Radical Cancer Treatments Dramatically Shorten Patients' Lives

A Fatal Flaw Revealed In Medical Treatment Development Model

(A preprint for comments)

Jianqing Wu, Ph.D. J.D.

Abstract

Upon a review of cancer theories, treatment development histories, and the treatment development methodology, the author shows that medicine is confined its focus to limited options long before correct knowledge of cancer was discovered. Treatment strategy was based on an old thinking that cancer must be removed with all cancer cells being eradicated, which existed long before 1846. From the latest discoveries of cancer knowledge, the author found that four lethal factors for cancer deaths are side-effects of medical treatments, emotional distress and chronic dress, lack of exercises or physical inactivity, and excessive nutrition in some cases.

By evaluating the adverse impacts of all four lethal factors, the author shows that they could collectively raise cancer apparent growth rate constants by one or more orders of magnitude. Compared with truly best treatment reference, surgery shortens life by huge margins. Claimed benefits of surgeries and drugs were established by conducting chain comparisons: comparing each drug or treatment with a similarly useless and harmful treatment. When surgery is used as a control for early-generation drugs and controls of newer drugs, it sets up a negative standard relative to the lifespan the patient would live if the cancer self-resolves or is held in check. Thus, whatever improvements found on later drugs and later treatments are relative to that negative standard. By appraising the magnitudes of adverse impacts of the four lethal factors, the claimed curative benefits of medical treatments must be refuted as non-existing.

Due to the great adverse impacts of the four lethal factors, medical treatments shorten lives in a super majority of cancer cases and may be the actual causes of avoidable deaths in some cases. The author also questions the merits of cancer early diagnosis and over treatments of cancer, and urges cancer research organizations to assess identified fatal flaws and take necessary actions on the uses of surgeries, chemotherapy, radiotherapy in cancer care.

Introduction

President Nixon declared a war on cancer in 1971 with his signing of The National Cancer Act. Half a century later, no cure has been found. Nearly all latest studies show that none of chemotherapy, adjuvant cancer drugs, and target drugs can cure cancer in a predictable manner. I will systematically evaluate the performance of medical treatments from many angles such as treatment history, cancer theories, treatment performance data, medical framework, and recent studies and meta reviews. Based on facts that are ignored in the entire medical history, I found that medicical treatments shorten patient lives and are largely responsible for creating the cancer epidemic. I will produce irrefutable evidence here to prove my findings.

A. Face-Value Benefits of Medical Treatments

We have heard time and again about "ground-breaking cancer research." One thing that has never changed is the approach used in cancer research and treatment model. A recent meta review shows that the complete response rates for remission are around 7.4% [Ashdown et al. 2015]. The complete response does not preclude cancer from relapsing, implying the actual performance is much worse. Chemotherapy has severe drug side-effects and causes cancer relapses at much faster speeds. A systematic review of thyroid cancer treatment performance found that response rate was 22.1% to 27.1%, with complete response rates being 2.5% to 3.4% [Albero et al. 2016]. A retrospective cohort study conducted a systematic evaluation of cancer approvals by the European Medicines Agency in 2009-13 and found that most drugs entered the market without evidence of benefit on survival or quality of life [Davis et al. 2017]. At a minimum of 3.3 years after market entry, there was still no conclusive evidence that these drugs either extended or improved life for most cancer patients. This is similar to another finding: "The overall contribution of curative and adjuvant cytotoxic chemotherapy to 5-year survival in adults was estimated to be 2.3% in Australia and 2.1% in the USA [Morgan et al. 2004].

Cancer researchers started seeking target drugs since around 1980. Targeted cancer therapies are used to block the growth and spread of cancer by interfering with specific molecules that are involved in the growth, progression, and spread of cancer. They may belong to hormone therapies, signal transduction inhibitors, gene expression modulators, apoptosis inducers, angiogenesis inhibitors, immunotherapies, and toxin delivery molecules.

A cancer drug like beta-blocker was thought to block cancer growth, but inevitably interferes with normal biological functions including blood glucose uptake by skeletal muscle. Half or more of people who start taking a beta blocker stop within a year [Harvard Letter, 2008]. The latest meta-study involving 319,006 patients shows that beta blockers have nearly no benefits [Na *et al.* 2018]. Another meta review similarly found dubious benefits or marginal benefits and small negative impacts, depending on cancer types [Yap *et al.* 2018]. Bai and Zhang [2018] conducted a meta review on the effects of angiogenesis blockade

for the treatment of gastric cancer, benefits are mixed. Small benefits are found for only certain types of cancers and certain types of patients. However, each of those studies is based on limited options that are used in medicine.

Another meta review also found that such drugs do not extend overall survival for biliary tract cancer [Li et al. 2019]. The use of target therapy with radiation compared to standard therapy increased the chance of severe adverse events while yielded comparable survival in glioblastoma multiforme patients [de Santos et al. 2015]. The addition of targeted drugs to TEM + RAD did not improve the overall survival of patients with glioblastoma multiforme; however, it had some effect of stopping cancer progression for patients treated by cilengitide but could not extend their overall survivals; and the rate of adverse effects was higher in the experimental group than in the placebo group [Su et al. 2016]. The average survival time is 12-18 months and only 25% of glioblastoma patients survive more than one year, and only 5% of patients survive more than five years.

The general picture is that a vast number of patients do not respond to cancer drugs, target drugs do not reduce the risk of cancer returns which are often terminal. All studies attempted to address cancer returns found no effects on cancer returns. In studies finding significant benefits, actual extension of average life is very limited as compared with similar treatments. “The claimed ‘targeted’ therapies that may or may not extend remission of cancer for a few months should not be accepted any longer as ‘cure’ by oncologists, scientist or patients….” [Maeda and Khatami, 2018]. Numerous surveys show that few doctors would consider using radiotherapy on themselves because it can cause new cancer, and that 75% of doctors would not consider using chemotherapy on themselves. Some cancer miracles have been accredited to target drugs; however, cancer fighting measures may be real reasons for miracles. I will show that those small benefits do not exist for the reasons I provide below.

B. Medical Treatments Were Guided By Obsolete Cancer Theories And Were Never Compared With Measures For Correcting Cancer Causes

One fatal flaw in medical treatments is revealed in Figure 1. The figure shows the time for cancer theories from pre-1800 to 2019, the start times of increasing uses of surgeries (1846), radiotherapy (about 1900) and chemotherapy (1946), the start time of discovering cancer cause factors and influencing factors (mainly after 1980), and the start time of discovering exercises effects (after 2000). Cause factors, risk factors and influencing factors fall within six large classes: the side-effects of medical treatments, the mental distress and chronic stress, exercises and inactivity, diet and nutrition, cancer fighting natural compounds, and certain other lifestyle factors. Those factors are shown in the top box in Figure 1.

A large number of cancer theories were proposed, but none of them can withstand time tests. The cancer theory history reflects how cancer treatments

progressed. It was believed that cancer is caused by a milk clot in a mammary duct, acidic lymph fluid, cancer poison, hormone, chronic irritation, infections, tobacco snuff, etc. [Wikipedia, cancer] Some theories include homoral theory (Hippocrates's belief), lymph theory (Stahl and Hoffman), blastema theory (Johannes Muller, 1838), chronic irritation theory (Virchow), trauma theory (widely accepted belief from the late 1800s until the 1920s), infectious disease theory (Zacutus Lusitani, 1575-1642, and Nicholas Tulp, 1593-1674) [ACS]. All old cancer theories are clearly wrong or inaccurate, but are presumed to have influenced the developments of cancer treatments.

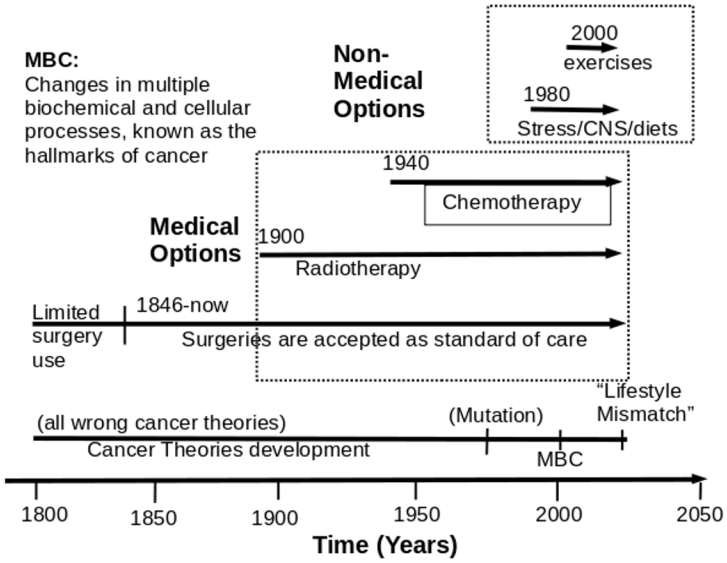

Figure 1 Time Lines of Cancer Theories, Medical Treatments, and Cause Factors Such As Stress, Inactivity, Diets, Lifestyle Factors.

Most influential cancer theories include somatic mutation theory (SMT) [Brücher and Jamall, 2016], somatic evolution theory [Nowell, 1976] and revolutionary cancer theory [Attolini and Michor, 2009]. None of modern cancer theories can explain all cause factors, risk factors and influencing factors. The SMT started in about 1914 when Theodor Boveri postulated that a combination of chromosomal defects could result in cancer. The SMT theory cannot explain the fact that while most mutations take place at the birth and new mutations are added in a similar pace in each year, cancer incidences strike mainly people above 60. They do not explain the roles of emotion, personal lifestyle factors and personal habits.

In the last half century, cancer research slowly discovered that cancer is accompanied with changes in a large number of biochemical and cellular process. Some of such changes are well reflected in “The Hallmarks of Cancer”

by Hanahan & Weinberg [2000]. Cancer is also caused by modern lifestyle, which mismatches what human genes were adapted to [Hochberg & Noble, 2017]. Inferring from known cause factors, risk factors, and influencing factors, cancer is a result of changed biochemical and cellular processes associated with misfitted lifestyles. Changed biochemical and cellular process patterns further imply that cancer cannot be cured by cutting off the tumor or killing all cancer cells. Thus, surgery, chemotherapy and radiotherapy were developed by relying on old and obsolete cancer theories.

The poor performance of medical treatments can be explained by examining the development history of medical treatments. The “benefits” of surgery for “curative” treatment of breast cancer was “recognized” by the Greek physician Galen of Pergamum (130–200 A.D.) and Scottish surgeon John Hunter (1728-1793). A century later, matured anesthesia art (e.g., diethyl ether in 1846). This standard of care had gained wide acceptance long before any remotely right cancer theory was developed. Its use in treating rectal cancer was prompted by anaesthesiological techniques. In 1908, William Ernest Miles introduced the basis of modern rectal cancer surgery with improved surgical options [Lange et al. 2009]. Thus, surgery is based on a “notion” that a tumor can be cut off and killed. It is like an attempt to change biochemical and cellular processes by cutting reactant media. An obvious “intuition” for its continuous use is reducing cancer burden.

The cutting-and-killing notion is still reflected in current medical practice. Patients are often told that cancers are “in remission” or they are “cancer-free.” The only thing that is true is that the tumor has been removed. However, current diagnostic technologies are unable to tell anything about cancer cells and the body’s biochemical and cellular processes, which may fuel cancer proliferation at much faster speeds. Next eruptions may take place in as short as fewer than 12 months.

