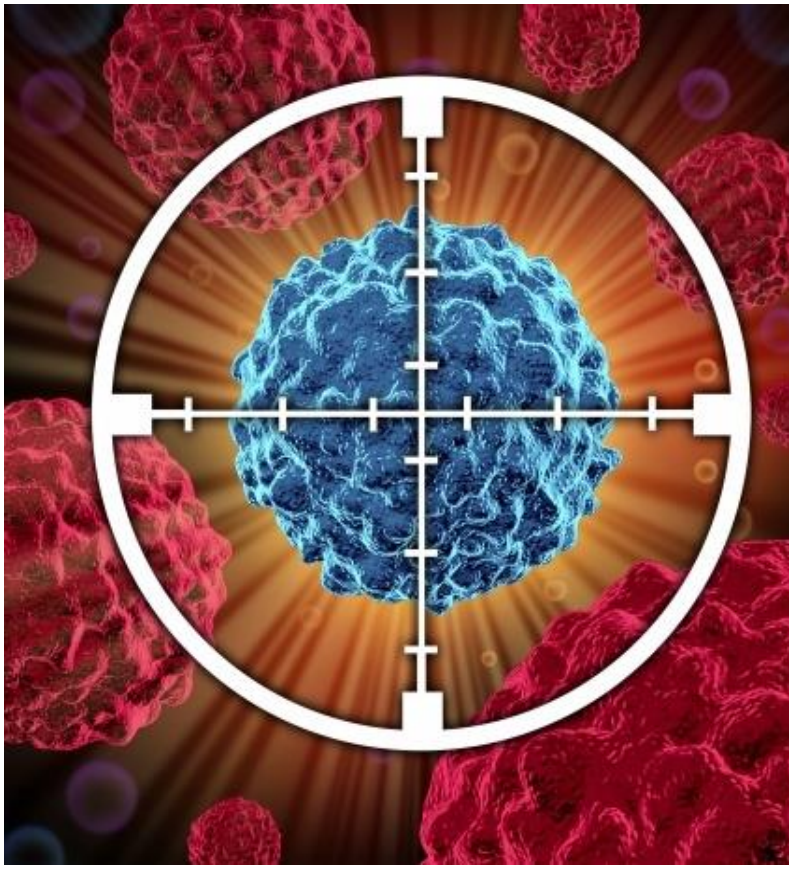

TYPES OF CANCER TREATMENTS, REASEARCH, AND THE HOLISTIC APPROACH

Fighting Cancer

Bolivar Corella

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TYPES OF CANCER TREATMENTS, REASEARCH, AND THE HOLISTIC APPROACH

New York is promoting health in 2015 and one of the many health priorities is the eternal fight against cancer, which is taking a different scientific approach at the personal level yet many pharmaceutical companies are still trying to develop the best drug possible for cancer treatment in Targeted Therapy; the Holistic Approach should be considered as a supplement to maintain overall wellness and counter the side-effects of more aggressive treatment.

Abstract

There is great excitement in the cancer research community as to the new drugs and methods that are being developed to fight cancer. The excitement is based on novel strategies, which fight cancer from a variety of dimensions. Recently, an article in the Washington Post entitled; "Cancer trials are changing. That could mean faster access to better drugs," highlighted the reasons behind this enthusiasm. (http://www.washingtonpost.com/national/health-science/paradigm-change-in-the-development-of-cancer-drugs/2015/06/01/09fcb4c4-086e-11e5-95fd-d580f1c5d44e_story.html?wpisrc=nl_headlines&wpmm=1)

The purpose of my work is to review some of the basic understanding in cancer biology, followed by a discussion of the mechanisms being investigated to fight cancer. I will first discuss the biology of cancer and how cancer cells initiate and grow in the human body. I will then focus my attention of the genetic alteration caused by cancer. There are several treatment options for cancer. The three main categories are surgery, targeted therapy, and systemic therapy. I will discuss each and compare and contrast each approach. This will lead my discussion to drugs that are specifically designed to combat cancer through genetic means. A host of drugs will be used as examples. Naturally, drug companies have a major stake in this arena and I will discuss their influences in cancer research. Often, the harmful side effects of drugs are not fully appreciated by patients and care givers. It is important to highlight these effects when making decisions as to what drugs are most suitable in fighting cancer.

The many types of cancer have made it difficult to find a cure for al types of cancer. Research studies have showed an improvement in the fight against one of the leading causes of death in the United States and in the world. The use of pharmaceuticals has helped to find the cure for cancer. However, there is the holistic approach that people suffering from cancer could take advantage of as an alternative without having to suffer from adverse reaction as seen in the use

of drugs. Drug companies may have influenced on scientific cancer research to avoid the use of the holistic method as an alternative in the fight against cancer.

Cancer

Cancer is the number one killer in the United States and the world. Cancer is a disease caused by the uncontrollable unusual grows of abnormal cells. The human body is made up of many millions of living cells. Normal cells grow, divide, and die on a regular basis. Individual age cells grow accordingly, at a young age, cells grow faster to allow a person to grow, and as the person starts to get older, the cell slows down its reproduction phase. Cells grow only to replace worn out cells and to repair injuries. Cancer cells can also invade other tissues, something that normal cells cannot do. Growing out of control and invading other tissues are what makes a cell a cancer cell. The change in the DNA of a cell is what causes cancer cells. DNA exists in every cell, and when the DNA of a cell is damaged, the cell either repairs the damage or dies. In cancer cells the opposite happens, the damaged DNA does not repair. However, the cell does not die and makes new cells that the human body does not need. Damaged DNA could be inherited, abnormal cell reproduction, or by something like the environment. However, it is hard to know what exactly is the cause of a person's cancer.

Because of the many different types of body cells, I am going to mention the different types of body cells in the human body. Then it will be easy to understand why cancer is treatable, however not curable in most cases. Since the human body is composed of trillions of cells and come in many shapes and sizes, cells are the fundamental unit of life. Every cell has a job to do in the human body by providing structure and stability to providing energy and means of reproduction for an organism. Cells comprise tissues, tissues comprise organs, organs comprise systems, and systems work together in an organism. It does not matter on the different types of cells in the human body. Cells depend directly or indirectly on one another.

Body Cells

a. - Stem Cells

Stem cells are unique cells of the body in that they are unspecialized and have the ability to develop into specialized cells for specific organs or to develop into tissues. Stem cells can divide and replicate many times to replenish and repair tissue. Scientist are attempting to take advantage of the renewal properties of the stem cells by utilizing them to generate cells for tissue repair, organ transplantation, and for the treatment of disease.

b. - Blood Cells

Blood cells are vital to life; they transport oxygen to the entire body to fight infection. There are three types of blood cells: red blood cells that determine the type of the blood of an individual. White blood cells are immune system cells that destroy pathogens and provide immunity, and Platelets help to clot blood and prevent excessive blood loss.

c. - Fat Cells

Fat cells are the major cell component of the connective tissue in which fat is stored, and then can be used for energy. Fat cells also produce hormones that influence sex hormone metabolism, blood pressure regulation, insulin sensitivity, fat storage and use, blood clotting, and cell signaling.

d. - Skin Cells

The skin protects the internal structures of the body from damage, prevents dehydration, acts as a barrier against germs, stores fat, and produces vitamins and hormones. The skin is composed of a layer of epithelial tissue (dermis) that is supported by a layer of connective tissue (dermis)

e. - Endothelial Cells

These cells make up the inner layer of blood vessels, lymphatic vessels, and organs including the brain, lung, skin, and heart. Endothelial cells handle angiogenesis or the creation of new blood vessels. As well as regulate the movement of macromolecules, gasses, and fluid between the blood and surrounding tissues, and help to regulate blood pressure. Endothelial cells form the inner lining of the cardiovascular system and lymphatic system structures.

f. - Nerve Cells

The nerve cells or neurons are the basic unit of the nervous system. Nerves send signals to the

brain, spine cord, and other body organs via nerve impulses. The central cell body contains the neuron's nucleus, associated cytoplasm, and organelles.

g. - Sex Cells

Sex cells are reproductive cells produced in the male and female gonads. During fertilization, sex cells unite to form a new individual.

h. - Cancer Cells

Cancer cell development can be caused by mutations that occur from factors such as chemicals, radiation, ultraviolet light, chromosome replication errors, or viral infection. Cancer cells are abnormal cells that reproduce rapidly, maintaining their ability to replicate and grow resulting in the development of masses of tissue or tumors. Cancer cells do not experience biological aging maintaining their ability to divide and do not respond to self-termination signals.

There are many types of cancer; they are typically named for the organ tissue, or cells in which they develop. The most common type of cancer is CARCINOMA or cancer of the skin. This type of cancer develops in the epithelial tissue that covers the outside of the body and lines organs, vessels, and cavities. SARCOMA develops in muscle, bone, and soft connective tissues including adipose, blood vessels, lymph vessels, tendons, and ligaments. LEUKEMIA develops in bone marrow cells called lymphocytes. This type of cancer affects "B" and "T" cells.

Cancer cell development may result from some factors including exposure to chemicals, radiation, ultraviolet light, and chromosome replication errors. Furthermore, viruses also have the ability to cause cancer by altering genes. Viruses change cells by integrating their genetic material with the host cell's DNA. The viral genes regulate cell development, giving the cell the ability to undergo abnormal new growth.

It has been estimated that only five to ten percent of all cancers are attributed to hereditary gene defect. The rest are related to environment pollutants, infections, and lifestyle choices. According to the world healthcare organization, thirty percent of al cancer cases are preventable. The single greatest preventable risk factor for cancer development globally is smoking; seventy percent of lung cancer cases are attributed to smoking.

Cancer cells use sugar at a high rate to continue to divide. Cancer cells use much more glucose to

grow than normal cells. Glucose is a simple sugar required for the production of energy through cellular respiration. These cells do not obtain their solely energy through glycolysis. Tumor cell mitochondria supply the energy needed to promote abnormal growth associated with cancer cells. Mitochondria provide an amplified energy source that also makes tumor cells more resistant to chemotherapy.

Cancer cells can hide among healthy cells; some tumors secrete a protein that is also secreted by lymph nodes. The protein allows the tumor to transform its outer layer into something that resembles lymph tissue. These tumors appear as a healthy tissue and not a cancerous tissue. As a result, immune cells do not detect the tumor as a harmful substance, and it is allowed to grow and spread unchecked in the body. Other cancer cells avoid chemotherapy drugs by hiding in compartments in the body. Some leukemia cells avoid treatment by taking cover in compartments in bone. Cancer cells undergo changes to avoid immune system defenses, as well as to guard against radiation and chemotherapy treatment. Cancerous epithelial cells go from resembling healthy cells with defined shapes to resembling loose connective tissue. The ability to change shape has been attributed to the inactivation of molecular switches called MICRORNA. These small regulatory RNA molecules have the ability to regulate gene expression. When certain MICRORNA become inactive, tumor cells gain the ability to change shape.

Cancer cells can have gene mutation or chromosome mutations that affect the reproductive properties of the cells. A normal cell dividing by MITOSIS produces two daughter cells. Cancer cells, however, divide into three or more daughter cells. The newly developed cancer cells may either lose or gain extra chromosomes during division. Most malignant tumors have cells that lost chromosomes.

One of the signs of cancer is the rapid increase in the blood vessel formation known as angiogenesis. Tumors need the nutrients provided by blood vessels to grow. The blood vessel endothelium handles both normal angiogenesis and tumor angiogenesis. Cancer cells send signals to nearby healthy cells influencing them to develop new blood vessels that supply the cancer cells. Studies have shown that when the new blood vessel formation is prevented, tumors stop growing.

