

# SPINAL CORD MEDICINE

## HANDBOOK FOR PATIENT AND FAMILY



## NUTRITION



**Frazier Rehab Institute**

A service of Jewish Hospital & St. Mary's HealthCare

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## **THE PATIENT AND FAMILY HANDBOOK**

This Handbook is designed to give you the information to better understand spinal cord injury and the tools needed to manage your health care needs successfully. Information is intended for you and your family because, those who love you, will often be involved in assisting you with your care needs while in the hospital, and in the home environment. As you read through the Handbook, your rehab team at Frazier is available to address your questions and provide you more information pertinent to your needs.

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## **A BRIEF NOTE ABOUT THE FOUNDER OF FRAZIER REHAB INSTITUTE**

In her early 20's, Amelia Brown of Louisville sustained a spinal injury in a car accident in the 1940's. With no rehabilitation services in Louisville, she traveled to New York for treatment. After returning to Louisville, she married a physician, Dr. Harry Frazier. Believing Louisville needed its own rehabilitation facility, Mrs. Frazier founded the Frazier Institute of Physical Medicine and Rehabilitation in the early 1950s. Her son, Owsley Brown Frazier, served as Chairman of the Fund Raising Committee for Frazier's new building, named the Frazier Rehab and Neuroscience Center, which opened in 2006.

## **DISCLAIMER**

The information contained herein is intended to be used in accordance with the treatment plan prescribed by your physician and with the prior approval of your physician. You should not begin using any of the methods described in this publication until you have consulted your physician. Jewish Hospital & St. Mary's HealthCare, Inc. D.B.A. Frazier Rehab Institute, its affiliates, associates, successors and assigns, as well as its trustees, officers, directors, agents and employees are not liable for any damages resulting from the use of this publication.

NOTE: Words *italicized* in the text below are defined in the Glossary at the end of this Chapter.

## NUTRITIONAL CARE

After spinal cord injury, changes take place in your body that can affect weight, muscle and bone mass, digestion, and general health. Understanding these changes and keeping well nourished are essential to all stages of recovery. There is much truth in the saying “You are what you eat.”

### SOON AFTER INJURY

Your nutritional needs may increase at the same time that appetite decreases. As a result, you may experience weight and muscle loss.

During the first several weeks after injury, calories for maintaining weight will likely increase because of the energy your body will need as it tries to deal with stress, fever, infection, and/or surgical or wound healing. At the same time, your appetite and food intake may decrease because of pain, emotional stress, illness, limited mobility, restricted diet, hospital environment or other challenges. Simply stated, if your body burns more calories than it takes in, you will lose weight, often times quite rapidly. Quick weight loss results in muscle loss, additional to fat loss.

Inability to use muscles due to injury also contributes to muscle breakdown. Loss of muscle in the lower limbs can be notable for those with paraplegia and tetraplegia. As a rule, the higher the level of spinal cord impairment, the greater the weakness or paralysis, and therefore more “muscle disuse” results. Consequently, more muscle is lost in the arms and upper trunk in people with tetraplegia than with paraplegia.

To minimize fast weight loss and muscle shrinkage, dietary changes can be made. These include adding snacks and special shakes formulated to meet your needs. If food intake continues to fall short of daily goals, alternative-feeding methods (tube feedings) can temporarily be used to assure that nutrition needs are met.

Just as the extent of injury varies from person to person, so do nutrient requirements. A registered dietitian can meet with you, establish nutrition goals and help devise ways for you to meet them.

### ONCE MEDICALLY STABLE

Once you are out of the acute or crisis phase, about one or two months after injury, your appetite and food intake will likely improve. As old eating habits return, weight and protein loss usually stop. With limited physical activity and disuse of certain muscles that come with spinal cord impairment, permanent changes in body composition occur. Lost muscle is replaced in part by fat, water and connective tissue, which burn fewer calories than do muscles. Therefore, you will need fewer calories to maintain weight as compared to pre-injury. Because muscle weighs more than non-muscle mass, you may look and feel heavier if you return to your usual weight. Some people

struggle to prevent excess weight gain starting a few months after injury. For muscular athletes with spinal cord injury, calorie needs will not need to decrease as much since muscle burns many calories.