Chemotherapy started gaining momentum around 1946 when Gustaf Lindskog’s study on non–Hodgkin's lymphoma was published. It had been heavily influenced by old cancer theories on infection. The “chemotherapy” was a term used for treating infectious diseases in the early 1900s. Penicillin was initially thought to have anti-tumor properties. The antibiotic, actinomycin D, had significant anti-tumor properties and enjoyed considerable use in pediatric tumors in the 1950s and 1960s. Medicine has slowly developed clinic trials as a standard for evaluating effectiveness of drugs [Twyman 2004, Legumes, 2009]. One key requirement of clinic trials is that the drug is compared with a control which may be a placebo and test subjects may not know whether they take the drug or the placebo. However, it is impossible to design a clinic trail where patients can change their lifestyles and do not know what they are doing. When this requirement was accepted, medicine essentially excludes as cure anything that cannot be controlled. What is excluded include mind (changing mental state, reducing stress, avoiding fears, changing faith, being happy, etc.), changing

lifestyles, getting rid of bad habits, using special diets, doing exercise, raising body temperature, altering body mechanical properties, etc. Moreover, using placebos in cancer is improper because cancer can cause deaths and controls are selected by using best-available-therapy [Au et al. 2007]. This approach is evaluating whether new drugs are superior to currently used drugs.

Accepting clinic trials and the best-available-therapy as controls essentially narrows treatment options down to include only things that can be swallowed without distinctive tastes and anything that will not grab the attention of the test subjects. Best candidates are synthetic drugs, radiation, and things that can be wrapped in small sizes for convenient administration.

The flawed elements in clinic trials naturally lead to strange drug-evaluating culture. After 1946, new cancer drugs were evaluated by chain comparison. Each cancer drug was compared with other drugs that had been known effective or approved [Tournigand et al. 2004, DeVita and Chu 2008, Chang et al. 2018, Sparano et al. 2018]. Most experimental designs of clinic trials can be found in the online database www.clinictrial.gov. Trail subjects in both control and experiment arms include surgery and one or more drugs. A common design pattern is randomized trial to compare the effectiveness of a new drug plus B with or without drug C in treating patients who have X cancer. While lifestyle factors are used in some studies, they are not used as controls. To save resources, the control arm can be shared among different clinic studies [Gee et al. 2017]. One example is reflected in panitumumab approval. The FDA approved this drug for its benefits of slowing down metastatic cancer. The drug extended mean time to disease progression or death by 36 days over the best available drugs (fluoropyrimidine, oxaliplatin and irinotecan).

Those cited studies as well as thousands of others reveal a chain comparison scheme: the benefits of each drug are determined by comparing the drug with surgery or an old previously approved drug, and the newest drug is compared with a previously approved new drug or equivalent. However, medicine has NEVER looked into other options such as lifestyles, mind, and personal habits because they are excluded by the implied presumption of the clinic trails. Medicine did not realize the fatal mistake until after 1980 when tens of thousands of studies were done to understand the cause effects of various diseases including cancer. However, medicine started using those study findings to assess disease risks, but not as cures. We heard strange thing that risk factors can cause cancer but cannot be used to cure cancer. Medicine keeps selecting the “tallest boys” from a room full of little boys and has not made efforts to seek giants in forests in the entire history.

Surgery is clearly a wrong method for cancer. It is clear that cancer is not a single tumor. Cancer may often come with a large number of tumors of different sizes, with different detection times. After a primary tumor is removed or destroyed, the body does not stop any cancer cells or even normal cells from

growing into new tumors. Cancer metastasis is not about one tumor in one site, cancer cells must be everywhere except that they cannot be detected and counted before they reached detectable tumor sizes. Surgeries with or without drugs and radiation cannot stop micro-tumors in pipeline because they cannot correct abnormal biochemical and cellular processes. All meta reviews have shown that the medicine has actually achieved very little in the last century. Those very “little” benefits are now under challenge here.

Surgery has escaped from being validated in the entire medical history. Since the surgery has been used as the standard treatment for cancer, the true benefits of surgeries are unknown. Before 1980, most cancer cause factors, risk factors, and influencing factors, and self-healing were largely unknown. In the entire period from 1846 to 1980, the true benefits of surgeries could not be assessed because most of the cause factors, risk factors, influencing factors, and self-healing were not understood or poorly documented. From 1980 to present, more of knowledge of cancer has been found, but medicine has not made meaningful efforts to evaluate surgeries’ “absolute” performance, which must be made against everything under the Sun. Since surgeries normally do not cause deaths within a year, their short-lasting cancer-free “benefits” are attractive to cancer patients.

Radical surgery often removes tumors with large tissue margins. It is common to remove a whole breast, the whole limb, a big portion of liver or lungs, one whole kidney, the entire colon and rectum, the whole bladder, the whole reproduction system, etc. from patients with advanced stages of cancer. Since patients do not immediately die, medicine assumes such radical measure is the only best approach. Medicine has never tried to understand how such operations shorten patient lives over their “best reference” lifespans that the patients would live if their cancers naturally resolve OR are held in check by any measures. Some patients are completely crippled, some become incomplete human beings, some loss ability to give birth, some are mentally and intellectually disabled, and others lose dignities. Cancer patients endure emotional pain and abandon or alter their life plans and hopes. Physical and emotional impacts in various degrees have not been used to appraise surgeries’ performance against “best reference” performance.

Surgeries were used as standard treatments [Verkooijen at al. 2005]. When surgeries were used as controls for chemotherapy and radiation, determined performance of chemotherapy and radiation is relative to that of surgeries. All drugs and other treatments are evaluated by comparing them against surgeries directly or indirectly. If surgeries have large negative benefits over the best references, the “determined” performance of chemotherapy and radiation can be still on the negative side. As I have shown that surgeries must shorten lives dramatically, drugs or other treatments may similarly shorten lives. Moreover, surgeries may set upper limits on the patient lives by their adverse effects. Whatever benefits of chemotherapy and radiation exhibit in clinic trails are only

some improvements over life-shortening treatments. It is possible that the perceived benefits of other treatments are meaningless because patients treated by surgeries are destined to die sooner. In addition, adverse effects of surgeries and cancer drugs may nullify whatever benefits alternative treatment factors may offer.

When those medical treatments were developed long before 1980, many cancer mechanisms were unknown, and most of cause factors, risk factors and influencing factors for cancer were unknown. The roles of lifestyles and a variety of life habits were unknown. The roles of potential hundreds of influencing factors such as omega 3, vitamins, antioxidants, free radicals, apoptosis-inducing compounds, exercise, mental distress and chronic disease, etc. were unknown. The side effects of surgeries were poorly understood and the side effects of drugs were poorly understood. The harmful effects of each individual treatment is hidden among other treatments. After the roles of the cancer cause factors, risk factors, and influencing factors were discovered, they have never been used as treatment factors or used as cancer fighting programs. Thus, “little boys” have never been compared with “giants” in cancer research.

The flaw in medicine is fatal beyond correction. Medical treatments are not selected from all possible options in nature. It ignores tens of thousands potential options. The benefits of surgeries are presumed and “historically recognized”; the benefits of newer drugs are established by making chain comparisons; and the benefits of radiation is driven by commercial interests. If they are compared with non-medical factors, most medical treatments actually shorten lives in a super majority of cases. “Scientific validity” is an unwarranted claim that cannot pass the weakest challenge, and the failed treatments are at least in part responsible for losing millions of lives in the world each year and the cancer epidemic that inflicts humans in the world.

The cancer treatment development history conclusively shows that medicine has narrowly focused on only a few “medical options.” It is like selecting the tallest boy from a room full of little boys. It can never find giants in forests (e.g., those non-medical options in Figure 2). There is no basis to assume that medical treatments are best, can extend lives or improve life quality because there is no way to exclude tens thousands of other options. The claim can stand only if the medical treatments are compared with all options that could be used to fight cancer. I will show that the “tallest boy” among the medical options is actually tiny fractions of giants in forests, and that medical treatments are not scientifically proved treatments by any standard.

C. Four Big Lethal Factors Associated with Medical Treatments

Cancer treatments are often associated with four lethal factors: the side effects, emotional distress and chronic stress, lack of exercises and physical inactivity, and excessive nutrition which is often seen on some cancer patients. I

will show those are biggest lethal factors which are worse than the cancer burden.

1. Details of four lethal factors

(1) Side effects of treatments. Systemic damages or adverse impacts are caused by cancer drugs, surgical operations or radiation. Systemic inflammation caused by surgeries can dramatically raise cancer growth and metastasis speeds.

(2) Emotional factor. Chronic stress can dramatically increase cancer initiation, growth and metastasis speeds. After a cancer is diagnosed, shock, mental distress, chronic stress, angry with disrupted personal life plans for education, marriage, and business will inflict maximum pains and suffering. I may call them collectively as “the emotional factor”.

(3) Long-term inactivity. When a person is confined to bed, he does not do enough physical activity that is essential to maintaining the body’s normal functions. This fact must be presumed to be one biggest culprit. I have cited two lines of evidence. One line of evidence is reflected in a study by Booth et al. [2012], which found lack of exercises is primary causes of a large number of chronic diseases and another line of evidence is Cormie et al. 2017.

(4) Excessive nutrition. It is often found in cancer care settings. Excessive nutrition is used as a strategy for restoring lost body weight in the early stage. Over eating can produce present good feeling, but harms patients in long terms for patients with solid cancer. Over nutrition exist in some cases only.

2. Magnitudes of the Adverse Impacts of the Four Lethal Factors

The purpose of this study is to draw a dynamic picture of caner growth. It is necessary to use a kinetic method to characterize cancer growth. Tumors often exhibit Gompertzian growth, but their growth speeds depend on cell numbers. Thus, the first order law must be the main feature of kinetics [Tubiana, 1988, 1989, Mehrara et al. 2007]. Cell divisions among all cells are initially synchronized, once the clock control is off, their division timings will become out of phrases after a number of division cycles, and the fractions in each phase of the cell cycle reach a steady state. After that, cells divide in an asynchronous manner with different number of cells dividing in different times. The growth of solid tumors will be level off exponential curves mainly due to resource limits. Some cancer cell cycles may be finished in 24 hours, and the fraction of cancer cells that are dividing vary from day to day. Growth rate constant (1/day) is equivalent to a fraction of cancer cells in the tumor that actually completes cell division in each day, and will be referred to as an apparent rate constant. All medical treatments raise cancer growth speeds. This is an extremely serious consequence of surgery, chemotherapy and/or radiation.

(1) Adverse effects of medical treatments

One adverse effects of surgery is it raises cancer growth speeds for returned cancer. Although some cancers recur many years after tumor surgical removal, a substantial fraction of patients develop overt metastases relatively soon after resection of their primary tumors [Colleoni *et al.* 2016; Cheng *et al*, 2012; Hüsemann *et al.* 2008]. A prior surgery dramatically alters the body's ability to resist future cancer [Krall *et al.* 2018; Colleoni *et al.* 2016; Cheng *et al.* 2012; Demicheli et al. 2007]. Surgically operated patients experience a sharp rise in the risk of distant recurrence that begins 6 months after surgery and peaks between 12 and 18 months. Patient stories on blogs comments also reflect the fact that most patients who have been operated with lungs cancer tend to return in about a year. The potential mechanism for causing cancer fast returns was not known until the study by Krall et al. by using a mouse model. This finding supports the fact that surgery can paradoxically augment development of metastases [Tohme et al. 2017].

The exact cause of cancer relapses had been debated. To rule out the cause as a natural progression of the disease or some aspects of cancer treatments, the study by Krall et al. provides conclusive evidence that surgical tumor resection triggers the outgrowth of otherwise-dormant metastases, leading to the synchronous pattern of relapse. The tumor incidence rate and tumor size are related to the severity of wound. The study further found that the systemic wound-healing response triggers tumor outgrowth at distance sites. The study pinpoints the wound of surgery as at least one cause of fast cancer returns and cancer metastasis. This is consistent with finding that inflammation promotes invasion and metastasis [Solinas et al. 2010].

