The slide features a light beige background with a green and blue decorative header. The Crohn's & Colitis Foundation logo is in the top left. The title 'IBD: Diet and Nutrition' is in large, bold, dark blue font. To the right is a graphic of a white plate divided into four colored quadrants (green, orange, purple, blue) with icons for an apple, a pepper, a wheat stalk, and a sandwich. Surrounding the plate are icons for a water bottle, a cheese wedge, and a knife and fork.

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IBD: Diet and Nutrition

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Faculty Disclosures

Kelly Issokson, MS, RD, CNSC has no affiliations to disclose.

Objectives

- ✓ Review importance of proper nutrition
- ✓ Describe impact of inflammatory bowel diseases (IBD) on digestion and nutrition
- ✓ Discuss healthy eating principles
- ✓ Describe impact of diet on IBD: onset, symptoms, and therapy through previous and current research

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Importance of Nutrition

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What's the Difference Between Diet and Nutrition?



Diet: The foods you eat on a daily basis



Nutrition: How your body uses the nutrients from the foods you eat for health.

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Critical Role of Nutrition

- Maintaining proper nutrition when you have IBD is very important
- Benefits of Proper Nutrition
 - Medications work more effectively
 - Improve healing, immunity, and energy levels
 - Minimize gastrointestinal symptoms
- However, IBD makes it difficult to eat enough calories and obtain sufficient nutrients... which can put patients with IBD at risk for malnourishment.
 - Why?
 - How?

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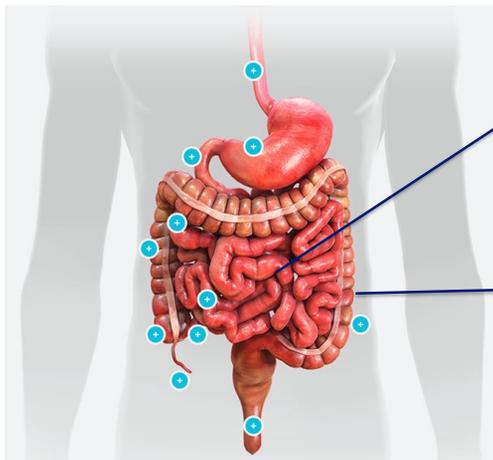
Impact of IBD on Digestion and Nutrition



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Gastrointestinal Tract



Small intestine

- Absorbs vitamins, minerals, and nutrients from the foods/drinks we consume

Large Intestine (Colon and Rectum)

- Absorbs water from the fluids we drink

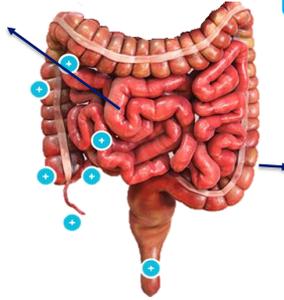
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How Can IBD Affect Digestion?

Crohn's Disease

- **Inflamed small intestine**
= does not fully digest food or absorb nutrients.
- Incompletely digested foods travel through intestines (may cause diarrhea).



Ulcerative Colitis

- Small intestine works normally.
- **Inflamed large intestine**
= does not absorb water, which causes watery stool (diarrhea) and the urgent need to go to the bathroom. Also, causes ulcers and blood loss.

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Patients with IBD at Risk of Malnutrition

IBD Symptoms

Diarrhea: Robs body of water, nutrients, electrolytes

Frequency/numerous bowel movements: Can cause a person to shy away from eating

Nausea/abdominal pain: Can reduce appetite

IBD Complications

Inflammation in and **surgical removal** of parts of the small intestine (Crohn's disease) can interfere with nutrient absorption

Generally, ulcerative colitis patients have fewer nutrient deficiencies; however, **weight loss and anemia** can be prominent due to diarrhea and blood loss

Patients with **ileostomies** may experience **nutrient losses** and dehydration if daily outputs exceed 1 liter

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Common Nutrient Deficiencies in Crohn's Disease

