

## Today's Objectives

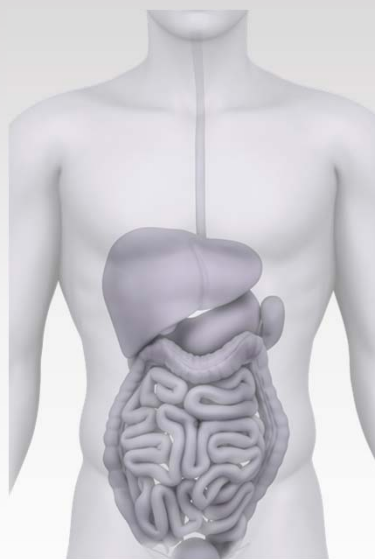
- Describe the importance of diet and nutrition in inflammatory bowel diseases (IBD)
- Review data on the role of diet in IBD
- Explain special and popular diets for IBD
- Review general healthy eating principles, and suggestions for diet during a flare
- Discuss eating outside your home at holidays and gatherings

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## Digestive Journey

- Digestion is process of food conversion into substances that body can absorb
- Body absorbs nutrients from food to function properly
- Most absorption occurs in small intestine
- Watery food residue and undigested secretions pass into large intestine where water is reabsorbed
- Solid, undigested food mixes with bacteria living in the large intestine to form bowel movements



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## Effects of IBD on Digestion

### Ulcerative Colitis

- Small intestine works normally
- Inflamed colon causes urgency; does not reabsorb water (diarrhea)

### Crohn's Disease

- Inflamed small intestine; less able to fully digest/ absorb nutrients
- Incompletely digested foods travel through colon (may cause diarrhea)

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## Diet and Nutrition are Important!

- **Diet** is the actual food consumed
- **Nutrition** refers to properly absorbing food and staying healthy
- Incorporating good nutrition into your diet is essential

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## Clinical Relevance of Diet and IBD

- Patients desire therapies that do not suppress the immune system.
- Diet and the gut microbiota are the two biggest environmental factors to which the gut is exposed.

### Diet is associated with new onset IBD

Systematic review conclusions

- High dietary intakes of total fats, PUFAs, omega-6 fatty acids, and meat were associated with an increased risk of CD and UC
- High fiber and fruit intakes were associated with decreased CD risk
- High vegetable intake was associated with decreased UC risk

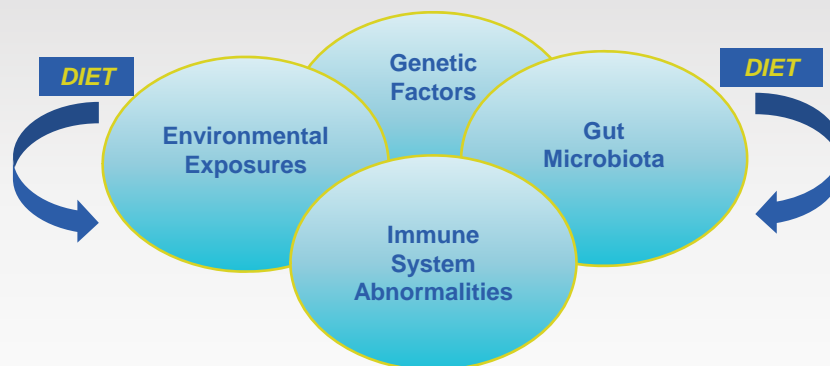
Hou JK, et al. *American Journal of Gastroenterology*. 2011;106:563-573.

Wu, Gary. Presentation: Diet, the Gut Microbiome, and the Metabolome in IBD: Potential Therapeutic Targets and Vision for the Future.

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## Making the Connection with IBD



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## What do IBD patients think?

- 15.6% of patients feel that diet causes IBD
- 40% of patients believe that certain foods cause flares
- Nearly one-half of patients with IBD report that IBD changes the pleasure of eating
- About two-thirds of patients report not eating certain foods they usually like to eat to prevent flares

Zallot C, et al. *Inflamm Bowel Dis*. 2013;19(1):66-72.

