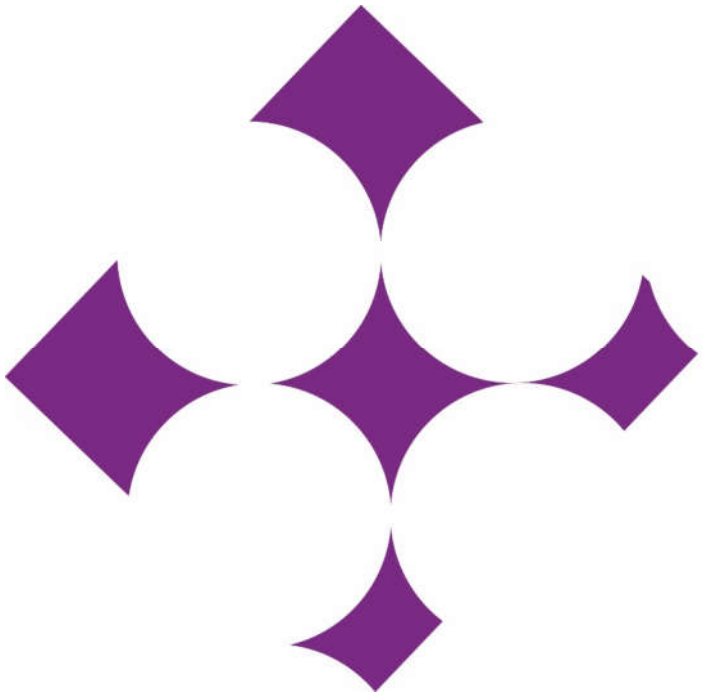

ARCC
Canadian Centre
for Applied Research
in Cancer Control

ARCC 2023

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Book of Abstracts

(In order of Abstract ID)

1 - The impact of a cancer diagnosis on the short- and long-term income of cancer survivors in Canada

Stuart Peacock[1], Lisa McQuarrie[1], Rachel Altman[2], Colene Bentley[1], Shiraz El Adam[1], Paulos Teckle[1]

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Background: With more cancer survivors living longer, attention has shifted to the long-term effects of cancer, which can be physical, psychosocial, or financial. Cancer can affect income from various sources, not only employment. Survivors of cancer have been found to have lower stores of physical (e.g., assets, properties) and financial wealth (e.g., stocks, savings) in addition to greater debt and risk of bankruptcy.

Objectives: The aim of this study is to compare the short- and long-term income of adult cancer survivors from across Canada to a propensity-score-matched control group from the general population.

Methods: Four data sources from 2000-17 were linked by Statistics Canada: the Canadian Cancer Registry, T1 Family File, Canadian Vital Death Statistics Database, and Longitudinal Administrative Databank. A linear mixed effects model was used to estimate the effect of cancer on income.

Results: Almost all cancer patients diagnosed between 18-64 years old experience a decline in individual income following a cancer diagnosis. On average (compared to controls), a cancer patient will experience a 5% fall in income in the year they are diagnosed, and an 8% fall in the following year. Many cancer survivors of working age increase work and income in years 5-10 post-diagnosis (an apparent compensatory effect), and females were found to work harder and longer than males.

Conclusion: There is a clear case for providing income support for cancer patients across the first 3 years post cancer diagnosis. Females need greater income support than males during these years.

2 - Real-world effectiveness and safety of durvalumab extended dosing for locally advanced non-small cell lung cancer during the COVID-19 pandemic

Xiaochen Tai[1], Jessica Arias[1], Andrew G Robinson [2], M. Sara Kuruvilla [3], Stephanie Brulé[4], Munaza Chaudry[1], Caroline E Muñoz [1], Scott Gavura[1], Kelvin KW Chan[1]

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Background: Ontario Health implemented extended dosing intervals for durvalumab treatment of locally advanced, stage III non-small cell lung cancer (NSCLC) to optimize patient access by minimizing patients' exposure to healthcare facilities during the COVID-19 pandemic. Previous small studies provided conflicting and non-definitive trends on efficacy and safety of durvalumab extended versus standard dosing intervals. Assessing real-world durvalumab extended dosing interval effectiveness and safety is necessary to ensure patients are not experiencing increased toxicity or reduced effectiveness.

Objective: To assess the real-world effectiveness and safety of durvalumab extended versus standard dosing intervals for treating patients with stage III NSCLC during the COVID-19 pandemic.

Methods: This was a retrospective, population-based observational cohort study using administrative health data from Ontario patients with locally advanced, unresectable stage III NSCLC starting durvalumab between December 2018-December 2021. Extended dosing patients received a durvalumab dosage of 20 mg/kg once every 4 weeks. Standard dosing patients received a durvalumab dosage of 10 mg/kg once every 2 weeks. Propensity score matching (PSM) reduced imbalances in baseline characteristics between groups. The primary outcome was overall survival, measured using Kaplan-Meier methods and Cox proportional hazards regression. Safety outcomes included unscheduled emergency department (ED) visits and hospital admissions within 30 days of last dose of durvalumab, measured using negative binomial regression.

Results: This study included 771 patients with NSCLC who received durvalumab between December 2018-December 2022. The PSM cohort included 224 patients in each treatment group. No significant difference in risk of mortality was identified between groups (HR: 0.99, 95% CI: 0.70-1.41; p>0.05). No significant differences in ED visits (RR: 1.22, 95% CI: 0.54-2.77; p>0.05) or hospital admissions (RR: 0.73, 95% CI: 0.17-3.13, p>0.05) were observed between groups.

Discussion: We did not identify significant differences in the effectiveness or safety of extended versus standard dosing of durvalumab among patients with NSCLC. The findings confirm the interim measure of extended dosing of durvalumab minimized patients' exposure to healthcare facilities during the COVID-19 pandemic without compromising the effectiveness and safety of their treatment.

4 - The Public Interest Group on Cancer Research - The 2022 Update

Sevtap Savas[1], Holly Etchegary[1], Cindy Whitten[2], Alicia Follett[1], Namiko Sakamoto[3], Janine Taylor-Cutting[3], Jason Wiseman[3], Derrick Bishop[3], John King[3], Teri Stuckless[2]

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Background: The Public Interest Group on Cancer Research (PI group) is a successful cancer-affected community member - scientist partnership that designs research studies and public engagement & outreach activities in Newfoundland and Labrador (NL).

Objectives: Our goal is to share the work and experience of the PI group that can inform other community member - scientist partnerships in oncology.

Methods: The PI group communicated through regular virtual meetings and email. Meeting minutes, email correspondence, website and local media activities, as well as the feedback received, were reviewed to identify the main activities and impact of the group in 2022.

Results: 2022 was a successful year for the PI group. In addition to providing consultations for research projects and public education activities, the PI group also organized a very successful Public Conference on Cancer that brought all stakeholders together; increased its advocacy and knowledge exchange activities through media articles and interviews; and disseminated its work in a peer-reviewed scholarly journal and at academic conferences. Last, a website was established to communicate the work of the group widely with all stakeholders.

Conclusions: The Public Interest Group on Cancer Research is a successful community - scientist partnership in cancer. Through needs assessments, study development, public outreach activities and advocacy, this group elevates the voices and lived experiences of cancer-affected individuals and families and identifies opportunities to enhance value-based cancer care in NL.

5 - Partnering with patient advisers in designing and delivering public engagement events on cancer

Sevtap Savas[1], Alicia Follett[1], Holly Etchegary[1], Cindy Whitten[2], Namiko Sakamoto[3], Janine Taylor-Cutting[3], Jason Wiseman[3], Derrick Bishop[3], John King[3], Tristan Bilash[4], Teri Stuckless [2]

[1]Faculty of Medicine, Memorial University, St. John's, NL, Canada., [2]Newfoundland and Labrador Health Services, NL, Canada., [3]Public Interest Group on Cancer Research, NL, Canada., [4]Patient author, Saskatchewan, Canada.

Background: The Public Interest Group on Cancer Research (PI group) is a public member-scientist partnership created in 2021 in Newfoundland and Labrador (NL). In October 2022, the PI group delivered the virtual Public Conference on Cancer that disseminated knowledge about cancer, cancer lived experiences, and cancer screening and support services.

Objectives: Our goal is to share the experience, expertise, and perspectives gained by the PI group during the planning and delivery of the Public Conference on Cancer.

Methods: The conference was held on October 15, 2022. Sixteen speakers were invited, including five patient and family member speakers. A conference participant feedback survey was implemented. Fifty-two participants completed the survey. In addition to responses to the survey, email and social media comments received were reviewed. Our reflections on the entire experience were also integrated.

Results: The comments received were largely positive, indicating the effectiveness of the Public Conference on Cancer. Patient and family speakers' talks were the most impactful part of the event, followed by the talks on cancer care and screening services offered to NL residents. The top challenges identified to address in future events included technical issues and reaching residents of rural and remote parts of the province.

Conclusions: The Public Conference on Cancer was a successful public event. The feedback received and the perspectives we gained as a result of this experience will help us deliver more effective and accessible public outreach activities on cancer.

6 - Progress in genetic prognostic studies in colorectal cancer

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Background: Genetic variables, such as somatic mutations and germline polymorphisms, can be associated with cancer patient outcomes. Since this information can be used in prognostication and treatment decisions, as well as in understanding the biology of cancer, genetic prognostic research has been an attractive research field.

Objectives: Our aim is to review the progress in genetic prognostic research in colorectal cancer, supported with data from our published studies.

Results: Traditional prognostic analyses often include established statistical methods, including the Cox regression method, while examining the relationship of genetic variables with patient phenotypes. While initially these studies were restricted to candidate variable/gene analyses, and later to candidate pathway analyses, eventually genomewide association studies became widely conducted in the study of prognosis. Extending these studies further, our lab and a few others have undertaken projects on two important but under-studied areas in prognostic research: 1) time-varying effects of the variables - including genetic variables - in patient outcomes, and 2) interactions between genetic variables that can explain the different outcome risks among patients. The first question can be solved by statistical methods, however identification of prognostic interactions often requires computational tools in addition to statistical methods. Two of the computational tools we have utilized for interactions are based on the Multifactor Dimensionality Reduction (MDR) method. Currently, our lab is focused on robust computational tools that can perform genomewide level interaction analyses, which will enable us to explore the larger landscape of genetic interactions in patient outcomes.

Conclusions: In our experience, genetic prognostic research in oncology has been progressing fast, but approaches beyond the traditional genomewide association analyses can further enrich and progress this research field. For example, both time-varying effects and interactions of variables can be missed in traditional survival analyses, contributing to missing heritability. To address this, researchers can take advantage of advanced statistical methods and artificial intelligence methods such as MDR to examine and identify currently unknown prognostic markers. The information gained from such studies then can inform future studies and help reveal the biological relationship between genetic variants and patient outcomes in cancer in more detailed and innovative ways.