Nutrient	Risk for deficiency
Vitamin B ₁₂	Inflammation or removal of the ileum
Folate	Sulfasalazine and methotrexate use; inflammation or removal of the duodenum
Vitamin A, D, E, K	Fat malabsorption; small bowel inflammation or resection can lead to malabsorption
Magnesium	Inflammation or removal of large portions of the jejunum and ileum, fistula losses, chronic diarrhea
Zinc	Inflammation or removal of distal duodenum or proximal jejunum, diarrhea, fistula losses, prednisone use
Calcium	Avoidance of dairy foods, fat malabsorption, prednisone use, inflammation throughout the small intestine
Potassium	Chronic diarrhea, vomiting, and prednisone use
Vitamin D	Prednisone use

11 Courtesy of Cimperman, Lisa. Presentation: Nutrition and Inflammatory Bowel Disease: 2013.

Common Nutrient Deficiencies in Ulcerative Colitis

Nutrient	Risk for deficiency
Folate	Sulfasalazine and methotrexate use
Magnesium/Zinc	Chronic diarrhea
Iron	Gastrointestinal bleeding
Potassium/Sodium	Chronic diarrhea, vomiting, and prednisone use
Vitamin D/Calcium	Prednisone use

12 Courtesy of Cimperman, Lisa. Presentation: Nutrition and Inflammatory Bowel Disease: 2013.

Food Sources That May Prevent Deficiencies

Nutrient	Food Sources
Vitamin B ₁₂	Meat, fish, eggs, dairy products, and fortified breakfast cereals
Folate	Fortified cereals, breads and grains, dark leafy greens, avocados
Vitamin A	Yellow or orange fruits/vegetables, fortified milk, cheese, eggs, liver
Magnesium	Dark leafy greens, bananas, avocados, peas and beans, soy products, grains
Zinc	Fortified breakfast cereals, chicken, pork, yogurt
Calcium	Dairy products and fortified nut milks/soy milk/milk alternatives
Potassium	Most fruits and vegetables – especially oranges, bananas, tomatoes
Vitamin D	Fortified milk/soy milk, tuna, salmon

13 Courtesy of Cimperman, Lisa. Presentation: Nutrition and Inflammatory Bowel Disease: 2013.

Dietary Supplements

- Before taking any vitamin or dietary supplements, discuss it with your doctor and/or dietitian
- Consider taking:
 - Daily multivitamin/mineral supplement
 - Calcium and vitamin D supplement
 - 1000 to 1500 mg daily (higher dose for patients on steroids)
 - 1000 to 2000 IU vitamin D daily
- You may also need:
 - Monthly B₁₂ injections or sublingual (if disease of the ileum or surgical resections)
 - Folate (with sulfasalazine or methotrexate use)
 - Zinc (limited course of 220 mg zinc – 2 to 4 weeks)

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Diet and Healthy Eating

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Challenges with Food Choices



Everyone's IBD is different... no one single diet or eating plan will work for everyone with IBD

Dietary recommendations must be tailored to the individual patient

Certain foods for individual patients may make symptoms worse

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General Recommendations

- ✓ See a dietitian with expertise in IBD
- ✓ Eat a well-balanced diet (as close as you can)
- ✓ Get tested for vitamin/mineral deficiencies
- ✓ Drink plenty of fluids
- ✓ Keep a food journal
- ✓ Slowly introduce new foods

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Recommendations During a Flare

Avoid Potential Problem Foods

- Foods high in insoluble fiber
 - Foods with sugar, artificial sweetener, and sugar alcohols
 - Lactose rich foods
 - Gassy vegetables and uncooked vegetables/fruit
 - High fat/greasy/fried foods
 - Caffeine
 - Alcoholic and carbonated beverages
- Eat smaller, more frequent meals
 - Stick with bland, soft foods (no spicy food)
 - May need to eat more protein during this time
 - If necessary, add oral nutrition supplement, such as Boost or Ensure

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Sugar

- Consuming too much sugar can cause imbalance of gut bacteria and can contribute to digestive upset.
- “Added sugar” includes sugars and syrups added to foods during processing, preparation, or at the table. Added sugars are found in foods low in other nutrients, such as: dairy desserts, baked desserts, sweetened beverages, and candy.
- Too much added sugar can worsen gastrointestinal symptoms during both active and inactive IBD and can further dehydrate the body.
- Try alternatives to hydrate yourself. Examples:
 - Fruit-infused water
 - Fruits

