

THRIVING WITH EXERCISE



A Wellness Manual for Cancer Patients & Survivors

Dr. Lauren Capozzi & Dr. Nicole Culos-Reed

Copyright 2020

TABLE OF CONTENTS

Prelude - Welcome from the Co-Founders.....	1
Acknowledgements.....	2
Disclaimer	3
Chapter 1 – Introduction to Cancer.....	4
Chapter 2 – Understanding Risk Factors.....	13
Chapter 3 – Playing an Active Role in Your Health.....	22
Chapter 4 – The Role of Physical Activity and Exercise for Cancer Survivors.....	31
Chapter 5 – Guidelines and Getting Started.....	42
Chapter 6 – Let’s Get Active.....	45
Chapter 7 – Tailoring Exercise Based on Tumour Type, Treatment, and Individual Factors.....	55
Chapter 8 – Eating Well After a Cancer Diagnosis.....	65
Chapter 9 – Making it Stick.....	75
Chapter 10 – Resources.....	85
More About our Co-Founders.....	90

Welcome, from the Co-Founders

Learn more about the Co-Founders at the end of this manual



Photograph: David Mollé

Welcome! We are delighted you have found this manual - your guide to wellness during your cancer journey.

Whether you have been recently diagnosed, are in the middle of treatment, or have finished treatment years ago, we are thrilled you are joining the growing number of cancer patients and survivors who want to enhance their wellness after a cancer diagnosis.

We are Dr. Nicole Culos-Reed and Dr. Lauren Capozzi, and together we have over 40 years in research, medicine, and exercise physiology, studying and designing evidence-based exercise and wellness programs for cancer survivors. Our goal with this manual is to provide you with a resource that is informative, practical, and will help you *thrive* throughout your cancer journey.

Many patients tell us that they often feel out of control during their cancer experience. Our goal is to offer **evidence-based wellness information** and strategies to help you regain control over your wellness and support your physical and emotional well-being. Many of the survivors who have done the Thrive Health exercise program or accessed our resources tell us that they are now more active than before their cancer diagnosis. We have supported thousands of people, just like you, take their first steps towards a healthier, more active lifestyle. Our goal is to help you safely and effectively **move more today** than yesterday.

As you probably know, more people are surviving cancer than ever before, but the impact of cancer and treatment on quality of life can be profound. Every year, millions of cancer survivors struggle to reclaim a sense of control over their health and well-being – both during and after treatment. Fortunately, exercise and physical activity are one of the best defences we have against cancer morbidity and to reduce the impact of treatment-related side effects.

Physical activity before treatment helps to improve health status, allowing for the initiation of difficult treatment, while activity during treatment allows for the maintenance of fitness and alleviation of symptoms. After treatment, physical activity improves many aspects of physical and mental well-being, resulting in overall enhanced quality of life. Regular physical activity can also reduce the risk of cancer recurrence, reduce cancer-related mortality, and reduce all-cause mortality!

The health benefits of activity are numerous, with cancer patients who are active reporting improved mobility, sleep and quality of life, as well as less stress, depression, anxiety, pain and fatigue. Unfortunately, many cancer survivors are inactive, and it can be challenging to start when you don't know how.

That is exactly why we started Thrive Health! We can't wait for you to join us and take steps towards a more active future.

Acknowledgements

Editors: **Dr. Lauren Capozzi** and **Dr. Nicole Culos-Reed**

Formatting Editor: **Julia Daun**

Chapter Contributors:

Chapter 1 – Introduction to Cancer

Emma McLaughlin, *BKinH, MSc Student, Faculty of Kinesiology, University of Calgary*

Chapter 2 – Understanding Risk Factors

Kelsey Ellis, *BSc, MSc Student, Faculty of Kinesiology, University of Calgary*

Chapter 3 – Playing an Active Role in Your Health

Delaney Duchek, *BASc, MSc Student, Faculty of Kinesiology, University of Calgary*

Chapter 4 – The Role of Physical Activity and Exercise for Cancer Survivors

Manuel Ester, *BSc, MSc, PhD Student, Faculty of Kinesiology, University of Calgary*

Chapter 5 – Guidelines and Getting Started

Julia Daun, *BKin, MSc, CSEP-Clinical Exercise Physiologist, PhD Student, Faculty of Kinesiology, University of Calgary*

Chapter 6 – Let's Get Active

Julia Daun, *BKin, MSc, CSEP-Clinical Exercise Physiologist, PhD Student, Faculty of Kinesiology, University of Calgary*

Chapter 7 – Tailoring Exercise Based on Tumour Type, Treatment, and Individual Factors

Julia Daun, *BKin, MSc, CSEP-Clinical Exercise Physiologist, PhD Student, Faculty of Kinesiology, University of Calgary* and **Lauren Capozzi**, *MD, PhD, CSEP-Clinical Exercise Physiologist, Adjunct Assistant Professor, Faculty of Kinesiology, Resident Physician, Physical Medicine & Rehabilitation, Cumming School of Medicine, University of Calgary.*

Chapter 8 – Eating Well After a Cancer Diagnosis

Katie Keller, *BSc, RD, The Nutrition Room Owner*, **Chelsia Gillis**, *RD, MSc, PhD, Department of Anesthesia, McGill University*, & **Julia Daun**, *BKin, MSc, CSEP-Clinical Exercise Physiologist, PhD Student, Faculty of Kinesiology, University of Calgary.*

Chapter 9 – Making it Stick

Nicole Culos-Reed, *PhD, Professor, Faculty of Kinesiology, University of Calgary; Adjunct Professor, Department of Oncology, Cumming School of Medicine; Research Associate, Psychosocial Resources, Tom Baker Cancer Centre, Calgary*, & **Julia Daun**, *BKin, MSc, CSEP-Clinical Exercise Physiologist, PhD Student, Faculty of Kinesiology, University of Calgary*

DISCLAIMER

The information provided by Thrive Health, both in this manual and online, is for informational and educational purposes only. It is not a substitute for professional health advice. You should always talk to your own physician or medical practitioners before beginning any lifestyle change. The use or reliance on any information contained on this site or in this manual is solely at your own risk.

Chapter 1: Introduction to Cancer

Contributor: Emma McLaughlin, BKinH

LEARNING OBJECTIVES:

- ❖ **BREAKDOWN OF CANCER:**
 - OVERVIEW OF THE PREVALENCE/INCIDENCE OF CANCER
 - HOW CANCER DEVELOPS
 - COMMONS TESTS USED TO DIAGNOSE CANCER
- ❖ **COMMON TREATMENTS FOR CANCER**
- ❖ **SURVIVORSHIP – CHALLENGES AND SUCCESSES**

This chapter provides a brief overview of cancer, its diagnosis and treatment, as well as some successes and possible challenges you may encounter throughout your cancer journey. Additionally, this chapter serves as a basis for the remaining chapters where you will learn about the risk factors associated with cancer, how physical activity and movement can play a key role throughout your journey, how exercise can be tailored to safely support your needs, and the role of nutrition, stress management, and sleep after a cancer diagnosis.

BREAKDOWN OF CANCER

You have likely heard and read a lot of information about cancer and your diagnosis. You may have found yourself overwhelmed by the amount of information (accurate or not) that is available. Taking time to understand your diagnosis, from reputable sources, is important as you move forward in making decisions about your health and wellness.

Cancer is very common, with 1 in 2 Canadians expected to be diagnosed with cancer.










Specifically, 43% of women and 45% of men are at risk of developing cancer in Canada².

In Canada, the **top 10 most common** diagnosed cancers include³:

1	Lung	6	Non-Hodgkin lymphoma
2	Breast	7	Thyroid
3	Colorectal	8	Melanoma
4	Prostate	9	Kidney and renal pelvis
5	Bladder	10	Uterine

Cancers are named based on the cell type affected. All cancer diagnoses can be categorized as one of the **seven types** of cancers⁴:

Carcinomas	Epithelial tissues which line your organs, glands, and vessels	
Sarcomas	Mesenchymal or supportive tissue, connective tissues, cartilage, bone, or muscle	
Lymphoma & Myeloma	Lymphatic cells & myeloid (bone marrow) cells	
Neurological tumors	Cells of the Brain and spinal cord	
Leukemias	Derived from blood cells	
Blastomas	Embryonal tissue	
Germ cell tumors	Reproductive cells	

How cancer develops:

Our genes direct our cells to grow, divide, function, or die. In healthy cells, these instructions are given and accurately followed. However, when there is damage or change to our DNA, this can cause a gene to mutate. As a result, these mutated genes cannot function properly. As orders and directions get mixed up, this can lead to the abnormal growth and division of cells outside of instructions of the genes, resulting in the development of cancer. Development of cancer cells can begin in any cell in the body. Once cancer cells spread to other cells and locations in the body, it is known as metastases⁵. There are numerous risk factors that can influence a cancer diagnosis, which will be discussed in the chapter *Understanding Risk Factors*. These mutated

genes can be developed over time through age, exposure to different risk factors, or can be inherited.

Diagnosing Cancer:

There are a variety of tests and procedures to determine a cancer diagnosis. Often, a combination of tests is used. Tests for diagnosis usually fall into three categories: imaging tests, endoscopies, and biopsies^{6,7}. Common **imaging tests** include^{6,7}:

Computed tomography (CT) scans	Scan used to provide detailed information about the size and shape of the tumor
Magnetic resonance imaging (MRI)	Scan used to determine if cancer has spread . Also commonly used to inform cancer treatment
Mammograms	X-ray to detect breast cancer
Nuclear medicine scans	Used to locate tumors and identify spread throughout the body
Ultrasounds	Used to locate tumors
X-rays and other radiographic tests	Used to identify cancer in other parts of the body

Endoscopy is a type of procedure that enables physicians to view inside their patient's body, and thus is commonly used to identify cancer in various locations throughout the body. Common endoscopy test locations, include^{6,7}:

Bronchoscopy	Used to view the lungs
Colonoscopy	Used to view the colon and rectum
Cystoscopy	Used to view the bladder and urethra
Laparoscopy	Used to view the abdomen and pelvis
Laryngoscopy	Used to view the larynx
Mediastinoscopy	Used to view the mediastinum (i.e. the thoracic cavity)
Thoracoscopy	Used to view the space inside the chest
Upper endoscopy	Used to view the esophagus, stomach, duodenum, and the beginning of the small intestine

Biopsies are used when a doctor suspects cancer and wants to confirm the diagnosis by examining the abnormal tissue. Biopsies involve the removal of a small amount of tissue which is then analyzed using a microscope. Biopsies can be taken throughout the body, based on where the tumor is suspected^{6,7}.

KEY POINTS






1. Cancer is the abnormal and uncontrollable growth of cells, which can spread to other parts of the body (metastasize).
2. While men are more frequently diagnosed than women, at least one in two Canadians are expected to be diagnosed with cancer throughout their lifetime.
3. There are seven main types of cancer: carcinomas, sarcomas, lymphoma & myeloma, neurological tumors, leukemias, blastomas, and germ cell tumors.
4. There are numerous risk factors that can potentially influence the development of cancer. When our DNA is damaged or changed, this can cause our genes to mutate, causing them not to function properly. This can lead to the abnormal growth and division of cells resulting in cancer.

COMMON TREATMENTS FOR CANCER




Over the past few decades, advancements in cancer treatment have contributed to significant improvements in 5-year survival rates. Many cancer treatment plans include a combination of several types of treatment, best suited for the individual and the specific cancer type. Based on the type of treatment(s) and individual factors, including health status prior to diagnosis, it is common to experience short and long-term symptoms and treatment side-effects.

There are a variety of cancer treatment options available. Often one or more treatment options are selected by your healthcare provider(s) to best reduce or remove the tumor. The duration of treatment and number of sessions will vary based on stage and grade of cancer.

There are two categories of cancer treatments, systemic and local⁶.
Systemic cancer treatments affect the entire body:

Bone marrow transplant (BMT)	Replacement of bone marrow which may have been damaged or destroyed through cancer and its treatment	
Chemotherapy	Mixture of medications to kill cancer cells	
Hormone therapy	Hormones targeted for breast and prostate cancer to stop and slow growth of cancer cells	
Immunotherapy	Biological therapy to assist immune system	
Stem cell transplant	Transfusion of blood-forming stem cells which may have been damaged or destroyed through other cancer treatment(s)	

Localized cancer treatment is targeted at the specific tumor site:

Radiation	High doses of radiation to shrink and kill cancer cells	
Surgery	Operation to remove tumor	
Targeted therapy	Used to identify and target changes in cancer cells	

KEY POINTS

1. Systemic cancer treatments affect the entire body, including bone marrow transplant, stem cell transplant, hormone therapy, immunotherapy, and chemotherapy.
2. Localized cancer treatments are targeted to the specific tumor site, including radiation, surgery, targeted therapy.

SURVIVORSHIP – CHALLENGES AND SUCCESSES

There are numerous challenges that you may encounter throughout your cancer journey. You may acquire changes to your body that are new and different to you, including hair loss, weight loss, and other changes in physical appearance. Additionally, you may experience changes in your personal life, with your job, family, and friends. Acknowledging the obstacles that you may face is important, so as to identify ways to cope (which will be discussed below, and in subsequent chapters).

Based on your treatment(s), you may experience an array of symptoms and side effects, including, but not limited to^{4,9}:

Short-term	Long-term
Changes to blood counts, including anemia (low hemoglobin)	Fatigue
Fatigue	Pain
Nausea/vomiting	Lymphedema
Pain	Neuropathy (numbness and tingling)
Swelling (edema)	Osteoporosis
Skin and hair changes	Incontinence
Diarrhea or constipation	Weight gain or loss

Adjusting to your “new normal” may also pose challenges in your personal and professional life. Communicating with your family, friends, and colleagues is important to ensure that they can support you in ways that feel appropriate and comfortable. On the other hand, you may be exposed to resources that help you throughout your survivorship journey, enabling you to cope throughout the challenges you encounter. These may include:

Surrounding yourself with supportive friends and family



Connecting with others who have had similar cancer journeys through cancer support groups. While doing this, it is important to acknowledge that each cancer journey is unique to the individual. Although there may be similar diagnoses or similar treatments, each person has their OWN experience



Enjoying new and old hobbies (e.g. painting, music, journaling, being active)



Staying physically active and seeking guidance from qualified exercise professionals with relevant exercise oncology-specific training and certifications

KEY POINTS

1. You may experience challenges throughout your survivorship journey, including changes to physical appearance, mental well-being, and relationships with friends, families, and colleagues.
2. On the other hand, successes in your survivorship journey can include finding support and trying some of your favorite hobbies (new or old).

CHAPTER SUMMARY

1. Cancer is the abnormal and uncontrollable growth of cells, which can spread to other parts of the body (metastasize)¹.
2. There are a several cancer testing options based on the specific type of cancer suspected.
3. There are a variety of different treatment options targeted at the specific tumor site, or the whole body. Decisions regarding your cancer treatment will be based on the discretion of your healthcare provider, based on your stage and grade of diagnosis.
4. You may encounter many challenges and successes throughout your cancer journey. It is important to remember that your journey is your own and unique. Find people to support you throughout your journey (e.g. family, friends, colleagues, support group, cancer-specific fitness classes).

REFERENCES

1. National Cancer Institute. *What is cancer.*
<https://www.cancer.gov/about-cancer/understanding/what-is-cancer>
2. Canadian Cancer Statistics Advisory Committee (2019). *Canadian cancer statistics 2019.* <http://www.cancer.ca/~media/cancer.ca/CW/publications/Canadian%20Cancer%20Statistics/Canadian-Cancer-Statistics-2019-EN.pdf>
3. Canadian Cancer Society (2020). *Cancer-specific stats 2020.*
http://www.cancer.ca/~media/cancer.ca/CW/cancer%20information/cancer%20101/Canadian%20cancer%20statistics%20supplementary%20information/2020/2020_cancer-specific-stats.pdf?la=en
4. Thrive Health Services. *Cancer & exercise.*
<https://thrivehealthservices.com/professionals/>
5. Canadian Cancer Society. *How cancer starts, grows and spreads.*
<https://www.cancer.ca/en/cancer-information/cancer-101/what-is-cancer/how-cancer-starts-grows-and-spreads/?region=on>
6. American Cancer Society. *Exams and tests for cancer.*
<https://www.cancer.org/treatment/understanding-your-diagnosis/tests.html>
7. Cancer.Net. *Tests and procedures.*
<https://www.cancer.net/navigating-cancer-care/diagnosing-cancer/tests-and-procedures>
8. National Cancer Institute. *Types of cancer treatment.*
<https://www.cancer.gov/about-cancer/treatment/types>
9. National Cancer Institute. *Side effects of cancer treatment.* <https://www.cancer.gov/about-cancer/treatment/side-effects>

Icons in this chapter are from Microsoft Word.

Chapter 2: Understanding Risk Factors

Contributor: Kelsey Ellis, BSc

LEARNING OBJECTIVES:

- ❖ DISCUSS RISK FACTORS ASSOCIATED WITH CANCER
- ❖ REVIEW NON-MODIFIABLE RISK FACTORS
- ❖ REVIEW MODIFIABLE LIFESTYLE FACTORS ASSOCIATED WITH IMPROVED CANCER OUTCOMES

Building off the previous chapter where we discussed cancer as a disease, this chapter will focus on factors that can predispose individuals to a cancer diagnosis and those that can improve overall outcomes following a diagnosis. Understanding your disease is a key step in gaining a sense of control over your health and well-being and decreasing your risk factors moving forward.

RISK FACTORS ASSOCIATED WITH CANCER

Cancer is a complex disease associated with many environmental, genetic and lifestyle-related risk factors¹⁻³.

CANCER RISK

Person's chance of developing cancer³.

VS

RISK FACTORS

Substance or condition that may play a role in increasing the risk of developing cancer or influence disease outcomes³.

In this chapter, we discuss risk factors in the context of disease development and disease progression. It is understood that a number of factors can influence the risk of a cancer diagnosis. You are likely familiar with some of these factors, including advancing age, smoking, inactivity, or excessive alcohol use. There are also factors that can impact your response to treatment, your risk of cancer recurrence, or disease progression. Furthermore, there are factors that can improve your physical and psychosocial outcomes related to living with cancer.

The impact of a risk factor is based on the individual, their environment, and lifestyle choices. Exposure to a risk factor does not guarantee the development or progression of cancer, but evidence does show that the longer the length of time for which you are exposed to a risk factor, and the higher the number of risk factors around you, the higher your risk of diagnosis or disease progression.³ It is important to understand your cancer risk factors so you can make informed choices about your health moving forward³.

There are two categories of risk factors: non-modifiable and modifiable risk factors. It is important to understand which factors fall under which category and focus on the factors under your control.

MODIFIABLE RISK FACTORS
Physical Inactivity
Nutrition
Smoking
Sleep
Stress

VS

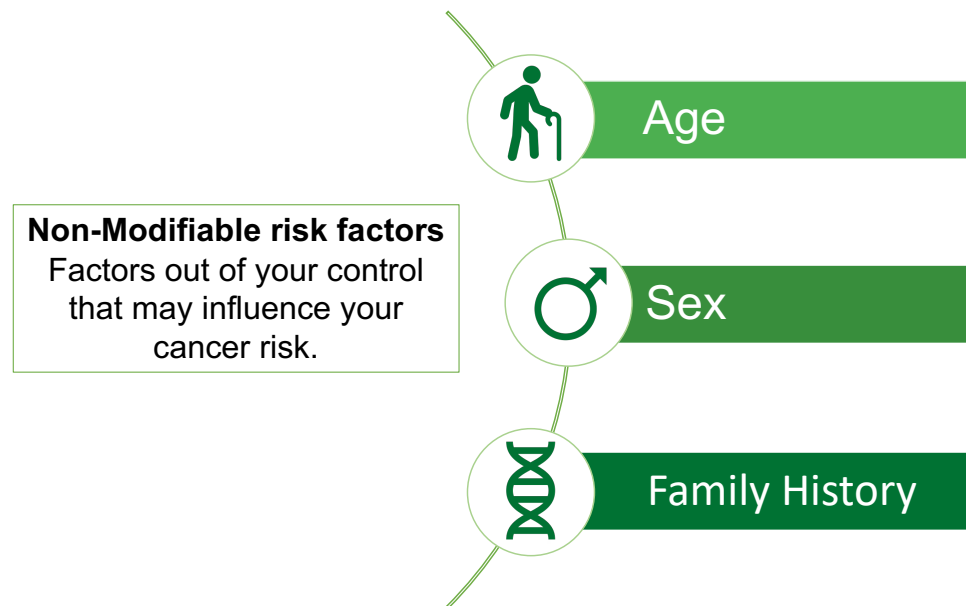
NON-MODIFIABLE RISK FACTORS
Age
Sex
Family History

KEY POINTS

1. Cancer development and progression may be influenced by a mix of environmental, genetic and lifestyle related risk factors.
2. Risk factors are a substance or condition that increases the risk of cancer, longer exposure and amount of risk factors involved contribute to cancer risk.
3. There are non-modifiable and modifiable risk factors.