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## Role of Diet

- No direct evidence that diet can *cause* or *cure* IBD
- IBD is not related to food *allergy* but symptoms may be worsened by food *intolerance*
- Proper diet may:
  - Improve symptoms of IBD
  - Enable healing
  - Give sense of control over IBD management
- Diet should be individualized for each patient

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## Diet Research

- Studies on the relationship between diet, nutrition, and IBD are limited
- Most studies are small, resulting in anecdotal outcomes
- Diet may have an impact on disease, but research has been inadequate to show how this takes place
  - Effects on immune system?
  - Changes in gut bacteria?

Hou JK, et al. *Am J Gastroenterol.* 2011;106(4):563-573.

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## Diet Research: Diet and IBD Development

- 2011 systematic review of diet and IBD
- Fats and meats
  - High intake associated with increased risk of IBD
- Fiber and fruits
  - High intake associated with reduced risk of CD
- Vegetables
  - High intake associated with reduced risk of UC
- Take home points
  - Limitations with this review (different studies, retrospective)
  - Not necessarily particular foods, but components common to many foods may have a role
  - Studies did not explore role of diet on current disease activity

Hou JK, et al. *Am J Gastroenterol.* 2011;106(4):563-573.

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## Diet Research: Food and Flares

- Within the large internet-based study: CCFA Partners
  - Food frequency questionnaires were used to measure eating patterns
  - Open-ended questions were asked about foods that improved or worsened IBD symptoms
- Foods that more frequently associated with improved symptoms
  - Yogurt, rice, bananas
- Foods that were associated with worsened symptoms
  - Non-leafy vegetables, spicy foods, fruit, nuts, leafy vegetables, fried foods, milk, red meat, soda, popcorn, dairy, alcohol, high-fiber foods, corn, fatty foods, seeds, coffee, and beans
- Take home points/limitations: self-reported, likely related to intolerances, no measures of inflammation

Cohen AB, et al. *Dig Dis Sci.* Aug 2012. Epub ahead of print.

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## Principles of Good Nutrition

- Maintaining good nutrition is key to:
  - Medications being more effective
  - Healing, immunity, and energy levels
  - Preventing or minimizing gastrointestinal symptoms and normalizing bowel function

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## Research on Vitamin D

- Higher levels of Vitamin D are associated with a reduced risk of development of Crohn's disease
- Vitamin D deficiency is common in IBD and is independently associated with lower quality of life and greater disease activity in Crohn's disease
- In a small randomized trial, oral vitamin D replacement reduced the risk of relapse in Crohn's from 29% to 13% ( $p=0.06$ )

Ananthakrishnan JK, et al. *Gastroenterology*. 2012;106(4):563-573.

Ulitsky A, et al. *J Parenter Enteral Nutr*. 2011;35(3):308-316.

Jørgensen SP, et al. *Aliment Pharmacol Ther*. 2010;32(3):377-383.

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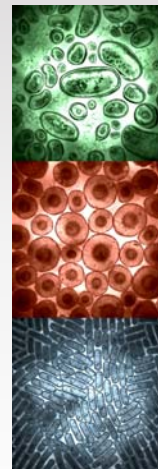
## Host- Microbial Mutualism in the Gut