### **IDEAL BODY WEIGHT IS LOWERED FOLLOWING PARALYSIS/DISABILITY**

After spinal cord injury/disability, one's ideal body weight changes, i.e., ideal body weight is typically lower. This is true as most individuals with injury/disability are not as physically active as they once were, need less calories daily to be healthy and avoid weight gain, and because the muscle mass in muscles groups that are paralyzed is smaller and weigh less. The ideal body weight is adjusted downward for those with paraplegia by 5-10% and for those with tetraplegia by 10-15%. (See Ideal Body Weight Charts for Men and Women at end of Chapter.)

### **HEALTH ISSUES AND NUTRITION - FOOD FOR THOUGHT**

**Skin Health - It's More Than Just Skin Deep.** Because of increased pressure on some parts of the body due to decreased movement, there is a greater chance for skin breakdown. This is compounded by decreased sensation, blood flow and muscle mass. When a person is underweight, insufficient padding over bony areas makes skin breakdown more likely. Obesity also poses a problem since fat has poor blood circulation. Blood delivers oxygen and nutrients to the cells to allow healing. Keeping a healthy weight can help prevent skin problems.

Nutrient rich foods should be selected to attain and maintain a healthy weight for managing skin problems. The diet should include foods rich in vitamins, especially vitamins A and C, and minerals, especially zinc and iron, along with ample calories, protein and fluids. For more on skin, see Skin Care Chapter.

**Bowel Function - Roughing It Up With Fiber.** After injury, bowel function slows down and you may become constipated due to decreased physical activity, reduced trunk-muscle tone, iron pills and/or pain medications. Constipation means fewer bowel movements or small, hard stools. It can be managed by diet that may lessen your need for stool softeners and laxatives.

Dietary *fiber* is one way to help resolve problems with bowel function. Fiber comes from food in the plant kingdom. It is the part of the plant that remains undigested and unabsorbed as it passes through your intestines. Fiber absorbs water in the intestine. This helps in the formation of soft, easy-to-pass stools. It may be helpful to eat foods with fiber many times during the day to aid your bowel program. Certain types of fiber can also resolve diarrhea, as it helps to form stools. If you have diverticulosis or other intestinal disorders, the high-fiber diet may need to be modified. Your dietitian can direct you in selecting the best high fiber foods to meet your specific needs.

There are two basic categories of fiber. Insoluble fiber, referred to as roughage, includes structural parts of plants such as vegetable skins and the outer covering of grains called bran. This type of fiber causes waste products to pass through the intestine faster. Soluble fibers are substances that dissolve in water to form gels, and help in the formation of soft stools. Included here are oats, barley and citrus fruits. Other good sources of fiber include baked potatoes with the skin, carrots, oranges, greens, berries and bran cereals.

### Simply Healthy, High-Fiber Snacks

- Apple wedges with peanut butter
- Whole-grain crackers and roasted pepper hummus
- Low-fat cereal with skim milk, topped with berries
- Carrots dipped in salsa
- Celery sticks dipped in low-fat pimento-cheese
- Air-popped popcorn sprinkled with parmesan cheese

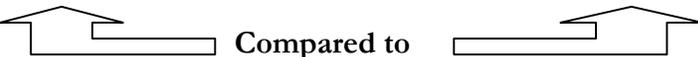
It is best to choose a wide variety of unprocessed plant foods including vegetables, fruits, nuts, legumes and whole-grain products when planning your menu. Prunes have especially good laxative properties.

Fifteen grams of fiber is the average daily intake for most Americans. Your goal, due to spinal cord impairment, may be closer to 35 grams, noting that individual needs may vary. An average serving of fruit or vegetables provides two to three grams of fiber, while legumes, dried beans and whole grains may contain more. Food labels list the grams of dietary fiber per serving. Refer to these labels when planning your meals.

