



# Complex Child E-Magazine

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## All about NG Tubes

by Susan Agrawal

Many children with special needs end up with a Nasogastric tube (NG tube) at some point in their lives. While a very useful device, the NG tube can also be a really bothersome and difficult thing to handle, both practically and emotionally. This article is a collection of tips and tricks for making the NG tube work, as well as parent-tested and recommended guidelines for use.

### **What is an NG tube?**

An NG tube is a narrow, flexible tube that is placed through the nose and down the esophagus, ending in the stomach. Formula or other liquid foods like breastmilk are provided through the tube for children who are unable to meet some or all of their nutritional needs by eating orally. Some children also require an NG tube for special diets, medications, or drainage. The tube is temporary, requires no surgery or anesthesia to place, and may be removed at any time.

### **Why an NG tube?**

The most common reason a child ends up with an NG tube is an inability to gain weight or feed well, though they have other uses as well. Weight issues may be due to health reasons, such as a congenital heart defect, gastrointestinal problems like severe reflux, anatomical issues such as a cleft palate, or mechanical problems like the inability to coordinate the suck and swallow.

### **How long should an NG tube be used?**

NG tubes are temporary. They are typically used in children who are only expected to need a feeding tube for a short period of time, usually one to three months. They may also be used to test whether or not a child is able to gain weight using a feeding tube before a more permanent tube is placed. Most doctors do not recommend continuing to use an NG tube for long periods of time because they are difficult to place, can be uncomfortable for the child, have potential side effects and risks, and are aesthetically disconcerting for many families and children.

In some cases, such as extreme medical fragility, unique anatomical concerns of the gastrointestinal tract, or a terminal illness, the NG tube may be used for a longer period of time.

**How is the tube placed?**

First, you must measure your child to determine how far to put in the tube so it reaches the stomach. A standard way to do this is to measure from the nose to the earlobe and then the earlobe to the bottom of the breastbone. Mark or note the appropriate length on the tube itself and then prepare the tube by dipping it into a water-based lubricant. The NG tube is then pushed through the nostril and down the esophagus until you have reached your mark. Some tubes contain a wire or stylet to help with placement, which is then removed after placement. Finally, the placement of the tube is verified (see below) and secured to the face with tape.

Most families find that using two people to place the tube is ideal. The child often needs to be held down by one person while the other inserts the tube. It is best to have all your supplies ready and at hand before beginning the insertion. Young babies should be swaddled during tube placement. In some cases, it can help to cover a baby's eyes with a hat during placement to prevent fear and grabbing of the tube.

Many studies have been conducted on using local anesthetics such as lidocaine during placement, but these have not proved to help very much. Placement tends to be uncomfortable for both parent and child.

**How long can an NG tube stay in the same nostril?**

This depends on the type of tube. Many tubes, primarily those made of PVC, are only designed to be left in place for three days. These tubes are typically used in hospitals for very short periods of time, either for feeding or drainage. They begin to stiffen after several days and can cause irritation and bleeding and must be removed.

Other tubes, particularly those made out of flexible materials like silicone, may be used for as long as one month. Many doctors recommend switching the tube from one nostril to the other every week to prevent irritation. A new tube should always be placed in the opposite nostril after one month of continuous use.

**How do you check placement of the NG tube?**

There are several different systems that can be used, and each has its issues. A common one is to fill a syringe with about 5ml of air, place a stethoscope on the belly, and then push the air through the tube, listening for the whoosh of air as it enters the belly. Unfortunately, many parents have noted that the sound is not all too different whether the tube is in place or the tube has been placed incorrectly into the trachea.

Another method is to draw back on the contents of the stomach using a syringe. If formula or gastric contents come back out, you know you are in the stomach. Never pull hard if you meet resistance since you could be catching the stomach lining in the syringe.

A similar technique involves withdrawing gastric contents and using pH strips to check them for acidity. An acidic response is likely to indicate gastric contents. This method

becomes problematic if the child consumes formula or food, which may change the pH of the gastric contents.