### Host benefits to bacteria

- Provides a unique niche
- Intestinal mucus provides a source of nutrition

### Bacteria benefits the host

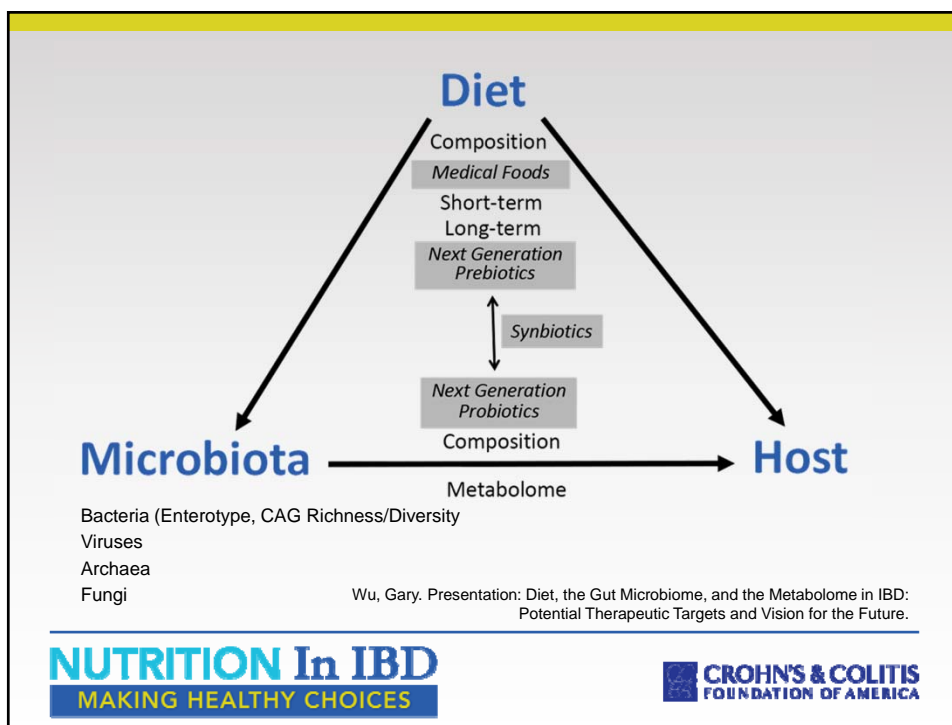
- Fermentation of indigestible carbohydrates and the production of SCFAs
- Biotransformation
- Urease activity participates in nitrogen balance
- Synthesis of certain vitamins
- Metabolize drugs
- Education of the mucosal immune system



Wu, Gary. Presentation: Diet, the Gut Microbiome, and the Metabolome in IBD: Potential Therapeutic Targets and Vision for the Future.

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## Is There a Special Diet for IBD?

- **NO**, THERE ARE NO SPECIAL DIETS FOR IBD
  - However, dietary modifications may help with symptoms
- Several diets advertised specifically for managing IBD
- Most have not been proven scientifically and benefits have not been seen in formal studies
- Talk to your doctor about your questions

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## Talk to Your GI/Dietitian Team

### Elimination Diet

- Keep food /symptoms diary
- Removes food intolerances over time

### Low fiber with low residue diet

- Minimizes bulk residue to stool
- Often during flares or strictures

### Total Bowel Rest

- Period of complete bowel rest
- Nourished with fluids intravenously
- May decrease inflammation

### Elemental Diet

- Limits carbohydrate intake
- Reduce microbes that may contribute to symptoms

### Gluten-free Diet

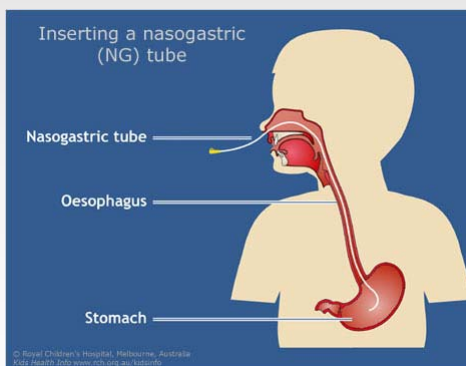
- Excludes grains that contain the protein gluten

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## Nutrition Support Therapy

- Additional supplementation may be necessary if,
  - Weight loss
  - Oral intake issues
  - Surgery
  - Obstruction
  - Severe inflammation
- Liquid nutritional supplements
- Enteral nutrition
  - Nutrient-rich liquid formula administered through
    - Nasogastric tube (NG tube): from nose to stomach
    - Gastrostomy tube (G-tube): from abdominal wall to stomach
- Parenteral nutrition
  - Delivered through catheter placed into large blood vessel
  - Requires specialized training to administer



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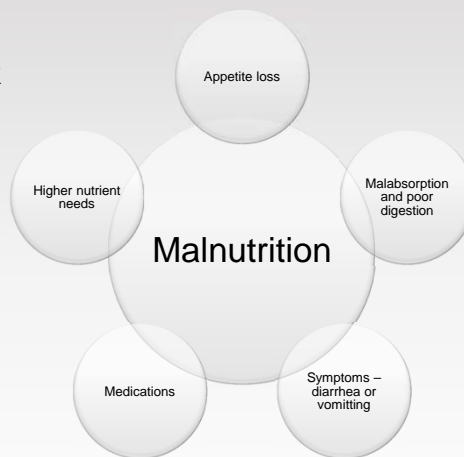
## EATING A WELL-BALANCED AND HEALTHY DIET