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Potential Foods to Include During/After Flare (If Well Tolerated)

- Diluted juices
- Fruit/vegetable smoothies
- Pureed vegetable soups
- Applesauce
- Canned fruit without added sugar
- Banana
- Pumpkin
- Oatmeal, cream of wheat
- Plain chicken, turkey, or fish
- Cooked eggs or egg substitute
- Mashed potatoes, rice, or noodles
- White bread
- Oral nutrition supplements



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Drink Plenty of Fluids

- In general:
 - Drink at least 64 ounces of water per day = eight 8-ounce glasses
 - Drink beverages slowly
 - Avoid using a straw
 - Alcohol and caffeinated drinks do not count = they dehydrate the body
- When experiencing diarrhea, you may be at risk of dehydration

Beverages to try:

- Water
- Low-sugar sports drinks
- Fruit juices diluted with water
- During severe diarrhea = rehydration drinks (eg, Pedialyte and diluted Gatorade)
- Oral Rehydration Solutions (ORS) – homemade recipes are available



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Recommendations for Healthy Diet

Calories

- Eat to maintain weight, or
- Increase calories by 250 to 500 calories per day for weight gain

Protein

- Divide weight (in pounds) in half. Aim for that amount of protein (grams/day).
Example: If you weigh 100 pounds, aim to eat 50 grams of protein/day.
Note: Protein needs increase with active inflammation, steroid use, surgery, etc. so, always check with your provider first.

Fluid and Electrolytes

- Divide weight (in pounds) in half. Aim for this amount of fluid (ounces/day).
- Increased need with diarrhea or after exercise
- Fluids with electrolytes (sodium, potassium) may be required as well

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Whole Grains

- Grains are a source of carbohydrates, your body's preferred energy source
- Also a source of fiber, several B vitamins (thiamin, riboflavin, niacin, and folate), and minerals (iron, magnesium, and selenium)
- Look for whole grains as the first ingredient listed with at least 3 grams of fiber/serving

Food Group	Recommended Foods	Foods to Avoid
Grains	Oatmeal, sourdough, and French breads	Refined grains and sweetened grains

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Fruits & Vegetables

- A diet rich in fruits and vegetables is associated with positive health outcomes
- Sources of many nutrients: potassium, magnesium, folate, vitamins A and C
- Aim for 5 to 9 servings of fruits and vegetables per day
- 1 serving = ½ cup cooked vegetables or 1 cup raw vegetables

Food Group	Recommended Foods	Foods to Avoid
Vegetables	<ul style="list-style-type: none"> • Cooked, pureed, or peeled vegetables • Vegetable stock added to rice or pasta for additional nutrients 	<ul style="list-style-type: none"> • Vegetables that are gas producing (eg, broccoli, Brussels sprouts) • Vegetables that have a tough skin
Fruit	<ul style="list-style-type: none"> • Cooked, pureed, canned, or peeled fruits • Smoothies 	<ul style="list-style-type: none"> • Fruits with added sugar

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Calcium

- Calcium is important for bone health, reducing the risk of osteoporosis and proper muscle functioning
- Foods that contain calcium are also sources of vitamin D, phosphorus, potassium, and protein
- Choose 3 servings per day
 - 1 serving = 1 cup of milk or yogurt

Foods high in calcium include:

- Dark, leafy greens
- Sardines with bones
- Skim or 1% milk (lactose free if intolerant)
- Other low lactose options include most hard cheeses, yogurt, and kefir
- Alternate milk options: soy milk, almond milk, rice milk



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Protein

- Protein is an important nutrient for healing after surgery and building components of the immune system
- One egg, an ounce of meat, 1 cup of milk = 7 grams of protein

Food Group	Recommended Foods	Foods to Avoid
Protein	<ul style="list-style-type: none"> • Lean sources (eg, fish, skinless chicken, eggs, tofu) • Smooth nut butters (eg, peanut, almond, cashew) • Low fat dairy • Vegetarian meat alternatives 	<ul style="list-style-type: none"> • Processed meats or high fat meats like sausages, hot dogs, bologna, fried meats, or fatty meats