Cancer cells can metastasize or spread from one location to another through the bloodstream or lymphatic system. Cancer cells activate receptors in the blood vessels that allow them to exit blood circulation and spread to tissue and organs. The cancer cells release chemical messengers called chemokine that induce an immune response and enable them to pass through blood vessels into the surrounding tissue.

When normal cells experience DNA damage, tumor suppressor proteins are released that cause

the cells to undergo programmed cell death or apoptosis. Due to gene mutation, cancer cells lose the ability to detect DNA damage and, therefore, the ability to self-destruct.

Not all types of cancer are equal

Humans have been exposed to many different types of terminal illnesses, and one of them had been the cause of death for many people. Many years of research and trials have not been able to find the cure for cancer. They have been trying many different approaches. However, the many types of cancer make it difficult to treat. There are many types of cancer treatments out there. However, none of those approaches has been accurate to fight cancer at an individual level, most of the types of treatments have been done at the cellular level only. However, the war against cancer continues and research and scientists found a new approach to the fighting cancer called, "Targeted Therapy."

As researchers have learned more about the gene changes in cells that cause cancer, they have been able to develop drugs that target these changes. (cancer.org) Treatment with these drugs is called "Targeted Therapy." The term 'targeted therapy' refers to a new generation of cancer drugs designed to interfere with a particular molecular target that is believed to have a critical role in tumor growth or progression. The identification of appropriate targets is based on a detailed understanding of the molecular changes underlying cancer. This approach contrasts with the conventional, more empirical approach used to develop cytotoxic chemotherapeutics — the main- stay of cancer drug development in past decades. Here, I summarize current progress in targeted therapy and review the potential targets that are emerging. I focus particular on kinases, which have so far proved to be a promising class of targets for cancer therapy. (web.mit.edu)

Targeted Therapy is the new approach and one of the most promising modalities for cancer treatment. The approach to Targeted Therapy is different from other conventional types of cancer treatments. Targeted Treatment attacks to specific cancer cells of an individual. Targeted Therapy is like any other modality to treat cancer with the use of drugs. However, Targeted Therapy Drugs do not work in the same way as standard chemotherapy drugs. Targeted Therapy drugs can attack cancer cells, and chemotherapy drugs attack cancer cells as well as healthy cells. Targeted Therapy is promising to fight cancer with less severe side effects. There is another advantage to the use of Targeted Therapy; many types of cancer could be treated with this method. In the past, only a few types of cancer could be dealt with Targeted Therapy. Targeted Therapies are a major focus of cancer research, and many future advances in cancer treatment will come from this modality.

Every disruption to the normal cell cycle progression and division leads to events leading to cancer. As well as the complex network of regulatory factors, the tumor microenvironment and stress signals, such as those resulting from damaged DNA, dictate whether cancer cells proliferate or die. (www.nature.com) The recent progress in molecular research has lead to the understanding of the molecular changes that underlie cancer development offer the prospect of specifically targeting malfunctioning molecules and pathways to achieve more efficient and rational cancer therapy. (www.nature.com)

Targeted Therapy is used to keep cancer from growing and spreading to become cancer cells; normal cells go through a process called carcinogenesis. (cancer.org) Cancer cells may then grow into a tumor or reproduce throughout a body system like how blood cancers do. Scientists have learned a lot about the molecules that are part of this process and the signal a cell gets to keep this process going. Targeted therapy disrupts this process. The drugs target certain areas of the cell and the signals that are needed for cancer to develop and to keep growing. These drugs are grouped by how they work or what part of the cell they target.

I believe science is a very exciting field; all the human discoveries in the medical field have changed the way healthcare is delivered today. The human body is one complicated structure; every organ was designed to perform a task. The scientists have been taken advantage of these organs' functions to treat cancer.

The human body produces many types of enzymes, which are specialized proteins that help control many of the things cells do. Some of the body cells are used to break down foods that we eat. However, some enzymes serve as signals for cancer cells to grow. Some targeted therapist block enzymes that are signals for cancer cells to grow. These drugs are called “Enzyme Inhibitors” The purpose of blocking these signals can keep cancer from getting bigger and spreading. Furthermore, even if the tumor is not getting smaller, the cell out of control growth has been interrupted. This interruption may give regular chemotherapy a better chance to work. As well as slowing or stopping out of control growth may help people to live longer, even without the use of any additional drug. (cancer.gov)

Many people with cancer are interested in trying anything that may help them find the cure for cancer, including complementary and alternative cancer treatments. Most of the time, a person with cancer receiving complementary treatment may feel as if they have little control over their health. However, alternative cancer treatments may offer them some feeling of control over their health. Nevertheless, many alternative cancer treatments are unproven, and some may even be dangerous. However, there is growing evidence that there is alternative cancer treatments that may provide some benefit.

Alternative cancer treatments may not play a direct role in curing cancer. Nevertheless, they may help to cope with signs and symptoms caused by cancer and cancer treatments. Alternative therapies may lessen common signs and symptoms such as anxiety, fatigue, nausea and vomiting, pain, difficulty sleeping, and stress. (mayoclinic.gov)

Integrating the best of evidence-based complementary and alternative cancer treatments with the conventional treatments receive may help relieve many of the symptoms associated with cancer and its treatment. Discussing all the options with the doctor and together could determine which strategies might work and which are likely to have no benefit. Collaborate closely with the physician to determine the right balance between traditional medicines and alternative cancer treatments. While complementary and alternative cancer treatments, such as acupuncture, may reduce nausea or pain, they are not powerful enough to replace cancer medications from the doctor. (mayoclinic.org)

The scientific method is one of the most reliable sources to work with to find a cure for cancer. Perhaps, the holistic method may be used as an alternative. However, the scientific method is the most accessed because it is reliable and proven to provide an excellent outcome nevertheless, of its many side effects due to the use of chemicals and radiation. On the other hand, the holistic approach is less known. However, there is not enough evidence that will show that this method can cure cancer, and many people are starting to use this method because it does not have many side effects as the conventional scientific method.

The scientific method provides patient with rigorous treatment. In which patients are committed to following strict diets and a bunch of tests and treatments, and even surgeries, which alter the physical appearance of the patient as well as their mental status.

The holistic method provides patients with more relax sort of treatment. In which the patient are committed to following strict diets, acupuncture, herb regiments, massages, tai chi, relaxation techniques, yoga, music therapy without having to worry about side effects.

Happiness and Meaningless

"Every man lives in two realms: the internal and the external. The internal is the realm of spiritual ends expressed in art, literature, morals, and religion. The external is the complex of devices, techniques, mechanisms, and instrumentalities by means of which we live." (Martin Luther King Jr.) I appreciate the logical thinking expressed by every human. Martin Luther King Jr. mentioned in his literature quote that, "man lives in two realms: the internal and the external."

The internal realm represents sick people that are more vulnerable to the environment. An ill person tends to be more spiritual and religious as well as focused on his moral values and beliefs. On the other hand, the external realm represents businesses that look for any opportunity to make money.

There is a true saying that the joy of some will bring sadness to others. People will do anything to achieve their goals, the happiness of some people will bring sorrow to others, and the sadness of other people may be meaningless to their business. Monopolizing a company brings joy to pharmaceutical companies, and the control of pharmaceuticals may bring grief to the consumer especially when the consumer's health is compromised by the high cost of medication to treat a terminal disease. Cancer is one of the primary causes of death in our country, a country rich in education as well as on research, and there is still no cure for cancer yet.

New York is a diverse city where millions of people live close to each other; we all share a small state where food and water are enough to feed us all for now. However, as the population grows, I wonder too how much food I will be able to access in a near future. I do not have to worry about food shortages because businesses people had figured it out. Genetic Modified Organisms (GMOs) is the solution to feeding our overpopulated city. Genetic modified organisms are part of a discussion among our lawmakers, and the concern for the consumer because these GMOs had been modified from its natural composition. These alterations show that they may be the cause of human cell changes that produce cancer as is stated in a USA Today report.

Understanding Cancer Prognosis

If a person has cancer, he/she may have questions about how serious their cancer is and their chances of survival. The estimate of how the disease will go for them is called prognosis. (cancer.gov/about-cancer)

It may be hard to understand what prognosis means, and it may be hard to talk about, even for doctors. Some of the factors that affect prognosis include:

- The type of cancer and where it is in their body

- The stage of cancer, which refers to the size of cancer and if it has spread to other parts of their body

- Cancer's grade, which refers to how abnormal the cancer cells look under a microscope. (cancer.gov/about-cancer)

- Grade provides clues about how quickly the cancer is likely to grow and spread.

- Certain traits of the cancer cells.

- Person's age and how healthy they were before cancer.

- How they respond to treatment.

When a person has cancer, they and their loved ones face many unknowns. Understanding their cancer and knowing what to expect can help them and their loved ones make decisions. Some of the decisions they may face include:

- Which treatment is best for them

- If they want treatment

- How to take care themselves and manage treatment side effects

- How to deal with financial and legal matters

Many people would like to know their prognosis. They find it easier to cope when they know more about their cancer. They may ask their doctor about survival statistics or search for this information on their own, or they may find statistics confusing and frightening, and think they are too impersonal to be of value to them. It is up to them to decide how much information they want.

If they do decide they want to know more, the doctor who knows the most about their situation is in the best position to discuss their prognosis and explain what the statistics may mean.

Understanding Statistics about Survival

Health Care Providers estimate prognosis by using statistics that researchers have collected over the years about patients with the same type of cancer. Many types of statistics may be used to estimate prognosis and the most commonly used are:

Cancer Specific Survival

This is the percentage of patients with a specific type and stage of cancer that have not died from their cancer during a certain period after diagnosis. The period may be one year, two years, five

years, and so forth, with five years being the period most often used. Cancer Specific Survival is also called Disease Specific Survival. In most cases, cancer-specific survival is based on causes of death listed in medical records.

Relative Survival

This statistic is another method used to estimate cancer-specific survival that does not use information about the cause of death. It is the percentage of cancer patients, who have survived for a certain period after diagnosis, compared to people, who do not have cancer.

Overall Survival

This is the percentage of people with a specific type and stage of cancer that have not died from any cause during a certain period after diagnosis. (cancer.gov/about-cancer)

Disease-Free Survival

This statistic is the percentage of patients who have no signs of cancer during a certain period after treatment. Other names for this statistic are recurrence-free or progression-free survival.

Because statistics is based on large groups of people, they cannot be used to predict exactly what will happen to them. Everyone is different. Treatments and how people respond to treatment can differ greatly. Besides, it takes years to see the benefit of new treatments and ways of finding cancer. So, the statistics their doctor uses to make a prognosis may not be based on treatments being used today.

Still, their doctor may tell them that they have a good prognosis if statistics suggests that their cancer is likely to respond well to treatment. Alternatively, he may tell them that they have a poor prognosis if the cancer is harder to control. Whatever their doctor tells them, keeps in mind that a prognosis is an educated guess. Their doctor cannot be certain how it will go for them.

If They Decide Not to Have Treatment

If they decide not to have treatment, the doctor who knows their situation best is in the best position to discuss their prognosis.

Survival statistics most often come from studies that compare treatments with each other, rather than treatment with no treatment. Therefore, it may not be easy for their doctor to give them an accurate prognosis.

