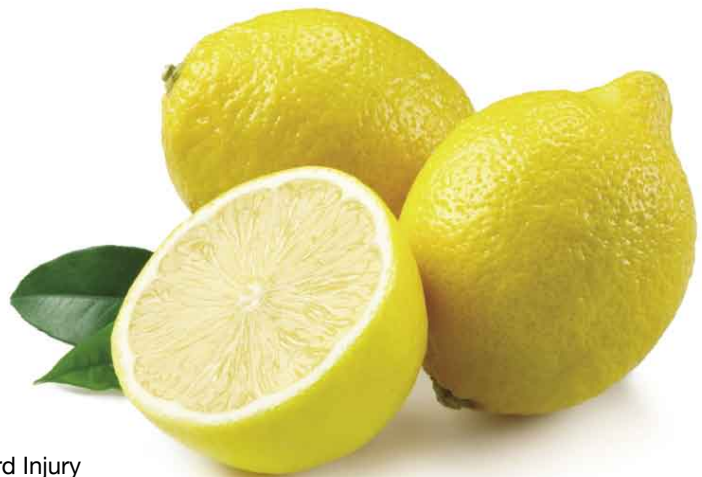


CHAPTER 1

Nutrition for Digestion

- Nutrition if you use muscle relaxants (Antispasmodics)
- Nutrition to enhance peristalsis
- Nutrition for stomach ulcers
- Nutrition for reduced stomach acid secretion
- Nutrition for gastroesophageal reflux disease (GERD)
- Nutrition if you use antibiotics
- Nutrition for low digestive enzyme activity
- Nutrition for gallbladder problems & gallstones
- Nutrition for pancreatitis
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- Nutrition for candida



SCI and Digestion

Great health begins with a healthy digestive system.

If your body is unable to properly digest and absorb vitamins, minerals and other essential nutrients from food, it can cause numerous nutritional deficiencies. This in turn can cause your body to not function to its maximum potential and contribute to illness and disease.

The most healthy, wholesome, well-balanced diet will go to waste if your body is unable to digest and absorb the foods you eat. Therefore, good digestion is the foundation to maintaining your overall health and helping to prevent illness.

It is well documented that a large percentage of people with spinal cord injury (SCI) have multiple nutrient deficiencies and show signs of malnutrition. These deficiencies can contribute to the development of many common, recurring and potentially life-threatening secondary health complications associated with SCI, such as a weakened immune system, constipation, pressure sores, and delayed wound healing, as well as cardiovascular and respiratory disease.

There are three primary functions of the digestive system:

- 1) Digestion of food**
- 2) Absorption of nutrients**
- 3) Elimination of waste**

This chapter will focus on 11 direct and indirect gastrointestinal disorders (specifically involving the digestion and absorption processes) which can occur as a result of SCI. It will explain why these disorders commonly occur and recommend foods, herbs & supplements to address and help prevent them. The elimination process is discussed in Chapter 2 - Neurogenic Bowel.

Common Conditions Post-SCI

It is very common for people with SCI who may have had few or no symptoms of indigestion, malabsorption, reflux, gas, bloating or gallstones pre-injury to suddenly be experiencing chronic problems with these conditions post-SCI. When the digestive process is compromised, every cell in the body is affected.



Common Nutrient Deficiencies Experienced by People with SCI

Below is a list of common nutrient deficiencies people with SCI experience, the role they play in your health and how these deficiencies can contribute to the development of common SCI-related secondary health conditions:

COMMON DEFICIENCY	ROLE IN BODY	LACK CAN CONTRIBUTE TO
Vitamin A	<ul style="list-style-type: none"> • required for strong immune system • collagen production/skin healing • antioxidant 	<ul style="list-style-type: none"> • increased susceptibility to infection • delayed wound healing
Vitamin B1	<ul style="list-style-type: none"> • important role in nerve cell function • helps build and maintain the protective covering around nerve cells called the myelin sheath • essential for energy production 	<ul style="list-style-type: none"> • depression • fatigue • constipation
Vitamin B2	<ul style="list-style-type: none"> • energy production 	<ul style="list-style-type: none"> • fatigue
Vitamin B6	<ul style="list-style-type: none"> • plays an important role in over 60 metabolic reactions in the central nervous system • involved with relaxation, mood, and sleep 	<ul style="list-style-type: none"> • depression • glucose intolerance • impaired nerve function • insomnia
Vitamin B9 (folic acid)	<ul style="list-style-type: none"> • involved in manufacturing DNA and neurotransmitters • protein metabolism 	<ul style="list-style-type: none"> • poor wound healing • diarrhea • anemia • depression • insomnia • irritability • fatigue • osteoporosis
Vitamin C	<ul style="list-style-type: none"> • essential for collagen production/skin integrity • liver detoxification • immune health • supports adrenal gland function • powerful antioxidant 	<ul style="list-style-type: none"> • pressure sore development and/or poor wound healing • weakened immune system/susceptibility to illness • depression • cardiovascular disease • constipation
Vitamin D	<ul style="list-style-type: none"> • critical for the absorption of calcium and bone health • supports immune system 	<ul style="list-style-type: none"> • osteoporosis • depression • weakened immune system/susceptibility to illness
Vitamin E	<ul style="list-style-type: none"> • powerful antioxidant • immune health 	<ul style="list-style-type: none"> • free radical damage, which can contribute to cardiovascular disease and poor wound healing • muscle weakness and poor coordination
Vitamin K	<ul style="list-style-type: none"> • essential for normal blood clotting • bone health 	<ul style="list-style-type: none"> • osteoporosis • compromised blood clotting
Calcium	<ul style="list-style-type: none"> • critical for strong bones • required for nerve transmission • cardiovascular function 	<ul style="list-style-type: none"> • osteoporosis • muscle cramps • high blood pressure

Common Nutrient Deficiencies People with SCI Experience (continued)

COMMON DEFICIENCY	ROLE IN BODY	LACK CAN CONTRIBUTE TO
Magnesium	<ul style="list-style-type: none"> involved in the production of energy, nerve conduction, muscle contraction and cardiovascular function 	<ul style="list-style-type: none"> heart disturbances anxiety fatigue physical weakness problems with nerve conduction and muscle contraction muscle cramps insomnia susceptibility to stress
Potassium	<ul style="list-style-type: none"> involved in cardiovascular function regulation of water balance muscle and nerve function kidney and adrenal function 	<ul style="list-style-type: none"> heart disturbances edema muscle weakness fatigue irritability
Zinc	<ul style="list-style-type: none"> critical to the entire body's immune and repair process skin health 	<ul style="list-style-type: none"> decreased healing time of pressure sores poor immune function/recurrent infections poor skin condition
Fiber	<ul style="list-style-type: none"> necessary for good digestion/bowel function maintaining balanced cholesterol levels maintaining balanced blood sugar levels 	<ul style="list-style-type: none"> constipation and bowel obstruction diarrhea gastrointestinal issues fatigue obesity high cholesterol

The root cause of nutritional deficiencies (such as the ones listed in the chart) can often be related to poor digestive function; individuals with SCI are at high risk of developing multiple gastrointestinal issues. However, with good nutrition and a healthy lifestyle, most, if not all, gastrointestinal disorders can be reduced or avoided by following the steps in this chapter.



Digestive Issues and SCI

Your digestive tract is 25-35 feet long. It is a complex, integrated system that consists of your mouth, esophagus, stomach and small and large intestines, as well as your salivary glands, liver, gallbladder and pancreas. Each system affects the others, so if one is not working well, it will decrease the function of the others and negatively impact your overall digestive process.

Your nervous and digestive systems are very closely interconnected. The nervous system connects the walls of your intestines to every corner of your body, and each of your organs has a supply of nerves connected to your intestines. Your gut's nerve supply is so complex that it has a network of over 100 million neurons that communicate with your brain and your immune system, affect your mood and emotions, and control your digestion.

Digestion is regulated by your autonomic nervous system, as well as hormones and other chemicals that control the movement and secretions of your digestive system. There are two arms of the autonomic nervous system – the parasympathetic nervous system and the sympathetic nervous system. The parasympathetic nervous system typically stimulates digestion, while the sympathetic system inhibits it.

Your autonomic nervous system may be affected after SCI, which can negatively impact peristalsis (the muscular contractions that propel food through the intestines). This in turn can slow the movement of food through your intestines, as well as cause gas, bloating and constipation.

The nervous system associated with your gut is so extensive that in 1996 Dr. Michael D. Gershon referred to the gut as our 'second brain'. So it is no wonder that an SCI significantly affects and impairs the digestive system.

After sustaining an SCI, many people are also suddenly consuming a number of prescription and over-the-counter medications. While necessary, many of these medications can negatively impact your digestive function and deplete certain nutrients from your body.