### **Why do you check placement of an NG tube?**

When placed, the tube will occasionally end up in the trachea instead of the esophagus. It is vital to check placement to ensure you are not feeding into the lungs. The tubes are also able to migrate up the esophagus, especially in children who vomit or retch frequently.

### **How often should you check placement?**

You should always check placement when a new tube is placed or replaced. You should also always confirm placement after a child retches or vomits, as it may migrate out of place. If your child has been tugging on the tube or it looks like it may have been pulled out slightly, it is wise to confirm placement.

Most doctors recommend checking the tube placement before all feeds or medication administrations. This system may work well if your child is on intermittent bolus feeds, but it is not practical if your child is fed continuously. In that case, checking the tube placement about every eight hours or two or three times a day is probably adequate.

### **What age children can get NG tubes?**

In theory, children of all ages can get NG tubes. In practice, they are much more useful in infants, older children who can cognitively understand not to pull the tube out, and children with physical disabilities who are unable to remove the tube.

Children in the toddler years, children with sensory problems, and children with cognitive or behavioral limitations are not good candidates for an NG tube. These children will typically pull the NG tube out repeatedly. If the tube is absolutely necessary, these children may need to wear splints on their arms ("No-nos") to prevent them from reaching their noses to remove their tubes.

### **Can the tube be pulled out accidentally?**

NG tubes always get pulled out, either accidentally by the parent or intentionally by the child. Some children pull the tube out multiple times a day. Since it can be both traumatic and irritating to replace the tube repeatedly, it may be best to switch to a more permanent tube for these children.

### **How do you secure the tube to the face?**

This is usually a matter of personal preference and experimentation. The tube must be secured well, using whatever type of tape your child tolerates. Most families run the tube to one side, taping to the cheek. A common system is to place a layer of Duoderm on the

child's face, place the tube over the Duoderm, and then placed another layer of Duoderm on top of that. Secure the entire dressing with a large piece of Tegaderm over the top. If the dressing begins to loosen up, you often only need to re-tape the top layers, preventing irritation of the skin. If Duoderm and Tegaderm are irritating to the skin, other types of tape may be used in a similar manner.

Another method of securing the tube is to create a tape loop around the tube, securing underneath the nose like a mustache, and then securing again to the side of the face as needed.

There are commercial products available for securing NG tubes, but most families find these to be less effective for children than tape.

Some families find that securing the tube up over the ear and then down the back, pinning the tube to the child's pajamas or taping it to the small of the back, can prevent intentional and accidental removal by little fingers. Depending on the child's anatomy, however, it may be uncomfortable to tape above the ear, but the same general strategy can be used starting below the ear or on the neck. This method may also help prevent the tube from tangling around the child's neck, especially if the tubing is then threaded down the child's leg.

### **What size NG tube should you use?**

Little babies typical use tubes that are 5 French (5F) or 6F in circumference. Large babies may use 8F tubes. Tubes larger than 10F in circumference are rare in children.

The length of the tube is entirely up to the family. Some families prefer short tubes that cannot get wrapped around the child's neck, while others prefer longer tubes that can be secured underneath clothing. Tubes come in all lengths, from less than 12 inches to more than 36 inches.

### **How do you give medications through the tube?**

Most NG tubes have a "Y port" at the end with two openings, one for a large catheter-tip syringe or feeding set, and the other for smaller syringes used for medication. Medications may be given through the smaller port as needed.

Some families have found that the ports stretch out or become difficult to keep closed over time. It may be helpful to use an adaptor or extension set with the NG tube to prevent this problem. In some cases, ports must be taped to stay closed.

### **What are bolus feeds?**

Bolus feeds are "meals" that are given over a short period of time through a feeding tube. Many families use a large 60ml syringe for bolus feeds. An open syringe (without the plunger) is attached to the NG tube. The syringe is filled with formula and the formula

slowly pours through the tube into the child's stomach. The rate may be altered by raising or lowering the syringe height.

