The Trend to Blend

Lisa Epp, RDN, LD, CNSC
Disclosures

I have a commercial relationship with Nestle, Abbott and Halyard Health as a consultant/member of speaker’s bureau, etc. and will provide practice recommendations that are based on formal structured review of the literature.
Objectives

- Evaluate who is using blenderized tube feeding (BTF).
- Define criteria that should be met prior to starting BTF.
- Be able to list tools needed to make and administer BTF.
- Construct sample recipes for BTF.
- Discuss differences between the premade whole food formulas.
Who is blending?
Mayo patients blending

- Authors conducted a study of Mayo patients (54 adults).
- BTF was used by 55.5% of patients.
- 90% expressed a desire to use BTF if provided with adequate information.
- GI symptoms
  - 83% had no symptoms on BTF
  - 67% had no symptoms on commercial formula.

Results: BTF is tolerated as well as commercial formulas.
Oley Foundation Survey

Pediatrics (125 respondents)
- 89.6% of pediatric patients used BTF
- 71% of total daily intake
- 75% used homemade blends
- 90.2% reported no weight loss when using BTF compared to 58.9% reported no weight loss when using commercial formulas

Adults (91 respondents)
- 65.9% of adult patients used BTF
- 56% of total daily intake
- 67% used homemade blends
- 51 (85%) reported no weight loss when on BTF vs 31 (32%) reporting no weight loss with commercial enteral formulas.

- Results: using commercial EN formula was more likely to lead to weight loss than using BTF ($P < .0001$).

HEN Demographics survey

- Online survey linked on Oley Foundation and Feeding Tube Awareness Foundation online.
- Coram and Pediatric Home Services also helped administer the surveys.
- 1519 surveys completed
  - 1062 <18 years old
    - 23.6% reported use of BTF
  - 457 ≥18 years old
    - 14.9% reported use of BTF

Abstract presented at ASPEN Nutrition Science and Practice Conference January 2018
Take away

• Many patients are blending and this should be part of every nutrition assessment for an enterally fed patient.
• Clinicians refusing to consider these formulas or homemade recipes may lead to patient harm.
• Some patients may not be able to blend and may feel “shame”.
• “much more energy with blenderized feedings & regular bowel movements”
• “its great to have flexibility and choice”
• “Feel the best I have in 10 years”
Criteria

- Talk to your primary care provider
- Mature stoma
  - 12 French or greater tube
    - Smaller French sizes may work with some commercial formulas and thinner home blends.
  - Some formulas may work with nasal tubes
- Determine a system for monitoring
- Nutrition professional available
Perceived benefits

RDN rapport

- 2,448 dietitians responded
- 58% use and recommend BTF
- Most common reason for use was parent request (70.2%)

Parents

- 244 parents responded, 50% using BTF in some way
  - Only half (49.3%) of parents using BTF referred to dietitians for feeding oversight

Clinical Benefits

- Improve reflux
- Decrease in vomiting
- Bowel regularity
  - Improved diarrhea
- Increased bacterial diversity of gut
- Bowel adaptation improved


Clinical Hesitation

- Limited published peer reviewed publications
- Microbial contamination
- Variability of nutritional composition
- Increase in clinician’s time
- Potential increase in cost/lose reimbursement
- Possible tube clogging, tube wears out more quickly
- May be more difficult to travel
- Facility or hospital may not support it

Tools needed
Tools

- Blender study
  - Blenders tested: Oster Blender, Cuisinart food processor, Magic Bullet, Mega Kitchen-Ninja System and Vitamix.
  - Vitamix seems to blend better than all of the devices, for thicker recipes, with the exception of the Mega Kitchen-Ninja System.
  - Increased blending time helped with less powerful blender.
  - Blendtec worked as well as Vitamix.

