Nutrition Support Basics: Tube Feeding & Total Parenteral Nutrition

By, Lindsay K. Johnson, RD, LD
Clinical Registered Dietitian, BJEC

Photos used are licensed: free for commercial use and sharing via google or personal photos
WHAT YOU WILL LEARN

- What is nutrition support
- How long does nutrition support need to be
- Tube feeding options
- Tube feeding and oral intake combined
- Total Parenteral Nutrition (TPN) options
- TPN and oral intake combined
- Signs of not tolerating nutrition support
- Safe weight gain & weight loss goals while on nutrition support
- Take – home tips
What is Nutrition Support?

- If you are unable to eat well enough to support your body’s estimated daily needs (orally), your doctor may prescribe nutrition support which can come in two forms: tube feeding (enteral nutrition, EN) or total parenteral nutrition (TPN).

- Choosing a medical procedure to initiate nutrition support can be a difficult decision to make and may involve questions about ethical, religious, personal and family preferences. An **advance directive** may also be needed if a loved one is no longer able to make this decision on their own (this document can be obtained from your clinical team).

- **Enteral nutrition (EN)** means you are feeding liquid nutrition through a small feeding tube into the gastrointestinal tract (stomach and/or intestines).

- **Total Parenteral Nutrition (TPN)** also called PN, means you are receiving nutrition through an IV (intravenous) access into your veins. A customized bag of fluids is hung and slowly infuses into your blood stream providing your nutritional needs prescribed by your doctor and dietitian. It is typically used when your GI tract is not functional or needs rest to heal.
Nutrition support is considered for the following reasons:

- Swallowing becomes difficult (dysphagia), this can happen after a stroke, Parkinson’s, multiple sclerosis, Alzheimer's, dementia, or as a natural side effect of the aging process.

- Injury or illness that restricts the ability to swallow temporarily, on a breathing machine (intubated), head & neck cancer, or trauma to swallowing muscles.

- Unable to eat enough related to weakness, emotional lack of interest, or unable to absorb nutrients as a side effect of gastrointestinal conditions.
How Long is Nutrition Support Needed?

- Depending on your unique situation, nutrition support may be short term (1-4 weeks) or longer term (1 month – 1 year). On rare occasions, some conditions and disease processes require nutrition support permanently.

- **Potential side effects and risk of nutrition support:**
  
  - Irritation to skin at the insertion site, for loved ones with dementia or confusion they may become agitated and pull on the feeding tube or pull out their IV line. This can require additional sedation and need of replacement of the feeding tube and increase risk of infection. A loved one may need to wear special abdominal binders to prevent future dislodgement of feeding tube (restraints are not preferred).
  
  - **Tube feeding:** potential increased saliva production increases risk of choking, if fluid from the stomach enters the lungs (aspiration) this can lead to pneumonia, diarrhea/constipation, abdominal distension or pain, nausea/vomiting, shortness of breath with additional fluids, swelling of hands/feet, and negative psychological impacts like anxiety/depression.
  
  - **TPN:** refeeding syndrome (in a malnourished state, over feeding may cause serious electrolyte shifts effecting the heart), elevated glucose levels, fatty liver, intestinal mucosal atrophy (cells lining the GI tract decrease their normal metabolic function when no longer being nourished by food)
  
  - Research shows that EN does not help wounds heal in patients with **advanced dementia or cancer**. This is related to the disease process and the body naturally declining (no matter how much increased nutrients are provided).
Tube Feeding Options:

- Short term nasogastric (nose to stomach NG) or nasoenteric (nose to intestine NJ) Dobhhoff (brand name) feeding tubes: A soft flexible plastic tube is inserted in one nostril of your nose and runs down your esophagus to your stomach or intestine where your calculated nutritional needs are provided via liquid formula. The formula may run at a slow rate all day long (continuous), over a cycle of 12-16 hours (often nocturnal while you are sleeping), or in 3-5 bolus feedings if feeding into the stomach (most similar to a normal eating pattern, 1-2 cups of liquid nutrition is given per meal “bolus”). Water flushes are also prescribed for hydration needs.

- Long term PEG (Percutaneous Endoscopic Gastrostomy) feeding tube (G-tube): A soft flexible plastic tube is surgically placed from outside your abdominal region into your stomach. A doctor uses an endoscope (tube with a light and camera) to guide the feeding tube through a small surgical incision. The PEG is secured outside the abdomen and the opening it comes through is called a stoma. The same feeding patterns listed for the Dobhoff above are options.

