

Relief from gastrointestinal disorders

With gastrointestinal conditions on a steady rise in recent years, improving overall gut function may be the most appropriate and obvious application for probiotics. Common signs of intestinal imbalance - meaning the "bad" bacteria have taken over - include diarrhoea, constipation, fatigue, headaches, gas and bloating, nausea and cravings for sugars and refined, carb-heavy foods. Instead of reaching for the nearest over-the-counter symptom quick-fix, incorporating probiotics into your diet may be a better and longer-lasting alternative, as they can repopulate your gut with more "good" bacteria.

Better digestion and nutrient absorption

An unhealthy gut does not digest foods properly. That means the absorption of essential vitamins and minerals necessary for survival may be greatly impaired. Probiotics change that by keeping harmful organisms in check and allowing for improved overall digestion and nutrient uptake.

Increased immune function

A healthy bowel is critical to immune function. The friendly bacteria of probiotics assist the immune system in recognizing harmful pathogens, like those that lead to cold and flu. Probiotics may be especially helpful for those with autoimmune diseases, who have a tendency for infection and who may be taking medications which actually suppress immune function, on the condition that a more gentle probiotics is chosen. One containing too many species or particularly strong yeast, for example, may pose a potential risk of overgrowth for an already compromised immune system.

Quick Facts

Probiotics can Decrease Lactose Intolerance

In a 1996 study, Jiang *et al.* studied milks containing *B. Longum* grown in a medium rich in lactose. He found that when lactose intolerant individuals consumed this special milk, they showed significantly fewer symptoms of lactose intolerance. They have been numerous studies that have shown probiotics to be helpful in decreasing lactose intolerance.

Reversed metabolic syndrome and encouraged weight loss

Research indicates that obese people have more harmful bacteria in the gut than lean people, while lean people have more friendly bacteria in their guts than those who are obese. Studies show that these unfriendly gut bacteria may actually cause low-grade inflammation in the body, contributing to obesity and making losing that weight more difficult. Probiotics may help on their own for a short time, but as always and especially in this case, they should be taken as a complement to a healthy diet. Processed foods and a diet high in sugars and unhealthy fats will only encourage the growth of unfriendly bacteria, insulin resistance and weight gain.

Clearer, better nourished skin

Studies indicate that probiotics may help to heal the systemic inflammation associated with certain skin disorders, such as eczema and acne. A Norwegian study has found that babies born to pregnant women taking probiotics had only half the risk of developing eczema, and in those children who did develop it, the severity of symptoms was greatly reduced. A separate study published in the *International Journal of Cosmetic Science* indicated that probiotics may also inhibit the growth of bacteria associated with acne.

Improved urogenital health in women

Similar to the intestinal tract, the ecosystem of the vagina is one of delicate balance, often challenged not just by antibiotics, but by spermicides and birth control pills too. Probiotics can help rebuild the microflora to a balance necessary for the prevention of yeast infections, urinary tract infections and bacterial vaginosis. Beneficial probiotics are available in the form of dietary supplements, and they are also found in fermented foods and organic cultured milk products like yogurt. When it comes to choosing those best suited to your own health, be sure to do your homework. Research the product you're considering thoroughly before use, as it is possible that not all bacteria listed on the label will be effective for your condition. Because they're present already in a naturally functioning, normal digestive system, probiotics are generally considered safe; however, it may be wise to consult with a health professional regarding the mixture of certain probiotics, as well as preferred applications for specific medical conditions.

Remember too that a well-balanced lifestyle and a non-toxic, nutrient-rich diet is necessary in order to ensure maximum gain from any probiotics routine. Reducing all types of stress is also particularly important, especially during the holiday season. Good daily habits are the

foundation of health, after all, and probiotics can assist in supporting that foundation.

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Message from the Editor

13th Edition

What is **FMT** ?

The medical team of NUHS from the department of Gastroenterology and Hepatology, Infectious Diseases and Microbiology will share their experience on **FMT** in this issue.

Switching gear to **IBS**, our invited guest, Prof Brooks D Cash from USA has graciously contributed an article on the Emerging Role of Probiotics in the Management of **IBS**, an increasingly common medical problem in our local population.

For all the Muslim doctors and friends, the editorial team wishes you a joyous Selamat Hari Raya celebration.

Thank you & God Bless !