Since fiber must absorb water in order to be effective, and because your fiber intake may increase, fluid intake should also be increased by about two cups per day (total 8-10 cups daily on average) as compared to before injury. Too little fluid along with a high-fiber diet can actually make constipation worse.

**Sample Menu.** The following sample menu shows how small changes can make a big difference in increasing the fiber content in a single meal.

4 oz. chicken breast	0 grams	4 oz. chicken breast	0 grams
1/2 cup mashed potatoes	1.5 grams	Small baked potato w/ skin	4.0 grams
1/2 cup mac & cheese	0 grams	1/2 cup broccoli & cheese	4.4 grams
1 dinner roll	0 grams	1 whole wheat roll	2.0 grams
1/2 cup applesauce	2.0 grams	1 medium apple with peel	4.5 grams
1 cup iced tea	0 grams	1 cup iced tea	0 grams
<b>Total fiber:</b>	<b>3.5 grams</b>	<b>Total fiber:</b>	<b>14.9 grams</b>


**Compared to**

If you stand to benefit from adding more fiber to your diet, do so gradually to allow your body to adjust. Otherwise abdominal cramping and excess gas can occur. If this happens and does not subside in a couple of days, lower the fiber in your diet.

**Other Digestive Problems – “Chewing” Foods Wisely.** After spinal cord injury, your stomach may empty more slowly. This can cause acute reflux or heartburn. Limit high fat foods and other irritants such as caffeine-containing beverages, mint, carbonated beverages, and citrus or tomato products. You may need to eat small, frequent meals instead of a few large ones. Sitting upright and avoiding crouching forward during eating is recommended. It is usually better to avoid lying flat after meals and you may find elevating the head of the bed while sleeping helpful. Avoid smoking, steer away from late-night snacks and wear comfortable clothing.

**Dysphagia.** Difficulty swallowing is called *dysphagia*. It is treated on an individual basis and involves changing the texture of foods and beverages to assure a safe swallow. See Chapter on Cognition, Voice and Swallowing.

**Bladder Function - Going With The Flow.** Adequate water intake is required for a good bowel program and for wellness, such as in regulating the body’s temperature. With less physical activity, urinary tract infections and kidney stones can become a problem especially if the urinary tract is not well flushed and the urine not properly diluted. While fluid needs vary from person to person, two to three quarts of fluid may be needed daily. Spacing fluids throughout the day instead of drinking large amounts at one time can help avoid over-distending your bladder and keep *intermittent catheterizations* about the same size.

Water is one of the best sources of fluid for your system to work properly. For some individuals, cranberry juice appears to prevent urinary tract infections due to its unique composition. Note that juices of any type are high in calories (8 oz. of regular cranberry juice = 150 calories) and can contribute to obesity. Use no-added-sugar juices and watch portion sizes. Regular sodas and other sugary drinks are similarly high in calories and can be substituted with diet sodas, sugar-free iced tea and the like, as part of a weight management program. Caffeine-containing drinks can have *diuretic* effects and may complicate a bladder program. Alcohol does not mix well with many medications, is high in calories, can increase fat in your bloodstream, and should be avoided, or at least discussed with your physician. Ice cream, sherbet, gelatin and soups also add to your daily fluid intake.

**Obesity - Don’t Take It Lightly!** After spinal cord injury, extra weight can cause problems with your breathing, overall health, self-help skills, mobility and transfers. Overuse syndromes involving the musculoskeletal systems, especially of the shoulders, are more likely to develop with added weight. Additionally, heart disease, arthritis, stroke and diabetes are health risks linked with obesity. Those who assist you when transferring also must carry the extra pounds you may carry.

