

CASE STUDY

THE ROLE OF PROBIOTICS IN HEALTHCARE: PAST, PRESENT, AND FUTURE



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PROBIOTICS AND GUT HEALTH

Gut health and how it impacts our overall health has been a growing topic of interest and investigation for several years. What seems to be emerging from the research is that an imbalance in the gut microbiome — not having enough healthy microbes to fight off less healthy ones — can make us more susceptible to a wide range of illnesses.

Several factors can damage gut health. According to Rose Pauley, APRN, Pediatric Gastroenterology at Boys Town National Research Hospital, she sees the impact on children who might not have had good microbiome colonization at birth, which can happen with cesarean delivery. She says children who take a lot of antibiotics in their first year of life can also have gut issues 10, 20 or 30 years down the road. Anesthesiologist and Critical Care Specialist, Paul Wischmeyer, MD, at Duke University Hospital, agrees, saying that evolutions in medicine and even a Western diet have led to major disruptions of what the normal bacteria living in our gut should look like. "That has set us up to be prime victims of gastrointestinal disorders, autoimmune diseases, pandemics like COVID, allergies, obesity and more," he says.

WHERE THE RESEARCH BEGAN

Ms. Pauley has been working in pediatric gastroenterology for nearly 40 years. In that time, she's seen the research and attitudes toward the value of probiotics evolve. "When I started in the field, we didn't know much about probiotics," she explains. "So we just didn't use them."

It wasn't until the early to mid-2000s that the research into various strains of probiotics started to take off. That's when Ms. Pauley, and the doctor she still works with today, were asked to lead some studies. "We were particularly interested in the effect of probiotics on *Clostridioides difficile* — or C. diff — and antibiotic associate diarrhea," she says.

Around this time, Dr. Wischmeyer began researching the effects of probiotics in critical care explicitly related to pneumonia and peritonitis in animals. "We found that the animals we gave probiotics to, before the illness had a chance to damage the gut, did not get nearly as sick as those that had no probiotics." What was really exciting, he says, is that they found no bacteria got into the bloodstream at all. "Normally, when you have severe pneumonia or a leaky gut causing peritonitis, bacteria will get into the bloodstream and lead to infection everywhere." As his career progressed, Dr. Wischmeyer was also involved in the first longitudinal study of microbiome changes in critically ill patients. The multicenter trial found that ICU patients experienced dramatic losses of healthy bacterial families within a day of being admitted.

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CASE STUDY

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PROBIOTICS IN ACTION TODAY

In his practice, John Damianos, MD, Internal Medicine at Yale New Haven Hospital, works in inpatient and outpatient environments. He recommends probiotics for people taking a course of antibiotics, as many physicians do today, and for other GI-related issues such as irritable bowel syndrome, functional dyspepsia, pouchitis, and more. He says there's also developing evidence that probiotics can increase the likelihood of *Helicobacter pylori* eradication when combined with the current standard of care of either triple or quadruple therapy. “So there are really multiple specific indications that I'm recommending probiotics for — but I'm not recommending taking any probiotic off the shelf. I'm recommending specific strains or mixes of strains that specify doses based on clinical trial data for people.”

Ms. Pauley regularly uses probiotics for babies with allergic colitis due to an allergy to cow's milk or sometimes even breast milk. “I've also found probiotics useful in treating post-COVID and other post-viral diarrhea that seems to linger,” she says. Beyond that, she notes there is growing research that indicates probiotics can affect the immune system in a way that makes people less prone to viral infections. “This seems to be especially true for people — like some of the children, teenagers, and young adults I see — who don't have great diets or access to whole foods, so the daily use of a probiotic is interesting to me in those cases.”

In addition to his role as a critical care physician, Dr. Wischmeyer is also the director of the nutrition team at Duke University Hospital and associate vice chair for Clinical Research for the Department of Anesthesiology. As a result, he spends about half his time researching nutrition, exercise, probiotics, and microbiomes to help people prepare for surgery and bone marrow transplants to lower the risk of pneumonia and hospital-acquired infections. “We know, for instance, probiotics can reduce C. diff by as much as 70%.” This is important, he explains, because C. diff is one of the fastest-growing iatrogenic diseases he sees today.

