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## Section I: What is cancer?

### What is cancer?

All cells - at some point in their lifespan - have the capacity to reproduce. Our bodies contain many cells that reproduce by dividing into “daughter cells”. Many types of blood cells, skin cells, cells in the digestive tract and sperm are examples of cells that are constantly dividing. The healthy body has control mechanisms to organize the methodical growth and repair of tissues. We need these cells to divide to provide for tissue repair, a healthy immune system, healthy blood and for fertility, and the control mechanisms generally do a very good job of directing this growth.

Our red blood cells have a lifespan of about four months. They carry oxygen to every other cell in the body, so we need to have them constantly replenished. Our immune systems are able to reproduce an army of cells which destroy damaging microbes such as bacteria, viruses, fungi and parasites.

In cancer, however, the control of growth and division of cells is disrupted and cells begin to replicate over and over again. This may result in a solid tumor or, in the case of a cancer of the blood, in tumors that may travel through blood vessels or the lymphatic system. (The lymphatic system helps drain excess fluid and helps remove various substances from your body.)

In general, while we often don't know the specific cause of any cancer, the DNA of individual cells becomes mutated or damaged and those control mechanisms for growth are also damaged. For example, a gene or gene group that helps control normal growth is damaged and the cells begin to proliferate (reproduce) rapidly and uncontrollably. Or, a gene which normally suppresses or inhibits growth can become mutated or damaged and no longer slows down the growth of cells. Also, during normal replication, the DNA must be copied; sometimes, during this process, mistakes are made and cancer may be one result.

Other mutations can create or act to wake up genes called oncogenes because of their involvement in growth. Oncogenes are bits of genetic information that can code for cancer. Most researchers believe it takes a combination or more than one mutation to cause cells to begin to grow out of control.

But what can cause the mutation in the first place? Well, there are a number of factors to consider. First, the older we get, the more some cells have had to replicate - and it becomes more possible for a mistake or mutation to happen. Viruses are also known to cause cancer as well as substances known as carcinogens - cancer-causing substances.

Lifestyles may also put you at a higher risk for cancer. Smoking, excess alcohol, obesity, unprotected or unsafe sexual practices and a history of sunburns can increase your risk of specific cancers. Some cancers occur more commonly in families with a specific gene mutation.

Finally, and this is a big, wide risk factor, there may be environmental causes of cancer. This can include solvents that you may have been exposed to, air pollution, pesticides, herbicides, heavy metals and other substances such as benzene, formaldehyde and asbestos. This is often an area over which you may have little control and which we don't know as much as we'd like. Many, many different substances are released into our environment with little control and even less understanding of how these substances may affect human health.

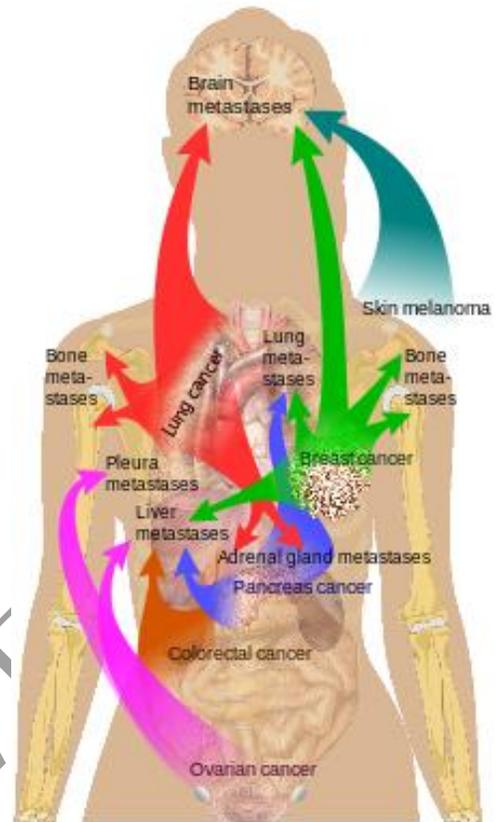
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## Cancer metastasis

Some cancers may metastasize, or spread, relatively quickly and easily, while others tend to spread more slowly. There are a number of routes for this spread.