Metabolism (how fast the body burns calories) slows down when your activity and muscle mass are decreased. Simply stated, fewer calories are needed to maintain your weight. Your needs may decrease only slightly or may be decreased by nearly half. Weight gain will result unless dietary intake is well managed.

National guidelines on weight management for people with spinal cord impairment do not exist. This is due to individual health variances such as activity level, metabolism, level of spinal cord injury, illness, infection, healing needs, and of course gender, age, weight and height. Yet a simple method to determine your maintenance daily calorie needs is to multiply your weight in pounds (adjusted if you are obese) by 10-14 calories. For weight loss efforts, a restricted daily calorie intake of 1500–1800 calories may be appropriate, noting that individual differences should be considered.

3,500 calories make up one pound of fat. Therefore adding even 100 extra calories beyond maintenance needs each day can result in 36,500 extra calories per year, totaling 10 pounds gained over the year!

Because your calorie needs are less than your pre-injury levels, choosing more vitamin-mineral rich foods that are lower in sugar and fat is essential. A good weight reduction plan allows you to include your favorite foods, dine in various types of restaurants and allows for high-calorie food on occasion. Weight management through exercise programs can also benefit endurance, stress levels, functional status and overall health.

As stated above, the daily caloric requirement for a person with paraplegia should be based on ideal body weight that is 5-10% below standard. The ideal body weight for a person with tetraplegia is between 10-15% less than standard. Diets that don't take this into account lead to obesity.

### **Behavioral Changes to Help a Weight Management Program be Successful**

- Work on changing your eating habits in ways that can last a lifetime.
- Eat a variety of foods each day.
- Do not try crash/fad diets that ultimately can lower your metabolism and make dieting even harder over time.
- Eat foods high in fiber since they add bulk and fill you before overeating higher calorie foods.
- Make plans to eat three meals daily. Skipping meals can reduce your body's ability to burn calories efficiently and also lead to overeating at the next meal.
- Be aware of portion sizes. You may wish to measure food portions for a few days to get an idea of your actual intake.
- Control snacking and be aware of the calorie content of foods. For example, 10 potato chips yield 108 calories; an 8-ounce shake, 285 calories; a can of beer, 150 calories; and one ounce of cheese, 90 calories.

**Cardiac Disease – Take It to Heart.** Limited activity coupled with changes in body composition can contribute to heart disease. It is also well known that diet plays a key role in controlling blood glucose, cholesterol, triglycerides and blood pressure. Weight control is of utmost importance, as your heart should not be burdened with pumping blood the extra distance that comes with extra pounds. An exercise program can improve heart health. Medications may also be beneficial.

### **Guidelines for Heart Healthy Eating**

- Limit total fat intake.
- Lower saturated fat (usually from animals) and trans-fats (some processed foods).
- Choose unsaturated fats such as olive oil or canola oil.
- Limit cholesterol-containing foods.
- Increase intake of whole-grain products, fruits and vegetables.
- Limit simple sugars and alcohol intake.
- Curb your intake of excess salt and salty foods if your blood pressure is high.
- Maintain a healthy body weight.

### A Heart Healthy “Sample Supper”

Lemon-baked fish  
Baked potato spears  
French-style green beans  
Tomato slices  
Graham crackers  
Skim milk

#### Food Preparation Tips for Following a Heart-Healthy Diet

- Trim all fat from meat and remove poultry skin before cooking.
- Cut out fatty foods and use less fat and oil in food preparation.
- Broil, roast, steam, bake or grill food on rack allowing fat to drip away.
- Avoid frying and use nonstick pans or vegetable sprays in place of fat.
- Remove fat from soups and gravies using a skimmer, or refrigerate the food in advance to permit the fat to harden at the surface for easy separation.
- Minimize animal fat, hydrogenated oils, and tropical oils (palm and coconut oils)
- Try non-salt spices and herbs for added flavor, especially when fat is reduced.
- Read package labels to check for unhealthy ingredients such as trans-fats.