Understanding the Difference between Cure and Remission

Cure means that there are no traces of their cancer after treatment, and cancer will never come back.

Remission means that the signs and symptoms of their cancer are reduced. Remission can be partial or complete. In a complete remission, all signs and symptoms of cancer have disappeared.

If they remain in complete remission for five years or more, some doctors may say that they are cured. , some cancer cells can remain in their body for many years after treatment. These cells may cause cancer to come back one day. For cancers that return, most do so within the first five years after treatment. However, there is a chance that cancer will come back later. For this reason, doctors cannot say for sure that they are cured. The most they can say is that there are no signs of cancer at this time.

Because of the chance that cancer can come back, their doctor will monitor them for many years and do a test to look for signs of cancer's return. They will also look for signs of late side effects from the cancer treatments they received.

Cancer Statistics

Cancer has a significant impact on society in the United States and across the world. Cancer statistics describe what happens in large groups of people and provide a picture in time of the burden of cancer on society. Statistics tell us things such as how many people are diagnosed with and die from cancer each year, the number of people who are currently living after a cancer diagnosis, the average age at diagnosis, and the numbers of people who are still alive at a given time after diagnosis. They also tell us about differences among groups defined by age, sex, racial/ethnic group, geographic location, and other categories.

Although statistical trends are usually not directly applicable to individual patients, they are essential for governments, policy makers, health professionals, and researchers to understand the

impact of cancer on the population and to develop strategies to address the challenges that cancer poses to the society as a whole. Statistical trends are also important for measuring the success of efforts to control and manage cancer.

Statistics at a Glance: The Burden of Cancer in the United States

In 2015, an estimated 1,658,370 new cases of cancer will be diagnosed in the United States and 589,430 people will die from the disease.

The most common cancers in 2015 are projected to be breast cancer, lung and bronchus cancer, prostate cancer, colon and rectum cancer, bladder cancer, melanoma of the skin, non-Hodgkin lymphoma, thyroid cancer, kidney and renal pelvis cancer, endometrial cancer, leukemia, and pancreatic cancer.

The number of new cases of cancer (cancer incidence) is 454.8 per 100,000 men and women per year (based on 2008-2012 cases).

The number of cancer deaths (cancer mortality) is 171.2 per 100,000 men and women per year (based on 2008-2012 deaths).

Cancer mortality is higher among men than women (207.9 per 100,000 men and 145.4 per 100,000 women). It is highest in African American men (261.5 per 100,000) and lowest in Asian/Pacific Islander women (91.2 per 100,000). (Based on 2008-2012 deaths.)

The number of people living beyond a cancer diagnosis reached nearly 14.5 million in 2014 and is expected to rise to almost 19 million by 2024.

Approximately 39.6 percent of men and women will be diagnosed with cancer at some point during their lifetimes (based on 2010-2012 data).

In 2014, an estimated 15,780 children and adolescents ages 0 to 19 were diagnosed with cancer and 1,960 died of the disease.

National expenditures for cancer care in the United States totaled nearly $125 billion in 2010 and could reach $156 billion in 2020.

U.S. Cancer Mortality Trends

The best indicator of progress against cancer is a change in age-adjusted mortality (death) rates, although other measures, such as quality of life, are also important. Incidence is also important, but it is not always straightforward to interpret changes in incidence. For example, if a new screening test detects many cancer cases that would never have caused a problem during someone's life (called over diagnosis), the incidence of that cancer would appear to increase even though the death rates do not change. However, a rise in incidence can also reflect a real increase in disease, as is the case when an increase in exposure to a risk factor causes more cases of cancer. In this scenario, the increased incidence would likely lead to a rise in mortality from cancer.

In the United States, the overall cancer death rate has declined since the early 1990s. The most recent Annual Report to the Nation on the Status of Cancer, published in March 2015, shows that from 2002 to 2011, cancer death rates decreased by:

1.8 percent per year among men

1.4 percent per year among women

2.1 percent per year among children ages 0-14

2.3 percent per year among children ages 0-19

Although death rates for many individual cancer types have also declined, rates for a few cancers have stabilized or even increased.

As the overall cancer death rate has declined, the number of cancer survivors has increased. These trends show that progress is being made against the disease, but much work remains. Although rates of smoking, one of the leading causes of cancer, have declined, the U.S. population is aging, and cancer rates increase with age. Obesity, another risk factor for cancer, is also increasing. More information about U.S. cancer mortality trends is available on the Lower Death Rates & More Survivors page.

The Surveillance, Epidemiology, and End Results (SEER) Program

NCI's Surveillance, Epidemiology, and End Results (SEER) Program collects and publishes cancer incidence and survival data from population-based cancer registries that cover approximately 28 percent of the U.S. population. The SEER program website has more detailed cancer statistics, including population statistics for common types of cancer, customizable graphs and tables, and interactive tools.

The Annual Report to the Nation on the Status of Cancer provides an annual update on cancer incidence, mortality, and trends in the United States. This report is jointly authored by experts from NCI, the Centers for Disease Control and Prevention, American Cancer Society, and the North American Association of Central Cancer Registries.

Cancer Drugs

Each year, FDA's Center for Drug Evaluation and Research (CDER) will typically approve more than 100 new medications. A portion of those are novel new drugs, medications that have not previously been approved by FDA and are often among the most innovative products serving previously unmet medical needs or otherwise significantly helping to advance patient care and public health.

This year, the news media has been concentrating on the number of novel new drugs – either new molecular entities or new therapeutic biologics – approved by CDER in 2014. Besides, that is understandable because we approved 41 novel drugs this year, the most in nearly two decades. But instead of looking at the approval tally, we prefer to focus on the significant benefits that many of these drugs bring to patients and the steps that CDER took to get these products to market in a timely manner while maintaining FDA's standards for safety, effectiveness, and quality.

Many of the 41 new drugs have the potential to add significant clinical value to the care of thousands of patients with serious or life-threatening diseases. They include eight new drugs for treating patients with various types of cancer,

In 2014, the Food and Drug Administration (FDA) approved 41 drugs that had not been approved previously for any indication, the most in nearly 20 years. Of these 41 novel drugs, 9 were approved for the treatment of cancer or cancer-related conditions.

The development of new therapeutic biologics, in particular, is a trend that continues to drive cancer drug development and approval by the FDA, according to Henry Francis, M.D., of the FDA's Center for Drug Evaluation and Research.

The FDA's acceleration of the review process for cancer drug approval is another important factor, added Dr. Francis. Because treatment options are limited for many cancer patients with advanced disease, the FDA has implemented expedited approval procedures for cancer drugs. In some respects, the approach resembles how the agency evaluated and approved early AIDS drugs, he noted.

The following are the new drugs for cancer or cancer-related conditions approved last year by the FDA:

Belinostat (Beleodaq) to treat relapsed or refractory peripheral T-cell lymphoma, Approved July 2014

Blinatumomab (Blincyto) to treat Philadelphia chromosome negative relapsed/refractory B-cell precursor acute lymphoblastic leukemia, Approved December 2014

Ceritinib (Zykadia) to treat ALK-positive metastatic non-small cell lung cancer, approved April 2014

Idelalisib (Zydelig) to treat relapsed chronic lymphocytic leukemia (CLL), follicular B-cell non-Hodgkin lymphoma, and small lymphocytic lymphoma, Approved July 2014

Netupitant and palonosetron (Akynzeo) a combination pill to prevent chemotherapy-induced nausea and vomiting, Approved October 2014

Nivolumab (Opdivo) to treat unresectable or metastatic melanoma, approved December 2014

Olaparib (Lynparza) to treat previously treated BRCA-mutated advanced ovarian cancer, Approved December 2014

Pembrolizumab (Keytruda) to treat unresectable or metastatic melanoma, Approved September 2014

Ramucirumab (Cyramza) to treat gastric (stomach) cancer, approved April 2014

In February 2014, the FDA also gave full approval for ibrutinib (Imbruvica) to treat CLL. It was initially given accelerated approval in 2013 for patients with mantle cell lymphoma, a rare and aggressive type of blood cancer. (cancer.gov/about-cancer)

Types of Cancer Treatments

There are many types of cancer treatments. The patients will receive a type of treatment according to the type and the stage of cancer. I will briefly touch in some of the available treatments. However, I will concentrate in Targeted Treatment because is the main type of treatment of my research, and Targeted Therapy nowadays is one of the most sophisticated treatments.

a. - Surgery

Surgeons use small, thin knives, called scalpels to cut the patient's body. Surgery requires cuts through skin, muscles, and sometimes bone.

Anesthesia is used to either put the patient to sleep or to numb the area of the incision. Anesthesia is drugs or other substances that cause the patient to lose their feelings or consciousness. The surgeons have three choices to use anesthetics.

Local anesthesia causes loss of feeling in one small area of the patient's body.

Regional anesthesia causes loss of feeling of a part of the patient's body.

General anesthesia causes loss of feeling and a complete loss of awareness or deep sleep.

There are many types of surgery. The type of surgery is based on the purpose of the surgery, also the part of the body that requires surgery, as well as the amount of tissue to be removed, and, in some cases, what the patient prefers. Whatever the case is, surgery may be an open surgery or minimally invasive surgery.

The surgeon in open surgery makes one large incision to remove a tumor, and maybe some nearby lymph nodes.

In minimally invasive surgery, the surgeon makes a few small incisions instead of one large one. The surgeon inserts a long, thin tube with a tiny camera into one of the small cuts. This tube is called a laparoscope. The camera projects images of the inside anatomy onto a monitor, this allows the surgeon to see what she/he is doing. The surgeon uses special sterile tools that are inserted through the other small incisions to remove the tumor and some healthy tissue. Many cancer patients go through surgery. Surgery is the best method to remove solid tumors that are contained in one area. It is a local treatment, which means that it treats only the part of the body with cancer.

b. - Radiation Therapy

Radiation therapy is a cancer treatment that uses high doses of radiation to kill cancer cells and shrink tumors. At low doses, radiation is used in x-rays to see inside the patient's body. At high doses, radiation kills cancer cells or slows their growth. Radiation therapy takes time to kill

cancer cells. It takes days or weeks of treatment before cancer cells start to die. Progressively, cancer cells keep dying for weeks or months after radiation therapy ends.

Radiation therapy could be delivered by two methods, external beam and internal.

External beam radiation therapy comes from a machine that targets radiation towards the patient's cancer. The machine is large and may be noisy. It does not touch the patient's body but moves around them, sending radiation to a part of the patient's body from many directions.

External beam radiation therapy concentrates on a specific part of the patient's body. For example, if the patient has cancer in his/her lungs, the patient will have radiation only to his chest, not to the whole body.

Internal Radiation Therapy

Internal radiation therapy is a treatment in which a source of radiation is put inside the patient's body. The radiation source can be solid or liquid.

Internal radiation therapy with a solid source is called brachytherapy. In this type of treatment, radiation in the form of seeds, ribbons, or capsules is placed in the patient's body in or near the cancer site.

The patient receives liquid radiation through an IV line. Liquid radiation travels throughout the patient's body, seeking out and killing cancer cells.

c. – Chemotherapy

Chemotherapy works by stopping or slowing the growth of cancer cells, which grow and divide quickly. Chemotherapy is used to treat and to cure cancer and to lessen the chance for it to return, or stop or slow its growth. Chemotherapy is used to shrink tumors that cause patient's pain and other problems.