NON-MODIFIABLE RISK FACTORS

There are many non-modifiable risk factors associated with increased cancer risk. It is important to be aware of these risk factors, to take preventative measures if need be. For example: early or regular screening for cancer.



These are risk factors **out of your control**, including:

AGE



A higher age is associated with higher risk of developing cancer. 90% of all cancers are expected to be diagnosed in Canadians aged 50 years and older¹.

SEX



Males are slightly more likely than females to develop cancer, which may be due to a variety of reasons including differences in risk factors or health behaviours¹.

FAMILY HISTORY



A family history of cancer may increase risk of developing cancer due to shared genetics or environment³. Having a close family member with cancer does not mean that you will develop cancer, and those without any family history of cancer may still be at risk³.

It is important to be aware of your risk factors and stay informed about ways to lower your risk and optimize your well-being.

MODIFIABLE RISK FACTORS

There are many modifiable lifestyle related risk factors that influence cancer development and progression. Approximately 40% of cancer cases may be preventable through lifestyle changes¹. Therefore, it is important to be aware of these modifiable risk factors and their link to cancer prevention, treatment and control. This allows you to make informed choices about your health-related lifestyle behaviors.



PHYSICAL INACTIVITY



Physical inactivity can increase the risk of a cancer diagnosis and cancer progression⁴. Research shows that physical activity can lower the risk of a cancer diagnoses⁴⁻⁶. In addition, physical activity can decrease mortality risk and cancer recurrence in those after a diagnosis of cancer⁴⁻⁶. It can also improve treatment outcomes and physical functioning and decrease psychosocial distress among cancer survivors⁴⁻⁶. It is important to note that being physically active reduces stress levels and improves sleep patterns as well. Physical activity information, guidelines, and resources for cancer survivors will be discussed in Chapters 5-7.

NUTRITION



Nutrient deficient and calorie-dense diets (i.e. high dietary fat, refined sugar, red and processed meats), have been associated with a higher risk for colorectal, breast, prostate and lung cancer⁹. Cancer patients are at a risk of malnutrition (i.e. inadequate food intake) and metabolic changes (ex: obesity, insulin resistance) due to their disease and treatments⁶. Malnutrition can negatively impact a person's response to cancer therapies and contribute to disease progression⁷. Additionally, metabolic changes are associated with increased risk of cancer recurrence⁷. More information on healthy eating after a cancer diagnosis can be found in Chapter 8.

SMOKING



Smoking is a well-established risk factor for cancer, specifically lung cancer⁸. Smoking may advance the risk of developing and dying from any cancer by up to 8-10 years, when compared to never smoking⁸. Quitting smoking offers an immediate and long-term benefit of up to a 2-year delay in the risk of developing cancer, and dying from cancer⁸. The longer the time (years) since quitting, the more significant the delay in developing cancer.

SLEEP



A short sleep duration has been associated with an increased risk of developing certain types of cancer, such as breast cancer⁹. Sleep disturbances and disorders are common for cancer patients and survivors, which may be associated with a lower quality of life¹¹. There is also an association between sleep and treatment compliance, with resulting impact on survival, pain control, circadian regulation, and immune and metabolic functions¹¹. For this reason, researchers and clinicians have increased their attention towards identifying and treating sleep disorders¹¹.

STRESS



Stress is a normal reaction in daily life, and not surprisingly, is more common among individuals coping with cancer. Unfortunately, chronic or long-term stress has been linked to increased cancer risk and progression¹². Stress is a complex process encompassing many environmental and psychosocial factors which have been linked to cancer progression and onset (i.e. chronic stress, depression, lack of social support, and other psychological factors), with current research showing that stress hormones in the body can affect tumour growth^{1,12}. Evidence shows that stress management interventions can improve coping and quality of life among cancer survivors¹³.

Adopting healthy lifestyle behaviours, such as being more physically active, having a healthy diet, quitting smoking, having good sleep habits, and managing your stress can help you regain control of your health.

KEY POINTS

1. Modifiable risk factors are controllable factors that may influence your chances of developing cancer.
2. Physical inactivity, nutrition, smoking, sleep, and stress are all modifiable risk factors.
3. It is important to be aware of these risk factors and their link to cancer prevention, treatment and control, to make informed choices about your health-related lifestyle behaviors.

CHAPTER SUMMARY

1. Cancer development and progression may be influenced by a mix of factors, including environmental, genetic, and lifestyle-related risk factors.
2. There are non-modifiable and modifiable risk factors. Modifiable risk factors include physical inactivity, nutrition, smoking, sleep, and stress.
3. It is important to be aware of these modifiable risk factors to make informed decisions about your lifestyle behaviours.

REFERENCES

1. Canadian Cancer Statistics Advisory Committee (2019). *Canadian Cancer Statistics*. Toronto, ON: Canadian Cancer Society. Available at: cancer.ca/Canadian-Cancer-Statistics-2019-EN (Accessed March 15th, 2020).
2. Brenner, D., Weir, H., Demers, A., Ellison, L., Louzado, C., Shaw, A., Turner, D., Woods, R., Smith, L. (2020). Projected estimates of cancer in Canada in 2020. *CMAJ : Canadian Medical Association Journal*, 192(9), E199-E205. <https://doi.org/10.1503/cmaj.191292>
3. Canadian Cancer society (2020). *Cancer information*. Canadian Cancer Society. Available at: <http://www.cancer.ca/en/prevention-and-screening/reduce-cancer-risk/can-cancer-be-prevented/?region=on> (Accessed March 15th, 2020).
4. Patel, A. V., Friedenreich, C. M., Moore, S. C., Hayes, S. C., Silver, J. K., Campbell, K. L., Winters-Stone, K., Gerber, L. H., George, S. M., Fulton, J. E., Denlinger, C., Morris, G. S., Hue, T., Schmitz, K. H., & Matthews, C. E. (2019). American College of Sports Medicine Roundtable Report on Physical Activity, Sedentary Behavior, and Cancer Prevention and Control. *Medicine and science in sports and exercise*, 51(11), 2391–2402. <https://doi-org.ezproxy.lib.ucalgary.ca/10.1249/MSS.0000000000002117>
5. Campbell, K. L., Winters-Stone, K. M., Wiskemann, J., May, A. M., Schwartz, A. L., Courneya, K. S., Zucker, D. S., Matthews, C. E., Ligibel, J. A., Gerber, L. H., Morris, G. S., Patel, A. V., Hue, T. F., Perna, F. M., & Schmitz, K. H. (2019). Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable. *Medicine and science in sports and exercise*, 51(11), 2375–2390. <https://doi-org.ezproxy.lib.ucalgary.ca/10.1249/MSS.0000000000002116>
6. Cormie, P., Zopf, E. M., Zhang, X., & Schmitz, K. H. (2017). The Impact of Exercise on Cancer Mortality, Recurrence, and Treatment-Related Adverse Effects. *Epidemiologic reviews*, 39(1), 71–92. <https://doi-org.ezproxy.lib.ucalgary.ca/10.1093/epirev/mxx007>
7. Arends, J., Bachmann, P., Baracos, V., Barthelemy, N., Bertz, H., Bozzetti, F., Fearon, K., Hütterer, E., Isenring, E., Kaasa, S., Krznaric, Z., Laird, B., Larsson, M., Laviano, A., Mühlebach, S., Muscaritoli, M., Oldervoll, L., Ravasco, P., Solheim, T., Strasser, F., ... Preiser, J. C. (2017). ESPEN guidelines on nutrition in cancer patients. *Clinical nutrition (Edinburgh, Scotland)*, 36(1), 11–48. <https://doi-org.ezproxy.lib.ucalgary.ca/10.1016/j.clnu.2016.07.015>
8. Ordóñez-Mena, J. M., Schöttker, B., Mons, U., Jenab, M., Freisling, H., Bueno-de-Mesquita, B., O'Doherty, M. G., Scott, A., Kee, F., Stricker, B. H., Hofman, A., de Keyser, C. E., Ruiter, R., Söderberg, S., Jousilahti, P., Kuulasmaa, K., Freedman, N. D., Wilsgaard, T., de Groot, L. C., Kampman, E., ... Consortium on Health and Ageing: Network of Cohorts in Europe and the United States (CHANCES) (2016). Quantification of the smoking-associated cancer risk with rate advancement periods: meta-analysis of individual participant data from cohorts of the CHANCES consortium. *BMC medicine*, 14, 62. <https://doi-org.ezproxy.lib.ucalgary.ca/10.1186/s12916-016-0607-5>

9. Wu, S., Zhu, W., Thompson, P., & Hannun, Y. A. (2018). Evaluating intrinsic and non-intrinsic cancer risk factors. *Nature communications*, 9(1), 3490. <https://doi-org.ezproxy.lib.ucalgary.ca/10.1038/s41467-018-05467-z>
10. Cao, J., Eshak, E. S., Liu, K., Muraki, I., Cui, R., Iso, H., Tamakoshi, A., & JACC Study Group (2019). Sleep duration and risk of breast cancer: The JACC Study. *Breast cancer research and treatment*, 174(1), 219–225. <https://doi-org.ezproxy.lib.ucalgary.ca/10.1007/s10549-018-4995-4>
11. Sateia, M. J., & Lang, B. J. (2008). Sleep and cancer: recent developments. *Current oncology reports*, 10(4), 309–318. <https://doi-org.ezproxy.lib.ucalgary.ca/10.1007/s11912-008-0049-0>
12. Thaker, P. H., Lutgendorf, S. K., & Sood, A. K. (2007). The neuroendocrine impact of chronic stress on cancer. *Cell cycle (Georgetown, Tex.)*, 6(4), 430–433. <https://doi-org.ezproxy.lib.ucalgary.ca/10.4161/cc.6.4.3829>
13. Speca, M., Carlson, L.E., Mackenzie, M.J., Angen, M. (2014). Chapter 13 - Mindfulness-Based Cancer Recovery: An Adaptation of Mindfulness-Based Stress Reduction (MBSR) for Cancer Patients, *Clinician's Guide to Evidence Base and Applications Practical Resources for the Mental Health Professional*, 2,293-316. <https://doi.org/10.1016/B978-0-12-416031-6.00013-X>

Icons in this chapter are from Microsoft Word.

RESOURCES

Canadian Cancer Statistics 2019:

<https://www.cancer.ca/~media/cancer.ca/CW/cancer%20information/cancer%20101/Canadian%20cancer%20statistics/Canadian-Cancer-Statistics-2019-EN.pdf?la=en>

Canadian Cancer Society - Cancer Information: <https://www.cancer.ca/en/cancer-information/cancer-101/what-causes-cancer/?region=on>

Thrive Health Services: <https://thrivehealthservices.com/>

Chapter 3: Playing an Active Role in Your Health

Contributor: Delaney Duchek, BAsC

LEARNING OBJECTIVES:

- ❖ TAKING AN ACTIVE ROLE IN YOUR OWN HEALTH
- ❖ WORKING EFFECTIVELY WITH HEALTHCARE PROVIDERS
- ❖ COMMUNICATION WITH FRIENDS AND FAMILY TO MOVE MORE

This chapter will review the various ways that you can play an active role in your health and wellness after a cancer diagnosis. We provide you with information about behaviours that can improve your health outcomes and introduce a variety of techniques that can help you maximize your time at medical appointments. Lastly, we will introduce the topic of social support and its important role in creating and maintaining healthy habits.

IMPORTANCE OF TAKING AN ACTIVE ROLE IN YOUR HEALTH, AND WHAT YOU CAN DO AS YOUR OWN HEALTH ADVOCATE

Healthcare providers, family, and friends all play an important role in supporting you to live a healthy lifestyle after a cancer diagnosis. But you play the most important role as your **own health advocate!** Creating a healthy personal environment and being aware of your health choices can have a significant impact on your overall wellness.



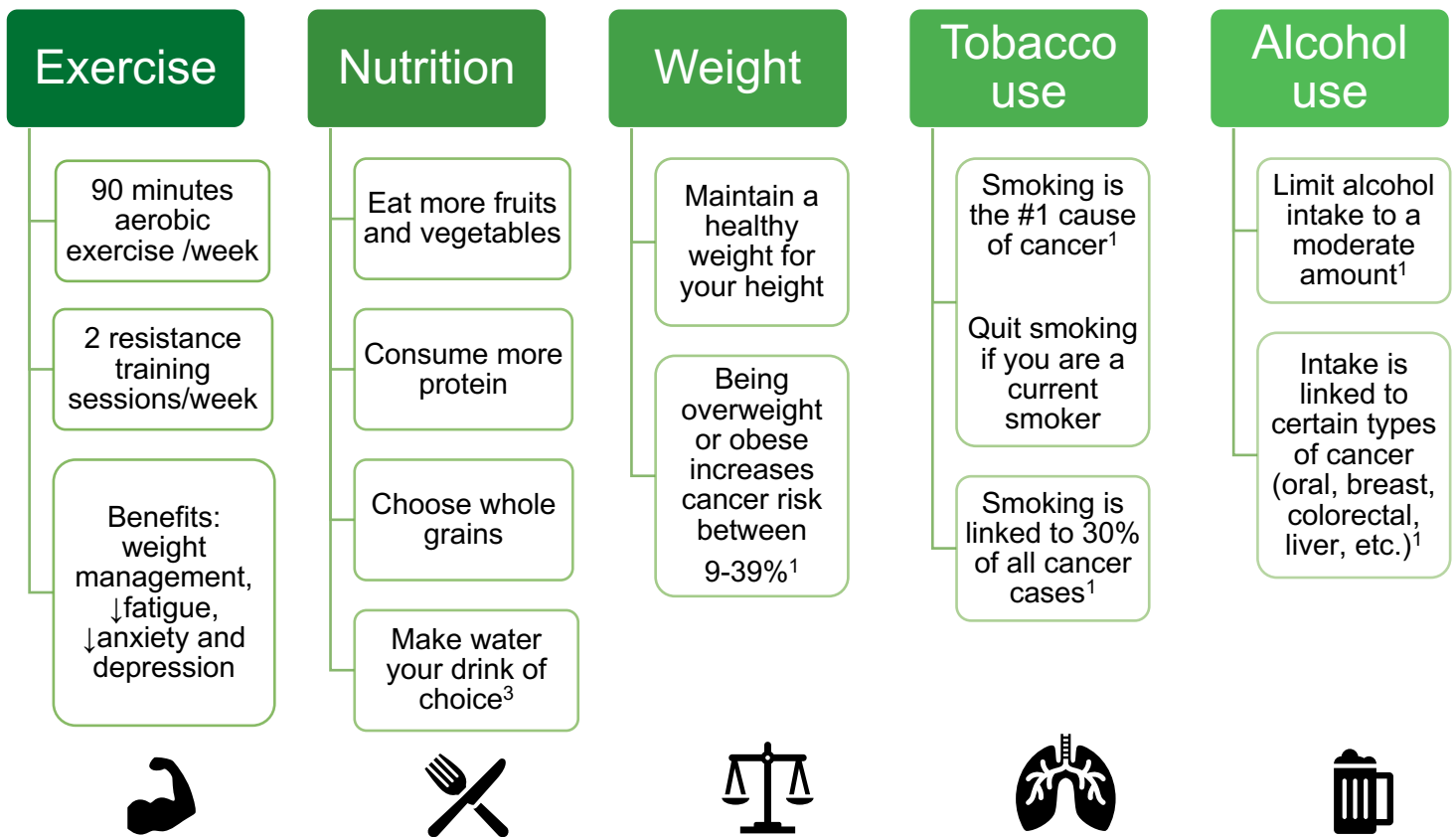
Modifiable risk factors are exposures or behaviours that have the ability to increase or decrease cancer risk and its progression. These risk factors are labelled as modifiable because they are **changeable at an individual level**. There are a number of evidence-based, modifiable risk factors that influence the risk of cancer and other chronic diseases^{1,2}:

1. **Tobacco use**
2. **Alcohol consumption**
3. **Being overweight or obese**
4. **Physical activity levels**
5. **Healthy eating habits**

Physical activity and healthy eating are behaviours that decrease the prevalence and risk of recurrence of cancer and other chronic diseases, while tobacco use, alcohol use, and being overweight increase the risk level. Focusing on making positive changes to these five key behaviours and exposures is an important way to take an active role in your health.

Below you will find recommendations for each modifiable behaviour. This is a great time to check in to see how you are doing in terms of your exercise, nutrition, weight management, tobacco

use, and alcohol use. Are you meeting the current recommendations? More information on health behaviours and modifiable risk factors can be found in Chapter 2.



Accessing resources is key in adopting and maintaining healthy behaviours. Resources can be found at healthcare provider clinics, on reputable websites, and on mobile Health (mHealth) technology applications. mHealth tools can be used to monitor behaviour, set reminders, and connect you to important information to support your behaviour change. For example, you can take advantage of free resources such as MyFitnessPal to track food intake and exercise behaviour. Zoelnsights is a health journaling app to keep track of your daily routines such as medications, activities (physical activity or other), and how you feel (side effects, fatigue, energy), allowing you to take control of your health.

If you are looking to stop smoking, a few helpful resources for quitting can be found at:

- **The Tobacco Atlas:** <https://tobaccoatlas.org/topic/quitting/>
- **Alberta Health Services:** <https://www.albertahealthservices.ca/topics/Page14487.aspx>
- **Alberta Quits:** <https://www.albertaquits.ca>

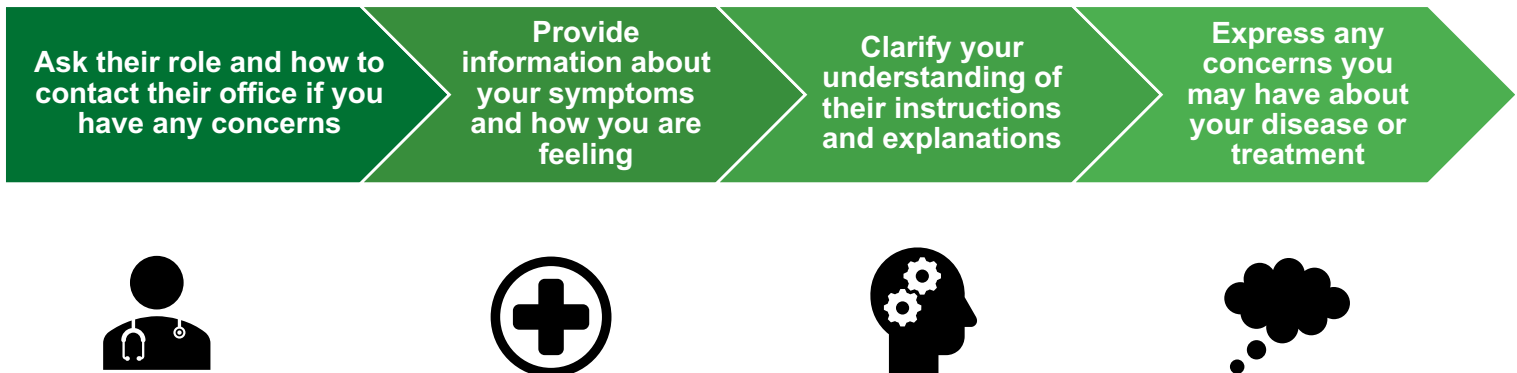
KEY POINTS

1. Taking an active role in your health is critical! People in your life, including healthcare providers, friends, and families, can further contribute to your health and overall well-being.
2. The top 5 modifiable health behaviours that are in your control are physical activity, a healthy diet, weight management, and minimizing tobacco use and alcohol intake³.
3. Apps, such as Zoelnsights or MyFitnessPal, can be a great resource for tracking and managing symptoms and side effects, as well as monitoring your diet and physical activity.