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## Risk for Malnutrition

- Patients with IBD are at risk of malnutrition
  - Loss of appetite
  - Increased caloric needs
  - Poor digestion and absorption of nutrients
  - Effects of IBD medications



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

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## Nutrient Deficiencies: Ulcerative Colitis

Nutrient	Risk for deficiency
<b>Folate</b>	Sulfasalazine use
<b>Magnesium</b>	Chronic Diarrhea
<b>Iron</b>	GI Bleeding
<b>Potassium</b>	Chronic diarrhea, vomiting and prednidone use

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

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## Nutrient Deficiencies: Crohn's

Nutrient	Risk for deficiency
<b>Vitamin B12</b>	Inflammation or removal of the <b>ileum</b>
<b>Folate</b>	Sulfasalazine use; inflammation or removal of the <b>jejunum and/or ileum</b>
<b>Vitamin A</b>	Fat malabsorption; disease of the <b>duodenum and/or upper jejunum</b>
<b>Magnesium</b>	Inflammation or removal of large portions of the <b>jejunum and ileum</b> , fistula losses, chronic diarrhea
<b>Zinc</b>	Inflammation or removal of <b>jejunum</b> , diarrhea, fistula losses, prednisone use
<b>Calcium</b>	Avoidance of dairy foods, fat malabsorption, prednisone use, inflammation throughout the <b>small intestine</b>
<b>Potassium</b>	Chronic diarrhea, vomiting and prednisone use

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

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## What to Eat to Prevent Deficiencies

Nutrient	Food Sources
<b>Vitamin B12</b>	Meat, fish, eggs, dairy products and fortified breakfast cereals
<b>Folate</b>	Fortified cereals, breads and grains, dark leafy greens, avocados
<b>Vitamin A</b>	Yellow or orange fruits/vegetables, fortified milk, cheese, eggs, liver
<b>Magnesium</b>	Dark leafy greens, bananas, avocados, peas and beans, soy products, grains
<b>Zinc</b>	Fortified breakfast cereals, chicken, pork, yogurt
<b>Calcium</b>	Soy or dairy products
<b>Potassium</b>	Most fruits and vegetables – especially oranges, bananas, tomatoes

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

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## Dietary Supplements

- Discuss all supplements with your doctor and/or dietitian
- Consider taking:
  - Daily multivitamin/mineral supplement
  - Calcium and vitamin D supplement
    - 500 mg elemental calcium 3x a day
    - 800 IU vitamin D daily
- You may also need:
  - Monthly B12 injections (if disease of the ileum)
  - And folate (with sulfasalazine use)

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## Practical Recommendations for a Healthy Diet

- **Calories**
  - Eat to maintain weight or increase calories by 250-500 calories per day for weight gain
- **Protein**
  - Divide weight (in pounds) in half. Aim for that amount of protein (grams/day)
- **Fluids and Electrolytes**
  - Divide weight (in pounds) in half. Aim for this amount of fluid (ounces/day)
  - Increased needs with diarrhea or after exercise
  - Fluids with electrolytes (sodium, potassium) may be required as well

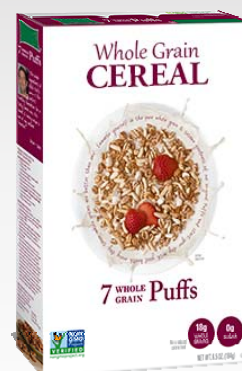


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## Whole Grains

- Grains are 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)
- Most adults need 6-8 ounces of grains per day
  - 1 ounce = 1 slice of bread, 1 cup of ready-to-eat cereal, or ½ cup of cooked rice, cooked pasta, or cooked cereal
- Look for whole grains as the first ingredient listed with at least 3 grams of fiber/serving



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## Fruits and Vegetables

- A diet rich in fruits and vegetables is associated with reduced risk for heart disease, diabetes, and obesity
- Sources of many nutrients such as fiber, potassium and magnesium, folate, and vitamins A and C
- Aim for 5-9 servings of fruits and vegetables per day
- 1 serving = ½ cup cooked vegetables or 1 cup raw
- Cooked and peeled may be better tolerated