In practice, the time from cancer tumor initiation to the time that the tumor is detected or could be detected is particularly important. For many types of cancers, cancer growth speeds start picking up at about 50 to 55. The incidence rate of cancer at age t will be proportional to probabilities of occurrence of each mutation per unit time and the sixth power of the age [Armitage and Doll, 1954, 1956]. Most patients are diagnosed at ages after menopause [Verkooijen at al. 2005, Sparano et al. 2018] while dormant cancer was frequently found from 80 to 85. The total growth times for most types of cancer is about 5 to 25 years while some types of cancer could take 50 to 70 years to reach a size that can be detected. A median time is about 15 years. One surgical operation will shorten next tumor's growth time to one and half a year. This implies that the surgical treatment raises the cancer apparent growth rate constant by as much as ten folds. For a tumor of an initial size to reach a detectable size, the product of the rate constant K and time t is fixed. When K is raised by 10 times, the growth time for achieving the same final tumor size will be reduced by 10 folds. The 10 folds rise in the growth rate constant is a game-ending side effect.

Chemotherapy and radiotherapy are also known for raising cancer growth speeds. One well known puzzle is the rapid return of cancer after administration of chemotherapy and radiotherapy. A rapid regrowth of cutaneous or pulmonary

metastases has been observed [Tubiana, 1988 and 1989] and in non-small cell lung cancer [Chen et al. 2011]. The change is characterized by a much shorter doubling time (DT) which is the time required to double cancer cells. In 31 human metastases in which it was measured, the value of this ratio ranged from 2.5 to 5. Since DT*K=Ln(2), the reductions of DT are equivalent to 2.5 to 5 times increases in the apparent rate constants.

Similarly, untreated and unresponsive patients had a growth fraction of less than 4% for myeloma, but relapsing patients, with the most rapid tumor doubling times, had growth fraction ranging from 14% to 83% [Drewinko et al. 1981]. Growth fraction is closely related to Doubling Time, it is inferred that rate constant increased by 3.5 to 20.75 times.

Cancer growth speed depends on cancer cell number. This is true even if other factors such as geometry, nutrition, etc. affect cancer division. Assuming that a cancerous aggregate of 100 cells becomes a detectable tumor of 1 billion cells in 10 years, it would have a daily addition rate of 0.004416 (1/day). This is equivalent to kinetic process where about 4.4 cells per 1000 cells in the tumor divide. The times for 100 cells to reach 1 billion cells under various rate constants are shown in Table 1 below.

Table 1 The Impacts of 2.5- 5 Times Increase in Growth Rate Constants

Change in K	Start Cell (No.)	Final Cells (Billion)	Rate Constants K	Time (Years)	Comment
Primary Tumor	100	1	0.004416	10	Slow
2.5X	100	1	0.01104	4	Faster
5.0X	100	1	0.02208	2	Very fast

If the original rate constant is large, the raised rate constant will be even larger. The adverse impacts of the treatment will be very large.

A raised rate constant means that the final cancer cell number from an initial number in a given time will be increased by a multiplier. This multiplier M can be estimated by M=Exp((n-1)*kt), assuming that tumor grows in the same pace. To see the adverse impacts of raised rate constants, a primary tumor with K=0.004416 (1/day) is used, when K is changed, the final cancer cell number will be increased by a multiplier. Multipliers are computed for 1, 3 and 10 years and different rate constants (2.5X, 5X and 10X) and shown in Table 2 below.

Table 2. Effects of Rate Constants' Multipliers on the Multipliers of Final Cancer Cells Numbers.

Rate Const. Multipliers N	Rate Const. (K)	Time (Years)	Cycles No.	Final Cells No Multipliers (M)
2.5	0.01104	1	365	11

2.5	0.01104	3	1095	1413
2.5	0.01104	10	3650	31637216440
5	0.02208	1	365	631
5	0.02208	3	1095	251280398
5	0.02208	10	3650	1.00E+28
10	0.04416	1	365	1995809
10	0.04416	3	1095	7.94E+18
10	0.04416	10	3650	1.00E+63
15	0.06624	1	365	6312262455
15	0.06624	3	1095	2.51E+29
15	0.06624	10	3650	1.00E+98

By raising the rate constant by 2.5 times, a returned or a secondary tumor would generate the final cancer cells by a big multiplier within the same time window. If the rate constant is raised by 5 times or more, it would be hard to live longer than 3 years. This is why returned cancer is often terminal if no other measures can stop the cancer from growing. Table 3 below shows how the final cancer cell numbers look like in various conditions.

Table 3. Effects of 2.5 to 5 Times Increases in Rate Constants on the Final Cancer Cell Numbers in 3, 5 and 10 Years

Rate Const Multiplier N	Start Cell No.	Rate Constants (K)	Time (Years)	Final Cell Number (Million)	Comments
(NA)	100	0.004416	10	1.0E+9	A 1st Primary Tumor
2.5	100	0.01104	3	1.8E+7	
2.5	100	0.01104	5	5.2E+11	
2.5	100	0.01104	10	3.2E+19	
5	100	0.02208	3	3.2E+12	
5	100	0.02208	5	3.2E+19	
5	100	0.02208	10	1.0E+37	

Increased apparent rate constant or reduced doubling time has great impact on final cell numbers. The tumor will become much larger with each day passing. This problem should be viewed in light of another problem that multiple tumors may erupt in various organs at dramatically increased rates (even though they are not detected). While the increased rate constants appear to be just small number, its great adverse effects lie in compounding effects. It is like multiple mortgage loans compounded at variable daily interest rates. A slight rise in the daily rates for one or two loans may bankrupt the debtor because it can affect each of the thousands of compounding cycles.

Most administering protocols of chemotherapy share a common flaw. Cancer dynamic nature determines that no drug can kill all cancer cells in the human body by batch applications; the half lives of a super majority of cancer drugs are short. They lose 90% concentrations in just 1 to 3 days. In each hiatus between two applications, cancer cells could generate a large number of new cells. Unfortunately, the changes of cancer cell numbers cannot be accurately detected by any method in medicine.

True side effects of cancer drugs were often underestimated. If the drug causes any symptoms in any part of the body, a correct presumption should be that the drug affects every part of the body because the same drug is circulated in every part of the body. The difference is that some parts of the body can tolerate the drug better and thus need more time to realize injuries. If the drug is slowly diminishing an organ's function reserve which is about 70% the total function. Damages to an organ will be felt only when most of the big reserve function of the organ has been destroyed.

(2) Adverse impacts of emotional factors

Emotional distress, chronic stress and other emotional factors speed up cancer initiation, growth and spread [Segerstrom and Miller, 2004; Sloan *et al.* 2010, Moreno-Smith *et al.* 2010; Lutgendorf, 2005 and 2011]. Despite inherent inaccuracies in those studies, the evidence, taken as whole, is conclusive and beyond dispute. Emotional factors also dramatically speed up cancer metastasis.

The study done by Sloan *et al.* [2010] sheds light on the magnitude of effects of chronic stress on cancer proliferation and metastasis. They used in vivo metastasis model where six-week-old female mice was used. Tumor cells (100,000) were injected into the 4th mammary fat pad or into the tail vein. Chronic stress was induced by restraining mice, which has been shown to induce chronic stress as shown by neuroendocrine activation. Induced stress was applied to mice for 2 hours per day for 20 days commencing 5 days before tumor cell inoculation or for 14 days commencing 2 days after surgical removal of the primary tumor. Metastasis was measured by measuring total bioluminescence in distance sites such as chest region and brachial lymph nodes. Cancer cells were estimated by measuring tumor-specific luciferase activity using an in-vivo imagine system. The mice were sacrificed on day 28 for later microscopic study. Chronic stress applied for 20 days increased the metastasis of the primary breast tumor cells to distant tissues by 38-fold versus controls in 28 days.

Assuming that the metastasis starts with one single cancer cell and the migration step is sufficiently faster and frequent that it is ignored, the rate constants for the stress-applied group is Ks=Kc+LN(38)/20, where Kc is the rate constant for the control that was not exposed to stress. The rate constant was raised by 0.182 (1/day), which is equivalent to DT 3.81 days. Even assume that the apparent growth constant K for the control is zero (e.g., the cancer would be in a dormant state), this rate constant would drive cancer growth at the speed equivalent to that for 100 cancer cells to reach 1 billion in about 89 days (23.35

DT). While the mice model in the study cannot be directly applied to humans and the kinetic model provides only a ballpark estimate, this number shows the serious adverse impacts on metastasis speeds. I personally heard stories where a shock and extreme fears can inflict extreme emotional pain. Some sophisticated patients and public members hold the view that a third of cancer deaths are caused in a big part by fears, chronic stress, and emotional distress.

(3) Adverse effects of physical inactivity and lack of exercises

Physical inactivity is important causes of a large number of chronic diseases [Booth *et al.* 2012, Carlsson at al. 2007]. They found: “The comprehensive evidence herein clearly establishes that lack of physical activity affects almost every cell, organ, and system in the body causing sedentary dysfunction and accelerated death.” Some cited studies in their study show that inactivity can produce adverse impacts in as short as 3 days. By making a reverse inference, exercises can have large beneficial effects. Although this study is not directed to cancer, exercise’s impacts through reducing inflammation are universal and inflammation is an important factor in cancer. It is natural to find that inactivity and lack of exercises must have big adverse impacts on cancer outcomes. Therefore, inactivity or insufficient exercises is one lethal factor for most cancer patients.

The magnitude of adverse impacts of lack of exercises on cancer outcomes cannot be found from literature, but the beneficial impacts of exercises are well documented. Exercise is found to be an important adjunct therapy in the management of cancer [Cormie et al. 2017]. In this review, a total of 100 studies were reviewed involving thousands of individual patients whose exercise behavior was assessed following the diagnosis of any type of cancer. They concluded: “[s]pecifically, superior levels of exercise following a cancer diagnosis were associated with a 28%–44% reduced risk of cancer-specific mortality, a 21%–35% lower risk of cancer recurrence, and a 25%–48% decreased risk of all-cause mortality.” Exercises have little or no perceived instantaneous effects on cancer at the initial time, its beneficial effects are added on a long-term basis. The beneficial effects are compounded for thousands of cycles, the accumulated effects are substantial. The magnitude of benefits and scope of effects are conclusively confirmed [Des Guetz et al. 2013, Friedenreich et al. 2016, Ibrahim et al. 2011, Je et al. 2013, Lahart at al. 2015, Li et al. 2016, O'Keefe at al. 2010, Otto at al. 2015, Schmid at al. 2014, Tipton 2014, Wu et al. 2016, Zhong at al. 2014].

While the cited studies have not addressed cancer metastasis, exercise is presumed to be the best measure for slowing down and stopping cancer metastasis. It works by reducing body inflammation level and influencing emotional health, both of which are shown to speed up cancer metastasis speeds. I note that exercises in the Western culture are still very primitive because those cited studies are done in a short history. Many exercise parameters relevant to its performance were not explored in cited studies. However, the performance of exercise in the cited studies already dwarfs the claimed benefits of medical

treatments. By correcting those problems, I believe that well designed and well executed exercise programs can be cures for most types of naturally occurring cancers.

(4) Adverse effects of excessive nutrition

Most cancer patients lose weights as a result of cancer's natural effects. This leads to a widespread belief that better nutrition is necessary. Over nutrition is often seen among patients in early stages of cancer although it is not an issue for those who could not eat or are near death. However, most cancer patients die while they are progressively losing weights, it is counter-intuitive to advise nutritional restriction in cancer care.