Chemotherapy is used to treat many types of cancer. For some people, chemotherapy may be the only treatment they could receive. However, most often, they will have chemotherapy and other cancer treatments. The types of treatment that they need depends on the kind of cancer they have, if it has spread and where, and if they have other health problems. Chemotherapy may be given in many ways. Some common ways include:

Oral. - the chemotherapy comes in pills, capsules, or liquids that patients swallow.

Intravenous (IV). - the chemotherapy goes directly into a vein, the injection of chemotherapy is given by a shot in a muscle in the patient's arm, thigh, hip, or right under the skin in the fatty part of the arm, leg, or belly

Intrathecal. - the chemotherapy is injected into the space between the layers of tissue that cover the brain and spinal cord

Intraperitoneal (IP). - the chemotherapy goes directly into the peritoneal cavity, which is the area in the patient's body that contains organs such as the intestines, stomach, and liver

Intra-arterial (IA) - the chemotherapy is injected directly into the artery that leads to the cancer

Topical. - the chemotherapy comes in a cream that the patients rub onto their skin

Chemotherapy is often given through a thin needle that is placed in a vein in the patient's hand or lower arm. IV chemotherapy may also be given through catheters or ports, sometimes with the help of a pump. Patients may receive chemotherapy during a hospital stay, at home, or as an outpatient at a doctor's office, clinic, or hospital. Outpatient means they do not stay overnight. No matter where patients go for chemotherapy, their doctor and nurse will watch them for signs of side effects. Patients may receive chemotherapy in cycles. A cycle is a period of chemotherapy treatment followed by a period of rest. For instance, patients might receive chemotherapy every day for one week followed by three weeks with no chemotherapy. These four weeks make up one cycle. The rest period gives their body a chance to recover and build healthy new cells. It is best not to skip a chemotherapy treatment. However, sometimes their doctor may change patient's chemotherapy schedule if patients are having certain side effects. If this happens, their doctor or nurse will explain what to do and when to start treatment again. Since everyone is different and people respond to chemotherapy in various ways, their physician and nurses cannot know for sure how they will feel during chemotherapy. Patients will see their doctor often. During these visits, the doctor will ask them how they feel, do a physical exam, and order medical tests and scans. Tests might include blood tests. Scans might include MRI, CT, or PET scans.

Patients cannot tell if chemotherapy is working based on its side effects. Some people think that severe side effects mean that chemotherapy is working well, or that no side effects mean that chemotherapy is not working. The truth is that side effects have nothing to do with how well chemotherapy is fighting their cancer.

d. – Immunotherapy

Immunotherapy is a type of cancer treatment that helps the patient's immune system to fight cancer. The immune system helps the patient's body fight infections and other diseases. It is made up of white blood cells, organs, and tissues of the lymph system. Immunotherapy is a type of biological therapy. Biological therapy is a kind of treatment that uses substances made from living organisms to treat cancer.

Many different types of immunotherapy are used to treat cancer.

Monoclonal Antibodies are drugs that are designed to bind to specific targets in the body. They can cause an immune response that destroys cancer cells. Other types of Monoclonal antibodies can mark cancer cells, so it is easier for the immune system to find and destroy them. These types of monoclonal antibodies may also be referred to as "Targeted Therapy."

Adoptive cell transfer is a treatment that attempts to boost the natural ability of their T cells to fight cancer. T cells are a type of white blood cell and part of the immune system. Researchers take T cells from the tumor. They then isolate the T cells that are most active against the patient's cancer or modify the genes in them to make them better to find and destroy the patient's cancer cells. Researchers then grow large batches of these T cells in the lab. Patients may have treatments to reduce their immune cells. After these treatments, the T cells that were grown in the lab will be given back to the patients via a needle in their vein. The process of developing their T cells in the lab can take two to eight weeks, depending on how fast they grow.

Cytokines are proteins that are made by patient's body cells. These proteins are essential for the body's normal immune responses as well as in the immune system's ability to respond to cancer. There are two main types of cytokines used to treat cancer are called interferons and interleukins.

Treatment Vaccines work against cancer by boosting patient immune system's response to cancer cells. Treatment vaccines are different from the ones that help prevent disease.

BCG (Bacillus Calmette-Guérin) is an immunotherapy that is used to treat bladder cancer. BCG is a weakened form of the bacteria that causes tuberculosis. When inserted directly into the bladder with a catheter, BCG produces an immune response against cancer cells. It is also being studied in other types of cancer.

e. - Hormone Therapy

Hormone therapy is known as hormone treatment, hormonal therapy or endocrine therapy. This type of cancer treatment slows or stops the growth of cancer, as well as lessen the chance of

cancer to return, stop, or slow its growth. Hormone therapy is used to reduce and prevent symptoms in men with prostate cancer, especially for men that are not able to have surgery or radiation therapy.

The types of Hormone therapy falls into two large groups. The first group blocks the body's ability to produce hormones and the second group interferes with how hormones behave in the body.

Hormone therapy is mainly used for the treatments of prostate and breast cancers that use hormones to grow. Usually, Hormone therapy is most often used along with other cancer treatments. The types of treatment that patients need depend on the kind of cancer, the extent of disease and how advanced it is, if it uses hormones to grow, and if patients have other health problems.

Hormone Therapy can be used with other cancer treatments, and hormone therapy can be useful making the tumor smaller before patients go for surgery. Also, hormone therapy, when used with another type of treatment, could lower the risk that cancer will come back after the main treatment. Also, hormone therapy destroys cancer cells that have returned or spread out to other parts of the patient's body. Just like any other cancer treatment, Hormone Therapy can cause side effects because hormone therapy blocks the body's ability to produce hormones or interfere with how hormones behave, it can cause unwanted side effects. The side effects patients have will depend on the type of hormone therapy patients receive and how their body responds to it. Every patient responds differently to hormone treatment, so not everyone gets the same side effects. Some side effects also differ by gender.

Men who receive hormone therapy for prostate cancer:

- Hot flashes

- Loss of interest in or ability to have sex

- Weakened bones

- Diarrhea

- Nausea

- Enlarged and tender breasts

- Fatigue

Women who receive hormone therapy for breast cancer:

- Hot flashes

- Vaginal dryness

- Changes in your periods if you have not yet reached menopause

- Loss of interest in sex

- Nausea

- Mood changes

- Fatigue

There are some common ways for Hormone therapy to be delivered.

Oral. - Hormone therapy comes in pills that can be swallowed.

Injection. - The hormone therapy may be given by a shot in a muscle in the arm, in the upper leg or hip, or right under the skin in the fatty part of the arm, leg, or belly.

Surgery. - Patients may have surgery to remove organs that produce hormones. In women, the ovaries and in men, the testicles are removed.

Patients receive treatment depending on which hormone therapy they are getting and how it is given. Patients may take hormone therapy at home, or they may receive hormone therapy at the doctor's office, clinic, or hospital.

Hormone therapy affects people in different ways. How patients feel depends on the type of cancer they have, how advanced it is, the kind of hormone therapy they are getting, and the dose. The doctors and nurses cannot know for certain how patients will feel during hormone therapy.

If the patients are taking hormone therapy for prostate cancer, they will have regular PSA tests. If hormone therapy is working, their PSA levels will stay the same or may even go down. But, if their PSA levels rise, this may be a sign that the treatment is no longer working. If this happens, the patient's doctor will discuss treatment options with them.

If patients are taking hormone therapy for breast cancer, patients will have periodical examinations, which usually includes exams of the neck, underarm, chest, and breast areas.

Patients will have regular mammograms though they probably will not need a mammogram of a reconstructed breast. Their doctor may also order other imaging procedures or lab tests.

Hormone therapy for prostate cancer may cause weight gain. Patients have to talk with their doctor, nurse, or dietitian if weight gain becomes a problem for them.

Hormone therapy should not interfere with the patient's ability to work.

f. - Stem Cell Transplant

Stem cell transplants is a process that restore blood-forming stem cells in patients that have had theirs destroyed by the very high doses of chemotherapy and or radiation therapy that are used to treat certain cancers. Blood forming stem cells are important because they grow into different types of blood cells. The main types of blood cells are:

-White blood cells. - These cells are part of the immune system that help the body fight infection.

-Red blood cells. - These are cells that carry oxygen throughout the body

-Platelets. - These cells help the blood clot

Humans need all three types of blood cells to be healthy.

1. - Types of Stem Cell Transplants

In a stem cell transplant, you receive healthy blood-forming stem cells through a needle in your vein. Once they enter your bloodstream, the stem cells travel to the bone marrow, where they take the place of the cells that were destroyed by treatment. The blood-forming stem cells that are used in transplants can come from the bone marrow, bloodstream, or umbilical cord. Transplants can be:

-Autologous. - the stem cells come from the patient

-Allogeneic. - The stem cells come from someone else. The donor may be a blood relative

but can also be someone who is not related.

-Syngeneic. - the stem cells come from an identical twin.

The donor's blood-forming stem cells must match the patients in certain ways. Stem cell transplants do not usually work against cancer directly. Instead, they help patients recover their ability to produce stem cells after treatment with very high doses of radiation therapy, chemotherapy, or both.

However, in multiple myeloma and some types of leukemia, the stem cell transplant may work against cancer directly. The adversity happens because of an effect called graft-versus-tumor that can occur after allogeneic transplants. Graft-versus-tumor occurs when white blood cells from patient's donor (the graft) attack any cancer cells that remain in their body (the tumor) after high-dose treatments. This effect improves the success of the treatments.

Stem cell transplants are most often used to help people with leukemia and lymphoma. Stem cell transplant may also be used for neuroblastoma and multiple myelomas.

Stem cell transplants for other types of cancer are being studied in clinical trials, which are research studies involving people.

The high doses of cancer treatment that patients have had before a stem cell transplant can cause problems such as bleeding and an increased risk of infection. Patients may talk with to their doctor or nurse about other side effects that patients might have and how serious they might be.

If the patients have an allogeneic transplant, they might develop a serious problem called graft-versus-host disease. Graft-versus-host disease can occur when white blood cells from their donor (the graft) recognize cells in patient's body (the host) as foreign and attack them. This problem can cause damage to the patient's skin, liver, intestines, and many other organs. It can occur a few weeks after the transplant or much later. Graft-versus-host disease can be treated with steroids or other drugs that suppress your immune system.

The closer their donor's blood-forming stem cells match the patients, the less likely patients are to have graft-versus-host disease. The patient's doctor may also try to prevent it by giving them drugs to suppress their immune system.

When patients need an allogeneic stem cell transplant, they will need to go to a hospital that has a specialized transplant center. Unless patients live near a transplant center, they may need to travel from home for their treatment. The patient might need to stay in the hospital during their transplant, the patient may be able to have it as an outpatient, or they may need to be in the hospital only part of the time. When patients are not in the hospital, they will need to stay in a hotel or apartment nearby.

A stem cell transplant can take a few months to complete. The process begins with a treatment of high doses of chemotherapy, radiation therapy, or a combination of the two. This treatment goes on for a week or two. Once patients have finished, they will have a few days to rest. Then, the patient will receive the blood-forming stem cells. The stem cells will be given to patients through an IV catheter. This process is like receiving a blood transfusion. It takes from one to five hours to receive all the stem cells.

After receiving the stem cells, patients begin the recovery phase. During this time, patients are waiting for the blood cells they received to start making new blood cells.

Even after their blood counts return to normal, it takes much longer for their immune system to recover fully—several months for autologous transplants and one to two years for allogeneic or syngeneic transplants.

