



Diet and IBD: Food For Thought

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Associate Professor of Medicine

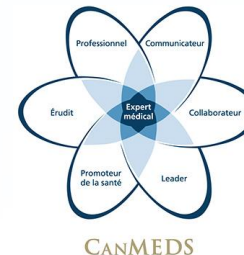
Cumming School of Medicine



Disclosures

- LyfeMD – Cofounder and CMO
- Pfizer
- Celltrion
- Janssen
- Organon
- Abbvie

Compétences CanMEDS



X	<p>Expert médical (En tant qu'experts médicaux, les médecins assument tous les rôles CanMEDS et s'appuient sur leur savoir médical, leurs compétences cliniques et leurs attitudes professionnelles pour dispenser des soins de grande qualité et sécuritaires centrés sur les besoins du patient. Pivot du référentiel CanMEDS, le rôle d'expert médical définit le champ de pratique clinique des médecins .)</p>
	<p>Communicateur (En tant que communicateurs, les médecins développent des relations professionnelles avec le patient et ses proches ce qui permet l'échange d'informations essentielles à la prestation de soins de qualité.)</p>
	<p>Collaborateur (En tant que collaborateurs, les médecins travaillent efficacement avec d'autres professionnels de la santé pour prodiguer des soins sécuritaires et de grande qualité centrés sur les besoins du patient.)</p>
	<p>Leader (En tant que leaders, les médecins veillent à assurer l'excellence des soins, à titre de cliniciens, d'administrateurs, d'érudits ou d'enseignants et contribuent ainsi, avec d'autres intervenants, à l'évolution d'un système de santé de grande qualité.)</p>
X	<p>Promoteur de santé (En tant que promoteurs de la santé, les médecins mettent à profit leur expertise et leur influence en oeuvrant avec des collectivités ou des populations de patients en vue d'améliorer la santé. Ils collaborent avec ceux qu'ils servent afin d'établir et de comprendre leurs besoins, d'être si nécessaire leur porte-parole, et de soutenir l'allocation des ressources permettant de procéder à un changement.)</p>
X	<p>Érudit (En tant qu'érudits, les médecins font preuve d'un engagement constant envers l'excellence dans la pratique médicale par un processus de formation continue, en enseignant à des tiers, en évaluant les données probantes et en contribuant à l'avancement de la science.)</p>
X	<p>Professionnel (En tant que professionnels, les médecins ont le devoir de promouvoir et de protéger la santé et le bien-être d'autrui, tant sur le plan individuel que collectif. Ils doivent exercer leur profession selon les normes médicales actuelles, en respectant les codes de conduite quant aux comportements qui sont exigés d'eux, tout en étant responsables envers la profession et la société. De plus, les médecins contribuent à l'autoréglementation de la profession et voient au maintien de leur santé.)</p>

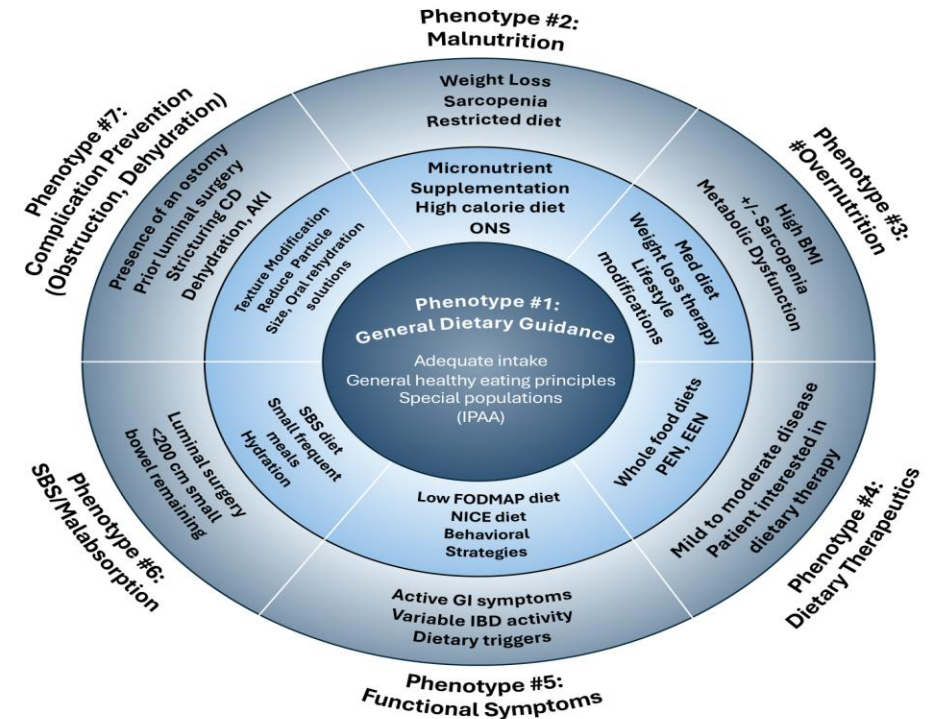
Learning Objectives

- 1 Discuss the nutrition phenotypes to personalize dietary approaches for the IBD patient
- 2 Discuss advances in dietary interventions in 2025
- 3 Explore implications and applications of dietary approaches for clinical practice
- 3 Discuss future novel directions for dietary sciences as applied to IBD

Nutrition Phenotypes in IBD

Ask yourself: What am I hoping diet will accomplish in this patient?

- Improve malnutrition/sarcopenia
- Induction of remission
- Maintenance of remission
- Disease prevention
- Prehabilitation/improved surgical outcomes
- High output Ileostomy / SBS / Pouchitis
- Improve overweight/obesity induced immune and metabolic dysregulation





Malnutrition and Sarcopenia

Prevalence of Malnutrition in Hospitalized and Outpatient IBD

45% moderate or severe malnutrition
1.2% on discharge summary

In IBD inpatients, **75–90%** of patients are malnourished when admitted to hospital

In IBD outpatients, **20–30%** of patients are malnourished

> 40% for **myopenia** among 4060 IBD patients



Medications

- Steroids: ↓ calcium, phosphate and zinc absorption
- Sulfasalazine: folate deficiency
- Cholestyramine: ↓ BA, FSV absorption

Primary Sclerosing Cholangitis

- ↓ bile flow: fat and FSV malabsorption

Relative pancreatic insufficiency

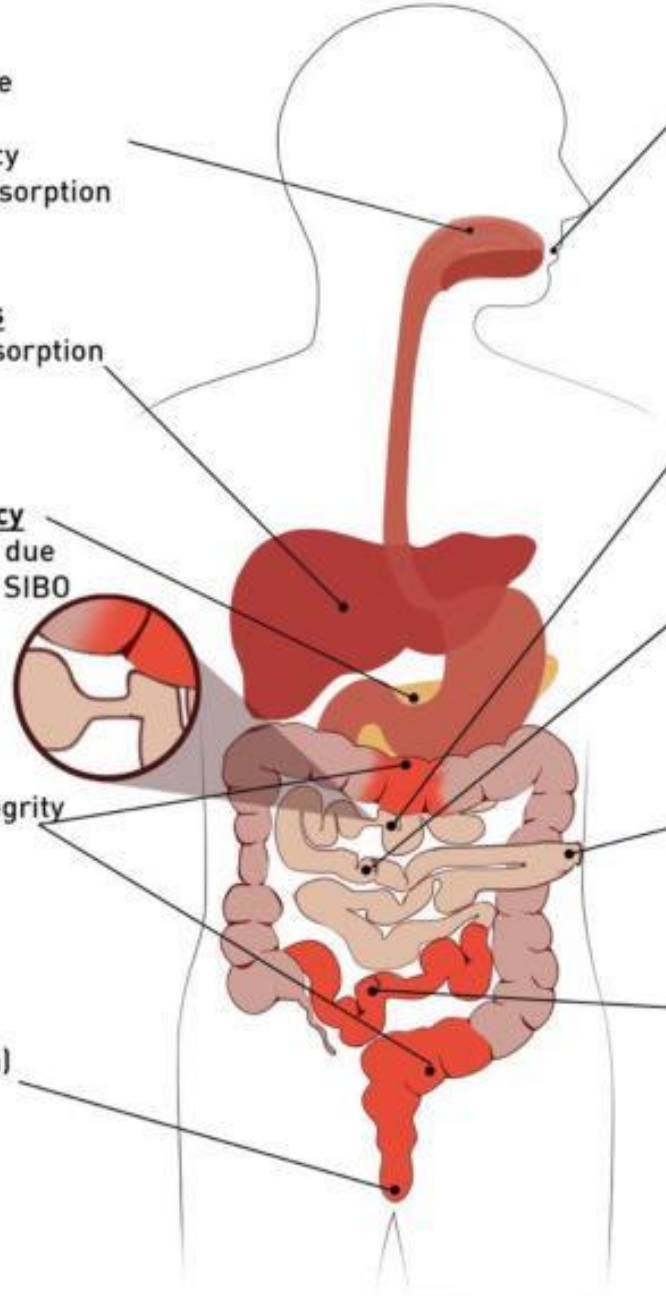
- ↓ mixing of digestive enzymes due to ↑ transit (post-surgical) and SIBO

Active inflammation

- ↓ absorptive area
- ↓ epithelial transport and integrity
- Protein losing enteropathy
- ↑ nutrient requirements
- ↑ GI blood (iron) loss

Diarrhea

- ↑ fluid, electrolyte (potassium) and trace elements (zinc) loss
- Dehydration



Reduced oral intake

- Restrictive or exclusion diets
- Anorexia, abdominal pain, nausea, vomiting
- Hospital procedures, endoscopy prep and prolonged NPO

SIBO

- Symptoms: bloating, diarrhea
- ↓ B12, BA deconjugation

Surgery

- ↓ surface area for absorption
- Dysmotility: ↑ or ↓ transit

Enterocutaneous fistula

- Loss of fluid, macro and micronutrients

Ileal surgery

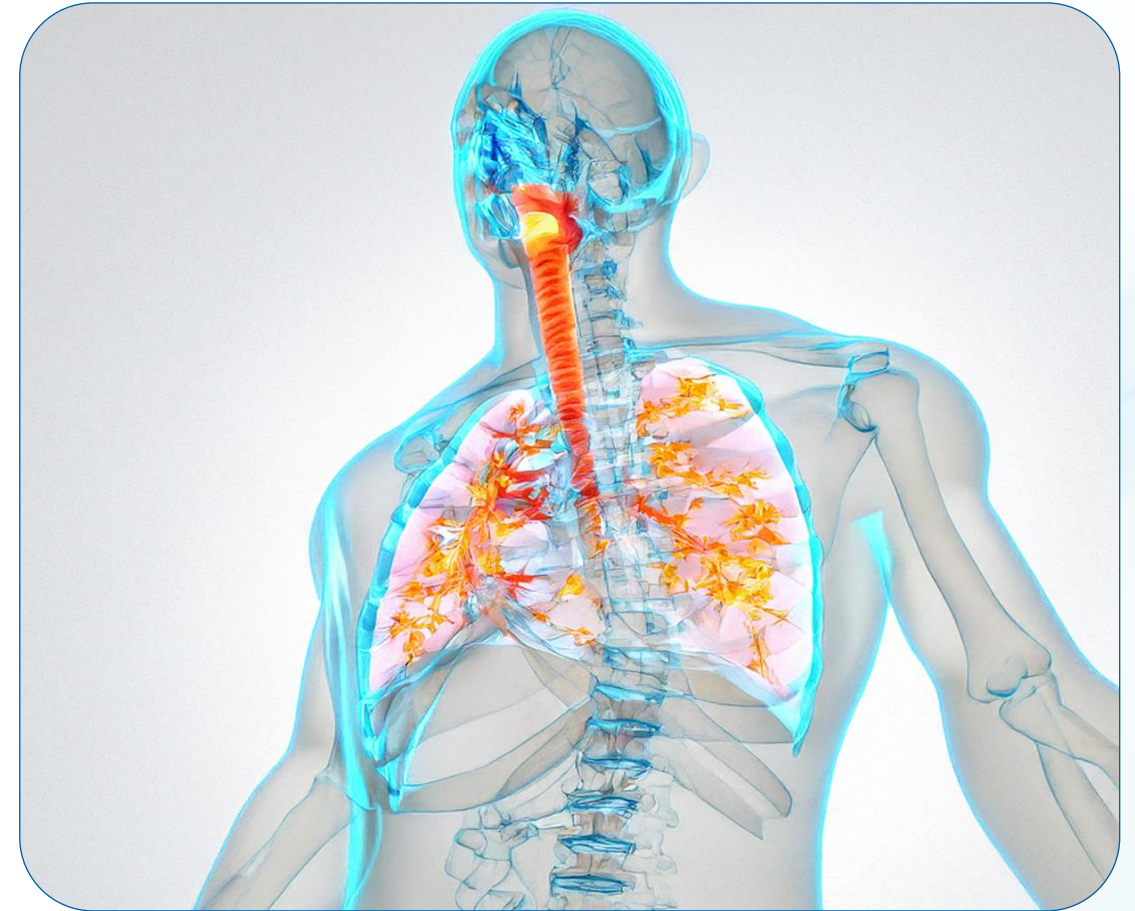
- > 50-60 cm ileum resected/diseased: partial BA malabsorption and B12 deficiency
- > 100 cm ileum resected: BA deficiency and fat malabsorption

Abbreviation Legend

- B12 - Vitamin B12
- BA - Bile acids
- GI - Gastrointestinal
- FSV - Fat soluble vitamins A, D, E, K
- NPO - Nil per os
- SIBO - Small Intestinal Bacterial Overgrowth

Complications of Malnutrition in IBD

- Increased infections (pulmonary, wound infection, abscess, UTI)
- Increased length of stay and readmission rates to hospital
- Wound breakdown, delayed wound healing
- Leakage or bleeding at the surgical site
- Cardiac and respiratory insufficiency
- Compromised bone health
- Decreased effectiveness of anti-TNF agents
- Decreased function and quality of life



General aspects

R3A: Patients with IBD are at risk of malnutrition and therefore should be screened for malnutrition at the time of diagnosis and thereafter on a regular basis.

R3B: Documented malnutrition in patients with IBD should be treated appropriately, because it worsens the prognosis, complication rates, mortality and quality of life.

R4: In general, the energy requirements of patients with IBD are similar to those of the healthy population; provision should be in line with this.

R5: Protein requirements are increased in active IBD, and intake should be increased (to 1.2-1.5 g/kg/d in adults). The protein requirements in remission are generally not elevated and provision should be similar (about 1g/kg/d in adults) to that recommended for the general population.