Cancer cells are in an unfavorable condition to compete for nutrition because more of them need nutrition for uncontrolled cell proliferation. Moreover, cancer cells cannot grow to become more than 1-2 mm in diameter if blood vessels are not generated [Gimbrone et al. 1972]. Even if blood vessels are created, cancer cells still compete for nutrition. There must be a concentration at which normal cells could get enough nutrients, but cancer cells could not. A large number of studies show that obese, over-eating of meats, etc. increase cancer risks. This is an indirect proof of adverse effects of excessive nutrition.

(5) Magnitudes of all adverse impacts of all lethal factors

The four lethal factors are often associated with or aggravated by cancer care. When those lethal factors are combined, their total adverse impacts should be presumed to be extremely large. How the individual adverse effects are added up is unknown. Surgery raises systemic inflammation, and speeds up cancer return speeds and cancer metastasis; chemotherapy and radiotherapy can cause cancer to repopulate rapidly, and dramatically raise cancer growth rate constants by 2.5 to 5.0 times. Cancer drugs develop drug resistance by a large number of mechanisms which are well known [Housman et al. 2014] and thus lose their effects to control cancer growth, while adverse impacts continue damaging the body. Emotional distress and chronic stress promote cancer growth and cancer metastasis by large margins. The lack of exercises is same as removing its great protective benefits. The lost benefits are great as exercise can reduce Hazard Rates by also half while the upper bound of benefits remain unknown. Excessive nutrition can be an additional lethal factor for patients who have good appetite.

The combined adverse impacts from the lethal factors raise growth rate constants often by one to two orders of magnitudes plus greatly increased potential for cancer to metastasize. This explains why medical treatments shorten the growth time from 15 years to 1.5 years to 6 months. One must reach a conclusion that medical treatments shorten patients' lives. Cancer survivors under the medical treatments are miracles because they overcome all those lethal factors to survive.

Based on medical development history, the medical treatments cannot conceivably yield real benefits for most cancer patients. All medical treatments methods were established by making chain comparisons, and each of the treatment methods clashes with evolution in some aspects. All claimed benefits are RELATIVE to the claimed benefits of the reference treatment method which is surgery. If surgery shortens a patient life by 50% to 90%, a few percent improvements determined by 5 years-survival rate (which is also an insufficient measure) cannot change the performance of new treatments. Similarly, statistical significant levels in drug studies are equally meaningless when controls are chosen by legal framework or commercial interests. Whether or not medical treatments extend lives must be based on human inherent ability to survive from cancer. That ability is abundantly reflected in the large number of cancer miracles where cancer resolves or heals naturally. Medicine cannot claim its merit by disregarding cancer fighting measures and ignoring the extremely severe adverse effects of the four lethal factors.

(6) Propagation against alternative true cures

Kinetic calculations in Table 2 show that final cancer cell numbers exponentially depend on rate constants. Non-medical options are measure such as exercises, emotional management, diets and nutrition, changing lifestyles, natural anti-cancer products, etc. They can influence the rate constants. When such measures are used to fight cancer, they do not contain those lethal factors that always exist in medical treatments, but can address cause factors and use influencing factors.

The effects of each factor are added up for all compounding cycles. Instantaneous and accumulated effects of both medical treatments and non-medical options are shown in Figure 2 below. When medical treatments are used, the side-effects are accumulated, and due to the adverse effects of raising cancer growth constants, the overall benefits slowly reach to zero or an absolute negative value in a long-term basis. In contrast, when non-medical options are used, they produce a small amount of often-undetectable beneficial effects in each day cycle. Since no adverse side effects are accumulated, the small beneficial effects are added up in a long-term basis to yield great benefits.

Medicine not only confines its options to the very few options that clash with evolution, but has made propagation to preclude true cures in its long history. Medicine frequently criticizes alternative options for fighting cancer. The medical establishment keeps discrediting any cancer fighting methods under a Listing of Unproven and Disaproven Cancer Treatments (Wikipeida): a common statement is like: “no evidence supports claims that XYZ is effective in preventing or treating cancer." [Brigden 1995, Wikipedia cancer]. Some of them are clearly best cancer fighting measures even though whether a patient can get real benefits depends on how to use them.

Medical establishment promotes its medical merits by creating a catch-22 for non-medical treatments. It never looks into any options beyond those anti-

evolutionary and harmful options, and does its best discouraging the public from exploring non-medical options. This bias is deeply built in the U.S. legal framework of medicine. Patent law bars patenting on anything that is from nature and made of nature. The legal bias provides a legal basis to wipe out whatever would cure cancer and discourage the public from exploring options outside medicine while many actors are driven by research funding from commercial concerns. One article states: “Some alternative therapies are harmful, and their promoters may be fraudulent.” Such statements are factually wrong by examining the performance of medical treatments: negligible curative benefits, massive adverse side effects, extreme high drug prices (cancer ‘designer’ drugs cost between $100,000–$1000,000). Those methods would be rejected by most doctors who recommend them to patients. No promotion could be more wrong than promoting medical treatments. Such propagation only harms public interest by forever preventing the mankind from finding cures for cancer and perpetually making cancer much worse than it really is.

Influenced by factually-wrong propagation over several decades, a vast majority of people in the world will avoid using lifestyle factors, choose the most radical medical options to have their tumors cut and burn, and accept high risk drugs which is more harmful to organs than cancer. Due to impairments of population health wisdom, it is impossible to dissuade patients to from getting on deadly palliative tracks. When the cancer approach is wrong, they survive only by miracles, and they still think only drugs can save their lives despite the disastrous performance findings by studies and reviews one after another. Only a small percent of patients survive by withstanding dramatically increased cancer growth speeds or by miraculously overcoming massive adverse effects.

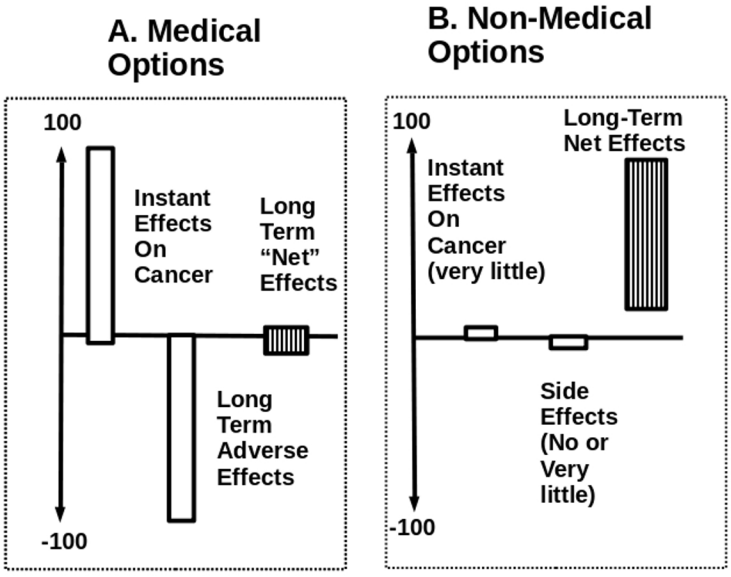

Figure 2 Instant and Accumulated Effects of Medical Treatments and Non-Medical Options Such as Exercises, Diets, and Lifestyles, Etc.

D. Cancer Self Healing and Mechanisms

A large number of cancers can resolve or heal naturally. Following are same examples.

1. Several exemplar cancer miracles

One well known cancer miraculous survivor is Guolin. She had her uterus removed in 1949 for uterus cancer. A return cancer spread to her bladder. She was operated six times, but nothing could stop her cancer from engulfing her. When the returned cancer became terminal, she started developing special exercises known as Qigong to combat her cancer, she not only got rid of her cancer completely, but also got rid of chronic diseases such as heart disease, arthritis, and high blood pressure. She spent her remaining life to teach her exercises until she died from other cause in 1983. Her exercises are immensely popular. Now, her Qigong is practiced in the U.S., Canada, Japan, Singapore, Philippines, Malaysia and Indonesia et al.

By using Quolin exercises, many patients with terminal cancer miraculously survived. One patient, Gao, had his thorax opened to remove tumor. Due to the widespread tumors, the surgeon had to stitch the thorax back without touching any tumor. He started using Quolin exercise by struggles: walking a step, taking a break, often spitting up blood. The exercise helped him survive. In another case, a patient, Zhu, had his eye ball pushed out by a stage 4 pharyngeal cancer with metastasis to the brain. The exercise in combination of herbs helped eliminate symptoms in two months, which is incredible.

A 50 years old man, one Mr. Liu, was diagnosed with a stomach cancer. When he was operated, the surgeon found that the cancer had spread to the liver and many organs in his abdomen. Stomach was stitched back because nothing could be done. To avoid unnecessary emotional distress, the surgeon told the patient that the cancer had been completely removed (this practice was common at that time in China). After the patient was discharged, he retired from his job, made a plan for recovery and changed his lifestyles. He is now around 80 and still alive. Stories like this are frequently heard. In early years when CT was not available, doctors could not accurately determine cancer conditions for operation. Thus, aborting operations was rather common, and some of patients survived for decades or their remaining lives.

Forbes reported several cancer miracles under “Cancer Miracles” on Feb 12, 2009. In one case, one Burrows was diagnosed with an inoperable liver cancer in November 2005. He was told to live for 30 to 60 days. In February

2006, Burrows developed abdominal bloating, shaking, chills and nausea. Soon after that he noticed that the lump on his stomach was gone. In another case, one Schou suffered a melanoma, which had spread to his liver, abdomen, lungs, bones and ten spots in his brain. He made changes to his diets. Four months later, 90% of his tumors had disappeared.

Another well documented cancer miracle is described in “Cancer: the mysterious miracle cases inspiring doctors”, by one Robson on March 6, 2015, BBC, Future. A 74-year-old woman was diagnosed with carcinoma, a form of skin cancer. Given his tumor condition and his age, her treating doctors were debating what could be done. Despite receiving no treatment at all, the tumors were shrinking and shrivelling under the doctors’ eyes. The tumors just disappeared. After 20 weeks, the patient was cancer-free, based on the biopsies and the scans.

There are about several hundred cases that can be considered well documented in literature. I estimate that the total number of cancer miracles is in millions. Most cancer miracles in developing nations were not documented or reported. Sometimes, cancer patients refused to accept medical treatments but lived for deceases or experienced cancer healed naturally. Some cancer miracles happened decades ago where surgery was attempted but aborted.

The time scales of resolving fully developed metastasis tumors in the above cases are from 2 to 5 months. The shortest times for resolving a tumor of an infant head size was reported to be about 40 days (Dr. Lee Ke’s book). I am compelled to find that human healing power is many magnitudes larger than the effects of medical treatments.

Those cited cases, together with several hundreds of documented cases and potentially million of cancer miracles, are conclusive and irrefutable evidence that cancer can resolve on its own, or can be cured by adjusting lifestyles. Any claim of terminal and incurable is factually false. Medicine confines its treatment options mainly to drugs, radiation and surgeries because the legal framework, professional regulations, and most research funding sources are tailored for them. Medicine does not explore any of a vast number of lifestyle factors such as diets, exercises, mind regulation, natural anti-cancer compounds, and life habits as cures.

2. Healing mechanisms

Some cancer experts claim that any non-approved methods other the legalized few cannot cure cancer. Their belief is based on a naive intuition that destroying the tumor must be the right way to go, and only radical medical treatments such surgery, chemotherapy and radiation can get rid of tumors. The notion to cut tumors and kill “all cancer cells” was slowly formed under the

influences of all wrong cancer theories 1500 to 1946. This wrong notion is deeply rooted in the medical professionals and has dominated medicine for centuries.