Stem cell transplants affect patients in different ways. How the patients feel depends on:

-The type of transplant that the patients have

-The doses of treatment patients have had before the transplant

-How patients respond to the high-dose treatments

-Their type of cancer

-How advanced their cancer is

-How healthy patients were before the transplant

Since people respond to stem cell transplants in different ways, the patient's doctor or nurses cannot know for sure how the procedure will make them feel.

Doctors will follow the progress of the new blood cells by checking patient's blood counts often. As the newly transplanted stem cells produce blood cells, patient's blood counts will go up.

The high-dose treatments that patients have before a stem cell transplant can cause side effects that make it hard to eat, such as mouth sores and nausea. Patients have to tell their doctor or nurse if they have trouble eating while they are receiving treatment. Patients might also find it helpful to speak with a dietitian.

Whether or not patients can work during a stem cell transplant depending on the type of job they have. The process of a stem cell transplant and recovery can take weeks or months with the high-

dose treatment. Patients will be in and out of the hospital during this time. Most of the time patients may need to stay nearby the hospital, rather than to remain in their home. So, if their job allows, they may want to arrange to work remotely part-time.

Many employers are required to change their work schedule by law to meet their needs during cancer treatment. Patients have to talk to their employer about ways to adjust their job during treatment. Patients can learn more about these laws by talking with a social worker.

g. - Targeted Therapy

Targeted therapy is the basic of precision medicine. Targeted Therapy is a type of cancer treatment that observed changes in cancer cells that divide, grow and spread. As well as researchers learn more about the cellular changes that generate cancer, they are able to design therapies more promising that control cancer cell changes or block its effects. The majority of targeted therapies are monoclonal antibodies or small molecule drugs.

Small molecule drugs are small enough to enter cells easily by what they are used to achieve goals that are within the cells.

Monoclonal antibodies are medications that are not able to enter cells easily. Instead, they attach to particular targets on the outer surface of cancer cells.

For some types of cancer, the majority of patients with that cancer will have a target for a certain drug so that they can be treated with that drug. Nevertheless, most of the time, the tumor will need to be tested to see if it contains targets for which there are drugs available.

To have a tumor tested for targets, it may need to have a biopsy. A biopsy is a surgical procedure to remove a piece of the tumor for testing. For any surgical procedure, there is a risk. The risk varies depending on the size of the tumor and where it is located. The doctor will explain the risks of having a biopsy for the type of tumor.

The majority of targeted therapies help treat cancer by interfering with specific proteins that help tumors grow and spread throughout the body. They treat cancer in many different ways.

- Targeted therapy help the immune system destroy cancer cells. One reason that cancer cells thrive is because they can hide from the immune system. Many targeted therapies can mark cancer cells so, it is easier for the immune system to find and destroy them.

Other targeted therapies help boost the immune system to work better against cancer.

- Targeted therapy stops cancer cells from growing. Healthy cells in the body usually divide to make new cells only when they receive strong signals to do so. These signals bind to proteins on the cell surface to divide. This process helps new cells form only as the body needs them. However, some cancer cells have changes in the proteins to divide with or without signals that are present. Some targeted therapies interlope with these proteins, preventing them from telling the cells to divide. This process helps slow cancer's uncontrolled growth.

- Stop signals that help form blood vessels. Tumors need to build new blood vessels to grow in response to signals from the tumor. Some targeted therapies are designed to interfere with these signals to prevent (Cancer.gov) the blood supply from developing. Without a blood supply, tumors stay small. Alternatively, if a tumor already has a blood supply, these treatments can cause blood vessels to die, which causes the tumor to shrink.

- Deliver cell-killing substances to cancer cells. Some monoclonal antibodies are combined with toxins, chemotherapy drugs, and radiation. Once these monoclonal antibodies attach to targets on the surface of cancer cells, the cells take up the cell-killing substances, causing them to die. Cells that do not have the target will not be harmed. (cancer.org)

- Cause cancer cell death. Healthy cells die in an orderly manner when they become damaged or are no longer needed. (cancer.gov) However, cancer cells have ways of avoiding this dying process. Some targeted therapies can cause cancer cells to go through this process of cell death.

- Starve Cancer of the hormones need to grow. Some breast and prostate cancers require certain hormones to grow. Hormone therapies are a type of targeted therapy that can work in two ways. Some hormone therapies prevent (cancer.gov) the body from making specific hormones. Others prevent the hormones from acting on the cells, including cancer cells.

Targeted therapies have some drawbacks. Cancer cells may be able to become resistant to Targeted therapies, that is why targeted therapies may work best when used with other cancer treatments, like chemotherapy and radiation. Drugs for some targets are hard to develop, and this may be due to the target's structure, the target's function in the cell, or both.

Targeted therapy can cause side effects. The side effects of targeted therapy may depend on the type of targeted therapy the patient receive and how the body reacts to the treatment. Diarrhea and liver problems are the most common side effects of targeted therapy. Other side effects might include:

- Blood clotting and wound healing

- High blood pressure

- Fatigue

- Mouth sores

- Nail changes

- Loss of hair color

- Skin problems. Skin problems might include a rash or dry skin.

There are medicines for many of these side effects. These drugs may prevent the side effects from happening or treat them once they occur. Most side effects of targeted therapy go away after the treatment ends.

Since the tumor may be tested to find targets for treatment, there may be risks to the privacy of the patient's personal information. The law protects the privacy of all information obtained from these tests. However, there is a slight chance that people may obtain genetically or other information from the health records outside of the medical team.

As researchers have learned more about the gene changes in cells that cause cancer, they also have been able to develop drugs that target these changes. Treatment with these drugs is often called targeted therapy.

Targeted therapy drugs, (cancer.gov) as are any other drugs used to treat cancer, are technically considered "chemotherapy." Nevertheless, targeted therapy drugs do not work in the same ways as standard chemotherapy drugs. Targeted therapy drugs are often able to attack cancer cells, at the same time; these drugs avoid creating less damage to normal cells. Instead, these drugs go after the cancer cells' inner workings—the programming that sets them apart from normal, healthy cells. These drugs tend to have different and lesser side effects than standard chemotherapy drugs.

Targeted therapies are used to treat many kinds of cancer. At the beginning of the discovery of targeted treatment, not many types of cancers could be treated with targeted therapy. However, nowadays these drugs are used to treat many types of cancer. Targeted therapies are one of the most promising cancer treatments, and are a major focus of cancer research today. Many future advances in cancer treatment may probably come from this field.

Targeted therapy is used to keep cancer from growing and spreading. To become cancer cells, normal cells go through a process called carcinogenesis. Cancer cells may then grow into tumors or reproduce throughout a body system like the one blood cancers do. Scientists have learned a lot about the molecules that are part of this process and the signals a cell gets to keep this process going. Targeted therapy disrupts this process. (tricolormedicos.com) The drugs target certain parts of the cell and the signals that are needed for a cancer cell to develop and to keep growing. These medicines are often grouped by how they work or what part of the cell they target.

Our bodies produce many types of enzymes, which are specialized proteins that help control many of the things our cells do. When most people think of enzymes, the first ones that come to mind are those that help digest the food we eat. (www.cancer.org) However, some enzymes serve as signals for cancer cells to grow. Some targeted therapies block enzymes that are signals for cancer cells to grow. These drugs are called enzyme inhibitors. Blocking these cell signals can keep cancer from getting bigger and spreading. Therefore, even if the tumor is not getting smaller, its out-of- control growth has been interrupted. This may give regular chemo a better chance to work. Slowing or stopping out-of-control growth may also help people live longer, even without adding other drugs. Enzyme inhibitors may be called different names based on the enzymes they block: (www.cancer.org)

• Tyrosine kinase inhibitors

• mTOR inhibitors

• Proteasome inhibitors

• Growth factor inhibitors

• Signal transduction inhibitors

• Multi-targeted kinase

Apoptosis-inducing drugs

Some targeted therapies change proteins within the cancer cells and cause the cells to die. Apoptosis-inducing drugs is the medical word for cell death. These medicines cause or induce cell death. Many cancer treatments, including radiation and chemo, cause cell changes that lead to apoptosis. However, targeted drugs in this group are different because they are aimed right at the parts of the cell that control whether cells live or die. (www.cancer.org)

Angiogenesis inhibitors:

Angiogenesis is the process of making new blood vessels. In most cases, this is a normal, healthy process. As the human body grows and develops, it needs to make new blood vessels to get blood to all of its cells. As adults, we don't have quite the same need for making new blood vessels, but there are times when angiogenesis is still important. New blood vessels, for instance, help the body heal wounds and repair damage. (www.cancer.org)

Nevertheless, a person with cancer goes through the same process that creates new blood vessels that gives a tumor its blood supply. This blood brings nutrients that allow cancer to grow and spread. Angiogenesis inhibitors target and stop or inhibit this process—they stop the tumors from making new blood vessels. This helps cut off the tumors' blood supply, and without blood, tumors cannot grow.

Many of these drugs work by blocking vascular endothelial growth factor, also called VEGF. VEGF is a family of protein growth factors made by some tumors. The VEGF proteins can attach to the VEGF receptors of blood vessel cells. This causes new blood vessels to form tumors (www.cancer.org) blocking this process prevents angiogenesis, which would build new blood vessels to feed tumors so tumors could grow.

1. - Types of targeted therapy

Today many different types of targeted therapies are used to treat cancer. Looking at examples helps a person understand how these drugs work. A few of the more commonly used targeted therapies are listed here, but this is not a complete list. There are many different targeted therapies in use, and new ones are coming out all the time.

There are two main types of targeted therapy drugs: (www.cancer.org)

• Antibody drugs are manufactured versions of immune system proteins called antibodies that have been designed to attack certain targets on cancer cells.

• Small-molecule drugs are not antibodies. Since antibodies are large molecules, this other type of drug is called a "small-molecule" targeted therapy drug.

2. - Some targeted therapy drugs

There are many different targeted therapy drugs. Here are a few examples:

Gleevec® (imatinib mesylate) this is one of the first targeted therapy drugs ever used to treat cancer. It is used to treat gastrointestinal stromal tumor or GIST, a rare cancer of the digestive tract and certain kinds of leukemia. Imatinib is a tyrosine kinase inhibitor that targets abnormal proteins, or enzymes, which form on and inside cancer cells and promote uncontrolled growth. Blocking these enzymes inhibits cancer cell growth (www.cancer.org)

Iressa® (gefitinib) Gefitinib is used to treat advanced non-small cell lung cancer. This drug targets the epidermal growth factor receptor (EGFR). These receptors are found on the surface of many normal cells, but certain cancer cells have many more of them. EGFR takes in the signal telling the cell to grow and divide. When gefitinib blocks this signal, it can slow or stop cell growth (www.cancer.org)

Sutent® (sunitinib) this drug is used to treat advanced kidney cancer, and some gastrointestinal stromal tumors also called GIST. It has considered a multi-targeted kinase inhibitor because it is a type of vascular endothelial growth factor (VEGF) receptor inhibitor, an angiogenesis inhibitor, and it blocks an enzyme called tyrosine kinase. By doing all of this, it slows cancer growth and keeps tumors from making their blood vessels to help them grow and spread (www.cancer.org)

Velcade® (bortezomib) this enzyme inhibitor may be used to treat multiple myeloma that does not respond to other treatments. Bortezomib is a proteasome inhibitor. A proteasome is a complex of enzymes that destroy proteins that the cell no longer needs. Some of these proteins contribute to regulating cell function and growth. Bortezomib stops the proteasome from breaking down these proteins, which in turn causes the cancer cells to die (www.cancer.org)

Other cancer treatments can be included in the group of drugs called targeted therapies. Here are some examples of these Monoclonal antibodies:

• Campath® (alemtuzumab)

• Erbitux® (cetuximab)

• Rituxan® (rituximab)

• Herceptin® (trastuzumab)

• Avastin® (bevacizumab)

Immunomodulating drugs, such as

• Thalomid® (thalidomide)

• Revlimid® (lenalidomide)

Cytokines such as

• Interleukins

• Interferons

• Granulocyte-macrophage colony-stimulating factor

The prostate cancer vaccine, Provenge ® (sipuleucel-T)

The targeted therapies listed above are often grouped as immunotherapies, or treatments that work with your immune system to fight cancer. Nevertheless, some of them act more like targeted therapy drugs. For example, bevacizumab acts as an angiogenesis inhibitor, and cetuximab and trastuzumab work like enzyme inhibitors. You can learn more about these drugs in our document called Immunotherapy (www.cancer.org)

The goal of targeted therapy treatment depends on the type of cancer and its stage and how far it has spread, targeted therapy can be used to:

• Cure the cancer.

• Slow cancer's growth.

• Kill cancer cells that may have spread to other parts of the body.

• Relieve symptoms caused by cancer.

The doctor will inform the patient about the goals of the therapy before the physician starts treatment. Sometimes treatment with a targeted therapy drug will be the only treatment the patient needs. However, in most cases, targeted therapy is used along with other treatments such as chemo, surgery, and radiation therapy.

Claim of Value

"The hard lump of his tumor—unexpected, meaningless and quite without use—had dragged him like a fish on a hook and flung him onto this iron bed—a narrow, mean bed, with creaking springs and an apology for a mattress. Having once undressed under the stairs, said goodbye to

the family and come up to the ward, you felt the door to all your past life had been slammed behind you, and the life here was so vile that it frightened you more than the actual tumor." (Solzhenitsyn, 1969)

It is obvious that the love of the family is what drives a cancer patient to keep the fight against a terminal disease. However, it is hard when a patient has to be separated from his family to receive the best possible treatment. The cancer patients may have no choice but to trade the commodities at home for the best possible cure for cancer. Furthermore, the patient has to sleep on a hard, narrow and cold bed. On the other hand, the family member's sacrifice having to leave a loved one in a strange place to see him free of cancer.

I will do whatever it takes to find the best possible treatment for a family member, even if I have to take a love one to the remotest place on earth. Even though my actions and decisions may not have the same point of view of others. Other family members may think my decisions are not the best decisions for their family member. However, we have lawmakers and humanitarian groups that may be in favor of or against my decisions. However, I think that I am intelligent enough to seek the best treatment possible for a family member. Sometimes it is hard to make decisions because people may oppose to it.

I encounter cancer patients on the daily basis and treat them with respect, and I show sympathy for their illness. However, I cannot jeopardize their methodic treatment. I know their pain is excruciated, but their treatment has to be continuous to be effective.

Besides family members, there are groups of people looking up for the well-being of patients, for example; the government may influence in decisions made by family members in the care of a cancer patient. Furthermore, the government has the right to make sure if an ill individual is obtaining the proper treatment. Is the patient mistreated at home?, is the patient being fed properly?

There are also groups of people that care for human rights; these groups may act in favor of mistreated patients who have been poorly treated by either their family members or by the cancer centers. These group of people serve as a human rights advocacy. However, not always these groups of people value the decisions made by family members because these individuals work in favor of human rights but not on family values.

The human rights are set of values that teach us how to treat humans. Religion and philosophy teach us psychological knowledge from which we learn how to be more human. From the quote above, we may learn that cancer patients may go through some stages of their fight against cancer. In some cancer centers, they may deny treatment due to patient's beliefs or economic

situations. Conversely, the point is what patients want to do next to overcome a terminal illness, or what the family intends to do to value the patient's decisions.

For centuries, we have been influenced by literature; from Aristotle to Shakespeare, we have acquired knowledge from poems and philosophy. Poems have helped us to sooth our minds and philosophy help us to enrich our knowledge. Therefore, poems and philosophy are important to ill people because poems and philosophy assist them in a special way to keep them calm. It is important to stay calm during hard times, especially when a person is sick and has to make crucial decisions to receive the best possible treatment available.

My patients while waiting for their treatment read poetry as well as gossip magazines. It depends on the cancer stage of every one of them; some of them that already passed a critical cancer stage read gossip or health magazines. Others in critical stage read poetry and medical journal because they do not know the outcome of their treatment. They want to obtain as much information possible about their treatment as well as trying to maintain their calm to follow their doctor's advice. I see them also writing in their journals, but I did not have the opportunity to ask them if there are any classes at Memorial Sloan to help them write their journals. I think it is a rude question to ask; journals are a personal and private thing.

It may not be the type of treatment that the patient fears, but a family may be a significant factor in managing his fears. Many people are attached to their family during good times as well as during bad times. In addition, if for any reason that ill person separates from his family, they may start to worry about the decisions he is going to have to make to obtain the best possible treatment for his illness. That person may not fear surgery, he may not fear getting a scar in his body to remove a mass or tumor. However, it is crucial to have knowledge of how the patient is going to cope by himself. It is important to know how well that person is going to make decisions for his treatment. Most of the time when a person has strong family values, it may be recommended to include the family to help him to make decisions for his treatment.

People suffering from terminal illness, for the most part, are in pain, and we do not know how severe that pain is. Therefore, we have to be sympathetic and to try to provide them with the best care possible. Just remember that people do not get sick for fun, people get sick unexpectedly, and when that happened, we have to help them to overcome their fears and make their stay as pleasant as possible.

Field trips

I deal with sick people every day; they come to my department for follow up scans. I build up a good relationship with them and on a daily basis, I have the chance to talk to them about their treatment. Some of them have good news, and some of them have bad news. With the relationship that we build up, I have the opportunity to ask them how they are doing. Therefore, I see some people every six months, others not too often, and the ones that just were diagnosed every other week.

When I talk to people every six months they are doing well, and only come to be monitored to check for any anomaly. They told me their stories when they were diagnosed, how they felt and how they reacted to such devastating news, and how they got back on track to fight their disease.

When I talk to people every other week, it is not such a pleasant conversation: they are mean, rude and moody. However, I manage to establish a conversation with them because they are going through the same pain the others did when they started to get their treatment.

Every patient that I had the chance to talk to went through rough times. They did not know what to do at the beginning of their diagnosis; they were in the denial stage, which is typical for a person when were diagnosed with terminal cancer. Then it comes to the second stage, the stage of acceptance in which the patients are much focused in their treatment than anything else. Most of the time family is a key factor to influence to go from the denial stage to the acceptance phase. And if they do not have a family, these patients come closer to church and overcome adversities by praying. Others tend to meditate to gain tranquility and piece of mind to make the right decisions to treat their disease.

After the patients gain tranquility they started to come for treatment and at this time is when they become another person, the treatment for their disease makes them change their personality as well as their physical appearance. When I see them in my department for the first time, they look as healthy as any other person with the difference that they are in my department for a reason. After a few weeks of treatment, they change completely and it is hard for me to recognize them. They are pale in color with no hair, skinny like a baseball bat, and they are in pain, moody and unrecognizable. The worse part of all is their pain-- it does not matter what or how much pain medication they get, they will always be in pain.

My daily routine looking at these people in pain drove me to do this paper. Someday, not to far away from now, I would love to see a cure for this terrible disease and that is why, with the guide of my professor and the advice of my mentor, I wanted to make this paper a personal contribution to the society especially to students and people that have been diagnosed with cancer. I want to let them know that soon research will find the cure for cancer.

Interviews

I met this precious little girl May when she was born; I used to visit her every month. She lives in Canada with her parents and with her dog. May is my friend's little niece. May was growing up as an average child, suddenly, one day while she was in one of her valet classes, she felt on the floor. She was practicing one of her routines turns and jumps and at that moment she was supposed to land on her feet after her jumped, but she could not hold her body up and landed on the floor. She started to cry and complaining of severe pain on her back, and she did not want to stand up. May was probably tired, and she did not wish to continue with her practice. Her mom took May home where she continued to complain of pain, Indiana (my friend's cousin) decided to take her to the hospital to see if there was any problem. The moment they arrived at the hospital, the doctor started to examine May, and when the doctor touched a spot on the middle of her thoracic spine, May screamed of pain. The doctor decided to run some additional test including X-rays and Cat-Scans. At that moment, the doctor suggested to have May taken to Sick Kids Hospital where they specialize in Cancer.

May King (alias name) was diagnosed with High-Risk Neuroblastoma at the age of four in March 2010. She is now fighting Neuroblastoma and chemo-induced MDS (pre-leukemia)

May was born on 2006, in Canada.

After May had been diagnosed with neuroblastoma, I had the opportunity to talk to Indiana (May's mother.) I asked her a few question of how that happened. At the beginning, they were confused and disoriented as well as they felt punished. A beautiful mix family Kirk, May's father, is Japanese descendant, and Indiana is Salvadorian. They met in Canada where they started her little family. Kirk had a son before with another woman, who is living with Kirk and Indiana because Tom's mom could not care for him, and Kirk had custody to Tom. He is a healthy young adult.

Question

How did it happen?

Answer

In December 2009, May started to have minor aches and pains on and off. There were several visits to the doctor, nothing was found, a set of x-rays was ordered and she was diagnosed with pneumonia.

May continued to have her active lifestyle, and after a ballet class in mid-March 2010, she complained that her lower back was hurting. Soon the pain on her back became so noticeable that she had trouble sleeping. After numerous visits, her pediatrician suggested it was time for May to be seen by the doctors at SickKids children's hospital for a more extensive examination.

On the day May was set to go to SickKids hospital, May's pain intensified to the point that she did not want to stand up or walk. X-rays revealed compressed fractures in her spine and doctors thought that she must have suffered a fall. Further tests were ordered, and an ultrasound showed a tumor under the adrenal gland and above the right kidney.

On March 26 2010, (May was four years and two months old) our little girl May was diagnosed with a form of cancer we had never heard before, Neuroblastoma. The cancer was high Risk, Stage IV, and unfavorable histology. NMYC (N-Myc proto-oncogene protein also known as N-Myc or basic helix-loop-helix protein 37 (bHLHe37), is a protein that in humans is encoded by the MYCN gene,) non-amplified. Also to the primary site of the tumor. Cancer was detected in her spine, at the top of her pelvis and sacrum. As well as in the upper part of her femurs on both legs, the sternum area, small areas around her neck, and the right side of her frontal skull. May did not walk for over a month as standing up caused her to scream in pain.

Question

How did you react?

Answer

Kirk and Indiana said, “we were devastated with such bad news, our little princess diagnosed with stage four neuroblastoma. We did not know what to do. However, we knew that we had to act immediately because of the stage of cancer. After we received the bad news, we had no choice but to move quick, so we took the advice of the oncologist of not to waste time and to start planning May’s treatment.”

Question

What did you do next?

Answer

Immediately, May started the treatment plan laid out by the (COG) Children's Oncology Group, the latest standard of care, or front line treatment for this cancer. In May's case, this was ANBL0032 with immunotherapy (ch14.18). This protocol called for five rounds of chemotherapy to shrink the tumors, followed by a major abdominal surgery to remove the primary tumor, followed by more chemotherapy, an autologous bone marrow transplant, radiation, and immunotherapy.

May completed the first five rounds of chemotherapy in June 2010, and in July 2010, she had surgery, where she also had her right kidney removed. After recovering from her surgery, May went through another round of chemotherapy. On September 7th, 2010, May was admitted to the transplant ward at SickKids to complete a Bone Marrow transplant.

After the high-dose chemotherapy she received during the bone marrow transplant period, May developed VOD (venous occlusive disease), an inflammation of the liver, a side effect of high-dose chemotherapy. This meant that May’s liver was too weak to go through the next step of the protocol - radiation. May was out of the COG protocol, and she could not receive immunotherapy, as radiation had to be given within 100 days of the transplant for May to qualify for Immunotherapy. This was a big blow for us.

Question

How did you react to the upsetting news that May could not continue with her treatment?

Answer

We contacted Sloan Kettering in New York as we wanted May to receive Immunotherapy- none of the other COG hospitals in North America would give it to May once she disqualified -at the time. The plan was to reduce May's cancer for her to proceed with immunotherapy.

At that time, scans before the Bone Marrow showed that 50% of May's cancer had gone away with the first five rounds of chemo. The cancer spots in the head and neck had gone away. Scans after the transplant until today (2014) continue to be the same. Meaning that the disease is not progressing, but not going away either. Biopsies of the tumor lighting up in her tummy show necrotic cells - meaning that the tumor is dead. She does have a spot in her spine that also lights

up; we cannot do a biopsy because it is in a difficult place. We want to believe that it is also death as it has not changed in the last two years.

All throughout 2011, May received irinotecan and temozolomide chemotherapies as an outpatient at SickKids Hospital in Toronto. This provided her with an excellent quality of life while keeping cancer in check.

Question

Did you look for alternative treatments?

Answer

Yes, May was one of the first children to enroll in the personalized medicine trial with Dr. Scholler at the NIH in Washington DC. However, as biopsies to her tumors showed necrotic cells, she was disqualified, as they needed a live tumor sample.

Question

How did you feel that May was not able to qualify for the “Targeted Therapy” personalized medicine?

Answer

It was upsetting to be unable to be part of this very promising type of personalized medical treatment. However, we knew we had to continue May’s treatment following our oncologist’s advice.

On January 18, 2012, May started MIBG 131 therapy at St. Justine's Children's Hospital in Montreal.

On July 2012, Maya enrolled in the DFMO (Preventative Trial of DFMO in Patients With High-Risk Neuroblastoma in Remission) study with Dr. Schoeller at Grand Rapids - Helen De Vos Hospital. A week prior to enrolling May's platelets had begun to drop.

August 2012 - 2 weeks into the DFMO study May was diagnosed with secondary cancer - Chemo induced MDS with (1,7) and (11,17) translocations. At the time of diagnosis, May had

over 20% blast, which was very close to being AML. May was not making any platelets and was transfusion dependent (once per week)

On September 2012, May started vidaza to treat the MDS (while waiting to find a donor for an allogeneic Bone Marrow transplant - the only cure for MDS).

January 2013 - May's peripheral blasts disappeared

February 2013 - May starts to make her own platelets, and she receives her last transfusion of the year.

April 2013 - Bone Marrow biopsy in 70 cells and later 200 cells show that the translocations had disappeared. May was technically in remission, or at least the Cancer was not detectable at the time. May had a great quality of life. Vidaza was very well tolerated, no nausea, no hair loss and it was taken as an outpatient.

Because no fully matched donor was found, we decided to postpone the transplant (the plan was to use May's chord blood), as this was something we dreaded. This would be a second transplant too toxic, a myeloablative transplant gave our daughter a 50% chance of coming alive out of it, a flip of a coin.. we needed to find something better. Vidaza turned out to be sort of a miracle for us; it gave us time.

October 2013 - Bone Marrow aspiration and biopsies showed one translocation back in the marrow (70 cells sampled). May had completed 14 rounds of vidaza.

Question

What other approach did doctors suggest?

Answer

The doctor suggested going through a small type of transplant. In addition, in December 2013 - We visited St. Jude Hospital to talk to doctors about a non-myeloablative transplant that also uses natural killer cells. St. Jude did not need to use a full match; they could do a mismatch halo transplant where I was the donor. This was like a mini transplant. The conditioning was not as toxic as it also relied on the natural killer cells to get rid of MDS (we hope Neuroblastoma as well), and fight any possible future relapses... We thought this was promising.

After 15 rounds of vidaza, Bone Marrow aspiration at St. Jude's Hospital in Memphis showed no translocations. Again, May was technically in remission. But by this time the bad cells were lurking around, they were coming and going. May was in good shape. What if the Neuroblastoma started to act up, what if.... we felt it was time again... May was fighting two cancers; we needed to move.

January 20, 2014 - May starts conditioning for Second Bone Marrow transplant at St. Jude hospital under the care of Dr. Brandon Triplett. (HAPNK1: KIR Mismatched Haploidentical Donor Hematopoietic Progenitor Cell and Natural Killer Cell Transplantation with a TLI Based Conditioning Regimen) Bone marrow cytogenetics of early January continued to show no translocations. Before her second transplant, Maya completed 16 rounds of vidaza and went into her second transplant with no detectable translocations or blasts.

From August 2012 to today (Jan . 2014) May did not receive any Neuroblastoma treatment. All Neuroblastoma scans have shown no progression of the disease, we hope and pray that it continues to be this way.

Question

How much did you life change?

Answer

You know, when your children are healthy, you have a piece of mind. You go to sleep peacefully every night, however in my case. When May goes to bed, we have to sleep with one eye open in the event of a fever or any other symptoms that require immediate attention. Many times, we had to take her to the emergency room because of fever or for severe pain and May cannot have any medication but prescribe by her oncologist. So basically our lives drastically changed. We want to travel or go somewhere before hand we have to make sure to have her prescribed medication in case of fever or pain. Worse case scenario is we have to go to the emergency room and call May’s primary oncologist for further instructions. Nothing is the same, and we are always ready for anything.

Question

Whom you think has been the biggest help to keep in the fight against neuroblastoma?

Answer

I think the family has been one of the biggest influences to maintain the fight against cancer. They were there for us, twenty-four hours a day, and seven days a week encouraging us not to give up. Friends and coworkers helped us with their prayers and good wishes. In addition, they provided us with vital information and introduced us to people with cancer knowledge that was also essential to find the different treatments available for May.

Claim of Fact

"IN ILLNESS, THE FREE MAN BECOMES UNFREE. ONCE ABLE TO choose his way and to determine his path. He now labors under the rule of forces more powerful than his own. Entering the realm of sickness, a man becomes aware, and painfully, of his tenuous balance between freedom and necessity, independence and contingency, choice and fate" (Boards, 2008).

Here we are in New York City, one of the most diverse cities throughout the world where population surpasses seven million. During the past few years, our City has been growing in population as well as in cancer research because a lot more people are contracting this disease. Many Hospitals of our area have been taking the initiatives to look at different ways to fight cancer. In 2015, many New York City Hospitals opened cancer research laboratories. Unfortunately, there is a lot of people with cancer. In addition, there are many more people contracting this terrible disease, from which many hospitals may have an opportunity to increase their revenues providing services to the affected population.

Since we live in a diverse city where every day, the rich and the poor people meet in the subway, on the street, and everywhere to go to work or to come back home. In New York City, everyone lives close to each other. However, not everyone may have the same treatment. Wealthy people may receive better treatment than the poor. People with insurance may receive the best treatment than people without insurance. However, when people were diagnosed with a terminal illness. It may be different because, some people may have the best treatment for cancer. On the other hand, people that cannot afford treatment may get some treatment, but at the end if there is no cure for it, they may die trying to fight the disease.

What role pharmaceutical companies play in all this business, I think they may play a big role in it. I always question myself how drug companies test their approved drugs to fight cancer. After testing in mice, which are going to be the first humans to be tested. Pharmaceutical companies

may pay people to try these newly developed drugs, but after they attempted to perfect the drugs, they may sell it for a very substantial price.

Whatever the case may be, either research hospitals are investing a lot of money as well as pharmaceutical companies to come out with the best possible drug to treat and cure cancer. People still suffering from pain, and they are unable to have peaceful family moments. That is the end of freedom, as Bradley mentioned in his book 'Pale Faces,' patients that contracted cancer are not free anymore. They become prisoners. They cannot do much on their own anymore; to spend one more day with their loved ones they have to rely on doctors and drugs. They used to do whatever on their own. Now, they cannot do it anymore; they have to choose what is best for them; sacrifices, prayers, and fate are what they want to battle that terrible disease.

In 2015, New York City offers many cancer centers to choose from to treat this disease and because of the increased percentage of new people diagnosed with this terrible disease, many hospitals in New York City have taken the initiative to research and try to help people with cancer to fight back the disease. Nowadays, we have unlimited Internet access to vital information, especially when it comes to obtaining information to how and where to go for cancer treatment. It is important to obtain as much information possible about the disease before making any decision in what type of treatment to choose. People diagnosed with cancer may have to obtain cancer treatment for a long time, if not for the rest of their lives. Therefore, it is essential for people to obtain the right information for the type of treatment for the type of cancer. People to have to obtain the right information from a reliable source and for the purpose of my research paper; I had found a few from the many Internet sources: WebMD.com, Cancer.org, and mayoclinic.org. Each of these websites are reliable sources and provide a vast of cancer information with the later discoveries and treatments available.

The source cancercenter.org has a lot of information about Targeted Treatment, which is one of the later discoveries in cancer treatment. Targeted cancer therapies are drugs that block the growth and spread of cancer by interfering with specific molecules that are involved in the growth of cancer. Targeted therapy is the most popular anticancer drug development. Targeted therapies are a cornerstone of precision medicine, which is a form of medicine that uses information about a person's genes and proteins to prevent and treat disease. Many targeted cancer therapies have been approved by the Food and Drug Administration to treat particular types of cancer. Others are being studied in clinical trials, and many more are being clinically tested on animals.

One approach to identifying potential targets is to compare the amounts of individual proteins in cancer cells with those in healthy cells. Proteins that are present in cancer cells or that are more

abundant in cancer cells may be potential targets, in particular if they are known to be involved in cell growth or survival.

Another approach to identifying potential targets is to determine whether cancer cells produce mutant proteins that drive cancer progression. Researchers look as well for abnormalities in chromosomes that are present in cancer cells but not in normal cells. Often, these chromosome abnormalities result in the creation of a fusion gene whose product called fusion protein, may drive cancer development. These fusion proteins are potential targets for targeted cancer therapies. (cancer.gov)

All of this information sounds promising to treat cancer. However, there are some factors, patients have to qualify to be able to receive this type of treatment, the patients have to have the appropriate target to be treated otherwise there is nothing to target. Also, the patients have to meet some criteria to qualify for this type of treatment; prior cancer treatments did not work or spread out to other parts of their body.

The information provided by WebMD.com website about natural medicine as a supportive treatment to prepare the patients for their cancer treatments. The holistic approach uses medicinal plants and oils obtained from nature.

Aromatic plants have been used in healing practices for thousands of years across many cultures, including ancient China, India, and Egypt. Methods to extract essential oils from plants were first discovered during the Middle Ages. The history of modern aromatherapy began in the early 20th century. In the eighties and nineties, aromatherapy was rediscovered in Western countries as interest in complementary and alternative medicine started to grow.