Bolus feeds may also be given using gravity bags or burettes. These are closed devices that can be filled with formula and hung on an IV pole or other device above the child. The rate of the feed may be adjusted by either raising the height of the bag/burette or using a roller clamp to partially open or close the tubing.

Finally, bolus feeds may be given using a feeding pump, programming the pump to dispense a certain amount of formula over a certain amount of time. Pumps are useful for children who are on-the-go, as they can be worn in backpacks while the child plays. They are also useful for children who need slower boluses, such as over an hour. The smallest and lightest possible pump, such as the Zevex Infinity, and the smallest backpack available, usually makes tube feeding on-the-go much more manageable.

### **What are continuous feeds?**

Continuous feeds are feeds that are given over a longer period of time, usually twelve or more hours a day. Some children receive continuous feeds only at night, while others receive them throughout the day and night. Other children may use a mixture of bolus feeds during the day and continuous feeds at night.

Continuous feeds must be given by a feeding pump. Once again, the smallest, lightest pump and backpack will make this much easier.

Some doctors recommend that all children on continuous feeds overnight should be placed on a monitor to make sure they do not aspirate and choke if the tube comes out of place.

### **How should the child be positioned during feeding?**

Children with NG tubes should always have their heads elevated during feeding. Feeding may be done sitting up, reclining at a 30 degree angle, or standing up. Children should have the heads of their beds elevated at night if feeds are given. This helps to prevent reflux, aspiration, and tube displacement.

### **What are common complications of NG tubes?**

Accidental tube removal is the most common complication, occurring extremely frequently for many families. Solutions for this problem include replacing the tube or switching to a more permanent type tube.

Another common problem is accidental placement of the tube into the trachea instead of the esophagus. It is usually obvious when this happens, as the child will choke and struggle much more than usual. Some children, however, give little to no response. It is vital to verify placement before starting feeds.

Displacement may also occur if the child vomits the tube out of place. Some children will vomit the entire tube right out of their mouths. If this happens, simply pull the tube back out of the nostril and replace it. It may be helpful to use a larger tube or a tube with a weight on the end to prevent this from happening.

Another common problem is irritation of the nose, nostril, or nasal passages from the tube. Bleeding is not uncommon. Switching the tube from one nostril to the other weekly may help. Lubricant or Vaseline may also be placed in the nostril twice a day. Irritation of the throat may also occur, and this can be treated with antacids or other prescription medications that coat the esophagus. Sinus and ear infections are typically more common in children with NG tubes.

Tape irritation from securing the tube is also exceptionally common. Using a base layer of tape can remedy this problem somewhat. It is also best to alternate taping positions from one cheek to the other to allow healing. Try a variety of hypoallergenic tapes until you find the one that is least irritating to your child.

Reflux and vomiting may be increased with the NG tube. The tube holds open the lower esophageal sphincter, allowing gastric contents to enter the esophagus more easily. Reflux medication may be necessary.

Some children may experience increased oral aversion with the NG tube. Some children will refuse to eat because of the sensation of the tube in the throat. Others may be defensive around their noses or mouths. It is important to have your child seen by a feeding therapist, speech therapist, or occupational therapist to handle this problem, though it is unlikely to resolve until the tube has been removed permanently. It may also be helpful to allow your child to suck on a pacifier during NG feedings.

Very rarely, an NG tube may be placed through the sinuses and enter the brain cavity. This is extremely rare but also very dangerous. Make sure you are adequately trained to place the tube and never force it if you feel resistance.

### **When should you switch from an NG tube to a G tube?**

This is, of course, a very personal decision. In general, if the child is gaining well on NG feeds and is expected to need the tube for three or more months, it is probably best to switch to the G tube. In addition, if the child is unable to tolerate the tube well, placements are difficult, or the tube is being pulled out constantly, a G tube may be a more appropriate choice.