"Take Charge," Crohn's & Colitis Foundation of America, Winter 2006

"Take Charge," Crohn's & Colitis Foundation of America. The Fruit Connection: How Sweet it is! Spring 2006

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## Sources of Calcium

- Calcium is important for bone health, reducing the risk of osteoporosis, and involved in muscle contraction
- Foods that contain calcium are also sources of vitamin D, phosphorus, potassium, protein
- Choose 3 servings per day
  - 1 serving = 1 cup of milk or yogurt
- Foods to include
  - Skim or 1% milk (lactose free if intolerant)
  - Other low-lactose options include most hard cheeses, yogurt, kefir, cottage cheese, ricotta cheese
  - Alternate milk options: soy milk, almond milk, rice milk



"Take Charge," Crohn's & Colitis Foundation of America. Eating Right: Strategic Nutrition for Healthy Bones. Spring 2007

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## Protein

- Protein is an important nutrient for healing after surgery and building the components of your immune system
- One egg, an ounce of meat, 1 cup of milk = about 7 grams of protein
- Foods to include: lean meat, low fat dairy, eggs, beans, cheese, nuts/nut butters, vegetarian meat alternatives
- Try to include a source of protein at each meal



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## Unsaturated Fats

- Omega 3 Fatty Acids
  - Increase your intake of fatty fish like salmon or tuna
  - Other food sources of omega 3's: walnuts, flaxseed oil, fortified foods
  - Omega 3 fatty acid supplement
    - Look for EPA and DHA content
    - These two should add up to 1-3 grams
- Monounsaturated Fats
  - Olive oil, canola oil, nut butters, avocados



"Take Charge," Crohn's & Colitis Foundation of America. Eating Right: The Skinny on Fats, Summer 2006

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## Potential Problem Foods

- Foods with added soluble fiber
- Artificial sweeteners and sugar alcohols
- Dairy products
- High-fat, greasy foods
- Spicy foods
- Cruciferous vegetables like broccoli, cauliflower, cabbage

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

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## Foods to Include During or After a Flare

- Diluted juices
- Applesauce
- Canned fruit without added sugar
- Oatmeal, cream of wheat
- Plain chicken, turkey, or fish
- Cooked eggs or egg substitute
- Mashed potatoes, rice, or noodles
- White bread



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

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## Examples of Popular Diets

<p><b>Specific Carbohydrate Diet™</b></p> <ul style="list-style-type: none"> <li>• Exclude starchy vegetables and grain</li> </ul>	<p><b>Concerns:</b> restrictive, can eliminate dietary sources of short-chain fatty acids (SCFA)- preferred source of colon cells</p>
<p><b>Low FODMAP Diet</b></p> <p><b>F</b> = Fermentable (Gas producing)  <b>O</b> = Oligosaccharides (fuctans and galacto-oligosaccharides)  <b>D</b> = Disaccharides (lactose)  <b>M</b> = Monosaccharide; (fructose)  <b>A</b> = and  <b>P</b> = Polyols (sorbitol and mannitol)</p>	<p><b>Concerns:</b> requires careful label reading; talk to a dietician for complete nutritional needs</p>
<p><b>Atkins™</b></p> <ul style="list-style-type: none"> <li>• Emphasizes meat, eggs, cheese</li> <li>• Limits grains, fruits, vegetables, dairy products</li> </ul>	<p><b>Concerns:</b> electrolyte abnormalities, dehydration, constipation; diets high in red meat associated with increased risk of colon and prostate cancer; low fiber associated with heart disease, stroke, diverticulitis, cancer</p>

"Take Charge," Crohn's & Colitis Foundation of America. The Specific Carbohydrate Diet: Does it Work? Summer 2005.

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## Examples of Popular Diets

<p><b>Paleo</b></p> <ul style="list-style-type: none"> <li>Eliminates refined sugar, dairy, legumes, and grains</li> <li>Allows meat, fish, poultry, fruits, and vegetables</li> </ul>	<p><b>Concerns:</b> limits nutrient-dense foods like carrots, watermelon</p>
<p><b>South Beach Diet®</b></p> <ul style="list-style-type: none"> <li>Limits disease-causing saturated fats</li> </ul>	<p><b>Concerns:</b> limits nutrient-dense foods like carrots, watermelon, bananas, and pineapple; menus average ~1200 calories per day</p>
<p><b>Weight Watchers</b></p> <ul style="list-style-type: none"> <li>Sound approach for weight loss</li> <li>Focus on increasing nutrient-dense/low-calorie foods</li> <li>Portion control</li> </ul>	<p><b>Concerns:</b> Specific needs and intolerances of IBD patients not identified</p>

