

Food and Fire: Diet in IBD

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Disclosures

- Research Support: Abbvie, Janssen
- Consultant: Abbvie, Janssen, Given, Soligenix
- Speaker's bureau: Abbott Nutrition, Prometheus

Disclosures

I would like to be more
successful "selling" EEN



Acknowledgements

- Bob Baldassano
 - Tireless proponent in US for nutritional therapy
- Sandy Kim, Arie Levine
 - My gut microbiome tutors
- Francisco Sylvester
 - My Vitamin D tutor

Acknowledgements

- My Jewish Mother
 - "There is nothing that food cannot cure"!



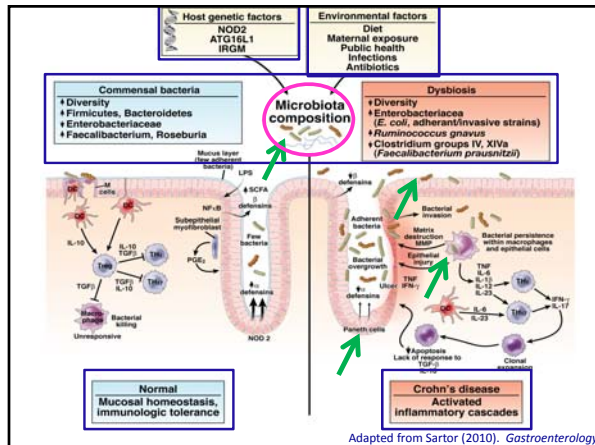
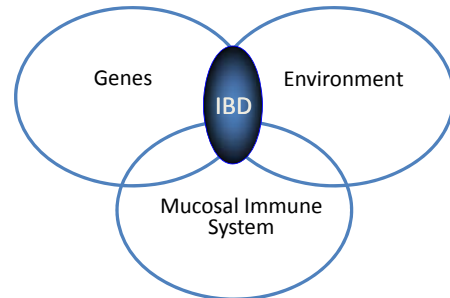
Objectives

- Review the emerging importance of the gut microbiome
- Review the evidence regarding exclusive enteral nutrition as a therapy in IBD
- Common nutritional concerns raised by patients and families with IBD will be reviewed.

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Multi-factorial Pathogenesis of IBD



The Treatment Naïve Microbiome in New – Onset Crohn’s Disease

(Gevers, et al. 2014. *Cell Host Microbe*)

- Microbiota co-occur in two groups/axes of organisms which are changed in children with CD
- Fecal samples collected at onset of disease do not reflect alterations of intestinal lining bacterial communities
- Antibiotics contribute to an imbalance of intestinal bacteria (dysbiosis)
- *Rectal biopsies are a strong disease predictor, independent of disease location

“But doctor—can’t we treat this with diet, all my friends say so..”

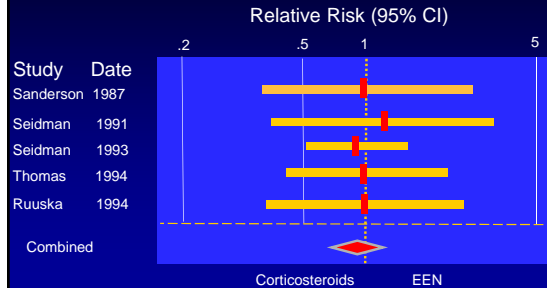
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Exclusive Enteral Nutrition (EEN): Primary Treatment of Active CD

- Therapeutic efficacy
- Effect of disease location?
- Elemental vs. polymeric formula?
- Mucosal healing?
- QOL?

EEN vs Prednisone: Clinical Proof of Dietary Therapy



Heuschkel et al, *J Pediatr Gastroenterol Nutr* 2000; 31:8-15

Exclusive Enteral Nutrition (EEN): Primary Treatment of Active CD

- Therapeutic efficacy
 - In adults: > 50%
 - In children: 50% to 75%
- Effect of disease location?
- Elemental vs. polymeric formula?
- Mucosal healing?
- QOL?