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Unsaturated Fats

Omega 3 Fatty Acids

- Salmon
- Tuna
- Walnuts
- Flaxseed oil
- Fortified foods

Omega 3 Fatty Acids Supplement

- EPA, DHA (1 to 3 grams)

Monounsaturated Fats

- Olive oil
- Canola oil
- Nut butters
- Avocados



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Helpful Eating Tips

Prepare in Advance

- Select restaurants and menu items that you have enjoyed in the past
- Check menus online before heading out
- Bring snacks with you

While Dining Out

- Ask questions! Do not be afraid to ask about ingredients or make special requests
- Watch for hidden fats (sauces, crispy dishes) and sugars
- Try steamed or broiled seafood or grilled chicken
- Ask for sauces/dressings on the side
- Divide food on your plate in half and eat slowly
- Limit alcohol and caffeinated beverages

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Holidays & Celebrations



- Know your limits!
- Stick to your normal eating habits as much as possible and avoid overeating
- Eat smaller, more frequent meals
- Bring a dish you know you can eat
- Inform family and friends

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Specific Diets – What to Consider

Important Note about Diets

- Most diets have not been scientifically proven to prevent or control IBD
 - There is a lot of debate in the medical community regarding the benefits of these diets
 - Some diets may be complicated to follow
 - Some diets may be risky
 - A diet should not replace medical therapy
 - **ALWAYS** speak with your doctor or dietitian first before starting a particular diet
- The best diet is one that meets **YOUR** nutritional needs, while helping you better manage your IBD symptoms.
 - Work with your doctor or dietitian to create a diet that is right for you.

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Examples of Popular Diets

Diet	Concerns/Considerations
Specific Carbohydrate Diet™ <ul style="list-style-type: none"> Grain free, soy free, sugar free 	<ul style="list-style-type: none"> Restrictive – can lead to malnutrition if not followed appropriately Can eliminate dietary sources of short chain fatty acids, preferred source of colon cells.
Low Fermentable Oligosaccharides, Disaccharides, Monosaccharides, and Polyols (FODMAP) <ul style="list-style-type: none"> Reduce/limit certain sugars 	<ul style="list-style-type: none"> Requires careful label reading. Usually short term (4 to 6 weeks) Talk to a dietician for complete nutritional needs.
Gluten Free <ul style="list-style-type: none"> Eliminate protein found in grains including wheat, rye, and barley products 	<ul style="list-style-type: none"> Some people with IBD may be sensitive to gluten and have gluten intolerance Food diary can help determine the effect of gluten containing food products.

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Examples of Popular Diets

Diet	Concerns/Considerations
Paleo Diet <ul style="list-style-type: none"> Eliminates refined sugar, dairy, legumes, and grains Emphasizes intake of lean, non-domesticated (game) meats and non-cereal plant based foods, such as fruits and nuts 	<ul style="list-style-type: none"> Limits nutrient dense foods No formal studies on this diet and IBD
Mediterranean Diet <ul style="list-style-type: none"> Fiber rich plant-based foods, olive oil, low-fat dairy, herbs and spices 	<ul style="list-style-type: none"> Eat poultry, eggs, cheese, and yogurt in moderation Eat red meat only rarely

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Vitamin Deficiency and Elimination Diets

- Diets that eliminate **dairy or lactose** may contribute to vitamin D deficiency. Vitamin D levels should be carefully followed.
- Additional bloodwork to check:
 - ✓ Vitamin B₁₂
 - ✓ Iron stores, ferritin
 - ✓ Zinc
- Consider multivitamins
- Before starting any elimination diet, consult with your healthcare team

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Impact of Diet on IBD



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Faculty Disclosures

Caroline Hwang, MD has affiliation with Nestlé Health Science (*Research*).