WORKING EFFECTIVELY WITH HEALTHCARE PROVIDERS

An important step when working to maximizing wellness is to establish **effective communication** with your healthcare providers. Healthcare providers can offer a wealth of information about your condition. However, providers are often busy with many patients. To ensure you maximize the time in your appointment, you can use specific strategies.

STRATEGIES FOR EFFECTIVE COMMUNICATION WITH YOUR HEALTHCARE PROVIDER:



Being prepared for your appointments can set you up to better understand your results and condition. There are several steps you can take to

start becoming an active driver in your own health.

1. **Create a survivorship care plan⁴.** A survivorship care plan is a complete record of your cancer journey, treatments, and check-ups/tests. To get a survivorship care plan, **ask your doctor about creating one.** It is never too early or too late to build a care plan with your healthcare providers. This plan can include:



- Future check-ups or tests to be completed.
- Possible long-term treatment effects.
- Ideas for staying healthy.
- Identify which healthcare providers are responsible for which part of your care.



2. **Take the time to learn/research about your cancer diagnosis on your own.** Having a base level of knowledge about your condition prior to meeting with experts will ease the conversation and facilitate understanding between you and your physician. Some reputable sites to visit for more information include:



- **CancerControl Alberta:**
- <https://www.albertahealthservices.ca/cancer/cancer.aspx>
- **MyHealthAlberta:** <https://myhealth.alberta.ca>
- **Mayo Clinic Cancer Centre:** <https://www.mayoclinic.org/departments-centers/mayo-clinic-cancer-center>
- **MD Andersen Cancer Centre:** <https://www.mdanderson.org>

3. **Take notes.** Make sure to write down important action items brought up during your appointments. You can also take note of what you would like to learn more about on your own time.



4. **Bring a friend or family member with you.** It is important to have a social network with people able to support you physically and emotionally. Social support can play a large role in quality of life⁵. Having an extra person at your appointment can be helpful when trying to take notes, understand information, and ask questions.



5. **Write down questions between visits.** This will ensure that you don't forget to ask any important questions. Bring your list of questions to your appointments.



6. **Ask for copies of results for clarity.** Having a physical copy of your results will allow you to refer to during your treatment journey.



7. **Have an updated medication list. Know the doses, how often you take each medication, and the indication.** Having an easily accessible document with all of your medications is essential. Bring this to all medical appointments. When medications change, make sure you update this list. Often, a pharmacist



can help to print off your current medications and review their indications, or reason for use.

8. **Track symptoms using an app.** Several apps, such as Zoelnsights, iCancer, CareZone, or Cancer.Net Mobile can help you track your symptoms and side effects on a daily basis. This allows you to track changes over time and report them back to your healthcare team at your appointments.



RESEARCH SPOTLIGHT!

Jenerette, C.M., & Mayer, D.K. (2016)⁶.

In this article, the authors describe the importance of patient-provider communication. Communication between healthcare providers and their patients can significantly impact health outcomes by better meeting cancer survivors' needs. Organizations that have prioritized patients at the centre of their clinical care planning and communication, demonstrate improved quality of health care, reduced costs, and stronger patient and provider satisfaction. **Patient-provider communication is an integral part of identifying the needs of cancer survivors and their families and is an important and necessary skill for the cancer survivor, their families, and their healthcare providers.**

KEY POINTS

1. Being prepared for the short time you are able to spend with physicians and other healthcare providers can help make the most of your appointments.
2. Creating a cancer survivorship care plan in partnership with your healthcare team is a great first step in making the most of your patient-physician relationship.
3. Other techniques such as bringing family or friends to appointments, writing down questions between your visits, and having an up-to-date medication list can help during physician appointments throughout your cancer journey.

COMMUNICATION & THE IMPORTANCE OF SOCIAL SUPPORT

Family and friends are a great source of social support for building health behaviours. Social support is one of the most frequently cited factors for building lifelong healthy behaviours, including exercise⁵. There are four key types of social support to promote a more active life – emotional, instrumental, informational, and esteem/appraisal support

1. Emotional support is the ability to be empathetic and caring towards others and receiving this in return. People with greater emotional support from their relationships have longer life expectancies and a better quality of life⁵. Having a friend or family member who checks in on you to ensure that you are staying active consistently is a great form of emotional support.

2. Instrumental support comprises all acts or things that other people can physically do for you to provide support⁷. This could include helping with chores or errands, cooking meals, or providing financial assistance. This type of support can include having a family member watch your children so you have time to be more active.

3. Informational support includes advice, information, and suggestions from others. This can help with problem-solving. Informational support can include friends, family, or exercise professionals who provide you with exercise resources or strategies to overcome barriers that prevent you from engaging in consistent exercise.

4. Esteem or appraisal support is support that includes words of encouragement or confidence from others. Appraisal support may come as cheering you on during exercise or encouraging you to stay active.

All forms of social support are linked to increased exercise adherence, or more consistent exercise habits. Building exercise habits long-term can be challenging, and social support has been shown to be a critical predictor of exercise adherence past the 6-month point⁸. Tap into the type of social support that you need to move towards a more active you!

KEY POINTS

1. Family and friends are a great resource for creating healthy lifestyle habits.
2. Four key types of social support are emotional, instrumental, informational, and esteem/appraisal support.
3. Social support is significantly linked to building consistent exercise habits past 6 months.

CHAPTER SUMMARY

1. There are many different ways to take an active role in your health.
2. The ways highlighted in this chapter include taking control of five modifiable risk factors (physical activity, healthy diet, body weight, tobacco use, and alcohol consumption), becoming an advocate for your health with your healthcare team, and asking your family and friends for social support to help you **move more** and build healthy lifestyle habits.
3. Modifying or managing certain behaviours or taking initiative in your relationships with healthcare providers will help you increase your sense of control during your cancer journey.

REFERENCES

1. Stein, C. J. & Colditz, G. A. (2004). Modifiable risk factors for cancer. *British Journal of Cancer*, 90(2), 299-303. <https://doi.org/10.1038/sj.bjc.6601509>
2. Derksen, J., Beijer, S., Koopman, M., Verkooijen, H. V., Van de Poll-Franse, L., & May, A. (2018). Monitoring potentially modifiable lifestyle factors in cancer survivors: A narrative review on currently available methodologies and innovations for large-scale surveillance. *European Journal of Cancer*, 103, 327-40. <https://doi.org/10.1016/j.ejca.2018.06.017>
3. Government of Canada (2020). *Canada's food guide*. Food-Guide Canada. <https://food-guide.canada.ca/en/>
4. Centers for Disease Control and Prevention (2020, May 28). *Survivorship Care Plans*. Cancer Survivors. <https://www.cdc.gov/cancer/survivors/life-after-cancer/survivorship-care-plans.htm>
5. Heaney, C. A. & Israel, B. A. (2008). Social networks and social support. In K. Glanz, B. K. Reimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice*, (pp. 189-210)
6. Jenerette, C. M., & Mayer, D. K. (2016). Patient-Provider Communication: The Rise of Patient Engagement. *Seminars in Oncology Nursing*, 32(2), 134-143. doi:10.1016/j.soncn.2016.02.007
7. Morelli, S., Lee, I., Arnn, M., & Zaki, J. (2015). Emotional and instrumental support provision interact to predict well-being. *Emotion*, 15(4), 484-493. <https://doi.org/10.1037/emo0000084>
8. Oka, R. K., King, A. C., & Young, D. R. (1994). Sources of social support as predictors of exercise adherence in women and men ages 50 to 65 years. *Women's Health*, 1(2), 161-75.

Icons in this chapter are from Microsoft Word.

RESOURCES

Alberta Health Services: <https://www.albertahealthservices.ca/topics/Page14487.aspx>

Alberta Quits: <https://www.albertaquits.ca>

CancerControl Alberta: <https://www.albertahealthservices.ca/cancer/cancer.aspx>

Mayo Clinic Cancer Centre: <https://www.mayoclinic.org/departments-centers/mayo-clinic-cancer-center>

MD Andersen Cancer Centre: <https://www.mdanderson.org>

MyHealthAlberta: <https://myhealth.alberta.ca>

The Tobacco Atlas: <https://tobaccoatlas.org/topic/quitting/>

Chapter 4: The Role of Physical Activity and Exercise for Cancer Survivors

Contributor: Manuel Ester, BSc, MSc

LEARNING OBJECTIVES:

- ❖ UNDERSTAND THE DIFFERENCES BETWEEN MOVEMENT, PHYSICAL ACTIVITY, AND EXERCISE
- ❖ DISCUSS THE BENEFIT OF PHYSICAL ACTIVITY FOR:
 - PHYSICAL WELLNESS
 - PSYCHOSOCIAL WELLNESS
 - MANAGING TREATMENT-RELATED SIDE EFFECTS
 - IMPROVING QUALITY OF LIFE
- ❖ KNOW HOW PHYSICAL ACTIVITY FITS ALONG THE CANCER JOURNEY
 - PRE- AND POST- CANCER DIAGNOSIS
 - BEFORE, DURING, AND AFTER TREATMENT
 - IMPACTING CANCER RECURRENCE/SURVIVAL

This chapter reviews the key role of physical activity and exercise for individuals after a cancer diagnosis. Physical activity and exercise allow you to play an active role in your health and wellness. To begin, we distinguish between movement, physical activity, and exercise, words that are often used interchangeably but actually have slightly different definitions. Next, we discuss the well-documented benefits of physical activity for cancer survivors and review how physical activity fits along the cancer journey.

DEFINING MOVEMENT, PHYSICAL ACTIVITY, AND EXERCISE

You have likely heard the terms movement, physical activity, and exercise. They are often used interchangeably, when in fact, they are different. It is important to understand these terms so you can best plan for activity that will benefit your health and well-being.





Photograph: David Mollé

PHYSICAL ACTIVITY AND MOVEMENT

These are similar terms that define **any activity** carried out by skeletal muscle that requires energy¹. This can be job, sport, or household-related activity. Examples of physical activity or movement include walking up and down the stairs in your home or at work, playing frisbee with your dog, or doing household chores.

EXERCISE

Exercise is a subset of physical activity, that is specifically **planned, structured, and repeated** with the **goal of improving or maintaining physical health and fitness**¹. Examples of exercise include meeting with a friend every Monday afternoon for a brisk walk, running on the treadmill or doing a strength training circuit at your local recreation centre, or following along with an online workout at home in your living room.

It is good to think about physical activity and movement as overarching terms, with exercise as a planned and structured subset of physical activity. Cancer patients and survivors benefit from both physical activity and exercise, so do what you can to be active in your daily life (i.e. taking the stairs or parking further away) while trying to incorporate structured exercise into your routine (i.e. planned workouts on Monday, Wednesday, and Friday each week). All movement counts, and the goal is to limit inactivity as much as possible. Our key message is simple – **move more!**

KEY POINTS

1. Any movement of the body in daily life is considered physical activity, or movement
2. Exercise is a specific subset of physical activity that is planned, structured, and repeated to improve or maintain physical fitness and health
3. All movement counts, whether it is being active in daily life or doing structured exercise. Key message is to **move more**.

THE BENEFITS OF PHYSICAL ACTIVITY FOR CANCER PATIENTS AND SURVIVORS

The effects of physical activity for individuals affected by cancer has been well-studied, with consistent evidence that it is safe and beneficial for all cancer types and at every stage, from pre-diagnosis to long-term survival. There are **numerous physical and psychosocial benefits** associated with being physically active throughout the cancer journey. Have a look through the diagrams below for an overview of the wide range of benefits of physical activity.

IMPROVED

- **CARDIOVASCULAR FITNESS²**
- **MUSCLE STRENGTH & ENDURANCE³**
- **MOBILITY IN JOINTS⁴**
- **BODY COMPOSITION AND BONE HEALTH^{5,6}**
- **PHYSICAL FUNCTION⁷**
- **SLEEP QUALITY⁸**
- **IMMUNE SYSTEM FUNCTION⁹**

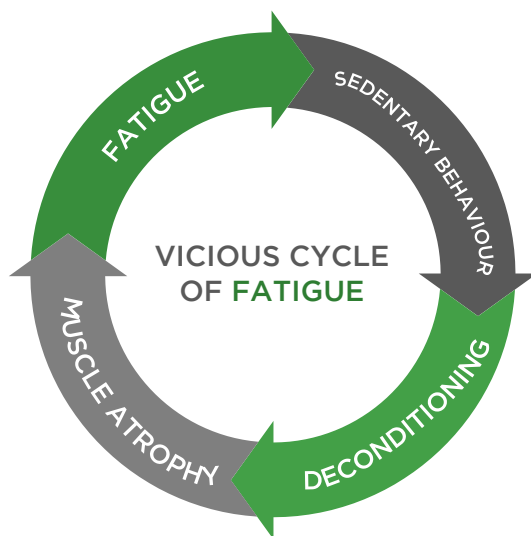


PHYSICAL BENEFITS

REDUCED

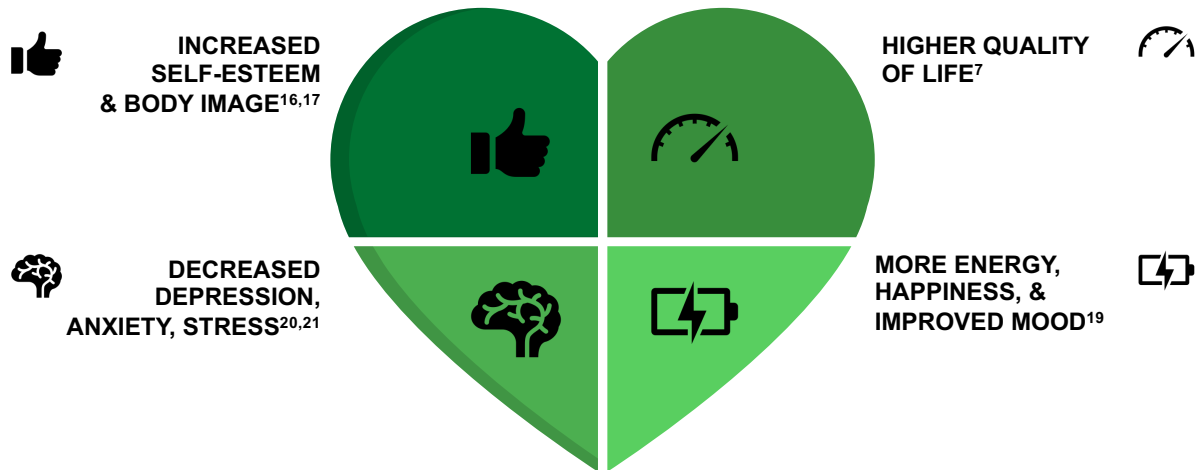
- **PAIN¹⁰**
- **NAUSEA¹¹**
- **FATIGUE^{12, 22, 23}**
- **BLOOD PRESSURE¹³**
- **MUSCLE WASTING¹⁴**
- **LYMPHEDEMA¹⁵**

Spotlight: Cancer-related fatigue



Cancer-related fatigue is the number one reported side effect of cancer and its treatment. As people feel tired, they tend to decrease their activity and become more deconditioned, leading to a vicious cycle of increasing fatigue. There are countless studies that have shown physical activity is effective in counteracting cancer-related fatigue. A 2017 review by Mustian compared data from 100+ studies (10,000+ participants) on 3 treatment approaches for cancer-related fatigue: pharmaceutical, psychological, and exercise²². The use of exercise therapy, alone or combined with psychological methods, was vastly superior to pharmaceutical interventions alone. Another review of nearly 9000 survivors (from 170 studies) found that aerobic, strength, and yoga-style exercise were all effective at reducing cancer-related fatigue²³.

PSYCHOSOCIAL BENEFITS



KEY POINTS

1. Physical activity has clear physical benefits: improving physical fitness, physical function, sleep, and immunity while reducing negative side effects of cancer.
2. Physical activity also increases self-esteem, body image, energy, mood, and happiness while decreasing depression, anxiety, and stress.
3. The physical and psychosocial effects of exercise lead to higher quality of life.

HOW DOES PHYSICAL ACTIVITY FIT ALONG THE CANCER JOURNEY?

Research shows that physical activity is safe and beneficial throughout the cancer journey, from before diagnosis and treatment into long term survivorship and palliative care. Depending on where you may be along the cancer journey, physical activity can have different benefits. This section summarizes some of the unique benefits of physical activity at each stage.



RESEARCH SPOTLIGHT!

Stout, N.L., Baima, J., Swisher, A.K., Winters-Stone, K.M., & Welsh, J. (2017)²⁴.

A systematic review of 51 systematic reviews, found that exercise is beneficial and safe (i.e. serious adverse events are uncommon) before, during, and after cancer across all cancer types and for a variety of cancer-related impairments. Further, the authors found that moderate to vigorous intensity exercise was the most effective for improving physical functioning and mitigating cancer-related impairments. Therapeutic exercise was beneficial to manage treatment related side-effects and treatment tolerance. **These results suggest that exercise plays a significant role across the cancer journey for managing well-being and improving patient outcomes.**

AN ACTIVE CANCER JOURNEY

Pre-Diagnosis

Reduced risk of developing various cancers

- 20% reduction in colorectal cancer for highly active individuals vs. sedentary²⁵
- 25% reduction in breast cancer²⁶
- Potential reduction for lung, endometrial, prostate, pancreatic, & stomach cancer²⁷⁻³⁰

During Treatment

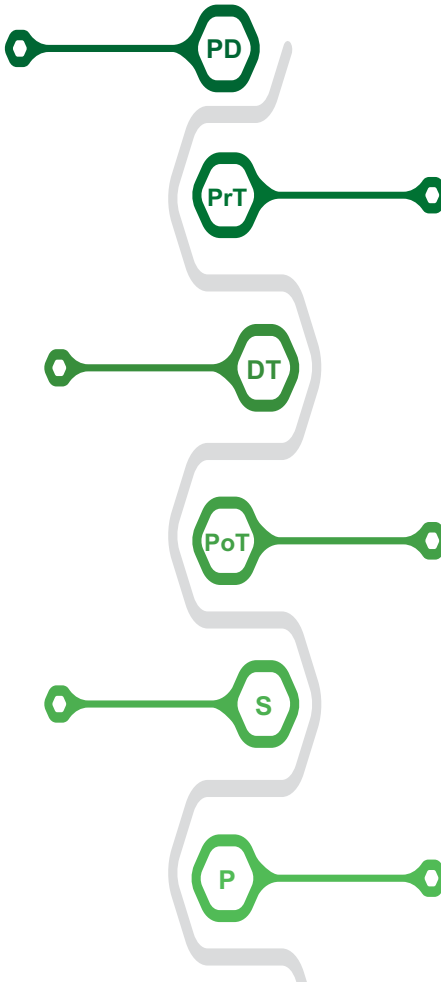
- Decreased fatigue, pain, & other side effects¹⁰⁻¹⁵
- Counteracts treatment-related decline in muscular strength/endurance & cardiovascular fitness^{2,3}
- Improved weight management (preventing extreme weight gain/loss)³³
- Reduced hospitalization time³⁴

Survival

Significantly reduced risk of

- Cancer recurrence^{37,39}
- Cancer mortality³⁵⁻³⁹
- All-cause mortality³⁵⁻³⁹

* Evidence from Breast, Colon, Ovarian, and Prostate cancer



Pre-Treatment

- Reduced emotional stress & improved coping^{31, 32}
- Maintained or improved fitness to increase treatment tolerance^{31,32}

Post-Treatment

Improved physical well-being

- Cardiovascular fitness, muscular strength, & endurance^{2,3}
- Mobility, body composition, immune system^{4,5,9}

Better psychosocial well-being

- Higher self-esteem¹⁶
- Reduced stress, depression, & anxiety^{20,21}

Reduced side effects

- Fatigue, pain, lymphedema, muscle wasting, & bone loss^{6,10-15}

Enhanced overall quality of life⁷

Palliation

- Better quality of life⁴⁰
- Decreased symptom frequency & severity
- Improved strength, mobility, & physical function

KEY POINTS

1. Physical activity is beneficial at all stages of the cancer journey.
2. Regular physical activity decreases the risk of some cancers while reducing the chances of recurrence and mortality in breast, colorectal, ovarian, and prostate cancer
3. If possible, it is best to maintain physical activity before, during, and after treatment. Doing so has numerous physical, psychological, and treatment-specific benefits that improve recovery and enhance long-term quality of life.
4. All cancer survivors benefit from moving more, and this lifestyle change can be made at any time. It's never too late to make a positive change for your health.