It is very common for individuals with SCI who had few or no symptoms of indigestion, malabsorption, gas, bloating, gallstones or reflux pre-injury to suddenly experience chronic problems with these conditions post-injury. Potentially making matters worse (depending on level of injury and loss of sensation), many individuals may not even be aware that they are experiencing gastrointestinal issues that could be contributing to other serious health problems.

It is important for you to be aware of these unique digestive risk factors, by paying close attention to your digestion and any potential signs of dysfunction. In doing so, you can make the necessary changes needed to support your digestion, and in turn, help prevent secondary health complications from developing.

Nutrition if you use muscle relaxants (antispasmodics)

Muscle relaxants are commonly used by individuals with SCI to help reduce spasms; however, they can also reduce the flow of your saliva. When your saliva flow is decreased it can not only lead to an uncomfortable condition referred to as dry mouth, but it can also affect your body's digestive and defense systems.

Saliva contains two very important substances:

- **Amylase** – a digestive enzyme (enzymes are proteins that help break down food into smaller pieces) which begins digesting starches into smaller sugars in your mouth
- **Antibodies** – help protect your digestive system and your entire body by destroying bacteria that may come in contact with your mouth

If saliva (the beginning of your digestive process) is inhibited, it can put an additional burden on the rest of your gastrointestinal system, potentially leading to issues such as gas and bloating.

If you are taking these muscle relaxants (antispasmodics) you need to do the following:

1 Chew your food well

This assists in the breakdown of food and reduces the burden on the rest of your digestive system.

2 Drink 6-8 cups of fluids/water every day

Drinking 6-8 cups of water, herbal tea or diluted juice will help produce essential digestive secretions, such as stomach acid, needed for optimal digestion. It also helps flush any harmful bacteria from your body.

Peristalsis

is the involuntary, wave-like muscular contraction that propels food through your entire digestive tract.

The gastrocolic reflex

is an automatic reflex of the large intestine (bowel) in response to food entering the stomach.

Nutrition to Enhance Peristalsis

In able-bodied individuals peristalsis occurs throughout the day, but is also stimulated by the gastrocolic reflex which occurs about 15 minutes after eating or drinking. Depending on the level and severity of your SCI, the gastrocolic reflex and peristalsis may be impaired, which chronically slows the movement of digested matter and waste through your digestive system.

Decreased peristalsis and the stagnation of digested food in your small intestine can contribute to:

- **Bacterial overgrowth** – potentially increasing your risk of illness
- **Increased fermentation** – the process where bacteria in your gut break down any undigested carbohydrates
- **Increased putrefaction** – the rotting of foods, such as proteins, in your gut

The by-products of fermentation and putrefaction are foul-smelling gases and toxins. This can contribute to chronic gas, bloating and abdominal discomfort – all common gastrointestinal problems for individuals with SCI.

On average, people pass gas 10-15 times a day, but excessive amounts of bloating and gas, as often experienced by individuals with SCI, are indications that something in the digestive system is out of balance.

There are several ways to naturally help stimulate peristalsis and support movement of digested food through your gut. These recommendations have none of the undesirable side effects caused by prescription medications, which are often used by individuals with SCI to increase the motility of the gastrointestinal tract.

Here are some simple and effective ways to help enhance peristalsis as well as reduce gas and bloating:

1 Eat and drink carminatives

Carminatives are foods and herbs that help reduce gas and relax intestinal muscles to allow gas to pass.

- **Drink fresh ginger or peppermint tea**
- **Chew on fennel and anise seeds**



2 Drink 6-8 cups of fluids/water a day

Water is essential in helping move matter more easily through your digestive tract. Keeping your body well hydrated by drinking 6-8 cups of water, herbal tea or diluted juice every day will help keep things moving. It's best to drink most of your fluids away from meals and only small amounts during meals.



3 Increase fiber

Increasing fiber in your diet is another effective way to help support peristalsis. Fiber, the indigestible matter in plants, helps create bulk in your stool, and keeps it moist and pliable to move more easily through your intestines.

Increase your fiber by eating more fruits with their skin (e.g., apples & pears), vegetables, peas, beans, lentils, oats & other whole grains. Or try taking a fiber supplement, such as whole husk psyllium or ground flax seeds.

4 Eat small, frequent meals

Eating stimulates the gastrocolic reflex and peristalsis, so consuming smaller, more frequent meals also helps to naturally support movement through your digestive tract.

5 Reduce/eliminate refined carbohydrates & processed foods

Reduce your intake of high glycemic foods (foods that increase blood sugar quickly). Foods that are high in simple or refined carbohydrates, such as white bread/bagels, white rice, white pasta, fiber-less cereals, baked potatoes, French fries, cakes, donuts, pastries, cookies, soda and candy can slow the motility of your intestinal tract. Specifically, when blood sugar levels rise too rapidly, sections of your small intestine (the duodenum and jejunum) propel digested matter through them at a slower rate.



Refined/processed breads, pasta and rice can act like glue in your gut, becoming very sticky, causing bowel transit time to slow even more. So avoid or eliminate processed foods as much as possible!

Nutrition for Stomach Ulcers

Your body produces a layer of slippery mucus to protect the lining of your intestinal track from highly acidic stomach acid and micro-organisms (such as fungi, bacteria and viruses).

After SCI, this protective mucus barrier is susceptible to degradation, which means not only can microorganisms penetrate your intestinal lining, making you more susceptible to illnesses, but corrosive stomach acid can damage your intestinal lining and lead to the development of ulcers and/or gastrointestinal bleeding.

Stomach ulcer symptoms:

- Abdominal discomfort approximately 45 to 60 minutes after eating
- Burning or aching that is usually relieved by taking antacids
- Abdominal tenderness

Stomach ulcers have been identified as one of the most common disorders of the digestive system during the first 4 weeks after SCI.

Lee & Ostrander,
The Spinal Cord Injured Patient

There are several factors that make individuals with SCI highly susceptible to the deterioration of the mucosal lining of the intestines, which can ultimately lead to ulcer development:

- **NSAIDs (Non-steroid anti-inflammatory drugs)** – while NSAIDs are used to address the pain and inflammation often experienced after SCI, they can also cause damage and inflammation to the lining of the digestive tract by blocking small protein messengers called prostaglandins. There are different types of prostaglandins that circulate throughout the body. Some prostaglandins cause pain and inflammation while others can lead to healing and repair. NSAIDs block all prostaglandins. Therefore, taking these medications might help eliminate pain, but they can also eliminate your body's ability to heal itself.
- **Nutrient deficiencies** – individuals with SCI are often deficient in numerous nutrients, including Vitamins A, C and E, all of which are necessary for maintaining the health of the intestinal wall and protective mucosal layer. NSAIDs also deplete Vitamin C.
- **Steroids** – long-term use of steroidal drugs, often used by individuals with SCI who experience chronic pain, can contribute to stomach and duodenal ulcers.

- **Stress** – causes the sympathetic nervous system to dominate over the parasympathetic nervous system. When this happens there is a decrease in blood flow to the gut. Good blood flow is necessary for maintaining the mucosal lining of the stomach. When blood flow is reduced during stress, the mucosal lining can deteriorate, making individuals more susceptible to ulcers.
- **H. pylori bacteria** – the increased susceptibility to the breakdown of the gastrointestinal lining makes individuals with SCI more vulnerable to a bacterium called H. pylori. This common bacterium can damage the protective mucus lining of the stomach and small intestine. Ideal conditions for H. pylori to flourish in are low stomach acid and low antioxidant levels (Vitamins A, C and E). Individuals with SCI are highly vulnerable to both of these conditions.

There are several nutrients that can help improve the strength and integrity of the intestinal lining and help reduce the development of ulcers:

1 Drink 6-8 cups of fluid/water a day

Water is essential to the production of the mucus lining in the intestines.

Drinking 6-8 glasses of fluid/water a day will help maintain this protective layer.



2 Eat foods rich in zinc, Vitamins A, C & E, glutamine & flavonoids

- **Vitamins A, C & E** – help repair and increase the strength of the intestinal lining, as well as enhance resistance to H. pylori.

These vitamins can all be taken in supplement form, or you can focus on eating foods rich in these vitamins such as sweet potato, carrots, spinach, broccoli, butternut squash, red/green peppers, broccoli, papaya, strawberries, Brussels sprouts, almonds, sunflower seeds & olives.

- **Zinc** – helps increase mucus production in the intestinal lining.

Zinc can be taken in supplement form or found in foods such as pumpkin seeds, sesame seeds, oats & yogurt.

- **Glutamine** – this amino acid accelerates the repair time of ulcers.

Glutamine can be consumed by drinking fresh cabbage juice, eating chicken, fish & eggs or taking it in supplement form.

- **Flavonoids** – are what give fruits and vegetables their vibrant colors. Flavonoids have many anti-ulcer activities as they help reduce inflammation, promote healthy arteries, help repair cellular damage and inhibit the H. pylori bacteria.

