Dietary Recommendations for Cancer Prevention

Introduction/Rationale

There is a tremendous amount of conflicting information regarding dietary choices in published scientific literature and the popular media. Some studies state fats are bad, some carbohydrates and starches, and others meats and meat products. Having said that there is some very consistent research information that is clear on what general dietary guidelines will promote health and prevent disease, namely cancer. Ultimately the current standard North American diet is making us sick. It is the one time in human history where we are both overfed and malnourished. A diet that focuses on prevention of cancer has the following general properties

1. Increase consumption of fruits and vegetables
2. Select produce farmed organically and locally
3. Whenever possible consume whole grains not refined
4. Reduce consumption of animal products and eliminate processed/non-organic meat products
5. Avoid foods that harbor significant toxic substances
6. Avoid potentially allergenic or inflammatory foods
7. Drink clean water
8. Eat a variety of foods that you enjoy

By sticking to these very simple guidelines you can expect to significantly reduce your risk of developing a variety of cancers or, if you have been previously diagnosed, a recurrence. In the following pages I will elaborate on each of these points and include dietary suggestions that you can use to menu plan.

1. Increasing Vegetable and Fruit Intake

All of the research has shown that consuming more than 5 servings of vegetables in a day will reduce risks of certain cancers/recurrences by over 70% (Miller et al 2010 and Randi et al 2010). Currently, the average North American consumes less than three servings of fruits and vegetables per day. Vegetables and fruit have a myriad of nutrients that can influence cancer development including:

- Polyphenols and bioflavonoids
- Bioactive indoles
- Fiber
- Pectins
- And many others we have not even identified yet

Try to remember the rainbow rule with every meal. That is consuming at least three colours with each meal. This will help to ensure a variety of carotenoids, bioflavonoids and…flavour.

2. Consume Local and Organic Produce

The nutritional value of our food has significantly declined over the past 3-4 decades, foods are becoming depleted of vitamins, minerals and other phytochemicals in the quest for higher yields. The food industry has

become more interested in the quantity of food that can be produced rather than the quality. This has resulted from the use of commercial fertilizers and pesticides along with genetically modified species. Large agro corporations and the demand for low cost high profit product have also lead to the demise of local, sustainable farming. This has caused a decline in producers from Canada and at the moment we rely on imports of food in order to feed the population.

In addition, the use of these pesticides and inorganic fertilizers combined with industrial pollution has lead to a low dose poisoning of our food supply. As a prime example the maximal allowable pesticide residues in North America are often 10-1,000 times higher than what is allowed in Europe. Not to mention that Europe has banned the use of hormones in livestock and dairy farming, but these chemicals are allowed and used constantly in North America.

By purchasing local and organic produce you can have several positive health, social and environmental benefits:

- Higher quality product due to greater freshness and better farming methods (Benbrook, et. al., 2008)
- Reduced pesticide residues in the food you eat (Benbrook, 2008)
- Reduce the environmental impact of long distance food importation and its increase of greenhouse gas emissions
- Supporting local agriculture and local farmers, once the back bone of our communities

3. Consume Whole Grains

Whole grains have the presence of the "Germ" which gives the grain that telltale, yellow/grey appearance. The "Germ" in the grain has high levels of zinc, carotenoids and oils that are important for health and development. In addition, whole grains are an important source of fiber that are essential for proper bowel health. Consumption of whole grains has also been associated with decreased risk of developing colorectal cancer (Haas et al 2009). In North America our diets are frequently full of refined grains made from either glutinous sources or corn. Try to use a greater variety of grains that are gluten free including:

- Rice
- Quinoa
- Amaranth
- Buckwheat (not a grain but can be made into a flour)
- Millet
- Sorghum
- Gluten Free Oats

4. Reduce Consumption of Animal Products and Eliminate Processed and Non-Organic Meat Products

In almost all large-scale nutritional studies excessive meat product consumption is associated with increases in cancer, cardiovascular disease, diabetes, etc. Those populations with the lowest meat product intake had lower levels of these diseases (Toden et al 2010). Further, processed meats including cold cuts, sandwiches and cured products like bacon have high levels of various preservatives (most importantly sodium nitrite) which are known carcinogens (cancer causing substances) (Sandler 2010).