Aromatherapy is not suggested as an alternative for cancer treatment, but as a form of supportive care to manage symptoms of cancer or side effects of cancer. There are many theories about how aromatherapy and essential oils work. One of the leading theories is that smell receptors in the nose may respond to the smells of essential oils by sending chemical messages along nerve pathways to the brain's limbic system, which affects moods and emotions.

Many studies of essential oils have found that they have antibacterial effects when applied to the skin. Some essential oils have antiviral activity against the herpes simplex virus. Others have antifungal activity against certain vaginal and oropharyngeal fungal infections. Also, studies on rats have shown that different essential oils can be calming or energizing. When rats were exposed to certain fragrances under stressful conditions, their behavior and immune responses improved.

One study showed that after essential oils had been inhaled, markers of the fragrance compounds were found in the bloodstream, suggesting that aromatherapy affects the body directly like a drug. In addition to indirectly through the central nervous system. (Web MD)

Clinical trials of aromatherapy have mainly studied its use in the treatment of stress, anxiety, and other health-related conditions in critically ill patients. Several clinical trials of aromatherapy in patients with cancer have been published with mixed results. (Web MD)

A few early studies have shown that aromatherapy may improve the quality of life in patients with cancer. Some patients receiving aromatherapy have reported improvement in symptoms such as nausea or pain and have lower blood pressure, pulse, and respiratory rates. Studies of aromatherapy massage have had mixed results, with some studies reporting improvement in mood, anxiety, pain, and constipation and other studies reporting no effect. (Web MD)

All this vital information obtained from reliable internet sources provide us with a vast explanation to the later scientific discoveries to treat cancer as well as with essential information about the supportive, holistic approach. I have seen people suffering from cancer, but I have not felt their pain. Their pain must be intolerable because every time I see them they are taking medication for it. Patients that come to my department told me that some of them use the supportive, holistic approach as part of their treatment, and that type of treatment helps them in some way. As I described above, some of them benefit from soothing their bodies and souls.

Unfortunately, at this moment, I do not have substantial information about medicinal cancer treatment. However, I have knowledge that people had benefited from this type of treatment. Shamans had provided service to people that I knew a long time ago back in my country. People that were diagnosed with liver cancer had benefit from the natural treatment provided by Shamans, and that is the purpose of my research to find out more information about this treatment. Of course, it is not going to be easy to obtain substantial information from the Shamans that preside these treatments and what types of natural plants they use to treat this type of cancer.

According to my investigation so far, targeted therapy is another type of cancer treatment from which patients still suffering from side effects of the chemicals use for their treatment, on the other hand, the holistic approach is used to help patients to soothe their bodies and souls.

Claim of Policy

"…Every blessing ignored becomes a curse. I don't want anything else in life. But you are forcing me to look at wealth and at horizons that I have never known. Now that I have seen them, and now that I see how immense my possibilities are, I'm going to feel worse than I did before you arrived. Because I know the things I should be able to accomplish, and I don't want to do so." (THE ALCHEMIST by Paulo Coelho)

How long people are suffering from cancer have to wait to find a treatment designed for their type of cancer. I have been working for eight long years at a prestigious cancer institution from which I have learned many things about cancer. When I started to work at Memorial Sloan Cancer Center I learned that they have been looking for the cure of cancer since eighteen eighty-four and I think that it is many years searching for the cure of cancer and that people who contracted this disease deserve a little better cancer treatment.

I see patients every day at work and I think if cancer treatment is a blessing or if it is a curse and this thought comes to my mind every day because I see how much my patients suffer from the treatment they receive. They are marked for life after surgery; they are bald after chemotherapy, and they are either fat from medicines or they are skinny from radiation.

It is easy to say that I work here, but it is hard to deal with sick people on a daily basis. However, I chose to work here because I like to help people, and I am proud to say at the end of my shift that I help people to live one more day. I like to be like their alternate cancer treatment by being kind, charismatic and informative I have made them feel a little better.

How long it is going to take to find the cure for cancer, I think everyone is asking this question. Cancer patients especially are waiting for the answer to this question; they may be tired of looking for ways to obtain the best cancer treatment for them. They are being forced to look for alternative cancer treatments because the conventional scientific method may not be working for many of them.

The experimental cancer treatment brings the adverse reaction to patients which is why they are tired of waiting for treatments that work. I thought that Targeted Therapy was going to bring a cure for a patient with cancer, but I was wrong. It may bring a cure for some but not for everyone with cancer. A patient to qualify for Targeted Therapy has to have been receiving another type of cancer treatment and match for the targeted therapy available for that type of cancer. So I was disappointed when I started to go into depth in my research about the different types of cancer treatments available and found out that Targeted Therapy was not what I had expected it to be, the treatment sounds promising, however I think that we have been waiting too long to be disappointed by targeted therapy.

There is another type of treatment available for cancer patients from which when I found out that is not a treatment but is a soothing therapy I was disappointed as well. This alternative cancer treatment is called The Holistic Approach that offers cancer patients with massages, acupunctures, psychological advice, and others.

How many more people suffering from cancer have to wait until The Government, Cancer Treatment Centers or Pharmaceutical companies may come out with the best possible cancer treatment for every patient. Why is cancer research concentration mainly in the scientific method? Why is there no research on natural resources like plants and herbs? There are many studies done on plants that gave positive results to treat many other illnesses, why could big companies try to find out if there is a possibility that a natural plant has a cure for cancer? I have knowledge that there is a possibility in Ecuador. A Shaman found the cure for abdominal cancer. When I found out about that, it was by one of my neighbors who received that treatment. I knew that it could not be a lie, and that is why, I am investigating more about what type of plants and herbs this Shaman is using to cure that type of cancer. I hope to find more information about this type of cancer treatment to include in my research paper. However, I am planning to travel to Ecuador to meet this Shaman at the end of this semester, so wherever my research paper for summer class ends. I am planning to continue with my research to try to help some people suffering from the type of cancer curable by the Shaman.

Let us look to any possibility to find the cure for cancer and let us take the many options we have and make it a blessing otherwise if we do not look further it could become a curse. People have suffered from this disease too long, and it is time to help them find a treatment that works. Let us remember that cancer patients are suffering and waiting for a cure, and now that I may know that there is a slight possibility for patient with abdominal cancer to offer them an alternative cancer treatment. I am not going to stop until I obtain valuable information for those cancer patients who are suffering and for those I see them every day.

Now that I know that the Shaman exists, I can see how immense my possibilities of meeting him are. I will feel better the moment I will find out what the herbs and plans are available for cancer treatment. Because I know the things I should be able to accomplish, I am looking forward to meeting the Shaman at the end of summer.

“I've learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.” (Maya Angelou)

I work as an MRI Technician at Memorial Sloan-Kettering Cancer Center, and on the daily basis I deal with cancer patients. To some of them, it does not matter how I treat them or how hard I

try to greet them. Others, they may not get the message that I want to deliver, however, at the end of their MRI visit, most of them are grateful for the treatment that I provided them.

People at higher risk of contracting cancer for early detection should have more preventative testing, as well as early intervention, and people living with cancer should have the opportunity to obtain different types of cancer treatments. I agree that people at high risk of contracting cancer should be constantly tested for cancerous cells, which would be helpful for them to be diagnosed at an early stage. However, most of the time early detection is not possible, cancer cells appear at some point at an advanced stage, and there are cases where testing did not detect cancer at all.

Memorial Sloan Kettering Cancer Center has been doing research on cancer for more than a hundred years, they have been in the business since 1884, and still they did not find the cure for cancer yet. I know all these years they have been working hard. I have the pleasure to work for this prestigious Cancer Center and everything we do here has to do with cancer research. We all work very hard every day to better our patients.

I am in contact with cancer patients on the daily basis and I can tell you that there are no good experiences. Before establishing a conversation, I have to think at what I am going to say because sick people tend to be more sensitive than other people are. In general, people in need drove me into writing this cancer research paper. I think cancer patients should obtain a better treatment for their illness.

When I had knowledge that cancer centers came out with Targeted Therapy, I was excited to see the outcome of this new cancer treatment, which was very promising at the beginning before I started to go more in depth in my research paper because Targeted Therapy treats cancer at a personal level. Then, I learned about the holistic medicine, which after doing my research, I found out that it does not cure cancer, it only treats the reactions to the cancer treatments; like nausea, headaches, vomiting, pain and offers piece of mind exercise. I know all these cancer centers are doing their best to come out with a drug to treat cancer. However, whatever policy they have is not working, we should move on to a total new approach. Don't you think?

I have knowledge of the existence of Shamans in Ecuador that had found the cure for cancer. One of my coworker's father was diagnosed with abdominal cancer, so my colleague approached me to ask me for an opinion, I told her that one day, I heard my mother in law talking about cancer and that I will mention this matter to my mother in law. Therefore, she told me the existence of Shamans in Ecuador and that she had knowledge of one of her neighbors received abdominal cancer treatment with plants and herbs. Before receiving his shamanic treatment, the doctor told him that he had six months to live, however, he still alive. This is valuable

information for patients suffering from abdominal cancer, however due to the lack of resources and time. Now, the existence of Shamans is just a theory until I am able to travel to Ecuador to see if I could be able to find out more information about the existence of Shamans and their type of cancer treatment.

If I will be able to find out that this theory is true, what type of cancer treatment would you prefer your family member to receive: Targeted Therapy or the Shamans' herbal treatment? We have to remember how much cancer patients suffer from scientific cancer treatments. Targeted Therapy is one of the last resource cancer treatments available, the patients have to be receiving another type of cancer treatment or had surgery. So, let us imagine the physical condition in which these patients are, probably; they may be bold and pale depending on how much radiation they were exposed to, they may be fat or skinny depending on what type of medicine are taking in, or they may be walking or in a wheelchair depending to what type of surgeries they were exposed to. All of these are reactions to the different types of radiation, drugs and chemicals, and surgeries used to treat cancer. On the other hand, the Shamans' herbal treatment may alter their eating habits and their lifestyle.

If I have money, I may not donate for more scientific cancer research. I would like to invest my money in researching in natural resources; like plants and herbs to fight cancer. I would like to go to South America, to the Amazon. Where, natural resources are free of contamination, the air is pure, and there is no noise, only the synchronize songs of local animals; birds, insects, monkeys and many more, as well as the roaring noise of fresh flowing water, the rivers are like the ocean, one cannot see from one side to the other side. Paradise is how I describe this place, I really missed it, it is been a long time since I visited the jungle. I think the jungle is the place where, I would love to see the beginning of the cure for cancer. It may not be easy for people to get accustomed to the jungle, the weather is muggy and hot, it may be one hundred degrees with one hundred percent humidity, and the rain visits unexpectedly. It will be many challenges to get settle down there, there is a lot of will animals as well as many mosquitos that won't leave you alone. However, if these small adversities are for a good cause, I am willing to take them and build a natural cancer center on the Amazon. If our Indians survived these adversities, we would survive too.

I would love to build a cancer center on the Amazon because patients receiving treatment for their cancer can have the chance to rest, and I mean to rest mentally, physically and free of pollution. Patients to strengthen their immune system need to eat fresh foods, breath pure air, and greater tranquility. The jungle would be the ideal place for these cancer people to concentrate on their treatment without going through the daily stress of the city.

Dreams does not cost anything especially when one is dying of cancer, it does not matter what type of medicine is offered to them as long as it cures their cancer they will be happy. Ones I dream to build a cancer center at the amazon where cancer people can breath pure air however I do not have that kind of money to build such of wonderful place. Until then let us stick to targeted therapy which nowadays is the most promising type of cancer treatment.

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