Sources of flavonoid rich foods include apples, red grapes, blackberries, blueberries, pomegranates, broccoli, cabbage & strawberries.



3 Increase your fiber

Fiber is associated with reduced rates of ulcers.

Fiber is found in fruits (such as apples, pears & berries) and vegetables (such as broccoli, carrots & spinach), legumes & whole grains.



4 Eat oats

Oats have demulcent properties, which means they help soothe inflamed and damaged tissues. Eating oatmeal on a regular basis is highly beneficial.

5 Drink aloe vera juice, meadowsweet, marshmallow root and/or slippery elm bark tea



- **Aloe Vera** - in cases of gastrointestinal bleeding, aloe vera juice can be very effective. Aloe vera is a plant that is filled with a gel, which contains compounds that act as astringents to help stop bleeding. This juice is soothing to an inflamed and irritated intestinal lining.

Aloe Vera can be taken in a pill, juice or tea form.

- **Meadowsweet** - contains many substances that help protect the mucus lining of the intestines. It acts as a natural anti-inflammatory helping to relieve an irritated intestinal lining and alleviate gas.
- **Marshmallow Root** - has a soothing effect on the gastrointestinal tract
- **Slippery Elm Bark** - has a soothing effect on the gastrointestinal tract

6 Take supplements: DGL licorice & HCL

- **DGL licorice** - this herb helps reduce inflammation, enhances blood flow to cells in the intestinal tract and promotes mucus secretion.

Studies show that DGL licorice is more effective at addressing ulcers than conventional antacid medications. Antacids deplete vitamin D, folic acid, B12 and the minerals calcium, iron and zinc. It also reduces stomach acid production, which in turn inhibits the digestion of proteins and minerals. DGL does not have these negative side effects.

Murray & Pizzorno, Encyclopedia of Natural Medicine

- **HCL** (Hydrochloric acid) - can help increase resistance to H. pylori.

This can be taken in supplement form.

7 Identify & avoid any food intolerances

Food intolerances can contribute to intestinal irritation, inflammation and damage. Milk, wheat, eggs and corn are some of the most common food intolerances.

Review the Food Elimination Diet in the Appendix.

Nutrition for Reduced Stomach Acid Secretion

Any kind of autonomic nervous system dysfunction, as experienced by individuals with SCI, can decrease your production of stomach acid, also known as hydrochloric acid (HCL).

When your HCL secretions are low, your entire digestive system will be weakened. Proper levels of stomach acid are essential for:

- **Breakdown of Proteins** - HCL helps break proteins down into amino acids, which are the building blocks of every cell in your body and critical for growth and tissue repair. This is important for individuals with SCI because protein is needed for wound healing, muscle building, liver detoxification and antibody production required for a healthy immune system.
- **Vitamin B12 absorption** - inadequate HCL secretion can lead to poor absorption of this vitamin. B12 is commonly deficient in individuals with SCI. Reduced levels of this nutrient can result in weakness, fatigue and nervous system problems.
- **Mineral absorption** - insufficient HCL levels can cause mineral deficiencies and this in turn can lead to a host of health problems. Essential minerals such as calcium, magnesium and zinc are necessary to help prevent the development of serious and potentially life-threatening SCI complications such as osteoporosis, cardiovascular disease and pressure sores.
- **Support the immune system** - HCL helps to kill microbes that are ingested with food.
- **Proper stomach emptying time** - when your HCL levels are very low, stomach emptying time can be delayed. When this happens bile can be regurgitated from your small intestines up into your stomach. Bile can be highly irritating to the stomach lining and cause discomfort. Studies indicate that in the initial weeks following SCI, there is significant slowing of stomach emptying.
Bono, Spinal Cord Medicine Principals and Practice
- **Secretion of Pancreatic juice** - if the food leaving your stomach is not made acidic enough by sufficient levels of stomach acid, your pancreas will not secrete sufficient amounts of pancreatic juice to help break down carbohydrates, fats and proteins. Your gallbladder will also not secrete sufficient amounts of bile into the small intestines to help emulsify fats. The decreased secretion of pancreatic enzymes and bile can also contribute to fermentation, putrefaction, gas and bloating, as well as inflammation and the development of food allergies. These conditions not only put extra burden on your digestive system, but the fermentation by-products and gases may be absorbed from your intestinal tract into your blood stream. These toxic wastes are then carried throughout the body putting additional burden on the liver and kidneys to detoxify.

Without enough bile, fats are not sufficiently emulsified. As a result, fats combine with minerals and ultimately contribute to the development of constipation, a very common secondary health complication for individuals with SCI.

Toxic waste products irritate the nerve endings in your gut, which are connected to other organs and membranes throughout your body. Because of this irritation, irregular nerve impulses are sent to organs or other areas of your body causing discomfort or pain.

Symptoms of low HCL

- Constipation or diarrhea immediately after eating
- Indigestion
- Undigested food particles in stool
- Weakened immune system
- Stools poorly formed, pale, greasy & floating
- Candida
- Allergies
- Weak cracked fingernails
- Bloating, belching, burning & gas
- Sense of fullness after eating
- Nausea after taking supplements
- Poor wound healing
- Iron deficiency
- Acne
- Bad breath
- Indigestion

The production of HCL naturally decreases as you age, so it's important to support your digestive system as you get older.

Given the importance of maintaining appropriate HCL levels, there are several ways that you can help support adequate acid levels and proper digestion:

1 Drink apple cider vinegar diluted in water

Vinegar is very similar to the stomach acid your body makes. Consuming apple cider vinegar diluted in water prior to meals is a simple and cost-effective way of increasing acidity.

2 Take HCL supplements

Take 1-2 HCL supplements, in the form of betaine hydrochloric acid, at every main meal to help breakdown protein and absorb minerals.

3 Drink 6-8 cups of fluid/water a day

Drinking water, particularly filtered, room temperature water helps your body produce HCL - so keep yourself well hydrated. However it is important not to drink too much with meals, especially ice cold or carbonated beverages, as this will shut down the digestion process. Herbal teas and fresh lemon juice in water can be included as part of your fluid intake.

4 Eat small meals more often

Large meals put greater demand on your digestive system. Smaller meals are easier on your body to digest.

5 Decrease intake of red meat, dairy products, processed foods & coffee

All of these foods contribute to low HCL production, so minimize or eliminate these from your diet.



Diseases associated with low stomach acid:

- Addison's disease
- Celiac disease
- Eczema
- Hepatitis
- Osteoporosis
- Rheumatoid arthritis
- Asthma
- Diabetes
- Gallbladder disease
- Chronic hives
- Pernicious anemia
- hyperthyroidism / hypothyroidism

Nutrition for Gastroesophageal Reflux Disease (GERD)

GERD is the condition in which stomach acid, bile and partially digested food in the stomach back up into the esophagus. Normally, the esophageal sphincter muscle pinches itself shut and prevents these substances from going back up, but if this sphincter is not functioning properly, these fluids can seep up into your esophagus causing burning. This burning sensation is often referred to as heartburn.

“Gastro” refers to the stomach.

“Esophageal” refers to the esophagus (the tube that carries food from the mouth to the stomach).

“Reflex” means to back up or flow backwards.

Individuals with SCI are at greater risk for developing GERD for several reasons:

- Reduced diaphragm strength which can affect esophageal sphincter pressure
- Delayed gastric emptying (food leaving the stomach into the small intestine)
- Immobilization and reclined positioning in the wheelchair
- Medications individuals with SCI commonly take, such as antispasmodics, tricyclic antidepressants, calcium channel blockers & meperidine

Symptoms of GERD

- Burning sensation above stomach
- Excessive salivation
- Belching
- Regurgitation
- Sour taste in mouth

Nutritional recommendations to help reduce GERD symptoms include the following:

1 Eat plenty of fiber

GERD is not common in people who eat high fiber diets, so eating plenty of fruits, vegetables, legumes and whole grains may help you avoid this condition.



2 Take HCL supplements

Symptoms of heartburn are often caused by too little stomach acid as opposed to too much. Supplementation with HCL at every meal has shown to help decrease these symptoms. Taking HCL supplements ideally with enzymes and bile will help ensure proper digestion and absorption of food and potentially help prevent partially digested foods from traveling back up into your esophagus.

3 Take probiotics

Taking daily probiotic supplements containing ‘good’ bacteria helps to maintain a healthy intestinal flora balance.

4 Drink warm water & lemon juice and/or cabbage juice

- **Warm water with fresh lemon juice** - before meals helps stimulate stomach acid production (warm water is preferred over cold or ice water because these decrease the digestive process).
- **Cabbage juice** - helps relieve heartburn. Cabbage contains a high content of glutamine, an amino acid that has an affinity for repairing the intestinal lining.



5 Drink herbal teas

- **Slippery Elm Bark, Marshmallow Root or Meadowsweet teas** - are very soothing to the lining of the intestinal track and can help relieve symptoms of heartburn.
- **Fresh ginger tea** - can help relieve symptoms of gas, bloating and discomfort.