**Osteoporosis – Boning Up On Calcium.** *Osteoporosis*, or thinning of the bones, can occur when physical activity is reduced. Bones are more apt to break when they lose their density. Calcium plays an important role in the development of healthy bones and teeth. This mineral also helps with muscle flexion and nerve reaction, influences heart function and blood clotting. Calcium supplementation with added vitamin D, which helps calcium to be absorbed, is often recommended to treat bone loss, but this should only be done with your doctor’s approval. This is because calcium that is resorbed from your bones in the paralyzed part of the body may reach high levels in your bloodstream, causing nausea, kidney stones and bone formation disorders. If this occurs, your doctor may restrict calcium in your diet.

If you are directed to bolster your calcium intake, food sources of choice include milk and other dairy products such as cheese and yogurt. Other foods rich in calcium are broccoli, kale, spinach and collard greens, dried figs, blackstrap molasses, legumes, dried beans and peas, tofu (if calcium is added in processing), salmon and sardines with soft bones included, and calcium-fortified juices and cereals. Adding calcium and vitamin D in pill form to your diet should be done only with the approval of your doctor who will monitor your bone mineral status.

#### Healthful Meal Planning – So Many Pastabilities

A variety of whole grains such as whole wheat, brown rice, assorted fruits and vegetables, will provide essential fiber, vitamins, minerals and other nutrients to help you to function at your best.

Lean meat, seafood, poultry, eggs and low-fat milk products, or suitable vegetarian-style replacements for these will provide needed protein. Ample water intake rounds out your meal plan. Balance is the key.

### **A Quick ‘N Easy Rule to Help in Planning Your High-Nutrient, Low-Calorie Meal**

- Choose more veggies than fruit
- Choose more fruits than starch
- Choose more starch than meat and dairy products
- Choose more meat and dairy than fat and sugar

### **A PRIMER ON NUTRIENTS**

Nutrients are essential for your body to function well. Protein, carbohydrate and fat contribute calories to the diet and therefore must be thoughtfully integrated into a weight-management program. Vitamins, minerals and phytochemicals are substances found within food that permit what we eat to be digested well and help the body run smoothly. Water is essential, as it is needed for complex chemical processes to take place, affecting overall body stability and health.

**Protein.** Protein affects stamina and vitality, is essential for healthy muscles and skin, and helps the body fight infection and repair tissue. Requirements associated with spinal-cord impairment do not differ from those who are able-bodied. As a rule, the American diet provides ample protein, making deficiency unlikely. Normally, about 20 percent of the total calories in the diet should come from protein; roughly 50-90 grams daily. While it is important to eat enough protein, excess amounts can be harmful to the kidneys and can add to problems associated with osteoporosis, obesity and heart disease, noting that protein rich foods are often high in fat. Chief sources of protein include: egg whites; red meat, seafood and poultry; milk and dairy products such as yogurt, and nuts or legumes such as peanut butter, soybeans and other dried beans.

**Carbohydrate.** Carbohydrates are the body’s chief source of fuel. It is advised to get at least half of your calories each day from carbohydrates, chiefly from complex carbohydrate rather than simple carbohydrates.

**Simple Carbohydrates.** Simple carbohydrates such as white flour, table sugar, honey, corn syrup, dextrose, as well as other refined forms, are found in cakes, cookies, candy, and desserts and snack foods. These foods are referred to as empty calories, or calories without healthful benefit, since most of the vitamins, minerals and fiber content have been stripped away during food processing.

#### **An average American consumes over 10 tablespoons of sugar daily!**

Some sources and their sugar content:

- One glazed donut – 2 Tbsp.
- One can of soda – almost 3 Tbsp.
- Single scoop of ice cream—over 1 Tbsp.
- One Tbsp. jelly – 1 Tbsp.