8 - Examining the Impact of Cancer on the Financial, Business, and Professional Well-being of Self-Employed Canadians: A Descriptive Study Protocol

Camilo Sierra Herrera[1], Christine Maheu[1], Wing Lam Tock[1]

[1]McGill University

Introduction: A cancer diagnosis can significantly impact a person's ability to work due to the various physical, emotional, mental, and cognitive side effects of cancer treatment. The impact of cancer on the self-employed (SE) is more significant as they lack the same benefits and job security as salaried workers. For the SE, a cancer diagnosis can result in greater income losses than salaried workers, decreased business productivity, foreclosure, and difficulty meeting basic financial obligations. In Canada, SE individuals account for approximately 15% of the workforce; however, cancer's impact on the SE is largely understudied.

Purpose: To describe the impact of cancer on SE Canadians' financial, business, and professional well-being.

Methodology: Descriptive multimethod cross-sectional survey design. Recruitment of 30 SE French and English-speaking Canadians diagnosed with cancer using convenience and snowball sampling techniques. Data collection using valid and reliable measures of financial, business and professional well-being. Descriptive and multivariate statistical analyses will be conducted to describe the study population and assess the relationship between demographic, clinical, and occupational work characteristics and the study variables. Participants who provide detailed responses to the survey questions will be analyzed using content analysis.

Results: Data collection will begin in the fall of 2023.

Study Implications: The study will help understand how cancer affects SE individuals' financial, business, and professional well-being, including lost revenue, decreased productivity, difficulty finding replacements, and career changes. This study could help policymakers and organizations create financial aid, financial management workshops and networking events for SE cancer survivors. Finally, the study will help healthcare providers understand SE cancer patients' unique challenges, thereby reducing stigma and improving support.

10 - Studying the social and workplace experiences of individuals with a history of cancer in Newfoundland and Labrador

Krista King[1], Derrick Bishop[2], Stephanie Budgell[2], Cindy Whitten[3], Eric Tenkorang[4], Jonathan Greenland[5], Teri Stuckless[6], Holly Etchegary[1], Sevtap Savas[7]

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Background: In a previous study conducted in Newfoundland and Labrador (NL), a significant portion of the participants reported negative experiences in their social and workplace settings following their cancer diagnosis. This study also found that select demographic groups were disproportionally affected by these experiences. Building on these findings, in the current study, we aim to attain a thorough understanding of these post-cancer experiences in NL.

Study objectives: To examine the lived social and workplace experiences of individuals diagnosed with cancer within the last 5 years in NL. We hypothesize that these experiences differ based on geographic location (e.g. Labrador and parts of Newfoundland), and among vulnerable groups, including young adults and members of the 2SLGBTQIA+ community. We will also compare the lived experiences among these patient groups.

Methods: This is a qualitative, patient-oriented study. Two patient partners have guided and will continue to guide the team throughout the project. Various tools and venues are currently being used for participant recruitment. Focus group methodology and thematic analysis will be utilized to understand the lived social and workplace experiences of participants. A sociodemographic survey will be utilized to collect pertinent participant information. Themes identified in each group will be compared to identify shared or unique themes among the patient groups.

Current state of the study: We expect to present study results at the conference. Participant recruitment has started and utilizes multiple venues and activities. These include information shared on our website; local and social media articles and posts; study posters displayed in the campus, clinics and community spaces; email contacts made to the relevant community organizations; and listserv circulations.

Expected outcomes and significance: This study will generate novel knowledge within the local context. An enhanced understanding of the social and workplace experiences of individuals with a history of cancer is expected to facilitate patient-centered conversations, promote social inclusion and justice, foster the development of healthy workplace policies, and lessen the burden of cancer in NL.

11 - Advancing health equity through cancer information and support services: a report on communities that are underserved

Apiramy Jeyapalan[1], Elizabeth Holmes[1], Tracy Torchetti[1], Laura Burnett[1]

[1]Canadian Cancer Society

The need for cancer information and support services is expected to grow as the number of people in Canada diagnosed with cancer increases due to our growing and aging population. The Canadian Cancer Society's (CCS) underserved communities project identifies communities that face barriers to accessing cancer information and support. The project's goal is to understand gaps, barriers and challenges faced by these communities and outline opportunities and tactics to address them. For our work, CCS has currently identified 10 underserved communities with 25+ sub-communities: 2SLGBTQI+, adolescents and young adults with cancer, advanced cancer, communities that don't speak English or French, Indigenous communities, newcomers to Canada, older adults, racialized communities, rare cancer and rural and remote communities. Both diversity and intersectionality are important considerations as individuals may identify with more than one community and bring those experiences with them.

A mixed-methods approach was used including data from literature reviews, stakeholder interviews, data and document reviews. Key informant interviews were conducted with CCS staff, patient advisory groups and organizations that engage with underserved communities, and cancer agencies nationally and internationally.

Gaps and barriers for each community were documented along with key opportunities and recommended tactics to improve information and support services. This project also identified key considerations for engagement with each community and 5 overall recommendations to support organization's work with underserved communities: train staff, address capacity, engage with communities, co-design with communities and develop an evaluation framework.

People with cancer face many challenges while navigating their cancer experience. They have many needs including physical, emotional, social, psychological, informational, spiritual and practical. Information and support can help people with cancer and their caregivers manage these needs. The evidence gathered through this project will guide engagement efforts and strategies to better serve underserved communities with information, peer and practical supports in a meaningful, evidence-informed way. Further, CCS encourages other organizations to co-develop tailored initiatives with underserved communities, guided by the perspective of people with cancer from those communities.

12 - The Canadian Cancer Real-world Evidence Platform: Generating actionable RWE to answer decision-maker questions

Qi Guan[1], Katharina Forster[1], Suriya Aktar[1], Samara Strub[1], Rebecca E Mercer[1, 2], Pam Takhar[1], Caroline Muñoz[1], Scott Gavura[1], Jonathan C Irish[1, 3, 4], Elaine Meertens[1], Avram Denburg[3, 5], Winson Y Cheung[2, 6, 7, 8], Stuart Peacock[2, 9, 10], Kimberlyn McGrail[11, 12], Reka Pataky[2, 9], Mina Tadrous[3, 13, 14], Kelvin KW Chan[1, 2, 3, 14, 15]

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The number of novel oncology pharmaceuticals is rapidly increasing, with cancer therapeutics occupying a substantial portion (25%) of public drug spending in Canada. However, there remains a knowledge gap between drug efficacy and effectiveness, as clinical trials are conducted with potentially small sample sizes, strict eligibility criteria, single-arm design, lack of relevant Canadian comparators, and short follow-up periods for study outcomes. There is thus a growing need for post-market drug evaluations (PMDE) using real-world evidence (RWE) to ensure that cancer therapies are safe, effective, and clinically relevant.

Launched in September 2022, the Canadian Cancer Real-world Evaluation (CCRE) Platform is a pan-Canadian network that supports CADTH's CoLab in PMDE. The CCRE consists of a diverse group of individuals with advanced expertise in pharmacoepidemiology, health services research, health technology assessment, biostatistics, cancer-related health policy, and patient engagement. The team is embedded in provincial cancer agencies in Ontario, Alberta, and British Columbia, with in-house access to health administrative data. This includes population-based data on systemic treatments, radiation, and surgery, in addition to other health services utilization data. In the remaining provinces, data may be obtained through CCRE's collaborations with the Health Data Research Network Canada and the CanREValue Collaboration. Databases available to the CCRE are updated in a timely manner, with some having only a 2-month lag from real-time data collection.

Leveraging pan-Canadian data, we have developed a flexible three-stream response system to triage queries based on the complexity and resources required to generate timely oncology RWE for decision-makers in Canada.

13 - Why Cannot We Prevent Preventable Cancers? Understanding People's Perspective On The Barriers To And Facilitators Of Human Papillomavirus Vaccine Uptake At Three Levels Across Saskatchewan -- Patient-, Provider-, And System-Level.

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Background: Canada has been a success story in implementing a publicly funded school-based HPV vaccination (HPVV) program. However, its earlier achievements are challenged by the rapidly prevailing anti-vaccine activism, reversing the earlier gains. Therefore, despite a widespread effort, the uptake of HPVV remained suboptimal in some Canadian jurisdictions. The rate of cervical cancer among Canadian women has not declined since 2005. The status quo of the cervical cancer incidence rate coupled with the suboptimal uptake of HPVV is in-part because HPVV's impact on cancer prevention has not been realized adequately by vaccine *providers* and *receivers.*

Purpose: The disease's infectious nature, its widespread transmission, and the consequent development of cancer of a preventable origin have become common knowledge among scientists and public health professionals. Further exploration of determinants of HPVV uptake (barriers and facilitators) is required to situate contextually appropriate policies around enhancing its uptake. We designed a study to explore determinants of HPVV uptake at three levels across Saskatchewan (patient, provider and system level).

Methods: This study employed a qualitative sequential mixed method inquiry using an Interpretive Description approach based on a pragmatic philosophy. The study was conducted in a phased manner. Phase 1 involved sending out short online surveys to all patient-level participants and conducting one-on-one semi-structured interviews with the patient, provider and system-level participants. Phase 2 was guided by findings from Phase 1, which involved sending responses to a detailed survey to the patient-level participants of the focus group discussion. With the system and provider-level participants, follow-up interviews were conducted, followed by a document analysis of the provincial document resources on HPVV.

Results: Data analysis identified two key themes as significant factors in HPVV uptake: 1. information, awareness and education about HPV infection and HPV vaccine, and 2. vaccine-related logistics.

Conclusion: A multi-component intervention to enhance HPV immunization rates remains instrumental, given the inconsistent uptake of HPVV by the population subgroups who voice unique barriers and facilitators. Interventions should target raising HPVV awareness, offering education, and tackling factors related to vaccine logistics in the cancer control continuum.

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* In the context of this study, patients are the vaccine receivers and include [+]migrant parents of kids eligible to get the HPV vaccine. The patient-level participants included the following subgroups (very recent immigrants, recent immigrants, and refugees). Vaccine providers represent frontline staff and supervisors, and system-level workers represent managers and directors.

[+] In the context of this study, migrant parents of kids eligible to get the HPV vaccine include very recent immigrants, recent immigrants, and refugees

14 - Patient Preferences in Metastatic Breast Cancer Care: A Scoping Review

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Background: Patients with metastatic breast cancer (MBC) have diverse medical, physical, and psychosocial needs that often require multidisciplinary and multimodal care. Understanding patient preferences is crucial to tailor MBC treatments and services and to foster patient-centered care. A scoping review was performed to summarize the current evidence on the preferences of patients with MBC regarding their care to identify knowledge gaps and key areas for future research. Methods: The EMBASE, MEDLINE, CINAHL and PsycInfo databases were comprehensively searched. Eligible articles included quantitative, qualitative, or mixed research methods studies that enrolled patients with MBC and evaluated patient preferences regarding their care (e.g., systemic treatment, supportive care, palliative care, communication). Studies that enrolled patients with early-stage breast cancer or patients with mixed metastatic cancer types (i.e., cancers other than breast) were excluded. Articles were summarized by study design and preference type evaluated. Results: Twenty studies enrolling 3,354 patients met the study eligibility criteria. Thirteen quantitative studies (65%), four mixed research methods studies (20%), and three qualitative studies (15%) were included. Healthcare provider views and preferences were also captured in nine studies (45%). Thirteen studies (65%) evaluated patient preferences relating to systemic cancer treatments, including specific drug preferences, mode of treatment administration, and treatment characteristic preferences (e.g., risk of side effects). Four studies (20%) evaluated preferences relating to communication or decision-making, typically with a focus on prognostic information. Three studies (15%) evaluated preferences relating to supportive care, including self-management practices and exercise programming. Conclusion: Studies to-date evaluating MBC patient preferences are heterogeneous and most have evaluated preferences for systemic cancer treatments. Future research priorities include evaluating patient preferences relating to multidisciplinary, multimodal care from physical to psychosocial therapies that prioritize patients' quality of life. Understanding MBC patient preferences regarding their comprehensive care can help tailor MBC healthcare delivery, enhance the patient experience, and improve health outcomes.

