Marsden Centre Aggressive Diet

In 1924 German Nobel Prize winner Otto Warburg discovered that most cancer cells do not generate their energy in the normal manner. The ***mitochondrion*** in cancer cells do not function properly therefore oxygen cannot be used to fuel the production of energy from sugar. This leads to reduced efficiency of energy production and lead to the excessive production of lactic acid, the byproduct of oxygen deficient energy metabolism of the cell. This has been referred to as the ***Warburg Effect***.

Recent findings both in Europe under the research team of Dr. Coy and in the United States at the Harvard Medical School have each identified enzymes that are elevated in cancerous cells. These enzymes are shown to shunt sugar away oxidative metabolism to the formation on lactate and other cellular components necessary for cancerous growth. Both researchers found that by altering or limiting the activity of these enzymes they were able to reduce the growth of cancer cells (Demetrius, Coy and Tuszynski 2010). Currently, research is being done to discover drugs that can alter expression and activity of these enzymes; however, until the discovery of those drugs, there are still options to limit the activity of these enzymes by limiting the sugars that are processed by them.

Diet's high in carbohydrates also have been shown to increase insulin levels in the body. Insulin has been widely shown to increase cancer cell growth likely by binding to growth receptors on cancer cells.

The Marsden Centre aggressive metabolic diet plan for cancer patients includes limiting the following foods:

Simple Sugars – Candies, cookies, desserts and other sweets
Starches – breads, pasta, rice, cereals and other grains
Certain Fruits – certain fruits, while high in certain anti-oxidants, often release significant levels of sugar and increase insulin

By reducing the carbohydrate intake in the body the liver is triggered to secrete a hormone called glucagon. This triggers the mobilization of ***glycogen*** (short term sugar stores) from the liver. Once the glycogen stores are used up ***glucagon*** causes normal cells to feed off of ***fat*** and ***amino acids*** derived from protein. The creation of energy from fats relies on the formation of ***ketones*** from the breakdown of fatty acids. These ketone bodies begin to be used as energy by cells when the carbohydrate intake falls

below 70 g/day. Some critics of low carbohydrates are concerned that excessive ketone bodies in the blood may lead to ***ketoacidosis*** a potentially severe, life threatening medical condition. This is avoided in the diet by the addition of a small amount of carbohydrate each day (40-60g/day). Thus making this diet a safe long-term strategy for cancer patients.

A Note On ***Cachexia*** – Cachexia, or significant weight loss, is a serious condition that can occur in patients with cancer. It is problematic because it is associated with a poorer prognosis. Cachexia generally has two main causes:

1. Reduced Appetite – often one of the most common side effects of many conventional therapeutics like chemotherapy and radiation is nausea, vomiting and reduced appetite. In addition, appetite can decline though any chronic illness for a variety of reasons. At the Marsden Centre for Naturopathic Excellence we attempt to employ a variety of botanical and homeopathic interventions to improve appetite and resolve or reduce nausea and vomiting. Let us know if you are experiencing a reduction in appetite during your treatments…we can help.
2. Metabolic tumor demands – since the energy metabolism of cancer cells is inefficient it requires substantial amounts of sugar to fuel its growth. As a result is can sequester calories from the rest of the body by this increased demand.

The diet we recommend is calorie dense, but not derived from sugar. While you may lose weight on this diet during the initial phases your weight should stay stable. If you are hungry choose from our acceptable list of foods to snack on or add to your meals. There are no limits to how much of these foods you can eat. If you do experience consistent weight loss on this diet please speak to your doctor at the clinic

Avoid Potentially Toxic Foods

Unfortunately, the modern industrialized world has created an environmental toxic crisis of epic proportions. Heavy metals, pesticides and herbicides, PCBs, Dioxin, plasticizers, synthetic hormones, etc. have all been dumped into our environment and subsequently into our food supply. At Marsden Centre for Naturopathic Excellence we strongly recommend choosing local, organic produce to cook with along with hormone free meats.