R6: Patients with IBD should be checked for micronutrient deficiencies on a regular basis and specific deficits should be appropriately corrected.

Best Practice Advice 5: Exclusive enteral nutrition may be an effective therapy in malnourished patients before undergoing elective surgery for Crohn's disease to optimize nutritional status and reduce postoperative complications



DIET and IBD PREVENTION

The Rise of IBD in Canada

2023
1 every
48 minutes



2035
1 every
38 minutes

2023 Impact of Inflammatory Bowel Disease in Canada
– Crohn's and Colitis Canada

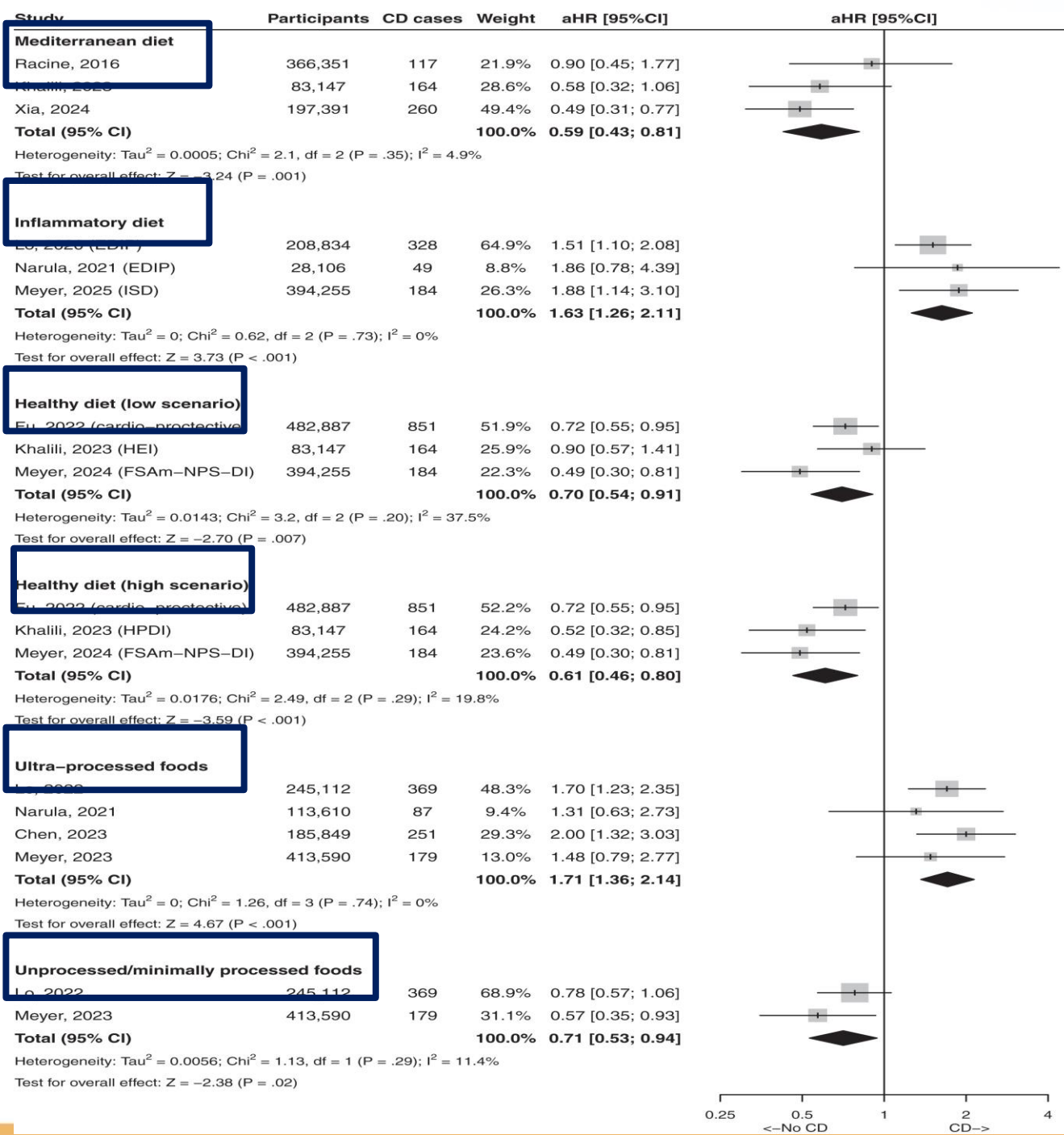
Pathogenesis of IBD



IBD: inflammatory bowel disease.

Impact of Diet on IBD Development Systematic Review and Meta-analysis

– Meyer et al. Eclin Med 2025

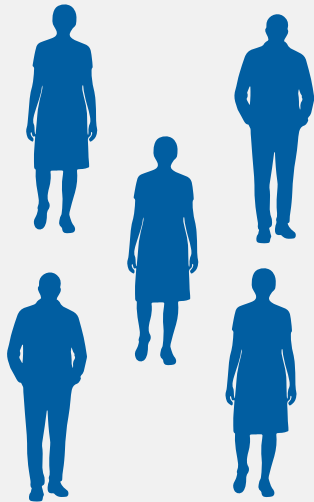


GEM Study

2289 Healthy FDR's of Patients With CD

Cross-Sectional Analysis

Healthy First-Degree Relatives N=2,289



Dietary Pattern

Mediterranean-like Dietary Pattern



vs. Non-Mediterranean-like Dietary Pattern

Effect of Dietary Pattern

Altered Microbiome Composition

↓ *Ruminococcus*

↓ *Dorea*

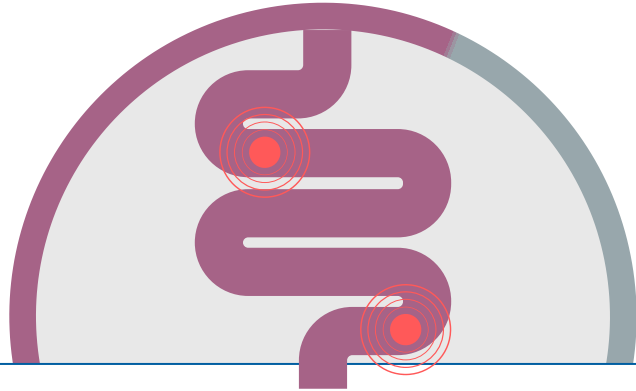
↑ *Faecalibacterium*



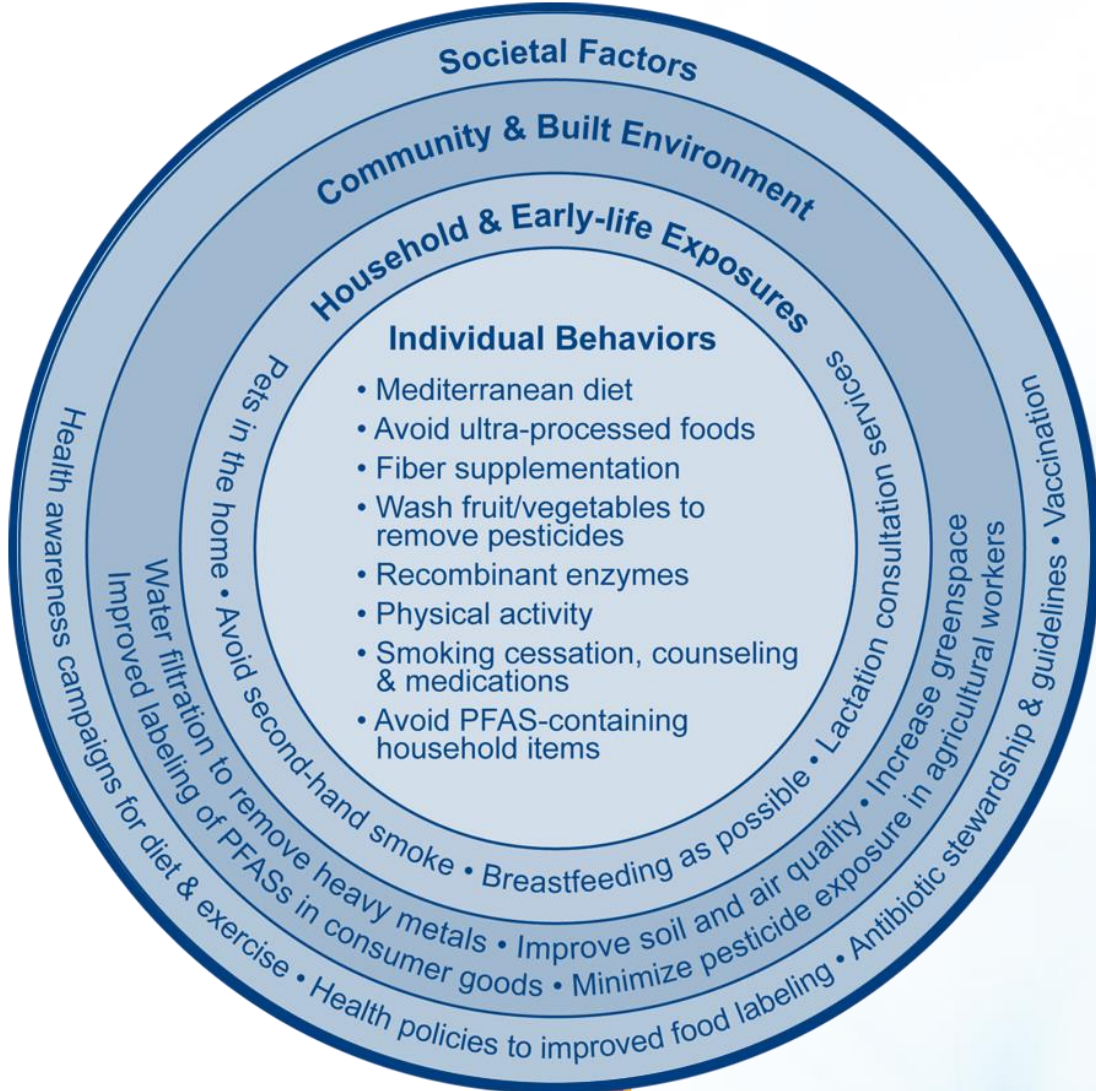
Subclinical Gut Inflammation

↓ Fecal Calprotectin





Potential environmental and lifestyle inflammatory bowel disease prevention measures. Candidate interventions.



^aInflamm Bowel Dis, izaf168, <https://doi.org/10.1093/ibd/izaf168>
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DIET as IBD TREATMENT

Induction & Remission

The IBD Diet Revolution has Arrived!

doi:10.1002/jgh3.13097

REVIEW ARTICLE

Revolution in diet therapy for inflammatory bowel disease

Sarah L. Melton,^{*,†} Alice S. Day,^{‡,§,¶} Robert V. Bryant^{‡,§,¶} and Emma P. Halmos^{*}

^{*}Department of Gastroenterology, Monash University & Alfred Health, [†]Nutrition Department, Alfred Health, Melbourne, Victoria, [‡]Inflammatory Bowel Disease Services, Department of Gastroenterology and Hepatology, The Queen Elizabeth Hospital, [§]Faculty of Health Sciences, School of Medicine, University of Adelaide and [¶]Basil Hetzel Research Institute, Woodville South, Adelaide, South Australia, Australia

Gastroenterology 2024;166:521–532

CLINICAL PRACTICE UPDATES

AGA Clinical Practice Update on Diet and Nutritional Therapies in Patients With Inflammatory Bowel Disease: Expert Review

Jana G. Hashash,¹ Jaclyn Elkins,² James D. Lewis,³ and David G. Binion⁴

JOURNAL ARTICLE ACCEPTED MANUSCRIPT

ECCO Consensus on Dietary Management of Inflammatory Bowel Disease

Vaios Svolos, Hannah Gordon, Miranda C E Lomer, Marina Aloï, Aaron Bancel, Alice S Day, Andrew S Day, Jessica A Fitzpatrick, Konstantinos Gerasimidis, Konstantinos Gkikas ... Show more

Author Notes

Journal of Crohn's and Colitis, jjaf122, <https://doi.org/10.1093/ecco-jcc/jjaf122>

Published: 12 July 2025 Article history ▼

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journal homepage: <http://www.elsevier.com/locate/clnu>



ESPEN Guideline

ESPEN guideline on Clinical Nutrition in inflammatory bowel disease

Stephan C. Bischoff^{a,*}, Palle Bager^b, Johanna Escher^c, Alastair Forbes^d, Xavier Hébuterne^e, Christian Lodberg Hvas^b, Francisca Joly^f, Stansilaw Klek^g, Zeljko Krznaric^h, Johann Ockengaⁱ, Stéphane Schneider^j, Raanan Shamir^k, Kalina Stardelova^l, Dariia Vranesic Bender^m, Nicolette Wierdsmaⁿ, Arved Weimann^o

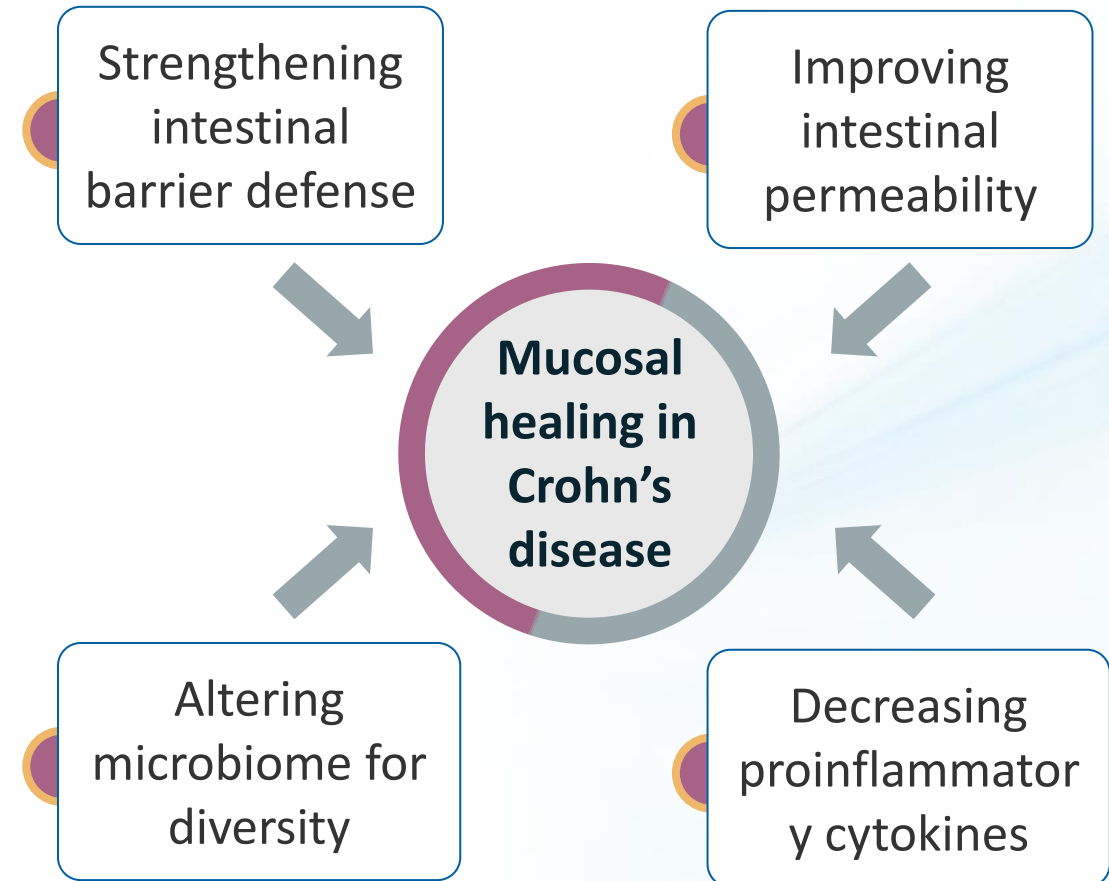
Why a Diet Revolution in IBD?