6 Don't over eat

Eating large, heavy meals can cause gastric juices to flow up into your esophagus. Therefore eating smaller more frequent meals throughout the day is recommended.



7 Reduce/avoid carbonated drinks, fried foods, chocolate, peppermint, alcohol and coffee

Eating these can either increase abdominal pressure or decrease the tone of your esophageal sphincter contributing to GERD.

Antacids, Proton Pump Inhibitors (PPIs) or H2 blockers

Antacids neutralize stomach acid, while PPI's and H2 blockers reduce gastric acid production. Individuals with SCI often use these to relieve the heartburn symptoms associated with GERD. These types of medications are commonly used because there is a widely accepted misconception that heartburn is caused by too much stomach acid, when in fact, the most frequent cause of heartburn is not enough stomach acid.

Taking these medications may temporarily help relieve symptoms, but this only reinforces the root cause of the problem by lowering stomach acid further, leading to digestive dysfunction, nutrient deficiencies and make an already under active stomach weaker. Therefore it may be beneficial to address GERD on an ongoing basis with more natural methods described above.

Optimal stomach acid pH ranges between 1.5 to 2.5, however the use of antacids, PPI's and H2 blockers can raise the pH to above 3.5. This increase in pH inhibits the action of digestive enzymes involved in protein digestion, decreases absorption of folic acid, B12 & D, calcium and iron and can be irritating to your stomach lining.

Nutrition if you use Antibiotics

Optimal digestion depends on healthy levels of intestinal flora, also known as 'good' bacteria because they perform the following roles:

- Good bacteria, such as *Lactobacillus acidophilus* attach to your intestinal lining to help prevent parasites or other pathogens from taking hold in your gut
- Produce lactic acid, which helps make the intestines unsuitable for pathogens to thrive in
- Produce hydrogen peroxide, which kills candida (candida is an overgrowth of yeast that individuals with SCI are susceptible to due to long term antibiotic use)
- Enhance peristalsis
- Increase absorption of minerals, such as calcium, copper, iron and magnesium
- Help make Vitamin K and B vitamins and help maintain the health of your intestinal tract
- Help prevent and treat antibiotic associated diarrhea



Individuals with SCI who undergo surgery are often given antibiotics to avoid the development of potentially life-threatening infections. Many individuals with SCI also continue to take antibiotics on an ongoing basis to treat chronic conditions such as bladder infections and pressure sores. While short-term antibiotic use is critical to help fight serious infections, long-term use can be detrimental to your digestive and immune systems, predisposing you to further infections.

Antibiotics mean “anti-life”. While they are very effective at destroying bad, often life-threatening bacteria, chronic antibiotic use can lead to resistant strains of bacteria that will need to be treated by different types of antibiotics, creating a vicious cycle of dependency. Most antibiotics cannot distinguish the difference between good bacteria and bad bacteria, so when you take them you wipe out the good with the bad, upsetting the ideal 85:15 good bacteria: bad bacterial ratio of

Stress, NSAIDs & steroid medications also upset the delicate balance of intestinal flora, therefore further compromising your digestive and immune functions.

1 Eat fermented foods

Fermented foods are high in good bacteria. Fermenting is the process where good bacteria break down carbohydrates and proteins in foods to help preserve them.

Fermented foods include yogurt, kefir, sauerkraut, miso & pickled vegetables.

2 Take probiotic supplements

If you have taken a course of antibiotics, it is essential that you take probiotic supplements for 2 to 3 months to help re-populate your gut with good bacteria. Probiotics, meaning “for life”, are live micro-organisms or ‘good bacteria’, similar to those naturally found in your gut.

There are many different bacterial species that live in your intestines and each prefers different locations within your gut to perform their various roles. When taking probiotic supplements, it is important to take ones with at least 8 billion active microorganisms containing at least several different species, such as *Lactobacillus acidophilus* and *Bifidobacterium*.

Nutrition for Low Digestive Enzyme Activity

The stress that many individuals with SCI experience not only contributes to decreased peristalsis, reduced HCL secretion, diminished mucosal lining and depleted intestinal flora, but it also puts individuals with SCI at higher risk of insufficient digestive enzyme activity.

Digestive enzymes called protease, amylase and lipase help further digest proteins, carbohydrates, and fats respectively. When you are stressed, physiological changes occur, which in turn make your digestive enzymes less effective. When this happens, the digestion of fats, proteins and carbohydrates may all be reduced. This in turn, can have adverse effects on every cell in your body.

Symptoms of insufficient enzyme activity

- Gas
- Constipation
- Chronic allergies
- Colds
- Sinus infections
- Bloating
- Discomfort after eating/heartburn
- Chronic fatigue
- Diverticulitis
- Irritable bowel syndrome

If your digestive enzyme activity is insufficient, your pancreas will have to work harder to produce more digestive enzymes to meet the demands of the foods you eat. **To reduce the burden on your pancreas and help your body digest and absorb nutrients do the following:**

1 Eat lots of fresh, raw fruits & vegetables

Raw fruits and vegetables contain food enzymes. Food enzymes however are very sensitive to temperature and will be destroyed if they are heated over 118 degrees F., so eating them in their raw state is the best way to assist your digestive function. Juicing helps to liberate enzymes from fruits and vegetables.

Enzymes are found in abundance in avocados, papaya, bananas & pineapple.



2 Eat lots of green, leafy vegetables

Green leafy vegetables help your digestive enzymes function optimally by creating a more favorable alkalized environment.

Eat lots of green leafy vegetables, such as spinach, cabbage, collard greens, kale & Brussels sprouts.



3 Drink 6-8 cups of fluid/water a day

Water helps digestive enzymes function more efficiently, however drinking too much water *during* meals can reduce enzyme effectiveness.

It is recommended that you only sip liquids during meals and drink the majority of your water away from meals.

4 Take Digestive Enzyme Supplements

Digestive enzymes (amylase, protease and lipase) can also be taken with meals to help digest your food.

Nutrition for Gallbladder Problems & Gallstones

The gallbladder is a 3-4 inch, pear-shaped organ located on the right side of your body, just below your liver. Its role is to store the 2 cups of bile produced by your liver each day and when stimulated, contract and release the bile into the small intestine. Once released, bile plays a multitude of roles in your digestion including:

- Emulsifying fats, meaning it breaks down fat globules into smaller fat droplets, thereby increasing the surface area for fat splitting enzymes (called lipase) which helps to break them down even further
- Neutralizing acidic food to prevent it from burning the lining of your intestine
- Keeping your small intestine free of microorganisms
- Reducing bloating
- Stimulating peristalsis
- Helping prevent constipation by incorporating water into your stool

Individuals with SCI have an increased prevalence of cholelithiasis (which is the formation of gallstones). Studies indicate that there is a three-fold increased prevalence of gallstones in people with SCI compared to able-bodied counterparts. This risk is so significant that some researchers believe cholelithiasis should now be considered a secondary complication of SCI.

Ketover, Ansel et al., 1996. Rotter & Larrain, 2003

Gallstones can significantly impair your digestive system by inhibiting or blocking the bile duct where bile is released. The gallbladder then becomes inflamed and is not able to perform its role of releasing sufficient amounts of bile into the small intestine. In extreme cases of inflammation, surgery is required to remove the gallbladder, which significantly decreases the amount of bile reaching the small intestine.

Anyone who has had their gallbladder removed needs long-term digestive support with digestive enzymes containing bile salts.

Symptoms of Insufficient Bile Reaching the Small Intestine

- Consistent gas and bloating from fatty foods
- Fat/greasy foods cause nausea or headaches
- Onions, cabbage, radishes, cucumbers cause bloating or distress
- Constipation
- Chronic bad breath or bad taste in mouth
- Excess body odor
- Clay colored stools

Symptoms of an Inflamed Gallbladder

- Pain in the upper right side of abdomen
- Pain below breastbone that shoots into right or left shoulder
- Nausea
- Vomiting
- Shaking/chills
- Urine may be tea or coffee colored

There are 4 types of gallstones: cholesterol; pigment; mixed (contains cholesterol, bile salts, bile pigments and inorganic salts of calcium) and mineral.

Studies reveal that gallstones after SCI are most often cholesterol stones, which form when there is an elevation of cholesterol in the bile.



When your small intestine does not receive sufficient amounts of bile, fat is not emulsified and digested properly. This can in turn lead to deficiencies in Omega-3 & Omega-6 fatty acids, as well as the fat soluble Vitamins D,E,K and A.

These vitamins also happen to be 4 of the nutrients individuals with SCI are commonly deficient in. They play important roles in the prevention and management of several SCI related secondary health complications, such as osteoporosis, cardiovascular disease and pressure sores.

Deficient bile output may contribute to constipation, as improperly digested fat combines with minerals creating stool that is more difficult to pass.

