

November 2022

# LIVING WITH CANCER



## COLORECTAL CANCER RESEARCH & PRACTICE UPDATES

Colorectal Cancer Canada curates monthly Research & Practice Updates to inform patients and their loved ones of new innovations in colorectal cancer care. The following updates extend from November 1<sup>st</sup> 2022 to November 30<sup>th</sup>, 2022 inclusive and are intended for informational purposes only

### NOVEMBER 2022 PREVIEW

Differences in the gut microbiome by physical activity and BMI among colorectal cancer patients.....	2
Exercise during chemo may help beat the treatment’s effects.....	4
High rate of actionable genetic variants found in colorectal cancer patients.....	5
Ensuring equitable access to cancer care for Black patients in Canada.....	6

## Differences in the gut microbiome by physical activity and BMI among colorectal cancer patients

November 2022

To better understand the role of the gut microbiome in colorectal cancer (CRC) development, a new study investigated associations between physical activity, body mass index (BMI), gut microbiome diversity and different abundances of gut microbes among CRC patients. The [study](#), published in the *American Journal of Cancer Research*, showed that regular exercise had a positive impact on promoting a healthy gut microbiome while also reducing inflammation in the body. The researchers found that patients who are more active have more diverse microbiomes and lower amounts of colorectal cancer promoting bacteria and higher amounts of bacteria that protect against colorectal cancer.

### What is the gut microbiome?

The gut microbiome is the totality of microorganisms that live in our gut, or intestines. The microbiome, while mainly comprising bacteria, is also made up of fungi, viruses, protozoa, and other microscopic organisms. Based on the broad evidence about the gut microbiome, having diverse populations of bacteria is an important characteristic of a healthy microbiome.

### What is BMI?

Body mass index (BMI) is calculated using a person's weight in kilograms or pounds divided by the square of their height in meters or feet. While BMI can give a rough estimate of body fatness, it is not a direct measure for body fat content or total health of the individual.

BMI	Weight Status
Below 18.5	Underweight
18.5 – 24.9	Healthy Weight
25.0 – 29.9	Overweight
30.0 and Above	Obesity

### Association between physical activity, BMI and cancer prevention and control

Both physical activity and BMI have emerged as predictive factors in cancer prevention and control, where increased physical activity levels throughout the cancer care continuum may reduce the risk of death by up to 38% in CRC survivors<sup>1</sup>. With BMI, there is not such a clear and

---

<sup>1</sup> Meyerhardt JA, Giovannucci EL, Holmes MD, Chan AT, Chan JA, Colditz GA, Fuchs CS. Physical activity and survival after colorectal cancer diagnosis. *J. Clin. Oncol.* 2006;24:3527–3534.

linear relationship with CRC survival, with superior survival outcomes seen for overweight and class 1 obese patients compared to other BMI categories such as underweight, or normal weight<sup>2</sup>.

The study aimed to understand how the gut microbiome may function as an underlying mechanism that influences the physical activity / BMI – colorectal cancer link.

### **The study**

179 patients with CRC (stages 1-4) were included in the study. Stool samples were taken pre-surgery and physical activity during the year before their diagnosis was assessed by questionnaire and participants were classified as being active vs. inactive based on the provided guidelines. BMI at this time was calculated based on the patients' medical records.

The diversity of the lower gut microbiome was observed and compared among patients classified as inactive vs. active, obese vs. normal weight. The researchers found that the gut microbiomes of active and normal weight patients are more diverse compared to those of inactive patients.

### **Conclusions**

These findings provide evidence for an association between higher physical activity levels and greater gut microbiome diversity, with quantities of microbial subtypes varying among CRC patients. The study data showed that overweight and obese patients had lower microbial diversity compared to normal weight and active patients, supporting existing evidence that indicates the negative impact of BMI on the gut microbiome among CRC patients. This highlights the gut microbiome as an interface of the obesity-colorectal cancer link.

Furthermore, the study findings show that increased physical activity may counteract obesity-induced metabolic effects and dysbiosis of the gut microbiome in CRC patients.

### **Take home message**

Findings from a recent study showed that regular physical activity may help to offset imbalances to the gut microbiome that occur as a result of obesity, reduce BMI and may extend the survival of patients with colorectal cancer.

[READ THE FULL ARTICLE](#)

---

<sup>2</sup> Brown JC, Meyerhardt JA. Obesity and energy balance in GI cancer. *J. Clin. Oncol.* 2016;34:4217–4224.

## Exercise during chemo may help beat the treatment's debilitating effects

November 2022

A new [study](#) involving patients with different cancer types who were undergoing chemotherapy found that exercising during treatment helped patients overcome the treatment's debilitating effects and speed up the return of function following chemotherapy. While previous research has shown that exercise can benefit cancer patients, this study focused on how exercise *during* treatment was able to impact the treatment's negative effects on the body.

### The study

In the Dutch study, 266 patients who were undergoing chemotherapy for testicular, breast or colon cancer or non-Hodgkin's lymphoma took part in a 6-month exercise program. Half of participants started the program during their chemotherapy treatment, while the other half started after chemotherapy had ended.