Melvin Wong
Editor-in chief

TheraPOOtics - A New Hope for Clostridium Difficile Infection



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There is now hope for patients with difficult-to-treat Clostridium difficile (C. difficile) infection, a condition that can be deadly for some.

The REANIMATE programme, started by doctors from the National University Hospital (NUH) divisions of Gastroenterology & Hepatology, Infectious diseases, and Microbiology, has performed the first fecal microbiota transplant (FMT) in Singapore, and possibly Southeast Asia, to treat patients with C. difficile infection.

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The normal gastrointestinal tract contains 10 times more bacterial than human cells in the body, and these are essential to maintaining good gut health. Antibiotic therapy can disrupt the balance of these normal microorganisms, and allow some disease-causing bacteria to flourish. This is akin to using strong pesticide on a garden lawn that destroys not only the weeds but also the protective grass. The cleared-out garden is then easily overgrown with new weeds that can now sprout unchecked.

One such toxic bacterium is *C. difficile*, which can usually causes problems after multiple courses of antibiotics, and causes symptoms such as severe diarrhoea, blood in stools, abdominal pain, and fever. In some severe cases, it can also result in the patient requiring surgery to remove the diseased part of the intestine, systemic infection and even death.

While it can affect patients of any age group, it tends to be more severe in the elderly and the very ill.

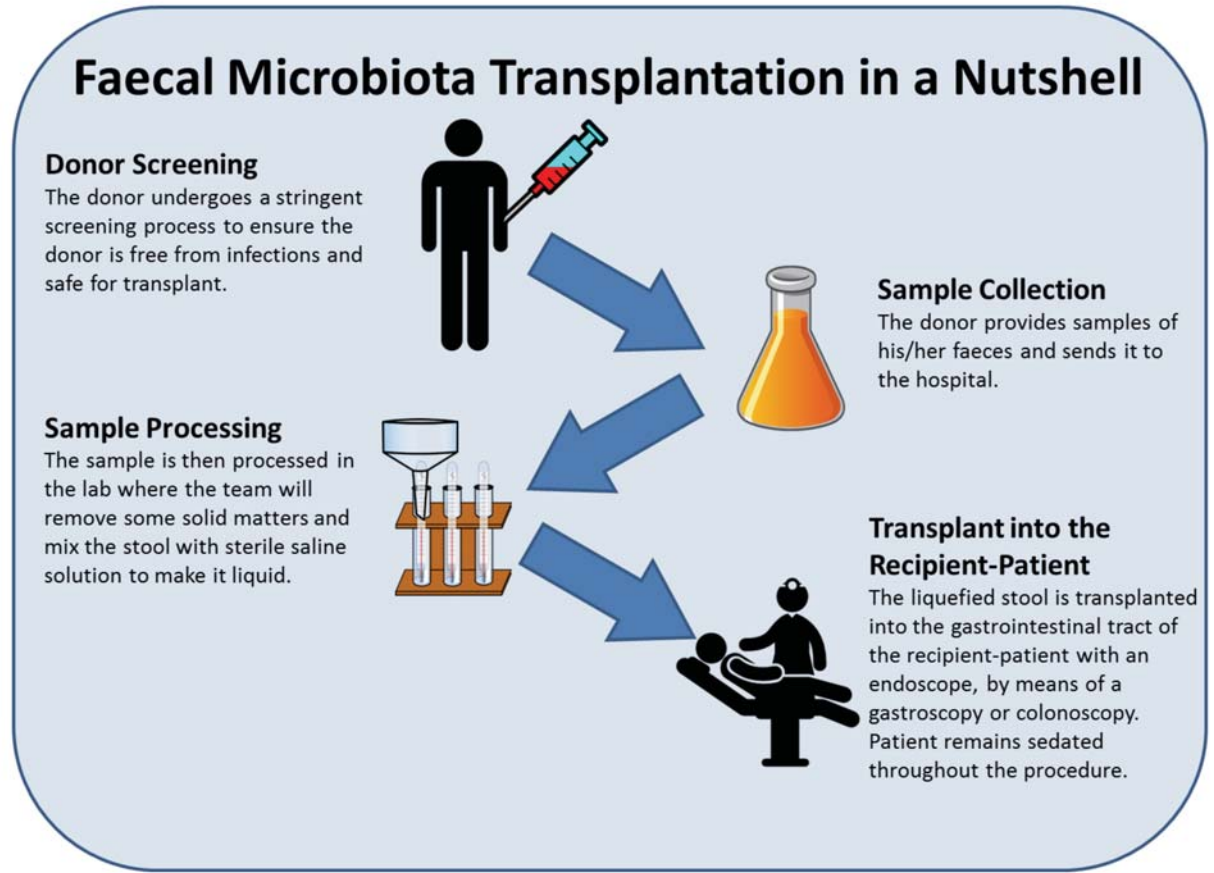
The first line of treatment for *C. difficile* infection is the cessation of the causative antibiotics, if the patient's condition allows. Targeted antibiotics are then used to treat the *C. difficile* infection but these are not always successful and even with successful treatment, the *C. difficile* infection can return in about 15-25% of the time. FMT offers hope to such difficult to treat patients with a high success rate.

