

Gastroenterology-2013: Short bowel syndrome: Recent advances - Trevor A. Winter- Stanford University School of Medicine

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Your bowels are made up of two parts -- the large intestine (the colon) and the small intestine. Short bowel syndrome is a condition in which your body can not absorb enough nutrients from the food you eat. The small intestine is where most of the nutrients you eat during digestion are absorbed into your body. Short bowel syndrome is a group of issues linked to low nutrient absorption. Short bowel syndrome typically occurs in people who had removed at least half of their small intestine, and often removed all or part of their large intestine, significant damage of the small intestine, poor motility, or movement, inside the intestines, surgery to treat conditions such as Crohn's disease, gastroschisis, and internal hernia or damaged by illness or injury. Depending on how well the small intestine works, short bowel syndrome may be mild, moderate, or severe. In infants, short bowel syndrome most commonly occurs after surgery to treat necrotizing enterocolitis. Some children are born with an abnormally short small intestine or with a part of their bowel missing.

The main symptom of short bowel syndrome is diarrhoea—loose, watery stools. Diarrhoea can lead to dehydration, malnutrition, and weight loss. Dehydration means the body lacks enough fluid and electrolytes including sodium, potassium, and chloride to work properly. When compared to solid stools, loose stools contain more fluid and electrolytes. These problems can be severe without proper treatment can be life threatening. Other signs and symptoms may include bloating, cramping, fatigue, or feeling tired, foul-smelling stool, heartburn, vomiting, and weakness. People with short bowel syndrome are often more likely to develop allergies and sensitivities to the food, such as allergy to lactose. Lactose intolerance is a condition in which people who eat or drink milk or milk products have digestive symptoms such as bloating, diarrhoea and gas. The complications of short bowel syndrome may include malnutrition, peptic

ulcers, kidney stones, small intestinal bacterial overgrowth. People with short intestine syndrome are unable to consume enough food water, vitamins, minerals, protein, fat, calories and other nutrients. What nutrients the small intestine has trouble absorbing depends on which section of the small intestine has been damaged or removed.

Short bowel syndrome treatment typically involves special diets and nutritional supplements, and a vein (parenteral nutrition) may require nutrition to prevent malnutrition. To diagnose short bowel syndrome, blood or stool tests to measure nutrient levels is recommended. Other tests may include imaging procedures, such as an X-ray with a contrast material (barium X-ray), computerized tomography (CT) scan, magnetic resonance imaging (MRI), and CT or MR Enterography, that can show obstructions or changes to the intestines. Treatment has two objectives: to alleviate symptoms, and to give you enough vitamins and minerals. The type of medication that you are having depends on how serious the condition is. Your treatment choices for short intestine syndrome will depend on which parts of your small intestine are affected, whether your colon is intact and whether your desires are your own. You may need to have several small meals per day for mild cases, along with extra fluids, vitamins, and minerals. Your doctor can also give you diarrhoea medication. For moderate cases, treatment is the same but you may need extra fluids and minerals through an IV from time to time. For more serious cases, you may get an IV feeding tube instead of eating meals. Or, you may have a tube placed directly into your stomach or small intestine. If your condition improves enough, you can stop the tube feedings.

Short bowel syndrome treatment may include:

- **Nutritional therapy.** People with small bowel syndrome will have to follow a special diet

and take supplements for nutrition. To prevent malnutrition, some people may need to get nutrition through a vein (parenteral nutrition) or a feeding tube (enteral nutrition).

- **Medications.** In addition to nutritional support, your doctor may recommend medicines to help manage syndrome of the short intestine, such as medicines that help control stomach acid, decrease diarrhoea or improve your intestine. Doctors may recommend that children and adults with short bowel syndrome undergo surgery.
- **Surgery.** Types of surgery include procedures for slowing nutrient passage through the intestine or an intestinal lengthening procedure (autologous gastrointestinal reconstruction), as well as small intestines

Short bowel syndrome is defined as “reduction of functioning gut mass below the minimum amount necessary for adequate water and electrolyte absorption and adequate digestion and absorption of nutrients”. This may occur when there is less than 200 cm of functional gut remaining. Most digestion and absorption occurs in the first 150 cm. Vitamin B12 and bile salts are absorbed in the distal ileum. The distal ileum provides a brake, through the effects of Peptide YY (PYY), and the ileocecal valve. PYY inhibits vagally stimulated gastric acid secretion, and gastric and intestinal motility. Following small bowel resection, gastric hyper secretion occurs, and proton pump inhibitor therapy is therefore required in the early management of patients. Glucagon-like peptide 2 stimulates gut hyperplasia, and increases the absorptive capacity of the residual small bowel. The amino acid glutamine is also thought to enhance intestinal adaption. The presence of the colon is associated with increased PYY levels, providing a “colonic brake”. Colonic bacteria produces short chain fatty acids from non-absorbed complex carbohydrates, which contributes significantly to nutrient and fluid balances. Problems of fluid and electrolyte balance generally occur when there is less than 120 cm small bowel remaining. Less than 50 cm of small bowel (with an intact colon), and less than 100 cm without a

colon invariably necessitates long-term parenteral nutrition. Management of SBS involves use of antidiarrheal agents (loperamide, tincture of opium), to reduce diarrhoea, and increase “dwell” time for absorption. In patients with an intact colon, dietary maneuvers include use of a high complex carbohydrate (60%), and a low fat diet. Patients should also be on a low oxalate diet to prevent the occurrence of oxalate stones. In patients without a colon, a high fat diet is generally implemented. Teduglutide, a GLP-2 analog has recently been shown to significantly improve intestinal absorption, with a decreased requirement for TPN. Surgical options include segmental reversal of the small bowel (Biachi procedure), and serial transverse enteroplasty (STEP procedure). Small bowel transplant is considered in patients who have developed life threatening complications of short bowel syndrome and TPN therapy.