- The tumor may grow into (invade) a neighboring organ or tissue
- Tumor cells may break off the parent tumor and travel through the lymphatic system and the lymph nodes (lymphatic metastasis)
- Or they may pass into the blood vessels (hematogenous metastasis).

The most common parts of the body for the emergence of metastases are the lungs, liver, brain, and the bones.<sup>1</sup>



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## An overview of conventional treatment approaches

### Surgery

Surgery is one of the most common treatment approaches for cancer. If you have a solid tumor, the surgeon will remove as much of that tumor as possible.

Other areas such as lymph nodes and surrounding tissue may be sampled in order to determine if the cancer has spread and to gain a more specific idea of staging (a measure of how advanced the cancer is) and possibly the specific type of cancer, if that has not already been determined.

Surgery may also involve the placement of a catheter or tube for the administration of chemotherapy or for blood draws. Reconstructive or plastic surgery may also be done to recreate a breast or perform a bone graft, for example.

### Chemotherapy

Chemotherapy (chemo) is the use of anti-neoplastic (anti-cancer) or cytotoxic (cell killing) drugs, either orally or by IV (intravenous, through the veins). There are many, many chemotherapeutic drugs, some used during part of the therapy only, some used specifically for one kind of tumor and some used for a variety of tumors. For our purposes, the most important factor is how and why they can kill cancer cells and how and why they cause adverse side effects.

Most chemotherapeutic drugs work by killing cells that are dividing - that is, by stopping mitotic cell division. Remember that cancer is the uncontrolled growth of cells, so chemo targets cells that are rapidly dividing. But other cells in your body divide as well. Some of the normal cells that rapidly reproduce are cells of the blood, cells of hair follicles, cells lining your gut, your mouth and your stomach. This is the reason - for a majority of side effects - those normal cells are being killed off as well.

### Radiation Therapy

In radiation therapy, high-energy beams are delivered to the tumor. X-rays, gamma rays and other charged particles are most often used. The hope is to limit the exposure of healthy tissue by directly targeting the tumor and by protecting normal tissue. There are two main types of radiation therapy - externally delivered radiation and brachytherapy, where the high energy beam is delivered by placing a radiation source directly into a solid tumor. In either case, the radiation destroys the tumor cell's DNA and thus its ability to grow. Radiation therapy is often done before, during or after surgery or chemotherapy.

### Proton Beam Therapy

Proton beam therapy uses a positively charged particle - a proton - to deliver the radiation. There are two main types of proton beam therapy: brachytherapy, which uses radioactive pellet; and external beam therapy. The real advantage of proton therapy is that the treated area drops off quickly, reducing damage to healthy tissues in small spaces such as the prostate, near the eyes or in children who have smaller anatomy.

### Brachytherapy

Brachytherapy can be either high or low dose. In brachytherapy, radioactive pellets or “seeds” about the size of a grain of rice are placed directly into the tumor. The low dose “seeds” are permanent, but because of the type of radiation used, they lose their radioactivity after a relatively short period of time. In the high dose brachytherapy, the “seeds” are removed.

### External Beam Therapy

External beam therapy is also known as IMRT (Intensity Modulated Radiation Therapy)<sup>2</sup> uses other imaging techniques such as an MRI, PET or a CT scan to guide the radiation to the tumor. This is often done from many different angles. The intensity and the shape of the radiation beam can be controlled to give the greatest radiation to the tumor while minimising exposure to the healthy tissue. These treatments are most commonly delivered for about 10-20 minutes daily over a period of six to eight weeks.

### Biological Therapies

Biological therapies use substances derived from biological processes as opposed to chemically synthesised drugs. This therapy is sometimes known as Biological Response Modifier Therapy (BRMT). Biological therapy helps your own body fight off the cancer cells, where in chemotherapy, the drugs kill the cancer cells directly.

Biological therapies include growth factors, vaccines and monoclonal antibodies. Therapy with monoclonal antibodies such as rituximab or herceptin may also be called targeted therapy because the antibodies are designed to “target” the cancer. Biological therapies include the use of BCG (Bacillus Calmette-Guérin), IL-2 (Interleukin 2) and IFN-alpha (Interferon alpha).

### Angiogenesis Inhibitors

All cells need a blood supply to survive, reproduce and spread. Angiogenesis inhibitors starve the tumor by preventing the growth of new blood vessels to the tumor. Examples of angiogenesis inhibitors include bevacizumab, sorafenib, everolimus and pazopanib.

## Laser Therapy

Laser is actually an acronym for “Light Amplification by Stimulated Emission of Radiation) and comprises a single high intensity beam of light that can be directed at a tumor. Lasers are most commonly used to treat tumors on the skin, cervix and certain lung tumors.

## Hyperthermia

Hyperthermia, or high temperature treatment of tumors, is most often used in conjunction with other therapies. In a hyperthermia treatment, the temperature of the tumor is brought up to around 111° F.

Hyperthermic treatment may, for example, be applied locally, to a skin tumor; regionally, to the abdomen, uterus or lungs; or to the whole body.

## Bone Marrow and Peripheral Blood Stem Cell Transplants

The bone marrow is a primary source of stem cells - the stem cells divide to form new blood cells. Stem cells can also be found in the blood vessels outside the bone marrow. Both of these sources of stem cells can be used to “restock” your blood after chemotherapy or radiation therapy. Often, your own stem cells are harvested before the chemo or radiation therapy. This is an autologous transplant. For some patients, a bone marrow donor must be found - someone whose blood cells very closely match the patient’s blood. These transplants are most commonly done to treat leukemias and lymphomas.

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## SECTION II: NUTRITION DURING CANCER TREATMENT AND RECOVERY

One old saying you may have heard is “You are what you eat”. Well, in real terms, that is very true. We digest the foods we eat and then use those digestion products as the bricks, mortar, siding, plumbing and electrical systems for our growth, health and protection. So, those leafy green vegetables you eat today will be helping to restore your bones, muscles, immune system and overall health tomorrow!

Cancer begins at the cellular level, where nutrition wields its greatest effect. Our nutritional status either weakens us, making us vulnerable to the development of cancer, or strengthens our bodies’ defense mechanisms, enhancing our ability to protect against disease, fight cancer and avoid recurrence.

So an understanding of how we can use nutrition to best support our cancer treatment and recovery is essential.

Our bodies are made up of and/or require:

- ◆ **Water** - there’s loads of varying advice on how much pure water to drink, but a reasonable rule of thumb is 2- 2.5 liters per day. <sup>3</sup>
- ◆ **Proteins** - long chains of amino acids. Essential amino acids are required in the diet because our bodies cannot synthesize them. A “complete protein” contains all the essential amino acids. Proteins can be considered the “workhorses” of the cell. They are the main component of enzymes, substances that are essential to performing the hundreds of biochemical reactions that occur 24 hours a day, seven days a week.

Other proteins in the muscles for example, provide scaffolding for the cells and allow for movement. And other proteins function as signaling molecules, as antibodies in the immune response and a host of other functions. Proteins are also the



primary component of our vital organs, muscles, skin, hair and nails.

- ◆ **Carbohydrates** - chains of various types of sugars. Carbohydrates can be complex chains of an assortment of sugars as you would find in, for example, whole grains or they can be simple sugars like the sugars you may add to your coffee or tea. Glucose is a simple sugar and so is fructose - the kind that is found in high fructose corn syrup. Glucose and fructose are both simple sugars, but their chemical structure is different. The functions of carbohydrates are many and include the storage of energy, providing the backbone of DNA, RNA and enzymes, and providing structure to your cells. Fiber, necessary for healthy elimination, is primarily a carbohydrate.
- ◆ **Lipids** - lipids are a large class of substances and include the different types of cholesterol, essential fatty acids such as the Omega-3 fatty acids and triglycerides, among others. Lipids also can function as energy storage, structural elements of cells, vitamins and signaling substances.
- ◆ **Minerals** - We divide the required minerals into two groups: the “macrominerals” and the “trace minerals”. Our bodies require quite a bit of the macrominerals and much less of the trace minerals. The macrominerals are calcium, sodium, potassium, magnesium, chlorine, phosphorus and sulfur. The trace minerals include, among others, iodine, copper, iron, manganese, selenium and zinc.
- ◆ **Vitamins** - vitamins can be divided into two main classes, the fat soluble vitamins such as vitamins A, D, E and K and the water soluble vitamins such as the B complex vitamins.
- ◆ **Intestinal bacteria** - the number of intestinal bacteria, by some estimates, is about 10 times the number of human cells!<sup>4</sup> These organisms are essential for producing vitamin B<sub>12</sub>, digestion and for certain aspects of our immune systems.
- ◆ **Other nutrients**. The list of “other nutrients” is long but includes anti-oxidants and bioflavonoids, saponins, phytoestrogens, organosulfurs and isothiocyanates. These are the types of nutrients you find in fruits, vegetables, tea and berries (anti-oxidants, bioflavonoids), vegetables (phytoestrogens, isothiocyanates (particularly in broccoli, cauliflower and brussel sprouts)) and whole grains (saponins). The organosulfurs are found in garlic, onions and chives.
- ◆ These are the nutrients that are so important for cancer prevention (especially the organosulfurs and the isothiocyanates) and for overall health.

What should you eat to promote your healing?

So, how can you get all these nutrients? Here are some general guidelines.

- ◆ Eat like your ancestors did! No, we are not suggesting you



go off to some cave and cook over a campfire. But, your ancestors ate *whole* foods, not processed foods. They ate hormone-free game meat. They ate nuts, seeds, fruits and vegetables.

And the fact is our ancestors did not die from the same diseases we are prone to. Sure, the ancient Egyptians knew about cancer and heart disease - but most of our ancestors died of infections and injuries. The current epidemics are obesity<sup>5,6</sup>, heart disease and diabetes.<sup>7,8,9</sup>

- ◆ Eat as many **fresh vegetables, fruits, whole grains, and legumes** as you can. Whole grains include brown rice, millet, oats, buckwheat, barley, quinoa, amaranth, corn, whole wheat, spelt, kamut and teff. Legumes are beans, peas and lentils. They include navy, adzuki, white, black, mung, garbanzo, pinto, lentils and split peas. These foods are high in protein, complex carbohydrates, fiber, vitamins and minerals. They also help support the intestinal bacteria vital for digestive health. Also be sure to eat seeds and nuts. The seeds can include sesame, pumpkin, flax and sunflower, to name a few. Head down to your local organic health foods store and check them out – try one new food a week and experiment!
- ◆ Try to minimize the fat in your diet, but keep in mind that some fats are essential to health. (See section on fats below.)
- ◆ Eat **fresh, whole foods** rather than processed, prepared foods. Processed foods may seem “easier” or more convenient, but beware the hidden costs. For example, during processing, many foods lose vitamins and minerals. Some may be added back; folic acid, for example is added into flours and grains. But, you may want to ask yourself, what *else* has been removed that hasn’t been replaced? Also, many processed foods contain high levels of sugar, preservatives and other agents. The fact is we simply don’t know what effect (or effects) most of these preservatives and other chemical have. They may be totally innocuous, but we simply don’t know for certain. When you are trying to maintain or regain health, it seems prudent to remove any uncertainties that you can. The term “whole foods” means grains and foods that have not had any of their components removed. Choose organic foods whenever possible; these will have fewer or no pesticides and other chemical residues on them.
- ◆ **Water, water, water!** Assuming healthy kidneys, the more water you drink the better hydrated you are and the better able to flush toxins out of your system.
- ◆ Increase the amounts of **nuts** and **seeds** in your diet - but careful of some of the roasted nuts and seeds as they may have been deep-fried or coated in oils and they may be overly salted.

- ◆ Increase the amount of deep sea **fish** and decrease the amount of meat - especially red meat - that you eat. Red meat in general has the wrong ratio of fats and is often filled with antibiotics and other chemicals. Wild caught fish is generally higher in Omega-3 fats than farmed fish and generally lower in various pollutants.<sup>10</sup> Some of the best fish to include in your diet are salmon, cod, trout, tuna, mackerel and ahi. Fresh salmon is an especially good source of healthy oil called eicosapentaenoic acid (EPA). Try to ensure that your fish is mercury free. Increase free-range poultry and eggs over red meats as well and avoid the skin. Avoid smoked meats that may contain nitrates or nitrites - these are nitrogen containing substances that have been associated with cancer.<sup>11</sup>
  
- ◆ Investigate the possibility that you have **food intolerances**. Gluten is found primarily in wheat products but also found in barley, rye and to some extent in oats, is one of the most common. Many people are also intolerant of dairy products. Some people are intolerant to both!  
 When an individual has these intolerances,(sometimes called sensitivities), their digestive and immune systems begin to react against these foods, causing a variety of problems including digestive, neurological, autoimmune and musculoskeletal issues. Some people have discovered their sensitivities after years of suffering headaches, digestive problems, skin rashes, recurrent infections or respiratory problems.
  
- ◆ **Fats and oils:** Fats have been much maligned in the past, but the right fats are critical for health. Some fats - mainly Omega-6 fats - have pro-inflammatory functions, meaning these fats can support or increase the inflammatory process which in turn, can promote various types of [cancer](#). Other fats - primarily the Omega-3 fats - are anti-inflammatory and subdue the inflammatory process. The issue lies in the *ratio* of Omega-3 and Omega-6 fatty acids – it's easy to consume Omega-6 fats because they are found in most vegetable oils. On the other hand, Omega-3 fats are found mainly in fish and in some plant sources<sup>12,13</sup> (flaxseed and flaxseed oil, canola oil, soybean oil, soybeans, walnuts, walnut oil, borage and purslane) and they are not as easy to obtain. So, people tend to have more Omega-6 than Omega-3 and *that* tips the balance toward inflammation.<sup>14,15,16</sup> Our ancestors consumed about the same amount of Omega-3 and Omega-6 fats - a 1:1 ratio. We tend to consume more than 15 times more Omega-6 fats! In some countries, people consume 20 times more Omega-6 than Omega 3. Not too surprising given these are the same countries where inflammatory diseases are epidemic. In fact, while ancient humans died from trauma and infections, they did *not* die from chronic disease - every one of which is worsened or caused by inflammation!<sup>17</sup>

## Foods to Avoid

We've already mentioned some foods to avoid: processed foods, smoked meats, red meat and prepared foods. There are a few more foods to watch out for, though.

- ◆ **Sugary foods:** Most of us have a sweet tooth and no one is saying *never* have any sweet. But, highly sugared foods induce a rapid rise in blood sugar. That sets up a whole host of problems; the most recognized are increasing the risk of diabetes and heart disease, high cholesterol, insulin resistance and weight gain.<sup>18</sup> [Breast cancer](#) and [colon cancer](#), for example, have been linked to obesity and inflammation. Fructose, particularly high fructose corn syrup, is considered by many to be central to an increased risk of obesity and moderation in its use is strongly recommended.<sup>19, 20</sup>
- ◆ **Stimulants:** This can be hard on people, but limiting the amounts of caffeine in coffee and black teas as well as soft drinks is advised. [Caffeine](#) can add stress to the adrenal glands and has been linked to cardiovascular disease and higher cholesterol levels.
- ◆ **Any foods with artificial colorings, flavorings and/or preservatives:** These products may increase inflammation and often their long-term effects are unknown.
- ◆ **Hydrogenated fats:** These are margarines and shortenings such as Crisco®. Instead, use pressed (or cold-pressed) vegetable oils such as corn, sunflower, sesame, coconut and canola oils, preferably in their unrefined form.

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## SECTION III: MIND BODY MEDICINE AND CANCER TREATMENT AND RECOVERY