While there are no guaranteed clean foods, we do know that certain foods are more contaminated than others. Here is a list of foods with documented toxicities to avoid:

Seafood to avoid due to toxicity concerns:	
• Bluefin tuna or Torro and Albacore tuna and even Skipjack tuna • Halibut • Chilean Sea Bass • Grouper • Orange Roughy • Shark/Dogfish • Skate • Atlantic Sole	• Catfish • Lingcod • Mahi Mahi (Opah) • Marlin • Farmed Salmon • Farmed Shrimp • Striped Bass • Swordfish • Asian derived Tilapia • Tile Fish
Seafood that have not been found to be contaminated with toxic chemicals, but are to be avoided due to sustainability concerns:	
• Atlantic Cod • Monk Fish • Abalone (unless it is farmed) • Anchovy • Clams • King Crab from Russia	• Octopus • Rockfish • Giant Scallops • Red Snapper • Spiny and Rock Lobster from Central America
Seafood safe to consume and do not harm the environment:	
• Arctic Charr • Pacific Halibut • Herring • Jelly Fish • Mackerel • Mullet	• Pollock • Sablefish • Sardines • Squid • Blue Whiting • Alaskan Sockeye salmon

Heavily Sprayed Produce (always purchase this produce list organically grown):**	
• Peaches • Apples • Sweet Bell Peppers • Celery • Nectarines • Strawberries	• Grapes (Imported) • Blueberries • Spinach • Potatoes • Lettuce • Kale/collard greens
Produce with the lowest Pesticide Residues (these products contain lower amounts of pesticide and are not as important to be purchased in the organic variety)**	
• Onions • Avocado • Sweet Corn (Frozen) • Pineapples • Mango • Sweet Peas (Frozen) • Asparagus • Mushrooms	• Kiwi • Cabbage • Eggplant • Cantaloupe • Watermelon • Grapefruit • Sweet potato
Meats and Poultry	
• Most animals in North America are given hormones to encourage rapid development and growth. The European Commission has banned the use of hormones in meat due to their potential effects on human health. Excessive hormones have been implicated in a variety of cancers. • Most meat and poultry products in North America are given large doses of antibiotics to prevent infection mostly due to poor raising conditions and cramped quarters. This overuse of antibiotics can lead to antibiotic resistance and excessive human ingestion. • You should always eat organic, free range, antibiotic free meats and poultry.	

** Source: Environmental Working Group 2011

Food Allergen/Sensitivity Avoidance Recommendations

Optimal digestive system health is essential for overall health regardless of what disease you might be suffering with. Some foods that we eat can have significant effects on intestinal flora and inflammatory reactions at the level of the gastrointestinal tract (Tlaskalova-Hogenova et al 2011). Ingestion of these foods can lead to ***intestinal dysbiosis and mycosis***, mucosa irritation and eventually intestinal atrophy which is often referred to as ***"leaky gut"***.

Dysfunction in the gastrointestinal tract will lead to:

1. Reduced absorption of nutrients
2. Impaired excretion of toxins
3. Impaired immune function

The following are foods to be avoided (your doctor will check all that apply to you):

- ☐ Dairy
  - Milk
  - Cheese (all types)
  - Yogurt
  - Cream
  - Ice Cream
  - Butter
- ☐ Meats
  - Beef
  - Pork
  - Game Meats (rabbit, venison, boar, moose, etc.)
- ☐ Citrus Fruits
  - Oranges
  - Melons
  - Cantaloupe
  - Lemons and Limes are acceptable
- ☐ Glutenous Grains
  - Barley
  - Rye
  - Oats
  - Wheat
  - Spelt
  - Kamut
- ☐ Nuts
  - Peanuts
  - Hazelnuts
  - Brazil nuts
- ☐ Eggs
- ☐ Onions and Garlic

Juicing…An excellent source of nutrient

Gerson Juice Therapy is a traditional treatment plan used in cancer for over 40 years. This approach involved the consumption of 10-13 glasses of fresh vegetable and fruit juices per day along with supplementation of potassium and iodine; and the performance of three or more coffee enemas daily. Proponents of the approach claim that this diet will cure cancer by alkalinizing the body, supporting healthy cellular metabolism and improving detoxification. While there are many case studies completed over 40 years and an inpatient treatment clinic providing this therapy, to date there have been no properly controlled trials showing the efficacy of the approach. In addition, it requires full time help to administer this treatment. Ultimately it is not a feasible treatment plan for most patients and the juicing of fruits goes completely against the low carbohydrate approach.

Having said that juicing certain vegetables is an excellent way to ensure you meet or exceed your recommended 7-12 servings of vegetables in a day. In addition, it is a great way to gain cancer preventing/fighting ***phytochemicals*** like ***phytosterols***, ***vitamins***, ***enzymes***, etc. Remember the following rules when juicing vegetables:

1. Use only the vegetables mentioned on the always allowed list or use the juicing recipes included at the end of this section to ensure you do not exceed your carbohydrate levels for the day
2. Use organic vegetables if at all possible to reduce the amounts of pesticide residues in your food
3. Wash using a vegetable wash then peel all vegetables prior to juicing. This again will reduce pesticide residues in you juice
4. Prepare only enough juice that you can immediately consume. Fresh vegetable juices are immediately oxidized and lose some of their healthy effects even after 20 minutes. Do not refrigerator your juices…consume immediately
5. Use a juice extractor juicer not a blender style juicer. Removal of cellulose component of the juice is essential for increasing the nutritional value and improving tolerability

Acceptable Food List Summary

Food on this list can be consumed in any quantity at any time on this diet

Meats • Lamb	Vegetables • Cauliflower* • Broccoli* • Green/Yellow Beans • Brussel Sprouts* • Cabbage (all varieties)* • Egg Plant • Fennel • Cucumber • Kale* • Kohlrabi* • Watercress • Celery • Leeks • Swiss Chard* • Parsley • Radishes • Olives • Asparagus • Spinach* • Tomatoes • Onions • Avacados • Endive • Green Lettuce • Romaine Lettuce • Arugula	Mushrooms • Cremini • Portobello • Shitake* • Maitake* • Chantrelles
Dairy and Goat • Sour Cream • Goats Cheese		
Poultry • Chicken • Duck • Goose • Turkey		Nuts and Seeds • Peanuts • Pine Nuts • Coconuts • Almonds • Walnuts • Macadamia Nuts
Fish • Arctic Charr • Pacific Halibut • Herring • Jelly Fish • Mackerel • Mullet • Pollock • Sablefish • Sardines • Squid • Blue Whiting		Fats and Oils • Flaxseed Oil* • Olive Oil • Grapeseed Oil • Hempseed Oil • Butter (clarified butter preferred)
Seeds • Flaxseed* • Sesame seed		Miscellaneous • Tofu • Stevia

*Food marked with an asterisk should be emphasized in the diet as they are especially helpful due to their health effects.

Note: If you do not see a food item on this list but would like to include it on the diet please contact the clinic nutritionist to ensure it can be added in safely.

Yellow List

You can make on choice from the food on this list to be consumed 1x/day

Name	Maximum Quantity/Serving
Strawberries	80 g
Bilberries	55 g
Raspberries	90 g
Redcurrants	65 g
Gooseberries	60 g
Cranberries	100 g

Orange List

You can make a choice from the food on this list to be consumed 3x/week

Name	Maximum Quantity/Serving
Grapes	30 g
Pineapple	80 g
Beetroot, cooked	85 g
Watermelon	60 g
Mango	35 g
Papaya	200 g
Carrots, raw	85 g
Peaches	55 g
Apples	40 g
Plums	45 g
Apricots	55 g

Food on these lists contain a moderate amount of carbohydrates which should not be over consumed to prevent exceeding the daily carbohydrates target.

Red List

Food on this list contain significant levels of carbohydrate in forms that lead to rapid elevations in blood sugars. These should be avoided at any time while on this diet.

Grains and Starches (This includes any product that contains these grains)	Fruit	Condiments
Amaranth Corn Quinoa Rice Buckwheat Any food containing flour Pretzels Noodles Rolls Bread Crisps Salt sticks, Biscuits Breadcrumbs (breadcrumb coating!) Ready-to-serve meals Sauces, thickened Biscuits and pastry Cereal products Soups, thickened Tortilla Bread Cake	Bananas Pomegranate Dry fruits Raisins Figs Dates Fruit juices, undiluted Beans Chickpeas, Peas Vegetable juices Potatoes Drinks Alcohol (exception 1 glass of red wine Beer Spirits Liqueur Chocolate Milk Fruit Juice	Jam and marmalade Sugar Honey Syrup Sweets or Candies

Nutrition Plan Summary

Increase foods predominantly composed of proteins and fats and leafy, green vegetables

Limit foods that have moderate levels of carbohydrates outlined on the Yellow and Orange Lists

Avoid foods that contain substantial amounts of simple carbohydrates and starches, which are outline on the Red List

Avoid the foods checked off by your doctor that may not be beneficial due to potential sensitivities. These may interfere with nutrient absorption and assimilation

Use juicing as a technique to easily ingest nutrient dense and alkalinizing vegetables in substantial amounts

Avoid foods that may contain environmental toxins that may contribute to illness or inhibit healthy immune and detoxification responses