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Diet & IBD Research Studies

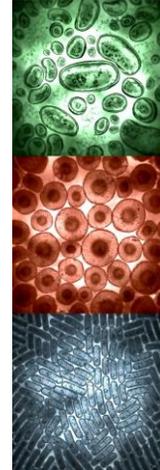
- Limited studies
- Most studies are small
- Difficult to study: Type of IBD, location of disease, medications, and disease activity can affect study results
- Diet may have impact, but research needs to show **how**
 - Effects on the intestinal immune system?
 - Changes in the intestinal microbiome (the organisms in the gastrointestinal tract)?



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Microbiome

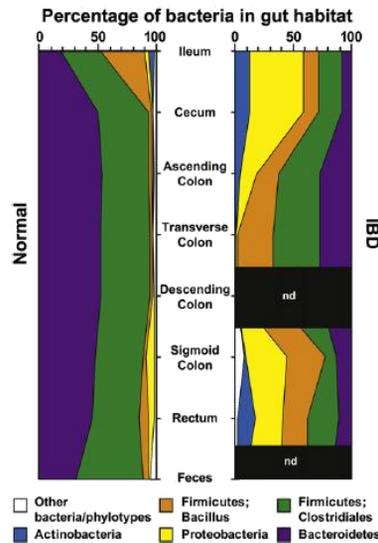
- Gastrointestinal tract contains a large number of micro-organisms (eg, bacteria, fungi, viruses) – collectively known as the “microbiome”
- The microbiome helps us breakdown and absorb nutrients from the foods we eat
- Studies show link between diet and composition of microbiome
- New studies of diet and the microbiome could:
 - Provide valuable information about disease development
 - Help identify new treatments



37 Albenberg LG, et al. *Curr Opin Gastroenterol.* 2012;28(4):314-320.



Microbiome Differences: Healthy Individual vs IBD Patient



38 Peterson DA, et al. *Cell Host & Microbe.* 2008;3(6):417-427.



Diet and Risk of Developing IBD

Several studies asked patients to recall (remember) the type of diet that they were eating before their diagnosis. In addition, there have also been large dietary studies followed over time in which some patients developed IBD and others did not.

Increased risk of ulcerative colitis associated with:

- High intake of sugar and soft drinks.
- Low intake of vegetables.
- High intake of animal protein and processed meats.
- High intake of omega-6 polyunsaturated fatty acids.
 - Red meat (beef, pork), cooking oil (corn, sunflower)

Lower risk of Crohn's disease associated with:

- High intake of fiber (fruits and vegetables).

Food additives (sweeteners, emulsifiers, thickeners, preservatives, food colorings) warrant further evaluation

Ananthakrishnan AN, et al. *Gastroenterology*. 2013;145(5):970-977; Chan SS, et al. *Inflamm Bowel Dis*. 2014;20(11):2013-2021; Chassaing B, et al. *Nature*. 2015;519(7541):92-96; Costea I, et al. *Gastroenterology*. 2014;146(4):929-931; D'Souza S, et al. *Inflamm Bowel Dis*. 2008;14(3):367-373; Hou JK, et al. *Am J Gastroenterol*. 2011;106(4):563-573; IBD in EPIC Study Investigators, et al. *Gut*. 2009;58(12):1606-1611; Jantchou P, et al. *Am J Gastroenterol*. 2010;105(10):2195-2201; Jowett SL, et al. *Gut*. 2004;53(10):1479-1484; Racine A, et al. *Inflamm Bowel Dis*. 2016;22(2):345-354; Shoda R, et al. *Am J Clin Nutrition*. 1996;63(5):741-745.

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Diet and Risk of Ulcerative Colitis (UC) Relapses

- Several studies have shown association between intake of animal protein and risk of UC relapses.
- In 1 study, 191 patients with ulcerative colitis in remission were followed for 1 year.
- Fifty-two percent of patients relapsed during the study period.
- Consumption of meat (particularly red meat) and processed meat increased likelihood of relapse.



By Jon Sullivan [Public domain], via Wikimedia Commons

40 Jantchou P, et al. *Am J Gastroenterol*. 2010;105(10):2195-2201; Jowett SL, et al. *Gut*. 2004;53(10):1479-1484; Shoda R, et al. *Am J Clin Nutrition*. 1996;63(5):741-745.