CHAPTER SUMMARY: BENEFITS OF PHYSICAL ACTIVITY FOR CANCER SURVIVORS

	Benefits of Exercise
Treatment response and managing side effects	<ul style="list-style-type: none"> ↑ treatment tolerance/completion ↓ frequency and severity of side effects (weakness, muscle wasting, and lymphedema) ↑ bone health and physical function ↓ short- and long-term cancer-related fatigue
Mental health	<ul style="list-style-type: none"> ↓ depressive symptoms and anxiety ↑ emotional well-being ↑ sleep quality ↑ mood/happiness
Quality of life	<ul style="list-style-type: none"> ↑ health-related quality of life ↑ across other aspects contributing to quality of life
Recurrence/survival	<ul style="list-style-type: none"> ↑ survival and ↓ recurrence (breast, colorectal, ovarian, and prostate) ↓ all-cause mortality

REFERENCES

1. Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public health rep*, 100(2), 126-31.
2. Scott, J. M., Zabor, E. C., Schwitzer, E., Koelwyn, G. J., Adams, S. C., Nilsen, T. S., ... & Jones, L. W. (2018). Efficacy of exercise therapy on cardiorespiratory fitness in patients with cancer: a systematic review and meta-analysis. *Journal of Clinical Oncology*, 36(22), 2297.
3. Fuller, J. T., Hartland, M. C., Maloney, L. T., & Davison, K. (2018). Therapeutic effects of aerobic and resistance exercises for cancer survivors: a systematic review of meta-analyses of clinical trials. *British journal of sports medicine*, 52(20), 1311-1311.
4. Dennett, A. M., Peiris, C. L., Shields, N., Prendergast, L. A., & Taylor, N. F. (2016). Moderate-intensity exercise reduces fatigue and improves mobility in cancer survivors: a systematic review and meta-regression. *Journal of physiotherapy*, 62(2), 68-82.
5. Padilha, C. S., Marinello, P. C., Galvao, D. A., Newton, R. U., Borges, F. H., Frajacomo, F., & Deminice, R. (2017). Evaluation of resistance training to improve muscular strength and body composition in cancer patients undergoing neoadjuvant and adjuvant therapy: a meta-analysis. *Journal of Cancer Survivorship*, 11(3), 339-349.
6. Dalla Via, J., Daly, R. M., & Fraser, S. F. (2018). The effect of exercise on bone mineral density in adult cancer survivors: a systematic review and meta-analysis. *Osteoporosis International*, 29(2), 287-303.
7. Buffart, L. M., Kalter, J., Sweegers, M. G., Courneya, K. S., Newton, R. U., Aaronson, N. K., ... & Steindorf, K. (2017). Effects and moderators of exercise on quality of life and physical function in patients with cancer: an individual patient data meta-analysis of 34 RCTs. *Cancer treatment reviews*, 52, 91-104.
8. Chiu, H. Y., Huang, H. C., Chen, P. Y., Hou, W. H., & Tsai, P. S. (2015). Walking improves sleep in individuals with cancer: a meta-analysis of randomized, controlled trials. *Oncology nursing forum*, 42(2), e54-62.
9. Fairey, A. S., Courneya, K. S., Field, C. J., & Mackey, J. R. (2002). Physical exercise and immune system function in cancer survivors: a comprehensive review and future directions. *Cancer*, 94(2), 539-551.
10. McNeely, M. L., Parliament, M. B., Seikaly, H., Jha, N., Magee, D. J., Haykowsky, M. J., & Courneya, K. S. (2008). Effect of exercise on upper extremity pain and dysfunction in head and neck cancer survivors: a randomized controlled trial. *Cancer*, 113(1), 214-222.
11. Winningham, M. L., & MacVicar, M. G. (1988). The effect of aerobic exercise on patient reports of nausea. *Oncology nursing forum*, 15(4), 447-450.

12. Meneses-Echávez, J. F., González-Jiménez, E., & Ramírez-Vélez, R. (2015). Effects of supervised multimodal exercise interventions on cancer-related fatigue: systematic review and meta-analysis of randomized controlled trials. *BioMed research international*, 2015.
13. Basen-Engquist, K., Carmack, C., Brown, J., Jhingran, A., Baum, G., Song, J., ... & Lu, K. H. (2014). Response to an exercise intervention after endometrial cancer: differences between obese and non-obese survivors. *Gynecologic oncology*, 133(1), 48-55.
14. Hardee, J. P., Counts, B. R., & Carson, J. A. (2019). Understanding the role of exercise in cancer cachexia therapy. *American journal of lifestyle medicine*, 13(1), 46-60.
15. Baumann, F. T., Reike, A., Hallek, M., Wiskemann, J., & Reimer, V. (2018). Does exercise have a preventive effect on secondary lymphedema in breast cancer patients following local treatment-a systematic review. *Breast care*, 13(5), 380-385.
16. Courneya, K. S., Segal, R. J., Mackey, J. R., Gelmon, K., Reid, R. D., Friedenreich, C. M., ... & Yasui, Y. (2007). Effects of aerobic and resistance exercise in breast cancer patients receiving adjuvant chemotherapy: a multicenter randomized controlled trial. *Journal of clinical oncology*, 25(28), 4396-4404.
17. Pinto, B. M., Clark, M. M., Maruyama, N. C., & Feder, S. I. (2003). Psychological and fitness changes associated with exercise participation among women with breast cancer. *Psycho-Oncology: Journal of the Psychological, Social and Behavioral Dimensions of Cancer*, 12(2), 118-126.
18. Knobf, M. T., Musanti, R., & Dorward, J. (2007). Exercise and quality of life outcomes in patients with cancer. *Seminars in oncology nursing*, 23(4), 285-296.
19. Rabin, C., Pinto, B., Dunsiger, S., Nash, J., & Trask, P. (2009). Exercise and relaxation intervention for breast cancer survivors: feasibility, acceptability and effects. *Psycho-Oncology: Journal of the Psychological, Social and Behavioral Dimensions of Cancer*, 18(3), 258-266.
20. Brown, J. C., Huedo-Medina, T. B., Pescatello, L. S., Ryan, S. M., Pescatello, S. M., Moker, E., ... & Johnson, B. T. (2012). The efficacy of exercise in reducing depressive symptoms among cancer survivors: a meta-analysis. *PLoS one*, 7(1).
21. Mishra, S. I., Scherer, R. W., Geigle, P. M., Berlanstein, D. R., Topaloglu, O., Gotay, C. C., & Snyder, C. (2012). Exercise interventions on health-related quality of life for cancer survivors. *Cochrane Database of Systematic Reviews*, (8).
22. Mustian, K. M., Alfano, C. M., Heckler, C., Kleckner, A. S., Kleckner, I. R., Leach, C. R., ... & Scarpato, J. (2017). Comparison of pharmaceutical, psychological, and exercise treatments for cancer-related fatigue: a meta-analysis. *JAMA oncology*, 3(7), 961-968.
23. Oberoi, S., Robinson, P. D., Cataudella, D., Culos-Reed, S. N., Davis, H., Duong, N., ... & Tomlinson, D. (2018). Physical activity reduces fatigue in patients with cancer and hematopoietic stem cell transplant recipients: a systematic review and meta-analysis of randomized trials. *Critical reviews in oncology/hematology*, 122, 52-59.

24. Stout, N. L., Baima, J., Swisher, A. K., Winters-Stone, K. M., & Welsh, J. (2017). A systematic review of exercise systematic reviews in the cancer literature (2005-2017). *PM&R*, 9(9), S347-S384.
25. Huxley, R. R., Ansary-Moghaddam, A., Clifton, P., Czernichow, S., Parr, C. L., & Woodward, M. (2009). The impact of dietary and lifestyle risk factors on risk of colorectal cancer: a quantitative overview of the epidemiological evidence. *International journal of cancer*, 125(1), 171-180.
26. Friedenreich, C. M. (2010). Physical activity and breast cancer: review of the epidemiologic evidence and biologic mechanisms. In *Clinical Cancer Prevention* (pp. 125-139). Springer, Berlin, Heidelberg.
27. Calle, E. E., & Kaaks, R. (2004). Overweight, obesity and cancer: epidemiological evidence and proposed mechanisms. *Nature Reviews Cancer*, 4(8), 579-591.
28. Giovannucci, E. L., Liu, Y., Leitzmann, M. F., Stampfer, M. J., & Willett, W. C. (2005). A prospective study of physical activity and incident and fatal prostate cancer. *Archives of internal medicine*, 165(9), 1005-1010.
29. O'Rorke, M. A., Cantwell, M. M., Cardwell, C. R., Mulholland, H. G., & Murray, L. J. (2010). Can physical activity modulate pancreatic cancer risk? A systematic review and meta-analysis. *International journal of cancer*, 126(12), 2957-2968.
30. Leitzmann, M. F., Koenig, C., Abnet, C. C., Freedman, N. D., Park, Y., Hollenbeck, A., ... & Schatzkin, A. (2009). Prospective study of physical activity and lung cancer by histologic type in current, former, and never smokers. *American journal of epidemiology*, 169(5), 542-553.
31. Schmitz, K. H., Courneya, K. S., Matthews, C., Demark-Wahnefried, W., Galvão, D. A., Pinto, B. M., ... & Schneider, C. M. (2010). American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. *Medicine & Science in Sports & Exercise*, 42(7), 1409-1426.
32. Spence, R. R., Heesch, K. C., & Brown, W. J. (2010). Exercise and cancer rehabilitation: a systematic review. *Cancer treatment reviews*, 36(2), 185-194.
33. Demark-Wahnefried, W., Campbell, K. L., & Hayes, S. C. (2012). Weight management and its role in breast cancer rehabilitation. *Cancer*, 118(S8), 2277-2287.
34. Ahn, K. Y., Hur, H., Kim, D. H., Min, J., Jeong, D. H., Chu, S. H., ... & Jeon, J. Y. (2013). The effects of inpatient exercise therapy on the length of hospital stay in stages I-III colon cancer patients: randomized controlled trial. *International journal of colorectal disease*, 28(5), 643-651.
35. Meyerhardt, J. A., Giovannucci, E. L., Holmes, M. D., Chan, A. T., Chan, J. A., Colditz, G. A., & Fuchs, C. S. (2006). Physical activity and survival after colorectal cancer diagnosis. *Journal of clinical oncology*, 24(22), 3527-3534.

36. Kenfield, S. A., Stampfer, M. J., Giovannucci, E., & Chan, J. M. (2011). Physical activity and survival after prostate cancer diagnosis in the health professionals follow-up study. *Journal of Clinical Oncology*, 29(6), 726.
37. Ibrahim, E. M., & Al-Homaidh, A. (2011). Physical activity and survival after breast cancer diagnosis: meta-analysis of published studies. *Medical oncology*, 28(3), 753-765.
38. Gunnell, A. S., Joyce, S., Tomlin, S., Taaffe, D. R., Cormie, P., Newton, R. U., ... & Galvão, D. A. (2017). Physical activity and survival among long-term cancer survivor and non-cancer cohorts. *Frontiers in public health*, 5, 19.
39. Cormie, P., Zopf, E. M., Zhang, X., & Schmitz, K. H. (2017). The impact of exercise on cancer mortality, recurrence, and treatment-related adverse effects. *Epidemiologic reviews*, 39(1), 71-92.
40. Centemero, A., Rigatti, L., Giraud, D., Lazzeri, M., Lughezzani, G., Zugna, D., ... & Guazzoni, G. (2010). Preoperative pelvic floor muscle exercise for early continence after radical prostatectomy: a randomised controlled study. *European urology*, 57(6), 1039-1044.

Icons in this chapter are from Microsoft Word.

RESOURCES

Alberta Cancer Foundation - My Journey Booklet:

<https://giving.albertacancer.ca/document.doc?id=905>

American Cancer Society: Survivorship during and after treatment:

<https://www.cancer.org/treatment/survivorship-during-and-after-treatment.html>

American Institute for Cancer Research - Living With Cancer Resource:

<https://www.aicr.org/>

BC Cancer Survivorship Resources: <http://www.bccancer.bc.ca/our-services/services/library/recommended-websites/living-with-cancer-websites/survivorship-websites>

Canadian Cancer Society After Treatment Ends: <https://www.cancer.ca/en/cancer-information/living-with-cancer/after-treatment-ends/?region=on>

Canadian Cancer Society Life after Cancer: <http://www.cancer.ca/en/cancer-information/cancer-journey/life-after-cancer/>

Cancer Survivorship: <https://www.cancer.net/survivorship>

Canadian Cancer Survivor Network: <https://survivornet.ca/>

Memorial Sloan Kettering Cancer Center - Living Beyond Cancer:

<https://www.mskcc.org/experience/living-beyond-cancer>

Chapter 5: Guidelines & Getting Started

Contributor: Julia Daun, BKin, MSc, CSEP-Clinical Exercise Physiologist

As they say, sometimes the hardest part is getting started! We want to make that part easier by providing these infographics which outline the benefits and guidelines for physical activity! Print them and post them in your home for an easy reminder to be active daily.

CANCER & EXERCISE GUIDELINES



WHAT IS RECOMMENDED FOR CANCER SURVIVORS?

- LIMIT INACTIVITY
- MOVE AS MUCH AS YOU CAN, WHEN YOU CAN. SOME IS GOOD, MORE IS BETTER.
- AIM TO INCORPORATE ALL THREE TYPES OF RECOMMENDED EXERCISE INTO YOUR LIFESTYLE:

AEROBIC ACTIVITY	STRETCHING	STRENGTH
90 MINUTES OF MODERATE INTENSITY / WEEK (ex. walking, biking, dancing)	ON MOST DAYS OF THE WEEK (ex. yoga, deep breathing)	2 DAYS / WEEK (ex. resistance training, balance)

EXERCISE FOR CANCER SURVIVORS IS: SAFE, BENEFICIAL, & RECOMMENDED FOR ALL

FOR MORE INFORMATION:

THRIVE HEALTH | HEALTH & WELLNESS LAB | ACE - ALBERTA CANCER EXERCISE

www.thrivehealthservices.com | https://www.ucalgary.ca/healthandwellnesslab | https://www.albertacancerexercise.com

@abiletotrive | MOVE MORE | Thrive HEALTH

Photographs: Julia Daun

INFOGRAPHIC #1 – CANCER AND EXERCISE GUIDELINES

This infographic provides an overview of the specific cancer and exercise guidelines. These guidelines were created based on years of research in exercise oncology. As the title suggests, think of these as a “*guideline*” – work towards these guidelines slowly and make modifications as needed. See below for the full infographic!

CANCER & EXERCISE: LET’S GET ACTIVE!



WHAT ARE THE BENEFITS?

PHYSICAL BENEFITS	PSYCHOLOGICAL BENEFITS
↓ FATIGUE	↓ DEPRESSION
↓ LYMPHEDEMA	↑ QUALITY OF LIFE
↑ PHYSICAL FUNCTION	↑ EMOTIONAL WELL-BEING
↑ BONE HEALTH	↑ SLEEP QUALITY

HOW TO GET STARTED:

- ALL MOVEMENT COUNTS.
- TAKE THE STAIRS WHEN & IF YOU CAN.
- PARK FURTHER AWAY.
- GET ACTIVE WITH A FRIEND.
- CHOOSE ACTIVITIES YOU ENJOY.
- LISTEN TO YOUR BODY.

FIND OUT MORE:

THRIVE HEALTH | HEALTH & WELLNESS LAB | ACE - ALBERTA CANCER EXERCISE

www.thrivehealthservices.com | https://www.ucalgary.ca/healthandwellnesslab | https://www.albertacancerexercise.com

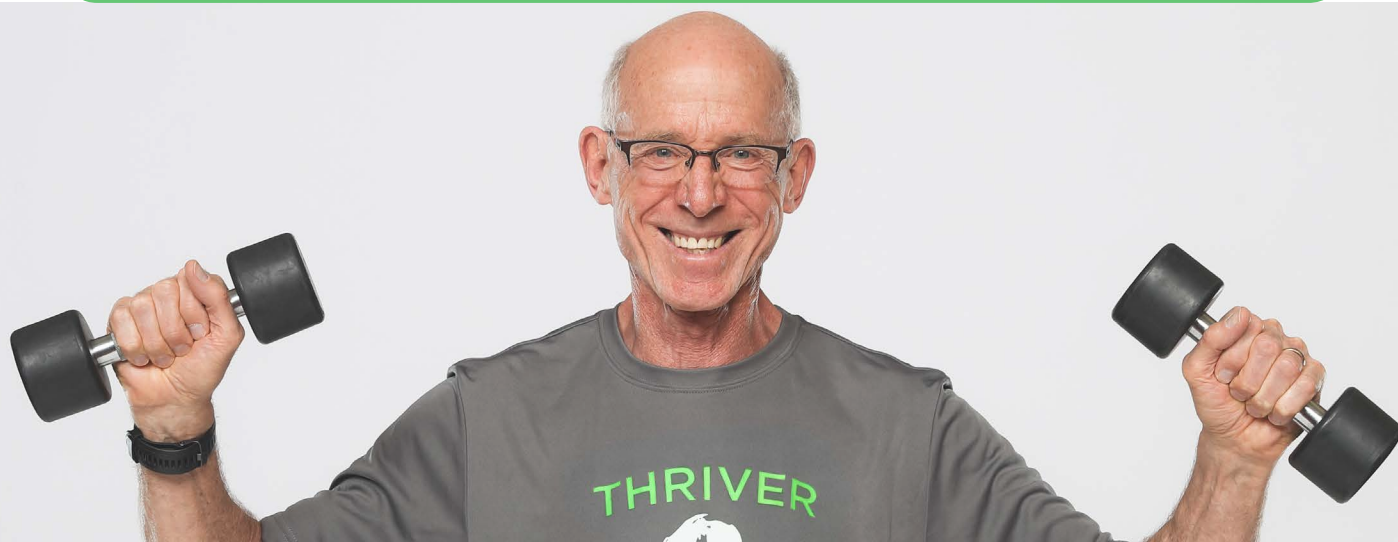
@abiletotrive | MOVE MORE | Thrive HEALTH

INFOGRAPHIC #2 – LET’S GET ACTIVE!

This infographic provides an overview of the benefits of exercise throughout the cancer continuum. Use this infographic as a guide to remind you of the benefits, and for tips on how to get started. See below for the full infographic!

CANCER & EXERCISE GUIDELINES

WHAT IS RECOMMENDED FOR CANCER SURVIVORS?



LIMIT INACTIVITY

MOVE AS MUCH AS YOU CAN, WHEN YOU CAN
SOME IS GOOD, MORE IS BETTER

AIM TO INCORPORATE ALL THREE TYPES OF RECOMMENDED
EXERCISE INTO YOUR LIFESTYLE:

AEROBIC ACTIVITY

90 MINUTES OF MODERATE
INTENSITY/WEEK

(ex: walking, biking, dancing)



STRETCHING

ON MOST DAYS OF THE WEEK

(ex: yoga, deep breathing)



STRENGTH

2 DAYS/WEEK

(ex: resistance training, balance)



EXERCISE FOR CANCER SURVIVORS IS: SAFE, BENEFICIAL, & RECOMMENDED FOR ALL

FOR MORE INFORMATION:

THRIVE HEALTH
www.thrivehealthservices.com

HEALTH & WELLNESS LAB
<https://www.ucalgary.ca/healthandwellnesslab>

ACE - ALBERTA CANCER EXERCISE
<https://www.albertacancerexercise.com>



@abletothrive

MOVE MORE



CANCER & EXERCISE: LET'S GET ACTIVE!

WHAT ARE THE BENEFITS?

PHYSICAL BENEFITS



↓ FATIGUE

↓ LYMPHEDEMA

↑ PHYSICAL FUNCTION

↑ BONE HEALTH

PSYCHOLOGICAL BENEFITS



↓ DEPRESSION

↑ QUALITY OF LIFE

↑ EMOTIONAL WELL-BEING

↑ SLEEP QUALITY

HOW TO GET STARTED:

ALL
MOVEMENT
COUNTS.

TAKE THE
STAIRS
WHEN & IF
YOU CAN.

PARK
FURTHER
AWAY.

GET ACTIVE
WITH A
FRIEND.

CHOOSE
ACTIVITIES
YOU ENJOY.

LISTEN TO
YOUR BODY.

