Nutrition in IBD

Caroline Hwang, M.D.
USC Medical Center
March 2, 2013
nutrition / n(y)oʊˈtriʃən /

**Noun**  The process of providing materials necessary (usually in the form of food) to cells and organs in order to support life

- Maintain healthy weight/muscle mass
- Promote wound-healing and ability to fight infection
- Energy to work & participate in society

**Diet**

**Supplements**

**Enteral, Parenteral Therapy**
Goals of Nutritional Plan/Therapy

- Identify and treat nutritional deficiencies
- Alleviate GI symptoms (diarrhea, bloating)

More Debatable

- As primary treatment for bowel inflammation (i.e., to prevent/treat flares)
  → no diet to date has been scientifically shown to prevent/cure IBD
DIGESTION
- Breakdown of food by acid, salivary & pancreatic enzymes

NUTRIENT ABSORPTION
- Majority (95%) occurs in the small intestine
  Duodenum: calcium, magnesium, iron
  Jejunum: carbs, amino acids, fats, most vitamins
  Ileum: vit B12, bile acids (used for fat metabolism)

WATER ABSORPTION
- 70-90% occurs in small intestine
- 10-30% occurs in large intestine (colon)
Malnutrition in IBD

- IBD patients at risk for malnutrition because of many factors:

  1) *Increased losses* Diarrhea (electrolytes), bleeding (iron)
  2) *Decreased intake* Poor appetite, limited diet (fruits, vegetables)
  3) *Malabsorption* Inflammation, surgery, fistula (surface area)
  4) *Catabolic state* Inflammation causes increase in metabolic/protein needs
  5) *Drug interference* Steroids block calcium absorption, SSZ blocks folate

- Malnutrition can occur with:

  1) *Macronutrients* Protein/energy (calories)
  2) *Micronutrients* Vitamins, minerals, trace elements
Macronutrient Deficiencies

- **Macronutrient deficiency** → weight loss, loss of lean muscle mass
  - Usually occurs only during flares (moderate-severe)

- **Calories**
  - Needs only slightly increased during flares, unless weight gain desired

- **Protein**
  - Daily protein needs between flares:
    
    \[ \text{# grams protein} = \text{weight in kg} \]
  
    - Needs may increase 25-50%:
      1) if you want to gain weight
      2) to recover losses after flare
      3) while you are on prednisone

- **Fluids & Electrolytes**
  - General rule of thumb: Drink half of your body weight in oz of water
    
    Drink more if having active diarrhea
  
    - If having diarrhea, consider electrolyte repletion with sports drinks or Pedialyte™

15 grams of protein
Micronutrients

- Water-soluble
  - B₁-₉, C

- Vitamins
  - A, D, E, K

- Fat-soluble

- Macrominerals
  - Ca²⁺, Mag²⁺, Iron

- Trace elements
  - Zinc, copper, Selenium
Micronutrient Deficiencies in IBD

- **Iron**
  - **Risk factors:** Active inflammation/chronic blood loss
  - **Diet sources:** Meat, fish, leafy greens
  - **Supplement:** Iron deficiency anemia, oral ferrous fumarate/gluconate or if cannot tolerate IV

- **Folate (vitamin B9)**
  - **Risk factors:** Ileitis/SB resection, Meds: methotrexate, sulfasalazine
  - **Diet sources:** Cereals, spinach, cantaloupe
  - **Supplement:** If deficient (B-complex), also all pts on MTX or SSZ

- **Vitamin B12**
  - **Risk factors:** Ileitis/small bowel surgery
  - **Diet sources:** Trout, tuna, beef, milk
  - **Supplement:** All pts with ileal surgery (>60cm) → intramuscular vit B12 for life
Micronutrient Deficiencies in IBD

• Calcium
  - **Risk factors:** Diarrhea, vitamin D deficiency
  - **Diet sources:** Milk, cheese, yogurt, tofu
  - **Supplement:** Most IBD patients
    1000mg in women aged 18-25, men<65
    1200mg in women age 25- menopause
    1500mg in postmenopausal women, men>65

• Vitamin D
  - **Risk factors:** Steroids, ileal resection, decreased sunlight
    - **Diet sources:** Salmon, tuna, milk, eggs
    - **Supplement:** Most IBD patients 600-2000IU daily
      Increase by 2-3x while on steroids
Micronutrient Deficiencies in IBD

- **Zinc**
  - **Risk factors:** Diarrhea
  - **Diet sources:** Red meat, crabs, wheat germ, pecans
  - **Supplement:** Limited course of 220mg zinc sulfate (ie 2 weeks) after surgery or with wounds/fistulas

- **Vitamin C**
  - **Risk factors:** Inadequate intake
  - **Diet sources:** Citrus, green peppers, cauliflower
  - **Supplement:** Harmless, multivitamin usually adequate (75-90mg)