- Jejunostomy feeding tube (J-tube, or G-J tube): This type of feeding bypasses the stomach and first part of the small intestine (duodenum) and is best for specific GI conditions where the esophagus, stomach, pancreas and/or colon needs time to rest and heal. The small intestine is “smaller” than the volume of the stomach and therefore needs a smaller volume of liquid nutrition. Longer cycles of tube feeding 12-16 hours or nocturnal tube feeding are best tolerated (1/4-1/2 c liquid nutrition infuses over each hour along with smaller water flushes).

- If tube feeding is not the best option for your situation, comfort feeding may be an alternative. This would include hand feeding of pleasurable favorite foods. Often it is helpful to work with a speech therapist to decide the safest texture of foods and if liquids need to be thickened.
Tube Feeding & Oral Intake Combined

- **Tube feeding can mimic a normal eating pattern** of 3-5 meals per day. Instead of eating the meal orally (via mouth) you will instead administer a “bolus” 1-2 cups of liquid nutrition via your feeding tube at your normal meal time. Some find it pleasant to still partake in family meals while others prefer taking their tube feeding in private. It is suggested to still partake in social events for maintenance of well being.

- When you are cleared to safely eat an oral diet and also have tube feeding prescribed by your doctor, bolus feeding is usually the easiest method to use. As you are able to eat more, you can decrease the amount of tube feeding. **A Registered Dietitian and/or home health nurse will calculate your nutritional needs** and make adjustments based upon how well you are eating and your weight goals.

- One approach is if you eat 75% of your meal, you do not need to give yourself any tube feeding. However if your goal is to gain weight you may still administer a small bolus at the end of the meal or 2 hours after your meal (if you are feeling too full).

- **Once you are able to consistently eat 50-75% of your meals**, drink water for hydration, and are maintaining your desired body weight, **the doctor will discontinue your prescribed tube feeding**. The feeding tube will remain in place “just in case” your appetite decreases again (about 8 weeks) or according to your specific goals assessed by your doctor. A small water flush should still be administered through your feeding tube to keep it functional, 1/3 c (3 times per day) for example.
Tube Feeding & Oral Intake Combined, continued

- It is helpful to keep a journal of the prescribed type of tube feeding (at home intermittent or bolus), in the clinical setting cyclic. Record the time the tube feeding is to be given, amount of water flush, amount of formula and any symptoms you may have after the tube feeding.
  - Before and after each tube feeding the feeding tube should be flushed slowly with a small amount of water (~30mL or 1 fluid ounce of warm water) using a syringe.
  - **Gravity (intermittent) feeding** may be ordered, where the formula slowly infuses from a bag hung on a metal pole (15-30 minutes estimated total feeding time).
  - **Bolus tube feeding** is typically much faster (5-15 minutes estimated time). The formula is poured into an open syringe and immediately flows through the feeding tube. This may not be tolerated as well and can cause nausea for some persons.
- If you are on a **cycle of tube feeding (running over 12-16 hours) or continuous (24 hours)** and starting to eat orally the amount of nutrition can be decreased by 50% to promote an appetite. Once you are able to eat 50-75% of your normal meals for 2-3 days and your weight is stable, the tube feeding can be discontinued.
  - The tube feeding would be programmed into a pump to start and stop at specific time, and water flushes will also be programmed for 4-6x per feeding cycle.
Total Parenteral Nutrition (TPN) Options

- TPN comes in a variety of options (prescribed by your Physician/RD):
  - TPN can be a **customized formula or a standard formula**:
    - Lipid free (if only used for 4-5 days) after this lipids are needed to avoid fatty acid deficiency
    - All in one Clinimix brand (protein, carbohydrates, fat) mixed all in one large bag
    - Customized: different amounts protein (nitrogen), lower carbohydrates (dextrose load) for diabetics, prescribed electrolytes, vitamins and mineral specific to your needs and adjusted based upon your biochemical lab results (blood draw)
  - Conditions that often **require more protein** include: Malnutrition, burns, major GI surgeries, trauma, or dialysis (chronic kidney disease)
  - **All of your estimated nutritional needs or a portion of them will be carefully calculated** by a Dietitian/MD and then mixed by a Pharmacist into large bag (1L-3L in total volume)
  - If you are diabetic, or on medication that causes your blood sugar to be elevated, insulin might be added to the bag. A daily multivitamin and/or trace elements are often added as well.
  - **IV hydration may also be needed** if your oral intake of water is limited or you are losing fluids from drains/wounds, a separate bag of fluids is then prescribed and hung with your TPN
TPN & Oral Intake Combined

- If you are on a cycle of **TPN (running over 12-16 hours) or continuous (24 hours)** and starting to eat orally the amount of nutrition can be decreased by **50% to promote an appetite** and/or run for a shorter cycle.