A huge body of evidence acquired after 2000 shows that cancer is highly sensitive to hundreds of lifestyle-related factors or cause factors. Emotional distress, chronic stress, lack of exercises and inactivity have been discussed above. Other factors include omega-3 fatty [Navarro *et al.* 2019], pollutants and toxins [Zhou et al. 2015], unhealthy diets and nutritional imbalance [Donaldson 2004, Grosso et al. 2017], inflammation causing factors [Solinas et al. 2010], che mical carcinogens [Stratton 2011], other chornic diseases such diabetes [Giovan nucci *et al.* 2010], natural products and natural apotosis-inducing compounds [B ailon-Moscoso et al. 2017, Sagar et al. (dated added), Millimouno et al. 2014], etc. Among those cause factors, risk factors, and influencing factors, some may be applicable only to certain patients or certain types of cancers. Right factors must be selected for each patients to achieve good results.

Other factors such as exercises, emotion management, diets and nutrients, body temperature, physical activity levels, etc. have universal impacts on all patients of all types of cancer, they could be used reliably to fight all types of fully developed cancer. Cancer cells have poor ability to tolerate moderately raised temperature [Levine & Robins, 1971], and exercises can slow down cancer growth by raising body temperature. Exercise also increases the degree of mechanical agitations, which can inhibit cell division [Yeung et. al., 2003]. Exe rcise cuases working muscles to deplete glucose level in blood and thus makes le ss glucose available to cancer cells. Exericses, diets and many lifestyle factors aff ect the vascular system, the renal system, the respiratory system and Central Ne rvous System, the body’s systemic inflammation level, and body’s physical conditi ons on a daily basis.

The impacts of lifestyle factors on cancer growth speeds are extremely large when viewed on a long term basis. Significantly lower risk of cancer recurrence was observed for patients with higher exercise levels in some studies [Holmes et al. 2005, Meyerhardt et al. 2006, Richman et al. 2011, Sternfeld et al. 2009]. Both exercise intensity and duration are important parameters. Three MET-hours is equivalent to walking at average pace of 2 to 2.9 mph for 1 hour. Compared with women who engaged in less than 3 MET-hours per week of physical activity, the adjusted relative risk (RR) of death from breast cancer was 0.80 for 3 to 8.9 MET-hours exercise per week; 0.50 for 9 to 14.9 MET-hours exercise per week; 0.56 for 15 to 23.9 MET-hours per week; and 0.60 for 24 or more MET-hours per week [Holmes et al. 2005]. Compared with patients engaged in less than three metabolic equivalent task (MET) -hours per week of physical activity, the adjusted hazard ratio for disease-free survival was 0.51 for 18 to 26.9 MET-hours per week and 0.55 for 27 or more MET-hours per week [Meyerhardt et al. 2006]. Men who walked briskly for 3 h/wk or more had a 57% lower rate of progression than men who walked at an easy pace for less than 3 h/ wk. Walking pace was associated with decreased risk of progression,

independent of duration. There was a suggestive inverse association between risk of progression and intensity of activity.

The author personally noted that an actively growing mole of 10 mm in diameter on chest was not held in check by regular walking, but was completely eradicated by jogging accompanied by six song uttering at one hour per day (about 42 MET per week) for about 2 years. Similarly, a flatten circular mass of about 6 mm in diameter on a hand was eradicated by the same jogging for about 1.5 years.

Having proved the feasibility of cancer self-healing in both real cases, theories, and research findings, I will show how lifestyle factors can be used to sufficiently slow down cancer growth or metastasis speeds by affecting the rate constants. The following table shows how small changes in growth rate constants affect final tumor sizes.

Table 4 The Effects of Reductions in Rate Constants on Cancer Sizes

Original K (1/day)	Reduction in K (%)	Rate Constant (K)	Time (Years)	Cycles or Days	Multipliers M
0.01	-1	0.0099	1	365	0.96
0.01	-1	0.0099	3	1095	0.89
0.01	-1	0.0099	5	1825	0.83
0.01	-1	0.0099	10	3650	0.69
0.01	-5	0.0095	1	365	0.83
0.01	-5	0.0095	3	1095	0.58
0.01	-5	0.0095	5	1825	0.40
0.01	-5	0.0095	10	3650	0.16
0.01	-10	0.009	1	365	0.69
0.01	-10	0.009	3	1095	0.33
0.01	-10	0.009	5	1825	0.16
0.01	-10	0.009	10	3650	0.026
0.01	-30	0.007	1	365	0.33
0.01	-30	0.007	3	1095	0.037
0.01	-30	0.007	5	1825	0.0042
0.01	-30	0.007	10	3650	1.7E-05
0.01	-50	0.005	1	365	0.16
0.01	-50	0.005	3	1095	0.0042
0.01	-50	0.005	5	1825	0.00011
0.01	-50	0.005	10	3650	1.18E-08

The above table shows how a small reduction in the growth rate constant will cause a large reduction in cancer burden in a long term.

A hypothetical example is used to show that if the rate constant is reduced by 10% from 0.01 to 0.009 (1/day), the total tumor size would be only 2.6% of the

reference tumor in ten years. A 10% reduction in the rate constant can lead to size differences by 38 times. Another example is used to show how a small change in rate constants affects tumor growth speeds: a tumor of 1 billion cells grows at the rate of 0.001 or 0.1%. If the tumor is held in check, it cannot produce more cancer cells. However, if in a cycle, the body condition encourages the tumor to produce a million cancer cells. Those extra cells would become 1.4, 3.0, and 6.2 million in 1, 3 and 5 years if they grew at the same rate. Those new cancer cells continue dividing by the same fraction for thousands of cycles. This is the basis why multiple slow-working non-medical factors can slow down or alter cancer outcomes.

The failure of a super majority of cancer patients lie in failure to under the cancer growth kinetics. Cancer compounding is very similar to loan compounding by variable daily interest rates except that cancer has the fast compounding pace. This is the reason people die. A good strategy is to use sufficient measure with sufficient fire intensity to hold cell division in check. When the measure is insufficient, cancer can still slowly progress. Fighting cancer must be aimed to disrupting the tumor condition in each day. A break in fight in any day will have long-term adverse impacts on the final outcome. This compounding nature explains the powerful impacts of exercises found in above cited studies.

The keys for success is “regular” exercises of “reasonably intensity” in “multiple sessions”. When body is in intense exercise, tissue physiological condition is unfavorable to cancer cell division. When the patient stops doing exercise, the boy’s physiological condition will slowly go back to the one that favors cancer cell division. Therefore, one important criterion is the time averaged MET value per each day must be sufficiently high. Reasonably intense exercises are performed in three to six sections in each day. Most cancer patients do not understand that strict discipline is the key to success. Cancer cell number is like the final loan balance of a mortgage compounding at a variable daily rate. To pay off a big loan, a debtor must strictly stick to payment discipline. A debtor will see an unmanageable balance if he skips payments on some payment cycles and makes partial payments in other cycles. Simulations can show that three-day exercises and two-day breaks will achieve very little.

E. Adverse Effects of Early Diagnosis of Cancer

When medicine can cure few cancer patients, medicine tries to combat cancer by using early diagnosis strategy.

It was estimated that among 70-79 year old people, more than one-third of Caucasian men and half of African American men have indolent prostate cancer that would not cause harm if not diagnosed and untreated [Jahn et al. 2015]. The detection of indolent prostate cancer has obvious adverse consequences, since most treatments do not produce benefits [Hoffman at al. 2014]. It has been

estimated that 42-66% of diagnosed prostate cancers would have caused no clinical harm had they remained undetected [Draisma et al. 2009]. One study estimated that the magnitude of over-diagnosis from randomized trials: about 25% of mammographically detected breast cancers, 50% of chest x-ray and/or sputum-detected lung cancers, and 60% of prostate-specific antigen-detected prostate cancers [Welch and Black, 2010].

Early diagnosis is a wrong strategy for several reasons. The latent times of naturally occurring cancers can be from 5 to 70 years. Growth from a large adenoma to cancer was estimated to require about 17 years, and generally the same mutations are present in primary tumors and their metastases [Wang et al. 2002, Wood at al. 2007, Jones et al. 2008]. The time scale implies that cancer could be easily controlled by any of a large number of non-medical measures. Second, it is a well known fact that many cancers are dormant and inactive and can remain in that state for patient lives [Aguirre-Ghiso 2007]. Histologically advanced microscopic tumors are detected in many tissues of adult humans [Greaves and Maley 2012, Naumov et al. 2006], but appear to be mostly held in check by unknown mechanisms. This line of evidence together with cancer self healing cases shows that cancer could be cured or held in check by using non-medical measures.

The biggest adverse effect of early diagnosis strategy is a shift of cancer diagnostic ages from old ages or post-death ages to younger ages. The strategy could label more people with cancer at the ages of 50, 60, 70, etc. rather finding cancer after their deaths or have the undetected tumors self resolved. A diagnosis of cancer always triggers the on-set of the adverse effects of three or four lethal factors. Early detection of cancer means starting ruining people's lives in earlier years of their lives. In addition, early diagnosis also inflicts routine emotional distress. Annual screening using embarrassing procedures such as colonoscopy can inflict great pains and sufferings. Each time when a growth, a polyp, bleeding or whatever is found, the person will be tormented for a few days until a biopsy can rule out malignancy. By creating routine panic and uncertainty, medicine generates unnecessary stress. I actually heard that a woman, who had repeated the same panic year after year, finally got a label of incurable cancer. Three or four lethal factors start inflicting pain on diagnosed patients for longer times.

Early diagnosis will generate a big cancer patient population. Cancer statistical data shows that maximum cancer occurring ages are above 70 years (1 in 3) and 85 above (nearly a unit). Now, men have a 39.66% probability, or approximately a one in three risk, of developing cancer in their lifetime. Men have a 22.05% lifetime risk of dying from cancer, while the risk for women is around 18.75%. Cancer in a good portion of old people is not diagnosed [Stemmermann, 1982]. The prevalence rate is close to 50% among US White and European men aged 80 or above. If this prevalence rate is added with the clinically diagnosed prevalence rate, one would expect to see a unity for those of

85 or above. Projected based on the age and racial distribution, life expectancy and total U.S. population in 2015, these data suggest roughly 45 million cases of potentially detectable prostate cancer in the US [Jahn et al. 2015].

The above data concern only one type of cancer. If all types of dormant and micro tumors were diagnosed and their incidence rates are added together for elderly people in their lifetimes, the total chances could be 90% to 100% for the people who have lived above 80. Medicine will never solve the cancer problem by cutting off tumors and killing cancer cells. Early diagnosis and treatment of indolent, small, and/or slowly developing cancer has more adverse impacts on patients, society and nation than any imagined benefits. Even for high malignant cancer, the incidental benefits brought by changes to lifestyles are not enough to neutralize the total adverse effects of the four lethal factors. The early diagnosis will deprive chances for tumors to self resolve and invite unnecessary battles against dormant, harmless tumors or tumors that could cause health problems only after deaths. Early diagnosis may be good for only extremely aggressive rare cancers that medical treatments can control while non-medical measures cannot.

