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CLINICAL CASE STUDY

Restoring Bowel Control and Reducing Nocturnal Symptoms Through Microbiome-Informed Care

For Healthcare Professionals Only

Introduction

To demonstrate the clinical utility of Microbiome Explorer™ and how it can be effectively integrated into practice, real-world case scenarios have been documented to illustrate its application and care. Below is a case managed by Alyssa Tait, Naturopath, showcasing her clinical work-up and the use of Microbiome Explorer™ in guiding patient management.

Clinical Background: Chronic Faecal Urgency with Nocturnal Symptoms

Chronic bowel dysfunction, including faecal urgency, incontinence, and nocturnal digestive symptoms, poses a considerable burden on quality of life. Contributing factors are often multifactorial and may involve both structural and functional disturbances of the gastrointestinal system. Conventional management frequently relies on symptom-suppressing medication, such as loperamide, without addressing underlying drivers.

In this case, a woman in her mid-sixties presented with longstanding faecal urgency and incontinence, along with nocturnal nausea and bloating that disrupted sleep. She was anxious about managing these symptoms during an impending overseas trip, which emphasised the need for effective and practical interventions.

Patient Presentation

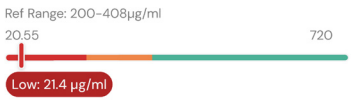
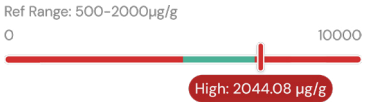
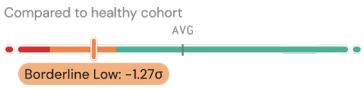
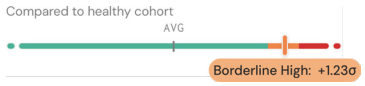
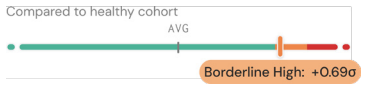
Characteristic	Details
Age	Mid-60s (female)
Symptoms	Faecal urgency, occasional incontinence, nocturnal nausea and bloating disrupting sleep
Diet	Elevated LDL- and total cholesterol but lean body composition
Intervention history	Reliance on loperamide for bowel control

Microbiome Findings (Baseline)

A Microbiome Explorer – Comprehensive analysis revealed several microbiome and GI marker abnormalities likely contributing to the patient's presentation.

Key findings included:

- **Digestive insufficiency:** pancreatic elastase markedly low (21.4 µg/mL), suggestive of pancreatic exocrine insufficiency.
- **Inflammatory drivers:** elevated trimethylamine producers and borderline high BCAA producers, and four oral species. High levels of plasma TMAO, mucin degrading species, hexa-LPS producing species, and oral species in the gut and low levels of IPA-producing species have been associated with intestinal and/or systemic inflammation[3–6].
- **Inflammation and barrier dysfunction:** elevated secretory IgA[7], faecal calprotectin, and zonulin.

Table 1. Microbiome Explorer™ Report Breakdown		
Marker	Baseline Finding	Clinical Interpretation
Pancreatic elastase		Digestive enzyme insufficiency
Secretory IgA		Intestinal immune activation
Propionate-producing microbes		Associated with slow transit, inflammation
Butyrate-producing microbes		Reduced anti-inflammatory capacity
Acetate-producing microbes		Suboptimal SCFA balance
IPA-producing microbes		Associated with intestinal and systemic inflammation
Mucin degradation		Associated with intestinal inflammation
Trimethylamine-producing microbes		Associated with systemic inflammation
Hexa-LPS producing microbes		Associated with intestinal inflammation
Hydrogen sulphide-producing microbes		
Oral species	4 detected	Suggests inflammation, reduced gastric secretory function or microbial translocation

Intervention

Goals of treatment included reduced faecal urgency and improved bowel control, improved digestive insufficiency, improved stool form, and reduced urgency and nocturnal nausea. Strategies were designed with practicality in mind given the patient's upcoming travel.

Table 3. Intervention Plan

Intervention	Dosage	Purpose
Digestive bitters (*Gentiana lutea* 1:2 and *Zingiber officinale* 1:2 blend)	1 mL 3x/day with meals	Digestive support, reduce nausea
Oat beta-glucan	10 g PromOat equivalent 3.5 g oat beta glucan or for travel, 14 g oat powder sachets containing 3 g oat beta-glucan	Improve stool form, reduce cholesterol
Pelvic floor exercises	Daily	Improve bowel control, restore continence
Specialist referral	N/A	Further investigation for possible pancreatic exocrine insufficiency

Follow-up and Retesting

After six months, repeat Microbiome Explorer testing revealed improvements across key microbiome and GI markers:

- **Digestive function supported:** oral species decreased from four to one.
- **Inflammatory activity reduced:** secretory IgA returned to normal range, mucin degradation decreased, though hexa-LPS producers remained essentially the same.
- **Microbial ecosystem and balance improved:** diversity and richness increased, propionate producers reduced and acetate producers increased and hydrogen sulphide producers decreased, though butyrate producers remained borderline low.

Clinical Outcome

- Resolution of faecal urgency, diarrhoea, incontinence, and sensation of incomplete bowel emptying.
- Marked reduction in bloating and nocturnal nausea.
- Improved blood lipid markers: total cholesterol decreased from 6.3 to 5.6 mmol/L; LDL-C decreased from 4.5 to 4.0 mmol/L.
- Imaging showed significant pancreatic atrophy, confirming pancreatic insufficiency, and enteric-coated pancreatic enzyme replacement therapy (Creon®) was initiated.