- Current immune-based therapies for IBD still have 30-40% primary nonresponse rate with 40% secondary loss of response despite new advanced therapeutic options
- Diet leverages different mechanisms of action vs. immune-based therapies
- Increased patient awareness and demand
- THE DATA SUPPORT IT



EEN – What is the Mechanism of Action?

- **Immune response:** ↓ pro-inflammatory cytokines (IL-1, IL-6, IL-8), restores intestinal barrier integrity, and modulates TNF-‘alpha’ pathways in epithelial cells
- **Microbiota modulation:** Shifts gut microbiome reducing pro-inflammatory taxa (*Escherichia coli*), increasing beneficial species (*Faecalibacterium*, *Roseburia*)
- Paradoxical findings when examining the effects of EEN which contains emulsifiers, maltodextrin, etc.
- Still not completely understood.

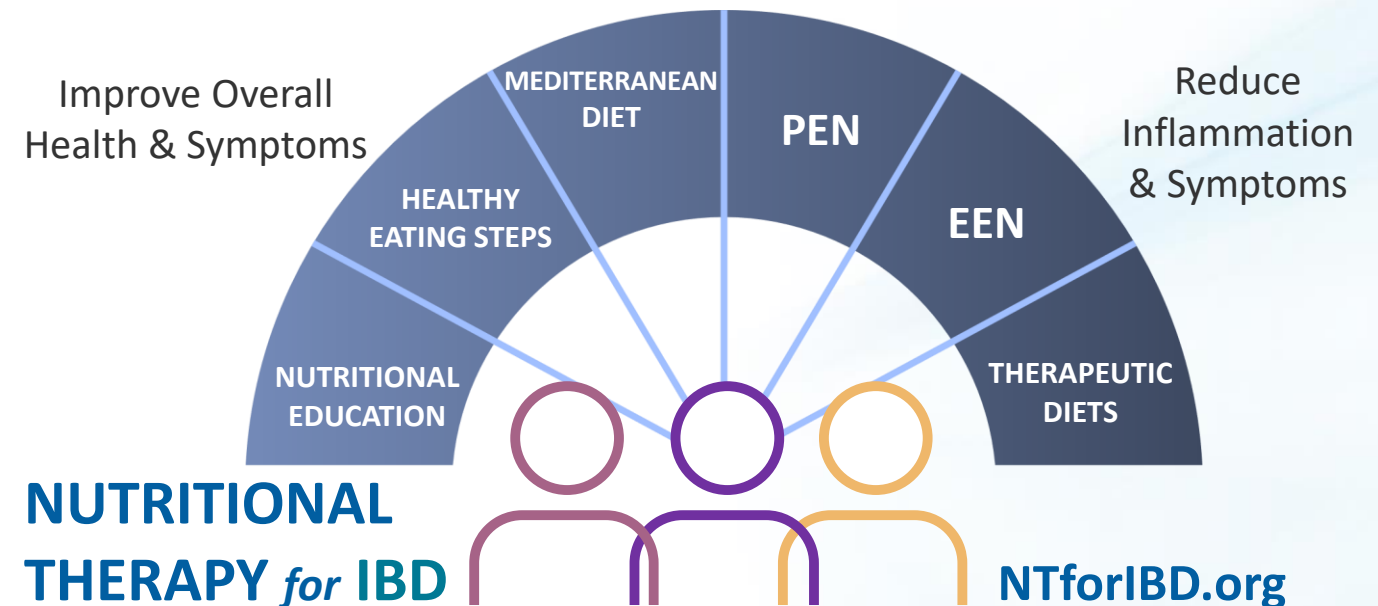


Therapeutic Diets

- CDED + PEN Induction
- CDED + PEN Maintenance
- Tasty and Healthy
- Mediterranean Diet
- Specific Carbohydrate Diet
- Modified Specific Carbohydrate Diet
- Intermittent Fasting
- IBD AID (Auto Immune Diet)
- Autoimmune Protocol Diet
- Low-Sulfur Diet
- IBD Food Pyramid

Evidence-Based Nutritional Therapy

An Option For Every Patient



Nutrition Considerations: Active Disease

Data on the use of CDED + PEN

- 15 studies (4 RCTs, 5 adults)
- Tolerance: CDED + PEN > EEN
- Induction clinical remission, CRP normalization ~70%
- Induction and maintenance of clinical remission >1 year (80% sustained remission)
- CDED + PEN: significant weight gain
- Reduction in UPF consumption
- Higher MED diet scores
- Better response in bionative vs. those who had loss of response to a biologic
- Limited endoscopic data

Inflammatory Bowel Diseases, 2023, XX, 1–15
<https://doi.org/10.1093/ibd/izad255>
Advance access publication 18 November 2023
Review Article - Clinical

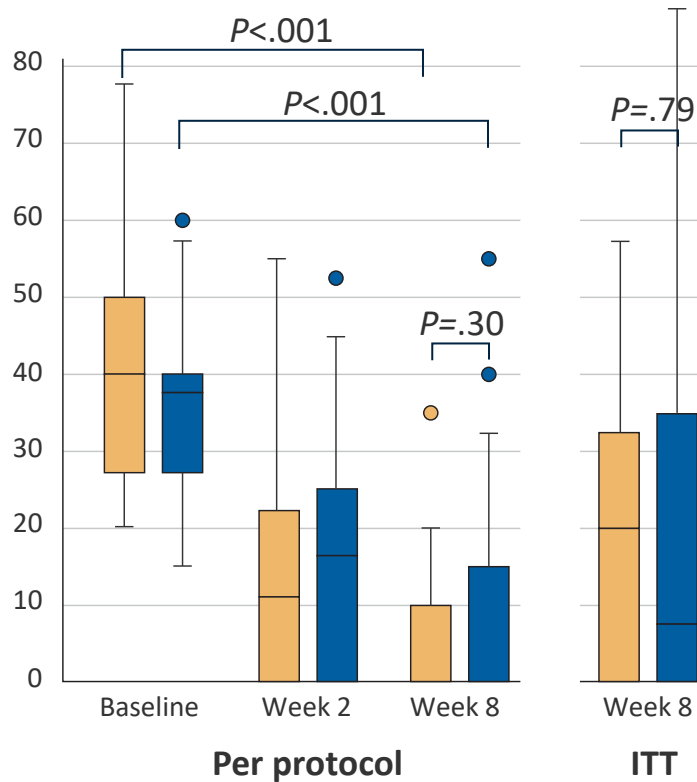


The Crohn's Disease Exclusion Diet: A Comprehensive Review of Evidence, Implementation Strategies, Practical Guidance, and Future Directions

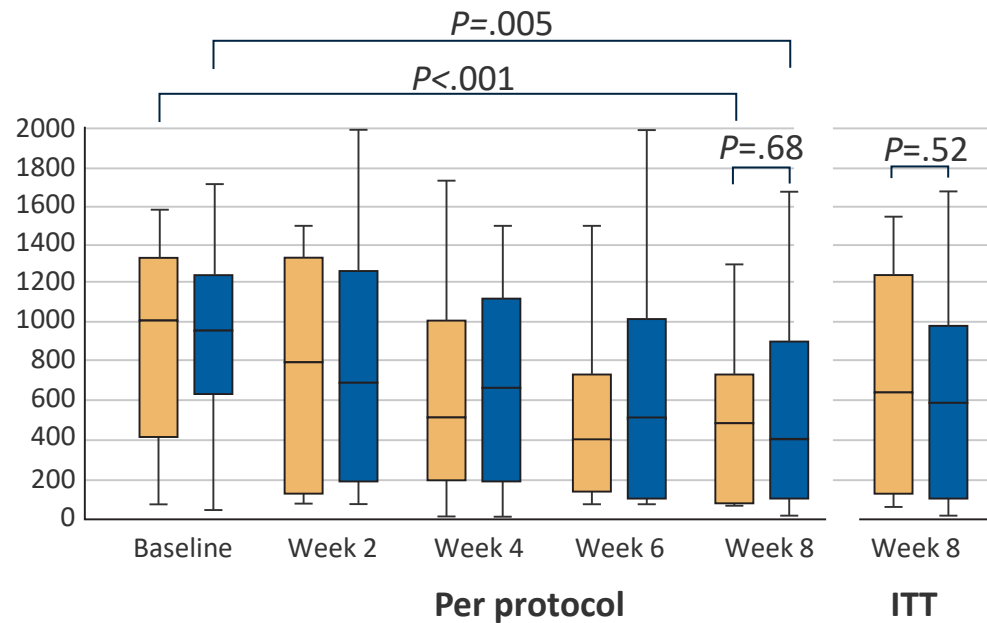
Rotem Sigall Boneh, RD, MSc, ^{*,†,Ⓛ} Catherine Westoby, RD, MRes, [‡] Ilan Oseran, MA, [§]
Chen Sarbagili-Shabat, RD, MSc, ^{*,§} Lindsey G. Albenberg, DO, ^{||} Paolo Lionetti, MD, ^{**,Ⓛ}
Victor Manuel Navas-López, MD, PhD, ^{††} Javier Martín-de-Carpi, MD, ^{††} Henit Yanai, MD, ^{§§,Ⓛ}
Nitsan Maharshak, MD, ^{¶¶} Johan Van Limbergen, MD, PhD, ^{|||,***} and Eytan Wine, MD, PhD ^{†††,Ⓛ}

Tasty & Healthy Whole Foods Diet vs. EEN: A Randomized Controlled Trial n=83

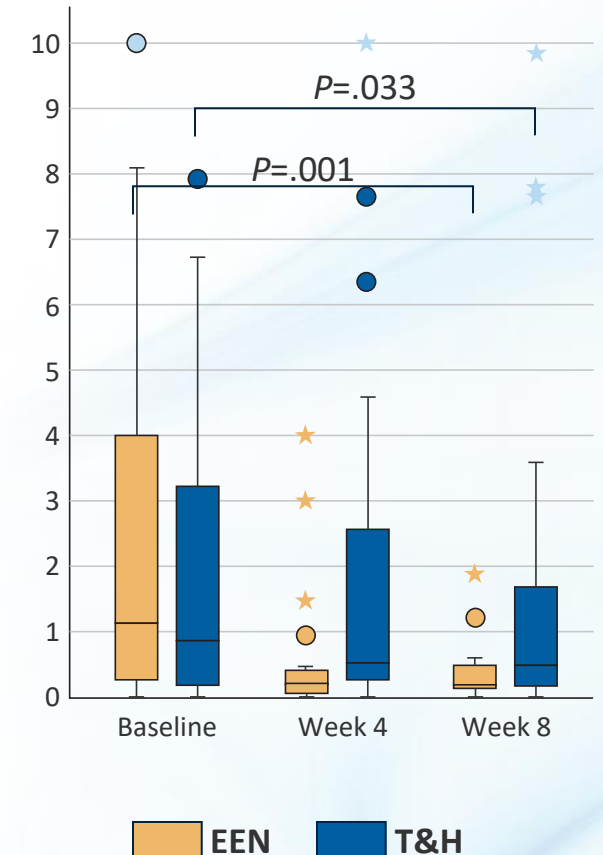
wPCDAI



Fecal calprotectin ($\mu\text{g/g}$)



CRP (mg/dL)



CRP: c-reactive protein; EEN: exclusive enteral nutrition; ITT: intention-to-treat; T&H: therapy & health; wPCDAI: weighted pediatric crohn's disease activity index. Frutkoff et al; Gastro. July 2025.

Anti-inflammatory diet – IBD MAID (Marsh et al. 2024)[†]

Design:

RCT of adult patients with UC or CD with an increase in symptoms and FCP > 50.

