LOS ANGELES INTEGRATIVE
Gastroenterology & Nutrition
Whole-Person Approach to Digestive Care

Functional Medicine Approach to Inflammatory Bowel Disease

- An Overview -

LOS ANGELES INTEGRATIVE
Gastroenterology & Nutrition
Whole-Person Approach to Digestive Care

Dr. Farshid Rahbar MD, FACP, ABIHM
Founder and Practicing Physician

Faculty Disclosure:
Dr. Rahbar has received no funds from any pharmaceutical company or commercial source.

LOS ANGELES INTEGRATIVE
Gastroenterology & Nutrition
Whole-Person Approach to Digestive Care

Acknowledgements:

- Dr. Michael Erdman, MBBS.

Inflammatory Bowel Disease

A chronic inflammatory disease that causes progressive functional and structural damage to the GI tract.

IBD Types

- Ulcerative Colitis (UC)
- Crohn's Disease (CD)
- UC-like Crohn's
- Indeterminate colitis
- Miliary Crohn's
- Microscopic / Collagenous colitis

Serologic testing

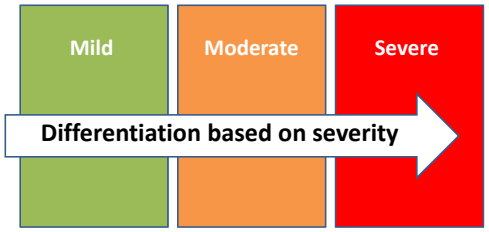
Differentiating UC and Crohn's from each other, as well as from non-IBD.

Catalog Number	Test Name	Assay	Reference Value
1800	IBD sgi Diagnostic	ASCA IgA ELISA	<8.5 EU/mL
		ASCA IgG ELISA	<17.8 EU/mL
		Anti-OmpC IgA ELISA	<10.9 EU/mL
		Anti-CBir1 IgG ELISA	<78.4 EU/mL
		Anti-A4-Fla2 IgG ELISA	<44.8 EU/mL
		Anti-FlaX IgG ELISA	<33.4 EU/mL
		IBD-specific pANCA AutoAntibody ELISA	<19.8 EU/mL
		IBD Specific pANCA IFA Perinuclear Pattern	Not Detected
		IBD Specific pANCA IFA DNAse Sensitivity	Not Detected
		ATG16L1 SNP (rs2241880)	No Mutation Detected
		ECM1 SNP (rs3737240)	No Mutation Detected
		NKX2-3 SNP (rs10883365)	No Mutation Detected
		STAT3 SNP (rs744166)	Mutation Detected
		ICAM-1	<0.54 µg/mL
		VCAM-1	<0.68 µg/mL
		VEGF	<345 pg/mL
		CRP	<13.2 mg/L
		SAA	<10.9 mg/L

IBD Severity Assessment Checklist

- No. of daily BM's.
- Anorectal symptoms
- Mucosal lesions
- Anemia.
- Weight loss.
- Bleeding
- Pain control required.
- Medication response.
- Hospitalizations.
- Surgery and signs of complicated disease.
- Anatomical extent of disease.

IBD Severity



Traditional Approach

Pharmaceuticals target inflammation at different levels:

- 5ASAs
- Corticosteroids.
- Immunomodulators.
- TNF alpha blockers.

5-aminosalicylic acid – (5ASA)

Sulfasalazine | Mesalamine

- 5ASAs reduce inflammation of intestine lining.
- More effective in UC
- Known to induce and maintain remission in mild to moderate UC.

Mesalamines

| Asacol | Pentasa | Lialda | Apriso | Delzicol |

These drugs differ in terms of their coating, which determine where in gut drug delivery occurs and how many times a day meds needs to be taken.

Corticosteroids

Prednisone | Prednisolone | Hydrocortisone | Budesonide

Used for moderate to severe flare ups of IBD.

Mechanism of Action

- Suppresses interleukin transcription
- Suppresses arachidonic acid metabolism
- Stimulates apoptosis of lymphocytes within the lamina propria of the gut.

