

The Why & How of BTF diets!

*Dr. Peggy Marcon & Kelsey Gallagher, RD
The Hospital for Sick Children*





Conflicts of Interest

❖ Faculty:

- Dr. Peggy Marcon & Ms. Kelsey Gallagher

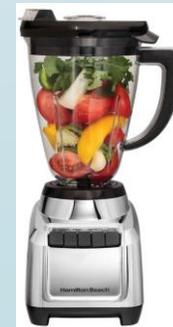
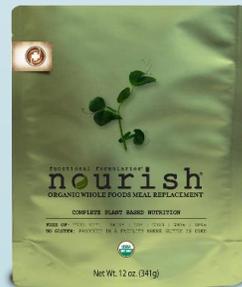
❖ Relationships with commercial interests:

- None to disclose

What are Blenderized Tube Feeds?

Pureed whole food and liquids administered directly into the Gastrostomy tube (G-tube)¹

- ❖ Two types of BTFs currently used:
 1. Homemade blended food prepared by caregiver
 2. Commercially available BTF (Complete & Partial BTF)
 - ✓ Compleat - nestlehealthscience.us
 - ✓ Kate Farms - katefarms.com
 - ✓ Liquid Hope, Nourish - functionalformularies.com
 - ✓ Pediasure Harvest - abbottstore.com
 - ✓ Real Food Blends - realfoodblends.com



A dark grey arrow points to the right at the top left. Below it, several thin, curved lines in shades of blue and grey sweep across the left side of the slide.

A BLEND Diet? Why & How!

- ❖ *Lots of families with children who had G-tubes in place were asking about running “real” food thru the tube rather than just commercial formula.*
- ❖ *There were “suggestions” that changing from all formula to some “real” food made some child feel better and got rid of symptoms like reflux and gas.*
- ❖ *Sure – why not – what would we suggest these children (and adults) eat if they did not need to be fed thru a tube.*
- ❖ *The story that one’s microbiome likes some variety in its’ diet!*



Push back!

- ❖ Not as healthy
- ❖ Contaminated due to cooking and storage
- ❖ Feeling that people with G-tubes need very exact accounting for nutrient intake
- ❖ Feeling of fear and loss of control – more on the part of the Health Care Team



EVIDENCE?

⇓ 2011 Cincinnati Children

- ❖ *Pureed by Gastrostomy Tube Diet Improves Gagging and Retching in Children With Fundoplication.*
 - *JPEN J Parenter Enteral Nutr.* 2011 May;35(3):375-9.

⇓ 2018 Sickkids

- ❖ *Blenderized Enteral Nutrition Diet Study: Feasibility, Clinical and Microbiome Outcomes of Providing Blenderized Feeds Through a Gastric Tube in a Medically Complex Pediatric Population.*
 - *JPEN J Parenter Enteral Nutr.* 2018 Aug;42(6):1046-1060.

