FODMAPs and Diarrhea in Enteral Nutrition

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Learning Objectives

- Identify the common characteristics of FODMAP carbohydrates in enteral feeding;
- How they act in a collective manner that somehow caused DIARRHEA in tube fed patients;
- Identify FODMAP ingredients in enteral formula labels;
**FODMAP** is an acronym or abbreviation with the letters representing:

- **F**ermentable – fermentation is the process of breaking down carbohydrates
- **O**ligo-saccharides
- **D**isaccharides
- **M**ono-saccharides
- **A**nd
- **P**olyols
A little bit of history
Irritable Bowel Syndrome
(Pathophysiology)

Input — Integration — Effect

Cognition affect
Sight, Sound, Smell, Somatosensory

Visoerosensory — Motility secretion — blood flow — inflammation

Brain-Gut Axis

Central nervous system (CNS)

Pain — Midbrain

Spinal cord — Enteric afferent receptor

All gut function (motor, sensory, and secretory) are controlled by intrinsic and extrinsic neural systems.

These systems interact in a bi-directional network between the brain and gut ⇒ brain-gut axis.
For people with IBS

FODMAPS certain sugars and fibers

- Poorly absorbed
- Rapidly fermentable
- Osmotically active

Diarrhea Constipation
BLOAT
GAS
Let’s look at some related literature about FODMAP’s

• TITLE:

“DIARRHEA during enteral nutrition is predicted by poorly absorbed short chain carbohydrate (FODMAP) content of the formula”


CONCLUSION:
Length of stay and enteral nutrition duration independently predicted diarrhea development, while being initiated on a lower FODMAP formula reduced the likelihood of diarrhea.
Formula FODMAP levels

- 10.6 to 36.5 grams per day
Observations about enteral formulas

- Virtually all enteral products are lactose-free
- Ingredients for Isosource 1.5 are different in the US. v. AU
- Ingredients did not always predict actual FODMAP composition—some terms are vague “maltodextrin”, “corn syrup”, “polysaccharides”, “soy fiber”
- Safe to say products with obvious high FODMAP ingredients such as fructose, inulin, FOS will be higher in FODMAPs.
- Maltodextrins and modified food starches are not considered FODMAPs
- No other clear enteral product recommendations available at this time

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Let’s look at some related literature about FODMAP’s

- **TITLE:**
  “Reduction in diarrhea incidence by soluble fiber in patients receiving total or supplemental enteral nutrition.”
  Homann HH, Kemen M, Fuessenich C, Senkal M, Zumbotel JPEN 1994 Nov-Dec; 18 (6);486-90

**CONCLUSION:**
Enteral feeding with a formula supplemented with partially hydrolyzed guar gum reduces the incidence of diarrhea in patients receiving enteral supplementation, regardless of the cause of diarrhea.
Let’s look at some related literature about FODMAP’s

- **TITLE:**
  “Diarrhea in enterally fed patients: blame the diet?”

**CONCLUSION:**
Enteral feeding is not generally considered the primary cause of diarrhea, which is frequently linked to prescribed medications.

Lower FODMAP’s formula, prebiotics, probiotics, probiotic derivatives, and lactoferrin may be used to manage enteral feeding – related diarrhea.
Sources of FODMAP in the diet...

<table>
<thead>
<tr>
<th>Oligo-Saccharides</th>
<th>Disaccharides</th>
<th>Monosaccharides</th>
<th>Polyols</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruits</strong></td>
<td>Milk and dairy products such as yoghurt, cheese, and ice-cream</td>
<td>Honey, corn syrup</td>
<td>'Diet', 'Sugar-free' or 'Low-Carb' foods that contain the additives: sorbitol (420), mannitol (420), maltitol (965), xylitol (967)</td>
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<tr>
<td>Apple, cherries, mango, pears, watermelon, peaches, large quantities of fruit juice or dried fruit</td>
<td>These are only a problem for those that are lactose intolerant.</td>
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<tr>
<td><strong>Vegetables</strong></td>
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<tr>
<td>Asparagus, artichokes, sugar snap peas, beans, onions and garlic</td>
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<tr>
<td><strong>Grains</strong></td>
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<td>Rye bread and crackers. Bread, pasta, couscous</td>
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References:

- AP&T Alimentary Pharmacology and Therapeutics
- Journal of Parenteral and Enteral Nutrition
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