- Once you are able to eat 50-75% of your normal meals for 2-3 days and your weight is stable, the TPN can be discontinued according to your clinical team and Doctors’ plan of care.

- Often as you are starting to eat while on TPN, it is best to **eat lighter foods that are more gentle on your GI tract:**
  
  - For example the **BRAT diet:**
    - Banana, Rice, Applesauce, Toast
    - Balance the sugar content at your meal with some protein and fat (1.5 Tablespoons of nut butter with ½ of a banana is one example)
    - **Slowly increase your water intake** (1/2-1 c of water with each meal), “lemonade color urine” is a sign of good hydration status. Dark “apple juice color urine” may indicate a need to drink more water. Proper hydration can support your kidneys.
Signs of Not Tolerating Nutrition Support

Symptoms to be aware of

- **Feeling too full, abdominal distension**, or abdominal pain could indicate less volume of tube feeding is needed, let your health care provider know how you are feeling.

- **Nausea** or feelings of needing to vomit, you may need to slow down your tube feeding, try a different formula or talk to your doctor about an anti-nausea medication.

- **More than 3-4 loose stools per day**, it is normal to have loose bowel movements while on a liquid diet, however excessive bowel movements are not normal and a different formula with or without fiber may help. A bacterial infection C. diff may also be causing these symptoms and can be tested for.

- Constant dry mouth and **feeling thirsty** may indicate additional fluid needs, this can be confirmed upon lab review by your clinical team.

- Feeling **dizzy, confused, light headed** may indicate a change in your blood sugar, and/or in your electrolytes and should immediately be communicated to your clinical team or doctor.

- **Fluid retention or swelling** in your legs, abdomen, or arms could indicate a need for less fluids. If you have heart or kidney disease you are more vulnerable to these fluid and weight fluctuations. Often **daily weights** are ordered by your clinical team to help better manage your hydration status. You doctor might add a **diuretic** to your plan of care to help remove excess fluids from your body.
Safe Weight Gain & Weight Loss While on Nutrition Support

- In order to have gradual weight gain you need to consistently put in more fuel versus what your body burns off.
  - If you ingest an **extra 500 calories per day**, at the end of a week you will have gained 1 pound.
  - There are 3,500 calories in 1 pound of fat, if you take 3,500 and divide it by 7 days in 1 week, this equals 500 calories per day needed for weight gain.
  - Depending on your frame size, activity levels, and conditions you may need to eat 250-1000 extra calories per day to see consistent weight gain.

- The opposite is true for weight loss goals.
  - A 500-750 calorie per day deficit would equate to **1-1.5 pounds per week** of weight loss.
  - If your BMI (body mass index) is higher (overweight or obesity) weight loss is usually recommended.

The first goal while being on nutrition support and sometimes after is **nutritional adequacy and stability**.

- It may not be the right time to focus on weight changes. This should be discussed with your doctor and dietitian. If appropriate planned weight changes will be prescribed and monitored by your clinical team.
- Drinking an **oral supplement like Boost daily** can support safe weight gain. Ask to talk to your dietitian about supplement options.
Take – Home Tips

- Nutrition support can be instrumental if you develop a condition that leaves you unable to eat your typical diet.

- While on nutrition support it is important for you and/or care providers to learn how nutrition support works and what to expect.

- When you understand the process of nutrition support, you have the tools needed to best support your body during the healing process.

- Communication with your clinical team should be a priority. Keeping a journal can help you better identify what is working well for you.

- Always follow the prescribed plan by your doctor and clinicians for the best possible outcome. It can be emotionally challenging at times, especially when eating food provides a sense of comfort.

- If you are ever feeling emotionally overwhelmed it is important to let your doctor know. There are resources that can be offered to help you feel more calm. Some may benefit from working with a psychiatrist.

- Remember to be patient as your body slowly heals and you are returning to your regular diet.
References


3. Cleveland Clinic, Center For Human Nutrition, M17/ Digestive Disease Institute, Tube-Feeding Instructions For Home; Cleveland, OH 44195.


6. SSM Health Care St. Louis, Making the Decision about Tube Feeding, educational pamphlet.
THANK YOU!

LEARN, GROW & LIVE WELL

Barnes Jewish Extended Care

Bethesda | BJC HealthCare

Exceptional Senior Living, Care & Services