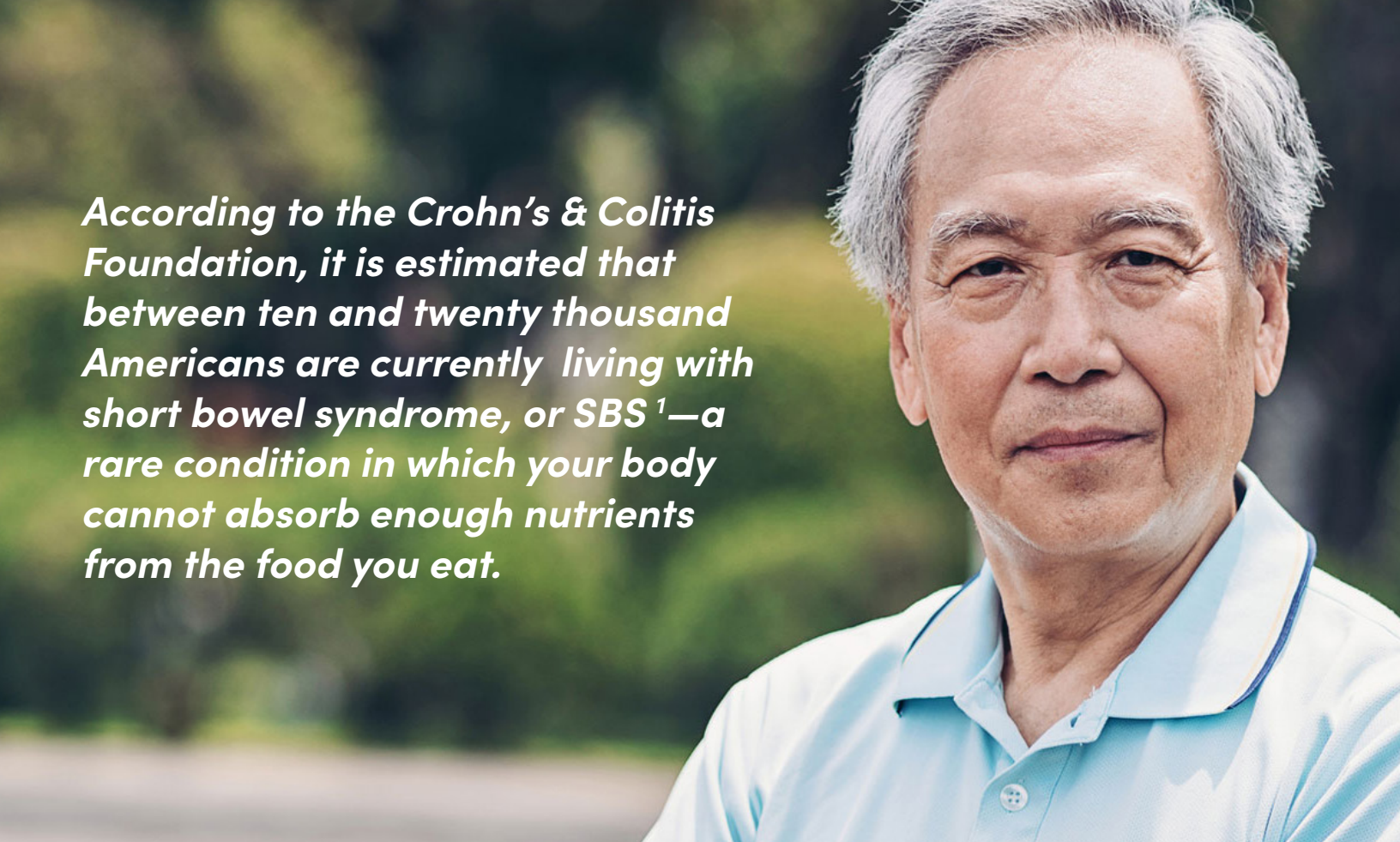


A photograph of a young couple embracing on a beach. The woman is in the foreground, smiling broadly, with her arms around the man's neck. The man is behind her, also smiling, with his eyes closed. They are both wearing light-colored shirts. The background is a soft-focus view of the ocean and sky.

LIVING & THRIVING

with Adult Short
Bowel Syndrome



According to the Crohn's & Colitis Foundation, it is estimated that between ten and twenty thousand Americans are currently living with short bowel syndrome, or SBS¹—a rare condition in which your body cannot absorb enough nutrients from the food you eat.