### What is Mind Body Medicine (MBM)?

- ◆ In the US, the National Center for Complementary and Alternative Medicine ([NCCAM](#)) is part of the National Institute of Health (NIH). NCCAM has defined Mind Body Medicine as a group of related yet distinct techniques thought to enhance the ability of an individual's mind - defined as thoughts, moods and visualizations - to directly affect their symptoms.
- ◆ In Australia, MBM is similarly defined by [Swinburne University](#) as focusing “particular therapeutic attention upon the role of the mind-body relationship in illness and health. The essential therapeutic aim is to promote bodily health and healing via the modality of mind - and through the mind-body relationship.”<sup>21</sup>
- ◆ MBM is a patient-centered approach, taking the patient's feelings, emotions, symptoms and needs, and working in a holistic manner and working to improve the patient's overall health and well-being. MBM places emphasis on the concept of healing past wounds and injuries, whether they are physical, mental, emotional or spiritual. MBM practitioners believe the mind has a largely untapped ability to surmount physical, mental and emotional limitations.
- ◆ The term patient-centred is just that in MBM - the *patient* takes a central role in charge of their physical, mental and emotional self. The patient can choose to heal and seek recovery and they can approach their recovery as they choose. This empowering of the patient works with the various approaches and modalities and has shown clear cut benefits measured by survival and by quality of life.
- ◆ An MBM treatment approach is considered successful - particularly in measurements of an individual patient's quality of life - if that cancer patient feels less depression and anxiety, is happier and more able to enjoy life. If that patient is able to laugh and play while enjoying the company of their family and friends that, too, is considered a success.
- ◆ The main point of many of the approaches in MBM is that if an individual is at their physical, mental, emotional and spiritual “best”, the treatments they have chosen are more likely to be successful.

- ♦ Support groups, cognitive-behavioral therapy, meditation, prayer, positive visualization, movement re-education, creative therapies, aromatherapy, yoga are all included as modalities of MBM.<sup>22</sup>
- ♦ In a recent review of the literature in MBM, it was recognized that state of the mind—positive and negative – is of critical importance in how the patient responds to various therapies.<sup>23</sup>
- ♦ Probably everyone is familiar with stories of how the mind and the mood can impact your health. Most people know at some level that the more depressed you are, the sicker you get.
- ♦ We have also known for many years that certain personality “types” were more likely to have heart attacks - the business man with a “Type A” personality was considered at risk for a heart attack and told to cut back on his number of working hours and to get a hobby.
- ♦ We now have much more evidence that it is not only heart attack but also other conditions - including cancer - that can be affected by how you think, feel and react to the various stressors in your life.
- ♦ Another recent review connected the psychological, the nervous and the immune systems, with additional information about stress and the development of heart conditions, depression, various nervous conditions, hormonal imbalances, cancer and more.<sup>24, 25, 26</sup>
- ♦ Humans have a physiological mechanism for dealing with short-term stress. But modern living has “stressed” the system to the point where it simply runs out of the ability to compensate for stress - and often, disease is one of the results. In MBM, the effort is centred around regaining and retaining the ability to deal positively and effectively with stress, and with enabling individuals to find peace and happiness whatever their situation is - and the result is healing and often cures.
- ♦ A cancer patient undergoing cancer therapy has choices as well. You can see your cancer experience in a way that is positive, hopeful and helpful. You can focus on all the positive things that you may be experiencing - the help and support of family and friends. Perhaps now is the first time in a long time you can begin to care for yourself and your needs - there’s nothing wrong with that!
- ♦ Maybe you can do some of the things you’ve never felt you had time to do - even if it’s as simple as watching the sunrise or sunset! Focusing on what you can do rather than what you can’t may give you an opportunity to find out some of those things aren’t really all that important after all.
- ♦ Now just might be the best time to find out what you would *rather* be doing.

Is there any REAL scientific basis?