**Complex Carbohydrates.** Complex carbohydrates include unprocessed fruits, vegetables, dried beans and peas, and whole-grain breads and cereals. These foods are packed with vitamins, minerals and other chemicals that serve the body in a number of ways. Fiber, or roughage, is a form of complex carbohydrate that aids digestion, specifically the bowel program. The value of fiber is further discussed under Bowel Function in this Chapter and in the Chapter on Bowel Care.

Milk, while known for its protein content, actually contains more naturally occurring sugar (lactose) than protein! It is neither a simple nor a complex carbohydrate, falling somewhere in between. Watch your milk intake if sugar intake concerns you.

**Fat.** Fat should make up less than 30% of total calories; under 45 grams for women and under 60 grams for men. Because fat is very dense in calories, no matter the source, only small amounts should be eaten in any one meal especially if you are concerned about your weight. Butter, salad dressing, cream cheese, and cooking oil are examples of foods that add up quickly in terms of fat grams, and therefore, calories. Whole milk, sausage, nuts, pizza, hot dogs, biscuits and cheese are examples of foods with hidden fats. The type of fat should be chosen with care, since saturated fats, can be unhealthy for your heart.

- Good oil / fat flows in the bloodstream. This is defined as unsaturated fat that comes mostly from plant sources and is liquid at room temperature. Examples are safflower, canola, olive, corn, peanut, soybean and sesame oils (unless hardened / hydrogenated as found in some processed foods.)
- So-called bad fat (saturated fat, hydrogenated fat and trans-fats) can raise blood cholesterol and contribute to hardening of the arteries. They are found mainly in foods of animal origin such as lard, meat, cheese, milk and egg yolk, and are usually solid at room temperature. Dietary cholesterol should also be limited as it can contribute to heart disease. Cholesterol is found in some foods of animal origin; not from plants.

**“All fats are created equal.”**

Whether the source is a “good fat” or a “bad fat,” the amount of calories is the same.

**Vitamins, Minerals and Phytochemicals.** There are virtually dozens of required vitamins such as vitamins A, B-complex, C, D, E and K, and minerals including calcium, iron, magnesium, zinc, copper and many others that serve your body. Phytochemicals, a vast group of chemicals found in plants such as lutein, lycopene, isoflavones, and ellagic acid, are now being studied for their roles in preventing and treating diseases. Food sources should be wholesome and not overly processed in order to retain their natural goodness.

- Whole foods are the best sources of vitamins and minerals since other chemicals that help with their absorption are naturally found within the food. A bottled supplement cannot contain all of these healthful substances.
- A one-a-day-type supplement may be of value if your diet doesn't meet daily requirements of

the basic food groups. Avoid taking high-potency supplements, unless a physician has prescribed them, as these nutrients must be balanced to work properly. A hit-and-miss method may be unhealthy.

- Inform your physician of vitamins, minerals, herbs or any other supplements taken, as they may interfere with your medications.

**Water.** Water is vital in that all of the chemical processes that take place in the body do so in a water bath. Adequate fluid intake helps to assure good kidney function, skin integrity and overall health.

## TIPS FOR DINING OUT

Dining out in a variety of restaurants should be easy to do and be enjoyable. However, foods are often served in abundance and contain high-calorie ingredients. The following are tips to keep in mind to avoid overindulgence.

- Make good substitutions if you are in need of cutting fat and calories. For example, you might trade greasy fries for a baked potato, rich desserts for fresh fruit, regular soft drinks for diet drinks and so forth. Sometimes, healthy, smart items are designated on the menu to help you make wise decisions.
- Avoid all-you-can-eat buffets, as there is a tendency to overeat.
- Select grilled, baked or broiled over fried foods. Ask that salad dressing, sour cream or butter be held or served on the side to allow you to control amounts.
- When in doubt about a menu item, ask your server about the ingredients.
- Avoid “mega-sized” meals from fast-food restaurants. A single large sized meal may provide an entire day’s worth of calories or fat.
- Some restaurants honor requests for half-portions at reduced prices. If only large portions are served, consider eating only half and taking the rest home.
- Many fast-food restaurants offer nutrition guides, which list food items and their nutrient content, allowing you to make wise choices.
- Strike compromises with regard to food preparation and food portions. For example, if you order regular versus low-fat salad dressing, watch your portion. If you order pizza, choose a vegetable topping over pepperoni or sausage, or fresh fruits as a side with a sandwich instead of potato chips. Select sandwich toppings of lettuce, tomato, pickles and fresh onions for flavor in place of fatty sauces, fried onions and cheese.