SBS is a challenging condition for patients, their families, and caregivers alike. With the right care, though, many of the challenges associated with the condition can be mitigated and overcome.

Some people with SBS may need to receive their nutrients intravenously through parenteral nutrition (PN) to stay healthy. Not only can this be accomplished in the hospital, but parenteral nutrition can continue at home allowing you to go on with your life! We at Nutrishare are working to transform home parenteral nutrition (home TPN) and SBS care, helping our patients with SBS thrive.

Read on to learn more about SBS, its causes and symptoms, how SBS can be treated, and how Nutrishare's unique approach to home TPN helps our patients take back control of their lives.

What is Short Bowel Syndrome (SBS)?

Short bowel syndrome (SBS), is a malabsorption disorder that prevents your body from getting enough nutrients from the food you eat. Normally, the food you eat is broken down (digested) throughout your digestive system and absorbed to be used throughout your body. However, with SBS, the body's ability to digest and absorb nutrients from food may be impaired. When SBS is severe, malnutrition, fatigue, and other symptoms may occur.

SBS often results in a radical shift in one's diet, temporarily or permanently. PN is frequently employed, either in the short or long term, to supplement the body's impaired ability to absorb nutrients.

What is the Cause of SBS?

The root cause of SBS is a lack of a functional small intestine, which normally performs the most work to digest and absorb nutrients from your food. In many cases, SBS develops as a result of the surgical removal of your small intestine due to conditions such as Crohn's Disease, tumors of the small intestine, or injury and trauma to the small intestine².

Surgical complications result in around half of all SBS cases. Other reasons include volvulus, in which the small intestine twists around itself and causes a bowel obstruction, and necrotizing enterocolitis, a condition mostly affecting premature and low birth weight newborns.

The condition of being born with an abnormally short small intestine is known as congenital short bowel; congenital SBS is often associated with volvulus and other malrotations of the small intestine, though the exact cause is still unknown.

SBS is a complex disease, and the specific symptoms and severity of SBS vary from person to person. In some cases, the requirement for PN can be short-term lasting for a span of a few weeks or months. In other circumstances, it can be a lifelong need.

Short Bowel Syndrome Symptoms

Because SBS is a condition that prevents the body from properly digesting food, symptoms of SBS³ may include:

- Abdominal pain and cramps
- Gas
- Diarrhea
- Greasy and foul-smelling stools
- Fatigue
- Lactose intolerance
- Malnutrition
- Weight loss



Diagnosis of SBS

SBS generally occurs when your body has less than six feet of functional small intestine remaining (the small intestine typically ranges between nine and thirty-four feet long, with an average length of 20 feet) although this length can vary and you are unable to maintain your nutrition or fluid status on your own.

If you are experiencing symptoms consistent with SBS, such as the ones listed above, your doctor's work to diagnose your condition⁴ will begin with an exam, history, and other tests in order to screen for nutrient and electrolyte deficiencies.



If deficiencies in key nutrients consistent with SBS present themselves in these tests, your doctor may next employ imaging procedures such as X-rays or a CT or MRI scan, which can also be useful to detect obstructions or changes to your intestines characteristic of SBS. Diagnosis of SBS can also involve an endoscopy, which visually examines the esophagus, stomach, and duodenum, and a colonoscopy, which examines the colon.

SBS Complications

Vitamin and nutrient deficiencies are some of the most common complications that can develop as a result of SBS⁵. These complications produce symptoms such as anemia, muscle spasms, bruising, and bone pain, among others.

Deficiencies in vitamin A, for example, can lead to night blindness or corneal ulcerations. Deficiencies in vitamin B can lead to anemia, irregular heartbeats, or peripheral neuropathy. And deficiencies in vitamin D can lead to rickets in children and osteoporosis in adults. Vitamin E and vitamin K deficiencies can cause a loss of voluntary muscle coordination and bleeding under the skin. A deficiency of zinc can lead to inflammation of the mucous membranes of the mouth and alopecia, and iron deficiency can cause weakness, fatigue, and shortness of breath.

The key to mitigating and preventing these complications is proper treatment, and this is why nutritional supplementation is so crucial for SBS patients. The purpose of PN is to ensure that the body receives all the nutrients it needs to prevent many of the above symptoms from manifesting if the absorption is inadequate.

