Complex Child E-Magazine

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All About NJ, GJ, and J Tubes

by Susan Agrawal

Some children, particularly those with motility problems or chronic vomiting, have a lot of difficulty tolerating feeds into the stomach. For these children, special feeding tubes can be placed that bypass the stomach in various ways, allowing children to be fed into the small intestine. This article will discuss the three main types of feeding tubes that bypass the stomach, Nasojejunal (NJ), Gastrojejunal (GJ), and Jejunal (J) tubes.

Why do some children need tubes that go into the small intestine?

There are a variety of reasons why some children need to bypass the stomach during feeding. Children who are chronic vomiters or who have severe reflux may end up vomiting the majority of oral or gastric (G) feeds, making it impossible for them to gain weight. Other children with reflux or vomiting may also aspirate food or formula from their stomachs into their lungs, causing respiratory issues. Some children have motility problems of the stomach, such as delayed gastric emptying or pseudo-obstruction, which make the stomach stop functioning as well as it should. Still other children have anatomical abnormalities of the stomach. All of these children may see improvement with tubes that bypass the stomach, such as NJ, GJ, or J tubes.

What types of tubes can be used to feed into the small intestine?

There are several different types of tubes that can be used for children who need these types of feedings, each with its own risks and benefits. These include NJ, GJ, and J tubes, as well as variant placements such as ND (Nasoduodenal) or TJ (Transjejunal) tubes.

NJ tubes

NJ tubes are like NG tubes, only longer. Instead of terminating in the stomach, the tube is threaded through the pylorus, the valve between the stomach and the small intestine, and then pushed forward into the middle part of the intestine, called the jejunum. In some cases, it may only be put in as far as the first part of the small intestine, the duodenum. This is called a Nasoduodenal tube (ND).

NJ tubes are typically placed by a regular radiologist or an interventional radiologist. In most cases, the tube is placed through the nose and then advanced into the stomach using

a continuous type of X-ray called fluoroscopy. In some cases, NJ tubes may be placed bedside, using the natural force of peristalsis (stomach contractions) to propel the tube into the small intestine.

NJ tubes are always temporary. Since all nasal tubes have a habit of being pulled out frequently, NJ tubes can be very problematic. A pulled-out NJ tube requires a trip to the hospital for replacement. For children who pull out their tubes frequently, an NJ tube is not a good option. It can be used in young babies, children with disabilities who cannot remove the tube, or older children who understand not to pull it out. Most children who need long-term feeding into the small intestine will change to a GJ or J tube.

NJ tubes are usually used for brief periods of time, such as in a child who needs a short period of gut rest, a child with a brand new G tube whose tract and stoma have not healed enough to use a GJ tube, in new babies who are expected to need the tube only temporarily, and in critically ill children who are expected to recover.

For information on issues and problems with nasal tubes, such as securing the tube to the face or dealing with the tube being pulled out, see the article on NG tubes.

GJ tubes

GJ tubes are dual-port tubes that use an existing Gastrostomy (G tube site), but thread through a longer tube into the jejunum. Most GJ tubes have two ports, a larger tube that enters the stomach, and a smaller tube that then continues on through the pylorus and into the small intestine. Like regular G tubes, there are a variety of styles available, including a button made by MicKey, and many varieties of long tubes, most of which are secured using a balloon.

GJ tubes are always initially placed in interventional radiology or surgery. Replacements are usually done by an interventional radiologist using fluoroscopy. Most children are able to have the tubes placed and replaced without anesthesia or sedation, as it only takes about 15 minutes and, while uncomfortable, is not usually painful. Children who are anxious or difficult to calm may need conscious sedation, such as a dose of Versed, before the procedure. In some facilities, children are fully sedated, though this is not recommended or necessary in most cases.

The main advantage of GJ tubes is that they allow flexibility. Children can be exclusively fed into the small intestine through the J port, or they can be fed into both the stomach (G port) and small intestine (J port) as tolerated. Some children may also drain or continuously vent the G port while feeding into the J port.

There are several other types of tubes that are very similar to a GJ. One is typically called a TJ (Transjejunal) tube. This tube does not allow access to the stomach, but simply threads a long tube through the gastrostomy stoma into the small intestine. These are used more widely in Canada and some other countries. Another similar tube is the GD (Gastroduodenal), which is identical to the GJ tube, but terminates in the first part of the small intestine.

For information on stoma problems and similar issues, see the previous article on G tubes.

J tubes

Stand alone J tubes are long tubes or buttons that are placed directly into the small intestine. A stoma is created using a variety of surgical procedures and the tube is inserted into the jejunum. Most doctors prefer to use a long tube initially, to allow for the site and tract to heal. The long tube may then be replaced with a standard button identical to those placed in a Gastrostomy.

There are several methods of placing J tubes. The simplest is a straight placement, which may be done using an endoscope (called a PEJ or Percutaneous Endoscopic Jejunostomy), or an open or laparoscopic surgical procedure. In this method, the tube is placed using a similar method to a Gastrostomy, by creating a hole directly into the small intestine and then securing the intestine to the abdominal wall. The tube can be replaced with a variety of long tubes and buttons. Typically, tubes need to be replaced by radiology to ensure they are positioned correctly, but in some cases, they may be able to be changed at home.