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Diet Research and IBD Symptoms

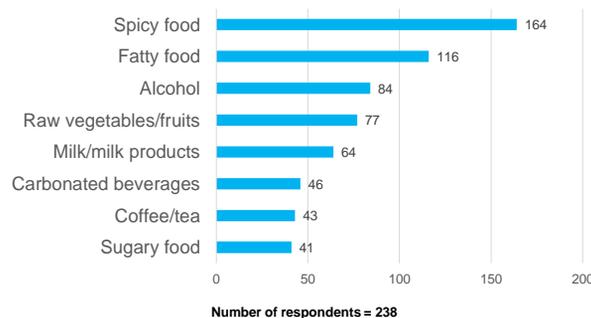
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Diet and IBD Symptoms

- Patients with IBD report that certain diets increased symptoms
- Up to 75% of patients with IBD say they follow a restricted diet due to food intolerances or perceived worsening of symptoms

Foods reported to worsen IBD symptoms



42 Limdi JK, et al. *Inflamm Bowel Dis.* 2016;22(1):164-170.

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Diet and IBD Symptoms

- IBD Partners Study: Survey 7000 patients with Crohn's disease or ulcerative colitis
- Patients were much more likely to identify foods that **worsened** rather than improved their symptoms
- Yogurt, rice, and bananas most often reported to improve symptoms

Foods most frequently reported to worsen symptoms:

Vegetables	Popcorn
Fruit	Dairy
Spicy foods	Alcohol
Fried foods	High-fiber foods
Milk	Fatty foods
Red meat	Seeds
Soda	Coffee

43 Cohen AB, et al. *Dig Dis Sci.* 2013;58(5):1322-1328.

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Fiber and IBD Symptoms: Helpful or Harmful?

- Patients with IBD are often advised to reduce the amount of fiber that they eat when they have active disease.
- Growing evidence suggests that fiber may not need to be restricted:
 - In 2014: One study reviewed 23 trials (1296 patients)¹
 - 12 studies in Crohn's disease showed no effect of dietary fiber
 - 3 out of 10 studies showed fiber supplementation to benefit disease outcomes
 - In 2015: the Foundation conducted a survey of 1619 patients and found that fiber was associated with reduced disease flares in Crohn's disease but not ulcerative colitis.²
- Therefore, recommendations to limit dietary fiber may need to be re-evaluated.

44 Wedlake L, et al. *Inflamm Bowel Dis.* 2014;20(3):576-586;
Brotherton CS, et al. *Clin Gastroenterol Hepatol.* 2016;14(8):1130-1136.

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Diet and IBD Symptoms: Low FODMAP Diet

FODMAPS: Fermentable, Oligo-, Di-, Monosaccharides And Polyols).

- Fructo-oligosaccharides (wheat, onions, legumes)
 - Lactose (milk, ice cream)
 - Fructose (apples, honey)
 - Galactans (legumes)
 - Sorbitol (stone fruits, artificial sweetener)
- Poorly absorbed carbohydrates increase small intestine water and colonic gas production due to fermentation by intestinal bacteria.
 - Can cause abdominal pain, bloating, increased gas, diarrhea, or constipation.
 - In a small study of patients with IBD in remission who followed a low FODMAP diet, there was a reduction in abdominal pain, bloating, and gas.
 - With re-challenge with fructans (wheat, onions, garlic) was associated with increased symptoms.

45 Benjamin JL, et al. *Gut*. 2011;60(7):923-929; Cox SR, et al. *J Crohns Colitis*. 2017 [Epub ahead of print]; Geary RB, et al. *J Crohns Colitis*. 2009;3(1):8-14; Pedersen G. *Dan Med J*. 2015;62(1):B4973; Prince AC, et al. *Inflamm Bowel Dis*. 2016;22(5):1129-1136.

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Diet and IBD Symptoms: Gluten-free Diet (GFD)

Crohn's & Colitis Foundation Partners survey, 1647 patients.