In North America livestock, poultry and dairy farmers are allowed to use hormones in the raising of their animals. Due to potential accumulation of these hormones in people over time Europe has banned their use. Ultimately meat needs to cease being consumed as main source of calories and instead become a smaller side type dish. Depending on your activity level you can look to consume no more than 8 oz of organic meat products per day.

5. Eliminate Toxic Foods In Your Diet

The following table details which foods harbor significant toxins and should be avoided. Given the nature of our environment this list is updated annually. This is an updated list:

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 do not harbor toxins, but are hazardous to the environment due to their method of catch/farming*	
• 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 • Cherry Tomatoes	• 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/honeydew melon • Watermelon • Grapefruit • Sweet potato

*Source: Monterey Bay Aquarium Seawatch and T. Grescoe's Bottom Feeders

**Source: Environmental Working Group 2011

6. Foods that Have Potential Anti-Cancer Effects

Many foods have been studied for their potential anti cancer effects. While no food at this time has been shown to be a cure for cancer, many foods have been shown to have an antagonistic action against the metabolism and growth of cancer cells.

Food	Effect	Notes
Fruits and Vegetables in General	Vegetables have a variety of ***phytochemicals*** that have shown potent effects against ***carcinogenesis***. Regardless of the type, eating more than 6 servings of vegetables/day have been shown to reduce rates of cancer and rates of cancer recurrences.	Breast cancer, colorectal cancer, and prostate cancer all show significant reductions in risk associates with increased fruit and vegetable intake.
Cruciferous Vegetables (cabbage, broccoli, cauliflower, brussel sprouts, etc.)	The vegetables in the cabbage family are well known for their anti-cancer properties. These vegetables have a variety of compounds that inhibit cancer growth. In addition, components in cruciferous vegetables aid in detoxification and therefore can help in reducing the accumulation of cancer causing toxins in the body.	For the best effects these vegetables should be lightly cooked via stir-fry or cooking in a minimum of liquid and should be chewed well.
Green Tea	Green and White Tea contains catechins, most notably EGCG (epigallactone catechin gallate), which have been shown to inhibit cancer growth and in large epidemiological studies to reduce rates of cancer. Green tea also contains a compound called theanine which helps with mood, reduce appetite and improve sleep. All of these effects are important in cancer prevention.	Japanese Matcha Tea has the highest level of catechins because it is a tea where you actually consume the leaf, however any green tea or white tea has high levels of EGCG. In general green teas should be steeped at 175^{0}C for 3 minutes for taste and health.
Berries (Aronia, Acai, blueberries, black berries, bilberry, etc.)	Berries are nature's most powerful antioxidants. They contain compounds called bioflavonoids which act as oil in the energy making machinery of all cells. By reducing oxidation or the formation of free radicals they have been shown to improve DNA repair and prevent cancer cell creation.	The darker and fresher and darker the berry the higher the anti-oxidant content. Choose organic produce to avoid exposure to pesticeides often used in the harvest of these berries
Omega 3 Oils (Fish Oils, flax seed oil, hemp oil)	Essential Fatty Acids, including omega 3 olis have recently been shown to be useful in the management of several cancers including pancreatic, gastric and colorectal tumours. Some of the mechanism behind this supportive affect are the anti-inflamtaory (Cox-2 inhibition) along with the dense energy source they can provide	Omega 3 oils can become readily oxidized and therefore fish should be lightly cooked and oils like flax or hemp should never be heated
Garlic, Onions, Leeks, Shallots and Chives	The "Allium" or garlic family of vegetables has large quantities of sulfur containing compounds. Animal studies have validated this families role in the prevention of many cancers. Not only do these sulfur compounds lead to cancer prevention, but can also support general detoxification.	Fresh, crushed garlic is the best source of sulfur compounds and should be preferred over supplements
Soy (Tofu, soy milk, edemame, miso, roasted soy beans)	Soy products (except soy sauce) contain important compounds called isoflavones. These molecules can act as hormone buffers and reduce risks of hormone sensitive cancers. They have been suggested as the reason why Asian countries have lower rates of cancers like ovarian, breast, or prostate.	Patients who are taking hormone antagonistic drugs like tamoxifen or arimidex should keep their intake of soy to no more than 100g/day
Mushrooms	Mushrooms contain molecules called polysaccharides. These are long chains of sugars. These polysaccharides have important actions on the immune system.	Agaricus bisporus (white button mushrooms) are the most commonly available mushrooms for cooking applications that have these polysaccharides although Shitake and Maitake had been most widely studied for health effects. Light stir-frying can increase their palatability while not inhibiting their immune stimulating action.
Tumeric	Tumeric is a very well studied herb/spice for its potential effects against cancer. Compounds in turmeric called curcuminoids (most importantly curcumin) have been shown to inhibit cancer growth and actually kill cancer cells in lab conditions.	Absorption of turmeric is best when taken with fats or oils.
Tomatoes	Tomatoes contain high levels of carotenoids and bioflavonoids. Carotenoids and bioflavanoids have been shown to have in vitro properties of cancer prevention and cancerous growth inhibition.	