The researchers found that patients who exercised during chemotherapy experienced a smaller drop in their peak oxygen uptake (also known as VO<sub>2</sub> peak), which is an indicator of overall fitness, after their chemotherapy had ended. Patients who exercised during chemotherapy experienced a VO<sub>2</sub> peak decline that was about half as much as the other group. Furthermore, patients who exercised during chemotherapy saw smaller declines in strength, quality of life, physical function, and fatigue.

### How does exercise combat side effects from chemotherapy?

While patients feel tired from chemotherapy, physical activity helps to promote changes in muscle strength and improve the body's overall physical condition. Exercise causes cellular changes in the body, stimulating the production of a component of the cell known as **mitochondria**. Mitochondria are responsible for generating energy for the cell to function. According to the researchers, having more mitochondria in muscle cells increases the body's energy supply as well as improving oxygen circulation. These factors allow the body to use energy more efficiently.

### What if someone cannot safely participate in exercise during treatment?

For some patients, it might not be possible to participate in an exercise program during chemotherapy. The researchers found, however, that participating in an exercise program after treatment has ended can still be beneficial. In the study, *all* participants were able to restore their fitness levels back to baseline (pre-treatment levels) one year after doing the exercise program, regardless of when they started it.

### What kind of exercise is recommended?

In the study, participants did 20-30 minutes of weight training 2 times a week, and 30 minutes of cardio such as biking or running on the treadmill 3 days a week. They also did a recreational sport such as soccer or badminton once a week. For the first 3 months, participants worked with a physical therapist and then continued their routine on their own for the last 3 months.

Individuals who have cancers that affect the lung or bone should work with a physical therapist to determine the most appropriate exercises.

### Take home message

A recent study showed that cancer patients who participated in regular physical activity during chemotherapy helped them counteract some of the treatment's debilitating effects such as fatigue and a decline in physical functioning and improve their quality of life.

[READ THE FULL ARTICLE](#)

## High rate of actionable genetic variants found in CRC patients

November 2022

A study published in *JCO Precision Oncology* found that multigene panel testing (MGPT) in a large cohort of patients with colorectal cancer (CRC) showed that there was a high rate of clinically actionable (i.e. treatable through existing therapies) germline mutations.

### What is germline testing?

Germline genetic testing looks for inherited mutations that are passed down from parent to child that could influence the development of certain diseases. In CRC, examples of germline mutations include the *MSH* genes, *EPCAM*, *MLH1*, and *PMS2* genes that are implicated in the development of Lynch syndrome, the hereditary syndrome that makes someone more likely to develop a range of cancers including colorectal.

Currently, germline genetic testing is only recommended for a subset of patients with CRC, generally those who are young-onset or who have family members who were diagnosed with the disease before the age of 50. The purpose of this study was to determine the rate at which clinically actionable mutations occur in a diverse CRC patient population.

### The study

Researchers examined data from 34,244 patients with CRC who did MGPT. Most patients were women (60.7%), and the majority were 50 years or older (68.9%). Patients were white (70.6%), Black (6.7%), Hispanic (5.6%), Asian (3.3%), Ashkenazi Jewish (1.7%) or another race (12.2%).

Through MGPT, 14.2% of patients had at least 1 pathogenic or likely pathogenic germline mutation (i.e. one that would cause a disease), 11.9% had clinically actionable mutations (mutations that would result in a disease for which a treatment exists), 9.1% of patients had pathogenic germline mutations associated with an increased risk of polyposis or CRC, and 5.7% had germline mutations related to Lynch syndrome.

Younger patients had higher rates of pathogenic germline mutations. The rate was

- 25.7% in patients younger than 30 years

- 17% in the 30-39 age group
- 14.1% in the 40-49 age group
- 15.4% in the 50-59 age group
- 14.1% in the 60-69 age group
- 11.3% in the 70-79 age group
- 10.1% in the 80+ age group

Ashkenazi Jewish and Hispanic patients had higher rates of pathogenic germline mutations compared to White patients.

### Conclusion and take-home message

The study findings provide MGPT data from the largest cohort of patients with CRC. The study showed that there are high rates of clinically actionable variants/mutations among patients with CRC. These data add to the body of evidence to support the broadening of genetic testing criteria for patients with CRC.

*The US-based National Comprehensive Cancer Network (NCCN) [recently updated](#) its recommendations that germline multigene panel testing should be offered to all individuals with CRC age <50 and be considered for **all** others, particularly for, **but not restricted to**, those with evidence of mismatch repair in their tumor or suggestive family history. These new recommendations expand the current testing criteria, which limited testing to certain age groups and types of cancer.*

[READ THE FULL ARTICLE](#)

### Ensuring equitable access to cancer care for Black patients in Canada

A recent study published in the *Canadian Medical Association Journal* explored potential solutions to ensure more equitable access to cancer care, including clinical trials and screening programs, for Black patients in Canada.