⇓ 2019 Boston Children

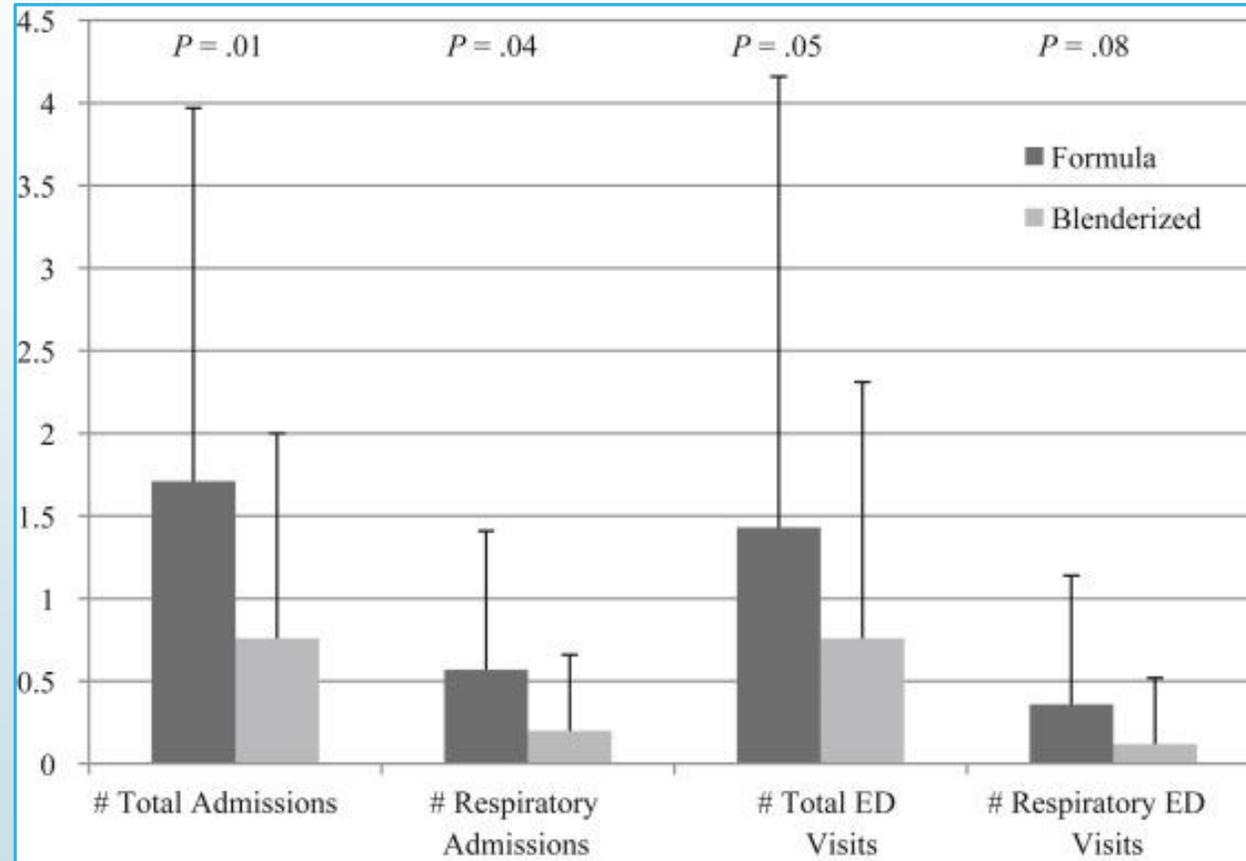
- ❖ *Health Outcomes and Quality of Life Indices of Children Receiving Blenderized Feeds via Enteral Tube.*
 - *J Pediatr.* 2019 Aug;211:139-145

Results from Our Study at Sickkids



- ❖ **BTF were feasible for families**
- ❖ **GI symptoms:**
 - Improvement even with partial BTF
- ❖ **Gut microbiome**
 - Gut microbiome = Flora in your GI tract
 - Increased diversity & richness – which is better for health
- ❖ **Nutrition composition:**
 - Comparable to formula
- ❖ **Increase caregiver satisfaction with G-tube feeds**
 - 100% would recommend this for another child!

Boston review of their patients



Who can do BTF?

- ❖ After one year of age including adults
- ❖ Less than one: some pureed food can begin when your child's Health Care provider would recommend starting "purees" if feeding by mouth.
- ❖ Children who are stable and on G-tube formula can begin partial or full BTF.
- ❖ BTF are not meant to replace **safe** oral feeding but to supplement that if your child needs top ups with tube feeds.
- ❖ If your child is underweight, then work with your dietitian to ensure good weight gain



BTF may even be recommended!

❖ Symptoms^{1,2}:

- Gas bloat after fundoplication surgery
- GERD symptoms
- Recurrent aspiration
- Irritability

❖ May Minimize³:

- Pneumonia
- Number of hospital visits



1. JPEN J Parenter Enteral Nutr. 2011 May;35(3):375-9

2. JPEN J Parenter Enteral Nutr. 2018 Aug;42(6):1046-1060.

3. J Pediatr.2019 Aug;211:139-145

Yum Yum!

- ❖ Family Affair: So now HOW do we do this?
- ❖ Getting parent's perspective on BTF:
<http://www.sickkids.ca/AboutSickKids/Newsroom/Past-News/2018/BLEND-diet-children-g-tubes.html>





What should I consider before starting BTF?

Personal:

- ✓ Is now the right time for me & my family to start BTF?
 - Extra time & energy required

Resources:

- ✓ Do I have access to a dietitian/medical team that is able to:
 - Create a BTF meal plan based on child's dietary needs
 - Initiate, transition & follow my child on BTFs
- ✓ Am I prepared for the potential added expenses?
 - Blender, syringes, food etc. (may be eligible for coverage)



You are interested in starting your child on BTF – but how do you start?