FIND OUT MORE:

THRIVE HEALTH
www.thrivehealthservices.com

HEALTH & WELLNESS LAB
<https://www.ucalgary.ca/healthandwellnesslab>

ACE - ALBERTA CANCER EXERCISE
<https://www.albertacancerexercise.com>

Chapter 6: Let's Get Active!

Contributor: Julia Daun, BKin, MSc, CSEP-Clinical Exercise Physiologist

LEARNING OBJECTIVES:

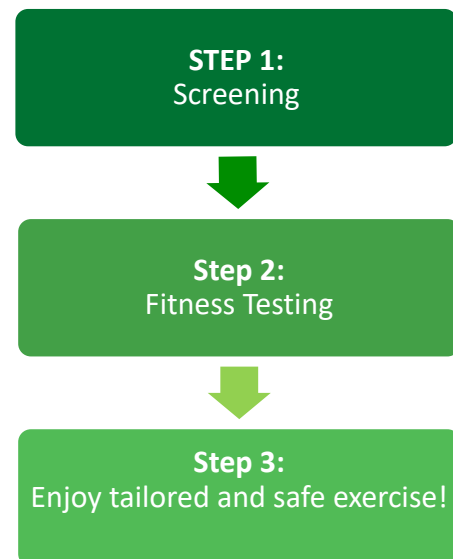
- ❖ GETTING STARTED – UNDERSTAND THE FIRST STEPS IN ENSURING A NEW PHYSICAL ACTIVITY PROGRAM IS RIGHT FOR YOU
- ❖ LEARN THE DIFFERENT TYPES OF EXERCISE, ALONG WITH DEFINITIONS, RECOMMENDATIONS, AND BENEFITS

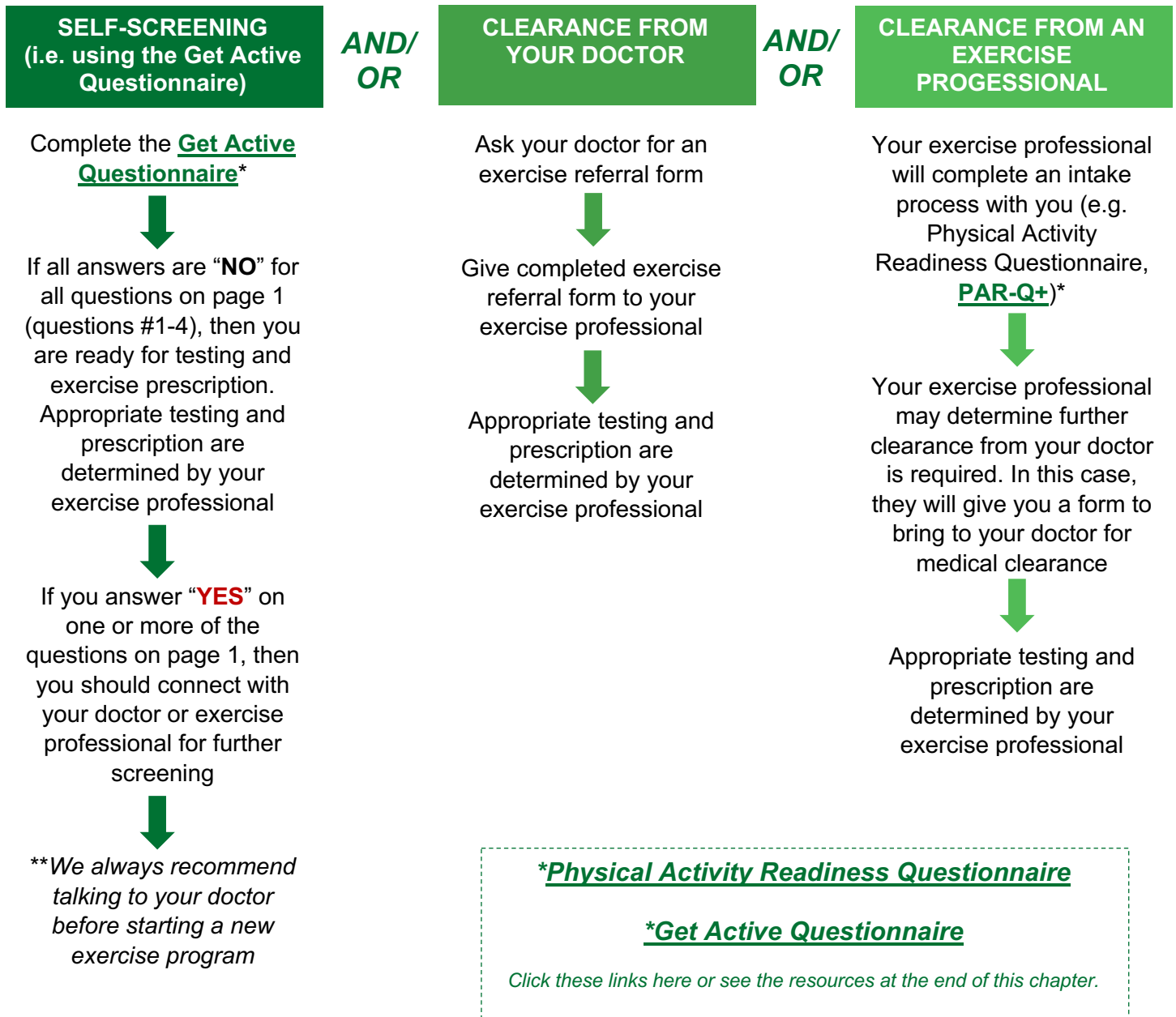
Up to now, we've talked about the role of physical activity and exercise for cancer survivors and the recommended exercise guidelines, but what comes next? In this chapter, we will be talking about taking the right steps to ensure a new physical activity program is right for you. We will also discuss the different types of activities that form our exercise guidelines! To better understand how to prepare yourself for an activity program, we will cover details of screening (e.g. why going over your medical history and overall health status is important), meeting with an exercise professional for testing and exercise prescription, and putting it all together into an exercise program individualized for you. We will also discuss the types of exercise that are important to incorporate into your daily life, which include, aerobic, resistance, balance, and flexibility training. These four types of exercise work together to keep your heart, muscles, bones, and joints working like a well-oiled machine!

GETTING STARTED – UNDERSTAND THE FIRST STEPS TO ENSURE A NEW PHYSICAL ACTIVITY PROGRAM IS RIGHT FOR YOU

STEP 1: SCREENING








Prior to beginning a new physical activity program, it is important to obtain clearance from either your doctor (e.g. Family Doctor, Oncologist) or an exercise professional (e.g. Clinical Exercise Physiologist) to ensure safety, individualization, effectiveness, and enjoyment^{1,2}. As you transition from your cancer diagnosis through treatment and into survivorship, obtaining a comprehensive assessment of your medical history, health status, personal goals, and purpose for exercising/moving more is of utmost importance³.





STEP 2: FITNESS TESTING

After receiving clearance for exercise, you may want more information about your current fitness level. This can be very helpful when tailoring an exercise program that is safe and effective. If you are working with an exercise professional, they may take you through a variety of fitness tests. The purpose of fitness testing is to establish a baseline for your overall physical functioning¹. Your exercise professional will select tests that are appropriate for you¹. This is how your exercise professional will design your tailored exercise program and prescription¹. Prescription is based on:

- **Cardiopulmonary characteristics** (e.g. heart rate and blood pressure) 
- **Cardiorespiratory health** (e.g. aerobic fitness of the heart, lungs and vascular system) 
- **Body composition** (e.g. height, weight, waist & hip circumference) 
- **Muscular endurance** (e.g. ability of your muscles to exert a force over time) 
- **Muscular strength** (e.g. amount of force your muscles can produce) 
- **Flexibility** (e.g. range of motion) 
- **Balance** (e.g. ability to maintain centre of gravity) 

In addition to designing a program based on your fitness testing results, it is important to consider your individual goals, preferences for activity, and accessibility of resources (e.g. available equipment or access to recreation centre)^{1,2}.



STEP 3: ENJOY TAILORED AND SAFE EXERCISE

Once you have an individualized exercise prescription and program, it's time to move! It's important to note that many of the above-mentioned fitness components may change during and after treatment. It is therefore important that you work closely with your healthcare team and an exercise professional to monitor changes and adjust your program as necessary¹. See Chapter 7 for more on how to tailor your exercise, to ensure safety and optimize potential benefits.

HOW DO I FIND AN EXERCISE PROFESSIONAL?



Seeking a fitness professional trained to work with cancer survivors is important to ensure you are receiving the most appropriate guidance. Training qualifications vary widely in the fitness industry, so taking time to understand the qualifications of the fitness professional you are working with is important. Below is a table outlining the designations of fitness professionals in Canada.

FINDING AN EXERCISE PROFESSIONAL

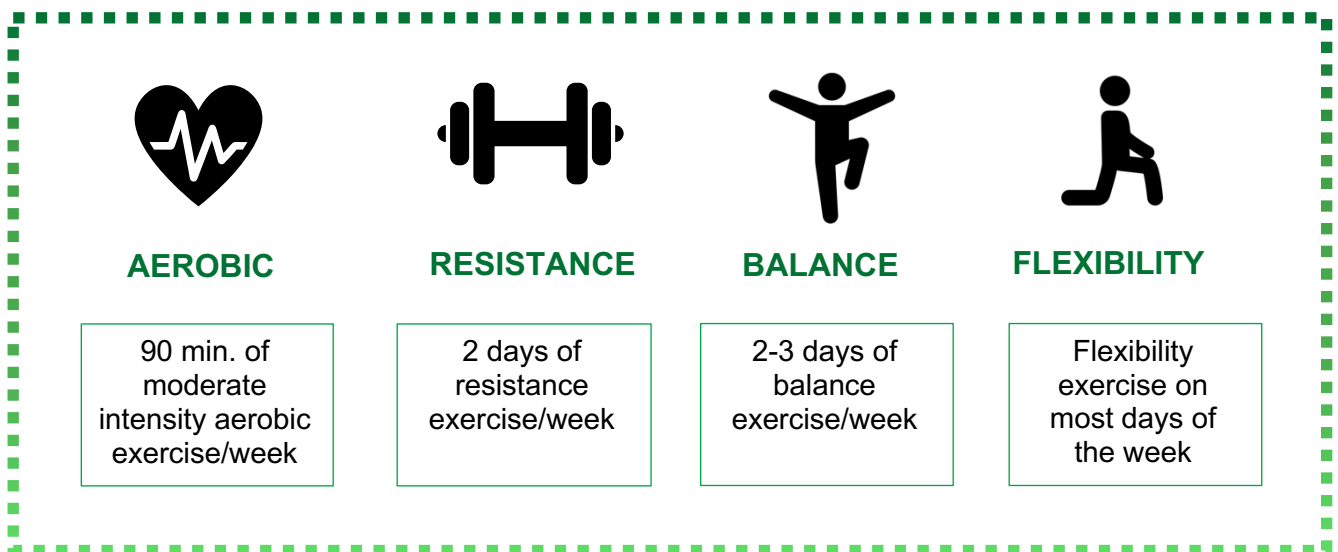
CSEP-CEP	CSEP-CPT	CANCER & EXERCISE CERTIFICATION
<p>The Canadian Society for Exercise Physiology (CSEP) – Clinical Exercise Physiologist (CEP) is the National Gold Standard in Canada.</p> <p>A CSEP-CEP has the highest designation to work with anyone and is able to clear you for exercise, perform any fitness test, and prescribe exercise.</p>	<p>The Canadian Society for Exercise Physiology (CSEP) – Certified Personal Trainer (CPT) is trained to perform certain fitness testing, as well as work with various populations.</p> <p>A CSEP-CPT is not qualified to assess or prescribe exercise for those with chronic diseases.</p>	<p>An additional certification that gives fitness professionals the necessary education to work with cancer survivors.</p> <p>This type of certification often entails cancer epidemiology, prevalence, diagnosis, treatment modalities, side-effects, and tumour-specific guidelines for modifying exercise.</p> <p>Ask your fitness professional if they have completed a cancer & exercise certification.</p> <p>Check out the Thrive Health Services website for a list of Thrive 5 Cancer and Exercise certified trainers!</p>
<p align="center">INTERNATIONAL EQUIVALENTS:</p> <p>American College of Sports Medicine (ACSM)-Certified Exercise Physiologist (United States)</p> <p>Exercise & Sports Science Australia (ESSA)-Accredited Exercise Physiologist (Australia)</p>	<p align="center">INTERNATIONAL EQUIVALENTS:</p> <p>ACSM-Certified Personal Trainer (United States)</p>	
<p align="center"><u>FIND A CEP:</u></p> <p align="center">https://www.ucalgary.ca/healthandwellnesslab/</p>	<p align="center"><u>FIND A CPT:</u></p> <p align="center">https://www.ucalgary.ca/healthandwellnesslab/</p>	<p align="center"><u>FIND A CANCER & EXERCISE COURSE:</u></p> <p align="center">https://thrivehealthservices.com/professionals/</p>

KEY POINTS

1. Obtaining clearance to exercise is an important first-step. Either your doctor or an exercise professional can assess your readiness to be more active.
2. Screening & fitness testing ensures all factors related to your diagnosis, treatment plan, and individual considerations are included in your exercise program.
3. Find the right exercise professional - one with a Cancer and Exercise Certification is important for appropriate training recommendations.

THE DIFFERENT TYPES OF EXERCISE AND THEIR DEFINITION, RECOMMENDATIONS, AND BENEFITS

Engaging in a variety of exercise methods is important to ensure optimal health benefits². This includes **aerobic** exercise, **resistance** exercise, **balance** exercise, and **flexibility** exercise.



1. AEROBIC EXERCISE



Definition: Aerobic exercise, also known as ‘*cardio*,’ (i.e. cardiovascular exercise) includes movements that speed up your heart rate and breathing rate for a period of time². Aerobic exercise can be performed in many different forms, such as walking, running, swimming, dancing, etc.²

Recommendations: It is recommended for cancer survivors to aim for at least a total of 90-minutes of moderate aerobic exercise per week⁴.

The Benefits: Improved cardiovascular (heart and blood vessel) health, increased lung capacity, reduced risk of cardiovascular complications, improved overall physical well-being.

The Role: Aerobic exercise plays a large role in maintaining healthy blood pressure, blood lipid levels, healthy weight, managing/preventing chronic disease, and overall functioning.

Examples: Walking, running, swimming, dancing, taking the stairs, biking, hiking, skiing, snowshoeing, organized sports, aerobic exercise classes, skipping rope, hula-hooping.

2. RESISTANCE EXERCISE



Definition: Resistance exercise, also known as ‘*strength training*,’ is any exercise that causes muscles to contract (e.g. lifting, pulling, pushing, or holding a weighted object or using bodyweight)². Resistance exercise helps to build muscle mass. As you age, along with taking certain medications and treatments, you begin to lose muscle mass; resistance exercise helps to both maintain and build it back².

Recommendations: It is recommended for cancer survivors to aim for at least 2 days of resistance exercise per week, including major muscle groups and whole-body movements (e.g. sit-to-stand)⁴.

The Benefits: Improved body composition (e.g. increased muscle mass, decreased fat mass), improved strength, increased physical function, and improved bone health.

The Role: Resistance exercise plays a large role in overall musculoskeletal (i.e. muscles and bones) health. Resistance exercise is important for maintaining functional body movement to help you carry out activities of daily living.

Examples: Sit-to-stand (you can do this from your couch or a chair at home), squat, push-up, lunge, row, bicep curl.

3. BALANCE EXERCISE



Definition: Balance training includes exercises that train your muscles to be stronger and more efficient at keeping you upright when performing activities of daily living (e.g. getting dressed, walking). Balance is key in preventing falls.

Recommendations: It is recommended for cancer survivors to incorporate 2-3 days of balance and stability exercise per week⁴.

The Benefits: Increased core strength, improved stability and execution of activities of daily living, decreased risk of falling, enhanced independence, and quality of life².

The Role: Balance and stability exercise plays a large role in preventing falls and allowing you to perform functional, everyday movements.

Examples: Standing on one leg, tree pose, wobble boards, walking in a straight line.

4. FLEXIBILITY EXERCISE



Definition: Flexibility exercise, also known as *mobility training*, is an exercise performed to lengthen a muscle in order to allow your body to move more freely².

Recommendations: It is recommended for cancer survivors to incorporate flexibility exercise on most days of the week.

The Benefits: Improved range of motion of joints, improved posture, decreased risk of injuries, improved physical performance.

The Role: Flexibility exercise plays a large role in maintaining joint health and your ability to perform various functional movements without pain and/or difficulty.

Examples: Yoga, Tai Chi, Pilates, stretching.

REST & RECOVERY



Although incorporating all types of recommended exercise into your lifestyle is important, allowing for at least one full day for rest and recovery is essential to allow your muscles, nerves, bones, and connective tissue time to rebuild^{1,2}. Along with exercise, sleep and nutrition comprise the “*three pillars*” for optimal health. These three pillars tend to have a reciprocal relationship, meaning one affects the other, and vice versa. For example, if one night you don’t get enough sleep, it might impact how you engage in exercise (e.g. you may not feel as energized). Similarly, if you wake up from a restful sleep, you might find you have more energy for exercise, or notice you recover faster⁵! Nutrition also plays a key role in this relationship, as certain foods may give you more energy, and help your muscles recover faster as well⁶. Check out the table below for some ideas of what you can do on your “*rest day*.”

REST DAY IDEAS		
REST & RELAX	REFUEL	ACTIVE RECOVERY
<ul style="list-style-type: none"> • Take a bath or a long, relaxing shower. • Practice self-care. What’s something that you could do to take care yourself (other than exercise, of course!)? • Sleep – ensuring you are getting enough sleep is important for muscle recovery and energy levels! • Connect with family and friends. 	<ul style="list-style-type: none"> • Fuel your body with your favourite nutritious foods, such as fruits, vegetables, and proteins. • Replenish your liquids after you’ve been active – drink lots of water! This is important even the day after (or before!) you exercise. 	<ul style="list-style-type: none"> • Engaging in some light movement can often help decrease muscle soreness. This could look like light stretches on a warm body (after a hot shower or bath) or go for a light/quick walk. • Plank your next week of activities! See <i>Chapter 9 – Making it Stick</i> for ideas on how to make exercise more sustainable!

RESEARCH SPOTLIGHT!

Ross, R., Chaput, J.P., Giangregorio, L.M., ... & Duggan, M. (2020)⁷.

The Canadian Society for Exercise Physiology (CSEP) published Canada's first-ever 24-hour movement guidelines for adults (ages 18-65). Within these guidelines, CSEP emphasizes that the whole day matters – including **physical activity**, **sedentary**, and **sleep behaviours**. It is recommended that adults **(1)** move more by adding movement throughout the day, including a variety of exercise types and intensities, **(2)** limit sedentary time to 8 hours or less per day including no more than 3 hours of recreational screen time, and breaking up long “sitting” periods where possible, **(3)** sleep well by obtaining good quality sleep on a regular basis; 7-9 hours of for those ages 18-64, and 7-8 hours for those 65+ years.

KEY POINTS

1. Incorporating a variety of exercises is important for optimal health results.
2. Recommended exercises include aerobic, resistance, balance and flexibility training.
3. Rest & recovery is an important part of your physical activity program.

CHAPTER SUMMARY

1. The first step in beginning a new physical activity program is obtaining clearance from your doctor or an exercise professional.
2. Screening and fitness testing are the basis for exercise prescription and is determined by both the exercise professional and the individual.
3. It is recommended that you seek guidance from an accredited exercise professional, such as a CSEP-Clinical Exercise Physiologist with cancer & exercise-specific training.
4. It is recommended that cancer survivors engage in a variety of exercise, including aerobic, resistance, balance, and flexibility training, as well as ensuring proper rest and recovery at least one day of the week.

