

## SCI & DIGESTION/BOWEL FUNCTION

After a spinal cord injury, both the digestion and elimination functions are affected. In turn, these can cause many people to experience on-going issues with constipation, hemorrhoids, involuntaries, and in extreme cases bowel obstruction.

To help establish consistent, efficient and manageable bowel routines, both the digestion and elimination functions should be addressed.

The following are brief explanations of the three key events that occur after spinal injury that can *inhibit* the proper functioning of the digestion/elimination systems.

1. A properly functioning digestive system enables the body to absorb the nutrients it needs to feed cells and provide the body with energy to carry out all its daily tasks and build a healthy, strong body. If this system is not working well and nutrients are not being absorbed properly, it can negatively affect how well the body functions, which in turn can contribute to the development of secondary health conditions.

Digestion occurs as a result of:

- mechanical processes
- chemical processes:
  - stomach acid
  - digestive enzymes

Both of the chemical processes above are responsible for helping to break down food. However stress, whether emotional, mental and/or physical (pain), negatively affects both of the chemical process involved with digestion. A spinal cord injury can cause an enormous amount of mental, emotional and physical stress.

Chronic stress lowers the production of stomach acid. This acid is critical to break down of proteins, as well as the breakdown and absorption of minerals:

- proteins are a necessary part of every living cell in the body. Therefore, it is vital that the body is provided with adequate amounts of this macronutrient in order to maintain proper cellular function. It is well documented that immediately following any kind of serious trauma or injury the body's requirement for protein increases so it is important to ensure that the body is getting what it needs in order to heal itself.
- protein also plays an important role in liver detoxification
- minerals are vital to the proper function and structure of our body

If stomach acid secretion is insufficient or inhibited because of stress, it can reduce the digestion and absorption of proteins and minerals and impede multiple organ and body functions. Additionally, it can decrease colon function and stagnate the elimination process.

Stress can also make digestive enzymes less effective. Digestive enzymes help digest fats, carbohydrates and proteins, but stress and the release of stress hormones such as cortisol can increase the acidification of body tissues. When tissues are more acidic, enzyme activity is inhibited, which reduces the enzymes effectiveness in digesting the nutrients consumed.

### Symptoms of Insufficient Stomach Acid & Digestive Enzyme Activity

- indigestion
- bloating
- gas
- burning sensations
- discomfort after eating
- constipation

2. Digestion also involves the mechanical process of propelling food through the digestive tract. This involuntary muscular contraction, called peristalsis, is altered for people with spinal cord lesions above T12 and this can lead to slower bowel transit time, which in turn can contribute to constipation, fatigue, as well as the development of hemorrhoids.

3. The last factor than can inhibit an individual's digestive/elimination process post-injury is the consumption of antibiotics to fight infections.

The intestines are home to several hundred billion microorganisms belonging to more than 400 species. These microorganisms are known as intestinal flora and they play a role in:

- digestion of foods
- dissemination of nutrients
- stimulating intestinal transit
- producing B and K vitamins
- boosting the immune system

The ideal bacterial balance for a healthy intestine/bowel and immune system is 85% friendly bacteria to 15% unfriendly. However, in most cases, antibiotics cannot distinguish the difference between good microorganisms and bad micro-organisms, so the good ones are wiped out with the bad upon the ingestion of antibiotics. When these good bacteria are depleted not only are the above health benefits compromised, but the intestines can become colonized by toxin producing bacteria which can lead to mal-absorption of fats, carbohydrates, protein, folic acid and vitamin B12.

Furthermore, because good bacteria help break down food matter and assist the digestive function, people often develop diarrhea when they are depleted.

## RECOMMENDATIONS

### 1. Eat 4-5 Small Meals a Day

- the act of eating helps to stimulate peristalsis, so eating smaller, more frequent meals can help this mechanical process

### 2. Increase Fibre

- 1 tbsp. whole husk psyllium or ground flax seeds/day
- fibre is critical to healthy bowel function and overall health
- fibre fills out the colon, softens and eases the excretion of stool

### Where Does Fibre Come From?

Fibre comes from the undigestible matter in plants. Good fibre sources include:

- vegetables
- fruits
- legumes
- whole grains

Fibre is divided into 2 groups – we need both!

1. **Soluble fibre** -can mix with water and forms a gel like substance.

- oats
- nuts
- fruits
- beans

2. **Insoluble fibre** - does not mix with water-this is what creates bulk in stool.

- vegetables
- fruit skins
- whole grains
- The health benefits of insoluble fibre include;
  - help decrease constipation & hemorrhoids
  - help prevent colon cancer & diverticulosis

### Tips to Improve Fibre Intake:

- eat whole fruits instead of drinking fruit juices
- replace white bread, pasta & rice with brown rice, whole grain bread & whole grain pasta
- choose whole grain cereals for breakfast
- snack on raw vegetables instead of chips, crackers & chocolate
- substitute legumes/beans for meat 2-3 times per week in chili & soups

3. **Take Probiotic Supplements**

- 1-2/day
- helps restore a healthy balance of intestinal flora to maintain bowel function
- eat fermented foods such as yogurt, kefir and sauerkraut, which are excellent sources of probiotics

4. **Eat Plenty of Naturally Enzyme Rich Foods**

- fresh, raw vegetables and fruits particularly:
  - pineapple
  - papaya
  - banana
  - avocados

5. **Take Digestive Supplements**

- 1-2 with every meal
- containing betaine hydrochloride; bile salts and enzymes such as bromelain
- help breakdown and absorb nutrients, as well as decrease indigestion, gas and bloating

**6. Omega 3-Fatty Acids**

- 2-4 capsules/day
- naturally help lubricate the bowel

**7. Drink Plenty of Fluids**

- 6-8 cups/day
- essential to help move waste matter through the colon

**8. Reduce or Eliminate High Glycemic Foods**

- meals that are too high in simple or refined carbohydrates can slow the motility of the intestinal tract—specifically when blood sugar levels rise too rapidly -- the duodenum and jejunum -- sections of the intestinal tract slow the propulsion of digested matter.

**REFERENCES**

1. Christopher Vasey **Acid-Alkaline Diet for Optimal Health** 1999
2. David Frankenfield **Energy Expenditure & Protein Requirements after Traumatic Injury** 2006
3. Bernard Jensen **Dr. Jensens Guide to Better Bowel Care** 1999
4. Michael Murray **Encyclopedia of Natural Medicine**
5. Elson M. Haas **Staying Healthy with Nutrition** 2006
6. Dr. David W. Roland **Vitamost: Encyclopedia of Food-Based Medicines** 2006
7. JL Walter 2008 **Evidence of Dietary Inadequacy in Adults with chronic SCI**
8. Kristin Tomey **Dietary Intake and Nutritional Status of Urban Community Dwelling Men with Paraplegia**
9. Suzanne Groah- **Nutrient Intake and Body after SCI** 2008