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## Note on Popular Diets

- No specific diet has been proven to control symptoms of IBD
- Many options exist and are promoted on the internet but...
  - Few well-controlled published studies
  - Can be difficult and complicated to follow
  - Potentially risky – restrictions may lead to poor growth, poor healing, and/or nutrient deficiencies

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

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## STRATEGIES FOR ENJOYING SPECIAL OCCASIONS

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### Restaurant Meals

- Check menus online and read descriptions carefully
- Ask for clarification of ingredients and don't be afraid to make special requests!
- Know your trigger foods
- Select restaurants and menu options you've enjoyed
- Keep snacks handy



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## Restaurant Meals

- Watch out for hidden fat
  - Sauces, crispy dishes
- Try steamed or broiled seafood, or grilled chicken
- Ask for sauces and salad dressing on the side
- Divide the food on your plate in half and eat slowly



"Take Charge," Crohn's & Colitis Foundation of America, No reservations: How to Take the Worry Out of Eating Out. Winter 2005.

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## Restaurant Meals

- Limit caffeinated beverages and alcohol
  - Can irritate the GI tract and move food through more quickly
- Alcohol interacts with many medications
  - Discuss potential interactions with your physician and pharmacist
- Choose water, sparkling water, unsweetened green tea, diluted juice



"Take Charge," Crohn's & Colitis Foundation of America. Drink to Your Health? Fall 2005.

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## Holidays and Celebrations

- Know your limits!
- Stick to your normal eating habits as much as possible
- Keep portions small; eat smaller, more frequent meals
- Keep track of new foods and symptoms
- Inform family and friends
- Bring a dish you know you can eat

"Take Charge," Crohn's & Colitis Foundation of America, 2006 Issue

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## Importance of a 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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## Additional Resources

- Academy of Nutrition and Dietetics - [www.eatright.org](http://www.eatright.org)
  - “Find a Registered Dietitian”
  - “Public” link for nutrition and health information
- Other resources for nutrition information
  - General healthy eating - [www.choosemyplate.gov](http://www.choosemyplate.gov)
  - IBD-specific information - [www.ccfa.org](http://www.ccfa.org)
  - Online tool and iPhone app for tracking diet - [www.ccfa.org/gibuddy](http://www.ccfa.org/gibuddy)
- CCFA Bookstore for more information:  
<http://www.ezpromostore.com/ccfaretail/bookstore>

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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
  - Dietary modifications and supplements
  - Stress management
  - Exercise

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## References

- Ananthakrishnan JK, et al. *Gastroenterology*. 2012;106(4):563-573.
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- Cohen AB, et al. *Dig Dis Sci*. Aug 2012. Epub ahead of print.
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## QUESTIONS AND ANSWERS

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## CCFA Resources



- Irwin M. and Suzanne R. Rosenthal IBD Help Center  
M-F, 9:00 AM-5:00 PM ET
  - Phone: 1-888-694-8872
  - Email: [info@ccfa.org](mailto:info@ccfa.org)
- Educational webcasts: [www.ccfa.org/resources/webcasts.html](http://www.ccfa.org/resources/webcasts.html)
- Connect with other patients
  - CCFA Community website: [www.ccfacommunity.org](http://www.ccfacommunity.org)
  - Support groups and Power of Two (peer mentors):  
– [www.ccfa.org/chapters](http://www.ccfa.org/chapters)
- GI Buddy: online tracking tool and mobile app [www.ccfa.org/gibuddy](http://www.ccfa.org/gibuddy)
- Local educational events, visit: [www.ccfa.org](http://www.ccfa.org)

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## CCFA Partners



- Registry of patient-reported outcomes
- Available for pediatric and adult patients

[www.ccfapartners.org](http://www.ccfapartners.org)

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**TWITTER  
QUESTION AND ANSWER CHAT**

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**Monday, December 1<sup>st</sup>, 2014  
4-5 PM EST  
#HappyHolidaysIBD**

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