Why is there a higher risk of gallstones with SCI?

While it is known that individuals with SCI are at higher risk of developing gallstones, it is not exactly clear why. The following are several theories:

- changes in nerve innervation of the gallbladder may alter its ability to contract properly.
- the sympathetic nerve supply to the gallbladder acts to relax it so that it can fill with bile. If it is unable to fill to its maximum volume due to changes in the sympathetic nerve supply, the bile may become more concentrated ultimately resulting in gallstones.
- studies indicate that extremely low calorie intake and rapid weight loss, which often happens immediately following SCI, can lead to gallstone development.
- obesity, can cause an increase in the secretion of cholesterol in bile contributing to the formation of stones.
- there is a significant correlation between slow bowel transit time and increased levels of an acid produced in the intestines called deoxycholic acid. A higher level of deoxycholic acid has been associated with people who have gallstones.
- gastrointestinal tract dysfunction - 99% of bile acids are created during the digestion process and re-absorbed in the small intestines. If absorption functions are impaired, there will be decreased re-absorption of bile acids, therefore reducing the bile acid pool and the rate of bile secretion. This too can result in an increased risk of gallstones.
- diets high in refined/processed carbohydrates and low in fiber lead to a reduced production of bile acids by the liver and a lower bile acid concentration in the gallbladder which tends to produce bile that is more super saturated with cholesterol. Bile that is super saturated with cholesterol contributes to gallstone formation. Low fiber consumption also reduces the absorption of deoxycholic acid, which lessens the solubility of cholesterol in bile.

Cholesterol-lowering drugs

May increase the risk of gallstones as these drugs lower blood cholesterol levels but increase levels of cholesterol in the bile.



The good news is there are many nutritional ways to help reduce the risk of developing gallstones:

1 Increase fiber

Fiber helps decrease the formation of deoxycholic acid by binding to it and excreting it from your body. Fiber has been shown to both prevent and help reverse gallstones, **especially water soluble fiber found in fruit, ground flax seeds and oat bran.**

2 Increase lecithin in your diet

Increasing lecithin in your diet helps increase the concentration of lecithin in the bile. This in turn helps increase the solubility of cholesterol, which can help reduce gallstone development. Taking lecithin supplements, a natural fatty substance found in **high concentrations in eggs and beef liver**, may also help reduce the risk of gallstone formation.

3 Take choline & methionine supplements

Gallbladder problems are often indicative of some type of liver dysfunction (**refer to Chapter 10 on Nutrition for the Liver**). These two nutrients are helpful at reducing gallstone formation as they help decrease fat in the liver, thus helping to maintain healthy bile concentrations.

4 Eat good fats

Fish oil, either from fresh fish or fish supplements, may also help inhibit gallstone formation as it helps to maintain healthy bile concentrations.

5 Increase foods rich in Vitamin C and E

A deficiency in these vitamins is related to the presence of gallstones. Supplementing with Vitamin C has been shown to help reduce cholesterol stone formation, the type of gallstones commonly found in individuals with SCI.

Foods high in Vitamin C include broccoli, Brussels sprouts, red/green peppers, strawberries, papaya & pineapple.

Foods high in Vitamin E include sunflower seeds, almonds, olives & olive oil.



6 Take HCL supplements

Decreased stomach acid secretion is another significant contributing factor to gallstone formation. Studies indicate that almost half of people who develop gallstones also have low HCL. Therefore, supporting HCL production is very important in reducing the risk of gallstone development.

7 Take herbs – milk thistle & dandelion root

These herbs can help increase bile secretion by the liver, as well as the solubility of bile, thus decreasing the risk of gallstones.





8 Reduce/avoid sugar, coffee & processed foods

- **Sugar/processed foods** - high sugar consumption is associated with an increased risk of cholelithiasis.
- **Coffee** - if you have gallstones, it is recommended that you reduce or avoid coffee as it can stimulate gallbladder contractions, which can set off gallbladder attacks. Instead, consume plenty of water to help maintain a healthy concentration.

9 Identify & avoid food intolerances

Food intolerances are correlated with an increased risk of gallstone development. It is believed that eating foods that don't agree with your body can cause swelling of bile ducts, resulting in impaired bile flow from the gallbladder. Therefore reducing all known food intolerances such as dairy and wheat may help reduce this risk.

(See Appendix for Food Elimination Diet.)

Nutrition for Pancreatitis

Individuals with SCI have an increased risk for pancreatitis (inflammation of the pancreas) during the acute stage of spinal injury. It is believed that during the initial stages of spinal trauma, sympathetic and parasympathetic imbalances may result in hyper-stimulation of the sphincter of Oddi (a valve that allows pancreatic juice to flow from the pancreas into the small intestines). This may lead to a decline or complete stoppage of pancreatic juice from flowing into the intestines, which can cause a backup of secretions, as well as pancreatic damage. Low secretion of pancreatic enzymes can lead to insufficient digestion, production of toxic substances, nutritional deficiencies and allergies.

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Symptoms of pancreatic insufficiency:

- Abdominal bloating/discomfort
- Gas
- Indigestion
- Constipation
- Passing of undigested food in stool
- Allergies
- Low immune function
- Vitamin & mineral deficiencies



1 Take Pancreatic Enzymes Supplements

These contain enzymes amylase, lipase and protease to help digest carbohydrates, fats and proteins. Take them with every main meal.

2 Take Pancreatic Glandulars

These contain pancreatic tissue to help support this gland.

Nutrition for Leaky Gut

The multiple gastrointestinal conditions described previously, whether experienced by themselves or in combination with one another, all contribute to poor digestion. When individuals with SCI have digestive dysfunction of any kind they are at risk of developing a subsequent condition called “Leaky Gut”, which refers to increased intestinal permeability.

A healthy intestinal lining is extremely tight knit allowing only properly digested foods, to pass through it and be absorbed into your blood stream. The intestinal lining also acts as a barrier to keep harmful bacteria and other unwanted substances out. However, when the intestinal lining is irritated and/or inflamed due to conditions such as, stress, low HCL, diets high in processed food, and chronic ingestion of NSAIDS, these tight knit junctions form gaps allowing larger molecules of food and other undesirable substances, like bacteria, to ‘leak’ into your bloodstream.

You might not think that a slightly undigested food particle leaking into the blood would be a problem, but it is. When abnormally large food molecules enter your bloodstream it can contribute to:

- Severe digestive distress
- Your immune system interprets these substances as foreign and stimulates an allergic response
- Irritation, inflammation and tissue damage in other areas of your body
- Autoimmune conditions

Leaky gut is associated with the following conditions; mal-absorption, food sensitivities, arthritis, allergies, Crohn’s disease, celiac disease, asthma, bronchitis, eczema, psoriasis, irritable bowel syndrome & inflammatory joint disease.

Symptoms of Leaky Gut

- Abdominal pain
- Diarrhea
- Asthma
- Arthritis
- Chronic joint/muscle pain
- Autoimmune diseases, such as rheumatoid arthritis & lupus
- Recurrent bladder infections
- Muscle pain
- Fuzzy thinking
- Gas
- Constipation
- Indigestion
- Bloating
- Anxiety
- Fatigue
- Skin rashes



Leaky Gut also impairs your body’s ability to absorb essential fatty acids, Vitamins A, D, E, B12, folic acid, copper, iron, magnesium selenium and zinc. In order to restore balance, it is recommended you complete the following:

1 Take digestive enzymes

These help to ensure that food is digested properly. Take with every main meal.

2 Eat foods high in Vitamin A, C & E

These vitamins help repair your gut. It is important to take additional supplements of all of these as they have powerful reparative properties.

Foods high in Vitamin A include sweet potato, carrots, spinach, kale, red peppers & butternut squash.

Foods high in Vitamin C include broccoli, Brussels sprouts, red/green peppers, strawberries, papaya & pineapple.

Foods high in Vitamin E include sunflower seeds, almonds, olives & olive oil.



3 Take glutamine

This amino acid has an affinity to repair the intestinal lining.

Fresh cabbage juice contains high amounts of glutamine and can be consumed on a daily basis.



4 Take a multi-vitamin

Helps ensure all basic nutrient needs are met.

5 Eat good fats

These help repair the intestinal lining and reduce inflammation.

Good fats are found in fish, almonds, walnuts, avocados & flax seeds.

6 Take a high potency probiotic

Good bacteria help restore your intestinal flora balance.

7 Drink slippery elm bark or marshmallow root tea

These herbs help to soothe the damaged gut.

8 Identify & avoid all food intolerances

Complete the Food Elimination Diet (see Appendix).

A leaky gut is raw, inflamed and irritated and needs time to rest. When all food irritants are eliminated and you give yourself the correct nutrients, your gut has the amazing ability to repair itself within 3 to 5 days. However, if damage is extensive and there are deep gaps formed in your intestinal wall, healing will take longer.