## READING THE FOOD LABEL

Finding healthy foods at the grocery store is easier than ever, due to label regulations by the USDA and FDA. Package labels can be easily read and provide valuable information at a glance. There are two places on the label on which to focus.

1. The “Nutrition Facts” panel shows serving sizes and nutrient amounts. It can help you to make wise decisions if you want to increase fiber, cut back on the amount of fat in your diet and lessen the amount of sugar or cholesterol in your diet. Because the amount of each nutrient on the label is based on the serving size listed, be sure to double the nutrient and caloric value if you double your serving size, or adjust downward if you eat only one-half the serving size.

2. The “Ingredient List” is a summary of the contents of the product, listed in order from greatest to smallest by weight. For example, if a cereal list ingredients as rice, sugar, nuts, and salt, this means that there is mostly rice in the cereal followed by sugar, and then other ingredients in diminishing amounts. You may find many surprises as you read labels. For example, corn syrup is added to some brands of peanut butter. It can also be surprising to discover what is not contained in the product, such as the lack of a sufficient amount of chicken contained in many canned chicken soups.

## RECAPPING THE ROLE OF NUTRITION – IN A NUTSHELL

Food is more than just something to eat. It comprises what we are made of and profoundly affects our well-being. By making wise choices when selecting foods, you can optimize your health and at the same time, savor every bite. Enjoy your diet changes and remind yourself of your investment in continued good health. *Bon appétit!*

## REFERENCES AND RESOURCES

<http://www.spinalcord.uab.edu/show.asp?durki=21481> - Nutrition

<http://www.magecerhab.org> - Nutrition

## GLOSSARY

**CALORIE** - A measure of the energy value of food; also refers to the heat output of the body. If too few calories are consumed from food as compared to the amount of calories “burned” by the body, weight loss will occur. Conversely, when more calories are consumed than expended, the body stores them and weight increases.

**CARBOHYDRATE** - One of the six classes of nutrients needed by the body. It serves as the body’s main fuel source and is subdivided into simple and complex carbohydrate groups

**COMPLEX CARBOHYDRATES** - Chemically complex foods that take longer to break down and yield more energy for the body as compared to simple carbohydrates. Examples are whole grain cereals, carrots and dried beans. Many of these foods are high in fiber, an indigestible form of carbohydrate, and consequently, can help a bowel program.

**CONSTIPATION** - Difficulty having a bowel movement, typically related to inactivity, dehydration and/or narcotic medications. It is important to maintain regular bowel movements to prevent constipation. Routine use of stool softeners and/or suppositories can also help prevent constipation. However, the proper diet can also help to manage/prevent constipation

**DIARRHEA** - A disorder of the intestine marked by abnormal fluid or loose, and/or frequent bowel movements. Sometimes this condition is affected by an infection, medication side effects and/or by diet.

**DIURETIC EFFECTS** - An increase in the secretion of urine. Some ingredients in foods such as caffeine and some medications can cause frequent urination

**DIVERTICULOSIS** - Condition where diverticula, small pouches, push out from the wall of the large intestine. If a pouch becomes blocked or infected, an inflamed state of diverticulitis can occur and become problematic.

**DYSPHAGIA** - An inability to swallow or difficulty in swallowing. Sometimes foods and beverages are modified in texture to help compensate for this condition so foods can be safely swallowed

**FAT** - One of the six nutrients needed by the body. While some fat is important to good health, excess fat can contribute to obesity and other health issues. Fatty foods include butter, margarine, oils and fats hidden in poultry skin, cheese, sausage, olives and nuts among many other sources.

