

# The Anti-Cancer Fight with the Wellness Menu

by

Michelle Sue and Kenneth W. Yip  
Department of Cell and Systems Biology  
University of Toronto, Ontario, Canada



## Part I – Introduction

William had recently turned 45 and was beginning to worry about his health. His concerns stemmed from his family's history of cancer, combined with his own unhealthy lifestyle habits. Unfortunately, several members of William's family and relatives had battled various types of cancer. Knowing this, William wanted to be proactive in decreasing his risk for cancer.

William decided to visit his family doctor to address his concerns and gain insight on ways to prevent cancer. Following his doctor's suggestions, William underwent medical testing. Based on the results of William's tests and lifestyle choices, the doctor informed him that he was at high risk of developing cancer. William was concerned and asked for cancer risk reducing strategies, especially regarding nutrition.

While it is known that genetic predisposition plays a significant role in the risk for developing cancer, lifestyle choices also have a large impact. When the doctor asked William, he admitted he made unhealthy lifestyle choices that were starting to take a toll on his body: smoking and drinking regularly; eating bacon; and although he consumed some fruit, he ate very few vegetables. William worked a desk job and occasionally went on a golf trip. His sedentary lifestyle had also caused significant weight gain, further decreasing his motivation to exercise.

## Part II – Cancer at a Glance

### Overview

Cancer is one of the leading causes of death, accounting for over 10 million deaths in 2020 according to World Health Organization (WHO); that is nearly one in six deaths (WHO, 2022). Cancer is a broad umbrella term that groups many diseases affecting multiple parts of the body (Cleveland Clinic, n.d.; WHO, 2022). Some of the most common forms of cancer include breast, lung, colon, rectal, and prostate cancers (Cleveland Clinic, n.d.). Many cancers can be successfully treated if detected early enough, and if combatted with appropriate treatment plans (Cleveland Clinic, n.d.; WHO, 2022). Further, it is estimated that approximately 1/3 of all cancers are preventable through healthy lifestyle choices (National Cancer Institute, 2015; WHO, 2022). Risk factors that increase the risk of developing cancer include, but are not limited to: tobacco use, high body mass index (BMI), excessive alcohol consumption, imbalanced diet (i.e., minimal fruit and vegetable intake), and sedentary lifestyle (Cleveland Clinic, n.d.; National Cancer Institute, 2015; WHO, 2022). Many of these cancer risk factors involve exposure to carcinogens or a buildup of harmful products in the body (National Cancer Institute, 2015).

It is important to note that while adopting healthy lifestyle habits can decrease your risk of developing cancer, there are some factors that are out of your control (Cleveland Clinic, n.d.; WHO, 2022). Some individuals may have genetic

predispositions in their family history for developing cancer (Cleveland Clinic, n.d.; National Cancer Institute, 2015; WHO, 2022). While researchers have found approximately 400 genes associated with cancer development, only about 5–10% of all cancer cases have been reported to be hereditary, meaning that the development of cancer is due to an inherited gene mutation from someone in the family who has previously developed cancer (Canadian Cancer Society, n.d.; Cleveland Clinic, n.d.). Some risk factors, like inherited mutations and aging, cannot be avoided, but many can (National Cancer Institute, 2015; WHO, 2022). Limiting one's exposure to avoidable risk factors can significantly lower one's risk for developing cancer.