Intervention:

- IBD-MAID diet (meals provided) or general healthy eating guidelines
- modified anti-inflammatory dietary pattern purposely designed to reduce intake of food additives (IBD-MAID)

Key Results:

- IBD-MAID was both well-tolerated and well-adhered to.
- statistically significant improvements in symptoms, QOL FCP and Crohn's disease activity
- Not significant in UC



[†]Marsh A, et al. Eur J Clin Nutr. 2024 Dec;78(12):1072-1081s

IBD Food Pyramid

AGA Clinical Practice Update 2024

Best Practice Advice 1:

Unless there is a contraindication, all patients with IBD should be advised to follow a Mediterranean diet rich in a variety of fresh fruits and vegetables, monounsaturated fats, complex carbohydrates, and lean proteins and low in ultra-processed foods, added sugar, and salt for their overall health and

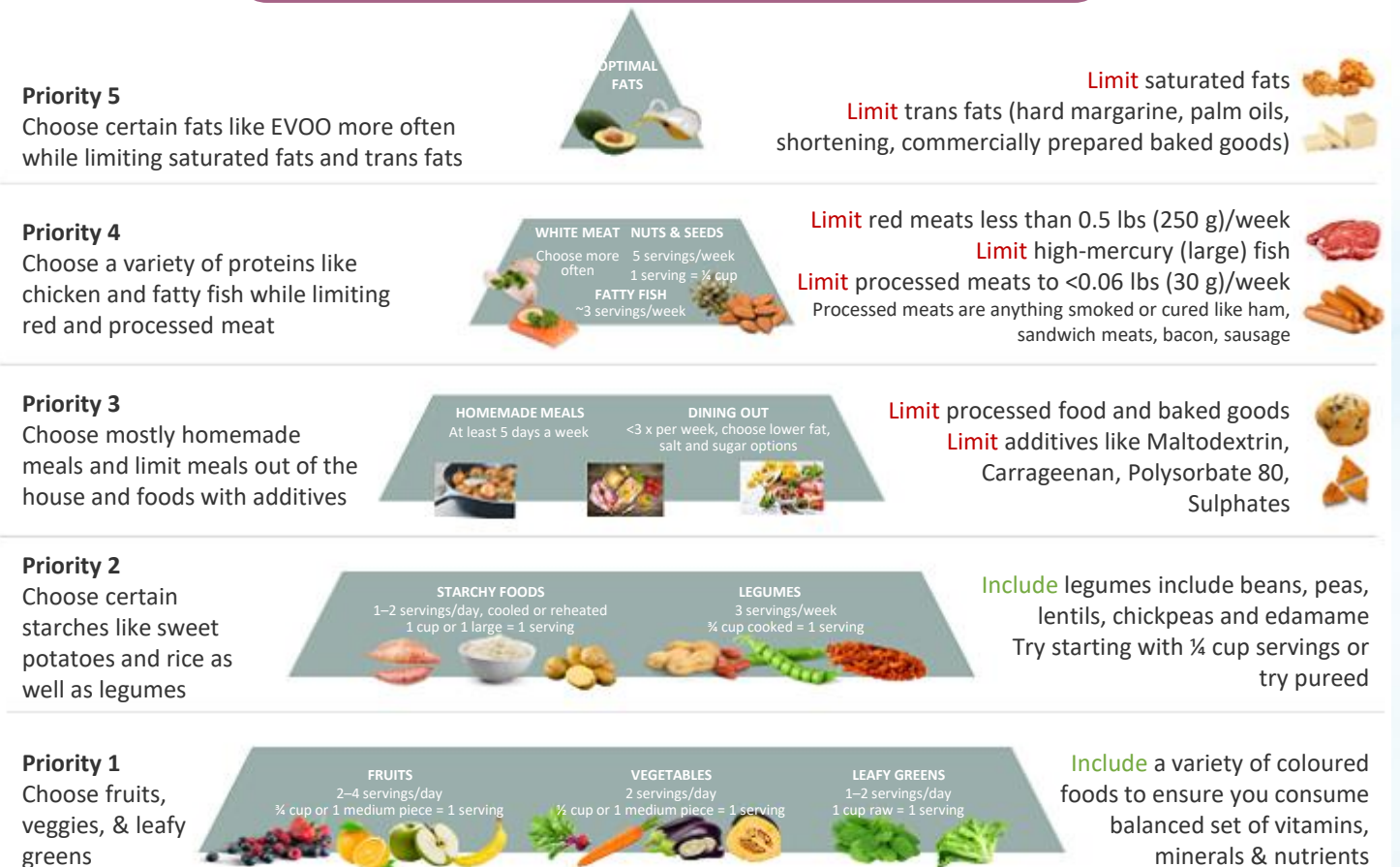


Review

From Evidence to Practice: A Narrative Framework for Integrating the Mediterranean Diet into Inflammatory Bowel Disease Management

Riya Gautam Naik ^{1,2}, Sarah A. Purcell ^{2,3,4}, Stephanie L. Gold ⁵, Victoria Christiansen ⁶, Leah D. D'Aloisio ¹, Maitreyi Raman ⁷ and Natasha Haskey ^{1,*}

THE IBD FOOD PYRAMID



Therapeutic Diet Intervention (Unpublished)[†]

Design:

Crohn's disease, mild-moderate 13-week RCT
(n=66) – 35% bioexposed with active disease biomarkers

Intervention:

Therapeutic Diet Intervention vs. Habitual Diet

Outcomes: symptoms, gut inflammation, systemic inflammation

Key Results:

 **Symptoms (HBI)** ↓ Significant improvement ($p=0.0327$)

 **Gut Inflammation (FCP)** ↓ Calprotectin reduced ($p=0.0341$)

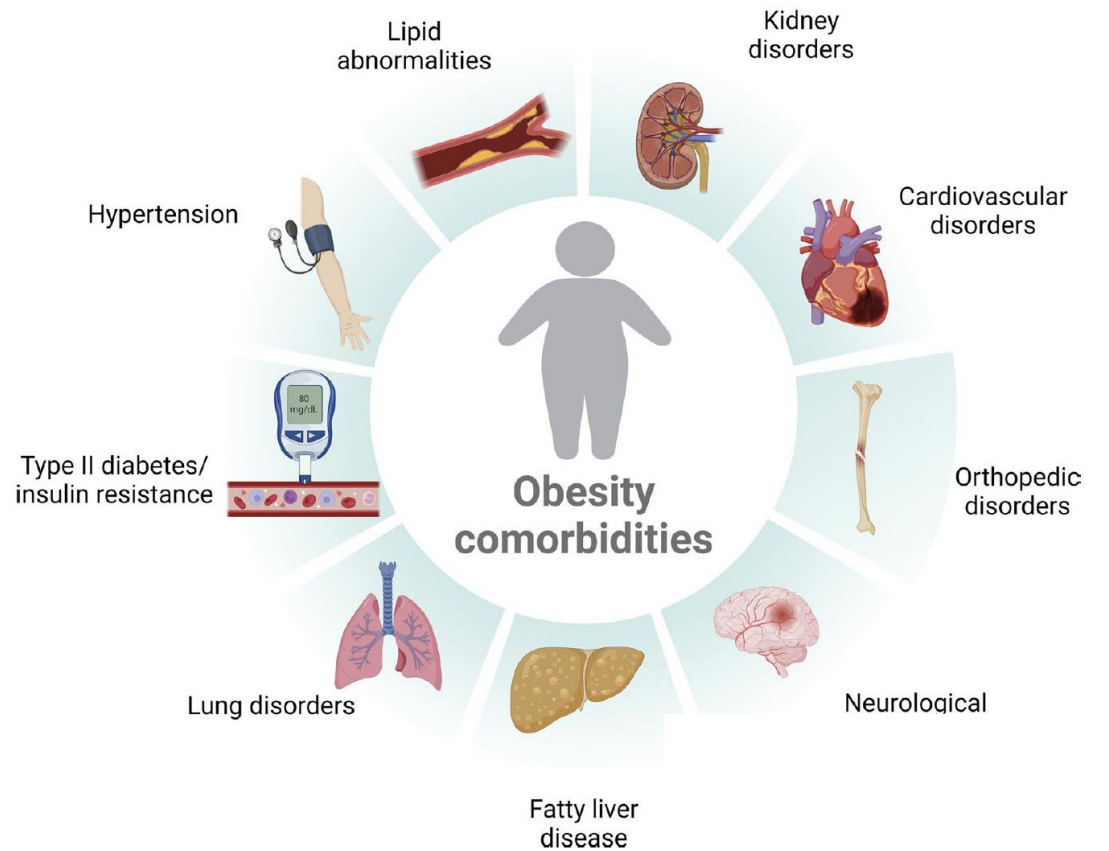
 **Systemic Inflammation (CRP)** ↓ CRP decreased ($p=0.0254$)



[†]Raman et al.

Health implications of obesity and IBD

- ✓ higher frequency of doctor visits
- ✓ more specialist consultations
- ✓ increased emergency room visits
- ✓ longer hospital stays
- ✓ **more aggressive IBD phenotypes**
- ✓ **loss of treatment response**
- ✓ **increased post-operative complications**



Guglielmi V et al. (2024) Front. Endocrinol. 15:134979

Nguyen et al (2019), CGH. 17:709

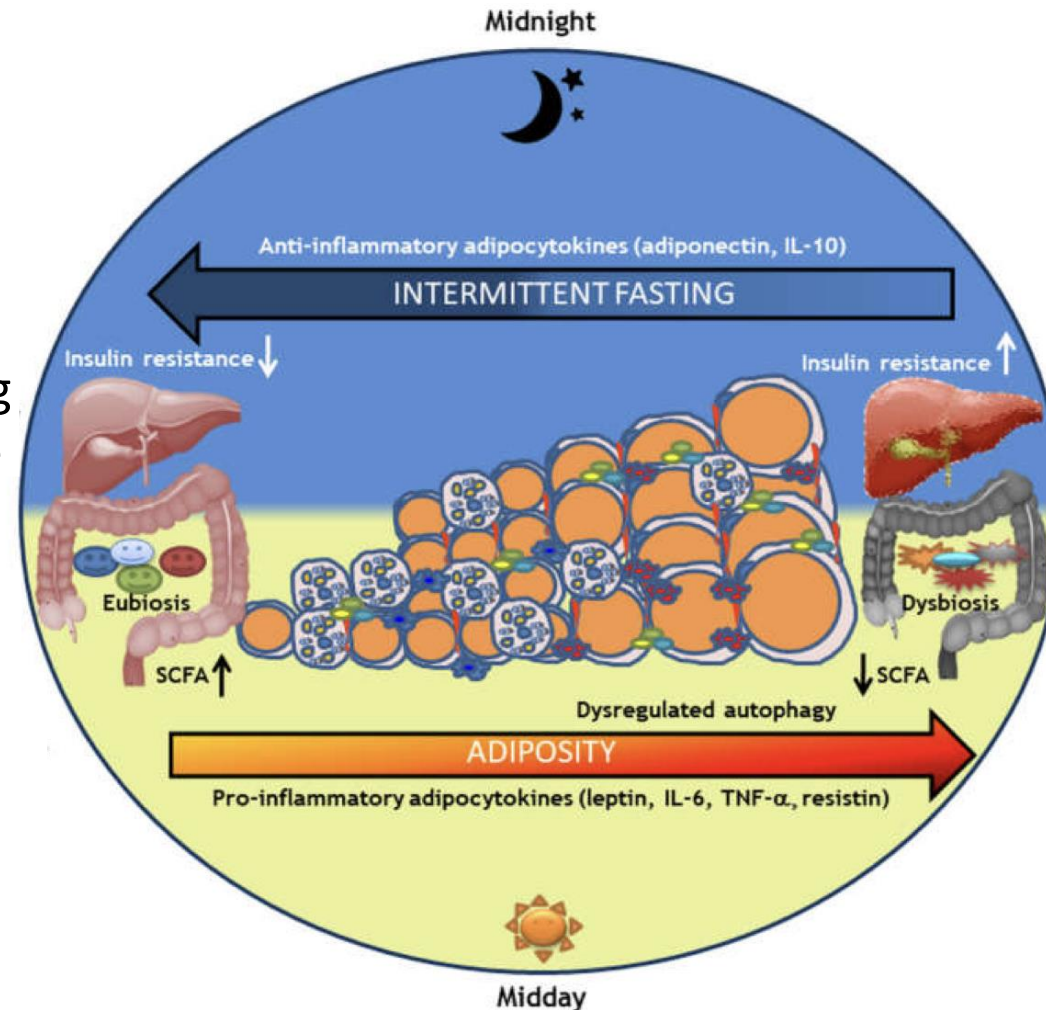
Yarur et al. (2023) Am J Gastroenterol:2005–2013

Image: Šket R et al. (2025) Adv Ther 42:72–93

Intermittent Fasting and IBD

Non-IBD Population

- ✓ Resets circadian rhythms
- ✓ Promotes adipose tissue remodelling
- ✓ Improves adipokine signalling
- ✓ Modifies the gut microbiome
- ✓ Improved insulin resistance

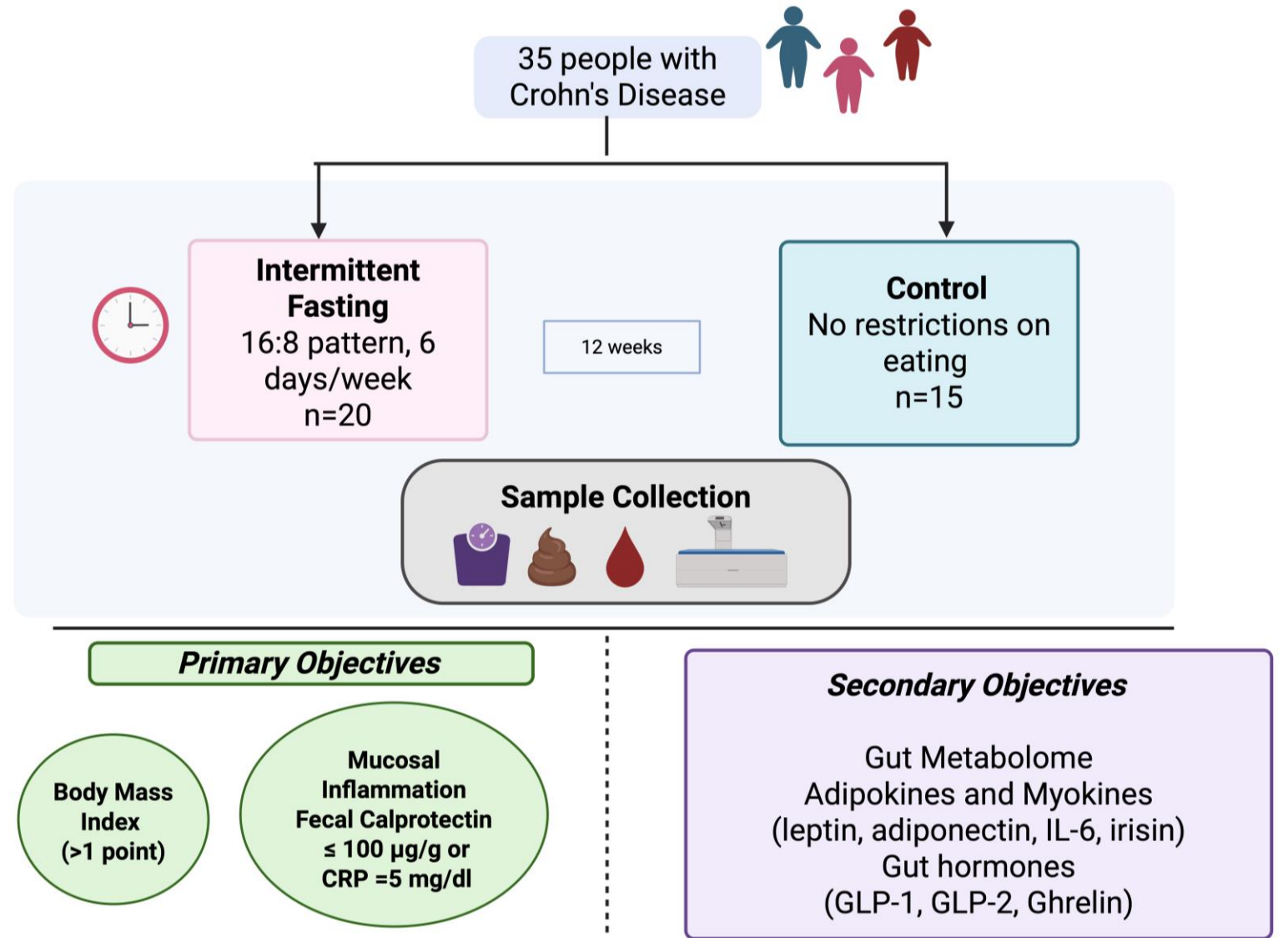


IBD Population

Few intervention studies exploring intermittent fasting (TRF) and its effects in patients with IBD