- Catheter tip O ring syringes
  - Don’t get sticky
  - Easier to push
  - May help to oil syringes

- Straight bolus extension sets
Tools

- Large bore gravity bags
- EnteraLite® Infinity® pump
  - May need to increase pump rate to compensate
  - Viscosity may result in inconsistent feeding times
- Bolee™ bags

Its Just Food and Water
Recipe development

- Exchanges
- Standard recipe
- Plate method
**Recipe idea 500 kcal (exchanges)**

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starch – well-cooked oatmeal, rice, pasta or potato</td>
<td>½ cup</td>
</tr>
<tr>
<td>Yogurt, reduced fat (2%)</td>
<td>¼ cup</td>
</tr>
<tr>
<td>Milk, 1%</td>
<td>¾ cup (6 oz)</td>
</tr>
<tr>
<td>Oil, canola</td>
<td>2 teaspoons</td>
</tr>
<tr>
<td>Fruit – canned, fresh or frozen apple, banana, peaches, mandarin oranges</td>
<td>½ cup</td>
</tr>
<tr>
<td>Vegetable – canned, fresh or frozen well cooked broccoli, carrots, green beans or cauliflower</td>
<td>½ cup</td>
</tr>
<tr>
<td>Meat – cooked tender chicken, turkey, beef, fish or smooth, soft tofu</td>
<td>½ cup</td>
</tr>
</tbody>
</table>

**PROCEDURE**: Put all items in a blender and mix well. This fits into a Magic Bullet. Refrigerate if not used immediately.
### Standard Recipe 1000 kcal

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
<th>Total Volume to send:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooked oatmeal</td>
<td>1 cup</td>
</tr>
<tr>
<td>Egg, cooked</td>
<td>1 each</td>
</tr>
<tr>
<td>Melon</td>
<td>½ cup</td>
</tr>
<tr>
<td>Whole milk</td>
<td>4 fl oz</td>
</tr>
<tr>
<td>Canola oil</td>
<td>1 teaspoon</td>
</tr>
<tr>
<td>Cooked brown rice</td>
<td>½ cup</td>
</tr>
<tr>
<td>Cooked green beans</td>
<td>½ cup</td>
</tr>
<tr>
<td>Canned peaches (drained)</td>
<td>½ cup</td>
</tr>
<tr>
<td>Yogurt (reduced fat 2%)</td>
<td>6 oz</td>
</tr>
<tr>
<td>Whole milk</td>
<td>4 fl oz</td>
</tr>
<tr>
<td>Pureed carrots</td>
<td>½ cup</td>
</tr>
<tr>
<td>Tofu</td>
<td>½ cup</td>
</tr>
<tr>
<td>Avocado</td>
<td>4 tablespoons</td>
</tr>
</tbody>
</table>
Family Meals

MyPlate Daily Checklist

Write down the foods you ate today and track your daily MyPlate, MyWins!

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Food Choices for Each Group</th>
<th>Did You Reach Your Target?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>1 1/2 cups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 cup of fruits counts as</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 cup raw or cooked fruit;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1/2 cup dried fruit;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 cup 100% fruit juice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>1 1/2 cups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 cup vegetables counts as</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 cup raw or cooked</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 2 cups leafy salad greens;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 cup 100% vegetable juice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grains</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>5 ounce equivalents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 ounce of grains counts as</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 slice bread;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 ounce ready-to-eat cereal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1/2 cup cooked rice, pasta,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1/2 cup 100% vegetable juice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>4 ounce equivalents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 ounce of protein counts as</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 ounce lean meat, poultry,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 egg;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 Tbsp peanut butter;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1/4 cup cooked beans or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1/2 cup nuts or seeds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dairy</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>2 1/2 cups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 cup of dairy counts as</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 cup milk;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 cup yogurt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 cup fortified soy beverage;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1/2 ounce natural cheese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 2 ounces processed cheese.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Limit:**
- Sodium to 1500 milligrams a day.
- Saturated fat to 16 grams a day.
- Added sugars to 35 grams a day.

**Activity:**
- Children 2 to 5 years old should play actively every day.

Track your MyPlate, MyWins

Consumer Recipe shortcomings

- Too many fruits/vegetables
- Too much protein
- Low in salt and potassium
- Forget the carbohydrate
- Too much water
- Not enough water
The following information is being provided for a learning experience and not to promote any one product over another.
Commercial products

1. Compleat®, Compleat® Pediatric, Compleat ® Pediatric Reduced Calorie, Compleat ® Organic Blends
2. Kate Farms® Komplete, Core Essentials, Peptide Plus 1.5, Kate Farms Pediatric Peptide 1.5, Kate Farms Pediatric Standard 1.2
3. Liquid Hope® and Nourish®
4. Pediasure Harvest™
5. Real Food Blends™
6. Ultrient™ (coming soon)
Conclusion

- Blended formula appears to be used in the majority of Mayo/Oley HEN patients

- Can meet nutrition needs with the help of a registered dietitian.

- There are many options available for patients who wish to use BTF.
References