Pathogen and Pathobiont Management

Pathogen management guidelines and considerations for pathobiont management to minimise the impact to beneficial gut microbes.

MetaXplore™
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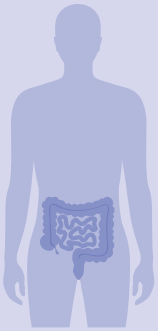
Pathogens defined

	Pathogen	Opportunistic pathogen	Pathobiont	Commensal
				
Definition	A microbial strain that can cause disease	A microbial strain that can cause disease in susceptible hosts	A microbial species associated with negative health outcomes*	A microbial species associated with positive health outcomes*
Management	Medical treatment dependent on pathogen and clinical presentation	Medical treatment may be considered in vulnerable patients	Targeted intervention may be considered if over-abundant	Targeted intervention may be considered if under-abundant
Example	*E. coli* 0157	*Klebsiella oxytocca*	*Bilophila wadsworthia*	*Faecalibacterium prausnitzii*

*Often based on cross-sectional studies where causation has not been established



When to consider testing for pathogen identification

Clinical indications for referring for diagnostic pathogen panel include:

- Chronic signs and symptoms of a pathogen infection, including loose stools, frequent defecation, weight loss, bloating, abdominal pain, nausea, vomiting^
- History of overseas travel or exposure to environments with reduced sanitation
- Immunocompromised patient
- Suspected or diagnosed post-infective IBS

^For acute or severe symptoms referral to the GP for testing is recommended.

Testing to support pathogen identification

Stool testing using MetaXplore GI Plus can be used for targeted pathogen detection[1] alongside gut microbiome[2] and gastrointestinal health marker[1] profiles. MetaXplore GI Plus utilises RT-PCR (real-time polymerase chain reaction) that is routinely used as a highly sensitive method for the detection of target pathogens, species or genera. MetaXplore GI Plus combines RT-PCR analysis with metagenomics to provide comprehensive insights into the health of the whole gut microbiome to support informed clinical decision-making.

[1]The faecal occult blood, real-time polymerase chain reaction (RT-PCR) and enzyme-linked immunosorbent assays (ELISA) used in the MetaXplore™ range are diagnostic and are approved for clinical use.

[2]The faeces pH assay used in the MetaXplore™ range is for research use only and not to be used as a basis for diagnosis. The metagenomic assays used in the MetaXplore™ range are to determine the microbiome populations and associated functional pathways in a faecal sample. The application is for research use only and not to be used as a basis for diagnosis.

Pathogen management guidelines

Medical treatment if detected

Entamoeba histolytica

Medical treatment if symptomatic

***Clostridium difficile* pathogenic strains**
C. difficile toxin B,
Hypervirulent *C. difficile*

Giardia lamblia

Medical referral if symptomatic

***Escherichia coli* pathogenic strains**
Enterotoxigenic *E.coli* (ETEC),
Enteroaggregative *E. coli* (EAEC),
E. coli 0157,
Shiga toxin
Shigella spp/ enteroinvasive *E.coli* (EIEC),
Enteropathogenic *E. coli* (EPEC)

Not necessarily pathogenic strains
Consideration of clinical presentation required

Aeromonas spp.
Campylobacter spp.
Cryptosporidium spp.
Cyclospora cayetanensis
Salmonella spp
Vibrio spp.
Yersinia enterocolitica

Metagenomic detected potential pathogens
e.g. Campylobacter_D upsaliensis,
Clostridium_P perfringens

Pathogenic role is unclear
Exclude other causes of symptoms before considering treatment

Dientamoeba fragilis
Blastocystis sub-types (species)*

Clinical context must always be primary consideration.

Pathobiont management checklist

STEP 1 Test the microbiome | **STEP 2** Evaluate the clinical case | **STEP 3** Consider the cause | **STEP 4** Treat the cause

Test the microbiome	Rule out pathogen requiring medical treatment or referral	☐
	Assess microbiome resilience by reviewing diversity and richness	☐
	Identify overabundant pathobionts by reviewing distance from average in species table	☐
	Identify underabundant commensals by reviewing distance from average in species table	☐
	Evaluate functional dysbiosis by reviewing microbial markers	☐
Evaluate the clinical case	Consider clinical context such as clinical symptoms, severity, and duration	☐
	Note the patient's vulnerability, such as immunocompromised status, age, or underlying conditions that may affect treatment decisions	☐
	Ensure any red flag gastrointestinal health markers have been medically investigated (elevated calprotectin or lactoferrin, detected occult blood)	☐
	Assess gut function and environment including inflammation and gut barrier by using gastrointestinal health markers	☐
Consider the cause	Determine gastrointestinal function and environment	☐
	Note functional dysbiosis	☐
	Consider underlying conditions	☐
	Review medication history	☐
	Evaluate dietary factors	☐
	Assess lifestyle and stress factors	☐
Treat the cause	Implement MetaXplore personalised insights to manage microbial markers	☐
	Maximise microbial diversity and richness	☐
	Support gastrointestinal function such as digestive secretions and motility	☐
	Regulate gastrointestinal environment by managing intestinal barrier and intestinal inflammation	☐
	Optimise diet and lifestyle to support microbiome and gut health	☐

Considerations for antimicrobial treatment

Consider the use of antimicrobials only when there is sufficient evidence linking the identified pathogen to patient symptoms.

Avoid unnecessary antimicrobial treatment to prevent disruption of the gut microbiome.

If antimicrobials are necessary, carefully weigh the potential benefits against the risks of collateral damage to the microbiome.

Consider using targeted therapies whenever possible to minimise the impact on beneficial microbes.

MetaXplore is proudly & exclusively available in Australia via Co-Biome and in the UK via Invivo Healthcare.

This guide has been developed for healthcare professionals. The MetaXplore range is only available for purchase through a healthcare professional.

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