pressure in the portal vein system. This pressure buildup can cause blood to flow backward from the liver into the veins of the spleen, stomach, lower esophagus, and intestines, causing enlarged vessels, bleeding and the accumulation of fluid in the chest or abdomen. This condition is most commonly seen in adults, often as a result of chronic liver problems leading to cirrhosis (scarring of the liver). Portal hypertension can also occur in children, although children are much less likely to require a TIPS.

A TIPS is used to treat complications of portal hypertension including:

- Variceal bleeding, bleeding from any of the veins that normally drain the stomach, esophagus, or intestines into the liver.
- Portal gastropathy, an engorgement of the veins in the wall of the stomach, which can cause severe bleeding.
- Severe ascites is the accumulation of fluid in the abdomen and/or hydrothorax in the chest.

Budd-Chiari syndrome, a blockage in one or more veins that carry blood from the liver back to the heart.
A TIPS reroutes blood flow in the liver and reduces abnormally high blood pressure in the veins of the stomach, esophagus, bowel and liver, reducing the risk of bleeding from enlarged veins across the esophagus and stomach.

A TIPS procedure involves creating a pathway through the liver that connects the portal vein (the vein that carries blood from the digestive organs to the liver) to a hepatic vein (one of three veins that carry blood from the liver to the heart).

A stent placed inside this pathway keeps it open and allows some of the blood that would ordinarily pass through the liver to bypass the liver entirely, reducing high blood pressure in the portal vein and the associated risk of bleeding from enlarged veins.

**WHAT TO EXPECT:**
The patient will arrive at the hospital and enter at the main entrance. The patient will report in to register and review insurance. The patient should have a copy of the orders as a precaution. The patient will be brought back to the department where we will confirm the patient’s identity, explain the procedure, and review their history.

In this procedure, x-ray or ultrasound equipment, a stent, and a balloon-tipped catheter are used. The equipment typically used for this examination consists of a radiographic table, an x-ray tube and a television-like monitor that is located in the examining room. Fluoroscopy, which converts x-rays into video images, is used to watch and guide progress of the procedure. The video is produced by the x-ray machine and an image intensifier that is suspended over a table on which the patient lies.

A catheter is a long, thin plastic tube, smaller than a pencil. The stent used in this procedure is a small wire mesh tube, often covered with a fabric made of GORE-TEX®. Other equipment that may be used during the procedure includes an intravenous line (IV) and equipment that monitors your heartbeat and blood pressure.

Image-guided, minimally invasive procedures such as a TIPS are most often performed by a specially trained interventional radiologist in an interventional radiology suite or occasionally in the operating room. Some interventional radiologists prefer performing this procedure while the patient is under general anesthesia, while some prefer conscious sedation for their patient.

Your child will be positioned on his/her back. They may be connected to monitors that track their heart rate, blood pressure and pulse during the procedure. A nurse or technologist will insert an (IV) line into a vein in their hand or arm so that sedative medication can be given intravenously. Alternatively, they may receive general anesthesia.

The area of the body where the catheter is to be inserted will be shaved, sterilized and covered with a surgical drape.
The physician will numb an area just above the right collarbone with a local anesthetic. A very small nick is made in the skin at the site. Using ultrasound, the doctor will identify the internal jugular vein, which is situated above the collarbone, and guide a catheter, a long, thin, hollow plastic tube into the vessel.

Using real time x-ray guidance, the doctor will then guide the catheter toward the liver and into one of the hepatic veins. Pressures are measured in the hepatic vein and right heart to confirm the diagnosis of portal hypertension, and also to determine the severity of the condition. To help plan for the placement of the TIPS stent, a contrast material will be injected in the hepatic vein to identify the portal venous system. Access is then gained from the hepatic vein into the portal system using a TIPS needle (a special long needle extending from the neck into the liver). A stent is then placed under fluoroscopy extending from the portal vein into the hepatic vein. Once the stent is in the correct position, the balloon is inflated, expanding the stent into place.

The balloon is then deflated and removed along with the catheter. Subsequently, pressures are measured to confirm reduction in portal hypertension. Additional portal venograms are also performed to confirm satisfactory blood flow through the TIPS.

Pressure will be applied to prevent any bleeding and the opening in the skin is covered with a bandage. No sutures are needed.

Your child will be admitted to the hospital following the procedure, where they will be closely observed.

HOW LONG WILL IT TAKE?
The procedure takes approximately one to several hours.

PREPARATION:
If your child was given a copy of the exam order or a prescription for the exam, you must present it at time of registration. Patients should expect to receive instructions from a radiology nurse two to three days prior to procedure.

PRECAUTIONS:
The precautions of the actual procedure will be discussed with the Pediatric Radiologist.

CONTRAINDICATIONS:
Please notify your physician and the Imaging staff if you have any allergies, especially to local anesthetics such as lidocaine.

MEDICATION ISSUES:
If the patient was given an order (prescription) for the exam, they must have that with them at the time of the exam. Patient should avoid taking anti-inflammatory medication 24-48 hours
prior to procedure (ex: Advil, Motrin, ibuprofen, Aleve, naproxyn, etc), aspirin, plavix, coumadin, or any other blood thinners should be stopped prior to exam. Please be sure to discuss discontinuation or prescribed medications with your physician, they will tell you how many days prior to the procedure to discontinue you medications. Do not discontinue without consultation with your physician first.