7. Avoid Potentially Allergenic Foods

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 only if your naturopathic doctor has checked them off:

- ☐ 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

8. Drink Clean Water

We take water quality for granted in North America as there are well-established water treatment facilities in almost all municipalities; however, normal water treatment in Canada has several key issues:

- Many non-microbial contaminants are not removed from municipal water. These include heavy metals, drugs, pesticides, etc.
- The use of halogens like chlorine and fluorine can cause the production of oxidative free radicals and may be linked to the development of some cancers and chronic disease (Nieuwenhuijsen et al 2009)

Ultimately, purity of water is the critical factor for quality water. Use a reverse osmosis filtration system or buy water that has been reverse osmosis filtered for daily drinking and cooking. Reverse Osmosis filters are very good at removing micro-contaminants in water. The resulting water will have a slightly lower pH due to the dissolution of ambient carbon dioxide into the water. This is not a health problem as the body has mechanisms to metabolize and excrete the carbon dioxide with little effort.

Reverse Osmosis filtered water is demineralized meaning it has very low levels of inorganic minerals. There is a misconception that due to the low levels of minerals in the water it will strip minerals from the body. This is incorrect and a general misunderstanding on the process of osmosis and the transport of minerals in the body.

9. Limit the Amount of Alcohol You Drink

Alcohol consumption, particularly heavy alcohol consumption, has been shown to be a factor in increasing the risk of developing many diseases and cancers, including colorectal cancer (Fedirko et al 2011 and Li 2011). In order to help minimize the amount of alcohol you consume, follow the "2-4 Rule": drink no more than 2 alcoholic beverages in one sitting, and no more than 4 per week. While consuming more than 2 alcoholic drinks a day has been associated with significant increases risk to develop various types of cancer (World Cancer Research Fund, 2007), having more than 4 drinks a week has been associated with increased risk of cancer recurrence (Kwan et al 2009 and Kwan et al 2010). Remember that one drink is equivalent to a 12-ounce bottle of beer, 5 ounces of wine, or 1.5 ounces of hard liquor.

10. Eat a Variety of Foods You Enjoy

In our modern world we have added too much science and technology to the subject of nutrition. In doing so, we have defined the foods we eat by macronutrients (protein, carbohydrate and fats), micronutrients (vitamins and minerals), and trace elements. Unfortunately this oversimplifies what is important in the foods we eat. The more we study vegetables and fruits the more we learn about their complexities and what important chemicals they contain (i.e. bioflavonoids, phytophenols, phytosterols, etc.).

In addition, the food we eat is not just important for physical sustenance. Families, communities and cultural groups often define themselves by the foods they prepare and ceremonies surrounding their consumption. It is important to remember to keep the joy in both the preparation and consumption of the food we eat. Ensure your diet is not only physically healthy based on the recommendations already made above but also emotionally nourishing. Eat a varied diet with flavors you enjoy and remember to experiment with new foods and new flavors so your diet does not become monotonous.

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