**FIBER** - Portion of a food which is not digestible, remains in the intestine and becomes a component in stool. High fiber foods promote regular bowel movements that are very important to patients with spinal cord injury. Low fiber and/or high sugar diets encourage constipation.

**INTERMITTENT CATHETERIZATION** - A procedure used to empty the bladder of urine using a catheter, a tube inserted into the bladder, at scheduled times.

**METABOLISM** - Metabolism refers to how quickly your body uses energy. It is affected by chemical changes that take place with physical growth, body temperature maintenance, energy required for your heart to beat, for breathing to take place, food to digest and many other physiological processes. With less physical activity, metabolism is likely to decrease and the body will need less energy (food) to maintain its self.

**OBESITY** - Obesity or overweight is caused when more calories are taken in than calories burned. Obesity increases risk for developing chronic disease. Nearly half of all people in the US are overweight.

**OSTEOPOROSIS** - Loss of bone density and mineral content occurs when new bone is not created as quickly as old bone is broken down. It can lead to bone brittleness and the risk of increased fractures.

**PROTEIN** - One of the six nutrients needed for the growth and repair of tissue. Some high protein foods are egg whites, milk products, meat, nuts and dried beans/legumes.

**SIMPLE CARBOHYDRATE** - One of the two subgroups of carbohydrate, which, due to their simple chemical structure, are quick to be absorbed/used by the body. Examples include table sugar, corn syrup, honey and fruit sugar. "Simple carbs" typically offer empty calories or low vitamin/mineral value and should be minimized in a diet plan.

**IDEAL BODY WEIGHT FOR MEN FOLLOWING INJURY/DISABILITY**

Height	Able-bodied/Pre Injury	Paraplegic	Tetraplegic
5'5"	136 lbs.	122-129 lbs.	116-122 lbs.
5'6"	142 lbs.	128-135 lbs.	121-128 lbs.
5'7"	148 lbs.	133-141 lbs.	126-133 lbs.
5'8"	154 lbs.	139-146 lbs.	131-139 lbs.
5'9"	160 lbs.	144-152 lbs.	136-144 lbs.
5'10"	166 lbs.	149-158 lbs.	141-149 lbs.
5'11"	172 lbs.	155-163 lbs.	146-155 lbs.
6'0"	178 lbs.	160-169 lbs.	151-160 lbs.
6'1"	184 lbs.	166-175 lbs.	156-166 lbs.
6'2"	190 lbs.	171-181 lbs.	162-171 lbs.

Further adjustments for frame size, musculature, and degree of impairment may be needed to arrive at the Adjusted Body Weight for the individual.

**IDEAL BODY WEIGHT FOR WOMEN FOLLOWING INJURY/DISABILITY**

Height	Able-Bodied/Pre-Injury	Paraplegic	Tetraplegic
5'0"	100 lbs.	90-95 lbs.	85-90 lbs.
5'1"	105 lbs.	95-100 lbs.	89-95 lbs.
5'2"	110 lbs.	99-106 lbs.	94-99 lbs.
5'3"	115 lbs.	104-109 lbs.	98-104 lbs.
5'4"	120 lbs.	108-114 lbs.	102-108 lbs.
5'5"	125 lbs.	113-119 lbs.	106-113 lbs.

Height	Able-Bodied/Pre-Injury	Paraplegic	Tetraplegic
5'6"	130 lbs.	117-124 lbs.	111-117 lbs.
5'7"	135 lbs.	122-128 lbs.	115-122 lbs.
5'8"	140 lbs.	126-133 lbs.	119-126 lbs.
5'9"	145 lbs.	131-138 lbs.	123-131 lbs.
5'10"	150 lbs.	135-143 lbs.	127-135 lbs.

Further adjustments for frame size, musculature, and degree of impairment, may be needed to arrive at the Adjusted Body Weight for the individual.