Glasgow Prospective: Effect of Disease Phenotype

- 114 patients over 3 year period (2004-2007)
- 8 weeks of EEN for active disease
- 52% oral; 48% NG (polymeric vs. elemental)
- Disease Location and Behavior (Vienna)
 - 73% inflammatory
 - 45% upper (L4)
 - 26% ileocolon (L3)
 - 17% colon (L2)

Buchanan et al, *Aliment Pharmacol Ther* 2009;30, 501-502

Glasgow Prospective: Effect of Disease Phenotype

- 80% remission at 8 weeks
- Significant improvement of BMI
- No Difference by:
 - Type of EEN
 - Disease behavior or location

Buchanan et al, *Aliment Pharmacol Ther* 2009;30, 501-502

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Cochrane Review: Effect of Protein Type

- 7 trial meta-analysis
- 113 patients elemental
- 109 patients polymeric
- No difference between groups
(OR 1.37; 95% CI 0.80—2.35; $p = 0.24$)

Zachos M, et al. *Cochrane Reviews* 2007, Issue 1, Art. No.: CD000542. DOI: 10.1002/14651858.CD000542.pub2.

ORIGINAL ARTICLE

Does polymeric formula improve adherence to liquid diet therapy in children with active Crohn's disease?

A F Rodrigues, T Johnson, P Davies, M S Murphy

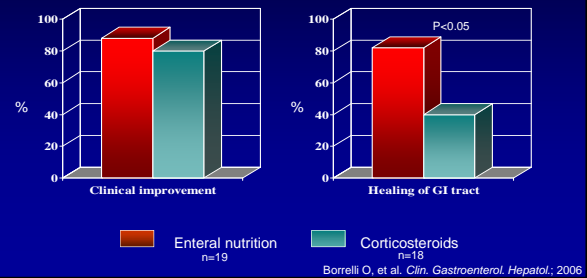
Arch Dis Child 2007;92:767-770. doi: 10.1136/adc.2006.103416

Polymeric formula did not effect adherence but was associated with significantly reduced need for nasogastric tube administration of formula.

Exclusive Enteral Nutrition (EEN): Primary Treatment of Active CD

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- **Mucosal healing?**
- QOL?

Polymeric Diet vs. Steroids for Induction



Exclusive Enteral Nutrition (EEN): Primary Treatment of Active CD

- Therapeutic efficacy
- Effect of disease location?
- Elemental vs. polymeric formula?
- Mucosal healing?
- **QOL?**

QOL and EEN

N = 28
88% remission at 8 weeks
QOL improved with ↓PCDAI
QOL did not reflect endoscopic healing

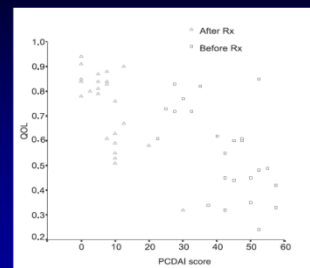


Figure 1. Relationship of quality of life (QOL) (IMPACT ID) with the paediatric Crohn's disease activity index (PCDAI) scores (x-axis). There is a significant negative correlation between the two variables ($r = -0.67$, $P < 0.05$).

Atzal NA, et al. *Aliment Pharmacol Ther* 2004;20:167-172

Clinical progress in the two years following a course of exclusive enteral nutrition in 109 paediatric patients with Crohn's disease

F. L. Cameron*, K. Gerasimidis†, A. Papangelou†, D. Missiou†, V. Garrick*, T. Candigan*, E. Buchanan*, A. R. Barclay*, P. McGrogan* & R. K. Russell*

- N = 109
- After 8 weeks EEN, remission 59%, improved 29% and no change 11%
- 58% relapsed during two year follow-up.
- A second course of EEN had a similar response rate,
- Height z-score did not improve over the 24 months despite addition of AZA.

AP&T 2013;37:622-629

ORIGINAL ARTICLE

A Novel Enteral Nutrition Protocol for the Treatment of Pediatric Crohn's Disease

Kernika Gupta, BA,* Angela Noble, MD,† Kelly E. Kachelias, RD,* Lindsey Albenberg, DO,* Judith R. Kellen, MD,* Andrew B. Grossman, MD,* and Robert N. Baldassano, MD*

(Inflamm Bowel Dis 2013;19:1374-1378)

- Retrospective chart review (1998—2010)
- 43 subjects (12.8 years; 67% male)
- 74% later than primary therapy
 - Were on stable doses of a variety of medications
- Received 80-90% calories by EN (most NG)
- Response rate 87%; Remission 65% by PCDAI
- No effect by disease location

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Conclusions:

- EN is a valid treatment option
 - Steroid free induction
- Polymeric as effective as elemental
- Seems independent of disease location
- Partial EN may be a valid adjunct
- Mechanism still to be fully established
 - Altered gut microbiota?