REFERENCES

1. Culos-Reed SN, Capozzi LC. (2016). *Cancer and Exercise: Training Manual for Fitness Professionals*, 4th Edition [Manual]. Calgary, Alberta: University of Calgary.
2. Canadian Society for Exercise Physiology (CSEP). (2019). *Physical Activity Training for Health (CSEP-PATH)*, 2nd Edition [Manual]. Ottawa, Ontario: Health Canada.
3. Courneya, K. S. (2010). Efficacy, effectiveness, and behavior change trials in exercise research. *International Journal of Behavioral Nutrition and Physical Activity*, 7(1), 81.
4. Campbell, K. L., Winters-Stone, K. M., Wiskemann, J., May, A. M., Schwartz, A. L., Courneya, K. S., ... & Morris, G. S. (2019). Exercise guidelines for cancer survivors: consensus statement from international multidisciplinary roundtable. *Medicine & Science in Sports & Exercise*, 51(11), 2375-2390.
5. Halson, S. L. (2008). Nutrition, sleep and recovery. *European Journal of sport science*, 8(2), 119-126.
6. Aoi, W., Naito, Y., & Yoshikawa, T. (2006). Exercise and functional foods. *Nutrition journal*, 5(1), 15.
7. Ross, R., Chaput, J. P., Giangregorio, L. M., Janssen, I., Saunders, T. J., Kho, M. E., ... & Duggan, M. (2020). Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years and Adults aged 65 years or older: an integration of physical activity, sedentary behaviour, and sleep. *Applied Physiology, Nutrition, and Metabolism*, 45(10), S57-S102.

Icons in this chapter are from the Noun Project and Microsoft Word.

RESOURCES

See a professional to get screened for physical activity: **Physical Activity Readiness Questionnaire**: <http://eparmedx.com/wp-content/uploads/2013/03/PARQPlus2019ImageVersion2.pdf>

Assess your readiness for physical activity with the **Get Active Questionnaire**: https://www.csep.ca/CMFiles/GAQ_CSEPPATHReadinessForm_2pages.pdf

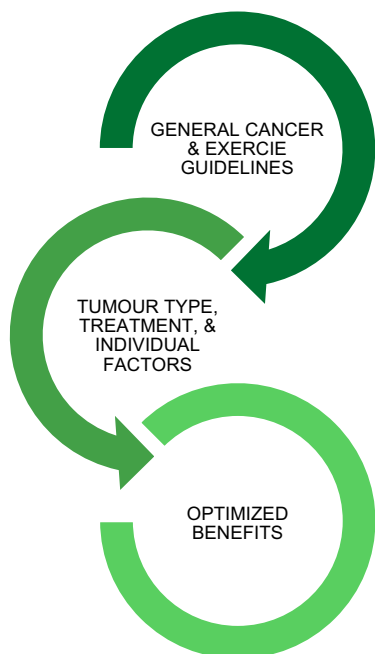
Chapter 7: Tailoring Exercise Based on Tumour Type, Treatment, and Individual Factors

Contributors: Julia Daun, BKin, MSc, CSEP-Clinical Exercise Physiologist, & Lauren Capozzi, MD, PhD, CSEP-Clinical Exercise Physiologist.

LEARNING OBJECTIVES:

- ❖ UNDERSTAND WHY IT'S IMPORTANT TO TAILOR EXERCISE TO ENSURE SAFETY AND OPTIMIZE BENEFITS
- ❖ LEARN THE RED, YELLOW, GREEN LIGHT SYSTEM

Throughout this manual, you have learned more about the physical and psychosocial benefits of physical activity and exercise for those diagnosed with cancer. We know that activity is beneficial throughout the cancer journey, from diagnosis into survivorship and/or palliative care, and that overall, limiting inactivity is key in maximizing quality of life. In the last chapter, you learned about the different types of activity and the current guidelines from the American College of Sports Medicine and the American Cancer Society. The guidelines provide a reference point, but for most cancer survivors, the guidelines have to be tailored to individual needs. Based on your past exercise experience, current physical condition, cancer type and treatment status, previous injuries, and exercise preferences, different type and amounts of activity will be appropriate. This chapter provides the information for tailoring exercise to meet your needs.



UNDERSTAND WHY IT'S IMPORTANT TO TAILOR EXERCISE TO ENSURE SAFETY AND OPTIMIZE BENEFITS

While cancer and exercise guidelines exist, they are general and thus not specific to each individual and their unique needs¹. Prior to engaging in exercise, it is important for cancer survivors to consider individual factors such as tumour type and stage, treatment plan, side effects, and individual factors, such as other chronic conditions, medications, lifestyle, and overall medical history. All of these elements play a large role in determining what and how to engage in exercise¹. The purpose of tailoring exercise is therefore to optimize benefits by establishing what is **safe, enjoyable, effective, and sustainable**.

SAFETY

Some exercises may not be appropriate for individuals with certain tumour types/locations, late-stage cancers and those with various contra-indications (e.g. a secondary chronic disease)¹. Work with an exercise specialist, such as a Clinical Exercise Physiologist, to review your medical history and tailor exercise to best suit your needs. Ultimately, you know your body better than anyone else – listen to how you're feeling. Below you will find a strategy for tailoring exercise based on how you are feeling, called the 'Traffic Light System'.

ENJOYMENT

Choosing activities that are meaningful for you can help make exercise enjoyable, and research shows, makes it more likely you will stick with your physical activity plan! You don't have to go to the gym or wear special clothing to be active. Choosing movement that you enjoy is key. What have you done in the past that you enjoy? Do you like to dance, walk, do yoga, or lift weights? Do you like exercising alone, or in a group? Are there certain people who you like to be active with? What outdoor activities do you enjoy? What indoor activities do you enjoy? Do you like to swim, hike, or cycle? Are there activities you have always wanted to try? Research has also shown that how you feel during exercise can impact exercise maintenance. In the exercise literature, both high intensity interval training² and lower intensity exercise³ have physical and psychosocial benefits, so it's really about choosing what feels best for you!

See page 62 for a list of activities. Sometimes all it takes is getting a few new ideas for activities you can try!

EFFECTIVE

Did you know that tailored exercise is more effective? Tailoring exercise specific to your goals, resources available, and schedule can lead to better adherence and overall progress! Consider a mix of both aerobic and resistance exercise, as in keeping with the guidelines discussed in the last chapter. Training for aerobic goals versus resistance goals are very different. For example, if you have an active job where you are engaging in 30+ minutes of walking each day, then perhaps you would consider adding in more resistance activities before aerobic activities. Alternatively, if you find yourself more sedentary throughout the day, then a combination of both aerobic and resistance exercises might be better suited for you. As another example, if you had a goal of running a 5km race, then you would want to focus more on aerobic training. If you have a job that requires you to lift heavy objects, then you would want to focus on strength training.

Further, depending on your health status, medical history and diagnosis, the types of activities you choose should also complement your health, rather than negatively impact it. For instance, if you were advised by your doctor to avoid high-impact activities, then you might choose non-weight bearing exercises, like swimming instead of running. Similarly, if your doctor recommends exercises to improve your bone health, then you might choose to focus on more resistance activities, like sit-to-stands from a chair or wall push-ups. As we explored in *Chapter 6 – Let's Get*

Active, all types of movement are important, but deciding the amount, frequency, and time of each will depend on your unique situation!

SUSTAINABLE

Although the guidelines recommend a certain amount of aerobic, flexibility, and strength training, meeting each may not be feasible for you right now. Moving your body relative to how you're feeling can help you stick with a regular habit of moving more.

To help you make activity sustainable, start by setting realistic goals, and then track your progress. Compare how you're doing with your original goal and make changes as necessary. For example, if your goal is to be active 4 times per week for 20 minutes, but you're only managing to fit in 3 sessions, modify your goal so it is achievable and sustainable. Then when you're achieving 3 sessions per week for a few weeks, try to increase it again to 4.

Please see Chapter 9, Making it Stick, for more information and strategies for sustainable activity!

RESEARCH SPOTLIGHT!

Luoma, M.L., Hakamies-Blomqvist, L., Blomqvist, C., ... & Saarto, T. (2014)⁴.

In this qualitative study examining the experiences of breast cancer survivors participating in a tailored exercise intervention, participants felt that tailored exercise for their population reduced their barriers to start exercising, and helped them feel more confident in their movement. One participant reported:

"I felt it was really important that we are instructed to do exercises that suit us. I'm really careful about how my hand and spine works and moves. I didn't know how much strain I could put on it. And how much I can stretch it".

These results suggest that tailoring exercise to suit each individual's needs can help survivors gain a sense of mastery, improve self-confidence, and positively impact the cancer journey.

KEY POINTS

1. Exercise guidelines for cancer survivors exist, but they are general.
2. Individualizing exercise is essential for safety, enjoyment, and sustainability/adherence.
3. Tailor based on tumour type, treatment plan, side effects, and individual factors. Seek help from an exercise specialist.
4. Listen to your body – you know what feels best!

THE RED, YELLOW, GREEN LIGHT SYSTEM

The **red**, **yellow**, **green** light system was developed to help cancer survivors assess how they are feeling, and how to choose activities based on energy and fatigue levels⁵. Energy and fatigue levels should be used to determine the **duration**, **intensity**, and **type** of exercise you choose to engage in on any given day.

On days when you have more energy and are less fatigued, consider engaging in more moderate (yellow light) or strong (green light) levels of exercise. On days when you have less energy, and are more fatigued, consider engaging in lighter levels of exercise (red light). The goal of following this system is to ensure exercise has a positive impact on your energy and does not increase your fatigue. For this reason, exercise specialists recommend cancer survivors to exercise within a 2-6/10 rating of perceived effort. Please see page 63 for the rating of perceived effort scale.



THE RED, YELLOW, GREEN LIGHT SYSTEM:

RED	YELLOW	GREEN
<ul style="list-style-type: none"> • Light effort • Feeling tired, sluggish • High fatigue and/or low energy • Choose activities that are shorter in duration & lower in intensity • RPE 1-2/10 	<ul style="list-style-type: none"> • Moderate effort • Feeling all right • Moderate fatigue/moderate energy • Choose activities that are both moderate in length and in intensity • RPE 2-3/10 	<ul style="list-style-type: none"> • Strong effort • Feeling good • Low fatigue and/or high energy • Choose activities that are longer duration & higher in intensity • RPE 4-6/10

ACTIVITY EXAMPLES FOR THE RED, YELLOW, GREEN LIGHT SYSTEM

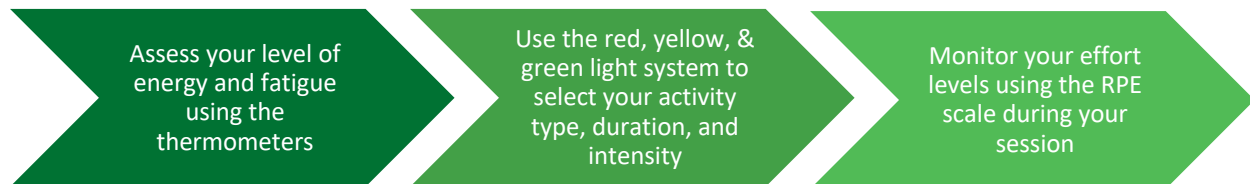
RED LIGHT ACTIVITY EXAMPLES	YELLOW LIGHT ACTIVITY EXAMPLES	GREEN LIGHT ACTIVITY EXAMPLES
<ul style="list-style-type: none"> • AEROBIC Walking around your house for 5-10 minutes • RESISTANCE -Leg extension from chair -Push-up from wall -Standing row 	<ul style="list-style-type: none"> • AEROBIC Walking outside for 10-15 minutes • RESISTANCE -Sit-to-stand from chair -Push-up from incline (e.g. kitchen counter) -Single arm bent-over row 	<ul style="list-style-type: none"> • AEROBIC Walking outside for 30+ minutes • RESISTANCE -Squat -Push-up from your knees or toes -Both arms bent-over row

HOW DO I ASSESS MY ENERGY AND FATIGUE?

You can use the energy and fatigue thermometers at the end of this chapter to monitor your levels before, during, and after a session.

HOW DO I KNOW HOW HARD I'M WORKING?

You can use the rating of perceived exertion (RPE) scale at the end of this chapter to help gauge your intensity level during an exercise session.



KEY POINTS

1. Choosing activities based on how you're feeling ensures that you benefit from increased energy, and decreased fatigue.
2. The red, yellow, green light system can help you determine an appropriate activity.
3. Use the thermometers and the rating of perceived effort scale at the end of this chapter to assess your energy, fatigue, and perceived effort.

CHAPTER SUMMARY

1. It's important to tailor exercise, as the cancer & exercise guidelines are general.
2. Tailor based on tumour type, treatment plan, side effects, and individual factors. Seek help from an exercise specialist.
3. Use the red, yellow, and green light system to assess energy and fatigue levels to choose your duration, intensity, and type of activity.
4. Use the energy & fatigue thermometers and RPE scale at the end of this chapter to gauge the type of exercise you choose to engage in.

REFERENCES








1. Culos-Reed SN, Capozzi LC. (2016). *Cancer and Exercise: Training Manual for Fitness Professionals, 4th Edition [Manual]*. Calgary, Alberta: University of Calgary.
2. Kilpatrick, M. W., Jung, M. E., & Little, J. P. (2014). High-intensity interval training: A review of physiological and psychological responses. *ACSM's Health & Fitness Journal, 18*(5), 11-16.
3. Ekkekakis, P., Parfitt, G., & Petruzzello, S. J. (2011). The pleasure and displeasure people feel when they exercise at different intensities. *Sports medicine, 41*(8), 641-671.
4. Luoma, M. L., Hakamies-Blomqvist, L., Blomqvist, C., Nikander, R., Gustavsson-Lilius, M., & Saarto, T. (2014). Experiences of breast cancer survivors participating in a tailored exercise intervention—a qualitative study. *Anticancer research, 34*(3), 1193-1199.
5. Leach, H. J., J. M. Danyluk, and S. N. Culos–Reed. "Design and implementation of a community-based exercise program for breast cancer patients." *Current Oncology* 21, no. 5 (2014): 267.

LIST OF ACTIVITIES

- Hiking
- Rollerblading
- Biking
- Golfing
- Canoeing
- Kayaking
- Lawn mowing
- Skateboarding
- Rowing
- Table tennis
- Paddle boarding
- Frisbee
- Skiing/snowboarding
- Snowshoeing
- Cross-country skiing
- Ice skating
- Tobogganing/sledding
- Curling
- Shoveling snow
- Hockey
- Tubing
- Walking
- Running
- Yoga
- Tai Chi
- Stretching
- Circuit class
- Dancing
- Swimming
- Hula hooping
- Bowling
- Tennis
- Badminton
- Pickle ball (indoor/outdoor)

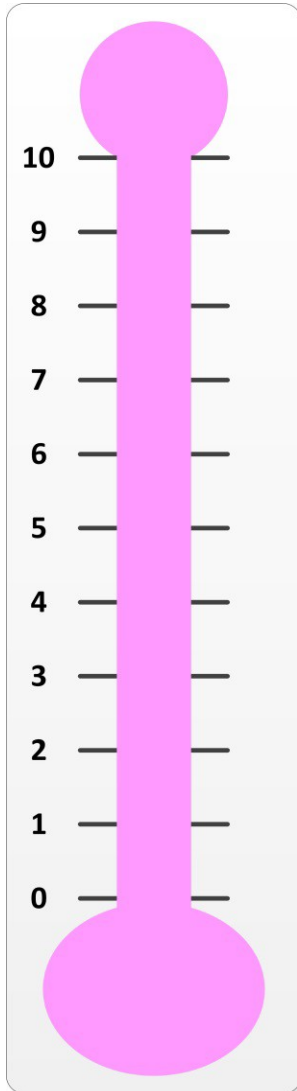
RPE SCALE

Rating of Perceived Effort (RPE)

0	Nothing at all	 
0.5	Very, very light	
1	Very light	like a person walking slowly at their own pace
2	Light	
3	Moderate	not especially hard - no problem continuing
4	Somewhat hard	 
5	Hard	heavy exercise - it feels hard - no problem continuing
6	Hard	
7	Very hard	
8	Very hard	strenuous exercise - person has to push themselves
9	Very hard	 
10	Very, very hard (maximal)	
extremely strenuous exercise - the hardest you have ever experienced		

Energy & Fatigue Thermometers

FATIGUE

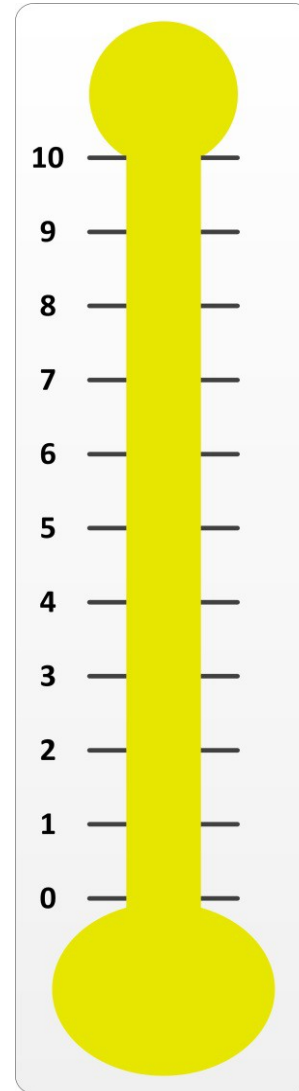


10 — COMPLETELY FATIGUED

5 — MODERATELY FATIGUED

0 — NO FATIGUE AT ALL

ENERGY



10 — HIGH LEVELS OF ENERGY

5 — MODERATE LEVELS OF ENERGY

0 — LOW LEVELS OF ENERGY

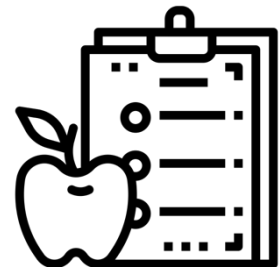
Chapter 8: Eating Well After a Cancer Diagnosis

Contributors: Katie Keller, BSc, RD, Chelsia Gillis, RD, MSc, PhD, & Julia Daun, BKin, MSc, CSEP-Clinical Exercise Physiologist

LEARNING OBJECTIVES:

- ❖ WHY HEALTHY EATING IS IMPORTANT FOR CANCER SURVIVORS
- ❖ HOW TO TAKE STEPS TOWARDS A WELL-BALANCED DIET
- ❖ MALNUTRITION: WHAT IS IT AND HOW TO KNOW IF YOU'RE AT RISK

Throughout this manual, you have learned about the important role of exercise for your well-being. But, did you know that eating well and nourishing your body will also help you *thrive*? Research shows that a well-balanced diet can help you heal during and after treatment, and improve your quality of life and overall health. This chapter will outline why healthy eating is important for cancer survivors, how to take steps towards a well-balanced diet, what malnutrition is, and how to know you're at risk of malnutrition.



WHY IS HEALTHY EATING IMPORTANT FOR CANCER SURVIVORS

Cancer and its associated treatments can place great nutritional demands on the body. There are many benefits of eating well before, during, and after a cancer diagnosis. The list below provides an overview of some of these benefits¹:

- **Maintain muscle mass and strength**, which ultimately helps improve the body's immune system and ability to fight infections
- Maintain **strength and energy** to participate in activities of daily living
- Maintain **a healthy weight**
- **Increase energy** and fuel physical activity
- Manage cancer treatment **side effects**
- Improve **mental health**
- Improve **quality of life**
- Reduce the risk of **cancer recurrence**
- Reduce the risk of **developing chronic illnesses**, such as heart disease and diabetes

HOW TO TAKE STEPS TOWARDS A WELL-BALANCED DIET

Eating well means including a variety of foods in order to provide your body with the nutrients you need to maintain health, feel well, maintain a healthy weight, and have good energy². Including a variety of foods helps provide your body with adequate amounts of calories, protein, fat, carbohydrate, fluid, vitamins, and minerals. The table below outlines the valuable role of these nutrients³:

Nutrient	Role	Examples of Food Sources
Calories	The fuel currency that our body uses for all bodily functions.	All foods provide calories
Protein	The building blocks of all of the body's tissues. Supports maintenance, growth, and repair of all of the body's tissues. Keeps your immune system healthy.	Meat, poultry, fish, seafood, eggs, dairy, nuts & seeds, soy, pulses/legumes
Fat	A dense source of calories. Helps the body grow and produce new cells and hormones. Facilitates absorption of fat-soluble vitamins, such as vitamin A, E, D, and K.	Oils, butter, nuts, eggs, dairy
Carbohydrate	Gives quick energy. Acts as the main energy source for all cells in the body, and is the exclusive fuel source for the brain. A source of dietary fiber.	Fruits, vegetables, bread, pasta, grains, cereals, crackers and pulses (beans, peas lentils)
Fluid	Transports nutrients through the body, maintains proper functioning of the digestive tract, and gets rid of waste.	Water, broth, milk, fruit or vegetable juices, sports drinks
Vitamins & Minerals	Perform hundreds of different roles in the body, including maintaining bone health, helping heal wounds, maintain/strengthen the immune system, and helps your body use energy from food.	All foods provide some form of vitamin and mineral. Nutrient-dense forms come from vegetables, fruits, nuts, seeds, whole grains, dairy and pulses/legumes.