- **Vitamin A**
  - **Risk factors:** Malabsorption, inadequate intake
    - **Diet sources:** Carrots, sweet potatoes, spinach, cantaloupe
      - Recommended daily 700-900 IU
  - **Supplement:** For wound healing, can supplement for 10 days (MD/ND supervision)
Goals of Nutritional Plan/Therapy

- Identify and treat nutritional deficiencies
- Alleviate GI symptoms (diarrhea, bloating)

More Debatable
- As primary treatment for bowel inflammation (ie to prevent/treat flares)
  → no diet to date has been scientifically shown to prevent/cure IBD
Common Diet Recommendations

• Low-residue diet during flares
  - Minimal fresh fruits & vegetables, nuts, seeds
  - Helpful for relieving abdominal pain, diarrhea
  - Especially important to avoid if you have stricture
  - Study in showed no difference in symptoms or need for hospitalizations/surgery in Crohn’s disease pts on low-residue vs. normal diet

• Lactose avoidance if intolerant
  - Lactose intolerance is common amongst IBD pts
  - More difficult to fully digest/absorb with faster bowel transit (diarrhea
Recent Diet Trends

- **Gluten-free**
  - Protein found in foods processed from wheat, barley or rye
  - Risk of celiac disease (gluten allergy) higher amongst IBD pts
  - Gluten intolerance relatively common amongst patients with IBS → pain/bloating but without inflammation on blood tests seen in celiac

- **Low FODMAPS diet**
  - FODMAPS = Fermentable Oligo-, Di-, Mono-saccharides And Polyols
  - Short-chain carbs poorly absorbed and thus fermented by bacteria → gas/diarrhea
  - Shown in several clinical trials to be effective in irritable bowel syndrome (IBS)
  - Quite restrictive, encourage working with nutritionist if want to try
Process of Elimination

To determine if certain foods are triggering symptoms of irritable bowel syndrome, some specialists recommend a low-Fodmaps diet, which stands for Fermentable Oligosaccharides, Disaccharides, Monosaccharides and Polyols. After six to eight weeks, the foods are gradually reintroduced at low levels to see what patients can tolerate.

**SOME FOODS CONTAINING FODMAPS TO ELIMINATE:**

**FRUIT**
- Apples
- Apricots
- Cherries
- Pears
- Watermelon
- Dried Fruit

**VEGETABLES**
- Asparagus
- Broccoli
- Cabbage
- Eggplant
- Garlic
- Mushrooms
- Onions

**CEREALS / GRAINS**
- Wheat, rye in large quantities
- Pasta
- Bread
- Cookies

**MILK PRODUCTS**
- Cow's milk
- Custard
- Ice cream
- Yogurt
- Soft cheeses

**OTHER**
- Sweeteners: sorbitol, mannitol, isomalt
- Fructose, corn syrup, honey

**BEANS / LEGUMES**
- Chick peas
- Kidney beans
- Lentils
- Soy beans

**SOME SUITABLE FOODS ON A LOW-FODMAP DIET:**

**FRUIT**
- Bananas
- Blueberries
- Grapefruit
- Lemons
- Raspberries

**VEGETABLES**
- Carrots
- Celery
- Green beans
- Potatoes
- Pumpkin
- Zucchini

**GRAINS**
- Gluten-free bread or cereal
- Rice
- Oats
- Polenta
- Tapioca

**MILK PRODUCTS**
- Lactose-free milk and yogurt
- Hard cheeses

**OTHER**
- Tofu
- Sugar
- Maple syrup
- Molasses

Source: Shepherd Works and the IBS Self Help and Support Group Photos: Getty Images (Soy beans); iStockphoto (Apples, Lemon); F. Martin Ramin for The Wall Street Journal (5)
Goals of Nutritional Plan/Therapy

- Identify and treat nutritional deficiencies
- Alleviate GI symptoms (diarrhea, bloating)

**More Debatable**

- As primary treatment for bowel inflammation (ie to prevent/treat flares)??
Popular Diets for IBD

SCD Lifestyle
The #1 Resource for naturally healing digestive disease, reducing stress and living a long, healthy life.

I'm On the GAPS Diet to Treat Crohn’s-Ulcerative Colitis and IT’S WORKING
January 25, 2011
written by: Tara Rosas

Click here and get relief from digestive distress.
Rationale for Dietary Interventions in IBD

- IBD increasing globally, but especially in countries that are adopting “westernized” diet
- Immigrants & their children have increased risk of IBD compared to family members in native country
- Several studies have shown association between IBD and increased intake dietary fat and sugars
- Increased understanding of effect of diet on the gut “microbiome” which plays major role in regulating/stimulating the immune system
IBD is more complex than a “food allergy” so removal of certain food likely not enough to reverse inflammation especially in moderate-severe disease.