17 - Targeted delivery of PEGylated liposomal doxorubicin by bispecific antibodies improves treatment of childhood leukaemia

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High-risk childhood B and T cell acute lymphoblastic leukaemia (high-risk B- and T-ALL) has a poor prognosis due to treatment failure and toxic side effects of therapy. Similarly, children diagnosed with B-ALL and acute myeloid leukaemia (AML) both harbouring *MLL* gene rearrangements have >50% relapse rates and poor overall survival. For these aggressive subtypes of leukaemia, there are only limited treatment options with most intensive chemotherapy regimens having reached the limit of tolerability. Drug encapsulation into liposomal nanocarriers has shown clinical success at improving biodistribution and tolerability of chemotherapy. However, enhancements in drug efficacy have been limited due to a lack of selectivity of the liposomal formulations for the cancer cells.

Here, we focus on the development of a dynamic and flexible "mix-and-match" approach for the targeting of liposomal drugs to high-risk childhood leukaemia. This approach allows for the rapid adjustment of therapy based on the specific cell surface receptors expressed on leukaemia cells. Specifically, PEGylated liposomal drugs are non-covalently complexed with an interchangeable panel of bispecific antibodies (BsAbs) that simultaneously bind to methoxy polyethylene glycol (PEG) on the nanoparticle surface and CD19, CD20, CD22 or CD38 receptors on leukaemia cells.

BsAbs improved the targeting and cytotoxic activity of a clinically approved and low-toxic PEGylated liposomal formulation of doxorubicin (Caelyx) toward a panel of >13 leukaemia cell lines and patient-derived cells that are immunophenotypically heterogeneous and representative of major subtypes of high-risk childhood leukaemia (E. Moles et al., Science Translational Medicine, 15, eabm1262, 2023). BsAb-assisted improvements in leukaemia cell targeting and cytotoxic potency of Caelyx correlated with receptor expression and were not detrimental toward healthy peripheral blood mononuclear cells or haematopoietic progenitors. Targeted delivery of Caelyx using BsAbs further enhanced leukaemia suppression and markedly extended overall survival in clinically-relevant patient-derived xenograft models of high-risk childhood leukaemia developed at our institute. Our methodology employing BsAbs represents an attractive targeting platform to potentiate the therapeutic efficacy and safety of liposomal drugs for improved treatment of high-risk leukaemia.

18 - Cost-effectiveness analysis of bevacizumab biosimilars for metastatic colorectal cancer: a comparative study using real-world data

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Background: MVASI (Amgen) and Zirabev (Pfizer) are two of the earliest bevacizumab biosimilars approved for the first-line treatment of metastatic colorectal cancer (mCRC). While the introduction of biosimilars present an opportunity to alleviate the financial toxicity owing to the escalating costs of novel biologics, biosimilars should be comparatively assessed against the reference biologic in a real-world setting to confirm that they are indeed cost-saving or cost-effective after implementation. This study aimed to confirm and quantify the real-world cost-savings of MVASI and Zirabev relative to originator bevacizumab (Avastin) for patients with mCRC.

Methods: We conducted a population-based, retrospective cohort study in Ontario, Canada, where originator and biosimilar bevacizumab are universally publicly funded. We assessed all mCRC patients who received originator bevacizumab between January 1, 2008, and August 11, 2019, or biosimilar bevacizumab between August 12, 2019, and March 31, 2021. Biosimilar cases and originator bevacizumab controls were matched 1:4 using propensity score methods to adjust for differences at baseline. We calculated 1-year total patient-level costs (in Canadian dollars) and effects (in life years and quality-adjusted life years (QALY)) from the public health payer's perspective. The primary outcome for estimating cost-effectiveness was incremental net monetary benefit (INMB), calculated at willingness-to-pay (WTP) thresholds ranging from $50,000-200,000 per life year gained. Sensitivity analyses included a subgroup analysis by biosimilar type (MVASI/Zirabev) and an analysis using a 2-year time horizon.

Results: The final propensity score-matched cohort included 747 biosimilar cases and 2,945 controls. Bevacizumab biosimilars were associated with an incremental cost of -$6,379 (95% confidence interval (CI): -9,417, -3,537) (i.e., cost-saving) and an incremental effect of 0.0 (95% CI: -0.02, 0.02) life years gained and -0.01 (95% CI: -0.03, 0) QALY gained. INMB estimates indicated that biosimilar bevacizumab is cost-effectiveness at all WTP thresholds assessed, with results remaining consistent across our biosimilar type subgroups and 2-year sensitivity analyses.

Conclusion: Bevacizumab biosimilars demonstrated real-world cost-savings while providing the similar survival benefits as originator bevacizumab, confirming the initial expectations of their implementation.

19 - Real-world comparative effectiveness of pembrolizumab vs chemotherapy for previously untreated PD-L1≥50% metastatic non-small cell lung cancer

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[1]Sunnybrook Health Sciences Centre, Toronto, ON, Canada, [2]Sunnybrook Health Sciences Centre, [3]ICES, Toronto, ON, Canada, [4]Canadian Centre for Applied Research in Cancer Control, Toronto, ON, Canada

Background: In the randomized KEYNOTE-024 trial, pembrolizumab demonstrated robust efficacy in patients with PD-L1≥50% metastatic non-small cell lung cancer (mNSCLC) with a median overall survival of (OS) of 26.3 months and 13.4 months in the pembrolizumab and chemotherapy groups, respectively (hazard ratio (HR)=0.62). However, it is unclear how well this efficacy translates to effectiveness in routine practice. Thus, we sought to assess the real-world effectiveness of pembrolizumab for patients with previously untreated PD-L1≥50% mNSCLC compared to platinum-based chemotherapy.

Methods: This was a population-based, retrospective cohort study of mNSCLC patients receiving first-line platinum-based chemotherapy (historical controls) from April 1, 2013, to January 17, 2018, or first-line pembrolizumab (cases) from January 17, 2018, to March 31, 2021, in Ontario, Canada. Baseline characteristics and outcomes were ascertained from linked administrative databases. The primary outcome was OS, assessed using Kaplan-Meier and Cox proportional hazards regression methods. To adjust for baseline differences, propensity-score matching was used to match the case and control cohorts (1:1). As a sensitivity analysis, we analyzed OS by histology subgroups (squamous versus non-squamous).

Results: A total of 2,284 matched patients were included in our propensity score-matched cohort. The median OS in the pembrolizumab group (13.0 months, 95% confidence interval (CI): 11.8-14.6) was significantly longer than the chemotherapy group (9.2 months, 95% CI: 8.0-10.0), with a HR of 0.81 (95% CI: 0.71-0.92). Pembrolizumab was associated with improved OS in both patients with squamous (HR=0.77) and non-squamous histology (HR=0.81).

Conclusion: The results of this study confirm the survival benefit of pembrolizumab monotherapy for previously untreated mNSCLC patients with PD-L1≥50% in routine practice, although the survival benefit diminished in the real world.

20 - Investigations of the Quality of Fertility Preservation Education Provided to Cancer Patients at Windsor Regional Hospital

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Background: Due to the increase in cancer-free survival among younger patients, fertility preservation is an important aspect of patient care that impacts quality of life. However, less than 25% of oncologists in North America discuss fertility options with their patients. Windsor, Ontario currently does not have a comprehensive fertility program. Thus, we anticipate that this will impact patient access and perception of fertility preservation. Patients' perspectives will be explored to help improve the dissemination of fertility preservation education provided at the Windsor Regional Hospital Cancer Centre.

Methods: A Retrospective chart-review involving cancer patients at Windsor Regional Hospital aged 18-39 at the time of diagnosis was conducted between January 15th, 2018, and January 15th, 2020. Of the 203 patients screened, 55 were identified as eligible for fertility preservation based on whether they received treatment that could impact their fertility. If fertility preservation education was made available to the patient, additional factors that impacted the ability to pursue these avenues, and satisfaction with the process were assessed via patient survey.

Results: 11 of the 55 eligible patients responded to the survey. 8 out of 11 respondents (72%) were not interested in fertility preservation. When fertility education was discussed, 86% of the time the conversation was initiated by a healthcare provider. Roughly 27% of the respondents pursued some form of fertility preservation. About 40% of respondents were satisfied with the level of fertility education received.

Conclusion: A small number of eligible participants were interested in fertility preservation, and a small number were satisfied with the level of fertility education. The next step is to develop a fertility education tool for the oncologists and healthcare team at the Windsor Cancer Centre. The goal is to create a standardized approach for the fertility preservation education provided to young cancer patients at the time of diagnosis.

21 - Patient and Caregiver-reported Acceptability of an “Automatic” Supportive and Palliative Care Referral for Advanced Lung Cancer Patients

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Objective: Timely palliative care interventions can help to alleviate the distress people experience after a diagnosis of an incurable, life-threatening cancer. However, referrals to palliative care continue to be late due to various provider and patient barriers. To determine patient-reported acceptability of a phone call from a supportive and palliative care (SPC) nurse offering consultation, automatically after first oncologist appointment for newly diagnosed stage IV non-small cell lung cancer (NSCLC).

Methods: This study tested a patient-provider co-designed, automatic referral pathway in a tertiary cancer centre. Two SPC specialist nurses screened out-patient clinic lists weekly and called all eligible patients offering a home consultation. Eligibility: >18 years, newly diagnosed/suspected Stage IV NSCLC and had first oncologist visit. Patients/caregivers were surveyed about the acceptability (5-point Likert scale) of consult call, using Sekhon’s Framework of Acceptability domains.

Results: Among 113 patients screen, 81 patients/caregivers were contacted and offered SPC consultation, with 82% accepting the in-home consult. Of 70 patients/caregivers who agreed to the research call: 4 did not recall the call, 3 did not consent, 15 were not reached, 11 only answered the acceptability question. Of 48 respondents, 94% rated overall acceptability of the call offering SPC consultation somewhat/completely acceptable. Of 37 respondents (full survey): 30% caregivers, 67% female, 52% ≤65 years, 30% ≤high school education, 85% spoke only English/French, 74% Caucasian. Within the domains of acceptability, 93% were comfortable receiving the call; 86% found the call valuable; 74% thought the call helped them; 96% didn’t find it took much physical/emotional effort and were confident in their ability to participate (ask questions/make decisions); 56% learned about SPC from the call, and no one expressed concern that the SPC nurse had access to their contact/health information.