### *Cellular and Molecular Biology*

The human body is comprised of trillions of cells that normally grow and divide to replace old or damaged cells (National Cancer Institute, 2007). When this natural process of cell division goes awry due to harmful genetic changes, uncontrollable cell division can occur, resulting in the formation of one or multiple lumps of cells, leading to cancer (National Cancer Institute, 2007). Cancer is, first and foremost, a genetic disorder; when the genes that control regular growth and division obtain particular mutations, growth and division is consequently accelerated. These mutations are also present in the new cells they create through division (Cleveland Clinic, n.d.; Patient Involvement in Cancer Research Program, 2020). On the one hand, genetic mutations arising from cell division and organism reproduction are responsible for the incredible diversity of life as we know it. On the other hand, these mutations may not always be advantageous and may result in the pathogenesis of diseases, such as cancer (Patient Involvement in Cancer Research Program, 2020). Cells bearing mutations causing uncontrollable growth form lumps of cells that continue to multiply and form tumors that can be benign (non-cancerous), premalignant (potentially cancerous), or malignant (cancerous) (National Cancer Institute, 2007; Patient Involvement in Cancer Research Program, 2020). Cancerous tumors are spread by invading nearby tissues, whereas benign tumors have not spread; if cells of benign tissues begin to spread, they can be re-classified as malignant. When cells of cancerous tumors travel to distant places in the body via the circulatory and lymphatic systems to form new tumors, they are termed metastatic tumors (National Cancer Institute, 2007).

### *Question*

1. List six differences between cancerous and normal cells. The following are some sources to consider:
  - “What Is Cancer? Symptoms, Signs, Types & Causes” by Cleveland Clinic: <<https://my.clevelandclinic.org/health/diseases/12194-cancer>>
  - “What Is Cancer?” by the National Cancer Institute (NCI), National Institutes of Health (NIH): <<https://www.cancer.gov/about-cancer/understanding/what-is-cancer>>
  - “What is Cancer?” by Cancer Basics: <<https://www.cancer.org/cancer/understanding-cancer/what-is-cancer.html>>
  - “What is cancer” by the Canadian Cancer Society: <<https://cancer.ca/en/cancer-information/what-is-cancer>>

### *Diagnosis, Staging, and Prevention*

After diagnostic tools such as blood tests, imaging tests, or biopsies have confirmed a cancer diagnosis, healthcare professionals will typically follow a cancer staging system in order to devise the best course of treatment. The most commonly used cancer staging system is the tumour, node, and metastasis (TNM) system (American Joint Committee on Cancer, n.d.; Cleveland Clinic, n.d.). Cancer is best combatted when it is caught early, which can be done by having regular checkups with your physician and undergoing cancer screenings to see if any abnormalities are present before symptoms appear (MD Anderson Cancer Center, n.d.). The type of screenings you receive would be tailored to your age and gender. Individuals can be at greater risk for certain cancers based on their age and gender, such as breast or colorectal cancer, but it should be noted that not all cancers can be screened for (MD Anderson Cancer Center, n.d.). There is currently no cure for cancer; this is why prevention is key. The simplest ways to decrease your risk of developing cancer have been disseminated through many internationally recognized institutions, and they largely revolve around making healthy lifestyle choices: live smoke free; maintain a healthy body weight; incorporate healthy foods; minimize foods that can increase cancer risk such as highly processed foods, charred grilled meats, and cured meats; have a healthy active lifestyle; limit alcohol consumption; undergo regular screenings; use sun protection; and get vaccinated (Canadian Cancer Society, n.d.).

### *Question*

2. Describe three controllable and three uncontrollable factors when assessing the risk of developing cancer. Be specific in mentioning if the factor increases or decreases the risk. The following are some sources to consider:
  - “Risk Factors for Cancer” by NCI: <<https://www.cancer.gov/about-cancer/causes-prevention/risk>>
  - “Reduce your risk” by the Canadian Cancer Society: <<https://cancer.ca/en/cancer-information/reduce-your-risk>>

## Part III – The CRAP Test

As previously mentioned, approximately 30–50% of all cancers are considered preventable, with diet playing an underappreciated role (World Health Organization, n.d.). With the accessibility and sheer abundance of information available online, it is important to be able to distinguish between evidence-backed information and the fads circulating online. The CRAP test was developed by Molly Beestrum (Beestrum, n.d.), and is also used in the NCCSTS case study “A Cure for Cancer?” written by Justin A. Pruneski (Pruneski, 2017). It is reproduced (and adapted) below for quick reference.