**Conclusions:
Our Patients are Correct!**

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 - Altered gut microbiota?
 - **Proves diet matters (?addition vs. subtraction)**

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Why is Diet Important?

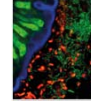


- 15.6% of patients feel that diet causes IBD
- Nearly one-half reported decreased pleasure of eating
- About two-thirds reported not eating certain foods they usually like to eat to prevent relapse

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

Diet Research

- Studies on the relationship between diet, nutrition, and IBD are limited
- Most studies are small with 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.

Diet Research: Food and Symptoms

- CCFA Partners (Internet based survey)
- Foods that more frequently improved symptoms
 - Yogurt, rice, bananas
- Foods that 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
- Limitations: self-reported, likely related to intolerances, no measures of inflammation



Cohen AB et al. *Dig Dis Sci.* Aug 2012.

The Low FODMAP Diet

- Dietary approach to minimizing symptoms associated with irritable bowel syndrome (IBS)
 - F = Fermentable
 - O = Oligosaccharides
 - D = Disaccharides
 - M = Monosaccharide; A = and
 - P = Polyols
- May be helpful in reducing gas and bloating
- Requires careful label reading
- Planning with an RD can result in a nutritionally complete diet

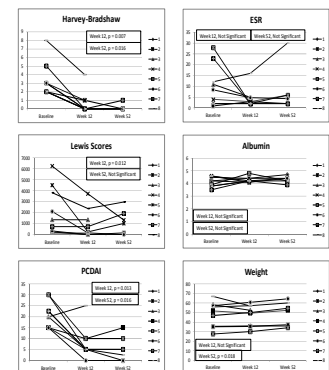
The Specific Carbohydrate Diet

- Excludes
 - Any processed sugar
 - Canned vegetables
 - All grains
 - Potatoes, yams, and other starchy foods
 - Chickpeas, bean sprouts, and soybeans
 - Canned/processed meats
 - All milk, high-lactose cheeses, commercial yogurt
 - Multiple other common condiments and food ingredients



SCD Open Label Trial in Peds CD

- 38% screen failure
 - 50% "diet too stringent"
- 9/10 completed 52 weeks SCD
- VCE used for mucosal healing



Cohen SA, et al. *JPGN* 2014

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 ↓

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

Review article: evidence-based dietary advice for patients with inflammatory bowel disease

E. Richman* & J. M. Rhodes*

Results

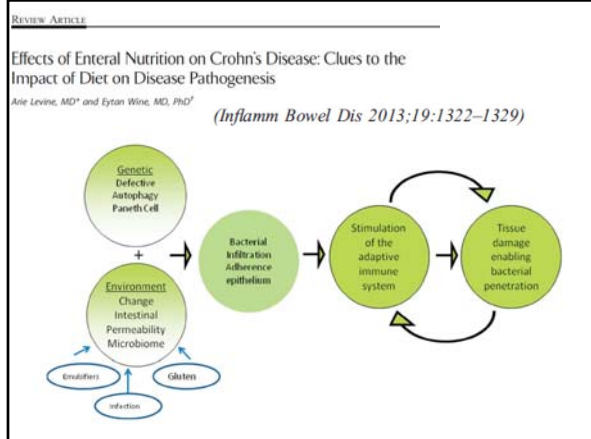
Enteral nutrition with a formula-defined feed is effective treatment for CD,

There is no direct evidence of benefit from any other specific dietary modification in CD, but indirect evidence supports recommendation of a low intake of animal fat, insoluble fibre and processed fatty foods containing emulsifiers.