Budesonide | UCERIS

A steroid which targets the small intestine and colon. Considered to be mainly "locally acting" because the majority of the drug is metabolized through the first pass – liver.

Immunomodulators

Azathioprine (Imuran, Azasan)
Antagonizes purine metabolism and may inhibit synthesis of DNA, RNA, and proteins.

6-mercaptopurine (6-MP, Purinethol)
Inhibits purine nucleotide synthesis and metabolism.

TNF blockers

Anti-TNF agents:
- **Infliximab** (Remicade)
- **Adalimumab** (Humira)
- **Certolizumab pegol** (Cimzia)
- **Golimumab** (Simponi, Simponi Aria)

Mechanism of Action - Unclear
TNF-α inhibitors promote rapid reduction in the number of cells at the inflammation site.

Anti-Integrin Biologics: (IBD)

- **Natalizumab** (Tysabri)
- **Vedolizumab** (Entyvio)

Cytokine IL 12 and IL 23: (CD)

- **Ustekinumab** (Stelara)

Vedolizumab - Entyvio

Mechanism:
- Blocks migration of leukocytes into gut via blockade of alpha-4-beta-7 integrin.

Key points:
- **Gut selective.**
- **Can be considered first line agent.**
- **Recommended for older patients, immunosuppressed, those with Hx of malignancy.**

Ustekinumab - Stelara

Mechanism:
- Blocks inflammation produced through IL 12 and IL 23.

Key points:
- **Can be considered a first line agent, particularly for older patients, the immunosuppressed, those with Hx of malignancy.**
- **Used in those who failed or intolerant to immunomodulators, corticosteroids or TNF blockers.**

Tofacitinib - Xeljanz

Mechanism:

– Selective Janus Kinase (JAK) inhibitor.

Key points:

– The first oral medication approved for treatment of moderate to severe UC.

What is considered healing?

1. Control of symptoms
   – Diarrhea, bleeding etc.
2. Overall improvement in QOL.
3. Mucosal healing.
4. Prevention of recurrence.
5. Prevention of cancer.

Treat-to-Target approach

Many experts are advocating paradigm shifts that emphasize mucosal healing, rather than clinical remission as the primary objective.

Functional Medicine Approach

Target patients that are in mild to possibly moderate activity.

- Lifestyle
- Diet
- Food Sensitivities
- Stress
- Environmental Toxicity (Mold, Heavy metals)
- Gut Dysbiosis (SIBO, SIFO)
- Altered microbiome
- Increased Intestinal permeability.
- Targeting the inflammation.

Considerations in IBD management

– Stress
– Use of ABX
– Dietary factors
– The anatomical description.
– OCP
– Smoking.
– Alcohol.

IBD Etiology

It is postulated that IBD arises due to a dysregulated immune response to a dysbiotic gut microbiome on a background of genetic predisposition.

IBD and Diversity

The gut microbiome plays an important role in the development of IBD.

Research suggests that patients with IBD exhibit a decrease in diversity of the gut microbiota and have an average of 25% fewer microbial genes than healthy persons.

David LA, Maurice CF, Carmody RN, et al. Diet rapidly and reproducibly alters the human gut microbiome. *Nature*. 2014;505(7484):559-563.

Smoking & Gut Integrity

Smoking modulates immune responses and diversity and composition of the gut microbiome through which it may exert its influence on disease risk.

Chronic smoke exposure *can* alter composition and integrity of epithelial mucous membrane, causing intestinal inflammation.

Allais L, Kerckhof FM, Verschuere S, et al. Chronic cigarette smoke exposure induces microbial and inflammatory shifts and mucin changes in the murine gut. *Environ Microbiol*. 2016;18(5):1352-1363.

Smoking & UC

- **Current smoking** appears to be **protective**.
- Smokers have a **milder disease course**, a **better prognosis** compared to nonsmokers, and have a **lower risk of colectomy**.
- Smoking cessation is frequently associated with relapse.