Nutrition for Candida

Candida is an overgrowth of yeast. Individuals with SCI are susceptible to this gastrointestinal condition due to stress, poor diets, antibiotic use, NSAID and steroid consumption, nutrient deficiencies, weakened immune system, low HCL, as well as reduced pancreatic enzymes and bile secretions.

Candida is a yeast that harmlessly resides on your skin, in your mouth, as well as in the urogenital and intestinal tracts. When there is a healthy balance of good bacteria in your gut they assist with the digestion of food and production of vitamins. However, when your balance of good bacteria is destroyed through stress and antibiotic use etc. yeast can quickly flourish. An overgrowth of yeast can cause infections in your mouth, skin and vagina and form spider like structures called myceles, which can penetrate through the intestinal wall and enter your bloodstream.

Mycele damage to the intestinal lining can contribute to the development of Leaky Gut and all of its associated conditions. When Candida colonizes the digestive tract it can produce toxins that are absorbed into the bloodstream which can impact your immune system, hormone balance and thought processes. Once in the blood, it can also lead to inflammation, allergic reactions and can mutate and hide from the immune system, potentially affecting tissues all over your body.

Symptoms of Candida

- Bloating
- Anxiety
- Depression
- Endometriosis
- Fuzzy thinking
- Low blood sugar
- Fatigue
- Gas
- Mood Swings
- Coated white tongue
- Vaginitis
- Insomnia
- Bladder infections
- Toe or fingernail fungus
- Indigestion
- Constipation and/or diarrhea
- Chronic sore or scratchy throat
- Chronic infections or rashes
- Chemical & food sensitivities
- Cravings for refined carbohydrates

Anti-fungal drugs only temporarily destroy yeast over-growth. Diet can play a critical role in helping to prevent and destroy the overgrowth of this fungus.

1 Eliminate/reduce sugar, wheat and yeast fed foods & drinks

Candida thrives on simple carbohydrates, especially sugar, so Candida can cause cravings for bread, wheat, starches, sugar and yeast containing foods, such as cheese and beer. Eliminating wheat, simple carbohydrates, such as sugar and milk products (milk contains a natural sugar called lactose which also feeds Candida) for at least 8-12 weeks is absolutely necessary.

It is advised to avoid the foods in the left-hand column of the following chart and replace them with the ones in the right hand side column.

FOODS TO AVOID:		FOODS TO CONSUME:	
• Sugar	• Milk	• Fish	• Nuts -
• Yogurt	• Ice cream	• Chicken	almonds, walnuts,
• Cheese	• Butter	• Beef	pecans, hazelnuts,
• Quinoa	• Wheat	• Eggs	brazil & macadamia nuts
• Barley	• Kamut	• Beets	• Seeds -
• Oats	• Rye	• Asparagus	sesame, pumpkin &
• Corn	• Rice	• Sweet	sunflower seeds
• Buckwheat	• Spelt	• Potato	• Nut butters -
• Amaranth	• Wild rice	• Dark, green	almond & cashew
• Couscous	• Dried fruit	leafy	
• Fruits	• Fruit juice	vegetables	
• Vinegar	• Yeast fed breads		
• Alcohol			



2 Take probiotics

This will help re-establish a healthy balance of good bacteria in your gut.

Eat fermented foods such as yogurt, miso & sauerkraut or take probiotic supplements.

3 Take a fiber supplement

Fiber helps maintain good bowel function and helps ensure you rid your intestines of toxins produced by the Candida.

Psyllium husk and ground flax seeds are good fiber sources.



4 Take a multi-vitamin

This will help ensure all your nutrient needs are met and help boost your immune system

5 Take foods rich in Vitamins A & C

These vitamins help boost your immune system.

Vitamin A rich foods include sweet potato, spinach, carrots & kale.

Vitamin C rich foods include papaya, red peppers, broccoli & strawberries.



6 Support your thymus gland

This pink-grey organ lies underneath the top of your breast bone and processes a type of white blood cell known as T-lymphocyte, which helps govern your immunity. Taking thymus glandulars, made from thymus tissue, has shown to be helpful in restoring and enhancing immune function, which can often become compromised when you have candida.

7 Support liver function

Enhancing your detoxification process is a critical factor in addressing Candida.
See Chapter 9 on Nutrition for the Liver for optimal liver function.

8 Take natural anti-fungal agents

After following the dietary recommendations above for a minimum of two weeks, you can then introduce anti-fungal agents. These are effective at helping kill off yeast. Begin taking low doses of these anti-fungal substances and then gradually increase the dose over one month to recommended therapeutic dosages.

Garlic, grapefruit seed extract, oil of oregano, thyme oil, the herb Pau D'arco & caprylic acid (made from coconuts) are all natural anti-fungal agents.



The recommendations for optimizing HCL, bile and pancreatic secretion, also help inhibit the overgrowth of Candida. It is also recommended that you follow the supplement recommendations, for Leaky Gut in order to help heal your intestinal lining.

Treating the surface symptoms of any gastrointestinal issue may bring temporary relief, but it provides very little in the way of long-term effects because the fundamental imbalance in your body remains unchanged. Addressing the root problem in your gastrointestinal tract through nutrition will help establish a balanced digestive system and body, and help improve your overall health and quality of life.

Quinoa salad

Quinoa is a delicious seed that is very easy to digest. It is gluten-free so it doesn't add extra burden to your intestinal tract. This recipe is great to have for left overs. **Servings: 8**

Ingredients:

- 1 teaspoon of extra virgin olive oil
- 2 cups of quinoa (well rinsed and drained)
- 1 small zucchini, chopped
- 2 teaspoons of fresh cilantro, chopped
- 1 teaspoon of fresh lemon juice
- Sea salt for taste
- 1 medium onion, peeled and chopped
- 1 teaspoon of freshly grated lemon zest
- 1 3/4 cup of low sodium chicken/vegetable stock
- 2 teaspoons of fresh parsley, chopped
- 1 teaspoon of fresh lime juice

Directions:

1. Place olive oil in a large skillet and heat over medium heat, add onion and cook
2. Add quinoa and cook for 5 minutes until grains become slightly toasted (this helps to bring out the flavours)
3. Add stock, lemon zest and zucchini, bring to a boil the reduce heat and let cook
4. Cover for 20 minutes until a small sprout pops out from the grain (that is when you know it is done)
5. Remove from heat and let stand for 10 minutes
6. Fluff with fork and add cilantro, parsley, lime & lemon juice, and season with sea salt

NUTRITIONAL CONTENT:

Proteins: 8 grams
Carbohydrates: 33 grams
Fats: 3 grams
Calories: 186

Tummy tamer smoothie

This refreshing smoothie contains digestive enzymes, fibre, Omega-3 fats and probiotics. It supports digestion, increases the absorption of nutrients and reduces gas and bloating.

Servings: 1

Ingredients:

- 1 cup of plain Greek yogurt
- 1/2 a cup of apple sauce or cut up apple
- 1 teaspoon of cinnamon
- 1/2 inch of ginger root, grated
- 1 freshly squeezed lime and/or lemon
- 1 tablespoon of ground flax seeds
- 1/2 cup of pineapple

Directions:

Place all ingredients in a blender and mix, Add further cinnamon if desired.

NUTRITIONAL CONTENT:

Proteins: 20 grams
Carbohydrates: 37 grams
Fats: 3 grams
Calories: 245

Pureed apple and squash soup

This hearty soup helps regulate digestive function, decreases gas and helps fight off bad bacteria. Servings: 4

Ingredients:

- 2 tablespoons of extra virgin olive oil
- 1 small onion, finely chopped
- 1 apple cored, peeled and finely chopped (or 1 cup of unsweetened apple sauce)
- 1 cup of unsweetened apple cider
- 1 teaspoon of ground ginger
- 1 teaspoon of ground cinnamon
- 3 1/2 cups of low sodium vegetable stock
- 3 acorn squash

Directions:

1. Cut squash in half and remove seeds. Bake in an oven at 400F/205C until soft
2. In a large pot heat oil and cook onion until soft
3. Add apples and apple cider and cook until apples are soft
4. Add the ginger, cinnamon and vegetable stock and bring to a boil
5. Stir in the baked squash and cook until heated through (about 8 to 10 minutes)
6. Reduce heat and simmer until thickened
7. Puree the mixture and season with salt
8. Serve in bowls and add Greek yogurt to garnish

NUTRITIONAL CONTENT:

Proteins: 3 grams
Carbohydrates: 44 grams
Fats: 0.5 grams
Calories: 266 cal



Food & Supplement Recommendations

- Consult with your medical or health care professional before starting any dietary changes and/or supplement use.
- If you are pregnant or nursing, do not take any supplements before consulting with your medical health care professional.
- References for this chapter are listed in the back of the book.