FMT involves repopulating the gastrointestinal tract with the necessary good microorganisms. This is achieved with microorganisms extracted from a healthy donor's faeces and transplanted through an endoscope into a patient suffering from *C.difficile* infection.

These good microorganisms then begin to multiply and flourish in the recipient-patient's colon to restore the normal gut ecosystem. As in the earlier analogy, this is planting back the protective grass in the lawn so that the weeds have no opportunity to take root.

The origin of the concept of FMT can be traced back to ancient Chinese history where faeces was used to treat various diarrhoea ailments. The first evidence-based study of FMT which was reported in the New England Journal of Medicine last year showed a success rate of 80-92% for patients undergoing FMT for *C. difficile* infection. Since the introduction of the FMT clinical service in NUH in Jan 2014, two such transplants have been performed successfully with good results.

Although the current use of FMT in NUH is to treat refractory *C. difficile*, it is a treatment with vast potential with possible applications for its use to other clinical conditions like inflammatory bowel disease, irritable bowel syndrome and other metabolic conditions.^{1,2,3}



Emerging role of probiotics in the management of IBS



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Introduction

Irritable bowel syndrome (IBS) is a common gastrointestinal diagnosis that is characterized by abdominal pain or discomfort in association with altered bowel function.^{4,5,6} IBS is very common and is within the top 10 reasons for consultation with a primary care provider.⁷

IBS has been traditionally managed with dietary, lifestyle modifications and pharmacotherapy.⁵ Conventional pharmacotherapy is typically symptom-directed. Complementary and alternative medicine (CAM) therapies, including probiotics and herbal therapies, acupuncture, and yoga, are often initiated by patients independently or on the advice of their healthcare providers to alleviate the symptoms of IBS.^{8,9} Given the increasing understanding of the important role that the microbiota play in the pathophysiology of IBS, manipulation of the human microbiome with probiotics has emerged as a common therapy for IBS.

The human microbiome contains an estimated population of 10¹⁴ organisms, which is approximately 10 times the number of cells in the human body¹⁰ and the human gut is believed to contain approximately 15,000 to 36,000 different bacterial species.¹¹ Human gut bacterial flora are involved in a variety of functions, including processing of undigested food, drug metabolism, vitamin production, and prevention of the attachment of pathogenic bacteria

to the gut wall.¹⁰ Gut flora play an important role in the maintenance of gut homeostasis and can impact a variety of functions, including motility, blood flow, secretion, mucosal immunity, intestinal permeability, and visceral sensation.¹¹ Alterations in the number and type of bacteria in the upper small intestine may result in diarrhoea, abdominal bloating and gas, malabsorption, and abdominal pain.¹¹ Alterations of the gut microbiota may also contribute indirectly to IBS by leading to changes in intestinal permeability, motility, and inflammation, and by affecting interactions between the gut and the central nervous system, all of which are involved in regulation of motility and visceral sensation.¹¹

Probiotics in IBS: Summary Assessment

At least three high-quality meta-analyses evaluating the efficacy of probiotics for IBS have been conducted.

A 2013 meta-analysis evaluated randomized, placebo-controlled, parallel-group studies in adults with IBS.¹² Most studies were short (4 - 8 weeks), evaluated individual IBS symptoms, and did not evaluate probiotic mixtures. Effects on most IBS symptoms were species-specific and significant improvements from baseline in abdominal pain, abdominal bloating/distention, and flatulence were observed compared to placebo. However, none of the species demonstrated significant improvements in stool frequency or consistency, straining during stool evacuation, sense of incomplete evacuation, or fecal urgency. Overall, the probiotic safety profile was similar to that observed with placebo.