Cosnes J. Tobacco and IBD: relevance in the understanding of disease mechanisms and clinical practice. *Best Pract Res Clin Gastroenterol*. 2004;18(3):481-496.
Lakatos PL, Szamosi T, Lakatos L. Smoking in inflammatory bowel diseases: good, bad or ugly? *World J Gastroenterol*. 2007;13(46):6134-6139.

Smoking and CD

- Current and former smokers have **elevated risk** for CD.
- Current smokers have a **worse prognosis** with an increased need for corticosteroids, immunosuppresants, and IBD-related surgeries.

Higuchi LM, Khalili H, Chan AT, Richter JM, Bousvaros A, Fuchs CS. A prospective study of cigarette smoking and the risk of inflammatory bowel disease in women. *Am J Gastroenterol*. 2012;107(9):1399-1406.
17. Lakatos PL, Szamosi T, Lakatos L. Smoking in inflammatory bowel diseases: good, bad or ugly? *World J Gastroenterol*. 2007;13(46):6134-6139.

Appendix & Intestinal Microbiome

The vermiform appendix directly interacts with the intestinal microbiome, which regulates the intestinal biofilm.

Kooij IA, Sahami S, Meijer SL, Buskens CJ, Te Velde AA. The immunology of the vermiform appendix: a review of the literature. *Clin Exp Immunol*. 2016;186(1):1-9.

Appendicectomy

- **Appendectomy protects against UC.**
- **The increased CD4/CD8 ratio and infiltration of CD4+ and CD69+ T cells in the appendix of patients with UC may act as a priming site in the pathogenesis of UC.**

Myrelid P, Landerholm K, Nordenvall C, Pinkney TD, Andersson RE. Appendectomy and the risk of colectomy in ulcerative colitis: a national cohort study. *AmJ Gastroenterol*. 2017;112(8):1311-1319.

Diet

Plays a predominant role in the pathophysiology of IBD exerting its effects by:

- **Modulating the intestinal microbiome**
- **Predisposing patients to proinflammatory substrate production.**
- **Disruption of mucus layer**
- **Increasing intestinal permeability.**

Fiber

- **Higher intake of dietary fiber has been associated with decreased risk of CD.**
- **Fiber obtained from vegetables or fruits had the greatest reduction in risk compared to fiber from cereals and whole grains.**

Ananthakrishnan AN, Khalili H, Konijeti GG, et al. A prospective study of long-term intake of dietary fiber and risk of Crohn's disease and ulcerative colitis. *Gastroenterology*. 2013;145(5):970-977.

Fish Oil & UC

- **Higher intake of dietary n-3 PUFAs (fish oil), EPA/DHA was associated with lower incidence of UC in middle aged adults.**
- **Diets rich in n-6 PUFAs (which is metabolized to arachidonic acid) was associated with an increased risk of UC due to proinflammatory properties.**

John S, Luben R, Shrestha SS, Welch A, Khaw KT, Hart AR. Dietary n-3 polyunsaturated fatty acids and the aetiology of ulcerative colitis: a UK prospective cohort study. *Eur J Gastroenterol Hepatol*. 2010;22(5):602-606.
de Silva PS, Olsen A, Christensen J, et al. An association between dietary arachidonic acid, measured in adipose tissue, and ulcerative colitis. *Gastroenterology*. 2010;139(6):1912-1917.

Fish Oil & CD

- **A higher ratio of omega 3/6 fatty acids has been found to be associated with a lower risk of CD.**

Amre DK, D'Souza S, Morgan K, et al. Imbalances in dietary consumption of fatty acids, vegetables, and fruits are associated with risk for Crohn's disease in children. *Am J Gastroenterol*. 2007;102(9):2016-2025

Animal Protein

- **High intake of animal protein (meat or fish) has been associated with an increased incidence of IBD.**
- **Additional risks: non-grassfed, non-organic, charred and BBQ foods.**

46. Jantchou P, Morois S, Clavel-Chapelon F, Boutron-Ruault MC, Carbonnel F. Animal protein intake and risk of inflammatory bowel disease: the E3N rospective study. *Am J Gastroenterol*. 2010;105(10):2195-2201.

Westernization of Diet

Saturated fats | Processed meats | Refined sugars

Associated with promoting dysbiosis, which may increase the proinflammatory state of the colon.

David LA, Maurice CF, Carmody RN, et al. Diet rapidly and reproducibly alters the human gut microbiome. *Nature*. 2014;505(7484):559-563.

Childhood dietary influence

Increased incidence of CD among subjects who have a lower intake of fruits, vegetables, and fish during adolescence

Ananthakrishnan AN, Khalili H, Song M, et al. High school diet and risk of Crohn's disease and ulcerative colitis. *Inflamm Bowel Dis*. 2015;21(10):2311-2319.

Zinc Deficiency

Dietary Zinc intake is associated with reduced risk of CD.

Patients with IBD who are zinc deficient have worse IBD-related outcomes, which eventually improve with replacement.

Siva S, Rubin DT, Gulotta G, Wroblewski K, Pekow J. Zinc deficiency is associated with poor clinical outcomes in patients with inflammatory bowel disease. *Inflamm Bowel Dis*. 2017;23(1):152-157.
Sturniolo GC, Di Leo V, Ferronato A, D'Odorico A, D'Incà R. Zinc supplementation tightens "leaky gut" in Crohn's disease. *Inflamm Bowel Dis*. 2001;7(2):94-98.

Sulfur & Sulfate

| preserved meats | alcoholic beverages | milk|
| food additives – carrageenan |

Sulfur containing foods are associated with relapse in UC and are commonly found with the westernization of diet.

Florin T, Neale G, Gibson GR, Christl SU, Cummings JH. Metabolism of dietary sulphate: absorption and excretion in humans. *Gut*. 1991;32(7):766-773.

Curcumin

| Anti-inflammatory | Antioxidant |

Effective in inhibition of TNF pathway, as well as CD4 T-cell proliferation.

Chen D, Nie M, Fan M-W, Bian Z. Anti-inflammatory activity of curcumin in macrophages stimulated by lipopolysaccharides from Porphyromonas gingivalis. *Pharmacology*. 2008;82(4):264-269.

Vitamin D Deficiency

Implicated as playing a role in the pathogenesis as well as the natural history of IBD.

Occurs more frequently in IBD patients than in the general population.

Nielsen OH, Rejnmark L, Moss AC. Role of vitamin D in the natural history of inflammatory bowel disease. *J Crohns Colitis*. 2018;12(6):742-752.

Vitamin D Deficiency

IBD patients who have vitamin D deficiency have a higher risk of flares and treatment refractoriness and a lower health-related quality of life.

Ulitsky A, Ananthakrishnan AN, Naik A, et al. Vitamin D deficiency in patients with inflammatory bowel disease: association with disease activity and quality of life. *JPEN J Parenter Enteral Nutr*. 2011;35(3):308-316.

What's Best?

SCD | Low Fodmap | Gluten Free | Paleo | Ketogenic

SCD

- Elaine Gottschall - Breaking the Vicious Cycle

A diet intended mainly for Crohn's disease, ulcerative colitis, celiac disease, diverticulitis, cystic fibrosis and chronic diarrhea.

- **Monosaccharides – OK.**
- **Disaccharides and polysaccharides – Not OK.**

- Nuts, aged cheeses, fish, beef, unsweetened juices - **OK.**
- Sugars, oats, pasta, potatoes, rice, sugar substitutes, and wheat **– Not OK**

Yeast & IBD

Mouse studies show that S. Cervevisiae aggravates the symptoms of IBD. That they had higher concentrations of Purines.

S. Cervevisiae can not break down purines that accumulate in the GI tract, transitioning to Uric Acid – which Exaccerbates inflammation.

University of Utah Health Sciences – Common yeast may worsen IBD symptoms in CD.

