Home Blended Tube Feedings
Annette Pederson, MS, RDN, CD
WA-PNPG Lifecare Solutions.

Objectives
• Identify patients who are appropriate for blenderized tube feedings
• Describe strategies to implement blenderized diets in the home
• Discuss the use of blenderized tube feedings in hospital settings

What is a blenderized tube feeding?

Blenderized Tube feedings

RDN Experience
Aspen Survey 2015

- 42% of Institutions use BTF for pediatric patients
- Used most often for patients with long term enteral feeding and per parents's request
- Cerebral Palsy, Developmental Delay, Oncology, Excessive vomiting

Pro's of BTF

- Diet can be customized for nutrition-food allergans, complex diagnosis
- Normalize Meal times
- Improved bowel function, tolerance to feedings
- May be more cost effective, insurance may not cover formula
- Decreased oral aversion, transition to oral feedings
- Environmentally friendly

Nutri in Clinical Practice 2016 Bobo et al

Pureed by Gastrostomy Tube Diet improves Gagging and Retching in Children with Fundoplication

- 52% reported a 76-100% decrease in gagging and retching
- Symptoms resolved almost immediately after beginning a pureed diet
- No parents reported a worsening in symptoms
- 57% report an increase in oral intake
- JPEN Pentiuk et al 2011

Cost of formula

<table>
<thead>
<tr>
<th>Formula</th>
<th>Cost per 100 kcal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homemade, conventional</td>
<td>0.36</td>
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<tr>
<td>Homemade organic</td>
<td>0.85</td>
</tr>
<tr>
<td>Pediasure</td>
<td>1.25</td>
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<tr>
<td>Compleat Pediatric</td>
<td>1.75</td>
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<tr>
<td>Real food blends</td>
<td>3.13</td>
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<tr>
<td>Liquid Hope</td>
<td></td>
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<tr>
<td>Nourish</td>
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</tr>
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</table>

Cons to BTF

- Some formulas do not provide all nutritional needs (protein, calories, fat, vitamins, minerals)
- May require more fluid flushes - BTF average 75% water
- Requires monitoring by RDN
- More time consuming than commercial diets.
- Food safety/Risk of contamination
- Can clog tubes

Not all formulas are created equal

Real food blends
- Calcium
- Vitamin D
- Vitamin E
- Vitamin E
- Vitamin K
- Folic acid
- Biotin
- Iodine
- Essential fatty acids

Nourish
- Phosphorus
- Vitamin D
- Vitamin E
- Folate, Vitamin C
- Copper, B vitamins
- Vitamin A (betacarotene)
- Vitamin K
- Magnesium

Should we try blenderized tube feedings?

Facts to consider

- **Medical Status** – patient medically stable
- **Medical condition** – caution with renal disease, metabolic disorders, multiple food allergies, immunocompromised, malabsorption
- **Age**: 6 months
- **Feeding Tube** – gastrostomy tube >14 fr, jejunostomy tubes
- Feeding Method
- **Family Resources**
Nutrition Assessment
- Medical reason for tube feeding and additional diagnosis
- Growth
- Diet – how are they tolerating and growing with current diet?
- What are their calorie, protein, vitamin, mineral, fluid and fiber needs?
- Will they tolerate bolus feeds?

Food Allergies
- Follow American Academy of Pediatrics (AAP) and American Academy of Asthma, Allergy and Immunology (AAAAI)
- Introduce 1 food at a time waiting 3-5 days to start a new food.
- Be sure to continuously check for nutritional adequacy.