- Celiac disease 10 (0.6%), nonceliac gluten sensitivity 81 (4.9%)
- **314 (19.1%)** had tried gluten-free diet.
- **135 (8.2%)** currently had a gluten-free diet.
- **65.6%** who tried gluten-free diet reported improvement in symptoms.
- **38.3%** reported fewer or less severe flares of IBD.
- Adherence to gluten-free diet was associated with improvement in fatigue.

46 Herfarth HH, et al. *Inflamm Bowel Dis*. 2014;20(7):1194-1197; Cox SR, et al. *J Crohns Colitis*. 2017 [Epub ahead of print].

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Diet as Therapy for IBD

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Diet as Therapy for IBD: Nutritional Support Therapy

Enteral nutritional therapy is the only dietary therapy that has been rigorously tested and proven to reduce inflammation in children with Crohn's disease.

Enteral Nutrition (EN): Tube Feeding OR By Mouth

- Exclusive Enteral Nutrition (EEN) – 100% exclusive formula
- Partial Enteral Nutrition – 30 to 50% of calories from formula, remainder is from solid food or regular diet

Parenteral Nutrition: Intravenous (IV) Feeding

- May supplement oral or tube feeding
- May be sole source of nutrients (total parental nutrition) – rare



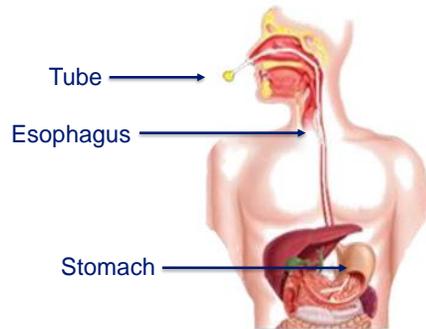
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Partial Enteral Nutrition (PEN) Study in Crohn's Disease

Randomized Controlled Trial evaluated use of PEN versus regular diet in maintaining remission in Crohn's disease.

Study was stopped early due to benefit in treatment group.



Relapse rate in PEN was 35% versus 64% in regular diet group

49 Takagi S, et al. *Aliment Pharmacol Ther.* 2006;24(9):1333-1340.

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Nutritional Supplements: Probiotics

Live micro-organisms that may improve the balance of good versus bad bacteria

- *E. Coli* strain Nissle 1917
- *Lactobacillus*
- *Bifidobacterium longum*
- VSL#3

Based on current research:

- Some evidence that VSL#3 may improve active ulcerative colitis and pouchitis.
- No evidence that probiotics improve Crohn's disease activity.

50 Derwa Y, et al. *Aliment Pharmacol Ther.* 2017;46(4):389-400.

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Diet as Therapy for IBD: Elimination Diets

Several diets have been described including:

- Specific Carbohydrate Diet (SCD)
- Crohn's Disease Exclusion Diet (CDED)
- Anti-inflammatory Diet (IBD-AID)
- Allergen Elimination Diet
- Semivegetarian Diet
- Low Fermentable Oligosaccharides, Disaccharides, Monosaccharides and Polyols Diet (Low FODMAP Diet)
- Mediterranean Diet

Only the **SCD** and **CDED** diets have shown improvement in clinical remission and reduction in markers of inflammation.

51 Sigall-Boneh R, et al. *J Crohns Colitis*. 2017;11(10):1205-1212.

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Diet as Therapy for IBD: SCD Diet

- Based on idea that malabsorption of complex carbohydrates, lactose, and sucrose causes bacterial overgrowth and intestinal injury.
- Small studies have shown improvement in symptoms and endoscopy findings.

Food Group	Include	Avoid
Fruits	All	Canned fruits
Vegetables	Most	Potatoes, yams, legumes, canned vegetables, seaweed
Protein	Nuts, fresh meats	Processed meats
Grains		Cereal grains (such as, wheat, barley, corn, rye, oats, rice), quinoa
Beverages/Dairy	Wine, lactose-free cheeses, homemade lactose free yogurt	Milk, instant coffee or tea, soda, fruit juices, soy milk, beer, commercial yogurts, unnatural cheeses including feta, mozzarella
Other	Honey, butter	Chocolate, corn syrup, margarine

52 Cohen SA, et al. *J Pediatr Gastroenterol Nutr*. 2014;59(4):516-521; Hou JK, et al. *Clin Gastroenterol Hepatol*. 2014;12(10):1592-1600; Obih C, et al. *Nutrition*. 2016;32(4):418-425; Walters SS, et al. *SOJ Microbiol Infect Dis*. 2014;2(3):1-13.