People with SBS who also receive home TPN may have an increased risk for developing long-term complications such as bacterial infections, thrombosis (blood clots blocking veins or arteries), gallstones or kidney stones, liver disease or fatty liver, and acidosis (an overabundance of acids in bodily fluids). Sepsis, an extreme and life-threatening reaction to an infection, can also occur as a complication.

An experienced clinical team and home TPN provider is also crucial to maintaining one's health with SBS.

How Do You Treat SBS?

Treatments for SBS vary depending on severity, which parts of the small intestine are affected, and whether or not the colon is still intact. Medications such as anti-diarrheal medications, lactase supplements, and proton pump inhibitors can be employed to reduce symptoms such as diarrhea, lactose intolerance, and excess stomach acid, respectively.

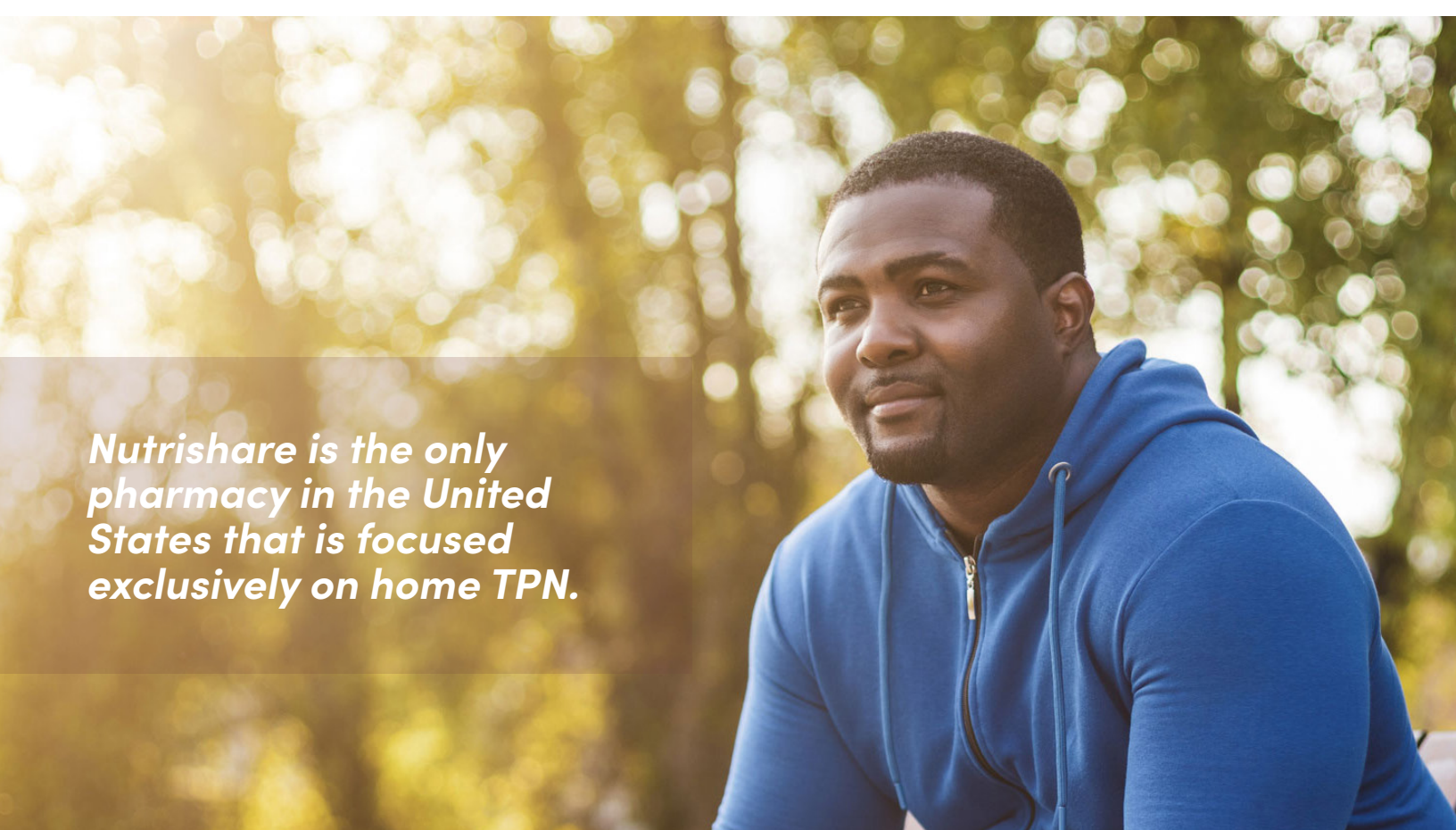
An important tool for treating SBS is nutrition care and management. Depending on the remaining length of small bowel and capacity for absorption of nutrients, modification of oral intake may be possible while some people may require nutrition support intravenously or using enteral nutrition where a feeding tube is placed into the stomach or small intestine.