Inclusion criteria:

- 1) ≥ 18 to ≤ 75 years of age
- 2) ileocolonic or colonic CD in clinical remission
- 3) stable dosing of medications for at least 3 months prior to recruitment
- 4) BMI > 25



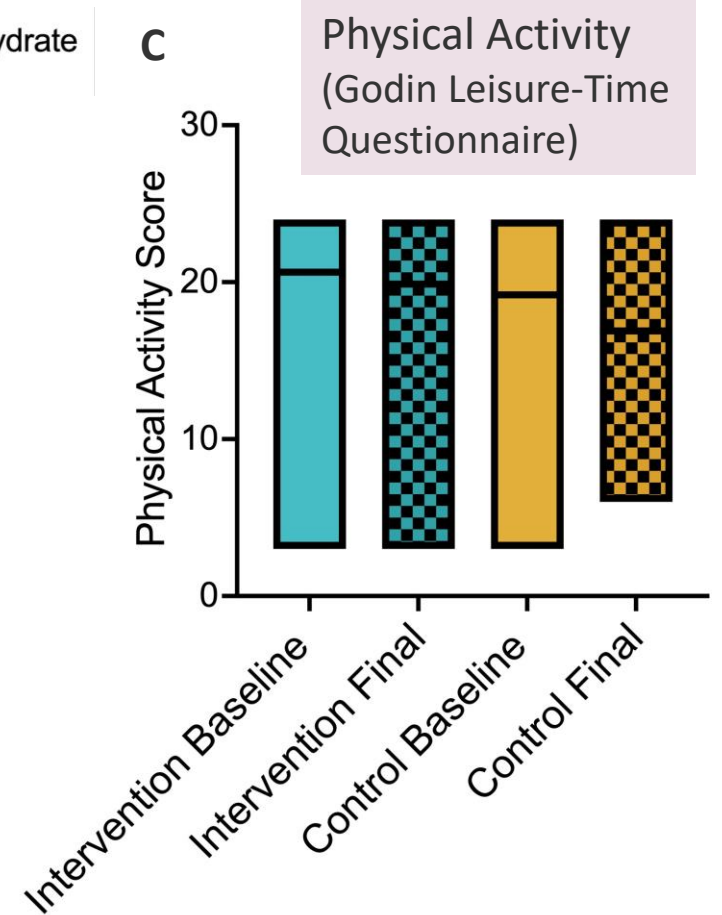
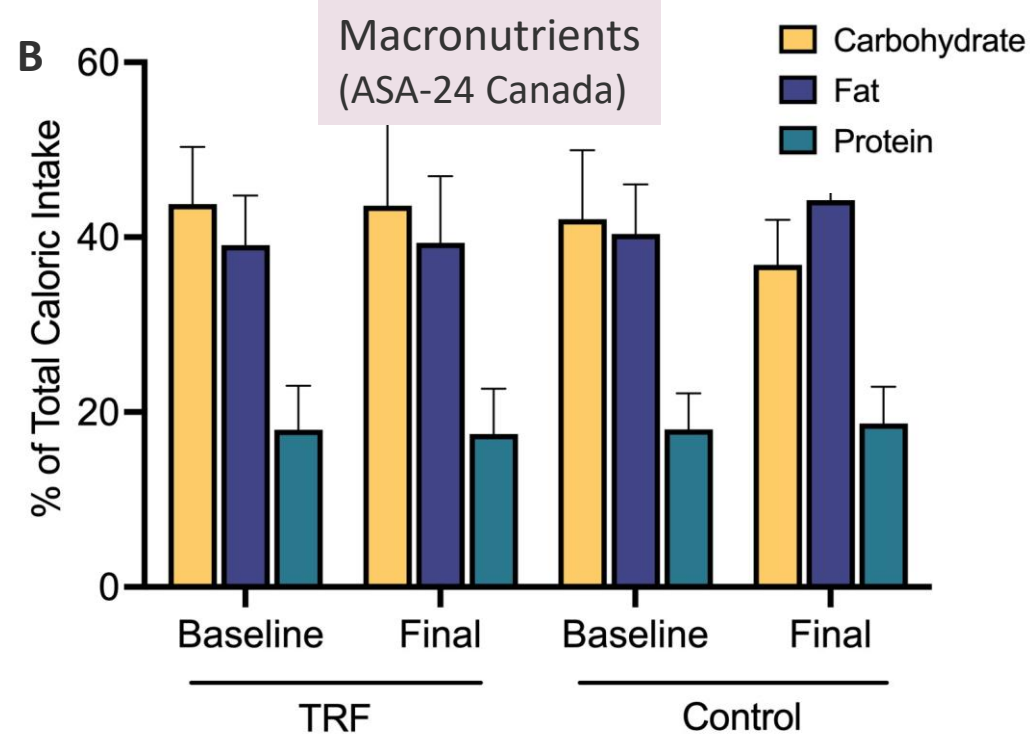
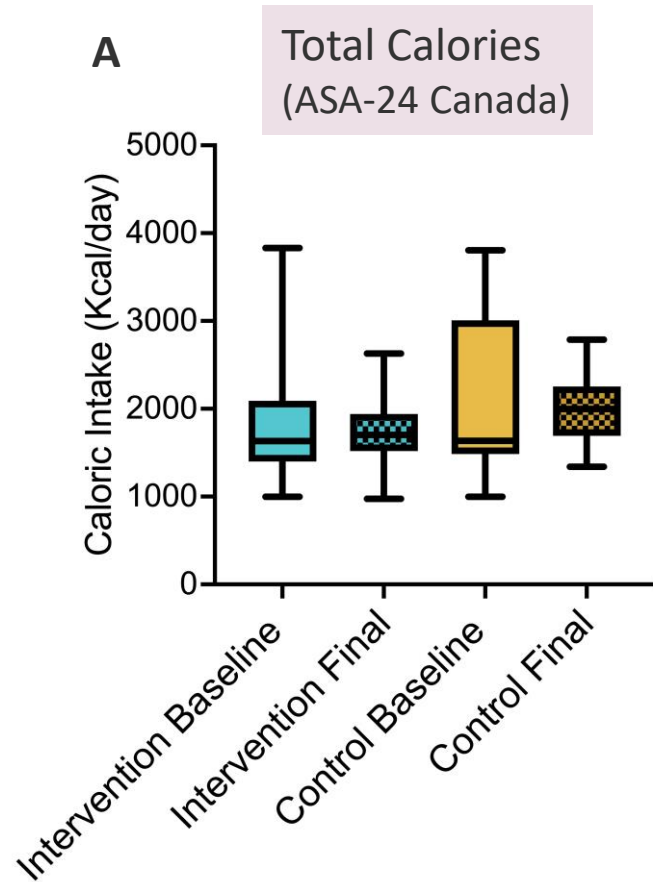
Demographic Profile

	TRF (n=20)	Control (n=15)
Age, years (mean ± SD)	49 ± 12	47 ± 16
Sex		
Female, n (%)	13 (65%)	9 (60%)
Male, n (%)	7 (35%)	6 (40%)
Body mass index, kg/m ²	29 ± 6	30 ± 5
PG-SGA:		
A – nourished	20 (95%)	15 (100%)
B – suspected malnutrition	1 (5%)	
Disease duration, months, (mean ± SD)	142 ± 121	148 ± 101
Disease Location, n (%)		
Terminal Ileum (L1)	10 (50%)	6 (40%)
Colon (L2), Ileocolonic (L3)	5 (25%)	7 (47%)
Perianal (P)	5 (25%)	2 (13%)
	2 (10%)	1 (7%)

	TRF (n=20)	Control (n=15)
Harvey-Bradshaw Index	4 ± 3 (Remission)	2 ± 2 (Remission)
C-reactive protein, mg/L (median, IQR)	1.9 (0.55 – 2.8) (n=17)	1.3 (0.80 – 6.2) (n=13)
Fecal calprotectin, µg/g (median, IQR)	101 (40 – 870) (n=19)	116 (50 – 370) (n=13)
Medications*: n (%)		
Biologic	12 (60%)	7 (47%)
Immunomodulator	4 (20%)	1 (7%)
5-ASA	1 (5%)	4 (27%)
Steroid	1 (5%)	1 (7%)
No medications	5 (25%)	4 (27%)

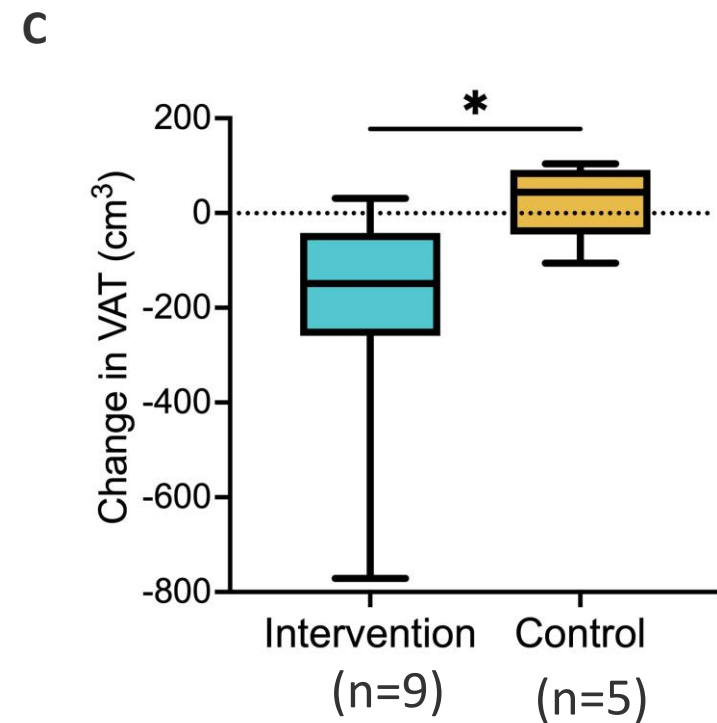
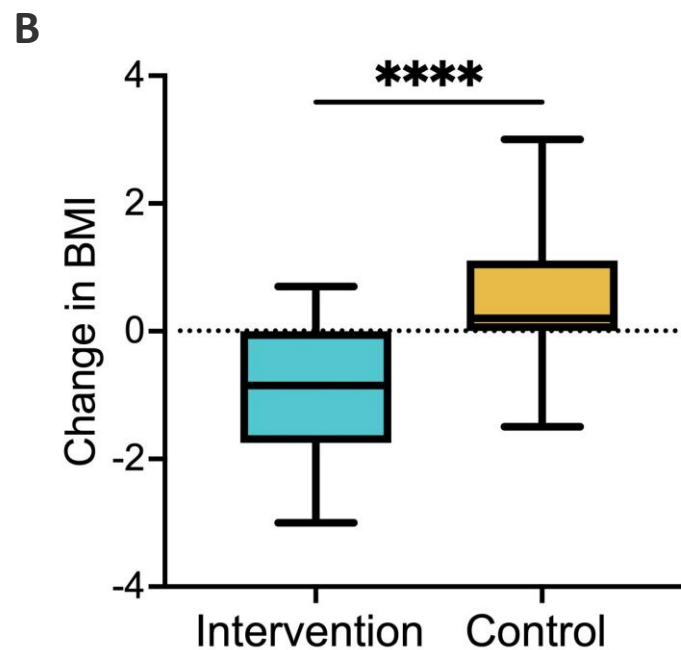
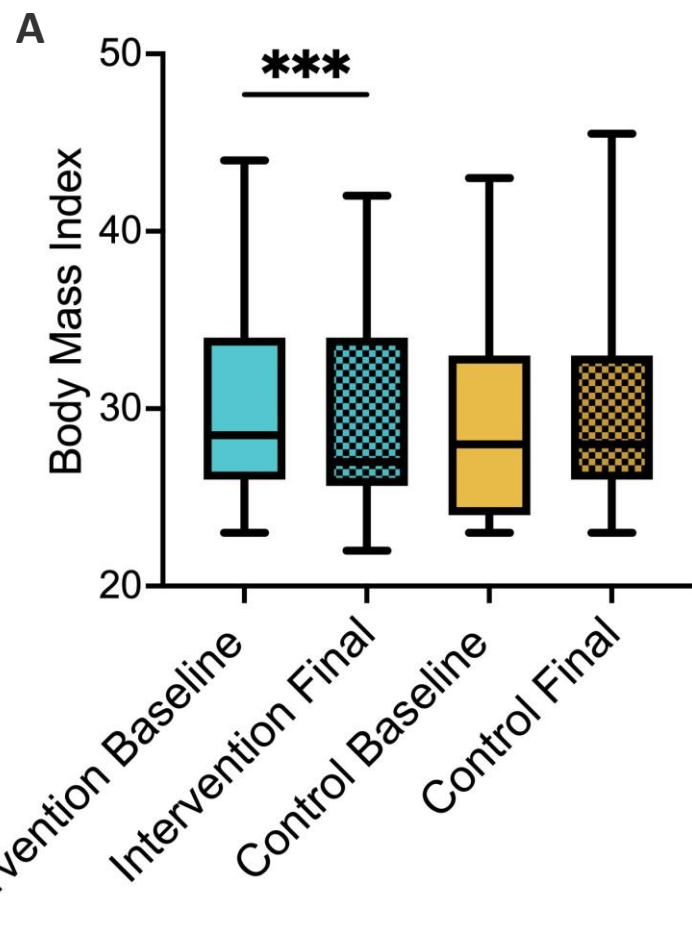
*Some percentages for medications may exceed 100% because participants may have been prescribed more than one medication.