Conclusions: Nearly all patients/caregivers found the SPC call offering consultation to be acceptable. Most patients agreed to the consultation offer. Routine calls offering SPC consultation may be an acceptable and timely alternative to awaiting conventional referral by oncologists.

22 - The PACES Study: A controlled before and after pragmatic trial of a cancer clinic-based intervention to increase early referral to specialist palliative care

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Background: Early referral to specialist palliative care (SPC) can improve symptom and quality of life outcomes that matter most to cancer patients during the late stage of their illness. We tested a multifaceted oncologist-facing intervention (Palliative Care Early and Systematic) in the real-world setting of a busy cancer clinic for its ability to increase the proportion of patients who receive early SPC (defined as SPC ≥90 days before death).

Methods: This is a pragmatic controlled before-and-after study performed in 18 outpatient cancer clinics in two tertiary cancer centers in neighboring metropolitan cities. It included adults deceased from colorectal cancer (CRC). In the baseline phase (April 2017-December 2018) patients received usual care. In the intervention phase (April 2019-December 2020), new clinical practice guidelines and resources were implemented. These changes included: a) systematically screening patients attending treatment clinics for unmet PC needs and alerting the primary oncologist, b) addition of a community-based palliative clinical nurse specialist to handle increased referrals, and enhance communication and co-management of patient needs among providers, and c) implementation of templated ‘shared care’ letters (providers, patient) to improve awareness of patients’ needs. The primary outcome was the proportion of CRC decedents who received early SPC.

Results: 695 decedents were included: Baseline phase (153 control, 188 intervention); Intervention phase (145 control, 209 intervention). From baseline to intervention, in the intervention arm, the proportion of decedents who received early SPC increased from 45% to 57%; in the control arm the proportion decreased from 48% to 44% (17% difference in differences; 95%CI 2% to 32%; P=0.03).

Conclusions: A multifaceted intervention aimed at increasing oncologists’ awareness of their patients’ appropriateness for early SPC increased by 17% the proportion of patients receiving early SPC as compared to controls. Additional research is needed to determine if in a real-world clinical setting further increasing the proportion of patients receiving early PC beyond 57% is feasible, and to understand the role of screening and alerting for oncologists.

23 - Priority-setting for hospital funding of high-cost innovative drugs and therapeutics: A qualitative institutional case study

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Background: Rising costs of innovative drugs and therapeutics (D&Ts) have led to resource allocation challenges for healthcare institutions internationally. There is limited evidence to guide priority-setting for institutional funding of high-cost off-formulary D&Ts, particularly for paediatric and rare disease populations, including pediatric cancers.

Objective: This study explores the values and processes that should inform institutional funding decisions for high-cost innovative D&Ts, through an in-depth case study of a quaternary paediatric hospital.

Methods: A review of the types of funding requests for high-cost off-formulary drugs that were submitted and approved at the case study institution between February 2021 and October 2022 was completed. Semi-structured qualitative interviews were conducted with institutional stakeholders (n=23) and two focus groups at the case study institution. Participants involved in, and impacted by, high-cost off-formulary drug funding decisions were recruited through stratified, purposive sampling. Reflexive thematic theory guided data analysis.

Results: Funding requests (and subsequent approval) for the use of high-cost D&Ts were disproportionately higher in oncology (48%). Overall, institutional resource allocation for high-cost D&Ts was identified as ethically challenging but critical to ensure sustainable access to novel therapies. Important substantive principles included: 1) clinical evidence of safety and efficacy, 2) economic considerations (direct costs, opportunity costs, value for money), 3) ethical principles (social justice, professional/organizational responsibility), and 4) disease-specific considerations. Multidisciplinary deliberation was identified as an essential procedural component of defensible decision-making, with the role of patients and families being contested. Participants identified tensions between innovation and the need for evidence-based decision-making; clinician and institutional responsibilities; and value for money and social justice. Participants emphasized the role of health system-level funding allocation in alleviating the financial and moral burden of decision-making by individual institutions.

Conclusions: This study identifies key values and processes to aid in the development and implementation of institutional resource allocation frameworks for high-cost innovative D&Ts, with significant relevance to novel oncology indications in children.

24 - COVID-19 associated outcomes in patients with cancer and the general population: A population-based, provincial study in Ontario, Canada.

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Introduction: Patients with underlying malignancies appear to be at increased risk of COVID-19-associated adverse outcomes. However, some studies suggested that this association was related to age and comorbidities.

Methods: We conducted a province-wide retrospective cohort study of the entire adult population of Ontario, Canada, from January 1, 2020 to November 30, 2021. We compared the incidence of SARS-CoV-2 infection, 14-day COVID-19-associated hospitalization, and 28-day COVID-19-associated death between patients with hematologic or solid cancers and the non-cancer population. We used Cox proportional hazards models to obtain adjusted hazard ratios (aHR) and 95% CIs.

Results: Of 11,732,784 adults included (51% female, mean ± SD age 44.34 ± 18.22 years), 279,287 (2.38%) had cancer (hematological malignancies n=33,901, solid tumors n=245,386). Patients with hematologic malignancies were at greater risk of SARS-CoV-2 infection (aHR=1.19, 95%CI: 1.13-1.25), 14-day hospitalization (aHR=1.75, 95%CI: 1.57-1.96), and 28-day mortality (aHR=2.03, 95%CI: 1.74-2.38) than the non-cancer population. Patients with solid tumors were at a slightly lower risk of SARS-CoV-2 infection (aHR=0.93, 95%CI: 0.91-0.95) but a higher risk of 14-day hospitalization (aHR=1.11, 95%CI: 1.05-1.18), and 28-day mortality (aHR=1.31, 95% CI: 1.19-1.44) than the non-cancer population. The 28-day mortality in hospitalized hematologic or solid tumor patients was high (50.7% and 45.8%, respectively, P=0.12). The risk of SARS-CoV-2 infection was lower for those with increasing numbers of COVID-19 vaccine doses received ($aHR_{1\ dose}$=0.63, 95%CI: 0.62-0.63; $aHR_{2\ doses}$=0.16, 95%CI: 0.16-0.16; $aHR_{3\ doses}$=0.05, 95%CI: 0.04-0.06).

Conclusion: We observed elevated risks of COVID-19-associated hospitalization and mortality in patients with hematologic malignancies and solid tumors even after accounting for the simultaneous effects of multiple comorbidities and demographics. Our findings support the prioritization of patients with cancer as increased-risk individuals for booster vaccination.

25 - Canadian Real-world Evidence for Value of Cancer Drugs (CanREValue) Collaboration: Application of Multi-Criteria Decision Analysis (MCDA) To Prioritize Re-Evaluations of Cancer Drug Funding Decisions.

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PURPOSE: CanREValue developed an MCDA rating tool to help decision-makers evaluate uncertainties and prioritize potential real-world evidence (RWE) projects stemming from initial drug funding decisions. The tool considers seven factors relevant to the importance and feasibility of conducting an RWE project. In collaboration with the Provincial Advisory Group (PAG) of CADTH, we conducted a 1-year validation exercise to (1) gain insight into consensus building and deliberation processes, (2) develop efficiencies in the application of the MCDA rating tool, and (3) apply the tool to various RWE proposals.

METHODS: Eleven pan-Canadian experts involved with cancer drug funding decision-making were invited to form the MCDA committee. Members reviewed evidence questions and applied the MCDA rating tool prior to meetings. During the meeting, an experienced facilitator led the committee through consensus building, deliberation, and prioritization. Members provided feedback during and following meetings.

RESULTS: Members participated in five meetings and reviewed/prioritized nine RWE questions initially identified as high priority by PAG. Through the explicit application of the MCDA rating tool, projects were prioritized low (4), medium (3) or high (2). Although members found the tool easy to use, several modifications were suggested to improve usability and increase clarity on criterion instructions, rating descriptions, and prioritization categories. The expertise and specific knowledge of the facilitator was noted to evoke thoughtful discussion and supported the achievement of consensus among members.

CONCLUSIONS: Several efficiencies and refinements to the MCDA rating tool were identified and will help to facilitate the integration of the tool into existing cancer drug funding processes.

26 - Cost-effectiveness of the CancerCare Manitoba (CCMB) Quit Smoking Program (QSP)

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Objectives: Smoking cessation, even after a cancer diagnosis, can lead to improved survival and treatment effectiveness. Still, 20% of cancer patients continue to smoke following diagnosis. We performed an economic analysis of the CCMB Quit Smoking Program (QSP) to demonstrate its value for money.

Methods: This matched retrospective study uses patient-level data to compare cancer treatment costs for patients who accessed QSP (QSP participants, n=360) to those who reported smoking but did not access QSP (non-QSP participants, n=357). It examines costs and outcomes related to cancer care and all-cause healthcare utilization, as well as the impact of QSP.

Results: Demographic differences between groups were minimal. A greater proportion of QSP participants were over the age of 65 (25.8%; non-QSP=15.7%, p<0.001) and lived in urban centres (QSP: 73.3%; non-QSP: 52.7%, p<0.001). Differences in costs per patient represent the incremental cost savings due to participation in QSP. All-healthcare utilization costs were estimated for both groups. Overall, we observed QSP participants have lower healthcare costs compared to non-QSP participants. Cost savings were estimated at $4,134 per person, with the highest costs savings observed for patients living with thoracic cancer ($9,583 per person). Cost savings for patients living with head and neck cancer or breast cancer were moderate at $1,036 and $2,003 per person, respectively. While cost savings for colorectal cancer were not observed for reasons not yet fully understood (-$2,187). Survival analyses indicate trends in higher probability of survival for QSP participants (HR 1.16 95% 0.93-1.45, p = 0.1883), but particularly for those living with thoracic cancer (HR 1.29 95% 0.99-1.68, p = 0.0581). It is expected studies with larger samples would elicit significant patterns of survival benefit.

Conclusion: This study shows value for money and trends to survival benefit for smoking cessation after a cancer diagnosis. While further research with larger samples are required, the combined data on utilization, cost, and survival provide confidence in the positive impact of QSP for patients and cancer system in Manitoba.

27 - Examining Access to Mental Health Interventions for Adolescents and Young Adults with Cancer: A Scoping Review Protocol

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Background: Adolescents and young adults (AYAs) diagnosed with cancer are at a higher risk of poor psychosocial outcomes due to their unique developmental and life course needs and barriers to accessing mental health care. This scoping review aims to explore and chart the different mental health interventions available to and implemented for AYAs across the cancer continuum.

Methods: We will examine existing literature on mental health interventions and psychosocial care for AYAs aged 15-39 following the Joanna Briggs Institute's methodology for scoping reviews. The search will focus on studies published in English between 01/01/2010 and 31/12/2022 in MEDLINE, EMBASE, CINAHL, PubMed, and PsycINFO databases. Relevant keywords and subject headings related to AYAs, cancer, mental health interventions, and psychosocial care will be searched. Two reviewers will conduct the screening process, including titles, abstracts, and full-text articles. Inconsistencies will be addressed through discussion. A standardized data extraction form will be used to collect data. Results will be synthesized through a combination of evidence tables and narrative summaries.

Results: The scoping review is in progress. Preliminary data will be presented.

Conclusion: Assessing the provision of mental health interventions is essential to providing patient-centred cancer care for AYAs. However, the sufficiency and accessibility of these interventions remains unclear. This information will help to break down barriers to accessing AYA-centered mental health care, identify strategies to mitigate psychosocial risks for AYAs, and guide future research and clinical practices for promoting the mental health and well-being of AYAs experiencing cancer.

28 - Partnering with patients to inform hereditary cancer care and prevention

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Background: Patient oriented research aims to improve patient outcomes and the quality of research by focusing on patient-identified priorities and engaging patients as partners. However, methods for meaningful patient engagement and the role of patient partners in genomics health research are not well described.

Aim: To describe the engagement of patient partners in a Strategy for Patient Oriented Research (SPOR) grant in Canada exploring the creation of an inherited cancer registry and nurse navigator risk management model in hereditary cancer syndromes (HCS).

Methods: Two patient partners with a hereditary breast and ovarian cancer syndrome or Lynch syndrome were recruited from team members' networks. Regular meetings and ongoing email communication among study leads and patient partners provide consistent communication and co-development opportunities.

Results: Patient partners were invited to engage across all phases of the study: reviewing the grant application, co-developing the qualitative study design and materials, and ultimately assisting with recruitment, data analysis, and knowledge translation planning. Offering choice in level of involvement is best practice for patient engagement and is appreciated by patient partners as affording them flexibility around their contributions. Patient partners meet regularly with the study team, with email communication in between, to provide feedback on study design, materials and preliminary results. As this study involves qualitative interviews and data collection about sensitive topics (e.g., cancer journey, lifelong risk management), patient partners' lived experiences informed the interview guide and preliminary data analysis. Patient partners co-developed the interview guide, highlighting priority questions about inherited cancer registries and nurse navigation models. Partners' lived experiences correspond with emerging themes in the data: Knowledge is power and enthusiasm for the nurse navigator role in HCS.

Conclusions: To date, patient partners provided important insights on the study population and methods, validation of emerging themes and knowledge translation planning. Their role reflects true research co-development. Ultimately, our aim is to build a rigorous patient oriented research program in hereditary cancers, informed by patient voices, from which lessons learned are shared and the care of families affected by HCS is improved.

29 - CURating Clinical Trials: Helping patients find Hope by exploring clinical trials opportunities

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Clinical trials play a crucial role in advancing cancer therapies and informing clinical practices. Despite their importance, limited accessibility leads to a persistently low enrollment. Up to 18% of patients from large academic centers enroll in clinical trials, while only around 2 percent of patients participate from smaller treatment centers. To address this issue, the Clinical Trials Navigator (CTN) program was introduced to facilitate enrollment by utilizing clinical trial experts to search for eligible trials. Hamm (2022) reported an enrollment rate of 7% with the integration of the CTN program of those patients participating in this program. This study provides updated results on the expanded CTN program, which enrolled 260 patients from 2019 and 2023. Patients were referred to the program through a physician, family, or self-referral. Following referral, the patients completed a comprehensive survey covering demographics and medical information. After receiving the survey results, the navigators search five CT registries for eligible trials. Subsequently, two physicians reviewed the search results and reported the results back to the patients. Throughout the process, the following data was collected: age, sex, cancer type, stage, patients' initial treatment center, number of eligible trials identified, enrollment status, clinical trial center, and health status. The study found that approximately 76% of referred patients had stage IV cancer. Breast, lung, and glioblastoma malignancies had the most referrals, accounting for at least 10% of cases each. Notably, 96% of the patients were referred from small-to-medium centers. Following the database search, the navigators identified a median of 1 clinical trial (0-8) in phases II, III, or IV for each patient. Overall, 24% of patients were referred out for trials, 44% were not referred, and 32% were lost to follow-up. Among the patients that were referred out for trials 26.7% enrolled in a trial, which were mostly being conducted in large academic centers. Overall, the expanded CTN program successfully enrolled 8.1% of patients into clinical trials for whom the follow-up data was available.

30 - Linking Drug Data from the Manitoba Tomorrow Project Cohort and Administrative Health Databases: Advancing a Long-Term Health Research Platform for Cancer Research

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Background. Large cohort studies have significant potential for cancer pharmacoepidemiology research. The Manitoba Tomorrow Project (MTP) cohort study aims to learn about cancer causes by following 10,000 Manitobans aged 30-74 years for up to 50 years. The MTP is part of a national network of similar cohorts called the Canadian Partnership for Tomorrow's Health (CanPath). In addition to its foundation of self-reported data, biologics and anthropomorphic measurements, CanPath plans to link each regional cohort's data to its provincial administrative health databases (AHD) - including drug and cancer data- to build the 'Canadian Cancer Study.'

Objectives. Our study will be the first to describe the MTP cohort, including a focused analysis of self-reported medication use and cancer status. Subsequently, we will explore the linkage of the MTP with the provincial drug and cancer AHD to evaluate the agreement between these data sources on drug and cancer data.

Significance. The proposed research will illustrate the available data on prescription drug use and cancer history and explore the benefits of linking this new cohort to well-recognized AHD in Manitoba to empower '*information-rich environments'* to facilitate future cancer pharmacoepidemiology research.

Methods. Descriptive analysis will assess the characteristics of MTP participants, particularly medication use and cancer status and allow comparison to the Manitoba general population. We will explore the feasibility of linkage with AHDs to evaluate the agreement with MTP drug and cancer data, including investigating factors associated with concordance, such as demographics, socioeconomic status, and comorbidities.

Preliminary Results. Most (74%) MTP participants are females and live in urban areas (77%); the median age at enrollment is 56. Some (10.9%) reported a history of cancer diagnosis, and 63.3% reported at least one chronic disease at enrollment.

Conclusion. The MTP and other CanPath cohorts will support future research assessing drugs' long-term effects on cancer, which can be enhanced by linkage with provincial AHD. Our work will contribute to efforts by CanPath to do similar linkage studies across Canada.

33 - Intellectual and Developmental Disabilities (IDD) and Cancer Symptom Reporting in Ontario, Canada

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Introduction: Symptom assessment is key to managing symptom burden post cancer diagnosis. People with IDD receive inequitable healthcare and experience worse outcomes from cancer; disparities may also exist in routine cancer symptom screening. In this study, we investigated whether differences exist in cancer symptom assessment between people with and without IDD.

Methods: We conducted a matched retrospective cohort of adults in Ontario with and without IDD who received a cancer diagnosis between 2012-2019 using administrative health data at ICES. Among people with cancer, those with IDD were matched 1:5 to those without IDD on age at diagnosis, sex, diagnosis year, cancer type, and regional cancer centre registration. Routine symptom surveillance was completed using the revised Edmonton Symptom Assessment Scale (ESAS-r). Cumulative incidence of first symptom assessment and mean cumulative number of assessments over time were estimated. Hazards models were used to examine the association between IDD and symptom assessment rates and effect modification by cancer stage. Cancer treatment within 6 months and frequency of clinic visits in the 5 years following diagnosis were explored as potential system-level factors.

Results: 1545 people with IDD were matched to 7,725 people without IDD. Individuals with IDD experienced a lower incidence of cancer symptom assessment (1-year probability: 0.62 vs. 0.77). People with IDD had lesser rates of symptom assessment (HR: 0.63, 95% CI: 0.59,0.67) and a lower mean cumulative number of ESAS assessments at 5 years (11.1 vs. 17.3). People with IDD also had fewer clinic visits during this same period (median: 12 vs. 29). Chemotherapy treatment (6 months) was less frequent among people with IDD (27.6% vs 48.2%), though rates of radiotherapy and surgery were similar. Results were consistent across cancer stages.

Conclusion: The incidence of cancer symptom assessment is lower among cancer patients with IDD compared to those without; individuals with IDD also experience lesser rates of clinic visits and chemotherapy treatment. These findings may indicate systemic barriers to equitable healthcare access for cancer patients with IDD.

34 - “Should I let them know I have this?”: Experiences with genetic discrimination amongst patients with hereditary cancer syndromes.

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Introduction: Hereditary cancer syndromes (HCS) represent approximately 10% of cancer patients. Hereditary Breast and Ovarian Cancer Syndrome (HBOC) and Lynch Syndrome (LS) are the most prevalent HCS. Patients are genetically predisposed to developing cancer, and require complex care. In addition to medical burdens, many patients are concerned about stigmatization based on their HCS diagnosis; this study aims to describe experiences with genetic discrimination that patients may face.

Methods: Semi-structured qualitative interviews were conducted with HCS patients with a molecularly-confirmed diagnosis of HBOC or LS residing in Ontario, British Columbia and Newfoundland & Labrador. Interpretive description was used for data analysis.

Results: Across Ontario (n=26), British Columbia (n=23) and Newfoundland & Labrador (n=24), 73 patients with HBOC (n=39) and LS (n=34) were interviewed. The sample included 51 females, 21 males and 1 gender-diverse individual. Overarchingly, patients worried about whether to share their HCS genetic diagnosis with others due to fears of being judged, stigmatized or discriminated against. Genetic discrimination regarding insurance coverage was of particular concern; patients discussed experiences of being denied coverage, receiving lesser coverage or paying higher fees upon disclosing their HCS status. These experiences extended to various insurance types, including life, health and disability insurance. Patients noted that insurance companies had roundabout ways of soliciting family health and genetic testing history without explicitly asking if an individual was positive for a cancer-associated gene. Beyond the insurance space, patients were also wary of genetic discrimination by employers, family and friends upon sharing their HCS diagnosis. For example, patients did not want employers to question their job performance nor did they want family members to comment on their appearance after being branded as “sick.” Lastly, many patients were unaware of the Genetic Non-Discrimination Act and expressed interest in learning more about the Act.

Conclusion: Genetic discrimination is a concern for many HCS patients, especially in terms of insurance coverage impacts. Despite non-discrimination legislation, patients remain uncertain of their rights and wary about sharing their diagnosis with others.

35 - Mapping gender diverse people's cancer outcomes and experiences: A scoping review

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Background

Gender diverse people (GDP) are at high risk of experiencing inequities throughout the cancer continuum, including lower rates of cancer screening, receipt of later stage diagnoses, and higher rates of mortality. Driving these inequities are discrimination and oppression. Cissexism, a unique type of oppression GDP experience, is premised on the understanding that all people are and should be cisgender manifests in many ways within the cancer system. Examples of cissexism include: exclusion from organized cancer screening programs; lack of psychosocial supports; and receipt of culturally inappropriate care. It is also widely acknowledged cissexism has led to the failure to develop inclusive measures in data used for cancer research, which has limited our collective understanding of GDP's cancer experiences and outcomes. High-quality knowledge syntheses are necessary for strengthening the evidence base to improve the cancer system's capacity in delivering equitable, patient-centred care to GDP.

Methods

This mixed methods scoping review responds to the question of how cancer affects GDP. We followed the approach outlined by the Joanna Briggs Institute. A search of multiple databases yielded 6,086 titles after de-duplication. Two reviewers independently screened titles and abstracts and identified 511 citations for full text review and data extraction. Extracted data will include cancer type and phase of cancer continuum, gender definition used, study design, results, and if gender minorities were consulted. Quantitative data will be qualitized through narrative interpretation and pooled with qualitative data following the meta-aggregation approach. Results will be reported following the PRISMA extension for scoping reviews (PRISMA-ScR).

Results

In progress

Interpretation

This is the first scoping review to systematically search and map evidence related to cancer outcomes and experiences for GDP across the entire cancer continuum. Results from this scoping review will direct future research efforts by expanding the wider body of research examining cancer disparities and identifying gaps and limitations in the literature related to cancer and gender minorities.

37 - Breast (female), colorectal, and lung cancer staging in people with intellectual or developmental disabilities: Two population-based cross-sectional studies in Manitoba and Ontario

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Background: Multiple studies have documented lower cancer screening rates among adults with IDD. However, worldwide there is limited quantitative research investigating cancer stage at diagnosis for adults with IDD. This study compares the risk of metastatic cancer stage for adults with IDD compared to those without IDD among patients with breast (female), colorectal, and lung cancer in Canada.

Methods: We conducted two separate population-based cross-sectional studies in Ontario and Manitoba with routinely collected administrative data at ICES and Manitoba Centre for Health Policy. People with breast (female), colorectal, and lung cancer were included (Manitoba: 2004-2017; Ontario: 2007-2019). IDD (before cancer diagnosis) was identified using established province-specific data algorithms. We used modified Poisson regression with robust error variance models to contrast the likelihood of metastatic cancer diagnosis between people with and without IDD. We pooled adjusted relative risks between Ontario and Manitoba with random-effects meta-analyses. Effect modification by age and sex (colorectal, lung) was examined.

Results: There were 115,456 breast (female), 89,815 colorectal, and 101,811 lung cancer patients included across both provinces. The risk of metastatic cancer was consistent in both provinces. Following meta-analysis, stage IV disease at the time of cancer diagnosis was more common among adults with IDD and breast or colorectal cancer compared to adults with breast or colorectal cancer without IDD (breast RR=1.60; 95% CI 1.16-2.20; colorectal RR=1.44; 95% CI 1.24-1.67). An increased risk of metastatic cancer at diagnosis was not observed in lung cancer patients. We did not identify significant effect modification by age or sex.

Conclusions: Adults with IDD were more likely to be diagnosed with metastatic breast and colorectal cancer compared to those without IDD. Intervening on processes and factors leading to worse stage at diagnosis, such as lower screening rates is required.

38 - “I worry I don’t have control”: The psychosocial impacts of living with a hereditary cancer syndrome

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Introduction: Hereditary Breast and Ovarian Cancer Syndrome (HBOC) and Lynch Syndrome (LS) are common hereditary cancer syndromes (HCS) where patients are genetically susceptible to developing cancers. Continuous screening and monitoring is often required which may impact patient’s lives. Evidence describing psychosocial impacts following a positive genetic diagnosis is limited. The goal of this study is to describe the psychosocial & lifestyle impacts of HCS.

Methods: Semi-structured qualitative interviews were conducted with diagnosed HBOC or LS patients across 3 Canadian provinces with varying HCS health systems. Interpretive description was used for analysis.

Results: Qualitative interviews were conducted with 73 patients (51 females, 21 males, 1 gender diverse individual; age ranges 25-80 yrs.) diagnosed with HBOC (n= 39) or LS (n= 34). Cancer worry, the fear of oneself or one’s family members developing cancer, was a common concern for many patients, rooted in a loss of control: “I worry I don’t have control”. Resulting from increased cancer risk, patients described heightened symptom monitoring and concerns that unlikely symptoms (e.g. cold symptoms) were cancer-related. Many parents expressed carrier guilt over possibly passing on their HCS to future generations. To cope with cancer worry, patients described changing their outlook to focus on the positive aspects of their diagnosis. To take control of their cancer, patients noted changes to their lifestyle, such as improving diet, exercise, and social activities. Additionally, some patients sought prophylactic surgeries to reduce their cancer risk, though they noted subsequent psychosocial and lifestyle impacts, such as challenges with body image and delaying family planning. Other strategies to gain control included joining patient groups, seeking professional therapy, or discussing their HCS journey with friends and family with similar lived experiences.

Conclusion: HCS diagnosis has psychosocial and lifestyle implications. Cancer worry is commonly expressed by patients, which can influence lifestyle changes as means of controlling cancer risk. This work emphasizes the need to provide multidisciplinary support to patients and families living with HCS beyond the point of diagnosis.

39 - Cancer incidence in people with intellectual or developmental disabilities: Two population-based retrospective cohort studies in Manitoba and Ontario, Canada

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Background and objective: Little contemporary evidence exists quantifying the risk of cancer for people with intellectual or developmental disabilities (IDD). Therefore, our objective was to report the incidence of cancer for adults with IDD and compare rates to adults without IDD in two Canadian provinces.

Methods: We conducted two separate population-based retrospective cohort studies at ICES and the Manitoba Centre for Health Policy using routinely collected data (timeframe: Ontario 1993-2019 and Manitoba: 1984-2018). Adults with IDD age ≥18 years were identified in both provinces using established algorithms. Each person with IDD was hard matched on birth year and sex to four people without IDD. Cancer cases were identified from provincial cancer registries. We estimated crude incidence rates for those with and without IDD. We then compared these estimates using multivariable Poisson regression analyses to estimate incidence rate ratios (IRR). Age-specific estimates were also estimated and compared.

Results: We included 121,651 and 486,604 Ontarians and 25,848 and 103,392 Manitobans with and without IDD, respectively. Females with IDD had a similar risk to females without IDD in both provinces. Adults with IDD were significantly more likely to develop acute lymphocytic leukemia, brain, bone and joints, esophagus, testis, and uterine cancers than age and sex matched comparators without IDD. For instance, Ontarians with IDD were 2.49 times as likely to develop acute lymphocytic leukemia (95% CI 1.45-4.29), 1.72 times as likely to be diagnosed with bones and joints cancer (95% CI 1.09-2.72), 1.48 times as likely to experience brain cancer (95% CI 1.22-1.78), and 1.73 times as likely to develop testicular cancer (95% CI 1.39-2.15). Adults with IDD were also more likely to be diagnosed with cancer at younger ages.

Conclusion: Cancer is a relevant chronic health concern for people with IDD, in particular younger individuals. Targeted and coordinated strategies addressing cancer care for adults with IDD that leverage resources in both the social and health systems are needed.

40 - Descriptive Analysis of first-line non-small cell Lung cancer treatment with Pembrolizumab in tumors expressing PD-L1 ≥ 50 % in patients treated in Québec's university teaching hospitals (DALP-First study)

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Background:
Since July 2017, pembrolizumab is authorized in Quebec for the treatment of first-line advanced or metastatic non-small cell lung cancer (NSCLC) patients corresponding to the inclusion criteria of KEYNOTE-024. In the fall of 2018, CADTH and the PGTM recommended the use of weight-based capped dosing (WCD) for certain checkpoint inhibitors, including pembrolizumab and this guidance was subsequently accepted by INESSS (Quebec's provincial drug evaluation and health-technology assessments agency). This dosing strategy progressively replaced the fixed pembrolizumab 200 mg dose every 3 weeks (FD) in Quebec's health care institutions.

Objectives:
Describe and assess the real-life use of pembrolizumab; Report progression-free survival (PFS), overall survival (OS) and immune related adverse events (IRAE); Compare outcomes between a fixed dose (FD) and a weight-based capped dose (WCD).

Method:
In this retrospective descriptive analysis, we identified patients who received pembrolizumab for first-line advanced or metastatic NSCLC between November 1st, 2017 and October 31st, 2019 in one of Quebec's four adult university teaching hospitals. Medical records of every patients were reviewed and followed until February 29th 2020.

Results:
Two hundred and seventy-nine patients were included in the analysis. Median PFS and OS were respectively 9.4 (95% CI, 6.6 to 11.2) and 17.3 months (95% CI, 12.9 to not reached), in comparison to a 10.3 months PFS and 30.0 months OS in KEYNOTE-024. IRAE causing delays or treatment interruptions were seen in 34.4% of patients (grade 3-4 IREA: 8.6%). Initiating treatment with FD (49 patients) or using WCD (230 patients) does not appear to affect PFS, OS or presence of IRAE. In a Cox regression model, the hazard ratio for death was 0.97 between WCD vs FD (p = 0.88). The use of WCD strategy allowed approximately $5.8 million CAD in savings during the course of our study.

Conclusion:
These findings support the effectiveness and safety of pembrolizumab in a real-world setting. The use of a WCD does not have a negative impact on patient outcomes.

41 - Enabling Improvement in CAR T-Cell Therapies in Canada

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In March 2022, the Canadian Personalized Health Innovation Network (CPHIN) held a real-world evidence summit to determine an optimal approach to accelerate adoption of innovative treatments. While access to data describing real world evidence was deemed critically important, summit members concluded there were more significant challenges ensuring effective collaboration amongst the multiple stakeholders involved in approving, delivering, and paying for innovative treatments. Furthermore, without addressing trust amongst these stakeholders, it will not be possible to fully resolve conflicts of interest. The summit culminated in a recommendation to use CAR T-cell therapy as an exemplar “innovative treatment” to further explore the opportunities to enhance collaboration.

During a one year project, CPHIN and its partners used an ‘action research’ approach to understand opportunities to improve quality of CAR T-cell therapy in Canada and to improve collection and use of data describing CAR T-cell therapy. This initiative engaged clinicians, scientists and leaders involved in CAR T-cell therapy from across Canada, including the execution of semi-structured, qualitative interviews with hematologists at the major CAR T-cell treatment and referring centres, including: BC Cancer Agency, Tom Baker Cancer, Saskatchewan Cancer Centre, Princess Margaret Cancer Centre, Kingston Health Sciences Centre, The Ottawa Hospital, McGill University Health Centre, CHU de Quebec, and Nova Scotia Cancer Centre. These discussions were supported by analysis of the data submitted to the Center for International Blood and Marrow Transplant Research.

From these discussions it became clear that a lack of standardized referral processes and communication between treating and referring physicians was resulting in critical treatment delays for patients. Furthermore, burdensome data reporting requirements and a lack of sufficient supporting resources has resulted in insufficient retrospective analysis and data sharing across Canadian centres. Additionally, the lack of coordination and visibility in patient volumes being treated and limited centre capacities has contributed to the ineffective capacity coordination across Canadian centres. Following the identification of these key findings, involved stakeholders developed recommended solutions to coordinate patient referrals and enable retrospective analysis within the system. CPHIN and its partners are now taking action to implement these recommended solutions.

As a part of this initiative, CPHIN successfully engaged and collaborated with a diverse group of industry stakeholders. From this experience the group has identified several key learnings which will enhance future cross-stakeholder ecosystem collaborations by supporting participant communications, fostering stakeholder engagement, and building trust.

During this panel discussion, the participants will describe the results of these effort including the opportunities and solutions identified as well as opportunities to apply this collaborative approach to other treatment areas. The panel will consist of the following members, who were involved in the planning and execution of the project: Alan Forster (EVP Chief Innovation and Quality Officer, The Ottawa Hospital), Dan Zimskind (Manager, ZS Associates), Mike Duong (Chair of Board of Directors, CPHIN), Helen Chen (Professor, University of Waterloo), Mike Kennah (Hematologist, The Ottawa Hospital).

42 - Healthcare contact days experienced by people with stage IV non-small cell lung cancer (NSCLC) in Ontario

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Background: For people with advanced NSCLC, frequent visits to healthcare facilities can become all-consuming, especially in the context of limited survival. We sought to describe patterns of contact days—days with any in-person healthcare contact as a measure of potential time toxicity— in a population-based sample.

Methods: We created a population-based, retrospective decedent cohort with health administrative data from Ontario, Canada, of adults aged ≥20 years diagnosed with stage IV NSCLC in 2014-2017 and died in 2014-2019. Analysis was stratified by systemic therapy (yes vs no). The primary outcome was contact days (outpatient and inpatient encounters, including tests, clinician visits and procedures) measured from diagnosis to death. Trajectories of the weekly percentage of contact days were plotted and normalized, and fitted with cubic splines.

Results: We identified 5,785 stage IV NSCLC patients (median age, 70 years, 46.3% female, 57.8% adenocarcinoma, 34.3% receiving systemic therapy). The median (IQR) survival was 108 days (49-426) and median percentage of contact days 33.3%. Median survival was longer in patients receiving systemic treatment vs. not (261 [152-420] days, vs. 66 [34-130] days), with median percentage of contact 22.2% in patients with treatment and 40.9% without. Trajectories of weekly contact days followed a U-shaped distribution, with the greatest health care contact following diagnosis, and prior to death. The difference between the maximal peak and trough was greater with systemic therapy (peak 34.8% vs trough 15.9%) vs. without (39.5% vs 27.6%). For systemic therapy, normalized trajectories were similar with one or two lines, and for patients receiving chemotherapy, and immunotherapy. The trough was slightly lower for targeted therapy (12.3% vs 17.7% chemotherapy, 15.9% immunotherapy).

Conclusion: Patients with stage IV NSCLC spent a significant proportion of days alive with health care contact (median 22.2% of 261 days with systemic treatment, 40.9% of 66 days for those without). The trajectory of contact days was U-shaped, being shallower for patients not receiving systemic treatments, which may reflect the steady need for end of life care.

43 - Implications of conditional regulatory approval on public spending of hospital-administered cancer drugs

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Background:

Health Canada's Notice of Compliance with Conditions (NOC/c) policy facilitates early access to promising new drugs before there is definitive evidence of clinical benefit. Subsequently, manufacturers need to complete confirmatory trials to be granted a NOC. Previous studies have examined the proportion of drugs that have met these conditions, and timelines to granting an NOC. For publicly funded hospital-administered cancer drugs (e.g., IV chemotherapy) in Ontario, we determined the proportion with NOC/c status and associated drug costs.

Approach:

All drug-indication pairs listed as of the 2021/22 fiscal year on the New Drug Funding Program (NDFP) and High Cost Therapy Funding Program (HCTFP) were included. We examined regulatory status at the time of listing and drug costs by regulatory status. Regulatory status was sourced from Health Canada databases and drug costs were sourced from Ontario Health's databases.

Results: In 2021/22, a total of 131 drug-indication pairs were reimbursed by NDFP/HCTFP and spending exceeded $700 million. In our analysis, 19 drug-indications had a NOC/c at time of listing. For 12 drug-indications, NOC conditions were met in an average of 4.0 years (range, 1.3 -7.3 years). While they were conditionally approved, cumulative spending exceeded $135 million. The seven drug-indications that still have a NOC/c have been listed on the formulary for an average of 1.9 years (range, 0.1-6.2 years) and over $28 million has been spent to date.

Interpretation: Given the robust pipeline of new cancer medications and budget pressures faced by public payers, confirmatory trials should be completed expeditiously.

44 - How do patients with hereditary cancer syndromes navigate the healthcare system? A qualitative comparative study across Canada

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Background: Hereditary cancer syndromes (HCS) account for 5-10% of all cancers. HCSs such as hereditary breast and ovarian cancer syndrome (HBOC) or Lynch syndrome (LS) can significantly increase one's lifetime risk of cancer. HCS patients therefore may require lifelong follow-up care, including screening and appointments with a wide range of specialists. However, after receiving an HCS diagnosis, patients are often left to navigate a complex system of care with variable surveillance services and screening programs across provinces.

Aim: To understand the care experiences and needs of HCS patients across Canada to inform clinical practice.

Methods: HCS patients who received a positive genetic test result for HBOC or LS were purposely sampled from clinics in Ontario (ON), Newfoundland and Labrador (NL), and British Columbia (BC), reflecting variation across genetic services and screening programs.

Results: Qualitative interviews were conducted with 73 patients (51 females, 21 males, 1 gender-diverse; age range 25-80yrs) diagnosed with HBOC (n= 39) or LS (n= 34). Several key themes emerged including navigation, advocacy, and access. Patients expressed difficulties in navigating recommended follow-up care and often mentioned a lack of knowledge from their healthcare professionals. Several patients highlighted the need for adequate communication about screening practices following risk-reducing surgeries. Patients often had to self-advocate for referrals and screening appointments. Access to genetic services, specialists and eligibility for screening programs were described as sometimes limited for HCS patients. Participants commented that their circle of care (i.e., number and diversity of specialists involved in care) was likely smaller than those with a previous cancer diagnosis and noted impacts on access to support services.

Conclusions: This is the first study to compare HCS patients' experiences with care across Canada. We found that HCS patients face numerous healthcare challenges. Receiving adequate guidance from healthcare professionals, having professional and informational supports, and timely access to screening were most widely discussed among participants. Identifying the needs and challenges for HCS patients can optimize care experiences and ultimately improve patient outcomes.

45 - Impact on costs and outcomes of multi-gene panel testing for advanced solid malignancies: A cost consequence analysis using linked administrative data

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Background
To date, economic analyses of tissue-based next generation sequencing genomic profiling (NGS) have required models with multiple assumptions. The OCTANE clinical trial (NCT02906943) is a prospective study evaluating the role of NGS for advanced solid tumors in Ontario, Canada. We performed a cost consequence analysis of OCTANE.

Methods
We undertook a longitudinal, propensity score-matched retrospective cohort study using linked administrative data. OCTANE patients (pts) at Princess Margaret Cancer Centre from August 2016 until March 2019 undergoing NGS panel testing were matched according to 19 variables with contemporary controls not enrolled in OCTANE. Primary outcomes were mean per capita health care costs (2019 Canadian dollars [CAD]) from the public payer's perspective, OS, clinical trial enrollment and EOL quality metrics.

Results
There were 782 OCTANE pts with 782 matched controls. Variables were balanced after matching (standardized difference [std. diff.]<0.10). Most common tumor sites were: Ovary (30.4%), endometrium (15.0%) breast (12.3%) and colon (8.6%). OCTANE pts had higher mean healthcare costs than controls ($79,702 vs. $59,550), mainly due to costs of oncology visits ($33,165 vs. $26,197), outpatient clinic visits ($8,696 vs. $5,114) and emergency visits ($1,723 vs. $1,373) (all p<0.05). Publicly funded drug costs were less for OCTANE pts ($20,015 vs. $24,465). Overall, OCTANE enrollment was not associated with improved OS (restricted mean survival time (RMST) [standard error]: 1.50 (±0.03) vs. 1.44 (±0.03) years, log-rank p=0.153), but OCTANE was associated with longer OS in ovarian cancer (RMST: 1.69 (±0.05) vs. 1.45 (±0.06) years, p=0.011) and biliary tract tumors (RMST: 1.16 (±0.13) vs. 0.80 (±0.11) years, p=0.02). Importantly, OCTANE correlated with increased clinical trial enrollment (25.5% vs. 9.5%, p<0.001) and fewer deaths in hospital (10.2% vs 16.4%, p=0.003). Results were robust in sensitivity analysis.

Conclusions

There was an increase in healthcare costs associated with NGS testing. The impact on OS was not significant in the overall population, but varied across tumor types. OCTANE was associated with greater trial enrollment, lower publicly funded drug costs and fewer in hospital deaths.

46 - Real-world cost effectiveness of first-line pembrolizumab for advanced melanoma: A population-based study by the Canadian Real-world Evidence Value for Cancer Drugs (CanREValue) Collaboration

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Background: Randomized controlled trials (RCTs) demonstrate large survival benefits with anti-PD-1 checkpoint inhibitors compared to anti-CTLA4 therapy for advanced melanoma. However, it remains unclear if patients in routine practice derive a similar survival benefit or if real-world health utilization differs from trials. Outcomes are needed to inform life-cycle health technology reassessment (HTA) with real-world cost-effectiveness analysis.

Methods: This study compared advanced melanoma patients treated with publicly funded first-line ipilimumab (September 2012 - December 2014) or pembrolizumab (June 2016 - March 2018) in Ontario. These periods were chosen to reflect distinct eras of access to treatment. Linked administrative databases were used to identify cases, covariates, health-utilization and all-cause death. Inverse probability of treatment weighting (IPTW) with stabilizing weights was used for covariate adjustment. Using a three-year time horizon, individual patient-level censoring-adjusted costs in 2019 Canadian dollars with a 1.5% annual discount rate were determined from the public payer's perspective. The outcome was quality-adjusted life-years (QALY) measured at the individual patient level. Health utilities were based on accepted Canadian values from the initial HTA. The incremental cost-effectiveness ratio (ICER) was determined with bootstrap confidence intervals (CI).

Results: Ninety patients treated with first-line ipilimumab, and 300 with pembrolizumab were identified. Covariates were balanced after weighting. Pembrolizumab was associated with improved OS (43.1% vs. 22.1% with ipilimumab at 3 years, IPTW adjusted hazard ratio: 0.52, 95% CI: 0.39-0.70; $p < 0.001$). Mean costs for pembrolizumab and ipilimumab were $212,706 (95% CI 196,122 - 229,290) and $158,352 ($143,218 - 173,484), and mean survival 1.20 QALY (95%CI 1.11 - 1.29) and 0.66 QALY (0.52 - 0.80) respectively. The ICER was $101,183/QALY (65,375 - 139,298). Probability of cost-effectiveness was 0%, 48% and 99% at willingness-to-pay thresholds of $50k, $100k and $150k respectively.