While cancer survival is improving in Canada due to earlier detection and advances in treatment, according to the most recent analysis of Canadian Cancer Registry data from 2006-2016, mortality from breast, colorectal, prostate and pancreatic cancers is higher in Black patients compared to white patients<sup>3</sup>.

**What is known about gaps in access to care for Black patients with cancer in Canada:**

---

<sup>3</sup> Hwee J, Bougie E. Do cancer incidence and mortality rates differ among ethnicities in Canada? *Health Rep* 2021;**32**:3–17.

- In Canada, there is a lack of routine collection of race-based data by provincial and territorial cancer registries, which limits our understanding of how differential access to cancer services impacts cancer outcomes across racial groups
- Some studies have connected Census data to provincial registries on cancer screening, incidence and mortality, while other studies have attempted to use geography and socioeconomic status as surrogates for race and ethnicity data. However, these approaches do not tell us enough about access to cancer clinical trials, or how different racial groups use novel personalized medicines.
- With respect to population-based screening: though population-based screening programs have been implemented in Canada for breast, cervical and colorectal cancers, Black and immigrant populations remain underrepresented in routine cancer screening<sup>4</sup>. Barriers to access cervical cancer screening among immigrant women included not having a primary care provider at all, not having a female physician, or coming from low-income households<sup>5</sup>. The researchers stress the importance of research populations reflecting the population who will benefit, so that the results are valid to the population at large.
- With respect to clinical trials: historical events such as the Tuskegee Syphilis Study caused enormous mistrust of health care systems among Black individuals. Race has not been sufficiently studied in clinical trial enrollment for the Canadian adult population.

### What are some potential solutions to improve access to cancer care for Black patients in Canada?

- For visible minorities and immigrant populations, cultural awareness training for healthcare providers, use of culturally focused media, use of multilingual health education, lay health educators and patient navigators are proven methods to increasing screening uptake<sup>6</sup>, and these strategies can be extended to improve understanding and adherence to cancer treatments.
- American Society for Clinical Oncology (ASCO) [strategies](#) to increase racial and ethnic diversity in clinical trials include partnering with patient and community leaders to design and conduct clinical trials that focus on reducing barriers for racialized patients<sup>7</sup>
- Routine collection of race and ethnicity cancer data. Sensitivity in Canada to the collection of this data, to ensure that the data are collected in the most ethical and meaningful way.

<sup>2</sup> Zhai, XF, et al. Traditional herbal medicine prevents postoperative recurrence of small hepatocellular carcinoma: a randomized controlled study. *Cancer* 2018;**124**:2161–8

<sup>5</sup> Lofters AK, et al. Predictors of low cervical cancer screening among immigrant women in Ontario, Canada. *BMC Womens Health* 2011;**11**:20.

<sup>6</sup> Kerner J, et al. Canadian cancer screening disparities: a recent historical perspective. *Curr Oncol* 2015;**22**:156–63.

<sup>7</sup> Oyer RA, et al. Increasing racial and ethnic diversity in cancer clinical trials: an American Society of Clinical Oncology and Association of Community Cancer Centers joint research statement. *J Clin Oncol* 2022;**40**:2163–71.

Though there is more race-based data from the UK and US, it is not enough to extrapolate that data to a Canadian context

- Enhanced use of culturally sensitive cancer care: efforts to provide more individualized, culturally sensitive cancer care to improve access to cancer screening, diagnosis and treatment in Canada. A 2021 study conducted in a racially and socioeconomically diverse Toronto community health centre, an Afrocentric education program on cancer screening was implemented and resulted in screening rates for breast, CRC and cervical cancer increased from 17-72%, 18-67%, and 59-70% respectively, between 2011 and 2018<sup>8</sup>. These demonstrate the impact that thoughtful, targeted, culturally sensitive interventions can have on access to health services among underrepresented groups.
- Understanding health and cultural literacy to improve access to cancer care: health literacy is about a person's ability to seek, understand and follow through with medical information to make informed choices. Cultural literacy is a subdomain of health literacy, and refers to how a person's social identity, beliefs and customs affect their medical decision making. The Canadian Black population is very diverse, first-generation Black African patients all the way to second- and third-generation patients of African/Caribbean descent. Distinct populations come with diverse cultural views and health understandings. About tapping into the cultural literacy of Black patients and framing health info based on their cultural understandings and cultural context.

### Conclusions and take home message

Addressing gaps in access to cancer care services is a health care priority if scientific advances are to be felt by underrepresented groups in Canada including the Black community. Attention to cultural sensitivity and better representation of Black people in the health care teams, better cultural awareness training for HCPs, multilingual and lay health educators and patient navigators, and better tailoring of health information to a patient's health and cultural literacy.

At the health care system level, there is an important need for the collection of race and ethnicity data to be able to fully understand where the gaps lie and how tailored interventions can improve access and outcomes in cancer care.

[READ THE FULL ARTICLE](#)

<sup>8</sup> Nnorom O, et al. Afrocentric screening program for breast, colorectal, and cervical cancer among immigrant patients in Ontario. *Can Fam Physician* 2021;67:843–9.