Claimed benefits of cancer early diagnosis are most probably false. The reduced incidence rate for cancer is mainly attributed to a reduced population of smokers in the population, a big reduction in the lung cancer cases, and indirect benefits from anti-cancer efforts such as healthy diet, lifestyles and exercises. Moreover, improved cancer survival rates among early diagnosed cancer patients are inaccurate because the 5-year survival rate is an improper measure of the survivals for early diagnosed cancer. Many early diagnosed and “survived” patients may die after this five-year window. Some might die 10 to 30 years later, which would be the same time window if they had not been diagnosed earlier. In addition, some patients would heal their cancers naturally if they had not been inflicted with the four lethal factors. An early cancer diagnosis will have overwhelming impacts of disrupting their life plans and life hopes. Making diagnosis by 10 years earlier but losing the life 7 years later is not a winning strategy except creating a misleading medical performance record. Some benefits of early diagnosis is a temporary trend seen for some types of cancer, and the true disastrous picture will appear only when those early diagnosed patients start dying. Based on some cited data, I believe that as many as 70% of the U.S. cancer cases are over-diagnosed.

Most of apparent benefits from medical treatments cannot be attributed to the medical treatments. Some patients appear to have been cured by medical treatments. If a cancer is cured while the patient accepts medical treatments, the true cures cannot be attributed to drugs, surgery and radiation, each which is not something that was used in evolution. Cancer is a result of cancer cell proliferation driven by changed biochemical and cellular processes. Current medical treatments cannot permanently restore altered biochemical and cellular process patterns. Cancer is not like a lodged bullet, poison, traumatic injuries,

and bacteria that can be removed. What actually cure cancer are things that are used in parallel to medical treatments.

Based on above reasons, a wiser strategy is to delay detection times to post-death and encourage people to use cancer-risk reduction programs to stop cancer from growing.

F. Over Treatments of Cancer Care

To save life from terminal diseases, patients naturally want to accept as many treatments as they can. Patients' trust in medicine, doctors' financial incentive to earn medical service revenues, and doctors' desire to avoid malpractice lawsuits for failure to diagnose or treat cancer join together to become powerful one-way driving force to form an over-treatment landscape. When all interests are aligned to promote over treatments, over treatments become the worst nightmare in medicine.

Patients' trust in medicine become very bad factor when medicine plays a definite role of shortening life in cancer care. Medicine is promoted as the only science-based medicine, and its performance in treating acute diseases is never be questioned by medical professionals. Even in treating cancer, patients still depend on medicine in treating any emergency problems as bleeding, blockages, fracture, stroke, heart attack, organ failure, etc. For those reasons, patients have developed complete trust in medical treatments.

The trust that patients have for medicine impair their judgment in the areas where medicine is incompetent. Most patients do not understand risks of medical treatments. In their minds, best care is more drugs, newest drugs, more treatments, and more hospital stays, etc. When cancer literature is full of controversies, doctors are often not in positions to render verdicts. Whenever decisions are to be made by patients, they nearly always want to try. Most patients cannot appreciate the magnitudes of harmful risks of medical treatments. Nothing can stop patients from making suicidal decisions.

It is well known that, unlike normal people, cancer patients are more willing to undergo treatments with small benefits and major toxicity [Matsuyama et al. 2006]. Over treatments are driven by their desire to look for any means for survival. Most patients could not conduct reasonable benefits-risk analysis. Over treatments are in part caused by conflicting findings in cancer research and an unrealistic expectation that a tiny good chance can happen to them. What is far important is that patients' desire for getting over treatments is in agreement with doctors' desire not to see inevitable poor outcomes from withholding treatments. Thus, patients often are on chemo even just a few days before their deaths. Despite this horrendous view, patients often hope that a 2% good chance of success will happen to them, but unavoidable drug side effects will not.

Studies show that a drug may extend life by a few months at high significant level but also has any combination of around 30 to 50 specific side effects. Cancer drugs can often damage nerves, liver, kidneys, ears, heart, etc, and can cause nausea, vomiting, hair loss, cognitive dysfunction, fatigues, and changes in sexual functioning and reductions in quality-of-life ratings. Most studies underestimate true side effects. Medicine always characterizes drug side effects as localized symptoms but not as systemic injuries. For example, if doctors see “mouth sores”, they just characterize it as “mouth scores”, but will not “expect” potential damages to heart tissues and renal tissues. They most probably overlook or ignore lost reserve functions of any organs (to a young person, losing 40% reserve function does not show up). Some hidden damages are revealed on patient’s conditions such as changed intellectual capacity, blood vessels (e.g., dark blue veins), and impaired nerve functions, etc.

In cancer care, a bizarre goal is to kill “every cancer cell” and reduce cancer biomarker concentrations to the lowest possible. If patients want to achieve zero levels, doctors often could meet patients’ demands. When the death rate is high, a refusal to meet a patient’s demand may be a ground for complaint or a malpractice suit if the patient later dies, but shortening the patient’s life by medical treatments will not. Honoring the patients’ demands is consistent with treatment protocols and the doctors’ financial interests. From published diseased patients’ stories on blogs, one can see a clear pattern that patients often drive for over treatments. When a patient is over treated, the adverse impacts from those legal factors are obvious.

The population medicine has molded a popular belief that every disease could be cured by the treatment protocol. However, cancer research has generated a massive number of conflicting, confusing and even wrong findings. Patients are tormented by such findings. Moreover, patients are unable to evaluate statistical analysis and experimental designs, and bet that any successful odds will happen to them. Medical science does not teach what will difference. Studies are full of confusing and improper use of statistic analysis. Most patients cannot tell differences between a 2% reduction in a hazard ratio at $p=0.001$ and a 20% reduction in death rate at $p=0.09$. When they cannot understand science or confused by “sciences”, they often err on the side of getting more treatments. They may choose a treatment which offers only 2% of chance of responsive rate with definite adverse reactions, which can cost their lives.

From discussions with cancer patients and posted case reports, I found that a good patient population cannot understand the real purpose of palliative care, the magnitudes of the risks of drugs, and the potential precluding effects of medical treatments.

Palliative care, which is always accompanied by three to four lethal factors, shortens patients lives. Final outcomes of palliative care are well understood in

cancer literature: the patients are deemed to die. Use of this option is based on a presumption that absolutely no other options can save life. However, medicine has no basis to assert that none of the tens of thousands of non-medical options will save life. Any assertion of incurable cannot stand in front of the cited miracles. Thus, “terminal” is based on a clearly wrong presumption. Patients’ consents to palliative care are acquired with a legal flaw.

Leaving the flawed incurable notion aside, patients should be informed of the nature of the care. Yet, for various reasons, many patients do not fully understand the nature of palliative care. It was found almost one third of patients being treated palliatively thought that their therapy was curative [Mackillop et al. 1988]. I estimate that a super majority of patients never think that cancer drugs can potentially preclude future cures. I have shown that emotion, side effects, inactivity and excessive nutrition are the most deadly combination and a good exercise program, mind management, anti-cancer diets, and changes in lifestyles and changed habits are the most powerful curative combinations.

Most patients cannot conduct risk-and-benefit analysis in accepting palliative care. Patients do not understand the long lasting adverse impacts of cancer treatments. Most patients hope that medical treatments can save their lives for a few years, with a wishful thinking to further extend life. They never understand palliative care most probably set the maximum overall survival times: when they get on this track, death is often an inevitable result unless they experience real miracles. Their lives are at the mercy of adverse events such as bleeding and organ failures. Medical literature understates drugs’ side effects. No body tells them that at least some side effects will not go away in long times or life times. I found that when a patient died from heart failure, renal failure, or multiple organ failure several months after the use of a drug, the patient cannot assert that the death has been caused by the drug. Thus, true side effects are much more severer than what are disclosed in studies.

Another problem is that cancer patients expose regular risks from medical treatments such as surgeries, drugs, and radiotherapy and from diagnosis procedure such as CT scans and invasive sampling operations. The risks from CT scans are known [Mathews at al. 2013, Zondervan et al. 2013]. If the risks from all sources are added up, they may hit 100%, and some patients are exposed to different categories of risks with each being close to a unity. They may get secondary cancer by certainty, ruin their kidneys by certainty, destroy the liver by certainty, and cripple their immune systems by certainty. However, since each risk is materialized by a time course, they can live and appear to be well. So, they keep taking more risks and more risks. If all risks are viewed on a long term basis, they would die in one of several ways. They do not know that the side effects of medical treatments preclude their chances for living normal lives. Even miracles will not extend their lives in meaningful amounts.

For above reasons, palliative treatments are often used in violation of the most fundamental legal principle that patients must give informed consent. If patients understand the fatal flaw in medical treatment performance evaluation together with all hidden risks, insufficiently documented risks, underestimated risks, a vast portion of patients may not accept palliative treatments. If cure exists in any of none-medical forms, few of them would accept palliative care.

In this study, due to the nature of studies, some evidence is approximate. However, the validity of this analysis does not require high data accuracy because the conclusion is not based on percent differences. Most facts are based on order of magnitudes or consistent patterns that cannot be questioned. Most studies are backed up by multiple reliable findings in cancer literature. Simulation data are used to show growth trends, factors effect patterns, and relative sizes. Most key facts are irrefutable and conclusive. The findings raise numerous issues in cancer research model, medical treatments for cancer, early diagnosis of cancer, over treatments, use of palliative care, etc.

Conclusion

The face value benefits of medical treatments for cancer is refuted for all of the following reasons:

(1) All medical treatments were developed on the “notion” to remove the tumor or kill cancer cells. This notion was formed long before 1846 and was rooted deeply in medical culture. This notion was based on wrong cancer theories that attributed the causes of cancer to foreign matter, infection, poison, and drama, etc. This notion is only partially consistent with modern cancer theory, clearly clashes with latest discoveries of massive changes in biochemical and cellular processes, and the latest evolutionary cancer theory. The latest knowledge and cancer theories implicate that cancer cannot be cured by cutting, radiating and drugging because they clash with evolution.

(2) The medical treatment options were confined by the flawed legal framework and commercial interests. All performance data of medical treatments are acquired by making chain comparisons among drugs, operations, and radiation, all of which are similarly useless and harmful. Medicine did not explore how a program comprising a plurality of lifestyle factors would perform. Thus, medicine does not know how medical treatments perform on an absolute scale, as compared with best references which would be achieved by any combinations of ten of thousands of lifestyle factors. The complete response rates of 7.4% of chemotherapy reflect the heights of “the tallest boys” selected from a room of little boys while the overall contribution of curative and adjuvant cytotoxic chemotherapy to 5-year survival in adults was estimated to be 2%. Due to lack of comparison, the “benefits” of surgeries are only presumed, and must be negative if surgeries are compared with best references.

(3) All medical treatments are associated with three to four deadly lethal factors. Surgery increases cancer apparent growth rate constant by as much as 10 times based on observed cases, previous findings and a recent finding on a mice model; and chemotherapy and radiotherapy can raise cancer growth rate constants by 2.5 to 5 or more times. Emotional distress and chronic stress can increase cancer growth rate constants for metastasis by adding 0.182 (1/day) to corespondent values. Surgery, chronic stress and physical activity/lack of exercise can promote cancer metastasis. When adverse impacts from surgery, chemotherapy, radiation, and emotional distress are added up, medical treatments cannot deliver benefits in a conceivable way. The rapid increase in growth speeds is a game-ending impact, but has been overlooked for decades. In a patient with total development time for a primary tumor to take about 15 years, the growth time for a tumor on a second eruption will be shortened to about 1.5 years after treatments and to less than a year for a tumor on a third eruption after treatments.

Hundreds of well-documented cases and estimated millions of undocumented cancer miracles conclusively prove that cancer can self resolve or heal naturally, with fastest time scale from 1 month to 6 months. The incurable notion is false as matter of a fact. Cancer self-healing becomes miracles because medicine does not explore cause factors as cases. All cancer miracles can be explained by the roles of lifestyle factors: mind/emotion, exercises, diets and nutrition, natural products containing any of tens of thousands of anti-cancer compounds, and other lifestyle factors, most of which are discovered after 1980 or even 2000. Those factors were never used as comparisons in re-evaluating medical treatments. The following findings can be made:

(1) A body of evidence conclusively show that potential benefits of exercises are one or more magnitudes larger than medical treatments if their respective effects are evaluated over a long term basis. The beneficial effects of exercises can be read out from Cormie et al. [2017]. Booth et al. [2012] for non-cancer diseases serves as strong supporting evidence since cancer is a systemic chronic health problem where inflammation is a central issue.