NUTRIENT	PURPOSE	FOODS	SUPPLEMENT DOSAGE	CONTRAINDICATIONS/CONSIDERATIONS
Alkalinizing foods	Decreased digestive enzyme activity	Spinach, kale, peas, asparagus, carrots, cabbage, beets, almonds, apple, dates, pear, banana & avocado	NA	NA
Aloe vera	Ulcers	Fresh aloe vera plant: cut off the bottom of one of the leaves and squeeze the juice from the fresh cut leaf into a glass. Add water to the glass and mix until a consistent liquid is formed Drink 10 to 20 minutes before you eat a meal	Start drinking aloe vera gel (approx. 1 teaspoon) 3 or 4 times a day Slowly build this up to 3 or 4 tablespoons, 3 or 4 times a day on an empty stomach Once the pain & bleeding has subsided continue to take a maintenance dose of 2 tablespoons 2 times a day on an empty stomach to avoid ulcers returning	Consult with your health professional if you are diabetic or taking diabetic medication as aloe vera can decrease blood sugar levels Diarrhea caused by the laxative effect of aloe vera can decrease the absorption of many drugs It is recommended that aloe vera should not be taken with the following conditions such as appendicitis, inflamed intestinal disorder, Crohn's disease and ulcerative colitis or if you are taking anti-arrhythmic medicine, corticosteroids, licorice, diuretics or drugs with cardiac glycosides Taking an overdose of aloe vera supplements could result in intestinal spasms, dehydration or stomach cramps
Anise seeds	Gas	Can be used in a tea or simply chewed	Up to 1 teaspoon a day	Large doses may cause nausea or headaches
Apple cider vinegar	Low HCL	Dilute 1 teaspoon of vinegar in water and drink with each meal If you cannot tolerate apple cider vinegar drink, you can try freshly squeezed lemon juice and water instead	NA	If you have stomach ulcers or heartburn this may cause burning. If you experience burning, immediately neutralize the acid by drinking a glass of milk
Caprylic acid	Candida	NA	1000 - 2000 mg a day with food	This is readily absorbed in the intestines, so it is important to take time release or coated capsules
Choline	Gallbladder	Beef, sardines, chicken, scallops, eggs & turkey	1000 mg a day	Choline in the form of phosphatidylcholine should not be taken by people with depression unless under physician supervision as it can worsen symptoms
Dandelion root tea	Gallbladder	As a tea - drink 2-3 cups a day (1 teaspoon per cup of hot water)	NA	Taking dandelion with antibiotics might decrease the effectiveness of some antibiotics Do not take with potassium (water pills) or lithium based medications People who are allergic to ragweed and related plants (daisies, chrysanthemums, marigolds) are likely to be allergic to dandelion. If you have allergies, be sure to check with your health care provider first before taking dandelion

NUTRIENT	PURPOSE	FOODS	SUPPLEMENT DOSAGE	CONTRAINDICATIONS/CONSIDERATIONS
Digestive Enzymes (containing HCL, bile & enzymes)	Low HCL Decreased digestive enzyme activity GERD Leaky Gut Gas/bloating Gallbladder Removal Candida Insufficient Pancreatic secretion	Juicing fresh fruits and vegetables helps to liberate enzymes from food that can help improve digestion If you can't juice, eat raw fresh fruits and vegetables	Take 1 to 3 pills at every meal Steps to take when starting digestive enzymes supplement specifically for low HCL: 1. Take one tablet with one of your main meals - if this does not alleviate symptoms, take 2 digestive enzymes at next main meal 2. Continue to increase the dose until you have reached seven tablets or until you feel a warmth in your stomach – whichever comes first. A feeling of warmth in the stomach means that you have taken too much HCL for that meal and you need to take one less at next meal 3. Continue with this until you get the warm feeling in the stomach and continue to drop by 1 pill again	If you experience burning this indicates you now have too much stomach acid, cutback by one pill Look for digestive enzyme capsules containing at least three basic enzymes: amylase, protease and lipase Stomach acid supplements should never be taken in the presence of an ulcer
DGL licorice	Ulcers	Not recommended to take in candy format due to high sugar content	DGL licorice is a special extract of the licorice root Take 380 mg tablets between meals 2-4 pills a day Chewable tablets are shown to be best form of DGL, as it works better when mixed with saliva	Do not use if you have high blood pressure
Omega-3 Essential Fatty Acids	Ulcers Gallbladder Leaky Gut GERD Candida	Ground flax seeds, flaxseed oil, walnuts, sardines, salmon, mackerel, tuna, anchovies & halibut	Fish or flax seed oil: 2-4, 1000 mg capsules or tablespoons of flax or fish oil a day in divided doses	Omega 3 has blood thinning properties. Consult with your health care professional if you are on blood thinning medication. Stop taking 2 weeks prior to surgery Fish oils can increase the risk of mania in patients with bipolar disorder People who have hypersensitivities or allergies to fish or shellfish may also be allergic to fish oil supplements. Signs of an allergic reaction include a rash or hives, difficulty breathing and swelling of the throat, face or mouth. An allergic reaction to fish oil should be considered a medical emergency
Fennel seeds	Gas	Can be used in tea or simply chewed	1 teaspoon a day	Fennel may mimic the action of a hormone called estrogen when used medicinally. For this reason, people with hormone-sensitive health conditions, such as uterine fibroids, endometriosis and reproductive cancers, should not take fennel People allergic to plant members of the Apiaceae family, including mugwort, carrots and celery, should not take fennel

NUTRIENT	PURPOSE	FOODS	SUPPLEMENT DOSAGE	CONTRAINDICATIONS/CONSIDERATIONS
Fibre - Insoluble	Overall healthy digestion Peristalsis	Insoluble Fiber – Wheat bran, oats, brown rice, whole grains, vegetables with skin on, broccoli, spinach & carrots	1-2 tablespoon whole husk psyllium a day	Always consume fiber supplements with a glass of water When you increase dietary fiber it may initially cause gas and bloating until the body adjusts Fiber may interfere with absorption of medications and supplements and therefore it is best to take 2 hours apart
- Soluble	Gallbladder GERD Candida Ulcers	Soluble Fiber – Oats, apples, pears, berries, beans, peas lentils, squash & avocados	1-2 tablespoon of ground flaxseed a day	Do not exceed 30 grams of fiber a day Fiber supplements in pill form should not be taken by people with esophageal disorders as the fiber can expand and cause obstruction Individuals who have had bowel spasms, history of colitis or inflammatory bowel diseases should use caution when taking fibre supplements
Flavonoids	Ulcers	Dark berries, apples, red grapes, spinach, tomatoes, red onions, red peppers & eggplant	2000-3000 mg a day	The flavonoid Quercetin may interfere with antibiotics
Food Enzymes	Impaired digestion and absorption Decreased Enzyme Activity	Raw fruits and vegetables especially pineapple, papaya, avocado, banana, grapes, mangoes, olives, dates & raw honey	1-2 plant enzymes with every main meal	Do not take in the presence of peptic ulcers
Garlic	Candida	1-2 raw garlic cloves a day	10 mg allicin a day	Check with health care professional if you are taking blood thinning medications or protease inhibitors before taking garlic supplements
Ginger Root tea	Gas/bloating	Add a few slices of ginger root in a cup of hot water. Let steep for 10 minutes and drink or add to juices	NA	Ginger may interfere or enhance the effects of blood thinners, barbiturates, beta-blockers, insulin and other diabetic medications Due to blood thinning properties it should not be taken before surgery Should not be taken if you have kidney disease Can be irritating to the intestinal mucosa so should be taken with or just after meals
Glutamine (amino acid)	Ulcers Leaky Gut Candida GERD	Chicken, eggs, fish & cabbage Fresh Cabbage juice – 1 Liter a day for two weeks	5-40 g a day for 4 weeks Best to take on an empty stomach with juice as amino acids compete for absorption	Large doses can soften stool. Take smaller doses first and build from there You should not supplement if you have hyper ammonemia, liver or renal failure It is not recommended to take a single amino acid for an extended period of time without supplementing with other amino acids as well. Long-term isolated amino acid supplementation can create an imbalance in the body
Grapefruit seed extract	Candida	NA	Day 1-3: 125 mg capsule 2 times a day Day 4-10: 125 mg capsule 3 times a day Day 11-28: 125 mg capsule 2 pills, 2-3 times a day	May cause headaches, itchiness, dry scalp, dizziness, nausea, abdominal pain, cough or sore throat Do not use if you are on blood thinning medications May cause allergic reactions- seek medical attention if you experience trouble breathing, rash or swelling of the mouth