A 2012 meta-analysis evaluated randomized controlled studies of probiotic efficacy for GI diseases, including IBS.¹³ This analysis evaluated improvement in global IBS symptoms: presence or absence of pain, flatulence, bloating, or anxiety; HRQOL; or change from baseline in symptom scores. Probiotics significantly improved global IBS symptoms, with a 23% relative risk (RR) reduction (RR ratio, 0.77; i.e., a relatively small effect size).

A 2010 meta-analysis of randomized controlled studies examined the efficacy of probiotics on global IBS symptoms.¹⁴ Probiotics significantly improved global IBS symptoms (RR=0.71), with a number needed to treat (NNT) of 4.



While there was significant heterogeneity observed among studies, there were no significant differences in efficacy among the different probiotics, including single-entity versus combination probiotics. For individual symptoms, significant benefits with probiotics versus placebo were observed for abdominal pain and flatulence, but not for bloating or urgency. This meta-analysis also reported that the safety profile of probiotics was similar to that observed with placebo.

Recent Evidence of Probiotics in IBS

Since publication of the meta-analyses mentioned above, numerous trials of probiotics in IBS have been published. A recent trial from the UK evaluated a liquid, multi-strain (*Lactobacillus plantarum*, *L. rhamnosus*, *L. acidophilus*, and *Enterococcus faecium*) probiotic against placebo in patients with IBS and demonstrated a significantly greater reduction in the IBS symptom severity score in patients randomized to the probiotic (-63.3 vs -28.3, p=0.01).¹⁵ Another study evaluated a multi-species probiotic formulation and also found superiority over placebo at 4 weeks for achieving the endpoint of "significant relief" of IBS symptoms.¹⁶ In another report, Italian researchers found that a multi-strain preparation of *Lactobacillus* and *Bifidobacterium* species along with prebiotics (inulin and tapioca starch) was associated with persistent improvements in flatulence in patients continued in a 6-month open-label extension of a previous 4-week randomized, placebo-controlled trial. Moreover, they found that patients who switched from placebo to the probiotic/prebiotic combination also experienced improvement in flatulence during the 6-month extension.¹⁷ Finally, another study from Italy found significant improvement with a combination of simethicone and *Bacillus coagulans* compared to placebo in 52 IBS patients followed for 29 days. Patients who received the combination product reported improvements ranging from approximately 30% to 50% in abdominal pain, discomfort, and bloating and 79.2% who received simethicone/*B. coagulans* rated their experience as good/very good vs. 3.8% given placebo.¹⁸

Conclusion

One of the major criticisms of probiotics as a therapy for IBS is the historically poor quality of the literature evaluating this therapeutic approach. While it is true that studies of probiotics for IBS have not been as rigorous as those involving other pharmacotherapies, the quality of clinical investigations in this burgeoning field is improving and the evidence supporting the use of probiotic therapy for IBS continues to accumulate. As our understanding of the interplay of the human microbiome with products of digestion and the enteric nervous system continues to increase, so too should our understanding of the optimal uses of probiotics in patients with IBS as well as other gastrointestinal disorders.

Six reasons probiotics will give you radiant health and beauty



(NaturalNews)¹⁹ Humans have more than 10 times the number of bacteria in their body than they have cells - about 100 trillion, representing more than 500 different species. When in proper balance, a delicate and precise ratio of 85 percent friendly bacteria to 15 percent "unfriendly" bacteria, the human organism quite naturally heals itself. But when something upsets that delicate balance, be it general lack of nutrition, exposure to certain or numerous toxins (depending on the individual) or a medically prescribed course of antibiotics, problems can arise. Under these desperate conditions, the body shifts into survival mode (sympathetic nervous system), bringing its own innate healing abilities (parasympathetic nervous state) to a slow or full stop.

But the miracle of probiotics can help restore us to optimal health. As the antithesis of antibiotics, which kills bacteria indiscriminately (both unfriendly and friendly) while still allowing other harmful bacteria, viruses, fungi and yeast to proliferate unchallenged, probiotics work to rebuild and rebalance this intestinal flora so critical to our health and our absorption of vital nutrients. In fact, probiotics are quite necessary in the aftermath of any course of antibiotics, and when taken properly, in conjunction with a healthy diet and lifestyle, it can help improve health dramatically. Their many benefits include, but are not limited to, the following: