

Small Intestinal Bacterial Overgrowth (SIBO)

Small intestinal bacterial overgrowth (SIBO) is a chronic intestinal disorder characterized by excessive amounts of bacteria in the small intestine, exceeding 10⁵–10⁶ organisms/mL. Bacterial overgrowth in SIBO may contribute to increased intestinal permeability and inflammation.

Signs, symptoms, and complications

Symptoms of SIBO, which may vary between individuals, are non-specific and often overlap with a number of other associated disorders, making it difficult to recognize or diagnose. SIBO typically presents with fatigue, weakness, and a number of gastrointestinal symptoms, such as abdominal pain, abdominal distension, bloating, flatulence, and chronic diarrhea. SIBO may also result in malabsorption of micro- and macronutrients, certain nutrient deficiencies, and other complications.

Complications and extraintestinal manifestations of SIBO may include:

- Anemia
- Arthralgias
- Chronic prostatitis
- Hypoproteinemia/hypoalbuminemia
- Interstitial cystitis
- Neuropathies
- Osteoporosis
- Restless legs syndrome
- Rosacea
- Steatorrhea
- Weight loss



Causes and risk factors

The development of SIBO can be attributed to a disruption in the homeostatic mechanisms that regulate the intestinal microbiota. Inadequate gastric secretion (hypochlorhydria) and small intestine dysmotility (impairment in mobility) are the two most common factors that predispose individuals to bacterial overgrowth. Other factors that have been shown to increase an individual's susceptibility to SIBO include:

- Age, resulting in increased risk in the elderly population
- Anatomic alterations or abnormalities of the GI tract, such as diverticula, strictures, fistulas, surgical loupes, and gastric or ileocecal valve resection
- Vagotomy, surgery that affects or removes part of the Vagus nerve
- Impairment of systemic and local immunity, immunodeficiency states
- Motility disorders, such as small intestine dysmotility, Celiac disease, and gastroparesis
- Irritable bowel syndrome (IBS)
- Certain metabolic conditions, such as diabetes (enteropathy) and hypochlorhydria
- Dysfunction of certain organs, such as cirrhosis, renal failure, pancreatitis, scleroderma, and Crohn's disease
- Certain medications, such as antibiotics, proton pump inhibitors, and ant motility agents
- Alcoholism

Intake of FODMAPs, fiber, prebiotics, and probiotics have also been shown to alter the intestinal microbiota and may, therefore, increase the risk of developing SIBO or exacerbate its symptoms.

Addressing SIBO

SIBO treatment typically involves:

- 1. Identifying any underlying causes**
- 2. Treating the bacterial overgrowth** with antibiotics or antimicrobial herbs, such as oil of oregano, wormwood, Coptis root, thyme, red thyme, field horsetail, olive leaf, and berberine extracts.
- 3. Correcting nutrient deficiencies** common in cases of SIBO, such as deficiencies in calcium, magnesium, vitamin B12, and fat-soluble vitamins A, D, E, and K.
- 4. Preventing recurrence**

Diet and SIBO

In cases of SIBO, carbohydrates, such as fructose, lactose, and fermentable oligo-, di-, monosaccharides and polyols (FODMAPs), may be fermented by bacteria in the small intestine leading to increased digestive symptoms, such as abdominal pain, bloating, and flatulence.

Some individuals may experience improvements in bacterial overgrowth and associated symptoms by following a carbohydrate-restricting diet, such as the elemental diet, the low-FODMAP diet, the Specific Carbohydrate Diet (SCD), and the Gut and Psychology Syndrome (GAPS) diet.