❖ **Discuss BTF with your Healthcare Team:**

- To determine appropriateness of BTF for your child
- This may include:
 - Pediatric Gastroenterologist, Pediatrician / Family doctor or other specialist following your child

❖ **Speak with your dietitian about:**

- Goals & objectives of starting BTF so dietitian can help
 - Ensure appropriate type of BTF chosen
 - Determine whether full or partial BTF makes most sense
 - Appropriate daily BTF schedule made



The Nuts & Bolts of Providing Safe & Effective BTFs

- 1. Adhere to Food Safety Guidelines**
- 2. Ensure your child is meeting dietary needs**
- 3. Ensure you have appropriate equipment to make & preserve BTF**
- 4. Avoid foods that are prone to blocking G-tubes**
- 5. Monitor changes in your child's bowel movements to avoid constipation**
- 6. Be prepared when going out or away!**

#1 Food Safety & BTF

❖ A recent study¹:

- Compared commercial formula, BTF made with pureed baby food and BTF made from blended table food.
- All three of the feeding types were safe for human consumption

❖ The food safety rules that apply for BTF are the same as the ones that apply to the rest of your family

❖ TIPS at the end of the presentation

1. [Nutr Clin Pract](#). 2019 Apr;34(2):257-263. doi: 10.1002/ncp.10226. Epub 2018 Dec 3

2 Ensuring Nutritional Adequacy

Your dietitian will determine your child's estimate requirements:

- Growth history
- Estimated requirements & projected needs
- Macro & Micronutrient requirements
- Fluid requirements



How we do it at SickKids: Diet Prescription

BLEND Calorie Prescription: 1000-1100 kcal/d

Week 1: Decrease formula by _____ mls per day or _____ mls per feed

Recommended Number of Food Guide Servings per Day		What's a serving?	Recommendations	Foods Chosen	Calorie & Protein Content	
Vegetables and Fruit	1	* ½ cup fresh/frozen/canned fruit or vegetables * ½ cup <u>cooked</u> OR 1 cup <u>raw</u> leafy vegetables	➤ Aim for 1 dark green & 1 orange vegetable ➤ Use a variety of each every day		Standard 1 x 60 kcal 1 x 1.5 g pro	Actual
Grain Products	1	* 1 slice bread * ½ bagel, pita, tortilla * ½ cup rice, quinoa, pasta * ¾ cup <u>hot</u> cereal/oatmeal OR 30 g <u>cold</u> cereal	➤ Make half the grain products whole grain ➤ Use a variety of grain products every day		Standard 1 x 100 kcal 1 x 3 g pro	Actual
Milk and Alternatives	½	* 1 cup milk, fortified milk alternative * ¾ cup yogurt, kefir	➤ Use milk or fortified milk alternatives ➤ Choose full fat products		Standard ½ x 140 kcal ½ x 12 g pro	Actual
Meat and Alternatives	0	* ¾ cup cooked legume, tofu * ½ cup cooked fish, meat * 2 eggs * 2 tbsp peanut or nut butter	➤ Choose meat alternatives (beans, lentils, tofu) and eat at least 2 servings of fish each week		Standard 0 x 145 kcal 0 x 12 g pro	Actual
Fats	0 ml	* Use canola, olive oils * Limit butter/hard margarine	➤ Include a small amount of unsaturated fat		Standard	Actual
Salt	0 ml		➤ Add a small amount			
Additional Fluids	_____ ml	* Choose water to thin foods or use as flushes * Use more in warm weather	➤ 75% of most food is water			
Formula	_____ ml					
TOTALS					230 calories 10.5 g protein	

Ensuring a balanced diet!



Snack



Meal



Micronutrient Considerations

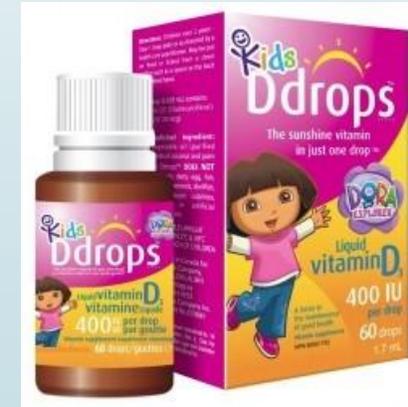
Sodium:

- ❖ Add ¼ tsp salt daily to BTF:
 - 575mg Sodium
 - Adequate Intake:
 - ✓ 1-3 years: 1000mg
 - ✓ 1-4 years: 1200mg



Vitamin D:

- ❖ D-drops
 - Recommended Dietary Allowance:
 - ✓ 1-8years: 600IU





Create a BTF Schedule

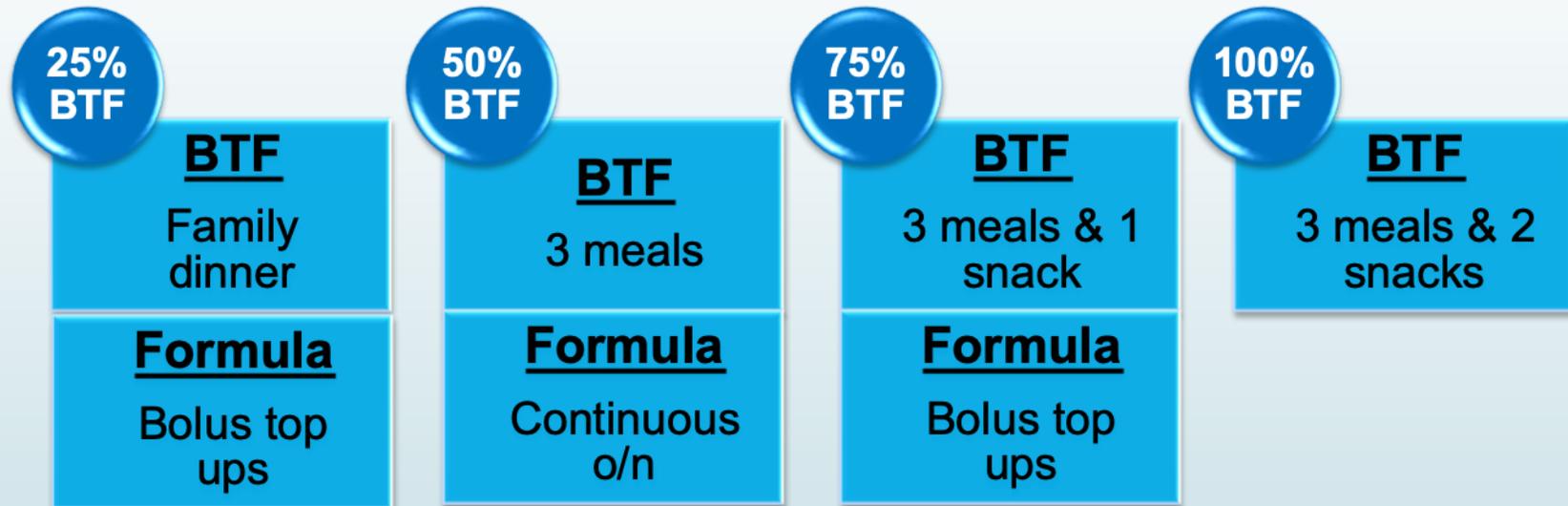
❖ Look at current feed schedule:

- Is your child currently on formula provided through bolus feeds, continuous feeds or a combination?

❖ Incorporating BTFs:

- Must be provided as bolus feeds (given in ≤ 2 -hours)
- Goal can be to incorporate BTF:
 - ✓ Partially:
 - 1 feed/day: At dinnertime with family OR when patient is likely to be the most successful
 - Use formula to provide remaining calories
 - ✓ Fully:
 - Slowly transitioning patient onto 100% BTF over ≥ 4 -weeks

Sample BTF Schedules



3 Equipment Required: Meal Preparation

1



2



3



Equipment Required: Administration

1



2

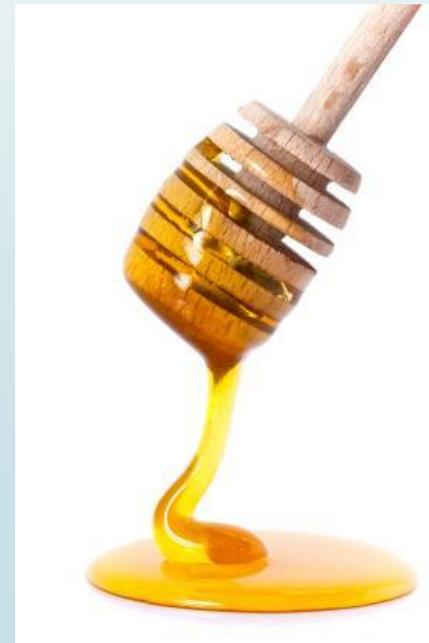


List cautionary foods at the end

Preventing Blocked Tubes: BTF Administration

TEST

- Consistency should be honey-like or thinner
- Test temperature of BTF against your wrist



Preventing Blocked Tubes: BTF Administration

PUSH

- 1st: Fill a syringe with 5ml of oil & administer
- 2nd: Fill multiple syringes with BTF
- 3rd: Syringe feed for 10-30minutes providing small frequent amounts of BTFs



5 Avoiding Constipation

1) Introduce whole grains gradually:

- On average BTFs had 6.3x more fibre than formula¹
- Initially no whole grain products
- Monitor stool consistency & frequency



2) Monitor Hydration:

- Monitor quantity of urine & colour
- Add more water or water flushes as needed

1. JPEN J Parenter Enteral Nutr. 2018 Aug;42(6):1046-1060.

Limited Kitchen Access

Limitations:

- ❖ Freezer space, hotel, camping, day trips, school, daycare etc.