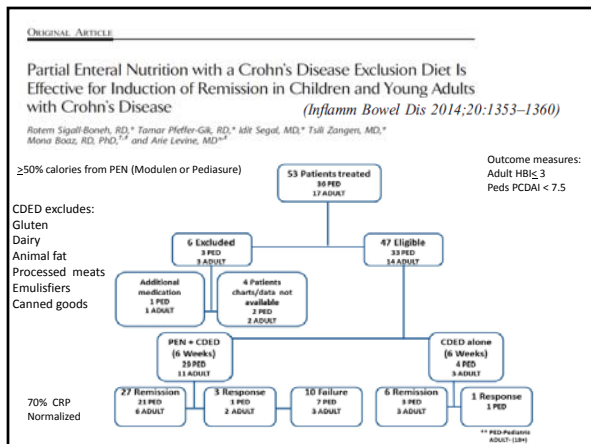
Some evidence supports vitamin D supplementation.

In ulcerative colitis (UC), evidence is weaker, but high intakes of meat and margarine correlate with increased UC incidence and high meat intake also correlates with increased likelihood of relapse.

AP&T 2013



CDED: CROHN'S DISEASE EXCLUSION DIET



BRIEF REPORT

Interactions Between the Dietary Polyunsaturated Fatty Acid Ratio and Genetic Factors Determine Susceptibility to Pediatric Crohn's Disease

Irina Costea,¹ David R. Mack,² Rozenn N. Lemaire,³ David Israel,⁴ Valerie Marci,⁵ Ali Ahmad,^{6,7} and Devendra K. Amre^{7,8}

we found that children who consumed a higher dietary ratio of u6/u3 were susceptible for CD if they were also carriers of specific variants of CYP4F3 and FADS2 genes.

Our findings implicate diet–gene interactions in the pathogenesis of CD.

Review article: evidence-based dietary advice for patients with inflammatory bowel disease

E. Richman^{*} & J. M. Rhodes[†]

Results

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AP&T 2013

Vitamin D and IBD

Higher Predicted Vitamin D Status Is Associated With Reduced Risk of Crohn's Disease

ASHWIN N. ANANTHAKRISHNAN,^{*} HAMED KHALILI,^{*} LESLIE M. HIGUCHI,[†] YING BAO,[§] JOSHUA R. KORZENIK,^{*} EDWARD L. GIOVANNUCCI,[‡] JAMES M. RICHTER,^{*} CHARLES S. FUCHS,^{§*} and ANDREW T. CHAN^{**}

GASTROENTEROLOGY 2012;142:482-489

High Residential Sun Exposure Is Associated With a Low Risk of Incident Crohn's Disease in the Prospective E3N Cohort

Prévost Jantchoy, MD, PhD,^{**†} Françoise Clavel-Chapelon, PhD,^{**§} Antoine Racine, MD,^{**§} Marina Kvaskoff, PhD,^{**§} Franck Carbonnel, MD, PhD,^{**§,||} and Marie-Christine Boutron-Ruault, MD, PhD,^{**§}

Inflamm Bowel Dis. 2014 Jan;20(1):75-81

CLINICAL GUIDELINE

Skeletal Health of Children and Adolescents With Inflammatory Bowel Disease

^{*}Helen Pappa, [†]Meena Thayer, [‡]Francisco Sylvester, [§]Mary Leonard, ^{||}Babette Zemel, and ^{||}Catherine Gordon

Give consideration to monitoring vitamin D status yearly in late winter or early spring, treat hypovitaminosis D, and consider recommending intake of 800 to 1000 IU of vitamin D per day to maintain optimal vitamin D status.

Treatment of Hypovitaminosis D

"Our recommendation is that it is reasonable to use cumulative doses of at least 400,000 IU if 25OHD level is <20 ng/mL. For levels >20 ng/mL but lower than 32 ng/mL a cumulative dose of at least 250,000 IU would be reasonable."

(JPGN 2011;53: 11-25)

Bottom Line on Popular Diets

- There is a difference between symptom control and disease control (corticosteroids)
- Popular diets are supported by testimonials more than well-controlled scientific studies
- Some diets may be worth a try BUT....
 - Discuss it with your physician or a dietitian to make sure that the diet is safe and nutritionally complete
 - Do not abandon conventional treatment!

THANK YOU!