Blenderized Tube Feedings

Blenderized tube feedings are becoming more common. Factors to consider for home enteral nutrition.

March 25, 2019 By Danielle Penick

Papyrus records dating back 3,500 year ago revealed that if people couldn't eat by mouth, they could be fed rectally. Yes, you read that correctly (it's amazing what the body is capable of)! These records reported beef, wine, eggs, wheat, and barley broths were often given. Even President James Garfield survived off of rectal tube feedings for 79 days, in 1881, after an assassination attempt. But we've come a long way since then. Enteral nutrition (any method of feeding that delivers nutrition through the gastrointestinal tract to deliver part or all of someones nutrition) as we now know it began in the 1900s.

Interestingly, during the genesis of enteral nutrition, all tube feedings were blenderized (liquified) because commercial products did not exist. Coincidently, a former coworker of mine started her career as a dietitian before the origins of commercialized tube feeding formulas. Because of this, one of her daily tasks was to write the recipe for the blenderized tube feeding formula for the hospital. Often her recipe included baby food that was thinned down with milk to help prevent it from clogging tubes.

A few years later her hospital had the option of using a commercial powder made by Mead Johnson called Sustagen. It had to be mixed with water and she said it was poorly tolerated. During the 60s and 70s advances in commercialized formulas resulted in more options for patients and the medical field. Since then, tube feeding formulas have only continued to progress, and are now even tailored for a variety of medical conditions and varying nutrition needs for our convenience. Over time, due to the risk of microbial contamination, blenderized tube feedings became less popular with many healthcare facilities. Commercial enteral nutrition formulas are packaged sterilely and reduce the risk of food borne illness. This technology has also resulted in increased hang times of 48 hours (in a closed system) versus 2 hours, has also reduced errors, and requires less time to prepare.

Why are people considering blenderized nutrition?

Outside of enteral nutrition, as a modern society, we typically have access to a wide ranging variety of foods in our diet—more than we've ever had in human history. However, this may not always hold true for those who cannot eat by mouth. With commercialized tube feeding formulas you receive consistent nutrients everyday. But this is not necessarily a bad thing as formulas can provide more nutrients than what many standard American diets offer. However, for those who

want the option of a wider variety of foods, it is a choice for people who don't eat by mouth. This is largely due to access to specialized high tech blenders that can blend food in the convenience of your own home. As a result, blenderized tube feedings are becoming increasingly more popular. Some people are even supplementing with it in conjunction with their commercialized formulas. Blenderized tube feedings can range from adding just one fruit and/or vegetable to a commercial tube feeding formula or to a diet that consists only of blenderized foods.

Other reasons for making blenderized tube feeds include food allergies or intolerances to ingredients that are in commercialized formulas, such as corn, cow's milk, and soy proteins. Some people also find it's cheaper to make tube feedings at home as a result of having to pay for formula out of pocket. Others want less sugar, or may be concerned about certain ingredients, or may desire more fiber or phytonutrients. However, commercial tube feeding formulas can provide consistency in known essential vitamins and minerals, proteins, fiber, etc that are present in foods. It is also not yet known if variety provides any health advantages in tube feedings currently, but we may learn more as research progresses.

Research

There is not much at this time, but in 2018, there was a systematic review that looked at nutrition outcomes in those who used blenderized tube feedings. This study found that patients generally experienced increased under nutrition and required more water. There were higher microbial loads in those using blenderized tube feedings, but the impact on patient outcomes was not assessed. The researchers also recommended considering patient and caregiver motivation and ability to obtain adequate resources.

Also in 2017, a study investigated head and neck cancer patients using PEG (percutaneous endoscopic gastrostomy) tubes who used either blenderized or commercial tube feedings. The authors looked at nutrition status at the start of tube feeding placement, at the 8th week of treatment, and 6 months after treatment. Currently having a PEG tube placed before treatment starts, to be used with concurrent cancer treatment as needed, is not uncommon to help prevent a decrease in nutrition status. Blenderized tube feedings in this study failed to restore protein loss and was found to be unsuitable. People with head and neck cancer often experience severe malnutrition at the time of diagnosis. The authors found that commercialized oncology specific formulas were better for sustaining body weight and composition even after 6 months from treatment.

The study found that neither those using a blenderized tube feeding or homemade formulas had nutrition improvement and instead experienced a significant decline throughout the study with the home-made formula group being the worst off. The outcome from this study demonstrates that homemade and blenderized foods did not adequately meet the nutrient requirements for patients with head and neck cancer scheduled to receive concurrent chemo and radiation treatment. As more research is conducted, we will learn more. Since there isn't strong conclusions it's important to talk to your medical care team.

Determining if blenderized tube feedings are right for you: Pros and Cons

What do you need if you decide to make blenderized tube feedings?

If you are just starting out, I recommend using an inexpensive blender initially to determine tolerance to this type of regimen, before taking the plunge and paying for a more expensive blender, only to find out this lifestyle isn't for you. Conversely, if this method is ideal then you will need to buy a commercial quality/high speed blender such as Vitamix or Blendtec, as these work best for liquifying foods. You will also need a strainer and storage containers.