A large meta-analysis has also indicated that using a probiotic can reduce the risk of upper respiratory infection by as much as 50%. This led Dr. Wischmeyer and his team to study the effect of probiotics to help minimize the spread of COVID-19. Funded through the FDA's Investigational New Drug (IND) program, the study used Culturelle® probiotics, delivering the probiotic strain *Lactobacillus rhamnosus* GG. “Although the study was small, we had some encouraging signals,” he says. “Our initial data showed that we could significantly reduce the symptoms from COVID-19 and the actual time to diagnosis.”

CHOOSING THE RIGHT PROBIOTIC

“The thing to understand is that not all probiotics are the same,” says Ms. Pauley. “You need to know you're using the right one for the right condition.” And that, she says, comes down to the data. Dr. Damianos, who serves on the Scientific Advisory Committee for the Alliance for Education on Probiotics (AEProBio), an international organization focused on advancing the science of probiotics, agrees. “One of the challenges in the field is that probiotics are considered supplements, so they aren't regulated in the same way as medications.” Although there's a lot of research and funding going into the field, there's a lot of misinformation out there as well. He says this leads many people to write probiotics off as a class.

That's one of the reasons as part of his work with AEProBio, Dr. Damianos writes a quarterly research review about the latest science as it pertains to probiotics. “I encourage people to consider probiotics like any other medication.” He uses antibiotics as an example. “Doctors don't just prescribe antibiotics — they diagnose an infectious disease syndrome first, identifying a particular bug. Then they treat the patient empirically, picking an antibiotic with a unique action mechanism that targets the specific pathogen.” The same goes for probiotics, he says. How do we know what works best for a

CASE STUDY

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particular indication? By taking the same steps as with any other pharmacological intervention. “We analyze the data from well-designed clinical trials that ideally have been replicated,” he explains. “Then, at some point, you have meta-analyses for a particular strain.”

Another challenge Dr. Damianos points out is that because of the current regulatory environment, there's no accountability for companies. “There have been numerous studies looking at this,” he says. “One took 16 commercially available probiotics off the shelf that claimed to contain some sort of Bifidobacterium.” The result? Only a single probiotic out of the 16 contained what it claimed. That's one of the reasons he, Ms. Pauley and Dr. Wischmeyer all recommend Culturelle® probiotics. “*L. rhamnosus* GG is the best studied probiotic strain,” he says. “And Culturelle as a company adheres to rigorous FDA-level standards so people — and doctors — can be confident in the stability and purity.”

LOOKING AHEAD — WHAT MORE CAN WE LEARN

All three would like to see more robust and broader-ranging clinical trials. “There's a much greater appreciation today for the gut-brain axis and a recognition of the microbiome's impact outside of uniquely gastrointestinal disorders,” says Dr. Damianos. “So now we're seeing people in dermatology, rheumatology, and neurology studying the importance of gut health.”

“Forty years ago, we really didn't understand the interaction between gut health and all these conditions,” says Ms. Pauley. “But today, we know how important a healthy gut is to our overall health.” She feels there could be something to learn about the role of probiotics in treating oral thrush. “It isn't only babies who get oral thrush. It happens to adults — especially those undergoing cancer treatments, and I'd love to see a placebo-controlled trial studying that,” she says.

Dr. Wischmeyer agrees, saying he thinks there's an opportunity to look at preventing pandemic viruses in particular. “COVID is still a big issue, and there are a lot of probiotic studies in animals that indicate a normal microbiome can make vaccines for viruses more effective. I think we need to look at how combining probiotics with vaccines in the winter can help prevent these pandemic infections.”

FIND OUT MORE

Visit the refreshed Culturelle® probiotics healthcare professional website for more information and resources relating to the portfolio.

PubMed is a good resource for keeping up-to-date on research in the field. In addition, AEPProbio publishes *The Clinical Guide to Probiotic Products* each year, which details probiotic strains and related applications.

Culturelle® probiotics: <https://culturellehcp.com/>

PubMed: pubmed.ncbi.nlm.nih.gov

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