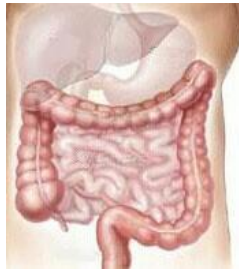


COLORECTAL CANCER TREATMENT & CLINICAL RESEARCH UPDATES

Month Ending August 18th, 2022

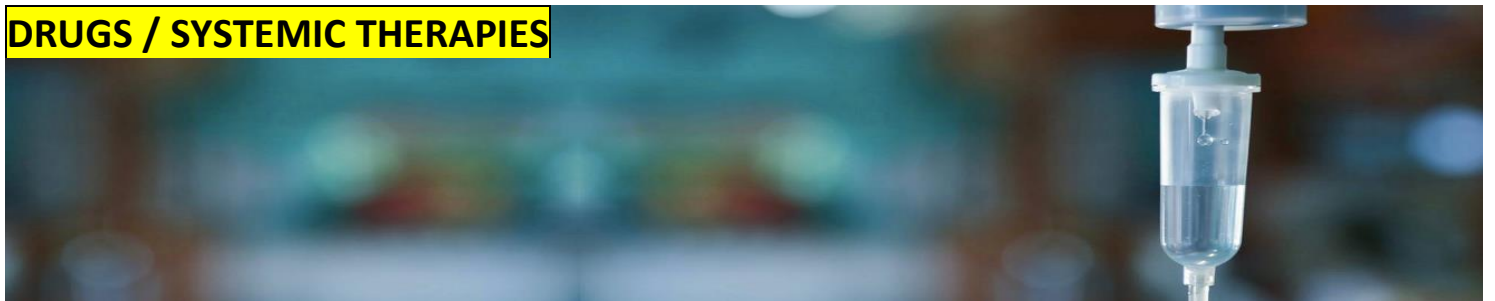


The following colorectal cancer treatment and research updates extend from July 14th, 2022, to August 18th, 2022, inclusive and are intended for informational purposes only.

This content is not intended to be a substitute for professional medical advice. Always consult your treating physician or guidance of a qualified health professional with any questions you may have regarding your health or a medical condition. Never disregard the advice of a medical professional or delay in seeking it because of something you have read on this website.

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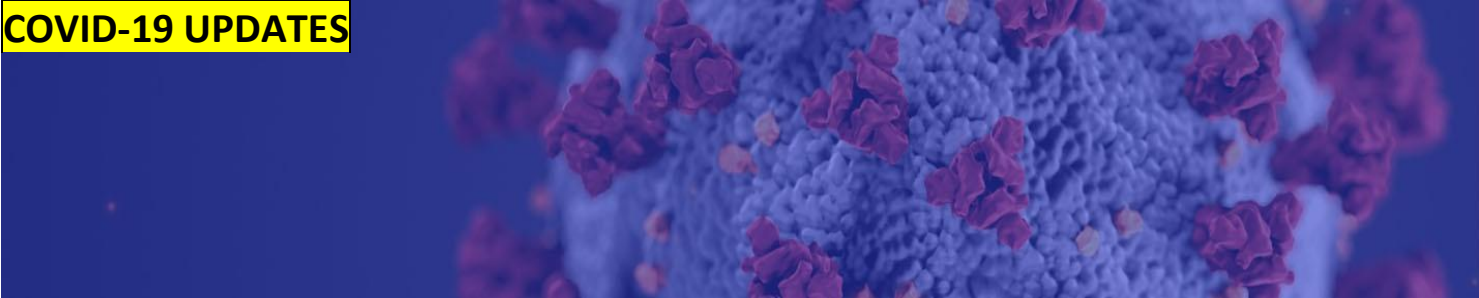
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DRUGS / SYSTEMIC THERAPIES

1. Phase II LEAP Clinical Trial For mCRC (Aug.10/21)

The purpose of this study is to determine the safety and efficacy of combination therapy with **pembrolizumab** (MK-3475) and **Levantine** (E7080/MK-7902) in patients with triple-negative breast cancer (TNBC), ovarian cancer, gastric cancer, **colorectal cancer (CRC)**, glioblastoma (GBM), or biliary tract cancers (BTC). Participants will be enrolled in

initial tumor-specific cohorts, which will be expanded if adequate efficacy is determined. The trial is available at the Odette Cancer Centre and at the Princess Margaret Cancer Centre in Toronto as well as the following Centres throughout Canada: Abbotsford, BC; Winnipeg, MB; CHU de Quebec. For information, visit the link below.

https://clinicaltrials.gov/ct2/show/study/NCT03797326?term=A+Multicenter%2C+Open-label+Phase+2+Study+of+Lenvatinib+%28E7080%2FMK-7902%29+Plus+Pembrolizumab&show_locs=Y#locn

2. TRK Fusion Cancer and How to Test for It (Aug.16/21)



TRK fusion cancer
and how to test for it



What is TRK fusion cancer?

- TRK (pronounced track) fusion cancer is a term used to describe **cancers that are caused by a change to the neurotrophic tyrosine receptor kinase (*NTRK*) gene** called a fusion
- During this fusion, an *NTRK* (pronounced en-track) gene **joins together, or fuses, with a different gene**
- This joining causes the body to make TRK fusion proteins, which can **cause cancer cells to multiply** and form a tumour
- The presence of TRK fusion proteins may be associated with **more aggressive cancer**



Having TRK fusion cancer doesn't change your original diagnosis, it just means that your **tumour is driven by an *NTRK* gene fusion**

Testing is the only way to find out if *NTRK* gene fusion is driving your cancer



TRK=tropomyosin receptor kinase

Who should be tested
for *NTRK* gene fusions?



Your doctor may consider testing in people:

- with solid tumours that are metastatic, and
- who are likely to experience severe complications from surgical resection, and
- when there are no satisfactory treatments options available

It's important to know what's driving your cancer to help your doctor take action

FastTRK

FastTRK is a clinical testing program for diagnosing *NTRK* gene fusions

Sponsored by Bayer, this is a complimentary service for healthcare professionals to find out if their patients' cancer has an *NTRK* gene fusion

Talk to your doctor about which tests
are recommended for you



© TM see www.bayer.ca/tm-mc
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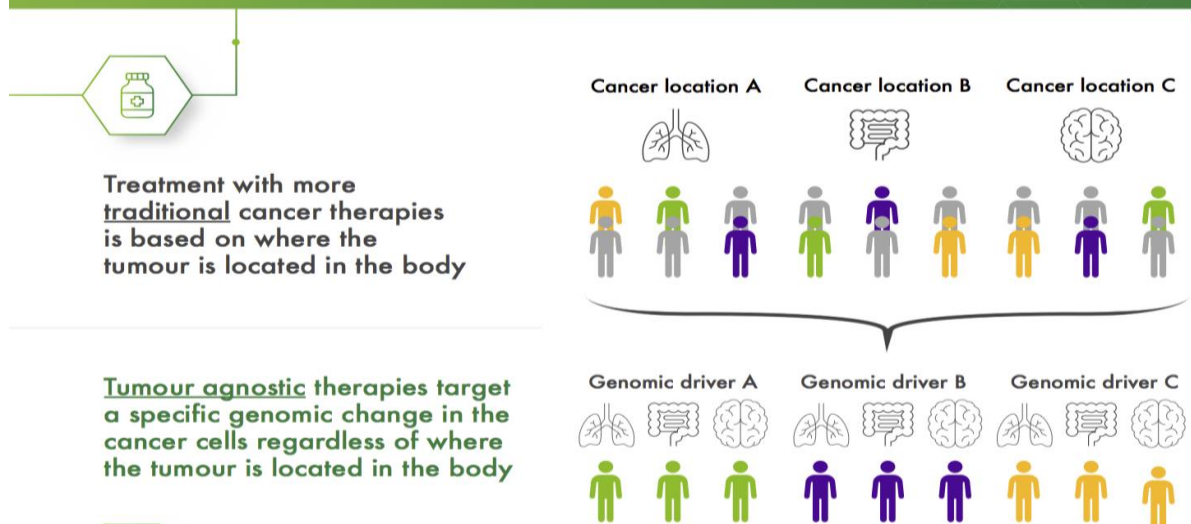
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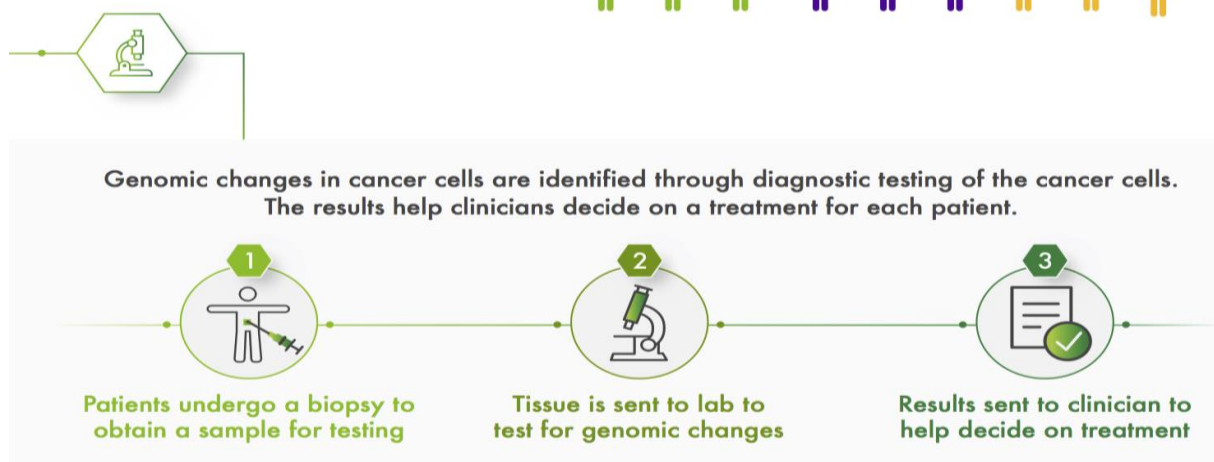
INTRODUCING

Tumour-Agnostic Therapies

Advances in precision medicine have brought therapies that specifically target what is driving a patient's cancer



Tumour agnostic therapies target a specific genomic change in the cancer cells regardless of where the tumour is located in the body



Advantages of tumour agnostic therapies

Targets the genomic change that is the root cause of the cancer to suppress tumour growth

Harnesses our growing understanding of cancer biology

Offers an innovative, new and effective approach to treating cancer

Change required to adopt tumour agnostic therapies in Canada

A shift in mindset: this is a new concept that differs from the traditional approach of treating cancer based on tumour location

Access to genomic testing: Identifying patients who would benefit from treatments requires a robust testing infrastructure

An evolved, more adaptive assessment of treatments for public coverage is required that includes recognition of smaller patient populations, new clinical trial methods, and ability to examine new data over time

MAC-VIT-CA-0007-1

<https://www.newswire.ca/news-releases/health-canada-approves-vitrakvi-r-larotrectinib-the-first-tumour-agnostic-cancer-treatment-for-advanced-solid-tumours-harboring-an-ntrk-gene-fusion-880379419.html>
<https://www.bayer.ca/en/media/news/?dt=TmpBPQ==&st=1>

3. A Phase II, Open-label, Multicenter, Study of an Immunotherapeutic Treatment for the MSI High CRC Metastatic Population (Aug.16/21)

The purpose of this study is to look at the effectiveness of the vaccine DPX-Survivac in combination with the drugs cyclophosphamide and **the immunotherapy Pembrolizumab** in patients with solid cancers who are identified to be MSI-High. All patients will receive combination therapy of DPX-Survivac, cyclophosphamide, and pembrolizumab. Patients participating will know which treatment they are receiving. The trial is currently hosted at the Odette Cancer Centre, and a new site is opening at Mt. Sinai Hospital.

4. Phase III Study at the Odette Cancer Centre Comparing Arfolitixorin vs. Leucovorin in Combination with 5FU, Oxaliplatin and Bevacizumab in Patients with Advanced CRC (Aug.16/21)

The purpose of this study is to look at the effectiveness of the drug Arfolitixorin in combination with 5-fluorouracil (5FU), oxaliplatin, and bevacizumab in patients with colorectal cancer (CRC). Patients with advanced/metastatic CRC who meet certain criteria may be able to participate. There will be two groups of patients participating in this study;

- one group will receive **Arfolitixorin** in combination with 5FU), oxaliplatin, and bevacizumab,
- while the other group will receive the drug **Leucovorin** in combination with 5FU, oxaliplatin, and bevacizumab (standard of care).

The doctor and study staff will not know which group a patient is in. Patients will be randomized to receive one treatment or the other.

About Arfolitixorin:

Arfolitixorin is Isofol's proprietary drug candidate being developed to increase the efficacy of standard of care chemotherapy for advanced CRC. The drug candidate is currently being studied in a global Phase 3 clinical trial. As the key active metabolite of the widely used folate-based drugs, arfolitixorin can potentially benefit all patients with advanced CRC, as it does not require complicated metabolic activation to become effective.

Treating cancer patients with arfolitixorin – The goals:

- When treating CRC, for example, arfolitixorin is administered in combination with 5-FU to increase cell mortality in circulating cancer cells and in cancerous tumours.
- Arfolitixorin is administered in conjunction with rescue therapy after high-dose treatment with the cytotoxic agent, methotrexate, in order to suppress the cytotoxic effect in surrounding healthy tissue. The treatment is used for certain types of cancer, such as osteosarcoma, a type of bone cancer. This involves administering arfolitixorin separately, 24 hours after the chemotherapy.

<https://sunnybrook.ca/trials/item/?i=293&page=49335> and <https://clinicaltrials.gov/ct2/show/NCT03750786>
(<https://isofolmedical.com/arfolitixorin/>)

5. Seagen's Potential Breast Cancer Blockbuster Tukysa Shows Promise in CRC (May 23/22)

Two years after its approval in the U.S., Seagen's potential blockbuster Tukysa is off to a promising start as a treatment for breast cancer. Now the Seattle-area biotech is hoping to expand its use to **colorectal cancer (CRC)** patients. The company recently revealed successful top-line results from the **Mountaineer trial** investigating the use of **Tukysa plus chemotherapy (Roche's Herceptin)** on patients with previously treated HER2-positive metastatic colorectal cancer (mCRC). Of 117 patients to receive the treatment, 38% experienced a complete or partial response, allowing the trial to meet its primary objective. Of those who achieved response to the regimen, their median duration without tumor growth was 12.4 months. The medicine also was well-tolerated. About 20% or more of patients experienced side effects that included diarrhea, fatigue, nausea or infusion-related reaction. Seagen plans to submit a new drug application to the FDA under its accelerated approval program.

<https://www.fiercepharma.com/pharma/seagens-potential-breast-cancer-blockbuster-tukysa-shows-promise-colorectal-cancer>

6. Improving HER2 Biomarker Testing in mCRC (Aug.12/22)

HER2 (also known as ERBB2) amplification or overexpression occurs in a relatively small proportion of metastatic colorectal cancer (mCRC) cases. Nevertheless, early identification of patients with this alteration, ideally through next-generation sequencing (NGS) testing, can help with selection of appropriate therapy and referral to clinical trials involving emerging HER2-targeted therapies for mCRC.

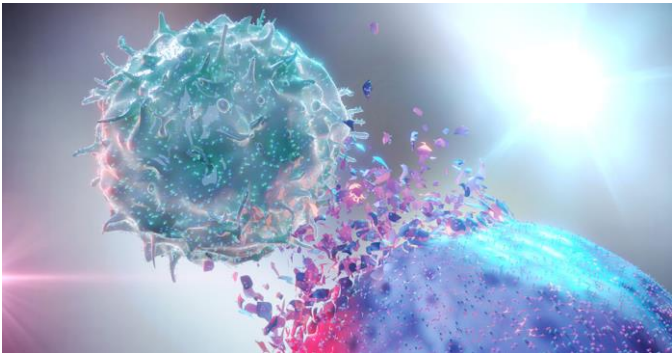
Because single-agent HER2 therapy has not been shown to be effective in mCRC, clinical trials of HER2-targeted therapies generally focus on dual HER2 inhibition (use of 2 HER2-targeted agents) or HER2 antibody-drug conjugates. Studies have found that dual anti-HER2 inhibition works very well in patients who have treatment-refractory mCRC and have HER2 overexpression or amplification. They are also very well-tolerated treatments overall compared with other options that you have in CRC.

HER2 is a small, but an important, biomarker that should be looked for in all patients with mCRC because of the immense therapeutic impact that it can create on the life of these patients. Although accessibility to HER2 testing should be adequate, because HER2 IHC is widely available, FDA approval of HER2-targeted therapies for mCRC is the next major hurdle to improving therapeutic options for affected patients with tumors that harbor this molecular aberration.

<https://www.ajmc.com/view/improving-her2-biomarker-testing-in-metastatic-colorectal-cancer>

7. New Targets Could Mean Better Immunotherapy for Colon Cancer (Apr.5/22)

A new study from a team at the Dresden University of Technology identified two proteins for potential immunotherapies that could make that line of treatment effective for a much larger patient pool with colon cancer. Immunotherapy cancer treatments are designed to help the body’s immune system locate and target cancerous cells that can otherwise grow undetected. These treatments have made a wave in the cancer space but have so far been very limited in which kinds of cancer they can successfully treat—and they have an overall success rate of only about 20%. The team identified **B7H3** and **B7H4** as possible drug targets to boost immunotherapies and then tested how inhibiting those proteins would affect cancer cells. The results showed significantly slowed growth or even shrinking tumor tissue in which these signals were disabled. It was observed that now the immune cells could invade the cancer tissue and started to control tumor cells. Thus, immunotherapy treatments targeting these proteins could prove much more effective at stopping colon cancer.



<https://www.fiercebiotech.com/biotech/researchers-uncover-new-immunotherapy-targets-how-gut-bacteria-helps-cancer-spread>
Image Source: <https://www.cancercenter.com/community/blog/2021/01/immunotherapy-cancer>

8. Personalis, BC Cancer Partner on Study of ctDNA Minimal Residual Disease (MRD) Tests for CRCs (Aug.15/22)

Personalis announced it has partnered with BC Cancer to study its NeXT Personal molecular residual disease assay in patients with colorectal and pancreatic cancers. The study aims to recruit approximately 220 patients from across British Columbia. The company hopes to determine the best time to draw blood for ctDNA sampling, as well as to study how ctDNA MRD testing may be useful in identifying cancer progression before current standard-of-care tests. Personalis will also work with BC Cancer to assess whether MRD testing in these patients has the potential to reduce healthcare spending compared to existing imaging tools. CtDNA surveillance may allow for earlier detection of cancer recurrence or progression, and therefore earlier intervention, which may improve patient survival. Further terms of the collaboration were not disclosed.

https://www.precisiononcologynews.com/business-news/personalis-bc-cancer-partner-study-ctdna-mrd-tests-colorectal-pancreatic-cancers?utm_source=Sailthru&utm_medium=email&utm_campaign=PON%20Daily%20Monday%202022-08-15&utm_term=PON%20Weekly#.Yv1bQS2z1bV

SURGICAL THERAPIES

9. Hepatic Artery Infusion Pump (HAIP) Chemotherapy Program – Sunnybrook Odette Cancer Centre (Aug.1/22)

The HAIP program is a first-in-Canada for individuals where colon or rectal cancer (colorectal cancer) has spread to the liver and cannot be removed with surgery. The program involves a coordinated, multidisciplinary team approach to care, with close collaboration across surgical oncology, medical oncology (chemotherapy), interventional radiology, nuclear medicine, and oncology nursing. The Hepatic Artery Infusion Pump (HAIP) is a small, disc-shaped device that is surgically implanted just below the skin of the patient and is connected via a catheter to the hepatic (main) artery of the liver. About 95 percent of the chemotherapy that is directed through this pump stays in the liver, sparing the rest of the body from side effects. Patients receive HAIP-directed chemotherapy in addition to regular intravenous (IV) chemotherapy (systemic chemotherapy), to reduce the number and size of tumours. **Drs. Paul Karanicolas and Michael Raphael** are the program leads and happy to see patients who may be eligible for the therapy.



Presently at Sunnybrook Odette Cancer Centre, HAIP is being used in patients with colorectal cancer that has spread to the liver that cannot be removed surgically and has not spread to anywhere else in the body. Patients who have few (1-5) and very small tumors in the lungs may be considered if the lung disease is deemed treatable prior to HAIP. If you believe you may benefit from this therapy and/or would like to learn more about the clinical trial, your medical oncologist or surgeon may fax a referral to **416-480-6179**. For more information on the HAIP clinical trial, please click on the link provided below.

<http://sunnybrook.ca/content/?page=colorectal-colon-bowel-haip-chemotherapy>

10. Living Donor Liver Transplantation for Unresectable CRC Liver Metastases (Aug.2/22)

Approximately half of all colorectal cancer (CRC) patients develop metastases, commonly to the liver and lung. Surgical removal of liver metastases (LM) is the only treatment option, though only 20-40% of patients are candidates for surgical therapy. Surgical therapy adds a significant survival benefit, with 5-year survival after liver resection for LM of 40-50%, compared to 10-20% 5-year survival for chemotherapy alone. Liver transplantation (LT) would remove all evident disease in cases where the colorectal metastases are isolated to the liver but considered unresectable.

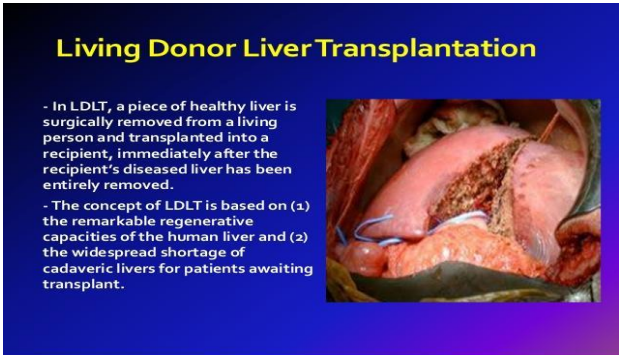


Image Source: <https://www.slideshare.net/AhmedAdel65/preoperative>

While CRC LM is considered a contraindication for LT at most cancer centers, a single center in Oslo, Norway demonstrated a 5-year survival of 56%. A clinical trial sponsored by the University Health Network in Toronto will offer live donor liver transplantation (LDLT) to select patients with unresectable metastases limited to the liver and are non-progressing on standard chemotherapy. Patients will be screened for liver transplant suitability and must also have a healthy living donor come forward for evaluation. Patients who undergo LDLT will be followed for survival, disease-free survival, and quality of life for 5 years and compared to a control group who discontinue the study before transplantation due to reasons other than cancer progression.

<https://clinicaltrials.gov/ct2/show/NCT02864485>

11. “Watch and Wait” Rectal Cancer Treatment Strategy Benefits Select Patients (Aug.10/22)

A “watch and wait” approach to certain types of rectal cancer is helping spare select patients from surgery while preserving a higher quality of life. Patients who can benefit from watch and wait include those with early-stage small tumors and those with more advanced cancer who are elderly, frail or have comorbidities and would otherwise require an ostomy.

Over the last 15 years, rectal cancer care has evolved and now involves giving patients total neoadjuvant therapy — not only chemotherapy with radiation therapy, but also stronger chemotherapy alone. Patients tolerate these therapies better before surgery than afterward. Researchers are also finding patients are better able to get all the chemotherapy they need without any breaks, delays or reduced doses, perhaps decreasing the chance of the tumor coming back. Another benefit is that tumors shrink more, allowing surgeons to perform more sphincter-preserving surgeries, which are special operations where a permanent colostomy isn’t necessary. In some cases, they can eliminate surgery altogether because tumors can no longer be detected after completing total neoadjuvant therapy.

Before the ‘watch and wait’ approach was implemented, researchers observed a clinically complete response in only about 10% of rectal cancer patients. With total neoadjuvant therapy, tumors are disappearing in 30-60% of patients. ‘Watch and wait’ was found to be a promising approach as long as patients agree to follow-up care.

<https://www.froedtert.com/stories/watch-and-wait-rectal-cancer-treatment-strategy-benefits-select-patients>

RADIATION THERAPIES/INTERVENTIONAL RADIOLOGY

12. Study Offered at the Odette Cancer Centre to Treat Recurrent Rectal Cancer (Aug.9/21)

Magnetic resonance-guided focused ultrasound (MRg-FU) is a less invasive; outpatient modality being investigated for the thermal treatment of cancer. In MRg-FU, a specially designed transducer is used to focus a beam of low-intensity ultrasound energy into a small volume at a specific target site in the body. MR is used to identify and delineate the tumour, focus the ultrasound beam on the target, and provide a real-time thermal mapping to ensure accurate heating of the designated target with minimal effect to the adjacent healthy tissue. The focused ultrasound beam produces therapeutic hyperthermia (40-42°C) in the target field, causing protein denaturation and cell damage. Currently, there is no prospective clinical data reported on the use of MRg-FU in the setting of recurrent rectal cancer. Recurrent rectal cancer is a vexing clinical problem. Current retreatment protocols have limited efficacy. The addition of hyperthermia to radiation and chemotherapy may enhance the therapeutic response. With recent advances in technology, the investigators hypothesize that MRg-FU is technically feasible and can be safely used in combination with concurrent re-irradiation and chemotherapy for the treatment of recurrent rectal cancer without increased side-effects. The study is being offered at the Odette Cancer Centre. Here is the link to the study protocol:

<https://clinicaltrials.gov/ct2/show/NCT02528175?term=magnetic+resonance+guided+focused+ultrasound&recr=Open&rank=1>



SCREENING

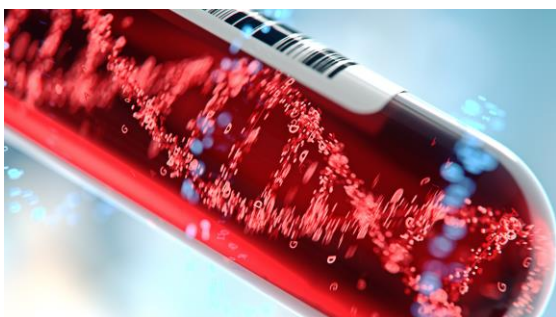
13. Trends in the Incidence of Young-Onset CRC with a Focus on Years Approaching Screening Age (Aug.10/22)

With recent evidence for the increasing risk of **young-onset colorectal cancer (yCRC)**, the objective of this population-based longitudinal study was to evaluate the incidence of yCRC in one-year age increments, particularly focusing on the screening age of 50 years. The study was conducted using linked administrative health databases in British Columbia, Canada including a provincial cancer registry, inpatient/outpatient visits, and vital statistics from January 1, 1986 to December 31, 2016. Researchers calculated the incidence rates per 100,000 at every age from 20 to 60 years and estimated annual percent change in incidence (APCi) of yCRC using joinpoint regression analysis. 3,614 individuals were identified with yCRC (49.9% women). The incidence of CRC steadily rose from 20 to 60 years, with a marked increase from 49 to 50 years. Furthermore, there was a trend of increased incidence of yCRC among women. Analyses stratified by age yielded APCi's of 2.49% and 0.12% for women aged 30-39 years and 40-49 years, respectively and 2.97% and 1.86% for men. These findings indicate a steady increase over one-year age increments in the risk of yCRC during the years approaching and beyond screening age. These findings highlight the need to raise awareness as well as continue discussions regarding considerations of lowering the screening age.

<https://academic.oup.com/jnci/advance-article/doi/10.1093/jnci/djaa220/6119347?questAccessKey=af490637-e51e-44d0-81b9-d1f2df7b60c9>

14. Guardant Debuts its First Cancer Screening Blood Test for Catching Colorectal Tumors (May 2/22)

The blood-testing company Guardant Health aims to offer a simpler option to people who may have missed their



recommended appointments to be checked out for colorectal cancer (CRC)—such as a colonoscopy—with the launch of its first **cancer screening test**. Guardant's **Shield test** is intended for adults over age 45 who have an **average risk** for CRC and show no symptoms, with a single blood draw performed in a provider's office. The test searches for early signs of CRC from pieces of tumor DNA found floating in the bloodstream. It can also help detect **recurring cancers** months earlier than the current standard imaging procedures and blood tests for carcinoembryonic antigen levels.

In a clinical study of about 300 samples, the assay showed 91% sensitivity in detecting positive cases, including 90% for people with early, stage I cancers, 97% for stage II and 86% for stage III. Shield also demonstrated a low rate of false positives, at 8%, but the company said that a negative result does not fully rule out the presence of cancer. People who have a signal detected by the test should be referred to a colonoscopy for confirmation, and Guardant said its blood test is intended to complement, not replace, current screening methods.

<https://www.fiercebiotech.com/medtech/guardant-debuts-first-cancer-screening-blood-test-catching-colorectal-tumors>

<https://www.fiercebiotech.com/medtech/guardant-health-launches-surveillance-blood-test-for-detecting-colorectal-cancer-recurrence>

Image Source: <https://www.science.org/content/article/catching-cancer-extremely-early>

15. CRC Screenings Take Center Stage at White House Meeting (Jul.26/22)

In May, first lady Jill Biden announced a call to action regarding the nearly 10 million cancer screenings in the United States that were missed because of the COVID-19 pandemic. Later in July, officials with Fight Colorectal Cancer (FightCRC) assembled a work group of colorectal cancer (CRC) survivors, patient advocates, and business leaders at the White House to share ideas about this issue. There was also a lot of attention paid at the White House meeting to liquid biopsies, which President Joe Biden has highlighted because these molecular tests can detect cancer earlier than traditional biopsies and are less invasive. **Liquid biopsy industry participants at the meeting included Guardant Health, Natera, Exact Sciences, Epigenomics, and Freenome.** By bringing together stakeholders across the healthcare community including industry, patient advocacy, academia, and government, key barriers to screening can be addressed and all eligible patients can be ensured access to life-saving innovations in cancer screening.

https://www.healthline.com/health-news/colorectal-cancer-screenings-take-center-stage-at-white-house-meeting?slot_pos=article_3&utm_source=Sailthru%20Email&utm_medium=Email&utm_campaign=daily&utm_content=2022-07-27&apid=35071678&rvid=f0f57ada60cbcff8355009cb5e3a7d953ab89292aca3a379e264fc11d37cf3b#Liquid-biopsies-part-of-the-solution

16. Blood Test Shows Potential as Way to Screen for Early-Onset CRC (Aug.10/22)

Scientists at City of Hope have developed a novel blood test that may in the **future be used to detect early-onset colorectal cancer (CRC)**, which has been on the rise in younger adults in recent years. The study is significant because it is the first time a novel microRNA (miRNA) biomarker has been identified, developed, and validated to detect early-onset CRC. Researchers systematically conducted a genome-wide analysis to identify miRNA signatures by analyzing a large, publicly available dataset. They extrapolated the data of patients with either Stage 1 or 2 early-onset CRC (42) or patients with late-onset CRC (370). (MiRNAs regulate gene expression.) Results were validated using blood samples from 149 patients with early-onset CRC and compared the data with a control group of 110. The researchers were able to identify four miRNAs that, combined, create a signature biomarker which can be used to detect and diagnose the presence of early-onset CRC in younger adults. While exciting, more research using larger patient cohorts must be performed before this novel liquid biopsy can be used in the clinic.

<https://www.cityofhope.org/blood-test-shows-potential-way-screen-early-onset-colorectal-cancer>

OTHER

17. Young Adult CRC Clinic Available at Sunnybrook (Aug.5/22)

A recent study led by the University of Toronto doctors has observed a rise in colorectal cancer (CRC) rates in patients under the age of 50. The study mirrors findings from the U.S., Australia and Europe. The growing CRC rates in young people come after decades of declining rates in people over 50, which have occurred most likely due to increased use of CRC screening (through population-based screening programs) which can identify and remove precancerous polyps. Patients diagnosed under the age of 50 have a unique set of needs, challenges and worries. They are unlike those diagnosed over the age of 50. **Dr. Shady Ashamalla (colorectal cancer surgical oncologist)**, and his team at the **Sunnybrook Health Sciences Centre** understand the needs of this patient population.



Dr. Ashamalla belongs to a multidisciplinary team of experts in the **Young Adult Colorectal Cancer Clinic** who will work with young CRC patients, regardless of disease stage, to create an individualized treatment plan to support each patient through their cancer journey. Their needs and concerns will be addressed as they relate to:

- Fertility concerns and issues
- Young children at home
- Dating/intimacy issues
- Challenges at work
- Concerns about hereditary cancer
- Relationships with family and friends
- Psychological stress due to any or all of the above

The team of experts consists of:

- Oncologists (medical, surgical, radiation)

- Social workers
- Psychologists
- Geneticists
- Nurse navigator

Should a patient wish to be referred to Sunnybrook, they may have their primary care physician, or their specialist **refer them to Sunnybrook via the e-referral form, which can be accessed through the link appearing below.** Once the referral is received, the **Young Adult Colorectal Cancer Clinic** will be notified if the patient is under the age of 50. An appointment will then be issued wherein the patient will meet with various members of the team to address their specific set of concerns.

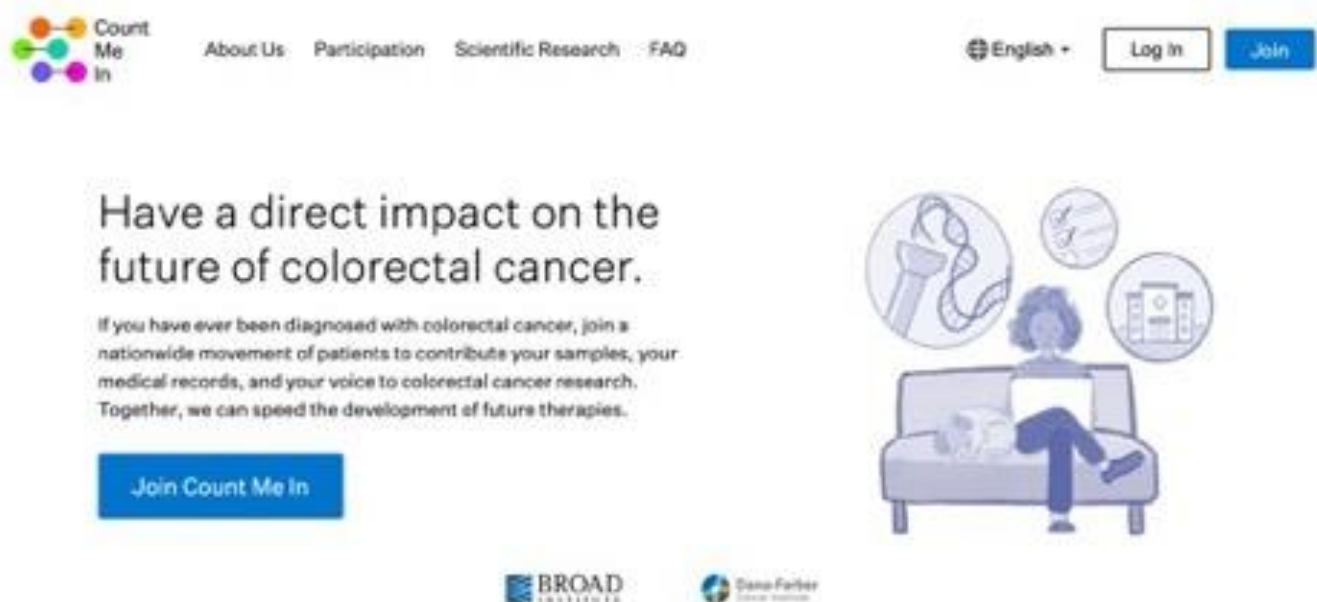
<http://sunnybrook.ca/content/?page=young-adult-colorectal-cancer-clinic>

18. CCRAN's Partnership with "Count Me In" (Aug.1/22)

CCRAN is proud to partner with Count Me In, a nonprofit research initiative, on The Colorectal Cancer Project. This new project is open to anyone in the United States or Canada who has ever been diagnosed with colorectal cancer (CRC). Patients can find out more and join at JoinCountMeIn.org/Colorectal.

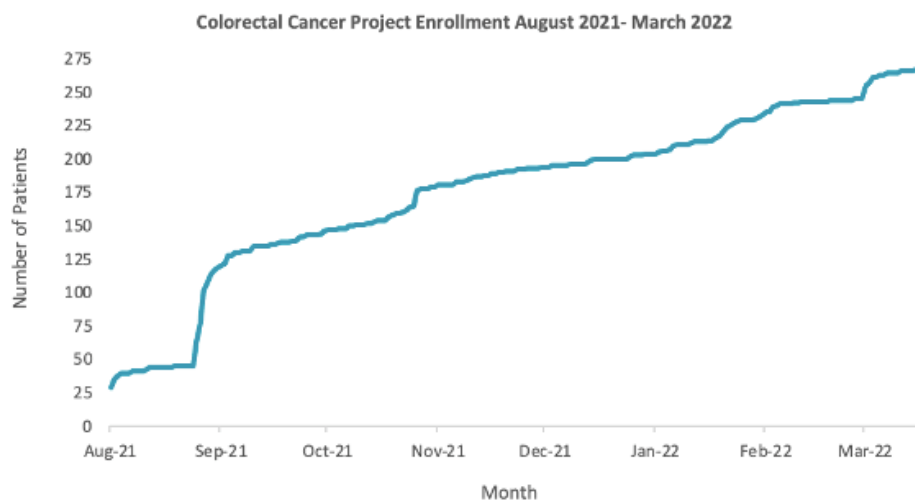
Through the project, patients are asked to complete surveys to share information about their experience with CRC, to share biological sample(s), and to allow for the research team to request copies of their medical records. The project team then de-identifies and shares data from these with the entire research community.

Every patient's story holds a piece of the puzzle that can help us better understand CRC. By discovering more about what drives cancer and sharing this data, CCRAN and the Colorectal Cancer Project believe insights can be gained to develop more effective therapies. One of the aims of the project is to reach populations that have been understudied, including individuals who are diagnosed with CRC at a young age, individuals from marginalized communities who have historically been excluded from research, and patients with metastatic CRC. Together, we can accelerate our understanding of CRC. To learn more or sign up to participate, visit JoinCountMeIn.org/Colorectal.

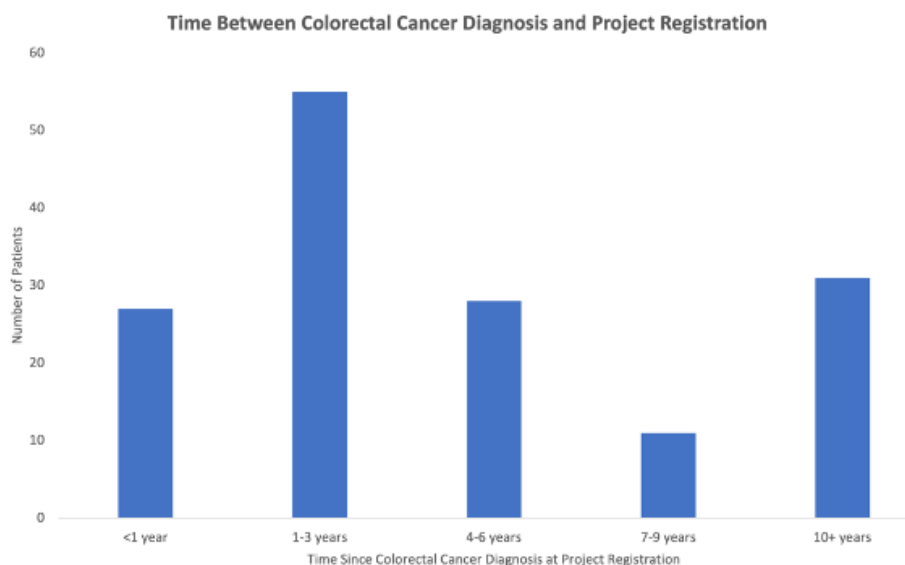
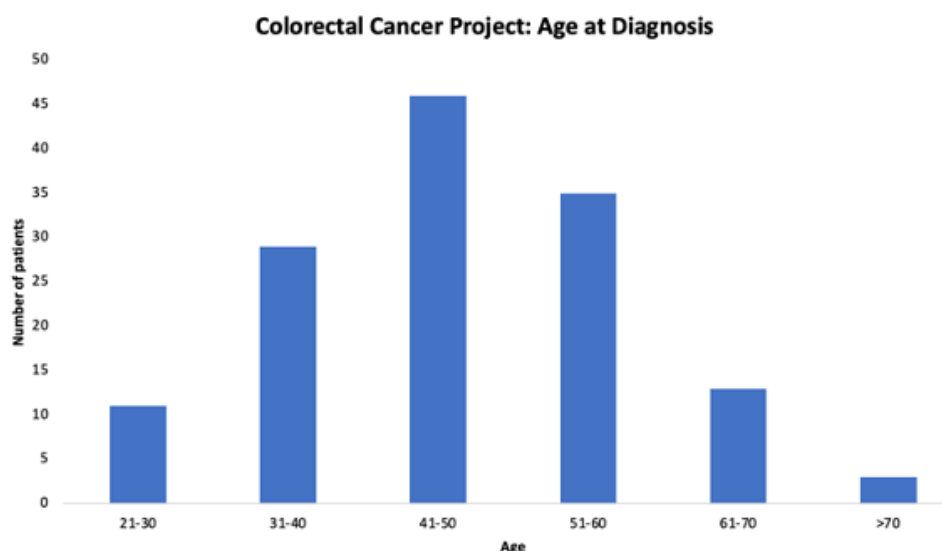


"Count Me In", a nonprofit cancer research initiative, is inviting all patients across the United States and Canada who have ever been diagnosed with colorectal cancer (CRC) to participate in research and help drive new discoveries related to this disease. The Colorectal Cancer Project will enable patients to easily share their samples, health information and personal lived experiences directly with researchers in order to accelerate the pace of research.

Patients who have been diagnosed with CRC at any point in their lives can join the project by visiting JoinCountMeIn.org/colorectal. From there, patients will be invited to share information about their experience through surveys and to provide access to medical records as well as saliva samples and optional blood, stool, and/or stored tissue samples for study and analysis. Researchers from the Broad Institute of MIT and Harvard and Dana-Farber Cancer Institute use this information to generate databases of clinical, genomic, molecular, and patient-reported data that is then de-identified and shared with researchers everywhere. To date, more than 9,000 patients with different cancers have joined Count Me In and shared their data. "We still do not know why there is an alarming rise in CRC in young adults", said Andrea Cercek, MD Co-Director, Center for Young Onset Colorectal and Gastrointestinal Cancers Memorial Sloan Kettering Cancer Center and co-scientific leader of the Colorectal Cancer Project. "What we do know is that this is a global phenomenon that affects otherwise healthy individuals with no known risk factors. The Colorectal Cancer Project will provide researchers important information that will lead to a better understanding of this disease."



Over 250 patients have joined the Colorectal Cancer Project since the launch in fall 2021. Every patient that joins the Colorectal Cancer Project enables us to learn more about colorectal cancer. Pts diagnosed at any age, whether newly diagnosed or years from their diagnosis, can enroll. If you have ever been diagnosed with colorectal cancer, you can visit JoinCountMeIn.org/Colorectal to enroll and have a direct impact on research and future treatment strategies.



Our colleagues at @ Count Me In are aiming to improve our understanding of colorectal cancer by learning directly from all CRC patients anywhere in the United States or Canada. To find out more about how to have your experience with colorectal cancer counted in research, visit JoinCountMeIn.org/colorectal.

All colorectal cancer patients in the United States and Canada have the opportunity to be counted in research.



JoinCountMeIn.org/Colorectal

<https://www.news-medical.net/news/20210914/Colorectal-Cancer-Project-launches-to-improve-understanding-of-the-disease-and-accelerate-research.aspx>
<https://www.medicalnewstoday.com/articles/antibiotic-use-linked-to-increased-risk-of-colorectal-cancer#Use-of-antibiotics-and-an-increased-risk-of-colon-cancer>

19. Patients and Caregivers Needed to Help Shape Early Research for a CRC Therapy (Aug.10/22)

The Project:


Site specific immunomodulators (SSIs) are a new class of therapy, made from dead bacteria. This therapy is designed to help the body's own defense system ('immune cells') fight cancer. SSIs may be a potential new treatment for colorectal cancer and have already been shown to be safe in cancer patients. **Our team of scientists and clinicians are planning a clinical trial to determine if SSIs can increase the number of patients who survive colorectal cancer metastatic to the liver.** The trial will start this Fall and is being led by Dr. Rebecca Auer (Ottawa) and Dr. Paul Karanicolas (Sunnybrook).

Why do we need your help?

We want patients and family members to help us shape our research, which aims to improve the experience of trial participants.

We are currently looking for patients, caregivers, or family members to join our team. As a part of our team, you will:

- ☐ Participate in group meetings (online and/or in person) with the research team from May 2022 to March 2024
- ☐ Help brainstorm and draft resources and documents for future trial participants
- ☐ Provide input on research to evaluate the usefulness of the developed resources



Who can apply?

We are looking for individuals with any of the following:

- ☐ A patient, family member, or a caregiver, with lived experience of colorectal cancer, liver metastases, and/or liver surgery
- ☐ Interested in helping shape research to assess a new therapy for colorectal cancer

No previous experience with SSIs or research is necessary. An orientation session will provide more information about the research project, and we encourage you to ask any questions you have at any time.

In appreciation for your time, partners will receive compensation for attendance at meetings and activities.

If you are interested in joining our team or would like more information:

Please contact Meredith Conboy, Research Assistant, The Ottawa Hospital Research Institute

Email: mconboy@ohri.ca



20. Study Suggests C. Difficile Drives Some CRCs (Jul.15/22)

Data collected by researchers at the Johns Hopkins Kimmel Cancer Center and the Bloomberg Kimmel Institute for Cancer Immunotherapy suggest that *Clostridioides difficile*, or *C. diff*, a bacterial species well known for causing serious diarrheal infections, may also drive colorectal cancer (CRC).

Several years ago, researchers in the Sears Lab discovered that more than half of patients with CRC had bacterial biofilms — dense collections of bacteria on the colon surface — whereas 10% to 15% of healthy patients without tumors displayed biofilms. However, when the researchers infected mice with biofilm samples derived from individual people with CRC, one sample caught their attention because it markedly increased colorectal tumors in the mice. To determine which bacteria may be causing tumors in the mice, researchers performed additional experiments to see if a single bacterial species or a community of bacteria were promoting tumor formation in the mice. They noted that toxigenic *C. difficile*, the type of *C. difficile* that causes diarrhea, was absent in the samples that did not cause tumors but was present in the samples that caused tumors in mice. When the researchers added this bacterium to the samples that originally did not cause tumors, it induced colon tumors in the mice. Cells exposed to this bacterium turned on genes that drive cancer and turned off genes that protect against cancer. These cells produced reactive oxygen species, unstable molecules that can damage DNA, and they also prompted immune activity associated with harmful inflammation.



While this link between *C. difficile* and CRC needs to be confirmed in prospective, longitudinal cohorts, developing better strategies and therapeutics to reduce the risk of *C. difficile* primary infection and recurrence could both spare patients the immediate consequences of severe diarrhea and potentially limit CRC risk later on.

<https://www.technologynetworks.com/cancer-research/news/study-suggests-c-difficile-drives-some-colorectal-cancers-363720>
<https://news.vumc.org/2022/07/28/c-difficile-may-contribute-to-colorectal-cancer-study/>
Image Source: https://www.cdc.gov/hai/organisms/cdiff/cdiff_infect.html

21. No Evidence of Heightened CRC Risk in Patients with Elderly-Onset IBD (Aug.5/22)

While most of the research of colorectal cancer (CRC) in patients with **inflammatory bowel disease (IBD)** has focused on a younger population, new research is looking at elderly-onset IBD and whether or not it is related to an increased incidence and mortality rate of CRC. Researchers estimated the risk of incident CRC and mortality in elderly onset IBD. The study included patients diagnosed with IBD aged 60 years and older between 1969-2017. Overall, the team identified 7869 patients with Crohn’s disease and 21,224 patients with ulcerative colitis. Of this group, 2.10% of patients with Crohn’s disease and 1.90% of patients with ulcerative colitis were diagnosed with CRC, compared to 2.26% and 2.34% of reference individuals. In addition, the cancer incidence was elevated during the first year following an IBD diagnosis. However, this decreased after the first year of follow-up. Following a CRC diagnosis, mortality was similar between patients with IBD and the general population. Therefore, the excess risk of CRC in elderly-onset IBD was probably due to bias and not observed beyond the first year.

<https://www.hcplive.com/view/evidence-heightened-colorectal-cancer-risk-patients-elderly-onset-ibd>

22. The Importance of Getting a Second Opinion (Apr.29/22)

A second opinion is an important part of becoming educated about your cancer and your treatment options. In order to receive appropriate treatment while the treatment of cancer continues to evolve tremendously, it is advantageous to seek more than one opinion about how your cancer can be treated. A second opinion is a review of the cancer diagnosis and the treatment recommendations of the physician who is treating the cancer by another, independent physician. Either the patient or the primary physician can initiate the process of getting a second opinion. Usually, patients obtain a second opinion after being referred to a second physician or to a special team of experts in a cancer center, called a multidisciplinary team. Second opinions are more likely to be comprehensive, or inclusive of every possible perspective, when performed in a cancer center with a multidisciplinary team, which usually includes surgeons, oncologists, radiation therapists, and sub-specialist oncologists. It is important to note that **second opinions will not offend competent physicians.** Second opinions will, however, provide reassurance to you and your family and ultimately allow you to receive the most appropriate therapy.

https://news.cancerconnect.com/newly-diagnosed/the-importance-of-getting-a-second-opinion?utm_source=CancerConnect&utm_campaign=5342058569-EMAIL_CAMPAIGN_9_20_2018_13_9_COPY_01&utm_medium=email&utm_term=0_4403223c9e-5342058569-6283611

23. Study Results Indicate Increase in Early-Onset CRC (Jul.25/22)



The incidence of early-onset colorectal cancer (CRC) is projected to increase by 2030 and more than double, according to a review article published in The New England Journal of Medicine. Additionally, there is delayed diagnosis in younger individuals and presentation of advanced disease that poses a need for awareness on early-onset CRC, according to investigators. The review detailed the importance of screening patients for the disease by addressing educational needs, overcoming barriers to screening, and increasing adherence to screening.

It’s essential that individuals are aware of recent recommendation changes for CRC screening. Previous recommendations indicated that individuals older than aged 50 years should start screening for CRC. However, given the rise of early-onset CRC, the US Preventive Service Task Force has recommended that individuals who are aged 45 to 49 years should also begin screening for CRC. Another recommended approach is earlier screening for individuals who have a family history of CRC. Another new screening approach could be the assessment of circulating tumor DNA in blood plasma, which is in clinical trials and has the potential to increase screening rates. However, access to care still must be addressed. Overall, the broader message should be for all patients to consult health care professionals on adhering to recommended guidelines.

<https://www.pharmacytimes.com/view/study-results-indicate-increase-in-early-onset-colorectal-cancer>
Image Source: <https://www.yalemedicine.org/news/second-opinions>

24. New NCCN CRC Guidelines Recommend Genetic Testing for All Diagnosed Patients (Aug.8/22)

As a result of recent research revealing that a significant number of colorectal cancer (CRC) patients with actionable variants are missed under previous genetic testing guidelines, the National Comprehensive Cancer Network (NCCN) announced new guidelines calling for testing to be available to all patients diagnosed with CRC. **Specifically, NCCN recommended 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.** The new guidelines follow recent landmark studies supporting universal genetic testing for all cancer patients, regardless of cancer type, age, stage or



family history. The data showed that nearly 1 in 6 CRC patients had inherited gene mutations that increased their risk of cancer. Additionally, more than 10% of patients in the study had changes to their cancer treatments based on genetic testing findings – many of whom would have been missed by previous limited testing guidelines. These new recommendations expand the current testing criteria, which limited testing to certain age groups and types of cancer. As the medical community's understanding of genetic links to cancer evolves, genetic testing guidelines must evolve with it.

<https://www.prnewswire.com/news-releases/new-nccn-colorectal-cancer-guidelines-recommend-genetic-testing-for-all-diagnosed-patients-301601618.html>
Image Source: <https://www.shutterstock.com/image-vector/dna-genetics-testing-icon-chain-magnifying-1085371934>

NUTRITION/HEALTHY LIFESTYLE

25. Upcoming EXCEL Presentation: Living an ACTIVE Life with and Beyond CRC (Aug.11/22)

Exercise for Cancer to Enhance Living Well (EXCEL) is a 5-year Canada-wide project, which offers free, 12-week exercise classes designed specifically for individuals undergoing or recovering from cancer treatment. This project will increase the accessibility of exercise programs for rural and remote cancer survivors. Physical activity can help overcome treatment-related side effects such as fatigue and pain, improve mental health by reducing anxiety and depression, and improve overall quality of life for individuals living with and beyond cancer. Studies show that physical activity may even reduce the risk of recurrence for some cancers.

Join us on **August 21st** at **CCRAN's National Online Support Group Meeting** to learn more about the benefits of physical activity for individuals living with and beyond colorectal cancer (CRC)), discuss tips for becoming and staying active, plan ahead to move more, and discover a wide range of free cancer-specific exercise resources or programs. The session will be led by Chad Wagoner, a Clinical Exercise Physiologist with the American College of Sports Medicine with a PhD in Human Movement Science from the University of North Carolina at Chapel Hill. His research centers around the development and evaluation of implementation for community-based exercise oncology programs in addition to examining the role of Clinical Exercise Physiologists within clinical cancer care to better connect those living with cancer to appropriate exercise oncology resources.

To learn more about the EXCEL study:
<https://kinesiology.ucalgary.ca/labs/health-and-wellness/research/research-studies/exercise-cancer-enhance-living-well-excel/>

To hear about participant experiences: <https://www.youtube.com/watch?v=c01oo4Yd3oA>

26. This May Be the #1 Worst Diet for CRC (Jul.10/22)

If you eat a lot of salty snacks, sweet treats, and red meat, then there's a chance your personal menu is made up of a Western-style diet. While it may not come as a surprise, it is extremely important to know that a Western-style diet can be hazardous to your health.

In a recent study, researchers looked at information from 134,775 participants of the Health Professionals Follow-up Study and the Nurses' Health Study and found 1,175 incidents of colorectal cancer (CRC) tumors. Those behind the study also found higher levels of polyketide synthase (pks+) Escherichia coli (E. Coli) in tumors of those who relied on Western-style diets. Researchers confirm this study supports a hypothesis that Western-style diet can cause CRC via this bacteria. Western diets are typically high in overly processed foods and refined carbohydrates, which can lead to inflammation. Western diets also lack fiber due to limited intake of fruits and veggies. While foods that are high in fiber 'brush' or 'clean' intestinal lining cells, low-fiber foods don't provide as much maintenance and cleaning action. This new research continues to support the concept that an unhealthy gut microbiome and poor diet can lead to chronic disease states.

<https://www.eatthis.com/worst-diet-colorectal-cancer/>





COVID-19 UPDATES

27. No Booster Necessary? Scientists Looking at Vaccines with Time-Released Microparticles (Jul.16/22)



Researchers from the Massachusetts Institute of Technology (MIT) are exploring a new drug delivery system that could work by using tiny microparticles shaped like coffee dispenser pods to administer drugs in the bloodstream at staggered times — anywhere from days to months later. The technology is still in the early laboratory stages and will need to go through animal and human testing. While much more needs to be done to prove that this approach works in the clinic, this technology could reduce the need for multiple shots and the prime-boost approach, which is currently used for most

vaccines. With this technology, the immune system could get primed on the initial dose and then microparticles could release a second and final dose at an appropriate time in the future.

Much like mRNA vaccines represent a potential leap forward in vaccine development with their high degree of customizability, speed of development, and potential for tailored therapies like cancer vaccines, experts say these microparticle containers could represent a leap forward for standard drug delivery. This approach could potentially be revolutionary for several applications, but above all for facilitating options for relatively underserved communities with limited or uncertain access to healthcare resources, and whose members may have difficulty in following up with trained medical personnel to receive administrations of medications, vaccines, or other drugs entailing a multi-dose series scattered over weeks or months.

https://www.healthline.com/health-news/no-booster-necessary-scientists-looking-at-vaccines-with-time-released-microparticles?slot_pos=article_1&utm_source=Sailthru%20Email&utm_medium=Email&utm_campaign=daily&utm_content=2022-07-18&apid=35071678&rvid=f0f57ada60cbcff8355009cb5e3a7d953ab89292aca3a379e264fc111d37cf3b#The-microparticle-future
Image Source: <https://www.hkpr.on.ca/2022/07/08/covid-19-vaccines/>

28. Blood Viscosity Enters the Equation in COVID Mortality (Jul.18/22)

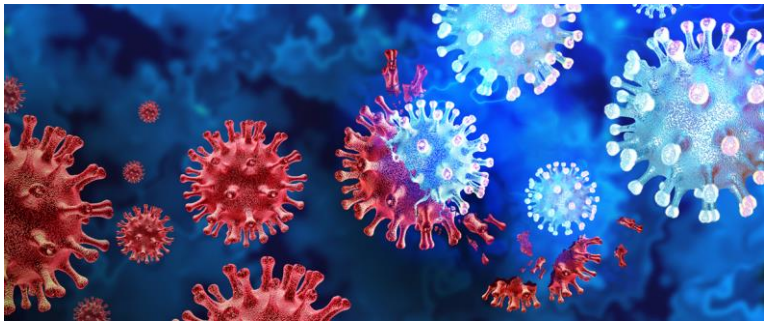
According to an observational study, people with thicker blood were less likely to survive hospitalization for COVID-19. The study included 5,621 COVID-19 patients hospitalized across six hospitals in the Mount Sinai Health System. As estimates of whole blood viscosity at different shear rates, estimated high-shear and low-shear blood viscosity (eHSBV and eLSBV) were associated with increased in-hospital mortality, such that one unit increases in each were associated with 36.0% and 7.0% greater risks of death, respectively. After adjustment for interleukin-6 and other inflammatory biomarkers, only the high-shear measure remained significantly associated with mortality. This study demonstrates the importance of checking for blood viscosity in COVID-19 patients early in hospital admission, which is easily obtained through routine lab work. Results can help determine the best treatment course for at-risk patients and help improve outcomes. Researchers are currently investigating the effects of therapeutic heparin to reduce the risk of complications during acute COVID-19 infections, which may greatly benefit those with high blood viscosity.

https://www.medpagetoday.com/infectiousdisease/covid19/99776?xid=nl_mpt_Oncology_update_2022-07-19&eun=q169463d0r&utm_source=Sailthru&utm_medium=email&utm_campaign=Automated%20Specialty%20Update%20Oncology%20BiWeekly%20TUESDAY%202022-07-19&utm_term=NL_Spec_Oncology_Update_Active

29. BA. 5: What We Know About Protection from Vaccines and Previous Infections (Jul.22/22)

The BA.5 subvariant currently accounts for 65% of infections in the U.S. BA.5 has mutations on the spike protein — the part of the virus that allows for cell entry — that have helped it spread quickly and partially evade antibodies generated from previous infections or vaccinations. Recent evidence suggests that the type of variant you were previously infected with can influence your risk of reinfection. People who were infected with a variant that preceded Omicron — such as Delta or Alpha — were estimated to be about 15% protected from a symptomatic BA.5 reinfection.

Individuals who developed an Omicron case were estimated to be 76% protected against a symptomatic BA.5 reinfection. Additionally, prior evidence has shown that immunity against symptomatic infections wane with time. In general, the longer out from a past infection, you are, the less robust your immune response will be. Booster vaccinations also increase antibodies quite a bit, which helps to overcome some of the virus’ immune evasion. The most severe infections continue to be in unvaccinated people. To get the most robust protection against coronavirus, experts recommend being fully up to date on COVID-19 vaccines no matter your previous COVID-19 history.



https://www.healthline.com/health-news/ba-5-what-we-know-about-protection-from-vaccines-and-previous-infections?slot_pos=article_1&utm_source=Sailthru%20Email&utm_medium=Email&utm_campaign=daily&utm_content=2022-07-25&apid=35071678&rvid=f0f57ada60cbcff8355009cb5e3a7d953ab89292aca3a379e264fc111d37cf3b#The-bottom-line:
Image Source: <https://healthmatters.nyp.org/omicron-subvariant-what-you-need-to-know/>

30. Frequently Asked Questions for COVID-19

Q: What is COVID-19 (or novel Coronavirus Disease - 19)?

A: Coronaviruses are a large family of viruses that can cause illnesses in humans and animals. Coronaviruses can cause illnesses that range in severity from the common cold to more severe diseases such as Severe Acute Respiratory Syndrome (SARS) and most recently, COVID-19. COVID-19 or novel coronavirus originated from an outbreak in Wuhan, China in December 2019. The most common symptoms associated with COVID-19 can include fever, fatigue, and a dry cough. Though additional symptoms have now been linked with the disease, which may include aches and pains, nasal congestion, runny nose, sore throat, diarrhea, skin rash and vomiting. It is also possible to become infected with COVID-19 and not experience any symptoms or feeling ill. The spread of COVID-19 is mainly through the transmission of droplets from the nose or mouth when a person coughs, exhales or sneezes. These droplets land on surfaces around a nearby person. COVID-19 can be transmitted to that nearby person who may end up touching the surface contaminated with COVID-19 and then end up touching their nose, mouth, or eyes. A person can also contract COVID-19 through inhaling these droplets from someone with COVID-19. Although research is still ongoing, it is important to note that older populations (over the age of 65), those with a compromised immune system and those with pre-existing conditions including heart disease, high blood pressure, lung disease, diabetes or cancer may be at a higher risk of severe illness due to COVID-19.

<https://www.who.int/news-room/q-a-detail/q-a-coronaviruses>

Q: What can I do to avoid getting Coronavirus?

A: There are various ways in which we can reduce our risk of contracting COVID-19. Below are some measures suggested by the World Health Organization

1. Keep at least 2 metres (or 6 feet) between yourself and other people. This will reduce the risk of inhaling droplets from those infected with COVID-19.
2. Regularly clean your hands for at least 20 seconds with warm water and soap, or an alcohol-based hand rub. This will kill any viruses on your hands.
3. Avoid touching your eyes, nose and mouth. If the virus is on your hands, it can enter the body through these areas.
4. Follow good respiratory hygiene by covering your mouth and nose with a tissue or elbow when you cough and sneeze. This prevents the droplets from settling on surfaces or being released into the air around you.
5. Stay home as much as possible, especially if you are feeling unwell. If you think you may have the Coronavirus, please see “What should I do if I think I have Coronavirus?” section.
6. Please wear a face covering or mask in public when physical distancing is not possible.

<https://www.who.int/news-room/q-a-detail/q-a-coronaviruses>

Q: Are there special precautions that people with cancer can take?

A: People with cancer (and other chronic ailments such as heart disease, diabetes, high blood pressure and lung disease) are at a higher risk of severe illness due to COVID-19 as cancer is considered a pre-existing health issue. Some cancer treatments including chemotherapy, radiation and surgery can weaken the immune system, making it harder for the body to fight infections and viruses, such as Coronavirus. It is important to diligently follow the World Health Organization’s recommendations above to reduce the risk of contracting COVID-19. If you have any concerns about your risk, it is best to contact your doctor or healthcare team.

Will anything change with regards to my cancer related medical visits? As each patient and treatment plan is unique, it is always best to contact your health care provider for updated information about your treatment plan. In some cases, it is safe to delay cancer treatment until after the pandemic risk has decreased. In other cases, it may be safe to attend

a clinic that is separate from where COVID-19 patients are being treated. Oral treatment options could be prescribed by your care provider virtually, without the need to attend the clinic. Finally, some follow-up appointments or discussions could be held virtually (via skype or zoom for example) or over the phone to minimize your risk. As we know, conditions and protocols are changing daily due to the nature of the COVID-19 outbreak, and vary based on location, therefore, the best first step is to reach out to your care provider for guidance.

<https://www.cancer.gov/contact/emergencypreparedness/coronavirus>

Should you wish to contact your local public health agency, please see below.

Alberta

COVID-19 info for Albertans

Social media: Instagram @albertahealthservices, Facebook @albertahealthservices, Twitter @GoAHealth

Phone number: 811

British Columbia

British Columbia COVID-19

Social media: Facebook @ImmunizeBC, Twitter @CDCofBC

Phone number: 811

Manitoba

Manitoba COVID-19

Social media: Facebook @manitobagovernment, Twitter @mbgov

Phone number: 1-888-315-9257

New Brunswick

New Brunswick Coronavirus

Social media: Facebook @GovNB, Twitter @Gov_NB, Instagram @gnbca

Phone number: 811

Newfoundland and Labrador

Newfoundland and Labrador COVID-19 information

Social media: Facebook @GovNL, Twitter @GovNL, Instagram @govnlsocial

Phone number: 811 or 1-888-709-2929

Northwest Territories

Northwest Territories coronavirus disease (COVID-19)

Social media: Facebook @NTHSSA

Phone number: 811

Nova Scotia

Nova Scotia novel coronavirus (COVID-19)

Social media: Facebook @NovaScotiaHealthAuthority , Twitter @healthns, Instagram @novascotiahealthauthority

Phone number: 811

Nunavut

Nunavut COVID-19 (novel coronavirus)

Social media: Facebook @GovofNunavut , Twitter @GovofNunavut, Instagram @governmentofnunavut

Phone number: 1-888-975-8601

Ontario

Ontario: The 2019 Novel Coronavirus (COVID-19)

Social media: Facebook @ONThealth, Twitter @ONThealth , Instagram @ongov

Phone number: 1-866-797-0000

Prince Edward Island

Prince Edward Island COVID-19

Social media: Facebook @GovPe, Twitter @InfoPEI,

Quebec

Coronavirus disease (COVID-19) in Québec

Social media: Facebook @GouvQc, Twitter @sante_qc

Phone number: 1-877-644-4545

Saskatchewan

Saskatchewan COVID-19

Social media: Facebook @SKGov, Twitter @SKGov

Phone number: 811

Yukon

Yukon: Find information about coronavirus (COVID-19)

Social media: Facebook @yukonhss, Twitter @hssyukon

Phone number: 811