Many people with SBS cannot eat as much food as people without the condition and may need to avoid certain foods altogether in order to mitigate the symptoms associated with SBS. TPN bypasses the intestines and is absorbed directly into the bloodstream to fill a vital role in making up for the body's lost nutrients, mitigating symptoms, and maintaining a better quality of life.

Since the cause of SBS is a deficiency in how much of the small intestine's length is available for nutrient absorption, in some cases there are also surgical options for treating SBS in children and adults.

Some surgical procedures such as the Bianchi procedure and serial transverse enteroplasty (STEP)⁶ focus on lengthening the intestine so that there is more intestinal surface area available to absorb nutrients. Others may be employed to slow the passage of food through the intestine so that more nutrients are absorbed by the length of functional intestine available.

When deemed appropriate, a small bowel transplant⁷ may also be used to treat SBS.



Nutrishare is the only pharmacy in the United States that is focused exclusively on home TPN.

Short Bowel Syndrome Diet

With SBS, nutrient intake is affected, and therefore changes in diet may improve absorption and help manage symptoms⁸. The small intestine is tasked with absorbing carbohydrates, proteins, fats, vitamins, and minerals from the food you eat and is divided into three sections—the duodenum, jejunum, and ileum—which all play different roles in digesting and absorbing nutrients. The jejunum has the largest surface area of the three sections and plays the biggest role in digesting and absorbing nutrients. Third and last is the ileum, which leads into the large intestine and has a major role in absorbing vitamin B12 and bile salts.

The human body is very adaptable, and it is possible for the remaining sections of the intestines to “learn” how to play the roles of the sections that have been lost or removed, though how much someone with SBS can regain the full range of their bodies’ digestive capabilities depends on the particulars of their condition.

Some people need PN for the short term as their body heals and adapts; for others, PN is a long-term necessity. A patient with SBS may slowly increase their food intake while their digestive system learns to adapt to its new condition, with PN acting as a supplement. Other patients may depend exclusively on TPN.

The oral diet for a person with SBS should be individualized for their GI anatomy, tolerances, and food preferences with the help of a Registered Dietitian with expertise in gastrointestinal disorders, especially SBS. Often instead of three large meals per day, their diet consists of about six to eight small meals. Small, frequent meals, eaten slowly and chewed well to make for easier absorption, cause less stress on the bowel, and also lessen the symptoms associated with SBS.

Beverages are best drunk in between meals, not with them, so as to not push food through the digestive system too quickly. In general people with SBS tolerate protein (fish, chicken, lean meats, eggs, and tofu) and complex carbohydrates (starchy foods, cereals, potatoes, rice or pasta, etc.), with moderate or low fat intake (oils, butter, mayonnaise, etc.). High-sugar foods should be avoided or limited.

DIET RECOMMENDATIONS

Recommended



Avoid or Limit



Managing SBS with Total Parenteral Nutrition

Parenteral nutrition (PN) delivers nutrients intravenously through a pump and an IV bag, bypassing the digestive system to bring nutrients straight to the rest of the body. For many with SBS, PN has saved countless lives since its development in the 1960s.

Many people with SBS rely on home TPN—in fact, well over half of all of Nutrishare's home TPN consumers have SBS⁹. Home TPN helps SBS patients ensure proper nutrition and maintain their health in the comforts of their own homes. Often, these individuals are eating along with receiving Home TPN.

Nutrishare provides a specialized team of healthcare providers, including clinicians who specialize in SBS care. Among our staff are board-certified nutrition support pharmacists and certified nutrition support clinicians - nurses and dietitians focused on providing our patients with all the care needed to achieve superior clinical results and thrive. Our team of clinicians works together with your doctor and dietitian to meet your nutrition needs in the best way possible.

How Nutrishare Can Help

Nutrishare is more than just a pharmacy.