Individual nutritional needs can differ depending on where you are at in your cancer journey. Let's discuss how eating well may look different depending on where you are in your cancer treatments¹.

DURING AND AFTER TREATMENT



- **Your body works harder while going through treatment and for a period of time after.** It requires **more overall calories and protein** to maintain your weight and normal functions. It is recommended that any weight loss goals you may have during treatment be postponed until you have adequately recovered from treatment to ensure you are maintaining your muscle mass. This helps keep your immune system strong, helps you tolerate treatment, and helps you recover as quickly as possible.
- Depending on the treatment side effects you experience, you may find it challenging to eat well. The following suggestions can help you to continue to eat well:
 - **Eat small frequent meals every 2-3 hours.** Eating less frequent larger meals may be intimidating.

- **Choose a protein source** at all (or most) meals and snacks. It is best to space out protein foods, rather than eating one large serving at once, to keep your muscles fed and strong throughout the day. Most people don't eat enough protein with breakfast, so try adding 1-2 high protein foods such as yogurt, cheese, cottage cheese, milk, and eggs.
 - **Choose calorie dense foods** at all (or most) meals and snacks to help make every calorie count. Ways to increase the overall calories in your meals if you are losing weight include adding butter or oil, higher fat dairy products, avocado, nut butters, and dressings or sauces.
 - **Choose liquid meals** such as smoothies or meal replacement drinks as needed.
 - **Include a variety of foods** to the best of your ability, but be compassionate with yourself and include foods you tolerate best. If you are concerned that you are not including all the essential vitamins and minerals, a generic multivitamin supplement may be right for you. Always speak with your doctor or dietitian before starting any supplements.
 - **Food is medicine.** If you experience symptoms, such as nausea or diarrhea, that make it difficult to eat well, speak with your doctor or dietitian.
- Nutrient needs and treatment side effects may persist for weeks to months after your last treatment. Continue as per the above recommendations to help speed recovery.

For more suggestions on how to add protein & calories to your meals and snacks, ways to manage treatment related side effects, and recipe ideas, visit the [Canadian Cancer Society's "Eating Well When You Have Cancer"](#) online resource.

DURING RECOVERY⁴



After finishing your cancer treatments, the following is recommended during your recovery and to reduce the risk of cancer recurrence or progression:

- **Eat a variety of nutrient dense and minimally processed foods.** Processed foods are packaged foods such as frozen meals or boxed foods.
- **Include a variety of different colours** of vegetables and fruits, such as dark green, red, and orange vegetables and fruits on a daily basis. Fruits and vegetables with bright colours are nutrient- and antioxidant-rich.
- **Include high fiber** foods such as whole grains and pulses (beans, peas and lentils).
- Aim to **increase plant sources of protein**, such as from tofu, edamame, pulses and nuts.
- **Limit red meats** (beef, pork, lamb, goat, etc.) to no more than 500 g (18oz)/week and avoid processed meats (ex: bacon, deli meats, etc.).
- **Limit or avoid refined grains**, such as white bread, and sugary beverages.

For nutrient dense recipes and meal inspiration, visit <https://www.aicr.org/cancer-prevention/recipes/>

RESEARCH SPOTLIGHT!

Gillis, C., Li, C., Lee, L., ... & Carli, F. (2014)⁴.

In a study examining the role of a multimodal nutrition, anxiety reduction, and exercise program for colorectal cancer pre-surgery (prehabilitation) vs following surgery (rehabilitation), the researchers found that those in the prehabilitation program recovered more quickly. In fact, twice as many patients who followed the prehabilitation program were back to their normal walking activities by 8 weeks following surgery. **This suggests that a prehabilitation program, including nutrition, has benefits for patient recovery.**

Making Small Sustainable Changes:

Making changes can feel hard at first. You may encounter roadblocks along the way and it can take a while before a change becomes a habit. If you stick with it, these changes become part of your daily habits and won't feel difficult to maintain. Here are some tips to making small sustainable changes that eventually turn into habits⁶:

CREATE A PLAN

What do you want and why?
What is your ultimate vision?
Make a clear plan of what you are working for and write it down.

START SMALL

Make a roadmap with small goals that will ultimately get you to your vision. Small changes make big differences.

TRACK YOUR PROGRESS

Record what you did and how you felt, as emotions and feelings can play a role in making a habit stick.

OVERCOME ROADBLOCKS

Remind yourself of your ultimate vision and your motivation. It also doesn't hurt to reach out to others for support, such as a family member, friend, or a dietitian.

REWARD YOURSELF

Choose a non-food reward, such as treating yourself to a new outfit or taking a long bubble bath. It is important to celebrate your wins, no matter how small.

Remember to be compassionate with yourself. If you lose track along the way, all it takes is one healthy choice to get you back on track. Receiving a cancer diagnosis can be scary and emotional. It is only natural to want to do everything you can to help your situation. There is an abundance of cancer related nutrition information online that comes from unqualified parties, and is not backed by evidence. This information can be harmful to your health. Always proceed with caution when getting nutrition advice that makes big promises, claims to cure or reverse your cancer, attributes a single nutrient/food/supplement to cancer, or significantly restricts foods or food groups. Reach out to a specialize health professional to learn about current evidence-based information.

- Speak to your oncologist
- Speak to a Registered Dietitian
 - Ask your oncologist or family doctor for a referral
 - If you live in Alberta, contact The Alberta Healthy Living Program
<https://www.albertahealthservices.ca/info/page13984.aspx>
- Find a dietitian through the Dietitians of Canada website
https://members.dietitians.ca/DCMember/s/find-dietitian?language=en_US
- Find a dietitian through the Dietitian Directory website
<https://dietitiandirectory.ca/>

KEY POINTS

1. Including a variety of foods helps provide your body with adequate amounts of calories, protein, fat, carbohydrate, fluid, vitamins, and minerals. This is important for feeling good physically and mentally, as well as for maintaining a healthy body weight.
2. During treatment and for a period of time after, your body works harder, so it requires more overall calories and protein to maintain your weight and normal functions.
3. After treatment, it's important that you eat a variety of nutrient dense foods to help you recover and reduce your risk of cancer recurrence. This includes vegetables and fruits, high fiber foods, plant sources of proteins, as well as limited refined grains and red meat.
4. Creating a plan that includes small, sustainable changes, tracking your progress, being kind to yourself, and including your healthcare team can help you be successful in maintain your nutrition goals over time.

MALNUTRITION: WHAT IS IT AND HOW TO KNOW IF YOU'RE AT RISK

An individual can become malnourished (or at risk of malnutrition) when the **nutrition from their food does not meet their body's needs**. Your nutrition needs can change as you get older, when you're living with a disease, or when you're going through treatment. Cancer and cancer treatments may increase the risk of malnutrition. Knowing how to screen yourself for malnutrition can help you advocate for your own health. Some signs to look out for that may suggest you are malnourished include⁷:

- Eating less than is normal for you
- Losing weight without trying
- Experiencing side-effects of treatment or other symptoms, such as feeling full quickly, nauseous, or finding that eating is becoming difficult
- Feeling weak, fatigued, and reduced physical performance

Below is a screening tool that you can use to determine if you could be at risk for malnutrition. Always reach out to your doctor or dietitian if you are concerned that you are malnourished.

KEY POINTS

1. Malnutrition is when the nutrition from food does not meet the body's needs. Cancer and cancer treatments may increase the risk of malnutrition.
2. Being aware of the signs of malnutrition is important to help you advocate for your own health.

CANADIAN NUTRITION SCREENING TOOL (CNST)

Name:	Age:	Weight:	Room:

Identify patients who are at risk for malnutrition

Ask the patient the following questions*	Date:		Date:	
	Admission		Rescreening	
	Yes	No	Yes	No
Have you lost weight in the past 6 months WITHOUT TRYING to lose this weight? <small>If the patient reports a weight loss but gained it back, consider it as NO weight loss.</small>				
Have you been eating less than usual FOR MORE THAN A WEEK?				
Two “YES” answers indicate nutrition risk†				

* If the patient is unable to answer the questions, a knowledgeable informant can be used to obtain the information. If the patient is uncertain regarding weight loss, ask if clothing is now fitting more loosely.

Patients at nutrition risk need an assessment to confirm malnutrition

Nutrition screening using a valid tool can generate a significant volume of requests for nutrition evaluation. Subjective Global Assessment (SGA) is a simple and efficient first-line assessment of nutritional status that can be used following a positive screening and to help prioritize cases.

If a patient is malnourished (SGA B or C), an in-depth nutrition assessment, along with treatment, is required by a registered dietitian.

The Canadian Nutrition Screening Tool was rigorously validated and tested for reliability in Canadian hospitals. Non-expert raters completed the tool and it was compared to the SGA conducted by a dietitian or trained nutrition researcher.

† If a patient is not at risk, rescreen within a week. Only consider weight change in the past week.



CHAPTER SUMMARY

1. Eating well before, during, and after a cancer diagnosis is important for your physical well-being, mental well-being, managing treatment side effects, reducing your risk of cancer recurrence, and reducing your risk of developing other chronic illnesses.
2. Eating well means including a variety of foods in order to provide your body with the nutrients you need to maintain health, feel well, maintain a healthy weight, and have good energy.
3. Your body has different needs depending on if you are on or off treatment, and it is important to individualize your nutrition plan to fit your unique needs.
4. Make small, sustainable changes to help you reach your nutrition goals, and seek help from your healthcare team, including your oncologist and Registered Dietician.
5. Malnutrition is when the nutrition from food does not meet the body's needs. You can use the Canadian Nutrition Screening Tool to determine if you could be at risk for malnutrition. Always reach out to your doctor or dietitian if you are concerned that you are malnourished.
6. Food is medicine – choosing to fuel your body with a balanced diet can help you *thrive* during your cancer journey.

REFERENCES:

1. Cancer Council Victoria. (2020). *Nutrition for people living with cancer.* <https://www.cancervic.org.au/living-with-cancer/nutrition/nutrition-for-people-living-with-cancer>
2. Breast Cancer.Org (2020, October 8). *How Your Body Gets Nutrients From Food.* https://www.breastcancer.org/tips/nutrition/healthy_eat/nutrients
3. American Cancer Society (2020, June 9). *Can I Do Anything to Prevent Cancer Recurrence?* <https://www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence/can-i-do-anything-to-prevent-cancer-recurrence.html#:~:text=Eat%20fruits%2C%20especially%20whole%20fruits,Avoid%20sugary%20beverages>
4. Gillis, C., Li, C., Lee, L., Awasthi, R., Augustin, B., Gamsa, A., ... & Carli, F. (2014). Prehabilitation versus Rehabilitation: A randomized control trial in patients undergoing colorectal resection for cancer. *The Journal of the American Society of Anesthesiologists*, 121(5), 937-947. <https://doi.org/10.1097/ALN.0000000000000393>
5. National Institute of Diabetes and Digestive and Kidney Diseases. (2019, April). Changing Your Habits for Better Health. <https://www.niddk.nih.gov/health-information/diet-nutrition/changing-habits-better-health>
6. Cancer Council Victoria. (2020). *Malnutrition.* <https://www.cancervic.org.au/living-with-cancer/nutrition/malnutrition>

Icons in this chapter are from the Noun Project and Microsoft Word.

RESOURCES

Alberta Health living Program: <https://www.albertahealthservices.ca/info/page13984.aspx>

American Cancer Society – Nutrition for People With Cancer:
<https://www.cancer.org/treatment/survivorship-during-and-after-treatment/staying-active/nutrition.html>

Canadian Cancer Society – Eating Well During and After Treatment:
<https://www.cancer.ca/en/cancer-information/living-with-cancer/feeling-your-best/eating-well/?region=qc>

Canada’s Food Guide: <https://food-guide.canada.ca/en/>

Eating Guidelines for Increasing Your Protein and Calorie Intake:
<http://www.pennutrition.com/viewhandout.aspx?Portal=UbY=&id=JMfsUQE=&PreviewHandout=bA==>

Find a dietitian through the Dietitians of Canada website:

https://members.dietitians.ca/DCMember/s/find-dietitian?language=en_US

Find a dietitian through the Dietitian Directory website: <https://dietitiandirectory.ca/>

Food Safety for People with a Weakened Immune System:

<https://www.canada.ca/en/health-canada/services/food-safety-vulnerable-populations/food-safety-people-with-weakened-immune-system.html>

National Cancer Institute – Nutrition in Cancer Care: <https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-pdq>

Chapter 9: Making it Stick

Contributors: Nicole Culos-Reed, PhD & Julia Daun, BKin, MSc, CSEP-Clinical Exercise Physiologist.

LEARNING OBJECTIVES:

- ❖ UNDERSTAND EXERCISE ADHERENCE AND EXERCISE MAINTENANCE
- ❖ LEARN ABOUT HEALTH BEHAVIOUR CHANGE STRATEGIES
- ❖ BUILD A PLAN TO START TO *MOVE MORE* AND BUILD A HABIT OF REGULAR EXERCISE

So far, you've learned about the importance of physical activity and exercise in the cancer journey, what you can do to *move more*, and what guidelines and tailoring mean. This chapter is all about *how to put your plan in place*. What do we mean? It's about what you can do to *build the habit of moving more, or engaging in regular exercise*. Research has found that there's a dose-response relationship between exercise and wellness benefits. In other words, the more you exercise, the more likely you are to achieve additional physical and psychosocial benefits. And there is substantial evidence that **behaviour change strategies** can help you succeed in building the habit of *moving more*! This chapter will cover exercise adherence and exercise maintenance, different behaviour change strategies, and how to build a plan to move more.

WHAT IS EXERCISE ADHERENCE VS EXERCISE MAINTENANCE?

Before we discuss the strategies you can use to engage in regular physical activity (move more) or exercise, let's define the key terms **adoption**, **adherence**, and **maintenance**.



ADOPTION

Adoption simply refers to starting a new health behaviour. In this case, starting to exercise or starting a new type of exercise that you have not done recently.

ADHERENCE

Adherence is your ability to *stick to it*. Once you get started, can you continue a regular exercise plan? Build your **exercise adherence** by simply trying to **move more** on a regular basis.

Adherence is important, and can be impacted daily by various barriers or facilitators. For example, cancer-related fatigue may derail plans for exercise on any given day. Likewise, a friend inviting you for a walk can facilitate being more active. Adherence is doing what you intended to do, and is a necessary ingredient when building the habit of *moving more*.

MAINTENANCE

Maintenance is about sustained engagement over the longer term. Somewhat arbitrary, **exercise maintenance** is often defined as regular exercise engagement for over 6 months¹. Our goal, in helping you to get started with regular exercise, is to support you in building a regular habit (**adherence**) and sustaining this over the long term (**maintenance**). This is what will ultimately enhance your feelings of control, improving your health and wellness, and ultimately your quality of life. Learning the behaviour change skills that will result in **exercise or movement maintenance** is essential to your success.

BEHAVIOUR CHANGE STRATEGIES

Building exercise or physical activity adherence and maintenance requires different strategies, depending on where you are in your exercise behaviour change. Based on the evidence, key strategies include the following:

BUILDING CONFIDENCE

- **Self-confidence**, or "**self-efficacy**" is essential to support your behaviour change. Building your self-confidence can be done in many ways.
- For example, learning to master a new physical activity will build your confidence. This confidence can help you engage in regular exercise (adherence) and ultimately leads to **exercise maintenance**.
- To get started, build upon what you have done in the past. Having succeeded at something in the past makes us more confident that we can do it again in the future. For

example, did you previously enjoy hiking? Since you've done it before and enjoyed it, start with light hiking.

- Determine what you enjoy doing, and do that! Tailor your exercise to your current abilities and fitness levels, making it less intense and thus physiologically challenging. As we talked about in previous chapters, plan to do exercise with others! This can also help build **confidence** to move more.

GOAL SETTING

Your long-term success begins with knowing your starting point, and where you would like to go. Goal setting is one strategy for guiding you along this journey.

- SMART² Goals is a framework you can use to help you set goals that are **Specific, Measurable, Attainable, Realistic and Relevant, Timely, and Together**. Think of a goal that's meaningful to you. How can you build your exercise plan to help to achieve that goal?
- Set a short-term goal (think daily or weekly) so that you can monitor your progress, and make sure you are on the path that leads to your longer-term goals.
- Notice how you feel when you achieve a goal. Experiencing success through *achieving a goal* is one of the ways we continue to build our **confidence**.

BARRIER MANAGEMENT

- An essential component to behaviour change is anticipating what **barriers** (obstacles) you may encounter along the way, and making a plan to overcome them.
- Think of what these barriers might be for you. Some of the most commonly-reported barriers are: a lack of time, lack of self-discipline, lack of an exercise partner, and lack of ability.
- Develop a plan for how you can address your specific barriers. Know that sometimes you may truly hit a roadblock. That's ok – you are likely to hit bumps as you build a new habit. But planning for what “might” take you off-track will support your exercise success, as you'll have a strategy to **overcome this barrier** if it arises. Be realistic, and don't expect success all the time (*give yourself grace – you can adjust!*).

MONITORING BEHAVIOUR

- Tracking your physical activity habits is important. Take the time to review your progress on previously set goals, and increasing awareness of progress. *Give yourself grace* as you build your exercise or movement habit. There is no ‘quick change’, or ‘7-easy steps’ to building a healthier you. It takes time to develop these new skills. **Monitoring your progress** will help you see what makes you successful, and what impedes your progress.

- There are many options to effectively track your physical activity levels – see what works best for you. Some ideas include:
 - (1) **an exercise log** – a physical or electronic “diary” where you can write your physical activities. Tracking the FITT components (Frequency, Intensity, Time or duration, and Type of activity), preferences, goals, and barriers, can all help you to better understand how to make movement a part of your daily habit.
 - (2) **a tracking app** – these are easy to install and are usually free! Zoelnsights, MyFitnessPal, Google Fit, Health Pal, etc., are ways to track your step count and possibly other physical and health activities. If you own a SmartPhone or iPad, one of these might work for you.
 - (3) **a smart watch or activity tracker**, such as a FitBit or Garmin, can help you record your activity levels. These come in a variety of shapes, sizes, and price points so that you can select what works best for you.

SOCIAL SUPPORT

- Research shows that having a support system improves exercise maintenance. **Social support** can come in many forms. It could be your partner or spouse who moves with you, a dog that needs a walk, a friend that check in on your movement plan, or a group exercise class that you join online or in-person.
- Think of what supports you to *move more*, and include it in your movement plan. Social support can also come in the form of praise, encouragement, or information that supports you to achieve your exercise goals. Ask your support network to support your movement in whatever way you may need!
- Having a qualified exercise professional who knows how to tailor exercise to meet your unique needs as a cancer survivor, is an essential form of support. See Chapter 6 for more on what to look for in your community-based exercise oncology program or trained fitness professional.