(2) Some striking cancer miracles happened when the tumor is inoperable or patients are unable to accept or refuse to accept medical treatments. I attribute those miracles in main part to avoidance of three lethal effects that surgery, and chemotherapy and radiotherapy can bring on to patients, and avoidance of raised apparent growth rate constants, and in a small part to avoidance of long-term inactivity.

(3) Some cancer miracles can be attributed to alternation of mental state. Since emotional distress, chronic stress, and mental state have huge impacts on metastasis processes, successful control of emotional problems and abasement of chronic stress could be enough to change cancer outcomes in some cases.

(4) Right dietary adjustments and nutritional programs, which can be achieved by a large number of ways, can easily alter cancer outcomes by reducing cancer proliferation rate constants. As shown in autopsy studies, the real difference between cancer-labeled patients and “normal” people are cancer growth speeds. Killing every cancer cells is a wrong strategy that should be abandoned.

(5) Any of other lifestyle factors or some of a massive number of natural anti-cancer compounds in natural products may be able to alter cancer outcomes by slowing down growth speeds of tumors. The role of herbs should not be refuted on the ground that no studies have been done.

Cancer self-healing is not a miracle. Basic research has found a massive number of cause factors, risk factors and influencing factors. I estimate that a good cancer fighting program is one to several magnitudes more powerful than any of radical medical treatments. Behind cancer miracles are thousands of basic discoveries, which could explain the mysteries of each cancer miracle. When miracles happen in a treatment setting, they cannot be attributed to medical treatments.

Early diagnosis of cancer is a wrong strategy because cancer is always a part of human life or somatic evolution that cannot be stopped. Early diagnosis is accompanied by three to four lethal factors and the total destruction of life plans, incidental benefits from early diagnosis is marginal, and the reduction in claimed cancer death rates is an “artifact” caused by the flawed five-year survival measure. Cancer screening torments fragile people by inflicting serious emotional pains. A better strategy is to using cancer risk reduction programs to slow done or reverse cancer under development.

The analysis above implicates multiple issues for palliative care.

(1) Given the fact that cancer can resolve by itself and naturally heal, the incurable notion is untrue. Medical failure is due to its own narrow focus and chain comparison tradition used in evaluating medical treatments.

(2) Patients are often not informed of one or more severe adverse impacts of medical treatments and nor the four associated lethal factors. They were never told how cancer drugs raise future cancer growth speeds.

(3) Research articles on drug side effects do not tell whole stories about drug side effects, and always characterize drug side effects as “localized” symptoms which can “go away” but ever attempt to explain how localized symptoms implicate systemic damages to organs and the brain. Most patients are never taught to appraise the accumulated risks from operations, drugs, radiation, CT scans, invasive tissue sampling, etc.

(4) A super majority of patients do not know that medical treatments have precluding effects on future cures. Few patients understand that the use of such drugs may completely diminish the body's ability to fight cancer in the future.

REFERENCES

ACS Early Theories about Cancer Causes, American Cancer Society. access ed at https://www.cancer.org/cancer/cancer-basics/history-of-cancer/cancer-causes-theories-throughout-history.html

Aguirre-Ghiso JA. Models, mechanisms and clinical evidence for cancer dormancy. Nat Rev Cancer. 2007;7:834–846.

Albero A, Lopéz JE, Torres A, de la Cruz L, Martín T. Effectiveness of chemotherapy in advanced differentiated thyroid cancer: a systematic review. Endocr Relat Cancer. 2016 Feb;23(2):R71-84. doi: 10.1530/ERC-15-0194.

Armitage P, Doll R. The age distribution of cancer and a multi-stage theory of carcinogenesis. Br J Cancer. 1954;8(1):1–12.

Armitage P, Doll R. A two-stage theory of carcinogenesis in relation to the age distribution of human cancer. Br J Cancer. 1957;11(2):161–9.

Ashdown ML, Robinson AP, Yatomi-Clarke SL, Ashdown ML, Allison A, Abbott D, Markovic SN, and Coventry BJ, Chemotherapy for Late-Stage Cancer Patients: Meta-Analysis of Complete Response Rates, Version 1. F1000Res. 2015; 4:232.

Attolini CS, Michor F. Evolutionary Theory of Cancer. The Year in Evolutionary Biology 2009: Ann. N.Y. Acad. Sci. 1168: 23–51 (2009).

Au DH, Castro M, and Krishnan JA. Selection of Controls in Clinical Trials, Introduction and Conference Summary. Proceedings of The American Thoracic Society Vol 4 2007

Bai ZG, Zhang ZT. A systematic review and meta-analysis on the effect of angiogenesis blockade for the treatment of gastric cancer. Onco Targets Ther. 2018 Oct 17;11:7077-7087.

Bailon-Moscoso N, Cevallos-Solorzano G, Romero-Benavides JC, and Orellana MIR. Natural Compounds as Modulators of Cell Cycle Arrest: Application for Anticancer Chemotherapies. Current Genomics, 2017, 18, 106-131

Booth FW, Roberts CK, Laye MJ. Lack of exercise is a major cause of chronic diseases. Compr Physiol. 2012;2:1143–1211.

Brigden ML. Unproven (questionable) cancer therapies. West J Med. 1995 Nov; 163(5): 463–469.

Brücher B, Jamall IS. Somatic Mutation Theory - Why it's Wrong for Most Cancers. Cell Physiol Biochem 2016;38:1663-1680

Carlsson S, Andersson T, Lichtenstein P, Michaelsson K, Ahlbom A. Physical activity and mortality: is the association explained by genetic selection? Am J Epidemiol. 2007; 166:255–259.

Chang SC, Liu KH, Hung CY et al. Adjuvant Chemotherapy Improves Survival in Stage III Gastric Cancer after D2 Surgery. Journal of Cancer 2018; 9(1): 81-91.

Chen CP, Weinberg VK, Jahan TM, Jablons DM, and Yom SS. Implications of Delayed Initiation of Radiotherapy Accelerated Repopulation after Induction Chemotherapy for Stage III Non-small Cell Lung Cancer. Journal of Thoracic Oncology Volume 6, Number 11, November 2011.

Cheng L, Swartz MD, Zhao H, Kapadia AS, Lai D, Rowan PJ, Buchholz TA, Giordano SH. Hazard of recurrence among women after primary breast cancer treatment—A 10-year follow-up using data from SEER-medicare. Cancer Epidemiol. Biomarkers Prev. 21, 800–809 (2012).

Colleoni M, Sun Z, Price KN, Karlsson, Forbes JF, Thürlimann B, Gianni L, Castiglione M, Gelber RD, Coates AS, Goldhirsch A. Annual hazard rates of recurrence for breast cancer during 24 years of follow-up: Results from the international breast cancer study group trials I to V. J. Clin. Oncol. 34, 927–935 (2016).

Cormie P, Zopf EM, Zhang X, Schmitz KH. The Impact of Exercise on Cancer Mortality, Recurrence, and Treatment-Related Adverse Effects. Epidemiologic Reviews, Volume 39, Issue 1, January 2017, Pages 71–92, **https://doi.org/10.1093/epirev/mxx007**

Davis C, Naci H, Gurpinar E, Poplavska E, Pinto A, Aggarwal A, Availability of evidence of benefits on overall survival and quality of life of cancer drugs approved by European Medicines Agency: retrospective cohort study of drug approvals 2009-13, BMJ 2017;359:j4530.

Demicheli R, Retsky MW, W. Hrushesky JM, Baum M. Tumor dormancy and surgery-driven interruption of dormancy in breast cancer: Learning from failures. Nat. Clin. Pract. Oncol. 2007; 4,699–710.

DeVita VT Jr, Chu E. A history of cancer chemotherapy. Cancer Res. 2008 Nov 1;68(21):8643-53.

Des Guetz G, Uzzan B, Bouillet T, et al. Impact of physical activity on cancer-specific and overall survival of patients with colorectal cancer. Gastroenterol Res Pract. 2013;2013: 340851.

Donaldson MS. Nutrition and cancer: A review of the evidence for an anti-cancer diet. Nutr J. 2004; 3: 19.

Dos Santos MA, Pignon JP, Blanchard P, Lefeuvre D, Levy A, Touat M, Louvel G, Dhermain F, Soria JC, Deutsch E, Le Teuff G. Systematic review and meta-analysis of phase I/II targeted therapy combined with radiotherapy in patients with glioblastoma multiforme: quality of report, toxicity, and survival. J Neurooncol. 2015 Jun;123(2):307-14. doi: 10.1007/s11060-015-1802-5.

Draisma G, Etzioni R, Tsodikov A, Mariotto A, Wever E, Gulati R, Feuer E, de Koning H. Lead time and overdiagnosis in prostate-specific antigen screening: importance of methods and context. Journal of the National Cancer Institute. 2009; 101:374–83.

Drewinko B, Alexanian R, Boyer H, Barlogie B, Rubinow SI. The growth fraction of human myeloma cells. Blood. 1981 Feb;57(2):333-8.

Friedenreich CM, Neilson HK, Farris MS, et al. Physical activity and cancer outcomes: a precision medicine approach. Clin Cancer Res. 2016;22(19):4766–4775.

Gee AW, Balogh E, Patlak M, Nass SJ (reportors), The Drug Development Paradigm in Oncology: Proceedings of a Workshop. National Academies of Sciences; National Cancer Policy Forum. Washington (DC): National Academies Press (US); 2017 Jul 24.

Gimbrone MA, Jr, Leapman SB, Cotran RS, Folkman J. Tumor dormancy in vivo by prevention of neovascularization. J Exp Med. 1972;136(2):261–276.

Greaves M, Maley CC. Clonal evolution in cancer. Nature. 2012;481(7381):306–13.

Grosso G, Bella F, Godos J, Sciacca S, Del Rio D, Ray S, Galvano F, Giovannucci EL. Possible role of diet in cancer: systematic review and multiple meta-analyses of dietary patterns, lifestyle factors, and cancer risk. Nutrition Reviews, 2017; 75 (6):405–419.

Hanahan & Weinberg. The Hallmarks of Cancer. Cell, Vol. 100, 57–70, January 7, 2000.

Harv Letter. A second look at beta blockers and blood pressure. A beta blocker alone isn't usually the best choice for simple, uncomplicated high blood pressure. Harv Heart Lett. 2008 Jun;18(10):4-5.

Holmes MD, Chen WY, Feskanich D, et al. Physical activity and survival after breast cancer diagnosis. JAMA. 2005;293(20):2479–2486.

Hochberg, ME & Noble RJ. A framework for how environment contributes to cancer risk. Ecology Letters (2017) 20, 117–134.

Hoffman KE, Niu J, Shen Y, Jiang J, Davis JW, Kim J, Kuban DA, Perkins GH, Shah JB, Smith GL, Volk RJ, Buchholz TA, et al. Physician Variation in Management of Low-Risk Prostate Cancer: A Population-Based Cohort Study. JAMA Intern Med. 2014

Housman G., Byler S., Heerboth S.h, Lapinska K, Longacre M., Snyder N. and Sarkar S., Drug Resistance in Cancer: An Overview. Cancers 2014, 6, 1769-1792; doi:10.3390/cancers6031769

Ibrahim EM, Al-Homaidh A. Physical activity and survival after breast cancer diagnosis: meta-analysis of published studies. Med Oncol. 2011;28(3):753–765.