SIBO & IBD

Testing and Treating Small Intestinal Bacterial Overgrowth Reduces Symptoms in Patients with Inflammatory Bowel Disease.

Sulfate reducing Bacteria

Sulfate reducing bacteria produce toxic hydrogen sulfide **H2S** as a result of oxidative metabolism.

Lewis JD, Abreu MT. Diet as a trigger or therapy for inflammatory bowel diseases. *Gastroenterology.* 2017;152(2):398-414.e6.

SIBO & IBD

A single randomized, controlled trial showed enteric release–formulated rifaximin to be superior to placebo in inducing clinical remission

- Prantera C, Lochs H, Campieri M, et al. Antibiotic treatment of Crohn's disease: results of a multicentre, double blind, randomized, placebo-controlled trial with rifaximin. Aliment Pharmacol Ther. 2006;23(8):1117-1125..

ABX and IBD

Exposure to ABX in first year of life associated with an increased risk of IBD, particularly CD

Shaw SY, Blanchard JF, Bernstein CN. Association between the use of antibiotics in the first year of life and pediatric inflammatory bowel disease. Am J Gastroenterol. 2010;105(12):2687-2692. 74. Ungaro R, Bernstein CN, Gearry R, et al.

ABX and IBD

A meta-analysis of 11 observational studies showed a marked increase in the risk of CD in children with exposure to most antibiotic groups.

- Ungaro R, Bernstein CN, Gearry R, et al. Antibiotics associated with increased risk of new-onset Crohn's disease but not ulcerative colitis: a meta-analysis. Am J Gastroenterol. 2014;109(11):1728-1738.

ABX and IBD

adults with incident IBD were more likely to have been prescribed antibiotics 2 to 5 years prior to diagnosis compared to controls.

- Gevers D, Kugathasan S, Denson LA, et al. The treatment-naive microbiome in new-onset Crohn's disease. Cell Host Microbe. 2014;15(3):382-392.

FMT

In 4 separate studies FMT for inducing remission of active UC have shown promising results

(28% FMT group vs 9% placebo group)

- Costello SP, Waters O, Bryant RV, et al. Short duration, low intensity, pooled fecal microbiota transplantation induces remission in patients with mildmoderately active ulcerative colitis: a randomised controlled trial. Gastroenterology. 2017;152(5):S198-S199.
- Moayyedi P, Surette MG, Kim PT, et al. Fecal microbiota transplantation induces remission in patients with active ulcerative colitis in a randomized controlled trial. Gastroenterology. 2015;149(1):102-109.e6.
- Paramsothy S, Kamm MA, Kaakoush NO, et al. Multidonor intensive faecal microbiota transplantation for active ulcerative colitis: a randomised placebocontrolled trial. Lancet. 2017;389(10075):1218-1228.
- Fang H, Fu L, Wang J. Protocol for fecal microbiota transplantation in inflammatory bowel disease: a systematic review and meta-analysis. Biomed Res Int. 2018;2018:8941340.
- Rossen NG, Fuentes S, van der Spek MJ, et al. Findings from a randomized controlled trial of fecal transplantation for patients with ulcerative colitis. Gastroenterology. 2015;149(1):110-118.e4.

Psychosocial Stress

Pathways through which stress may exert a role in the pathogenesis of CD and UC:

- **Vagus nerve inhibition,**
- **Proinflammatory cytokine production,**
- **Modification of the gut microbiome,**
- **Increase in intestinal permeability.**

- Bonaz BL, Bernstein CN. Brain-gut interactions in inflammatory bowel disease. Gastroenterology. 2013;144(1):36-49

Psychosocial Stress

High perceived stress has been associated with IBD flares.

Bernstein CN, Singh S, Graff LA, Walker JR, Miller N, Cheang M. A prospective population-based study of triggers of symptomatic flares in IBD. Am J Gastroenterol. 2010;105(9):1994-2002.

Patients with low stress and good coping mechanisms had fewer relapses than those with avoidant coping and high perceived stress.