No differences in caloric intake, macronutrient intake or physical activity between groups†



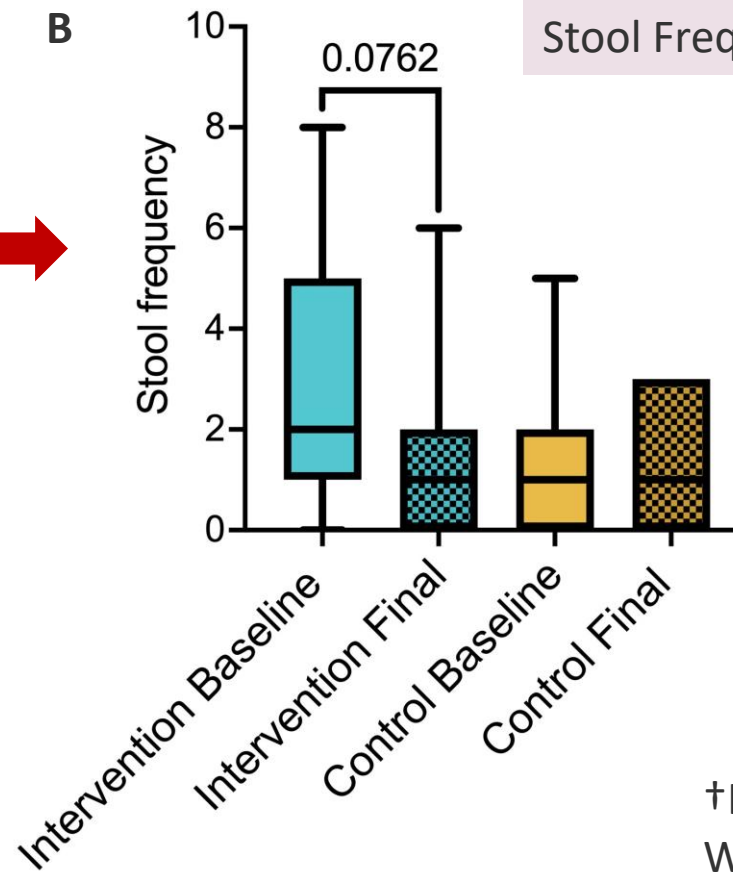
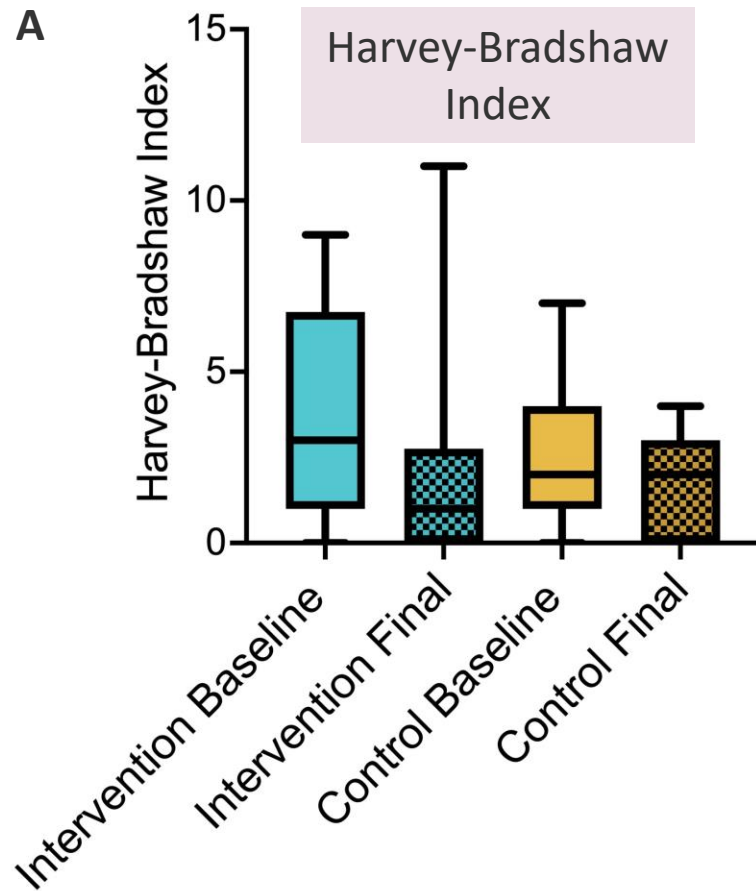
†Intention to treat analyses
n= 20 TRF, n= 15 controls

TRF reduced body mass index and visceral adipose tissue (VAT) †

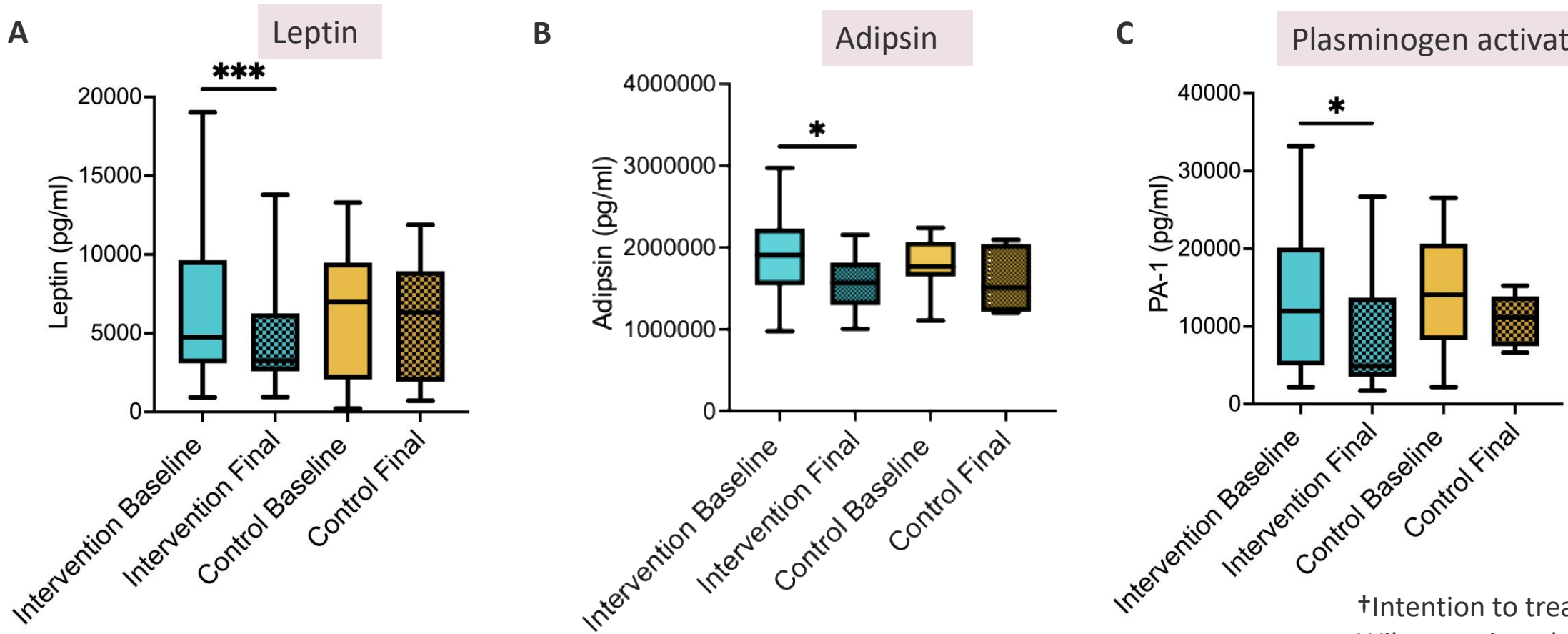


†Intention to treat analyses
n= 20 TRF, n= 15 controls
Mann-Whitney U test
***** $p < 0.0001$, *** $p < 0.001$

TRF improves clinical disease activity †

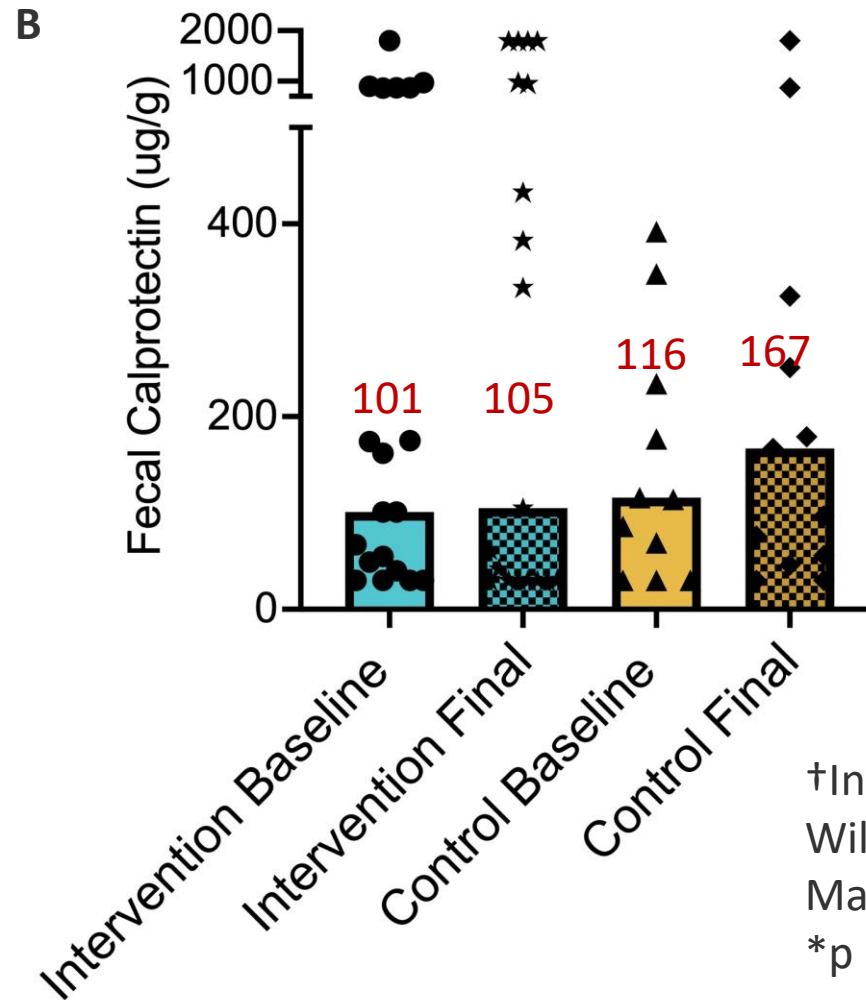
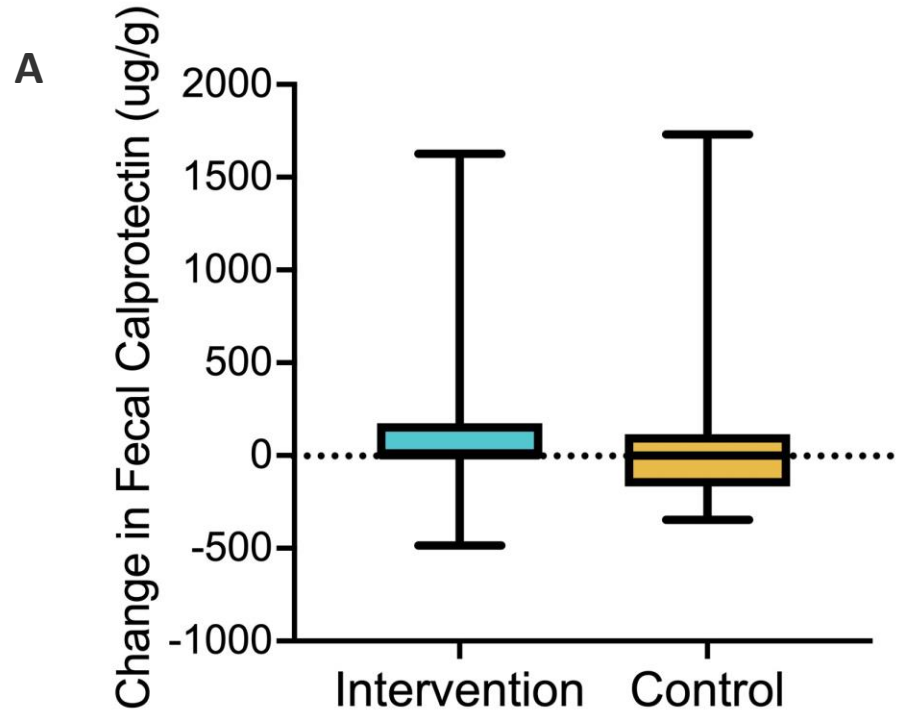