How -Tos
- Lydia

Recipes?
• Compare recipe to estimated needs

• Add additional foods and supplements to meet nutrient and calorie needs
Step 1 - choose a protein

- Milk and milk substitutes (Hemp, oat or pea milk)
  - Formula
  - Yogurt
  - Meat
  - Tofu
  - Nut butters
  - Eggs
  - Fish
  - Legumes
  - If vegetarian – use complementary proteins

- Fortified Soy milk: complete
- Fortified Rice milk: low protein
- Fortified Hemp, Oat, Pea, Almond milk (protein varies)
- Soy, almond, coconut yogurt

Step 2 - choose carbohydrates

- Fruits and Vegetables
  - Vitamin A & Vitamin C
  - Provide a variety daily
  - Thickening Agents
  - Grains to add kcals/fiber/thicken
  - Use cooked rice, quinoa, soaked cheerios, etc.
  - Need up to ~ 8 Tablespoons of infant cereal
  - Can add cornstarch or white granulated sugar

- Amaranth
- Arrowroot
- Barley
- Brown rice
- Buckwheat
- Corn
- Oat
- Potato
- Quinoa
- Teff
Choose healthy fats
- Avocado
- Chia seeds, flax seeds
- Coconut oil
- Eggs
- Nuts/nut butters/nut oils
- Olive oil
- Salmon

Remember Water

Calculate free water
1. Calculate the amount of fluid need (oz or ml)
2. Blend recipe to consistency of pudding (thick) or cream (thin)
3. Measure the amount of formula
4. Multiply by 25% = extra fluid needed
   - Eg. Lydia needs 1500 ml/day to meet minimal hydration needs. Formula makes 1200 ml total (~75% free water)
   - 1200 ml X .75 = 900 ml of free water
   - 1500 ml - 900 = 600 ml/day additional water needs

Caution with Electrolytes
- Sodium & Potassium Supplementation often inadequate:
  - best with dietary sources
  - can add with table salt, “Lite salt”
  - may use electrolyte solution - pedialyte/gateraide/homemade, but these add calories
Analyze Recipe

Food Safety

Do you need to supplement?

Use DRI as reference.

• Vitamin supplementation is not usually covered by insurance—keep cost in mind.

Liquid vitamins

• Communication.

• Keep it to a minimum.

Use clean equipment

Wash hands often

Thaw foods properly

Cook meats to proper temperature

Keep raw foods and cooked foods apart

Transport foods to school/hospital with ice packs, labeled

Start with a clean kitchen – disinfectant wipes or 1 teaspoon bleach to 1 gallon hot water

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Target</th>
<th>Average intake</th>
<th>Status</th>
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<tbody>
<tr>
<td>Vitamin A</td>
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<tr>
<td>Vitamin C</td>
<td>90 mg</td>
<td></td>
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<tr>
<td>Thiamin</td>
<td>1.2 mg</td>
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<tr>
<td>Riboflavin</td>
<td>1.7 mg</td>
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<tr>
<td>Niacin</td>
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<td></td>
</tr>
<tr>
<td>Vitamin B6</td>
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</tr>
<tr>
<td>Folate</td>
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<tr>
<td>Calcium</td>
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<tr>
<td>Iron</td>
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<tr>
<td>Zinc</td>
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</tr>
<tr>
<td>Phosphorus</td>
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<td>Magnesium</td>
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</tr>
<tr>
<td>Protein</td>
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</tr>
<tr>
<td>Fat (saturated)</td>
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</tr>
<tr>
<td>Carbohydrate</td>
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</tr>
<tr>
<td>Fiber</td>
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<tr>
<td>Cholesterol</td>
<td>&lt;200 mg</td>
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</tr>
<tr>
<td>Sodium</td>
<td>&lt;2300 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>3500 mg</td>
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</tbody>
</table>

Food Safety

Start with a clean kitchen – disinfectant wipes or 1 teaspoon bleach to 1 gallon hot water

• Use clean equipment

Wash hands often

Thaw foods properly

Cook meats to proper temperature

Keep raw foods and cooked foods apart

Transport foods to school/hospital with ice packs, labeled
Administration

Lydia

Thick Blends

- Administered by syringe
- Start as 1-2 oz bolus pushed slowly in over 10 minutes.
- Increase bolus to 4-8 oz goal.
- Flush with water/liquids to meet fluid needs.