- Bitton A, Dobkin PL, Edwardes MD, et al. Predicting relapse in Crohn's disease: a biopsychosocial model. Gut. 2008;57(10):1386-1392

Major Depressive Disorder

Associated with failure of infliximab therapy and decreased time to retreatment.

Persoons P, Vermeire S, Demyttenaere K, et al. The impact of major depressive disorder on the short- and long-term outcome of Crohn's disease treatment with infliximab. Aliment Pharmacol Ther. 2005;22(2):101-110.

Sleep Disturbance

Sleep disturbance at baseline during remission was associated with a 2-fold increase in the risk of active disease in patients with CD at 6 months (OR, 2.00; 95% CI, 1.45-2.76).

Ananthakrishnan AN, Long MD, Martin CF, Sandler RS, Kappelman MD. Sleep disturbance and risk of active disease in patients with Crohn's disease and ulcerative colitis. Clin Gastroenterol Hepatol. 2013;11(8):965-971.

Sleep Disturbance

Having fewer than 6 hours of sleep per day and having more than 9 hours of sleep per day were associated with an increase in the risk of UC.

Ananthakrishnan AN, Khalili H, Konijeti GG, et al. Sleep duration affects risk for ulcerative colitis: a prospective cohort study. Clin Gastroenterol Hepatol. 2014;12(11):1879-1886.

Urban living

A meta-analysis of 25 and 30 observational studies in UC and CD, respectively, demonstrated an association of urban environment or residence with a higher incidence of UC and CD, respectively.

Soon IS, Molodecky NA, Rabi DM, Ghali WA, Barkema HW, Kaplan GG. The relationship between urban environment and the inflammatory bowel diseases: a systematic review and meta-analysis. *BMC Gastroenterol*. 2012;12:51.

Air Pollution

Prior to the implementation of environmental regulations, between 1940 and 1980, the increase in incidence of UC and CD paralleled growing air pollution.

Thia KT, Loftus EV Jr, Sandborn WJ, Yang S-K. An update on the epidemiology of inflammatory bowel disease in Asia. Am J Gastroenterol. 2008;103(12):3167-3182.

Exercise

In a large prospective study of 1857 patients with UC or CD, an increase in the level of exercise was associated with a decrease in the risk of active disease by 32% in patients with CD and 24% in patients with UC at 6 months.

Jones PD, Kappelman MD, Martin CF, Chen W, Sandler RS, Long MD. Exercise decreases risk of future active disease in patients with inflammatory bowel disease in remission. *Inflamm Bowel Dis*. 2015;21(5):1063-1071.

A case of Bartonella and IBD

Bartonella henselae and inflammatory bowel disease

Francesco Massei, Mauro Massimetti, Francesco Messina,

- **Patient had increased thickness of the terminal ileum on ultrasonography - a sensitive and specific finding that suggests IBD.**
- **During treatment Patient subsequently developed fevers, multiple hypoechogenic lesions in the liver and spleen, suggestive of hepatosplenic granulomatosis, a well-known complication of B henselae infection.**

Bartonella henselae and inflammatory bowel disease

Francesco Massei, Mauro Massimetti, Francesco Messina, Pierantonio Macchia, Giuseppe Maggiore

- **IgM antibodies to *B. henselae* were highly positive.**
- **The patient received ciprofloxacin for a week, then azithromycin for 5 days.**
- **Fever subsided 2 days after starting azithromycin.**
- **Thickening of the terminal ileum and hypoechogenic lesions of liver and spleen normalised in 6 weeks.**

Heavy Metal

Both Mercury and Nickel toxicity have been associated as contributors to intestinal permeability and IBD.

Consideration is required for any prosthesis, dental implants and piercings.