J tubes may also be placed incorporating a Roux-en-Y or gastric bypass procedure. This method creates a small "limb" out of a portion of the jejunum, which is then attached to the abdominal wall, creating a "tunnel" into the jejunum. The feeding tube is placed inside this limb. While this method allows for a more stable tract and easy tube changes that can be performed at home, it is a much more complicated and difficult surgery that fundamentally alters the anatomy of the jejunum. Some children, especially those who have motility or sensory problems of the nerves in the gut, may have significant side effects from such a procedure.

Jejunostomy stomas require similar care to Gastrostomy stomas, as discussed in the previous article on G tubes. J tube stomas, however, have a tendency to leak around the tube more often. Because of this leakage, children may have more problems with granulation tissue and irritation.

What type of feeds may be used for J feeding?

Because the jejunum is a smaller diameter than the stomach and lacks an expandable area or fundus, continuous or slow feeds using a pump are mandatory in J feeding. Some children may need to be on feeds 24 hours a day, while others may be able to feed at a faster rate for 16-20 hours per day. Medications may be given as small boluses.

Since children are typically hooked up to the pump for the majority of the day, a small pump and backpack, such as the Zevex Infinity with supermini backpack, is an absolute must.

What type of formula may be fed into the small intestine?

While technically any standard tube feeding formula may be used, most children are given formulas that are already predigested or broken down into their elements. These are typically digested and absorbed much better in the jejunum. Examples of these formulas include Peptamen, Elecare, Neocate, or Vivonex.

There is little experience with blended diets and J feeding, but in general, it is not recommended. These type of diets require the acidity of the stomach to break down the food into an absorbable form. Since feeding into the small intestine places the formula in a more basic pH environment, blended diets may not be digested or absorbed well in most children.

Can medications go through an NJ, GJ, or J tube?

Yes, almost all medications can be put through these tubes. There are a few medications, such as Carafate, that need to go into the stomach, but most medications are absorbed into the small intestine and can be given through any type of J tube.

The exception is medication that is in bead form or tablets that do not dissolve smoothly. These are likely to clog the tube, which is particularly a problem with the narrower size of NJ and GJ tubes.

In general, it is best to give medications in liquid or suspension form. Tablets should be well-crushed or allowed to dissolve completely before administering.

Do tubes into the small intestine need flushing with water?

The recommendations on flushing vary. Some physicians say flushing is not required since feeds are continuous and most children receive flushes after medications anyway. Others suggest flushing once or twice a day, just to remove debris from the tube. Some argue that the tube should be flushed every four or so hours to prevent clogging. The amount of flushing needed depends on the doctor's preference and your child's specific use of the tube.

When flushing an NJ or GJ tube, you need to use enough water to flush the entire J portion of the tube. This is typically 10-20ml, depending on the length of the tube.

What are the typical complications of NJ, GJ, and J tubes?

The most common complication of these tubes, and especially NJ and GJ tubes, is displacement of the tube. In most cases, the NJ or GJ tube is displaced into the stomach, where it coils up. In some cases, it can even end up prolapsed into the esophagus. When

the tube is displaced, children typically have an increase in vomiting or pain. They may begin vomiting up formula or you may see formula draining from the G port of a GJ tube.

A quick test to see if a GJ tube is displaced is to insert a colored juice or even water mixed with food coloring into the J tube. Open up the G port to drain. If the colored solution comes right back out of the G port, the tube is likely in the stomach and will need to be replaced. Note that some children do backflow bile and other substances from the jejunum to the stomach, so this test will not work for those children.

J tubes, and particularly J tubes that have been placed without a Roux-En-Y, also may become displaced by coming out of the tract. This is a more serious problem, as formula may enter the abdominal cavity. Symptoms may include leakage of formula or systemic symptoms such as fever and unstable vital signs. Many physicians prefer tubes be replaced and then checked by X-ray to avoid this problem.

In rare cases, more serious side effects may occur. These include perforation of the intestine by a GJ or NJ, misplacement of the NJ or GJ into the lung at either initial placement or after retching/vomiting, and other rare side effects.

Can a child eat orally while on J feeds?

Yes, some children may be able to eat or drink orally while receiving supplemental feeds into the intestine. This depends on the child's reason for the tube and the motility in the gut.

Can a child return to G feeds after being on J feeds?

Yes, children who improve may switch to G feeds later on. From a mechanical point of view, all that needs to be done to switch an NJ or GJ to an NG or G tube is to pull out the old tube and replace it with the new one. A separate J tube may also be removed, though the stoma often needs surgical closure.

From a feeding point of view, it can be difficult to transition back to G feeds from J feeds. The stomach often shrinks down and "forgets" how to work. It is vital to begin slowly, usually with just water to stretch out the stomach. It may take several weeks or months to transition from J to G feeds. Some children may not have success, depending on their diagnosis and motility problems.