Dietary Strategies for Fecal Incontinence (FI)

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Cassandra Pogatschnik, RD, LD, CNSC
Center for Gut Rehabilitation and Transplant (CGRT)
Center for Human Nutrition
Digestive Disease Institute

Introduction

Definition of FI:
- Continuous or recurrent uncontrolled passage of fecal material (>10 mL) for at least one month in an individual older than three years of age
- Lack of control over defecation

Causes
1) Altered bowel habits due to underlying etiology
2) Complications from ano-rectal surgery
3) Damage from childbirth
Both diarrhea and constipation can contribute to FI; therefore dietary advice must be tailored to address the underlying stool consistency.

Loose stools fill the rectum quickly and are more difficult to hold than solid stools.

Intestinal Failure May Lead to FI

- Loss of small bowel absorptive capacity
  - Obstruction
  - Dysmotility
  - Inflammation/Infection
  - Surgical resection
  - Congenital defect
  - Mucosal disease

- Presenting features
  - Chronic diarrhea (FI)
  - Dehydration
  - Electrolyte abnormalities
  - Micronutrient imbalances
  - Malnutrition

**Length and Sites of Absorption**

**Duodenum**
- ~30cm
- amino acids, mono- and disaccharides, iron, selenium folate, copper

**Jejunum**
- ~150cm
- monosaccharides, a.a.’s, lipids, A-D-E-K, Ca, PO₄, Mg, zinc, chromium, H₂O and lytes

**Ileum**
- ~250cm
- Vitamin B₁₂, intrinsic factor, bile salts, H₂O and lytes

**Colon**
- ~150cm
- H₂O, Na, Cl, K, bile salts

Average SB length 16 ft / 488cm

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**Learning Objectives**

- Identify dietary factors contributing to increased diarrhea, which may contribute to FI
- Recommend appropriate macronutrient distribution to optimize absorption and lesson feculent volume
- Educate IF patients regarding the use of Oral Rehydration Solutions (ORS)
- Discuss dietary fiber and its benefits for FI
- Review Anti-diarrheal therapy
- Recognize treatment for vitamin and mineral deficiencies that may contribute to diarrhea
**Dietary Factors**

- Small, frequent meals
- Separate fluids from meals
- Limit sugar alcohol containing foods and medications
- Limit cruciferous vegetables
- Limit GI stimulants
  - Alcohol
  - Caffeine

**Diet Based on Presence of Colon**

- Percent calories absorbed
  - High Carbohydrate Diet
  - High Fat Diet
  - High Carbohydrate Diet
  - High Fat Diet

**Diet Based on Presence of Colon**

![Graph showing fecal output (L/day) for different diets with and without colon.](image)

- **WITH COLON**
  - CHO 50-60% (limit sweets)
  - PRO 20%
  - FAT 20-30%
  - Meals 5-6 daily
  - Isotonic fluids
  - Fiber as tolerated
  - Lactose as tolerated

- **NO COLON**
  - CHO 40-50% (limit sweets)
  - PRO 20%
  - FAT 30-40%
  - Meals 4-6 daily
  - Isotonic, high Na fluids
  - Fiber as tolerated
  - Lactose as tolerated

Byrne et al. NCP 15:306-311, 2000
Simple vs. Complex CHO

**AVOID**
- Sugar
- Candy
- Cakes, cookies, pies
- Regular soda pop
- Jelly, jam, syrup
- Ice cream, sherbet
- Sorbet
- Sugar-containing supplements

**INCLUDE**
- Pasta
- Potato
- Breads
- Cereals
- Rice
- Whole grains as tolerated
- Fruits and vegetables as tolerated

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Hyper-osmolar Diet

**Short Bowel Syndrome**

Osmosis and Fluid Balance

= Diarrhea
= Dehydration

Sugar

Contents of Small Bowel

Intestinal Wall

Blood
Oral Rehydration Solution (ORS)

Sodium-glucose Co-transport

- Osmolarity 200-300 mosm/L
- Sodium 60-90 mEq/L

ORS and Other Beverages

<table>
<thead>
<tr>
<th></th>
<th>Sodium</th>
<th>Carbohydrate</th>
<th>Osmolality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mEq/L</td>
<td>g/L</td>
<td>mOm/kg</td>
</tr>
<tr>
<td>WHO-ORS</td>
<td>75</td>
<td>13.5</td>
<td>245</td>
</tr>
<tr>
<td>Rice-based</td>
<td>70</td>
<td>20</td>
<td>260</td>
</tr>
<tr>
<td>Pediatric sol</td>
<td>45</td>
<td>20</td>
<td>270</td>
</tr>
<tr>
<td>Sports drink</td>
<td>20</td>
<td>60</td>
<td>380</td>
</tr>
<tr>
<td>Ginger ale</td>
<td>3</td>
<td>90</td>
<td>540</td>
</tr>
<tr>
<td>Apple juice</td>
<td>3</td>
<td>124</td>
<td>730</td>
</tr>
<tr>
<td>Chicken broth</td>
<td>250</td>
<td>0</td>
<td>450</td>
</tr>
<tr>
<td>Ensure Plus</td>
<td>32</td>
<td>165</td>
<td>680</td>
</tr>
</tbody>
</table>
Common ORS Recipes