Nutrishare is the only pharmacy in the United States that is focused exclusively on home TPN. Understanding the nutritional challenges our patients face and their wants and needs are all foundational to our system of care, which is designed around helping our patients achieve superior clinical results. We believe in ensuring a higher standard of home TPN care.

One of the best ways to manage long-term TPN is being an informed patient. We are focused on empowering our patients through education, support, and individualized one-to-one clinical care. A Nutrishare patient has support from a dedicated clinician focused solely on their complete nutrition care working in concert with the patient, family, and clinical management team.

Our patients can have their supplies delivered nationwide—we have patients who have done things they once thought they would never do again, such as traveling all across the country! We make sure that our SBS patients are aware of all of their options for treating and managing their conditions and help them feel confident that they are making the best choices for their treatment.



Our SBS patients report declines in hospitalization, fewer catheter complications, and a vastly reduced risk of other complications associated with SBS under our care.

A photograph of two middle-aged men walking through a lush green forest. The man on the left is wearing a dark green quilted jacket over a teal shirt and khaki pants. The man on the right is wearing an orange jacket over a grey sweater and blue jeans. Both are smiling and appear to be engaged in conversation.

Nobody in the Nutrishare Neighborhood faces the challenges of their conditions alone.

Get Started With Nutrishare

Becoming a part of Nutrishare brings our patients into a wider community of patients, caregivers, and physicians through our Nutrishare Neighborhood program, which makes use of regular virtual gatherings with fellow home TPN consumers, consumer education seminars by clinical experts, a quarterly newsletter, and consumer stories to empower our patients as well as their caregivers and physicians.

Nobody in the [Nutrishare Neighborhood](#) faces the challenges of their conditions alone. Through our Nutrishare Neighborhood, countless people have made lasting friendships and learned how to best manage their conditions to live their lives to the fullest.

Our services are accepted by most insurance plans as well, ensuring a wide range of treatment capability around the country.

[Get started with an Insurance Pre-check](#)



Sources

¹ Short Bowel Syndrome and Crohn's Disease – Crohn's & Colitis Foundation. Crohn's & Colitis Foundation. (n.d.). Retrieved October 10, 2022, from <https://www.crohnscolitisfoundation.org/sites/default/files/legacy/assets/pdfs/short-bowel-disease-crohns.pdf>

² Massironi, S., Cavalcoli, F., Rausa, E., Invernizzi, P., & Braga, M. (2019, December 28). Understanding short bowel syndrome: Current status and future perspectives. *Digestive and Liver Disease*. Retrieved October 10, 2022, from [https://www.dldjournalonline.com/article/S1590-8658\(19\)30922-3/fulltext](https://www.dldjournalonline.com/article/S1590-8658(19)30922-3/fulltext)

³ Lehrer, J., Fraser, M., & Watson, L. R. (Eds.). (n.d.). Short Bowel Syndrome in Adults. Cedars Sinai. Retrieved October 10, 2022, from <https://www.cedars-sinai.org/health-library/diseases-and-conditions/s/short-bowel-syndrome-in-adults.html>

⁴ Mayo Foundation for Medical Education and Research. (2022, January 6). Short bowel syndrome. Short Bowel Syndrome – Diagnosis & treatment. Retrieved October 10, 2022, from <https://www.mayoclinic.org/diseases-conditions/short-bowel-syndrome/diagnosis-treatment/drc-20450377>

⁵ Short bowel syndrome. NORD (National Organization for Rare Disorders). (2021, February 1). Retrieved October 10, 2022, from <https://rarediseases.org/rare-diseases/short-bowel-syndrome/>

⁶ Pediatric bowel lengthening surgery: Bianchi and step. Children's National Hospital – Ranked #5 in the Nation and #1 for Newborn Care. (n.d.). Retrieved October 10, 2022, from <https://childrensnational.org/visit/conditions-and-treatments/surgical-techniques/bowel-lengthening-surgery-bianchi-and-step>

⁷ NHS. (2019, September 16). Small bowel transplant. NHS choices. Retrieved October 10, 2022, from <https://www.nhs.uk/conditions/small-bowel-transplant/>

⁸ Flesher, M. (2020, March 18). Short bowel syndrome and Diet. Gastrointestinal Society. Retrieved October 10, 2022, from <https://badgut.org/information-centre/health-nutrition/short-bowel-syndrome-and-diet/>

⁹ Short bowel syndrome. Nutrishare. (2022, October 4). Retrieved October 10, 2022, from <https://nutrishare.com/education/short-bowel-syndrome/>