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Diet as Therapy for IBD: Crohn's Disease Exclusion Diet (CDED)

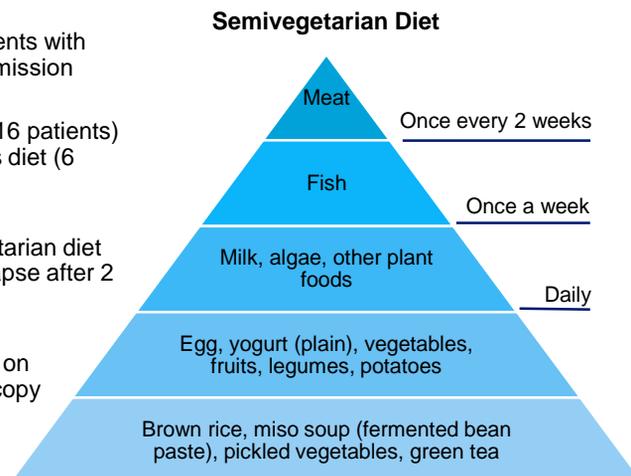
- Reduce exposure to foods thought to cause intestinal inflammation, change the microbiome, alter the mucous layer in the gut, or change intestinal permeability.
- Whole food diet: fruits, vegetables, meats, complex and simple carbohydrates.
 - Avoid gluten, gluten free baked goods, dairy, animal fats, processed meats, products containing emulsifiers, canned goods, packaged products with an expiration date.
- Improvement in clinical symptoms and inflammatory markers (ESR, CRP).
- Forty-seven patients treated.
 - Remission in 70% of children and 69% of adults.
 - Reduction of CRP in 21/30 (70%) of patients with symptom remission.
 - With or without partial enteral nutrition.

53 Sigall-Boneh R, et al. *Inflamm Bowel Dis.* 2014;20(8):1353-1360.

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Semivegetarian Diet in Crohn's Disease

- Twenty-two adult patients with Crohn's disease in remission
- Semivegetarian diet (16 patients) versus an omnivorous diet (6 patients)
- Patients on semivegetarian diet were less likely to relapse after 2 years
- Evaluated only based on symptoms (no endoscopy evaluation)



54 Chiba M, et al. *World J Gastroenterol.* 2010;16(20):2484-2495.

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Current Diet Studies by the Crohn's & Colitis Foundation

DINE-CD Research Study Specific Carbohydrate Diet (SCD) vs Mediterranean Diet

- Patients with active Crohn's disease based on symptom and CRP or calprotectin.
 - Compare effectiveness of SCD and Mediterranean diet to:
 - Improve symptoms
 - Improve intestinal inflammation
 - Improve fatigue, pain, joint symptoms
 - Evaluate sustainability of the diet when food is no longer provided through study.
- ✓ All food provided over a 6-week period.
 - ✓ Daily online survey of Crohn's disease symptoms.
 - ✓ Patient will follow diet on their own for an additional 6 weeks.
 - ✓ Access to a dietician for support.

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Current Diet Studies by the Crohn's & Colitis Foundation

Food and Resulting Microbial Metabolites (FARMM) Study

- Compare Western diet, vegan diet, and enteral formula diet
 - Evaluate how diet influences the intestinal microbiome composition and function
- ✓ 3-year study
 - ✓ Follow diet for 2 weeks
 - ✓ Researchers will evaluate microbial composition and function in the gut

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Importance of GI/Dietitian Team



Work together to identify factors for nutrient loss and recommended replacement

Optimized nutrition can improve healing, particularly after surgery

Make healthy nutritional changes to complement medical therapies

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IBD Management: Overall Picture

IBD treated through a variety of treatment approaches

Good nutrition does not replace conventional medical and surgical therapies for IBD

Complementary approaches can help with symptom relief, but talk to your doctor before taking any alternative therapies

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