- **Gatorade G2**: 12 oz + One salt packet (1/8 tsp)
- **Gatorade G2**: One liter + ½ tsp salt
- 2 c Gatorade + 2 c Water + ½ tsp salt
- 1.5 c Powerade + 2.5 c Water + ¾ tsp salt
- One liter Water + 2/3 tsp salt + 2 tbsp sugar + sugar free Crystal Light/Kool Aid

Soluble Fiber

- Soluble fiber absorbs liquid and forms a gel
  - Thickens stool, may give heightened sign of urgency
  - Slows transit
- Fiber is fermented in colon to form SCFA
  - Additional calories
  - Improved absorption of sodium and fluids
- Additional benefits
  - Lowers LDL cholesterol
  - Improves the glycemic control by slowing passage of nutrients
Types of Fiber

**Soluble**
- Pectins, gums; some hemicelluloses, mucilages, polysaccharides
- E.g. Oatmeal, bananas
- Fermentable by colonic bacteria
- Forms a viscous gel in GI tract
- Increases fecal transit time

**Insoluble**
- Cellulose, lignin, some hemicelluloses mucilges, & algal polysaccharides
- E.g. Coarse wheat bran
- Non-fermentable in colon
- Increased fecal volume
- Decrease fecal transit time, prevent constipation

Dietary Sources of Soluble Fiber

- Potatoes
- Bananas
- Bread
- Rice
- Oatmeal
- Tortillas
- Barley
- Rye

- Legumes
- Apples
- Avocados
- Sweet Potatoes
- Squash
- Carrots
- Beets
- Peaches
- Pears
Antidiarrheals

Direction of Food Movement
- Contracted Muscle
- Food Bolus
- Relaxed Muscle

Nightingale J. Gut 2006; 55:iv1-iv12

Antidiarrheal Therapy
To increase intestinal transit time

<table>
<thead>
<tr>
<th>Medication</th>
<th>One Dose</th>
<th>Starting Dose PO QID</th>
<th>Max Dose/Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loperamide (Imodium)</td>
<td>2 mg tab</td>
<td>1-2 tabs</td>
<td>8 tabs</td>
</tr>
<tr>
<td>Diphenoxylate (Lomotil)</td>
<td>2.5 mg tab</td>
<td>1-2 tabs</td>
<td>8 tabs</td>
</tr>
<tr>
<td>Codeine</td>
<td>15 mg tab</td>
<td>15-60 mg</td>
<td>240 mg</td>
</tr>
<tr>
<td>Tincture of Opium</td>
<td>0.5 mL</td>
<td>0.5-1.5 mL</td>
<td>6 mL</td>
</tr>
</tbody>
</table>

*All antidiarrheal meds should be given ½ hr to 1 hr before meals*
Liquid Medications

Sorbitol
Discomfort
Nausea
Vomiting
Diarrhea
Dry mouth
Xerostomia
Fluid/lyte loss
Lactic acidosis
Edema

5 - 20 g/day can produce symptoms
20 - 50 g/day can cause diarrhea


Sorbital

<table>
<thead>
<tr>
<th>Liquid Medications/Dosage</th>
<th>Sorbitol Content</th>
<th>Potential Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loperamide</td>
<td>Some brands may contain sorbitol</td>
<td>2mg chewable</td>
</tr>
<tr>
<td>Diphenoxylate (20-40mL/d)</td>
<td>1-8 g/d</td>
<td>Crush tablets</td>
</tr>
<tr>
<td>Codeine (20-80mL/d)</td>
<td>2-8 g/d</td>
<td>Crush tablets</td>
</tr>
<tr>
<td>Potassium Chloride</td>
<td>2.1-13.1 g/d</td>
<td>Klor-Con Powder</td>
</tr>
<tr>
<td>Magnesium Gluconate (15-45mL/d)</td>
<td>4.2-12.6 g/d</td>
<td>Crush MagTab SR or Mg Gluconate tab</td>
</tr>
<tr>
<td>Bicitra (13-78 mL/d)</td>
<td>6-36 g/d</td>
<td>Oracit, Citric acid</td>
</tr>
</tbody>
</table>
Other Possible Nutritional Factors

- Zinc deficiency
- Niacin deficiency