EFFECTIVE COMMUNICATION

- Communicating your activity goals and your plan to move more with your friends, family, and healthcare professionals is important to ensure that others can support you as you build your plan to achieve your regular physical activity.
- As you begin to engage in exercise, be sure you are cleared by your healthcare team if necessary (see Chapter 6 and the [Get Active Questionnaire](#)).
- **Talk positively to yourself!** We are often hardest on ourselves – think about your successes, and use these to motivate yourself when you may be finding it hard to stay

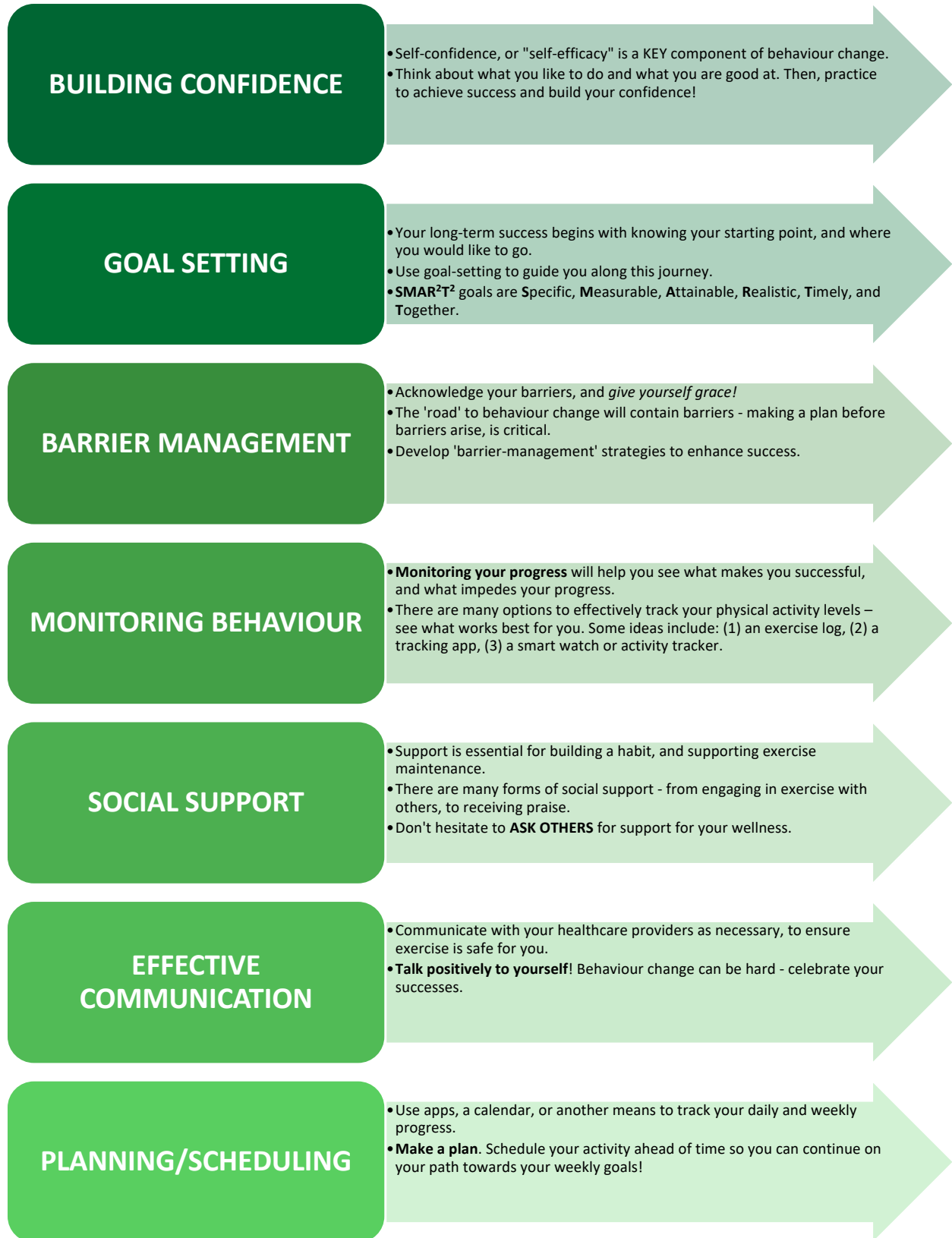
active. Think about how you would talk to a friend – use that tone with yourself to gently encourage yourself to *keep moving*.

PLANNING/SCHEDULING

- Planning ahead is one of the best ways to stick to your goal. For example, every Sunday, try looking at your week ahead and see where you can fit physical activity sessions.
- On your busier days, try scheduling 5-10 minutes of movement. On days where you have more time, maybe you schedule a longer session, like a group exercise class, a walk with a friend, or a combination of activities.
- Re-visit your schedule every week (e.g. every Sunday) and incorporate both structured and unstructured activities. Take a look at your SMAR²T² goals and use that to guide your planning.

SEE WHAT WORKS FOR YOU

These are some of the most common behaviour change skills to support your habit of moving more. Try different strategies, and see what works for you. Using one or more of these strategies will increase your success with exercise behaviour change success. And importantly, these same strategies can be ‘tweaked’ to support your health behaviour change in other important domains, including nutrition, sleep, or stress reduction.



BUILD A PLAN TO *MOVE MORE*

To support your behaviour change, here is a template that you can customize for your plan to move more!

My Goal: _____

Why This is Important To Me: _____

My Supports: _____

SMAR₂T₂ Plan:

Specific: _____

Measurable: _____

Attainable: _____

Realistic/Relevant: _____

Timely: _____

Together: _____

FITT Principle:

Frequency (how often will I move?): _____

Intensity (how hard/at what intensity will I move?): _____

Time (how much time will I spend on my movement?) : _____

Type (what type of movement will I do?): _____

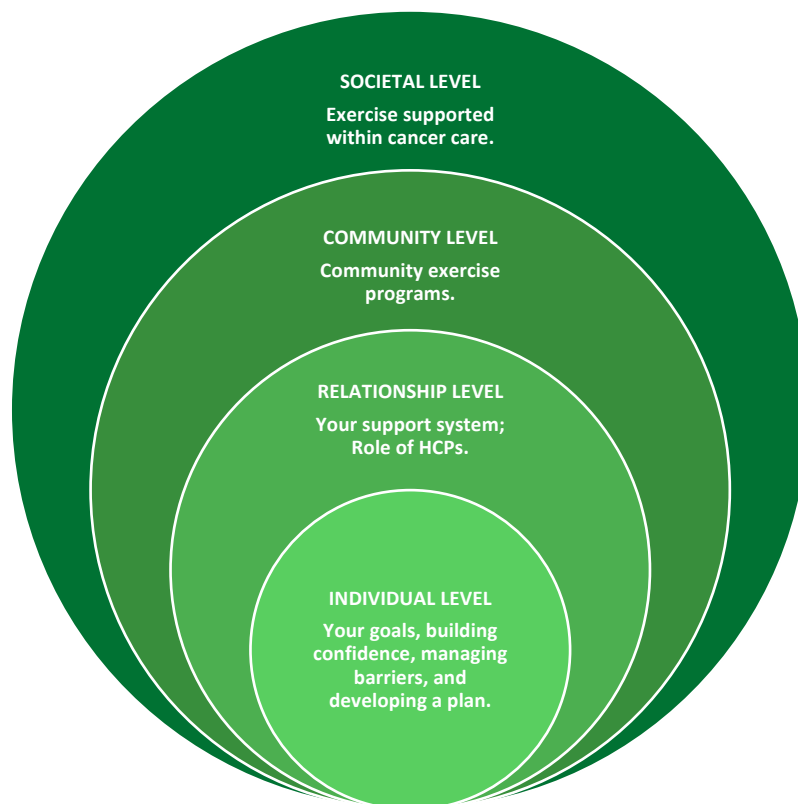
Barriers to Deal With: _____

Strategies to Overcome Barriers: _____

SUPPORT IN YOUR ENVIRONMENT

“Behaviour change is up to you!”. While we often hear this, it is important to recognize that there are factors outside of the individual that can help or hinder behaviour change. When we think about the role of movement or exercise for cancer survivors, we know that both the cancer care setting as well as the community setting, can play critical roles that can support **exercise as part of standard cancer care**.

THE SOCIAL-ECOLOGICAL MODEL & SUPPORT FOR EXERCISE IN CANCER CARE



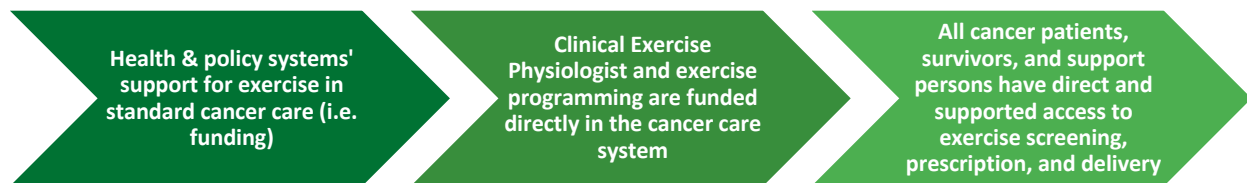
Beyond the skills that you can build, and the relationships you have to support your wellness, it will be easier for you to build your exercise habit if the larger environment, at both the clinical care and community levels, supports an active lifestyle. This can include having access to exercise oncology programs in the community, with trained fitness professionals. It can be a cancer care system that refers you to such programs. And it can be a larger healthcare system that builds in the supports for wellness across cancer care, and the wider spectrum of chronic disease management.

RESEARCH SPOTLIGHT!

Santa Mina, D., Sabiston, C.M., Au, D., ...& Chang E. (2018)³.

In this research article, the authors present a pathway for connecting cancer patients, survivors, and their support persons with exercise-related resources (e.g. exercise oncology programming). This pathway includes the role of the healthcare provider and qualified exercise professional as an instrumental players for creating accessibility to these resources – the healthcare provider can either refer their patients to a qualified exercise professional or promote exercise self-management. **This article helps to bridge the gap between the evidence for, and availability of exercise in the cancer care journey and the patients, survivors, and support persons that could benefit from these resources.**

Your voice can help to achieve these system and policy level changes, so that exercise becomes part of standard cancer care. To help us get there, speak with your healthcare provider team, advocate within your local healthcare system, or reach out to your insurance provider or your local politician to become an advocate for exercise in cancer care.



KEY POINTS

1. The key to getting long term benefits from activity comes from the ability to stick with it, also called Exercise Adherence.
2. Once you build the habit, behaviour change skills become important to achieve, or Exercise Maintenance.
3. Various behaviour change skills are essential when building a sustainable habit of *moving more*. Build your confidence, garner social support, and develop a plan to achieve your movement goals.

CHAPTER SUMMARY

Exercise behaviour change will result in you experiencing a better overall quality of life. As cancer survivorship numbers continue to grow, it is essential that you are supported to build a regular habit of physical activity and exercise. Using strategies such as goal-setting, planning/scheduling, and identifying your common barriers, will all increase your success.

Start low and progress slow – with the goal of simply *moving more* on a daily basis. With these skills, you will be on your way to building the habit of regular physical activity and exercise.

REFERENCES

1. DiClemente, C. C., & Prochaska, J. O. (1998). *Toward a comprehensive, transtheoretical model of change: Stages of change and addictive behaviors*. In W. R. Miller & N. Heather (Eds.), *Applied clinical psychology. Treating addictive behaviors* (p. 3–24). Plenum Press. https://doi.org/10.1007/978-1-4899-1934-2_1
2. Bronfenbrenner, U. (1992). *Ecological systems theory*. In R. Vasta (Ed.), *Six theories of child development: Revised formulations and current issues* (p. 187–249). Jessica Kingsley Publishers.
3. Santa Mina, D., Sabiston, C. M., Au, D., Fong, A. J., Capozzi, L. C., Langelier, D., ... & Chang, E. (2018). Connecting people with cancer to physical activity and exercise programs: a pathway to create accessibility and engagement. *Current Oncology*, 25(2), 149.

RESOURCES

Thrive Health Services – Behaviour Change Infographics:

<https://thrivehealthservices.com/all-infographics/>

TOP 6 MODIFIABLE HEALTH BEHAVIORS



TOP 6 MODIFIABLE HEALTH BEHAVIORS
FOR OPTIMAL HEALTH AND WELLNESS

HOW DO YOU STACK UP?
One of the most significant barriers to making healthy choices is knowing what health behaviours are important and how you currently 'stack-up' compared to the recommendations. Reviewing evidence-based health behaviour guidelines is a good starting point! Evaluate where you or your clients fit. Is there room for improvement?

#1 Body Weight
One of the best ways to prevent disease and illness and achieve optimal physical and mental health is to maintain a healthy body weight. Body mass index (BMI) can give you an idea of your...

#2 Physical Activity
Recommended weekly activity for cancer survivors is at least 90 minutes of moderate intensity aerobic activity, plus 2 days of resistance exercise, and flexibility.

Download PDF ↓

HOW TO SET SMARTT GOALS



GOAL SETTING

SMARTT GOALS
SMARTT goals can help you reach your goals but keeping them within your reach

Specific
What, where, why?

Measurable
How much or how many?

Download PDF ↓

MOTIVATION CHECKLIST FOR MOVING MORE



MOTIVATION CHECKLIST

Find at least two reasons on the list below that will motivate you to be more active.

It makes me feel better.

Download PDF ↓

Chapter 10: Resources

Here is a list of all the resources that are listed throughout the Thrive Manual, as well as additional resources to support you in your cancer journey. We encourage you to look at your local organizations for information and education. These are our go-to evidence-based resources for cancer information, statistics, movement, nutrition, survivorship, and more! We encourage you to look at your local cancer and wellness organizations for additional information and education.

ADDITIONAL EDUCATION IN CANCER AND EXERCISE

Thrive Health Services: <https://thrivehealthservices.com/>

Thrive Health Services – Behaviour Change Infographics:
<https://thrivehealthservices.com/all-infographics/>

Health and Wellness Lab: <https://www.ucalgary.ca/healthandwellnesslab/>

Remote Exercise Videos: <https://www.ucalgary.ca/healthandwellnesslab/resources>

MyHealthAlberta 3-Minute Movement Videos:
<https://myhealth.alberta.ca/Alberta/Pages/cancer-exercise-videos.aspx>

Alberta Healthy Living Program: <https://www.albertahealthservices.ca/info/page8930.aspx>

Alberta Health Services – Getting Active:
<https://www.albertahealthservices.ca/topics/Page14486.aspx>

Cancer and Exercise Monthly Presentations:
https://app.booking.ca/ahs_cancerpatienteducationpub/index.asp

TrueNTH Lifestyle Management (Physical Activity, Stress-Reduction, and Nutrition Programs and Resources for Men Living with Prostate Cancer): <https://lifestyle.truenth.ca/>

Prostate Cancer Centre – Patient Education: <http://www.prostatecancercentre.ca/our-programs/patient-services/>

- See Dr. Nicole Culos-Reed speaking exercise for prostate cancer [HERE](#).
- See additional videos on yoga and movement for prostate cancer [HERE](#).

GETTING READY FOR PHYSICAL ACTIVITY

See a professional to get screened for physical activity: **Physical Activity Readiness Questionnaire:** <http://eparmedx.com/wp-content/uploads/2013/03/PARQPlus2019ImageVersion2.pdf>

Assess your readiness for physical activity with the **Get Active Questionnaire:**
https://www.csep.ca/CMFiles/GAQ_CSEPPATHReadinessForm_2pages.pdf

CANCER STATISTICS AND INFORMATION

Canadian Cancer Statistics 2019:

<https://www.cancer.ca/~media/cancer.ca/CW/cancer%20information/cancer%20101/Canadian%20cancer%20statistics/Canadian-Cancer-Statistics-2019-EN.pdf?la=en>

Canadian Cancer Society - Cancer Information: <https://www.cancer.ca/en/cancer-information/cancer-101/what-causes-cancer/?region=on>

CANCER ORGANIZATIONS

Wellspring: <https://wellspring.ca/>

Canadian Cancer Society: <https://www.cancer.ca/en/support-and-services/support-services/support/?region=on>

Alberta Cancer Foundation: <https://www.albertacancer.ca/>

CancerControl Alberta: <https://www.albertahealthservices.ca/cancer/cancer.aspx>

Mayo Clinic Cancer Centre: <https://www.mayoclinic.org/departments-centers/mayo-clinic-cancer-center>

MD Andersen Cancer Centre: <https://www.mdanderson.org>

National Cancer Institute: <https://www.cancer.gov/>

FITNESS ORGANIZATIONS

The newly released Canadian 24-Hour Movement Guidelines are here! Visit the **Canadian Society for Exercise Physiology** to find out more.

ParticipACTION: <https://www.participaction.com/en-ca>

American College of Sports Medicine – Resource Library: <https://www.acsm.org/read-research/resource-library>

ADVOCACY RESOURCES

Online Petition for Exercise in Standard Cancer Care: https://www.change.org/p/cancer-care-exercise-in-cancer-care?utm_source=share_petition&utm_medium=custom_url&recruited_by_id=eca9a4d0-46e4-11ea-ab40-b5a1392a0660

SURVIVORSHIP RESOURCES

Cancer Survivorship: <https://www.cancer.net/survivorship>

Memorial Sloan Kettering Cancer Center - Living Beyond Cancer:
<https://www.mskcc.org/experience/living-beyond-cancer>

American Cancer Society: Survivorship during and after treatment:
<https://www.cancer.org/treatment/survivorship-during-and-after-treatment.html>

Alberta Cancer Foundation - My Journey Booklet:
<https://giving.albertacancer.ca/document.doc?id=905>

Canadian Cancer Society After Treatment Ends: <https://www.cancer.ca/en/cancer-information/living-with-cancer/after-treatment-ends/?region=on>

Canadian Cancer Society Life after Cancer: <http://www.cancer.ca/en/cancer-information/cancer-journey/life-after-cancer/>

Canadian Cancer Survivor Network: <https://survivornet.ca/>

American Institute for Cancer Research - Living With Cancer Resource:
<https://www.aicr.org/>

BC Cancer Survivorship Resources: <http://www.bccancer.bc.ca/our-services/services/library/recommended-websites/living-with-cancer-websites/survivorship-websites>

NUTRITION AND CANCER RESOURCES

American Cancer Society – Nutrition for People With Cancer:
<https://www.cancer.org/treatment/survivorship-during-and-after-treatment/staying-active/nutrition.html>

Canadian Cancer Society – Eating Well During and After Treatment:
<https://www.cancer.ca/en/cancer-information/living-with-cancer/feeling-your-best/eating-well/?region=qc>

Canada’s Food Guide: <https://food-guide.canada.ca/en/>

Eating Guidelines for Increasing Your Protein and Calorie Intake:
<http://www.pennutrition.com/viewhandout.aspx?Portal=UbY=&id=JMfsUQE=&PreviewHandout=bA==>

Find a dietitian through the Dietitians of Canada website:
https://members.dietitians.ca/DCMember/s/find-dietitian?language=en_US

Find a dietitian through the Dietitian Directory website: <https://dietitiandirectory.ca/>

Food Safety for People with a Weakened Immune System:

<https://www.canada.ca/en/health-canada/services/food-safety-vulnerable-populations/food-safety-people-with-weakened-immune-system.html>

National Cancer Institute – Nutrition in Cancer Care: <https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-pdq>

OTHER

MyHealthAlberta: <https://myhealth.alberta.ca>

Alberta Health Services: <https://www.albertahealthservices.ca/topics/Page14487.aspx>

The Tobacco Atlas: <https://tobaccoatlas.org/topic/quitting/>

Alberta Quits: <https://www.albertaquits.ca>

We hope you find this manual helpful. For additional resources and to access our free Thrive Health wellness infographics and worksheets, visit us at www.thrivehealthservices.com and follow us on social media - @abletothrive (Twitter and Instagram).

In health,
Lauren and Nicole

MORE ABOUT OUR CO-FOUNDERS

Our co-founders, Dr. Nicole Culos-Reed and Dr. Lauren Capozzi, are world-leading researchers and clinicians in health behaviour change, cancer physiology, rehabilitation, and exercise, and know what it takes to help cancer survivors *thrive*.



Photographs: David Mollé

Nicole Culos-Reed, PhD

Co-Founder, Thrive Health Services

Professor, Faculty of Kinesiology, University of Calgary.
Adjunct Professor, Department of Oncology, Cumming School of Medicine.

Research Associate, Psychosocial Resources, Tom Baker Cancer Centre, Calgary.

With over 25 years of academic experience, Dr. Nicole Culos-Reed is an expert in the field of behaviour change in physical activity for healthy and clinical populations. Her research primarily focuses upon the determinants and outcomes of physical activity for cancer survivors, the psychosocial outcomes associated with a healthy lifestyle, and the translation of evidence into sustainable community-based programming. Understanding adoption and long-term maintenance of health behaviours are key factors in her work.



Lauren Capozzi, MD, PhD, CSEP-CEP

Co-Founder, Thrive Health Services

Adjunct Assistant Professor, Faculty of Kinesiology, University of Calgary.

Resident Physician, Physical Medicine & Rehabilitation, Cumming School of Medicine.

CSEP-Clinical Exercise Physiologist.

With over 15 years of experience in the fitness industry, and a strong academic and clinical focus on health behaviour adoption and adherence, Dr. Lauren Capozzi delivers practical evidence-based expertise for chronic disease prevention and management. As a physician, researcher, and exercise physiologist, Lauren brings first-hand clinical expertise to her practice. Her ongoing research interests include the design of health promotion interventions and the translation of these programs into sustainable community-based programming.