NUTRIENT	PURPOSE	FOODS	SUPPLEMENT DOSAGE	CONTRAINDICATIONS/CONSIDERATIONS
Lecithin	Gallbladder	Eggs & beef liver	100 mg capsule 3 times a day	May cause nausea, diarrhea and pain in the abdomen Do not take lecithin supplements if you are allergic to eggs or soy
Multi-vitamin	Candida Leaky Gut	Eat a wholesome diet of fresh fruits, vegetables, eggs, nuts/seeds, fish, legumes & meat	As directed on label	May cause nausea
Marshmallow Root tea	Ulcers GERD	1 to 2 teaspoon of dried herb in 1 cup of boiled water, then steep for 10 minutes	NA	Marshmallow root may reduce blood sugar levels and/or have diuretic effects. Consult with a physician before taking marshmallow root supplements if you take blood thinning, diuretic or diabetic medications Marshmallow root may slow the absorption of medications or other supplements you may be taking. Therefore take several hours before or after taking other drugs or herbal remedies Stop taking marshmallow at least 2 weeks before a scheduled surgery
Meadowsweet tea	Ulcers GERD	1 to 2 teaspoon of dried herb in 1 cup of boiled water let steep for 10 minutes	NA	May increase effects of aspirin and other pain medications
Methionine	Gallbladder	Chicken, eggs, tuna, halibut & yogurt	1000 mg a day Best to take on an empty stomach with juice as amino acids compete for absorption	Do not use if you have cardiovascular disease or acidosis It is not recommended to take a single amino acid for an extended period of time without supplementing with other amino acids as well. Long-term isolated amino acid supplementation can create an imbalance in the body
Milk Thistle (Silymarin)	Gallbladder	NA	70 to 210 mg capsules of milk thistle 3 times a day before meals	Consult with your health professional if you are taking the following medications: antipsychotics, anti-histamines, cholesterol lowering medications, anti-anxiety, antiplatelet and anticoagulant drugs (blood thinners), oral contraceptives or cancer drugs May lower blood glucose levels. Those with diabetes on anti-diabetic medication should have their blood glucose monitored
Oats	Ulcers	1/2 cup a day soaked steel cut or rolled oats a day (avoid instant oatmeal as this is usually higher in sugar and contains less fiber)	NA	NA
Oil of oregano	Candida	NA	0.2 to 0.4 ml twice a day between meals dilute with 1 cup of water	Side effects may include warm/burning sensation, upset stomach if the oil is not properly diluted in water, allergies or vomiting It may also inhibit the absorption of iron therefore if you are taking iron supplements speak to your health professional before taking
Pancreatic glandular	Pancreatitis	NA	250 mg capsule 3 times a day	Look for glandular that are freeze dried, de-fatted (toxins removed from fat) and have not used chemicals and heat in the processing

NUTRIENT	PURPOSE	FOODS	SUPPLEMENT DOSAGE	CONTRAINDICATIONS/CONSIDERATIONS
Pau d'Arco	Candida	NA	500 mg capsules 2 pills 2-3 times a day	Can cause dizziness, nausea, vomiting and diarrhea Can interact with blood-thinning medications, It may also increase the risk of bleeding in people with hemophilia or other clotting disorders
Peppermint	Gas/bloating	Use fresh leaves to make as a tea or in a juice	NA	May cause lower esophageal sphincter to relax and contribute to heartburn/GERD
Probiotics	Overall Digestion GERD Ulcers Leaky Gut Candida Gas/bloating	Fermented foods such as yogurt, kefir, sauerkraut, pickled foods, tempeh & miso	1-2 capsules a day on empty stomach at bedtime	If you are taking antibiotics you can take probiotics, but just ensure that they are consumed 2 hours apart. If you have completed a course of antibiotics you will need to continue probiotics for at least 2-3 months When purchasing a probiotics make sure you look for the following: <ul style="list-style-type: none"> • Contains a minimum of 8 billion active micro-organisms • Contain at least several types of bacteria including Lactobacillus acidophilus and Bifidobacterium bifidus • Freeze dried probiotics as this keeps the flora dormant until it enters your body • Keep stored in the fridge
Slippery Elm Bark	Ulcers GERD Leaky Gut	Simmer 1 teaspoon in 2 cups hot water for 20 minutes, strain and then drink	2-4 capsules 3 times a day for 3 weeks	If you are allergic to any type of elm tree you should not take this supplement Take 2 hours away from medications as it can decrease the effectiveness of the medication
Thymus glandular	Candida	NA	125 mg capsule 3 times a day	Thymus extract may increase the effectiveness of antibiotics Do not use with autoimmune conditions or those taking anti-rejection, corticosteroids or immune-suppressant medications Thymus extract may play a role in immunological disorders associated with stress and anxiety. Caution is advised in patients taking anxiolytics due to possible additive effects Thymus extract in conjunction with bronchodilators may have additive effects Caution is advised in patients with heart problems
Vitamin A	Ulcers GERD Leaky Gut Candida	Sweet potato, carrots, red peppers, squash, spinach & kale	5 000 – 10 000 IU a day with food The synthetic forms of Vitamin A such as palmitate or acetate have a great potential to produce toxic symptoms	Woman who are sexually active or of child bearing age should not use high doses (over 10 000 IU) of Vitamin A due to risk of birth defects. Doses over 10 000 IU should be done under the supervision of your health professional
Vitamin C	Ulcers Leaky gut Candida GERD Gallstones	Papaya, bell peppers, broccoli, Brussels sprouts, kale, kiwi, strawberries & pineapple	2000 - 3000 mg a day with food Buffered forms of Vitamin C are easier on the stomach Taking Vitamin with bioflavonoids will help increase absorption	Sulfa antibiotics increase elimination of Vitamin C from the body High doses of Vitamin C can cause loose stools or cause gastrointestinal problems so reduce dosage if needed Take in divided doses throughout the day as Vitamin C is quickly used up in the body Take lower doses if you are prone to kidney stones Consult with your health professional if you are on blood thinning medication as Vitamin C can act as a natural blood thinner

NUTRIENT	PURPOSE	FOODS	SUPPLEMENT DOSAGE	CONTRAINDICATIONS/CONSIDERATIONS
Vitamin E	Ulcers GERD Leaky Gut Candida Gallstones	Sunflower seeds, almonds, pine nuts, olives, spinach, blueberries & Swiss chard	800 IU a day for ulcers, GERD, leaky gut & candida 200 – 400 IU a day for gall stones Best taken with food Best form to take is with mixed tocopherols including D alpha-tocopherol, tocotrienols and succinate Do not use synthetic form dl-alpha-tocopherol as it acts very differently in the body	If you have heart disease or diabetes do not take doses over 400 IU a day This is a natural blood thinner, so consult your health professional first if you are taking blood thinning medications or if you have a bleeding disorder Stop taking this supplement 2 weeks before surgery Prolonged and high level intakes of Vitamin E greater than 1500 IU a day can actually be detrimental to the immune system
Water	Muscle Relaxant consumption Ulcers Peristalsis Digestion Low HCL	Drink a minimum of 6 to 8 glasses of water everyday	NA	Try to drink filtered water, which has had toxins and other impurities removed (preferably carbon or reverse osmosis filter systems) Avoid distilled water, which can leach minerals from the body Avoid water stored in plastic bottles, which can leach chemicals into the water potentially disrupting hormone balances
Zinc	Ulcers GERD Leaky Gut Candida	Sesame seeds, pumpkin seeds, oats & yogurt	50-100 mg in divided doses a day with food Best absorption forms include: zinc picolinate, acetate, citrate, glycerate and monomethionine Poor absorption forms include: Zinc oxide and zinc sulphate	Take in divided doses during the day to prevent possible nausea Consult with your health professional first if you have high cholesterol Higher doses of zinc (greater than 100 to 300 mg a day) can impair the immune system and may lead to a copper deficiency

MEDICAL DISCLAIMER

Eat Well, Live Well with Spinal Cord Injury discusses health care issues associated with spinal cord injuries (SCI). The information provided in this book is not meant to offer medical diagnosis or advice, or substitute for medical or other professional health care treatment.

Many of the recommended vitamin, mineral and other nutrient dosages are higher than traditional recommended daily allowances (RDAs) and dietary reference intakes (DRIs). RDAs are defined as the average daily dietary intake level that is sufficient to meet the nutrient requirements of nearly all healthy individuals. These intake levels, however, fail to address disease prevention, optimal nourishment and individual differences and needs, including those with chronic health conditions such as SCI. Studies also indicate that because adults with chronic SCI tend to have poor dietary patterns and nutrient deficiencies, coupled with their high prevalence of secondary health complications, they can have increased nutrient requirement levels above RDAs and DRIs. Therefore, this book often recommends higher therapeutic supplement dosages to provide necessary nourishment and health.

The nutritional information and recommendations in each chapter are intended to provide you with a foundation of nutritional knowledge and helpful tips and strategies that you can use to complement your existing health care routine.

We strongly advise that you consult with your medical or health care practitioner before starting the dietary changes and/or supplements which are outlined in this book, as well as discuss any possible drug-nutrient interactions. Never disregard professional medical advice, or delay in seeking it, because of any material you have read in this book.

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