Jahn J.L., Giovannucci E.L., Stampfer M.J. The high prevalence of undiagnosed prostate cancer at autopsy: Implications for epidemiology and treatment of prostate cancer in the prostate-specific antigen-era. Int. J. Cancer. 2015;137:2795–2802. doi: 10.1002/ijc.29408.

Je Y, Jeon JY, Giovannucci EL, et al. Association between physical activity and mortality in colorectal cancer: a meta-analysis of prospective cohort studies. Int J Cancer. 2013; 133(8):1905–1913.

Jones S, et al. (2008) Comparative lesion sequencing provides insights into tumor evolution. Proc Natl Acad Sci USA 105:4283– 4288.

Krall JA, Ferenc R, Mercury OA, Pattabiraman DR, Brooks MW, Dougan M, Lambert AW, Bierie B, Ploegh HL, Dougan SK, Weinberg RA. The systemic response to surgery triggers the outgrowth of distant immune-controlled tumors in mouse models of dormancy. Sci. Transl. Med. 10, eaan3464 (2018).

Lahart IM, Metsios GS, Nevill AM, et al. Physical activity, risk of death and recurrence in breast cancer survivors: a systematic review and meta-analysis of epidemiological studies. Acta Oncol. 2015;54(5):635–654.

Lange MM, Rutten HJ, van de Velde CJ. One hundred years of curative surgery for rectal cancer: 1908-2008. Eur J Surg Oncol. 2009 May;35(5):456-63.

Legumes C.R. lemons and streptomycin: A short history of the clinical trial. CMAJ. 2009;180:23–24.

Levine EM & Robins EB. Differential temperature sensitivity of normal and cancer cells in culture. Journal of Cellular Physiology. 1970;76(3):373 – 379·

Li T, Wei S, Shi Y, et al. The dose-response effect of physical activity on can cer mortality: findings from 71 prospective cohort studies. Br J Sports Med. 2016 50(6):339–345.

Li Y, Zhou Y, Hong Y, He M, Wei S, Yang C, Zheng D and Liu F. The Efficacy of Different Chemotherapy Regimens for Advanced Biliary Tract Cancer: A Systematic Review and Network Meta-Analysis. Frontiers in Oncology. May 2019,Volume 9,Article 441.

Lutgendorf SK, Sood AK, Anderson B, et al. Social support, psychological distress, and natural killer cell activity in ovarian cancer. Journal of Clinical Oncology 2005;23(28):7105-7113.

Lutgendorf SK, DeGeest K, Dahmoush L, et al. Social isolation is associated with elevated tumor norepinephrine in ovarian carcinoma patients. Brain, Behavior, and Immunity 2011;25(2):250-255.

Mackillop WJ, Stewart WE, Ginsburg AD, Stewart SS. Cancer patients' perceptions of their disease and its treatment. Br J Cancer. 1988;58:355-358.

Maeda H and Khatami M. Analyses of repeated failures in cancer therapy f or solid tumors: poor tumor-selective drug delivery, low therapeutic efficacy and unsustainable costs, Clin Transl Med. 2018; 7: 11.

Mathews JD, Forsythe AV, Brady Z, et al. Cancer risk in 680000 people exposed to computed tomography scans in childhood or adolescence: data linkage study of 11 million Australians. BMJ 2013;346:f2360 doi: 10.1136/bmj.f2360 (Published 22 May 2013)

Mehrara E, Forssell-Aronsson E, Ahlman H, and Bernhardt P. Specific Growth Rate versus Doubling Time for Quantitative Characterization of Tumor Growth Rate. Cancer Res 2007; 67: (8). April 15, 2007

Meyerhardt JA, Heseltine D, Niedzwiecki D, et al. Impact of physical activity on cancer recurrence and survival in patients with stage III colon cancer: findings from CALGB 89803. J Clin Oncol. 2006;24(22):3535–3541.

Millimouno FM, Dong J, Yang L, Li J, and Li X. Targeting Apoptosis Pathway s in Cancer and Perspectives with Natural Compounds from Mother Nature. Can cer Prev Res; 2014; 7(11); 1081–107.

Moreno-Smith M, Lutgendorf SK, Sood AK. Impact of stress on cancer metastasis. Future Oncology 2010;6(12):1863-1881. doi: 10.2217/fon.10.142

Morgan G, Ward R & Barton M. The contribution of cytotoxic chemotherapy to 5-year survival in adult malignancies. Clin. Oncol. (R. Coll. Radiol.) 16, 549–560 (2004).

Na Z, Qiao X, Hao X, Fan L, Xiao Y, Shao Y, et. al. The effects of beta-blocker use on cancer prognosis: a meta-analysis based on 319,006 patients. OncoTargets and Therapy 2018:11 4913–4944.

Naumov GN, Akslen LA, Folkman J. Role of angiogenesis in human tumor dormancy: animal models of the angiogenic switch. Cell Cycle. 2006;5(16):1779–87.

Navarro SL, Kantor ED, Song X, Milne GL, Lampe JW, Kratz M, White E. Factors associated with multiple biomarkers of systemic inflammation. Cancer Epidemiology Biomarkers and Prevention. 2016;25(3), 521 10.1158/1055-9965.EPI-15-0956

Nowell, P. C. (1976). "The clonal evolution of tumor cell populations". Science. 194 (4260): 23–28. doi:10.1126/science.959840. PMID 959840.

O'Keefe JH, Vogel R, Lavie CJ, Cordain L. Achieving Hunter-gatherer Fitness in the 21(st) Century: Back to the Future. Am J Med. 2010; 123:1082–1086.

Otto SJ, Korfage IJ, Polinder S, et al. Association of change in physical activity and body weight with quality of life and mortality in colorectal cancer: a systematic review and meta-analysis. Support Care Cancer. 2015;23(5):1237–1250.

Richman EL, Kenfield SA, Stampfer MJ, et al. Physical activity after diagnosis and risk of prostate cancer progression: data from the cancer of the prostate strategic urologic research endeavor. Cancer Res. 2011;71(11): 3889–3895.

Sagar S.M., Yance D., and Wong R.K. Natural health products that inhibit angiogenesis: a potential source for investigational new agents to treat cancer—Part 1, CURRENT ONCOLOGY — VOLUME 13, NUMBER 1.

Schmid D, Leitzmann MF. Association between physical activity and mortality among breast cancer and colorectal cancer survivors: a systematic review and meta-analysis. Ann Oncol. 2014;25(7):1293–1311.

Segerstrom SC, Miller GE. Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry. Psychological Bulletin 2004;130(4):601-630.

Sloan EK, Priceman SJ, Cox BF, et al. The sympathetic nervous system induces a metastatic switch in primary breast cancer. Cancer Research 2010;70(18):7042-7052.

Solinas G, Marchesi F, Garlanda C, Mantovani A, Allavena P. Inflammation-mediated promotion of invasion and metastasis. Cancer Metastasis Rev. 2010;29:243–248.

Sparano JA, Gray RJ, Makower DF, Pritchard KI, Albain KS, Hayes DF, et al. Adjuvant chemotherapy guided by a 21-gene expression assay in breast cancer. N Engl J Med 2018;379(2):111–121. 10.1056/NEJMoa1804710

Stemmermann GN. Unsuspected cancer in elderly Hawaiian Japanese: an autopsy study. Hum Pathol. 1982 Nov;13(11):1039–1044.

Sternfeld B, Weltzien E, Quesenberry CP Jr, et al. Physical activity and risk of recurrence and mortality in breast cancer survivors: findings from the LACE Study. Cancer Epidemiol Biomarkers Prev. 2009;18(1):87–95.

Stratton MR. Exploring the genomes of cancer cells: progress and promise. Science. 2011;331:1553–1558. doi: 10.1126/science.1204040.

Su J, Cai M, Li W, Hou B, He H, Ling C, Huang T, Liu H, Guo Y. Molecularly Targeted Drugs Plus Radiotherapy and Temozolomide Treatment for Newly Diagnosed Glioblastoma: A Meta-Analysis and Systematic Review. Oncol Res. 2016;24(2):117-28.

Tipton CM. The history of “Exercise Is Medicine” in ancient civilizations. Adv Physiol Educ. 2014;38(2):109–117.

Tohme S, Simmons RL, Tsung A. Surgery for Cancer: a trigger for metastases. Cancer Res. 2017;77:1548–1552. doi: 10.1158/0008-5472.CAN-16-1536.

Tournigand C, André T, Achille E, et al., FOLFIRI Followed by FOLFOX6 or the Reverse Sequence in Advanced Colorectal Cancer: A Randomized GERCOR Study. J Clin Oncol (2004) 22:229-237.

Twyman RA. A brief history of clinical trials. The Human Genome. 2004. Sep, http://genome.wellcome.ac.uk/doc_WTD020948.html. Accessed on Oct 2009.

Tubiana M. Repopulation in human tumors. A biological background for fractionation in radiotherapy. Acta Oncol 1988; 27: 83-8.

Tubiana M. Tumor Cell Proliferation Kinetics and Tumor Growth Rate, Acta Oncologica, 1989;28:1, 113-121, DOI: 10.3109/02841868909111193

Verkooijen HM, Fioretta GM, Rapiti E, Bonnefoi H, Vlastos G, Kurtz J, Schaefer P, Sappino A, Schubert H. and Bouchardy C. Patients' Refusal of Surgery Strongly Impairs Breast Cancer Survival. Ann Surg 2005;242: 276 –280.

Wang TL, et al. (2002) Prevalence of somatic alterations in the colorectal cancer cell genome. Proc Natl Acad Sci USA 99:3076 –3080.

Welch HG, Black WC. Overdiagnosis in cancer. J Natl Cancer Inst. 2010 May 5;102(9):605-13. doi: 10.1093/jnci/djq099.

Wikipedia, cancer, **https://en.wikipedia.org/wiki/Cancer#History**

Wikipedia, List of unproven and disproven cancer treatments **https://en.wikipedia.org/wiki/List_of_unproven_and_disproven_cancer_treatmentsCancer**.

Wood LD, et al. (2007) The genomic landscapes of human breast and colorectal cancers. Science 318:1108 –1113.

Wu W, Guo F, Ye J, et al. Pre- and post-diagnosis physical activity is associated with survival benefits of colorectal cancer patients: a systematic review and meta-analysis. Oncotarget. 2016;7(32):52095–52103.

Yap A, Lopez-Olivo MA, Dubowitz J, Pratt G, Hiller J, Gottumukkala V, Sloan E, Riedel B, Schier R. Effect of beta-blockers on cancer recurrence and survival: a meta-analysis of epidemiological and perioperative studies. Br J Anaesth. 2018 Jul; 121(1):45-57. Epub 2018 May 3.

Yeung PK, Wong JT. Inhibition of cell proliferation by mechanical agitation i nvolves transient cell cycle arrest at G1 phase in dinoflagellates. Protoplasma. 20 03 Mar;220(3-4):173-8.

Zhong S, Jiang T, Ma T, et al. Association between physical activity and mortality in breast cancer: a meta-analysis of cohort studies. Eur J Epidemiol. 2014;29(6):391–404.

Zhou Y, Li C, Huijbregts MAJ., Mumtaz MM, Carcinogenic Air Toxics Exposure and Their Cancer-Related Health Impacts in the United States. PLOS ONE DOI:10.1371/journal.pone.0140013

Zondervan RL, Hahn PF, Sadow CA, Liu B, Lee SI. Body CT scanning in young adults: examination indications, patient outcomes, and risk of radiation-induced cancer. Radiology. 2013;267(2):460-9. doi: 10.1148/radiol.12121324. Epub 2013 Feb 5.