TRF decreases leptin, adipisin and plasminogen activator-1†



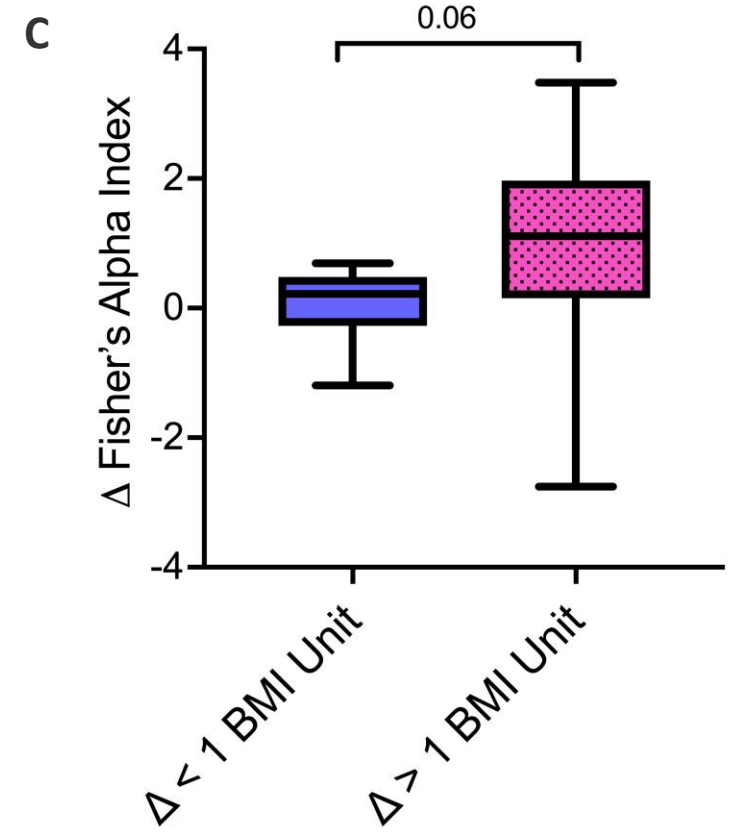
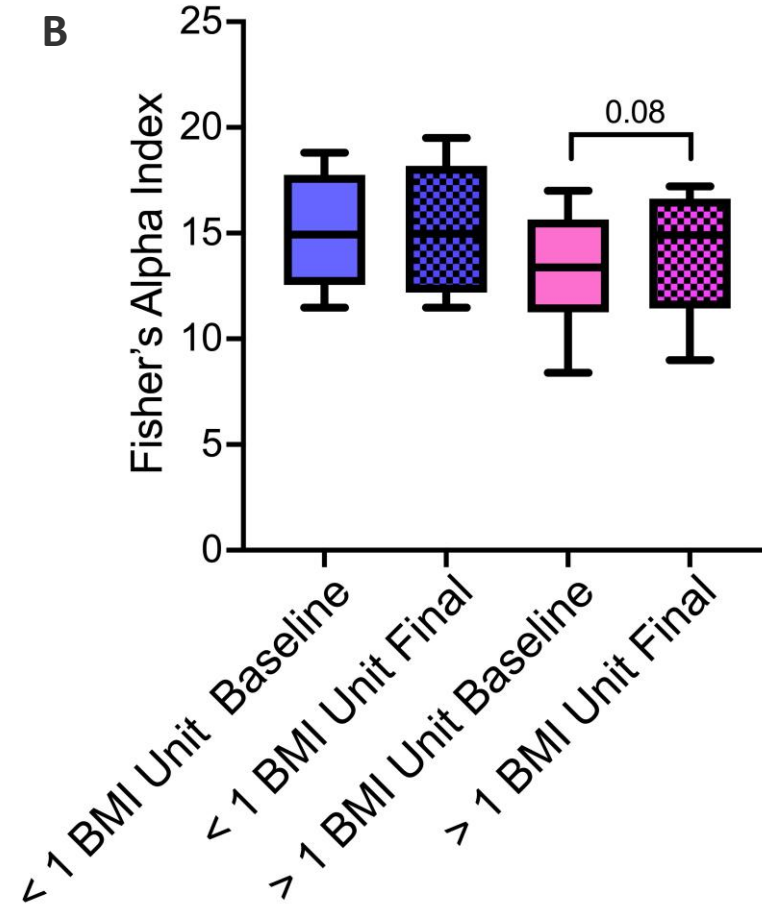
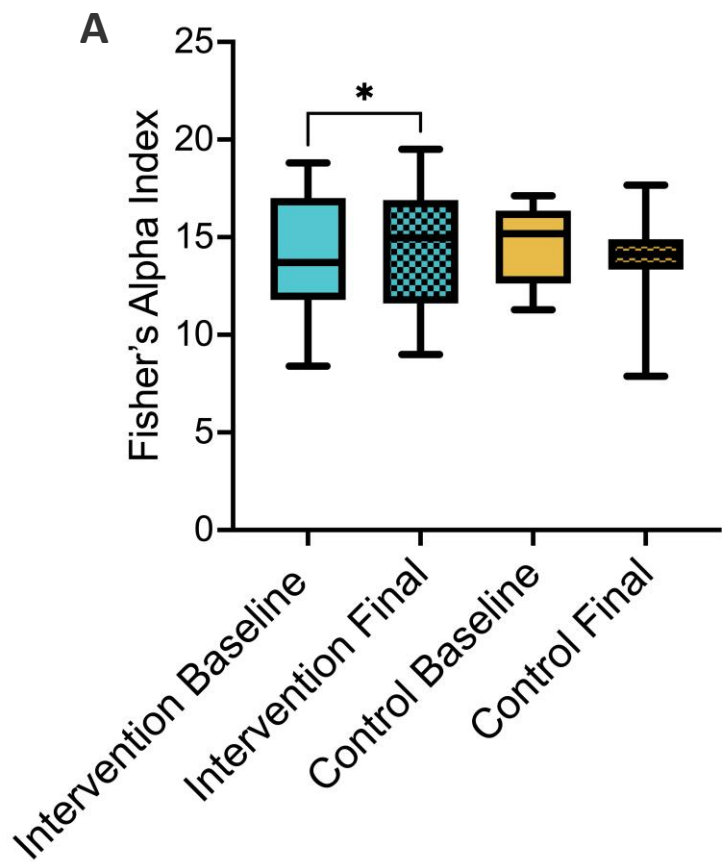
†Intention to treat analyses
Wilcoxon signed rank test
Mann - Whitney U test
*p < 0.05; ***p < 0.001

ITT analyses showed no change in fecal calprotectin levels



†Intention to treat analyses
Wilcoxon signed rank test
Mann - Whitney U test
*p < 0.05

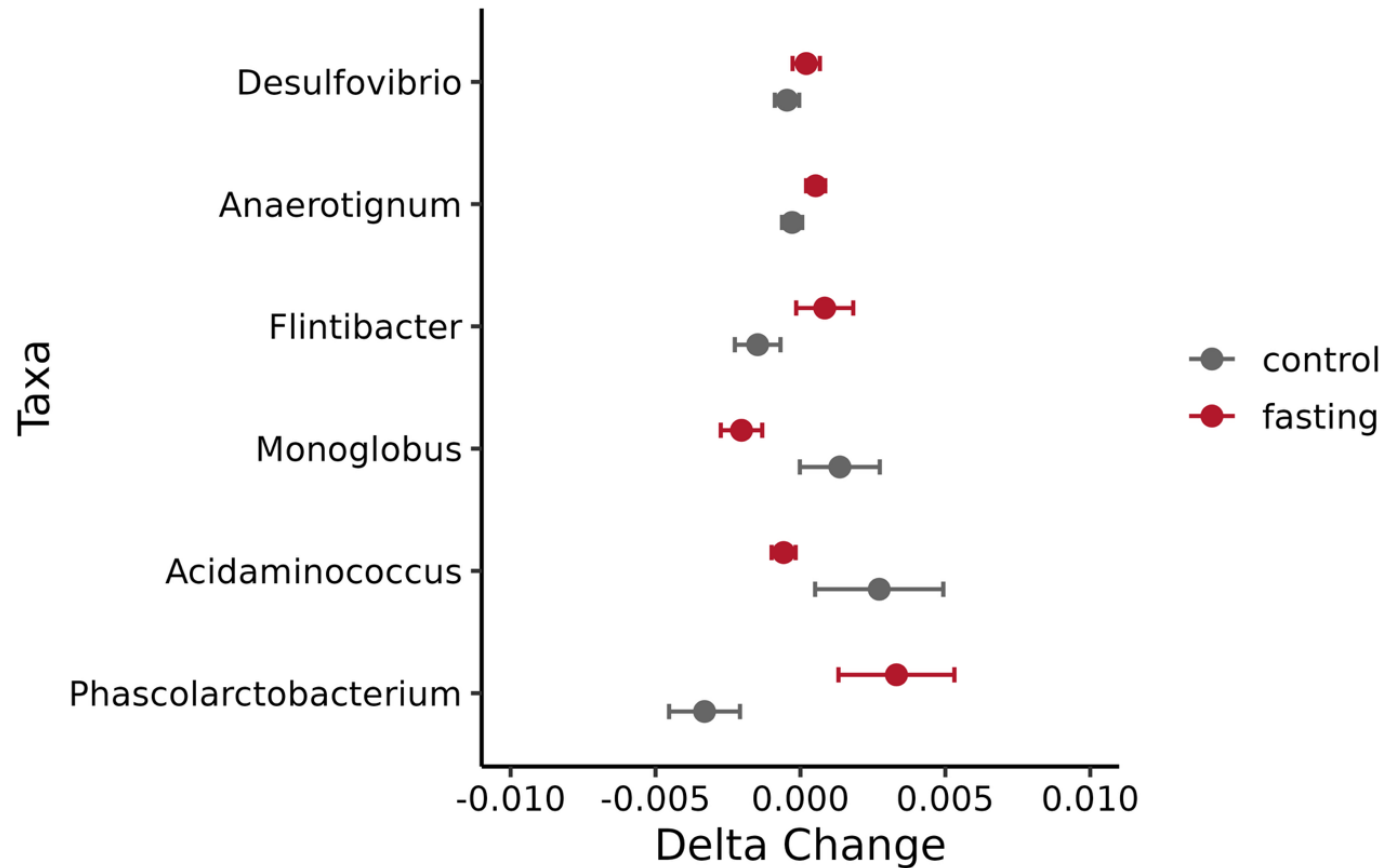
Fisher's Alpha Index reveals greater bacterial diversity with TRF



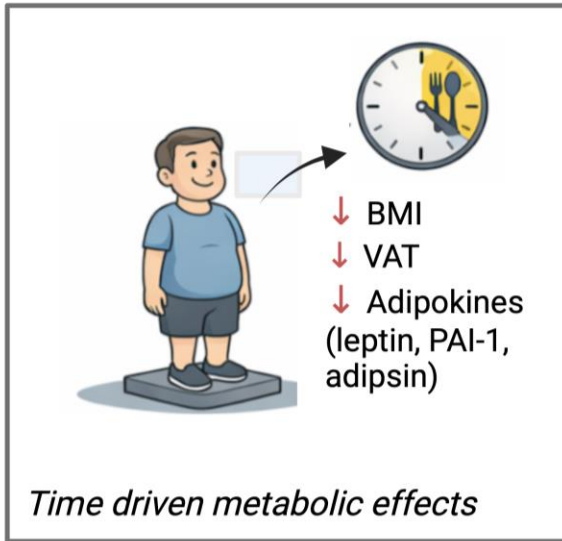
@DDWMeeting | #DDW2025

Wilcoxon signed rank test
Mann - Whitney U test
*p < 0.05

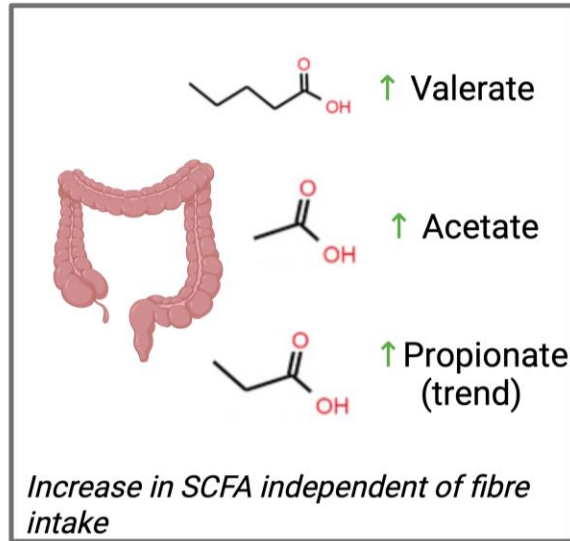
Fasting Modulates Gut Microbial Composition with Enrichment of *Phascolarctobacterium*



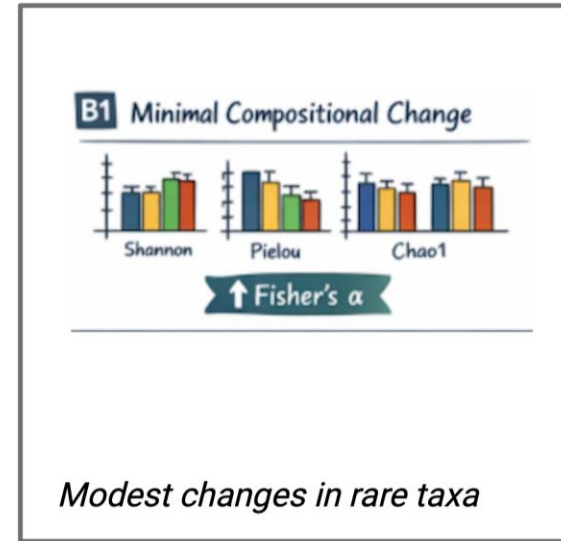
TRE



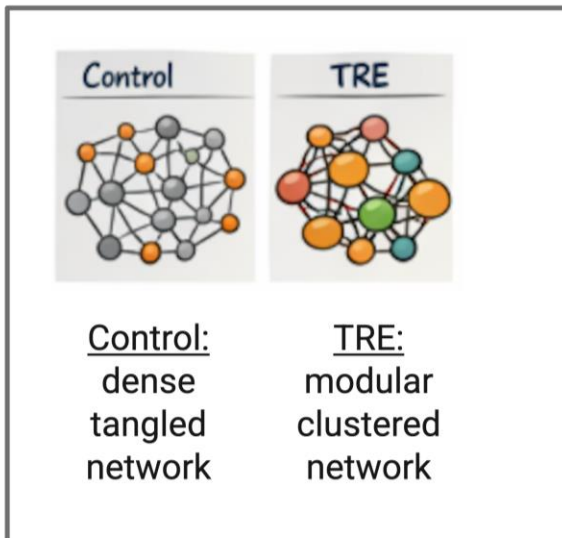
Short Chain Fatty Acids



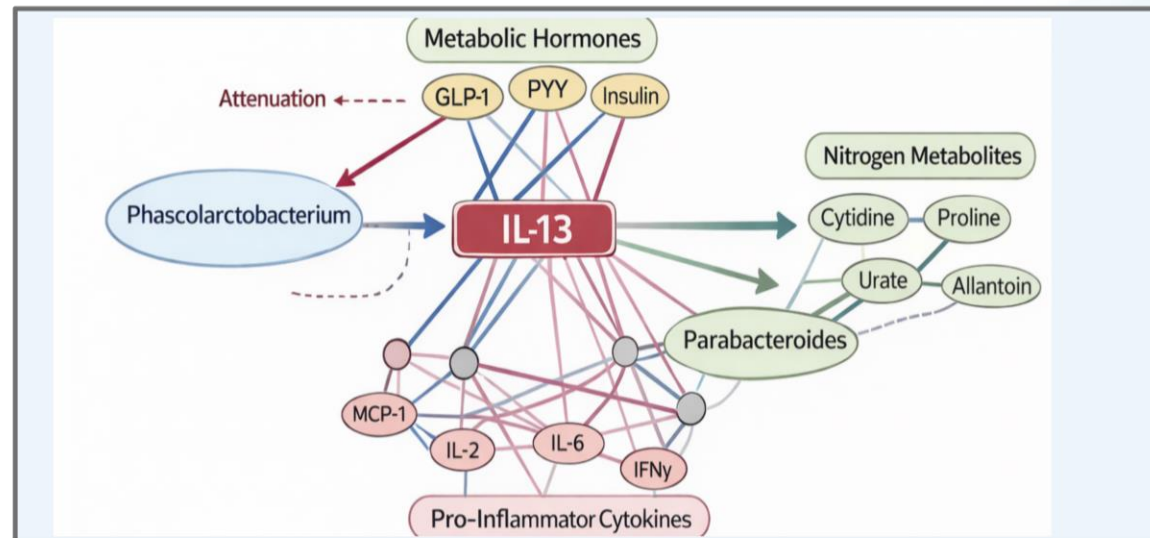
Minimal Taxonomic Δ



Network Architecture Δ



Immuno-metabolic Network



Constructing a Metagenomic Estimation of Dietary Intake (MEDI) Database

- Uses stool metagenomic sequencing to identify **food DNA** (>400 foods)