The CRAP test is a tool for you to assess the reliability of sources, and will be useful when you are doing research for other classes.

### *C – Currency*

- Is the resource still currently relevant to your research?
- Has it been revised recently? Does it cite up-to-date information?

### *R – Reliability*

- Is the information provided at this source verifiable and accurate through other sources?
- Is there evidence supporting the information provided? Are there citations?

### *A – Authority*

- Is the information source trustworthy?
- Are the author’s credentials and their publisher trustworthy?

### *P – Purpose / POV*

- Is the author trying to inform, persuade, entertain, or sell you anything?
- Are there links indicating this is sponsored content?
- Does the author have any concerning conflicts of interest?

Diet trends come and go, so it is important for you to be able to understand what is truly good for you, and what lacks scientific evidence to back up the claim.

## Questions

3. Choose one of the official cancer nutrition sources below, and use the CRAP test to explain why it would be a trusted source. Write one sentence for each of the *C*, *R*, *A*, and *P*.
  - American Institute for Cancer Research: <<https://www.aicr.org/cancer-prevention/food-facts/>>
  - Memorial Sloan Kettering Cancer Center: <<https://www.mskcc.org/experience/patient-support/nutrition-cancer>>
  - American Cancer Society: <<https://www.cancer.org/cancer/risk-prevention/diet-physical-activity/acs-guidelines-nutrition-physical-activity-cancer-prevention/guidelines.html>>
  - MD Anderson: <<https://www.mdanderson.org/prevention-screening/manage-your-risk/diet.html>>
4. Your turn! Use the CRAP test to find an example of an incredible cancer nutrition source. Be sure to provide a bibliographic reference for your chosen source. List some reasons why you would not consider this source a reliable one.
5. Build William a realistic anti-cancer diet plan for a week. A summary of recommendations from top sources can be found on the Anticancer.ca website here: “Cancer-Fighting Food Recommendations from the World’s Leading Cancer Organizations”: <<https://anticancer.ca/docs/general-cancer-prevention>>

## Part IV – Going Beyond (Ethics)

Both genetics and the environment play a significant role in influencing cancer risk, but the challenge lies in understanding which one has a larger influence when they interact. While it is known that those with lower socioeconomic status (SES) tend to have higher cancer mortality and incidence rates, this relationship remains complex and multifactorial. Factors contributing to increased cancer rates observed in those of lower SES include, but are not limited to, limited healthcare access, increased exposure to carcinogens, and educational disparities. People with lower SES may also find it more difficult to maintain a healthy lifestyle because of limited access to healthier and more expensive food options, resulting in greater consumption of unhealthy processed foods. Other unhealthy lifestyle choices often seen in lower SES populations include less available time to dedicate to exercise, higher rates of smoking, and excessive alcohol consumption, which all increase the risk of developing cancer (Coughlin, 2021).

### *Questions*

6. In the United States, the Food and Drug Administration (FDA) is primarily responsible for ensuring companies are held accountable for producing and selling safe goods for consumers in industries such as food, vaccines, and other biological products. One of its responsibilities is to ensure food products are properly labelled and contain accurate information in the “Nutrition Facts” label found on the back of food items to help consumers make healthier choices. In the state of California, Proposition 65 is an enacted law whereby food companies are required to warn consumers of significant exposure to harmful chemicals causing cancer, birth defects, or other reproductive harm in their goods. This warning label is often placed alongside the “Nutrition Facts” label. Do you think it is ethical for food companies to continue to market unhealthy products to consumers, knowing that it can increase the risk of cancer, among other health issues?
  
7. Fresh produce and unprocessed foods promote a healthier diet and therefore a decreased risk of developing cancer, but they are more expensive and therefore less accessible for lower-income communities. Certain communities may also be located in a food desert, known as a geographic area where residents have very limited access to quality affordable healthy food. Given these circumstances, is it ethical or practical to encourage people to eat them more and prioritize the sale of local or organic fresh produce over less healthy foods?

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