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Probiotics in capsule form: what do the large clinical trials actually show?



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Abstract

Probiotic capsules are often marketed as a universal solution for everything from bloating to mental well-being. But when you look at the large, randomised controlled trials (RCTs) - the gold standard of medical research - the reality is more nuanced. The research clearly shows that probiotics are **not "one-size-fits-all"**. The effect depends entirely on the specific bacterial strain you take, and on the condition you want to treat. This article reviews the current evidence across the most studied areas.

Introduction

Our gut hosts billions of microorganisms that play a decisive role in our health. When we take probiotics in capsule form, we are deliberately trying to send live, beneficial bacteria down to this ecosystem. But there is a big difference between taking a supplement to "support health" and having solid scientific documentation that it actually works.

To find the truth we have to turn to large clinical studies in which probiotics have been tested head-to-head against placebo in thousands of patients. See also our overview of [gut microbiome, probiotics and IBS](#).

Clinical results: where do the capsules work?

1. Protecting the gut during antibiotic treatment

When a doctor prescribes antibiotics, the medication unfortunately kills both the disease-causing bacteria and the good gut bacteria. This often leads to diarrhoea. Here the large clinical data show a very strong effect.

Taking specific probiotic capsules (in particular the strains *Lactobacillus rhamnosus* GG or the yeast *Saccharomyces boulardii*) alongside an antibiotic course markedly reduces the risk of both ordinary diarrhoea and the serious, hospital-related infection with *Clostridium difficile* [1].

2. Irritable bowel syndrome (IBS)

[Irritable bowel syndrome](#) is one of the most common reasons people buy probiotics. A comprehensive review pooling data from **82 large randomised studies** with a total of **10,332 patients** [2], as well as more recent umbrella reviews [5], confirms that probiotics can reduce abdominal pain and overall [IBS](#) symptoms.

The researchers remind us, however, that the results vary widely. Capsules containing a **combination of several different bacterial strains (multispecies)** generally show the most consistent effect on bloating [2, 5].

3. Chronic constipation

If the problem is a sluggish bowel, the clinical data also offer help. A large meta-analysis of 15 randomised trials showed that probiotics can on average reduce intestinal transit time by **13.75 hours** and increase the number of weekly bowel movements [3].

Important detail: the study specifically looked at the difference between capsules with a single bacterial strain and capsules with several different strains. It turned out that **only multispecies capsules** delivered a statistically robust improvement in constipation [3].

4. Chronic inflammatory bowel disease (IBD)

When it comes to the serious chronic inflammatory conditions of the bowel, the research splits sharply into two:

- **Ulcerative colitis**: The large clinical trials show that high-dose probiotic capsules in combination with the patient's standard medication **can effectively help** dampen the disease and maintain remission [4].
- **Crohn's disease**: Here the large, strict placebo-controlled trials have unfortunately had to conclude that probiotics have **no detectable effect** compared with placebo [4].

5. The gut-brain axis: mental health

One of the newest and most striking research areas is the so-called "**psychobiotics**". A large, updated meta-analysis covering **72 clinical trials with over 6,000 participants** has examined whether bacterial capsules can affect the brain [6].

The results showed a statistically significant reduction in symptoms of **anxiety and depression** as well as an improvement in **sleep quality** in the groups receiving probiotics [6]. The researchers do point out, however, that the really large long-term "Phase III" trials are still missing before probiotics can be prescribed as a definitive treatment for mental disorders.

The technical corner: what makes a capsule effective?

The large clinical trials measure not only patients' symptoms but also the capsule's ability to survive the journey through the body. For a probiotic capsule to work at all, it must meet two strict scientific requirements:

1. **Acid resistance:** Stomach acid is extremely acidic ($\text{pH} \approx 1.5 - 3.5$) and easily kills unprotected bacteria. Scientific trials therefore typically use **enteric-coated (acid-resistant)** capsules, which remain intact in the stomach acid and only dissolve when they reach the neutral environment of the intestines.
 2. **Guaranteed CFU at expiry:** CFU stands for *Colony Forming Units* (the number of live bacterial colonies). Clinical trials use doses between **1 billion and 100 billion ($10^9 - 10^{11}$) live bacteria per day**. What matters is that this number is **guaranteed at the expiry date** - not only when the capsule was packed at the factory - because bacteria slowly die over the months on the pharmacy shelf.
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Safety and side effects

For the broad, healthy population, probiotic capsules are extremely safe and well tolerated. But the large medical reviews come with a clear warning: **if you are critically ill in hospital, have a strongly weakened immune system or have an indwelling central venous catheter, you should stay away from probiotics** [5]. In these rare cases, the administered bacteria have been observed to cross into the bloodstream and cause serious sepsis [5].

Conclusion

Science does not support the idea that a random probiotic capsule turns a healthy person "super-healthy". But if you are facing an **antibiotic course**, struggling with **irritable bowel syndrome** or suffering from **constipation**, there is solid, PubMed-documented evidence that the right capsules with the right strains can make a noticeable difference.

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We work up gastrointestinal symptoms with colonoscopy, gastroscopy, coeliac screening and faecal calprotectin. See also: Gut microbiome, probiotics and IBS, Chronic diarrhoea, Chronic constipation, SIBO, Low-FODMAP diet for IBS.

References (PubMed-based)

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