Thin Blends

- Administered via Plunger Syringe
- Push slowly
- Allows for varying degrees of thickness
- Via Gravity
- Bag/Syringe without plunger
- Elevated to gravity to flow through
- Formula required to be very thin

Thick vs Thin

Calculating and Preparing a Pureed-by-Gastrostomy-Tube (PBGT) Diet for Pediatric Patients With Refetching and Gagging Postfundoplication

Theresa D'Amato, CNS, BSN, LD, CSP
Kathy Sotolco, REN, RDN, CSP
Scott Pfeiffer, MD

Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio
Thin Blends

- May be administer with pump
- Thin formula required to flow through pump
- Pump feeds to run < 2 hrs. for food safety
- "Pump warning: " Do not use homemade blenderized or liquidized foods or other non-commercially available feeding solutions..."

Implementing

- Consider patient experiences
- Fiber content of formula
- Review food safety with parents

Monitoring

- Initially monitor more frequently for growth/tolerance/nutrient intake.
- Food records – monitor for tolerance bowel movements, urinary output

Tips and Tricks

- Foods blend better when warm
- Use water from cooked vegetables for liquid
- Skin on fruits and vegetables add fiber
More tips

- Use refillable pouches or mason jars
- Buy in bulk
- Canned, jarred, baby food or frozen fruits and vegetables can be used
- Coffee grinder for vitamins or pill crusher
- Crockpots to cook grains, meats, legumes and large batches of food

Difficult to blend foods

- Breads
- Corn
- Nuts
- Seeds (chia, flax, strawberries, blackberries)

What about clogs

- Thicker foods puree better then add liquid
- Strain your formula
- Use a bolus extension
- Generally extensions get clogged - they can be disconnected and blown out – or use cotton pipe cleaner

Equipment

- Blenders
- Equipment
- Storage Containers
- Refrigerator or freezer space
- Misc
Storing BTF

- Store feedings in the refrigerator up to 24 hours, in covered container. 24 hours, it is important to throw away unused feeding.
- Do not leave homemade tube feedings out of the refrigerator for more than 2 hours.
- Recipes with milk may not freeze well. Add formula or milk after thawing.
- Frozen blenderized foods should be kept for no longer than 3 months.

Hospitalization & BTF

- Options:
  - Commercial formula
  - Hospitals may be willing to make BTF using their standardized recipes or family recipe
  - Bring BTF from home. This increases the risk for food borne illness, there are guidelines you will need to follow when you make, transport and store the tube feeding

Websites

- [www.supertracker.usda.gov](http://www.supertracker.usda.gov)
- The Oley Foundation, "Making Your Own Food for Tube Feeding"
- "Real Food for Real People, a Blended Diet Resource"
- [http://www.foodfortubies.org/](http://www.foodfortubies.org/)
- [http://youstartwithatube.blogspot.com](http://youstartwithatube.blogspot.com)
- [http://mealtimenotions.com](http://mealtimenotions.com)
- [http://www.feedingtubeawarness.org/Blenderized-Diet.html](http://www.feedingtubeawarness.org/Blenderized-Diet.html)
- [www.fightbac.org](http://www.fightbac.org) Consumer education about food safety
References

• The Homemade Blended Formula Handbook, by Marsha Dunn Klein and Suzanne Evans Morris, 2007, Mealtime Notions LLC (written for parents of tube-fed children)
• Blended Foods for Home Tube Feeding: Learn About the Benefits, Risks, and Strategies for Success By Theresa A. Fessler, MS, RDN, CNSC Today’s Dietitian Vol. 17 No. 4 P. 30

Resources continued

• O'Gorman, EA. Complete Tubefeeding: Everything You Need to Know About Tubefeeding. Tube Nutrition and Blended Diets. CreateSpace Independent Publishing Platform; 2012. Written by HEN Consumer