Ongoing Management Plan

To maintain progress and address residual challenges, a longer-term plan was implemented.

Table 4: Ongoing Management Plan

Intervention	Purpose
Pancreatic enzyme replacement (Creon®)	Compensate for pancreatic insufficiency
Oat beta-glucan (4 tsp daily or in smoothies)	Maintain cholesterol and stool form
Galacto-oligosaccharides (GOS)*	Help maintain stool form, reduce hexa-LPS producers, support diversity
Diet optimisation	Gradually increase fibre intake; include kiwifruit (2/day) and legumes every second day

* Patient found it more palatable than oat beta-glucan.

Table 2. Microbiome Explorer™ Result Comparison

		Baseline	Follow-up
GI Health Markers	Secretory IgA	Ref Range: 200–408µg/ml 20.55 — 720 Low: 21.4 µg/ml	Ref Range: 200–408µg/ml 20.55 — 720 Low: 36.68 µg/ml
	Pancreatic elastase	Compared to healthy cohort AVG High: +2.88σ	Compared to healthy cohort AVG Borderline High: -+1.09σ
	Propionate-producing microbes	Ref Range: 500–2000µg/g 149.56 — 7500 High: 2044.08 µg/g	Ref Range: 500–2000µg/g 149.56 — 7500 In Range: 1530.84 µg/g
Diversity	IPA-producing microbes	Compared to healthy cohort AVG Borderline Low: -1.27σ	Compared to healthy cohort AVG Low: -1.35σ
	Acetate-producing microbes	Compared to healthy cohort AVG Low: -1.82σ	Compared to healthy cohort AVG In Range:0.00 σ
	Mucin degradation	Compared to healthy cohort AVG Low: -1.74σ	Compared to healthy cohort AVG Low: -2.5σ
Microbiome Markers	Trimethylamine-producing microbes	Compared to healthy cohort AVG High: +1.39σ	Compared to healthy cohort AVG In Range: -0.97σ
	Butyrate-producing microbes	Compared to healthy cohort AVG High: +1.36σ	Compared to healthy cohort AVG Borderline High: +0.98σ
	Hexa-LPS producing microbes	Compared to healthy cohort AVG Borderline High: +1.23σ	Compared to healthy cohort AVG High: +1.29σ
	Hydrogen sulphide-producing microbes	Compared to healthy cohort AVG Borderline High: +0.69σ	Compared to healthy cohort AVG In Range: -0.14σ
	Oral species	4 detected	1 detected

Clinical Insights

This case illustrates how Microbiome Explorer testing can:

- Identify hidden contributors to bowel dysfunction, including digestive insufficiency, imbalanced SCFA production, and possible microbial translocation.
- Guide personalised interventions that resolve symptoms while uncovering underlying pathologies.
- Work in tandem with conventional medical workup in complex cases.

Conclusion

Microbiome Explorer analysis uncovered functional digestive insufficiency and microbial imbalances in a patient with longstanding faecal urgency and nocturnal digestive symptoms. Guided by these insights, a tailored intervention resolved urgency, incontinence, and bloating, while also uncovering pancreatic atrophy requiring medical treatment. This case highlights the utility of microbiome-informed care in complex gastrointestinal presentations.

References

1. Xu, M. et al. Acetate attenuates inflammasome activation through GPR43-mediated Ca2+-dependent NLRP3 ubiquitination. Exp. Mol. Med. 51, 1–13 (2019). 2. Arpaia, N. et al. Metabolites produced by commensal bacteria promote peripheral regulatory T-cell generation. Nature 504, 451–455 (2013). 3.Matsuura, M. Structural Modifications of Bacterial Lipopolysaccharide that Facilitate Gram-Negative Bacteria Evasion of Host Innate Immunity. Front. Immunol. 4, (2013). 4. Thompson, K. N. et al. Alterations in the gut microbiome implicate key taxa and metabolic pathways across inflammatory arthritis phenotypes. Sci. Transl. Med. 15, eabn4722 (2023). 5. Zhernakova, A. et al. Population-based metagenomics analysis reveals markers for gut microbiome composition and diversity. Science 352, 565–569 (2016). 6. Farhangi, M. A. & Vajdi, M. Novel findings of the association between gut microbiota–derived metabolite trimethylamine N-oxide and inflammation: results from a systematic review and dose-response meta-analysis. Crit. Rev. Food Sci. Nutr. 60, 2801–2823 (2020). 7. Chen, L., Reynolds, C., David, R. & Peace Brewer, A. Development of an index score for intestinal inflammation-associated dysbiosis using real-world stool test results. Dig. Dis. Sci. 65, 1111–1124 (2020). 8. Joyce, S. A., Kamil, A., Fleige, L. & Gahan, C. G. The cholesterol-lowering effect of oats and oat beta glucan: modes of action and potential role of bile acids and the microbiome. Front. Nutr. 6, 171 (2019). 9.Vulevic, J., Drakoularakou, A., Yaqoob, P., Tzortzis, G. & Gibson, G. R. Modulation of the fecal microflora profile and immune function by a novel trans-galactooligosaccharide mixture (B-GOS) in healthy elderly volunteers. Am. J. Clin. Nutr. 88, 1438–1446 (2008).