192. Rice KM, Walker EM, Wu M, Gillette C, Blough ER. Environmental mercury and its toxic effects. J Prev Med Public Health. 2014;47:74–83. [PMC free article] [PubMed]

Lectins

| Beans | Peanuts | Lentils | Tomatoes | Potatoes | | Eggplant | Fruits | Grains|

- **Naturally occurring carbohydrate-binding protein that sticks to cell membranes in the GI Tract.**
- **They exist in plant and animal food.**
- **Hold no nutritional value when consumed in foods.**
- **Found in the highest amounts in legumes, nightshade vegetables, dairy products, and grains.**

Galectins in IBD

World J Gastroenterol. 2008 Sep 7; 14(33): 5133–5137.
Published online 2008 Sep 7. doi: 10.3748/wjg.14.5133
PMCID: PMC2744002
PMID: 18777589

Roles of galectins in inflammatory bowel disease

Akira Hokama, Emiko Mizoguchi, and Atsushi Mizoguchi

Author information • Article notes • Copyright and License information Disclaimer

Galectin-1 and Galectin -2 contribute to the suppression of intestinal inflammation by the induction of apoptosis of activated T cells,

Galectin-4 is involved in the exacerbation of inflammation by specifically stimulating intestinal CD4+ T cells to produce IL-6.

RESEARCH Open Access

Low dose Naltrexone for induction of remission in inflammatory bowel disease patients

Mitchell R. K. L. Lie†, Janine van der Giessen†, Gwenny M. Fuhler†, Alison de Lima, Maikel P. Peppelenbosch, Cokkie van der Ent and C. Janneke van der Woude*

Naltrexone has a direct effect on intestinal epithelial wound healing and Endoplasmic stress reduction.

healing (scratch assay), cytokine production and endoplasmic reticulum (ER) stress (GRP78 and CHOP western blot analysis, immunohistochemistry) were investigated in HCT116 and CACO2 intestinal epithelial cells, human IBD intestinal organoids and patient samples.

Antiulcer Peptide - BPC157

•Shows no toxicity
•A lethal dose is not achieved.
•Stable in human gastric juice.

In comparison with other standard treatments it is more effective for ulcers and various wounds, and can be used without a carrier needed for other peptides, both locally and systemically.

BPC157 – rat studies

World J Gastroenterol. 2017 Dec 28; 23(48): 8465–8488.
Published online 2017 Dec 28. doi: 10.3748/wjg.v23.i48.8465
PMCID: PMC5752708
PMID: 29358856

Stable gastric pentadecapeptide BPC 157 in the treatment of colitis and ischemia and reperfusion in rats: New insights

Antonija Duzel, Josipa Vlainic, Marko Antunovic, Dominik Malekinusic, Borna Vrdoljak, Mariam Samara

BPC 157 is a fundamental treatment that quickly restores blood supply to the ischemically injured area and rapidly activates collaterals.

BPC 157 has been shown to have a beneficial effect on ileoileal anastomosis healing.

Dietary habits.

- Eating too much, too fast, too late
- Grilled and charred foods
- Non organic, non GMO.
- Gyphosate

What is the Approach

Evaluate severity of IBD

Identify what is moderate to severe.

Work with a gastroenterologist.

Identify risk factors that drive inflammation

Heavy metals	Alcohol
Metal allergy	Lack of sleep
Mycotoxins	Smoking
Stress	Lack of exercise.
Red meat	High carbohydrate intake
Burned meat – charring	Dietary habits.
Food Allergies	Food sensitivities

Correct malnutrition or micronutrient deficiency to aid recovery

Identify and correct SIBO/SIFO

?? Parasites

Intestinal Permeability Issues

Zinc
Glutamine
Omega3
Antioxidants
Amino Acids
Colostrom
BPC157

Interesting
Closing Points

Constipation and Colitis.

- Constipation is not a typical symptom of Crohn's disease.
- Constipation can be a symptom of Crohn's disease complications.
- It also can be a side effect of medications.

Constipation can be a symptom of ulcerative colitis, particularly in people with left-sided disease, where only the left side of the large intestine is inflamed.

Miliary Crohn's Disease

Mycobacterium avium complex.

https://humanpara.org/dr-william-m-chamberlin/

Okotoka pathway – Australia.