Tips to getting started

Start by cutting food into chunks and adding it to the blender with additional liquids to thin the food out. This could be in the form of milk, milk substitutes, broth, water, juice, or even commercialized nutrition supplements or tube feeding formulas. Make sure to blend the food to the same consistency and then strain out any seeds or chunks or bones etc because it needs to go though a tube with ease. To make a more balanced formula, you can try blenderizing a meal that you would normally eat, add some liquid, and then blend it. Foods that may be easier to blend include nut butters, avocados, sweet potatoes, yogurt, kefir, bananas, oatmeal, cream of wheat, peas, etc. Conversely, foods that have more potential to clog tubes, include green beans, flax seeds, and berries for example. If eggs are not thoroughly cooked before blending, they can also cause clumping. Foods that can gum up in the blender include olives, bagels, tapioca, white rice, muffins, and white pasta.

Food safety is paramount in someone with a compromised immune system! I cannot emphasize hand washing enough, along with thoroughly cleaning fresh produce, and cooking foods as well as they would be cooked if you were to eat them by mouth. After making blenderized tube feeds, package up, and store leftovers promptly in the fridge for a maximum of 24 hours or long-term in the freezer. Blenders, utensils, syringes also need to be thoroughly cleaned right after each use.

It’s also important to note that you should NOT mix medications in with blenderized tube feedings. Try not to add too much protein powder (if adding any) because you can easily exceed daily protein needs. Be cautious of not giving yourself more than what you would eat by mouth in a sitting. Make sure that the stoma has matured because if the tube were to clog then you may not be able to have a new tube replaced until then. A really important factor is to determine what’s best for you with your medical care team. You should always discuss this with them before deciding to do this on your own and changing your regimen.

By Jan Sedivy on Unsplash

Delivery methods for blenderized tube feedings

- G-tubes (most common tube)

- Gravity bag
- Bolus
- Pump

Things to consider

If you decide to use blenderized tube feedings, you will want to make sure that the tube size is 14 French (Fr) or larger. Feeding through an NG-T (nasogastric) is extremely difficult or not possible as it's usually a small bore tube and more prone to clogging—this type of tube is uncommon for use at home, fortunately. As with any person eating by mouth, you should sit upright or have your body elevated 30 degrees or more to prevent reflux. Tubes also need to be flushed with warm water before and after feeds are given, as well as whenever medicines are administered. Water flushes are extremely important to clean tubes and prevent clogging.

If you are using tube feeing bags or a pump for delivery, then these typically only work with thinner blends. More fluid must be added to blenderized tube feedings and may not be appropriate for those with increased calorie needs or those on fluid restrictions. Another thing to consider if giving feeds via pump, the blend should be infused over 2 hours or less to avoid spoilage. If left too long the ingredients can separate and increase the risk for clogging and may also provide an inconsistent intake of nutrients.

Those who have malabsorption, poor digestion (intestinal motility issues), or who are on fluid restrictions will not likely be able to use blenderized foods. You are more likely to tolerate blenderized tube feedings if your intestines are not compromised and are on tube feedings due to inability to swallow.

There are many blenderized tube feeding recipes online and recipes can vary greatly. A recipe does not always offer adequate nutrition for everyone. So it's really important to start with a registered dietitian consult to assess if the regimen is appropriate for your needs. There are MANY variables to ensuring adequate nutrition, that is safe for your personal and medical needs. Otherwise, you can risk being under or over fed with various calories or nutrients. Dietitians will calculate calories, proteins, carbs, and fats that are appropriate based on your height, weight, past medical history, age, labs, gender, activity level, and treatment status. They will also continue to monitor your nutrition progress and make adjustments as needed. Nutrition is not always a one size fits all. Not all dietitians are trained in this area however, so it may be helpful to seek out one who is.

If you prefer a commercial blenderized tube feeding formula, there are a few options such as Real Food Blends, Liquid Hope, Compleat, or Kate Farms. These are going to be more expensive than most standard formulas and often insurance won't pay for these products. Sometimes, however, if a physician, physicians assistant, or nurse practitioner write for an order with a very specific medical reason as to why this type of formula is needed over a standard one, then insurance may pay for it. Medical reasons can include other formulas are not tolerated, adverse or allergic

reaction (like severe nausea, vomiting, and diarrhea).

Resources

- For adequate sanitation and food safety tips, check out fightbac.org
- For recipes try Nestle Health Science
- Feeding Tube Awareness Foundation
- University of Virginia: Blenderized Feeding Options — The Sky's the Limit

Final Thoughts

Regardless of what decision you make, it will still be essential to have a commercial tube feeding formula on hand for emergency situations or if you are traveling and refrigeration is not available. Currently to date there is little published data available with evidence to show that blenderized tube feedings translate into any significant beneficial outcomes, but that doesn't mean it won't one day be the case. The are many anecdotal statements from patients, caregivers, and clinical staff reporting positive experiences on social media, professional discussions, questionnaires, and one on one during appointments. People have reported that there has been an improvement in constipation, reflux, improved tolerance to the tube feeding and even normalization of the feeding process. As a result, it's important to talk with your team to see what's most appropriate for you, since the right choice for someone else may not be the right choice for you. Making any health care decision can be overwhelming, but know that you can meet your nutrition needs with one method or the other. We live in an incredible time that is often full of choices.

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