It is possible to improve GI symptoms in the short-term (ie eliminating dairy) without treating underlying disease.

To justify using diet as primary means of controlling IBD (and discontinuing medications), diet should be shown scientifically to reduce inflammation.

Most drug clinical trials use colonoscopy as their standard: Healed mucosa = fewer flares, hospitalizations and surgeries.
Popular Diets for IBD

SCD Lifestyle

The #1 Resource for naturally healing digestive disease, reducing stress and living a long, healthy life.

Eat Well Feel Well

More than 150 delicious Specific Carbohydrate Diet™-compliant recipes

Meals to help manage Crohn's disease, ulcerative colitis, celiac disease, diverticulitis and other digestive conditions

KENDALL CONRAD

Foreword by Elaine Gottschall, N.Sc., author of the bestselling Breaking the Vicious Cycle

I'm On the GAPS Diet to Treat Crohn's-Ulcerative Colitis and IT'S WORKING

January 25, 2011

written by: Tara Rosas

Colitis Stories, Diet, Happy Stories, Remission Stories

The NEW SCD How-To Book!

Click here and get relief from digestive distress.
Specific Carbohydrate Diet

- Developed by Sidney Haas, MD and popularized by Elaine Gottschall
- Gottschall’s book now in its 13th printing, 1M+ copies sold, translated into 7 languages

Monosaccharides: glucose, galactose, fructose

Disaccharide: sucrose, lactose, isomaltose, maltose

Polysaccharide: starch, glycogen, cellulose

- SCD allows only monosaccharides to maximize absorption & prevent bacterial overgrowth
- Products with commercial syrups/sugars, starchy vegetables, dairy products not allowed
- Other foods, such as fruits, greens, animal protein, and nuts, are allowed
Evidence for SCD

- Recent small study of 11 IBD patients on SCD for 6-10 months and 100% had symptom resolution (Olendzki et al: *Clin Trans Sci Res* 2011)
- No studies showing that SCD reduces bowel inflammation
- Diet is very restrictive, can cause significant weight loss/social isolation
- Recommend that all patients who want to try SCD do so in collaboration with nutritionist & follow weight & blood tests
Other Diets

- **GAPS diet**
  - Similar to SCD but emphasizes early use of homemade meat stocks, fermented foods, avoidance of dairy

- **Paleolithic diet**
  - Based on belief that modern diseases (heart, diabetes, autoimmune) caused by veering from our hunter-gatherer diet/lifestyle
  - Consists of foods that can be hunted or gathered: meat (wild or pasture-fed), seafood, fruits, vegetables, nuts, seeds
  - Excludes grains, legumes, dairy, potatoes, refined salt/sugar

- **Low FODMAPS diet**
  - Study of 72 IBD patients → 50% had improvement in symptoms (pain, bloating, diarrhea better), but no blood testing/colonoscopy performed
Elemental Diet

- Elemental diet = Nutritional therapy with liquid nutrients with partially hydrolyzed amino acids, fats, sugars
- Shown in several studies of pediatric Crohn’s pts to be effective in reducing inflammation (similar studies in adults have not yet been replicated)
- However children had to have elemental feedings by feeding tubes because of difficulty following diet,
- High rate of relapse once regular diet resumed
- Elemental diets extremely difficult to follow, taste fatigue,
Risks of Specialized Diets

- Potential weight loss or weight gain
- Possible vitamin and mineral deficiency
  - Avoidance of fruits/vegetables: vitamin A, C
  - Dairy avoidance: calcium, vitD
- Concern for worsening colitis with complete elimination of grains and starchy vegetables → short-chain fatty acids (important food source for colonocyte cells)
My Advice

- Can consider diet as adjunct to medications
- Work with a nutritionist to create meal plans and to monitor weight & vitamin/mineral levels
- Improvement in symptoms ≠ remission
- Put diets to the same standards as medications → colonoscopy showing healed mucosa before even considering stopping meds
Other Natural Remedies

- **Probiotics**
  - Specific probiotics have been shown to be beneficial in mild ulcerative colitis, pouchitis, recurrent C. diff infections (VSL-3, florastor)
  - Many OTC formulations don’t have beneficial bacteria or have insufficient quantities

- **Curcurmin/tumeric**
  - Placebo-controlled clinical trial has shown improvement in symptoms/colonoscopy findings after 6 months of 2 grams/day
Questions?
Why Is Nutrition Important in IBD?

- IBD patients are at risk for malnutrition, especially during flares, or with fistulas or surgery.
- Certain foods can worsen gastrointestinal symptoms (diarrhea, bloating, abdominal pain).
- Many patients are concerned about conventional medical therapy for IBD and are interested in finding diets or “natural” remedies instead.