Potential Solutions

- 1) Jarred baby food
 - ✓ Stage 1 or 2
- 2) Commercial BTF
 - ✓ Compleat Pediatric
- 3) Travel blender
 - ✓ Magic Bullet
- 4) Cooler/Insulated lunch kit





Summary

- ❖ **BTF are a real choice**

- Follow up with your doctor & dietitian to help you get started

- ❖ **Nutrition composition is comparable to formula:**

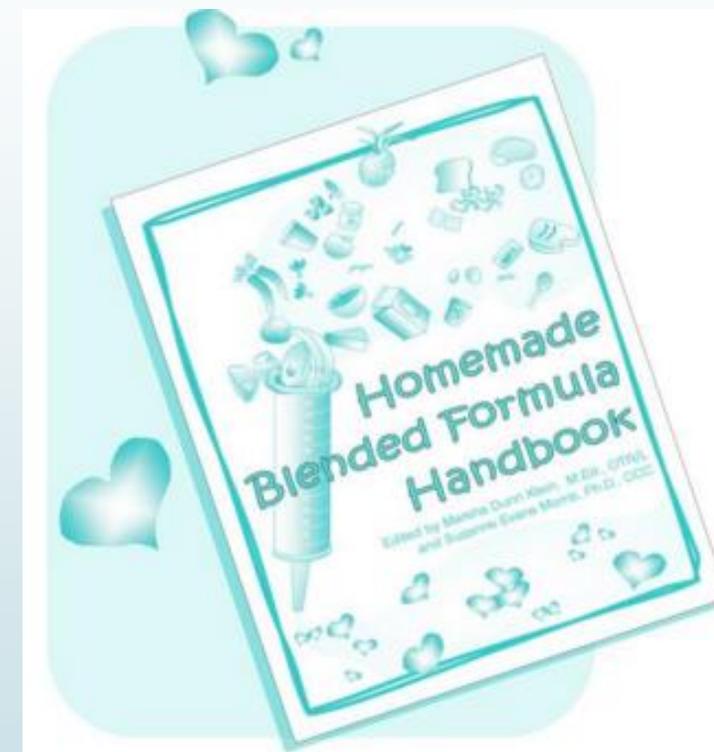
- Ensure BTF are well balanced. Follow dietitian's guidance
- With a few extra steps BTF is just like having a family meal

- └ **BTF can:**

- Improve GI symptoms
- Increase diversity & richness of gut microbiome
- Increase parent/caregiver satisfaction with G-tube feeds

Resources

- ❖ SickKids Handbook & Prescriptions:
 - Available to be shared with your Dietitian
- ❖ Homemade Blended Formula Handbook
 - Authors: Marsha Dunn Klein & Suzanne Evans Morris
- ❖ Oley Foundation (non-profit educational resource for patients on enteral or parenteral nutrition) <https://oley.org/>
- ❖ Food safety guidelines www.homefoodsafety.org
- ❖ www.foodsafety.gov
- ❖ Sample BTF recipes www.ginutrition.virginia.edu
- ❖ www.foodfortubies.org



Questions?



Food Safety Recommendations

❖ At the Grocery Store

- Wrap raw meat & fish in a separate plastic bag
- Ensure canned goods are free of any dents, leaks or bulges
- Pick up items that need to be kept cold or kept hot last
- If the trip from grocery store to home is long, bring cooler to keep foods cold

❖ The Fridge & Freezer

- Ensure refrigerator is kept at 39°F (4°C)
- Ensure freezer is kept at (0°F) (-18°C) or lower
- When ready to use frozen foods, they should be thawed out slowly in the refrigerator

❖ The Leftovers

- Stored in shallow dishes with an airtight lid. Label the leftovers by name and date before placing in the fridge or freezer
- The shelf life of the leftovers will depend on the type of food and if it is stored in the fridge or freezer. Speak with dietitian for more information

Preventing Blocked G-tubes

Cautionary Food Items

Fruit & Vegetables

- × Raspberries & blackberries
- × Dried fruit
- × Celery
- × Corn
- × Popcorn

Grain Products

- × Seedy breads
- × Sticky rice

Milk & Alternatives

- × Yogurt with seeds
- × Hard cheese

Meat & Alternatives

- × Whole nuts & seeds

Fats

- × Cold butter