Epigenetics

- ◆ We've talked about diet, exercise, tai chi, yoga and relaxation techniques. Perhaps you are at the point where you are thinking this is all well and good, but is there any scientific basis and proof that these approaches are useful and helpful? The answer is yes. In fact, the answer appears to exist in our DNA and how it is monitored and controlled. The answer lies in a relatively new but rapidly expanding field called epigenetics.
- ◆ Epigenetics is defined as the “heritable changes in gene expression that occur in the absence of alterations in DNA sequences”<sup>27</sup> “Epi” means “upon”, “over” and “above”, so it is a control mechanism over and above the genetic code - epigenetics is the study of the control of gene expression.
- ◆ DNA codes for proteins-- and these proteins are central to continued health. Epigenetics studies how the DNA coding--and therefore protein structure-- can be switched on or off by environmental and lifestyle factors - and the potential effects when a DNA segment (a gene) is turned on or off. When the genes are turned on or off, the proteins are either made or not made-- and this can seriously impact on a number of conditions, including cancer.
- ◆ When it comes to cancer, there are a few important terms and concepts.
- ◆ An oncogene, when switched on, can cause the changes necessary for cancer to develop but an activated oncogene can be silenced or switched off by a tumour suppressor gene.
- ◆ However, if the oncogene is turned on and the tumor suppressor gene is switched off, the cells can become uncontrolled and cancer is a result.
- ◆ In the simplest terms, epigenetics investigates which factors can help turn oncogenes off and which can turn tumor suppressor genes on. And those often turn out to be environmental, nutritional, emotional and stress-related factors.
- ◆ It has been found that the environment, stress, disease, mood and the food we eat can change our DNA in measurable ways - and these changes can be handed down to our children.<sup>28, 29,30</sup>
- ◆ There are hundreds of genes that are controlled using epigenetic means - these control the end results of stress, disease, the environment and food. And, this control mechanism is applied to genes important in the prevention and progression of cancer - the oncogenes and the tumor suppressor genes.
- ◆ This means that our environment, the chemicals in our environment, our stress levels, moods and the food we eat can all affect our health, particularly regarding cancer. A number of genes known to be involved in the appearance and progression of cancers have been found to be directly affected by epigenetic changes.<sup>31, 32, 33, 34</sup> Some of these changes were related to environmental factors.<sup>35,36</sup> Other changes have been related to foods and dietary choices.<sup>37, 38, 39</sup> Still other changes reflect various lifestyle choices.<sup>40, 41, 42</sup>

- ♦ Epigenetic research has also begun to focus on how epigenetics may be involved in how different cancers begin;<sup>43</sup> how some cancers can escape the surveillance of the immune system (which is thought to be important in destroying cancer cells); how it can be affected by the mind, by food, and by the environment<sup>44</sup>; and how these changes can then allow cancer to spread and come back.<sup>45,46</sup>
- ◆ What is most critical to you as a cancer patient is the research showing that various factors - including environment<sup>47, 48, 49</sup>, diet and nutrition,<sup>50, 51</sup> lifestyle choices<sup>52, 53, 54</sup> and emotional<sup>55, 56, 57, 58, 59</sup> - play a large and important role in the epigenetic control of cancer. In other words, it is becoming apparent that not only “you are what you eat” and “man does not live by bread alone”, but we also are what we *think* and what we *feel*.
- ◆ It has been said: “Technological advances make it feasible to envisage that in the future personalized drug treatment and dietary advice and possibly tailored food products can be used for promoting optimal health on an individual basis, in relation to genotype and lifestyle.”<sup>60</sup>
- ◆ Dr Dean Ornish and others<sup>61</sup> conducted a pilot study to examine changes in a group of men who had been diagnosed with prostate cancer and who for various reasons, had chosen not to use chemotherapy or radiation therapy. The gene expression in the prostate was studied after intensive nutritional and lifestyle interventions. The nutritional interventions included whole, organic foods and a balanced, nutritious diet. Lifestyle interventions included support groups, meditation, yoga and Tai Chi.
- ◆ This study showed that after these dietary, lifestyle and MBM interventions, the genes changed. Even more stunning to the scientific world (and it *was* pretty stunning): this group showed that as the gene expression changed because of epigenetic mechanisms, there was a *significant* clinical improvement. 48 genes were switched on (up-regulated) and 453 genes were turned off (down-regulated). These researchers also saw significant improvements in weight, abdominal obesity, blood pressure, and lipid profiles.
- ◆ The overall translation of this and other studies was that eating healthier foods, living a healthier life and communicating and sharing your emotional life with others resulted in an improvement *without* any drugs or surgery. This is not to suggest that you shouldn’t consider chemotherapy, surgery or radiation therapy. That choice can be a life-saving choice - but it does indicate that when you add to this improved diet, lifestyle and an improved outlook, your chances of success can increase even more.

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<sup>1</sup> <http://www.cancer.gov/cancertopics/factsheet/Sites-Types/metastatic>

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