Findings:

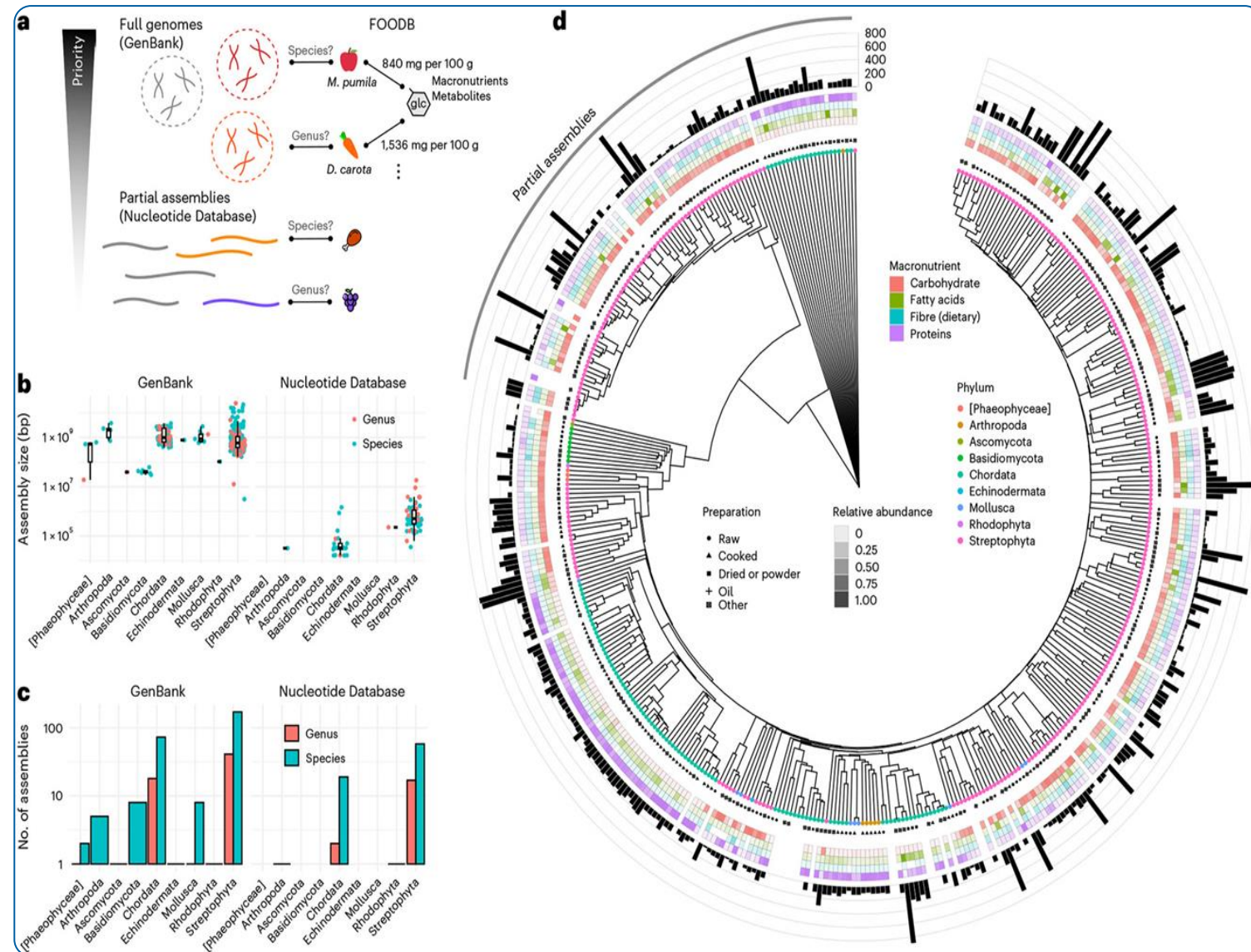
- Qualitatively reliable vs. food records in controlled studies

Opportunities:

- Objective tool for diet assessment in IBD/nutrition studies
- Integrates with microbiome research

Challenges:

- Extensive validation still needed



Multi-omic digital twins models predict FCP



Diet recall



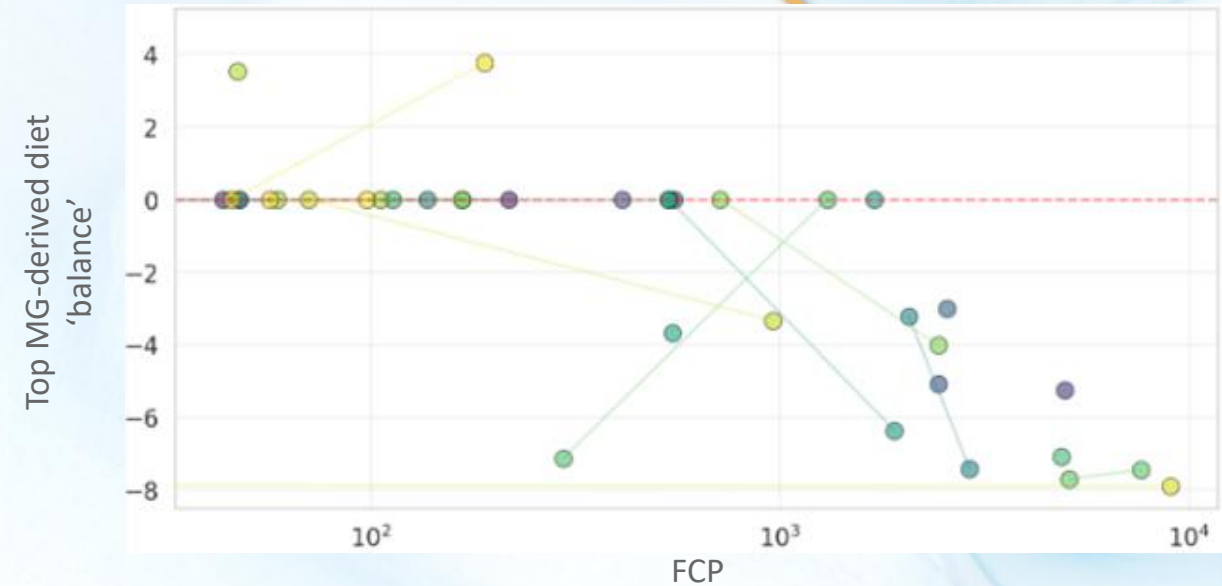
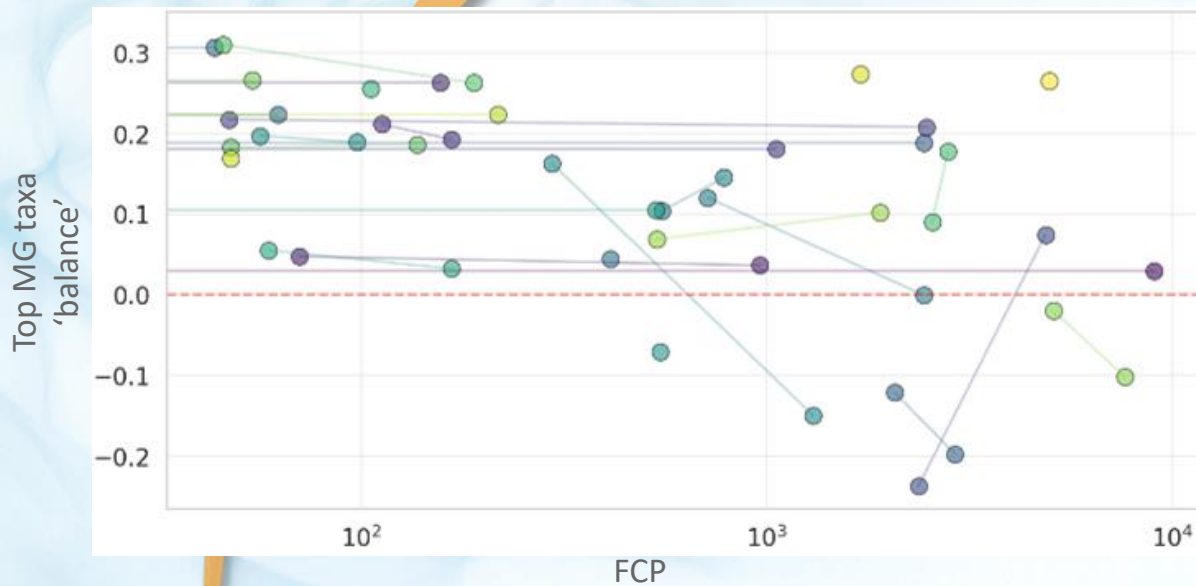
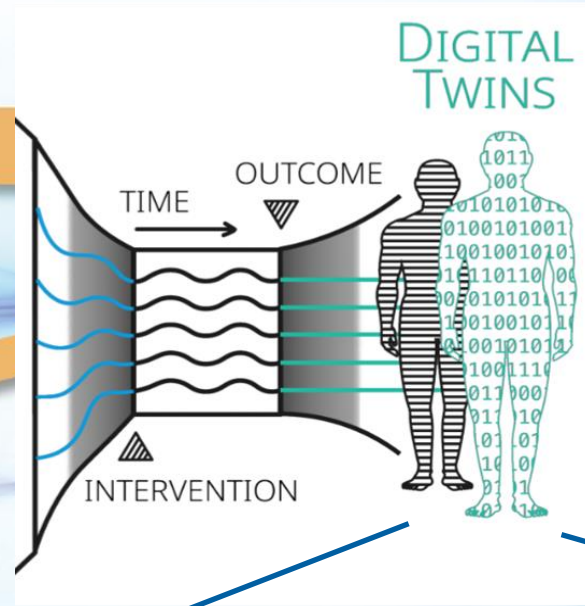
Metabolites



Taxa
(from MG)

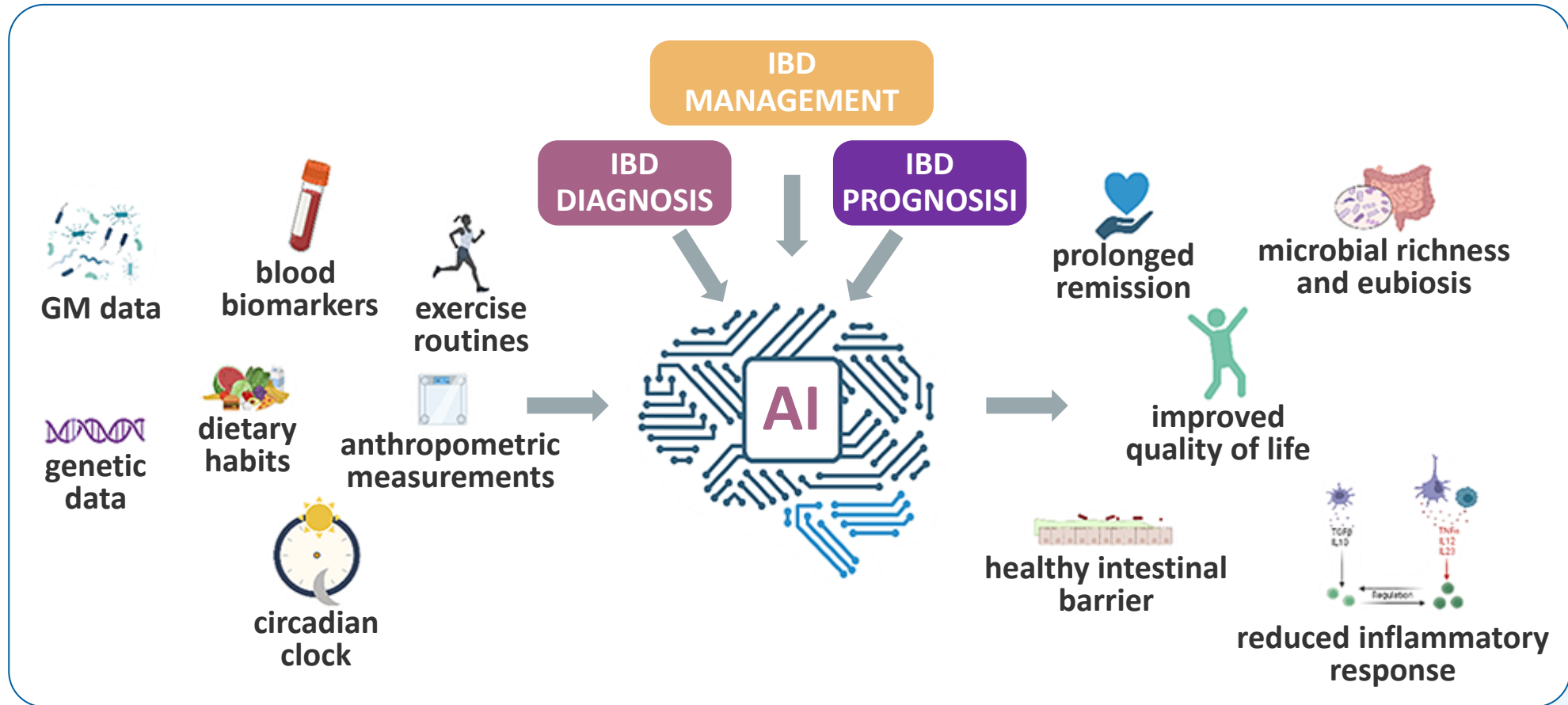


Diet
(from MG)



Leveraging AI for precision nutrition in IBD (Baldi et al., 2025)†

Nutrition is no longer a one size approach for all



Practical Implementation of Diet/ Nutrition Intervention

Malnutrition - YES/NO

ARFID – Yes/NO

Define Disease Activity
YES

Define Disease Activity
NO

Define Disease Activity
NO

Clinical Symptoms
YES/NO

Clinical Symptoms
YES

Clinical Symptoms
NO

Patient Ready?
Current Medical Therapies?
Support Available (RD, Coach)

IBS Overlap / Low FODMAPs
Mediterranean Diet

Mediterranean Diet ± Weight
Management

Oral Therapeutic Diet
EEN / PEN

Monitoring (HBI, CRP, FCP,
Cross-Sectional Imaging, Endoscopy)



Thank you!
Time for discussion!