Conclusions: In real-world patients, first-line pembrolizumab for advanced melanoma was associated with improved OS compared to ipilimumab. The real-world cost-effectiveness estimate of $101,183/QALY is similar to the model-based estimates ($114,389/QALY to $151,369/QALY) used in the initial health technology assessment recommendation prior to reimbursement.

47 - The Use of New Primary Cancer Screening Among Stage IV Cancer Patients in Alberta: A Population-Based Real-World Study

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Introduction: Despite the suggestion by Choosing Wisely Canada (CWC) against new primary cancer screening for patients with metastatic cancers due to limited benefits and potential harms, the real-world adherence to this guideline remains unclear. This study aimed to investigate the prevalence and associated factors of new primary cancer screening among stage IV cancer patients in Alberta.

Methods: In this population-based cohort study, we leveraged data from multiple sources: Alberta Cancer Registry, provincial cancer screening programs, and administrative data within Alberta. The study cohort included all patients diagnosed with stage IV common solid cancers during 2006 to 2017, who deceased within one year of diagnosis. The Most Engaged Physician (MEP) for each patient in the database was identified as the physician with whom the patient had the most frequent encounters. The rate of new primary cancer screening was analyzed through descriptive analyses. To understand the variables related to new primary cancer screening, we deployed univariate analyses and multivariable logistic regression analyses.

Results: In total, 21,691 stage IV cancer patients were included in this study, with a median age of 71 (IQR 62.0-80.0) years, and median survival of 80.0 (IQR 10.5-149.5) days. The most common cancer types were lung (51.7%), gastrointestinal (esophageal, gastric, and colorectal, 21.8%), pancreatic (10%), and genitourinary (8.3%) cancer. In total, 1,416 (6.5%) patients received screening tests after the stage-IV cancer diagnosis, and a total of 1,912 screening tests comprising 51.8% colonoscopies, 43.0% fecal immunochemical tests, 1.8% Pap smears, and 3.4% mammographies. Factors associated with receiving screening included younger age, female sex, lower socioeconomic neighbourhoods, residing outside Calgary zone, surgery treatment, less advanced N stage, and medical oncologist MEP.

Conclusions: A substantial proportion of stage IV cancer patients who died within one year of diagnosis in Alberta underwent new primary cancer screening. Further investigation is needed to understand and address the factors contributing to unnecessary screening in this patient population.

48 - Estimating cancer diagnostic interval using deep learning method based on population-based real-world health data

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Introduction

Over 50% of cancer patients are diagnosed at advanced stages (stage III and IV), indicating missed opportunities for early diagnosis. However, to investigate the mitigating factors associated with delayed diagnosis, the first step is to identify the diagnostic interval (from early sign of cancer to definitive diagnosis) that is not explicitly documented in routinely collected health data. This study aimed to develop a data-driven machine learning algorithm to identify cancer diagnostic interval through analyzing the patterns of health visits.

Method

We analyzed provincial cancer administrative data (2005-2017) in Alberta for common solid cancers, depicting the entire one-year pre-diagnosis health encounters. The first half-year data was labeled as no cancer, and the latter half assigned specific cancer types, forming a multi-class classification problem. The dataset was split into a 70:30 training-testing ratio. A Convolutional Neural Network (CNN) was used to learn patterns of health encounters (frequency and type of visits). Post-training, saliency map analysis was applied to identify key encounters indicating early cancer signs, then diagnostic interval was determined as the period from the first key encounter to confirmed diagnosis.

Results

The optimal CNN model attained an overall 85% F1 score on the test set for identifying cancer diagnosis. Via saliency map analysis, the model successfully determined 78,015 patients' diagnostic intervals, which included breast (30.9%), lung (23.1%), colorectal (17.0%), and prostate (29.1%) cancers. The median diagnostic interval was found to be 19.0 (IQR 7.0-31.0) days for breast cancer, 23.0 (IQR 3.0-43.0) days for colorectal cancer, 31.0 (IQR 9.5-52.5) days for lung cancer, and 41.0 (IQR 21.0-61.0) days for prostate cancer.

Conclusion

Our approach demonstrated the potential of data-driven deep learning methods to extract insights from routine health data to identify cancer diagnostic intervals. This can facilitate the investigation of the actionable factors associated with late cancer diagnosis for improvement of cancer care and patient outcome.

49 - A descriptive analysis of in-person and telehealth appointments for medical and radiation oncology services at BC Cancer during the COVID-19 pandemic

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Background: During the COVID-19 pandemic, BC Cancer shifted a significant portion of patient-healthcare provider interactions from in-person to telehealth. As telehealth visits will remain a component of cancer care, it is important to understand the utilization of in-person and telehealth visits to ensure quality of care. In this study, we aim to characterize the appointment types attended by patients at BC Cancer in 2022.

Methods: A retrospective descriptive study was conducted using BC Cancer electronic medical records. We analyzed all appointments related to patient-provider interactions for patients receiving radiation or medical oncology consult and follow-up services. Appointment types were characterized by patient and clinical characteristics. Patients' socioeconomic status was determined by the linkage of residential postal codes to census-derived area-based measures. The factors that influenced the provision of appointment type were explored through crosstabulation with appointment and patient characteristics.

Results: In 2022, 68,794 patients attended a total of 270,762 appointments for medical or radiation oncology services. Across all visits provincially, 61% were conducted in-person and 39% were conducted by telehealth (i.e., telephone, video at a BC Cancer centre, or video at a patient's home); this percentage ranged from 24% to 59% across the six centres. Most patients resided within an hour drive from a BC Cancer centre (73%) and 25% were in the most-deprived economic dependency instability group. In-person appointments were primarily follow-up visits for patients receiving medical oncology treatment (35%) and post-treatment (36%). 79% of new consultations were done in-person. Amongst all in-person appointments, most occurred at the BC Cancer Vancouver centre (32%). Most patients received a combination of in-person and telehealth appointments (96%); only 2% had all in-person and 2% had all telehealth appointments.

Conclusion: Overall, most patients received a combination of in-person and telehealth appointments with in-person appointments utilized the most for new consultations. Findings from this study may guide a step toward identifying appropriate treatment delivery methods for cancer patients as telehealth becomes commonplace in cancer care beyond the pandemic.

51 - Patient-physician sex concordance and associations with treatment practices and cancer outcomes in a real-world population-based cohort

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The impact of sex inequities in healthcare may be magnified in medical oncology, where patients and physicians often navigate life-limiting illnesses and intensive treatments. We aimed to examine the associations among patient-physician sex concordance, treatment practices, and cancer outcomes.

This was a population-based, retrospective cohort study of adults diagnosed with stage II-IV colon or lung cancer in 2013-2020 in Alberta, Canada and referred to a medical oncologist. We classified patient-physician dyads as sex-concordant (female-female, male-male) or discordant (female-male, male-female). We analysed time-to-event data using Kaplan-Meier methods and associations with Cox and logistic regression.

We identified 11,830 patients treated by 189 medical oncologists. Among patients, 49% were female and 50% were in sex-concordant patient-physician dyads. The median age was 68 years, 64% had lung cancer, and 51% had stage IV disease. In sex-concordant and discordant dyads, respectively, median overall survival (OS) was 19.1 and 20.9 months (p = 0.06) while median cancer-specific survival (CSS) was 23.3 and 25.2 months (p = 0.28). In multivariable analysis, sex-concordance was not significantly associated with OS or CSS in the overall cohort and in female patients. But among male patients, sex-discordance was significantly associated with lower OS (HR, 1.10; 95% CI, 1.02-1.17) and CSS (HR, 1.11; 95% CI 1.03-1.20), largely driven by differential outcomes in stage IV disease. Older age, higher comorbidity burden, lung cancer, and advanced stage correlated with worse outcomes in all multivariable models. Among patients with stage II-III disease, 22% received adjuvant systemic therapy and of those with stage IV disease, 63% received any systemic therapy. Sex concordance was not significantly associated with systemic therapy utilization rates or time to initiation.

Sex concordance between patients and medical oncologists did not generally correlate with differential systemic therapy use and survival. However, male patients treated by female physicians had worse outcomes compared to those treated by male physicians. Cancer outcomes may be prone to the effects of sex bias in specific patient-physician relationships.

52 - Estimates of the future prevalence of cancer in Ontario (2019-2034)

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Background: Cancer prevalence describes the number of people diagnosed with cancer who are alive, including people recently diagnosed, under treatment, in the survivorship phase and who are long-term survivors. Cancer prevalence in Ontario has been rising due to improved survival, declining mortality and increasing incidence. Estimating the future prevalence of cancer can help health system planners, policy-makers and healthcare service providers anticipate the amount and type of health system resources needed for treatment and for ongoing health services.

Methods: Projections for 2019 to 2034 were derived using the Prevalence and Incidence Analysis Model (PIAMOD) statistical package. Incidence data from 1984 to 2018 were extracted from the Ontario Cancer Registry. Ontario population and all-cause mortality were obtained from Statistics Canada databases for single years of age (0+ years). Age-cohort models with different parameters were fitted to the historical cancer- and sex-specific incidence data. These models, together with tabulated relative survival rates, were used to calculate annual age-specific prevalence projected counts by sex and cancer type. The projected counts were then converted to prevalence proportions.

Results: The prevalence of cancer is projected to increase by about 50% from an estimated 845,188 people in 2019 to 1,265,216 in 2034. This represents (a 45% increase in males from 386,404 to 558,836 prevalent cases and a 54% increase in females from 458,784 to 706,380, in 2019 to 2034, respectively. People age 60 and older and people with thyroid, kidney and uterus cancers are expected to have the largest relative increases in prevalence in the future.

Discussion and conclusion: The anticipated growth in cancer prevalence in Ontario is similar to findings from modelling studies in the United States and in the United Kingdom. Because many cancer survivors are now expected to live long after their diagnosis, it is important to consider the impact of cancer treatment, recurrence and subsequent cancers, psychosocial care and other important effects that survivors may experience.

53 - Survival after cervical cancer diagnosis by immigrant and screening status: a population-based retrospective cohort study in Ontario, Canada

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Background: Despite improvement in screening and HPV vaccination, cervical cancer is the 4th most frequent cancer among Canadian women aged 15 to 44 years. Immigrants in Ontario, Canada's most populous province, are known to have lower rates of cervical cancer screening, but potential differences in survival are unknown.

Methods: Multiple linked health-administrative databases were used to create a census of Ontarians diagnosed with cervical cancer between April 1, 2012 and March 31, 2017 (sampling size=4301), and we examined the association of immigration-related, sociodemographic, and healthcare-related factors with 5-year survival. Cox proportional Hazards models were stratified by age (<50, ≥50) and stage [early-stage (1and 2), late-stage (3 and 4)]. Multivariate models included age in years, neighborhood income quintile, number of Aggregated Diagnosis Group (ADG) comorbidities, number of primary care visits prior to diagnosis, and continuity of care.

Results: Overall, 5-year mortality among immigrants was 21% and 28% among non-immigrants. In adjusted models, among those younger than 50-years of age, immigrant status was not associated with 5-year survival regardless of stage at diagnosis. However, among those 50 years and older, immigrant status was associated with an inverse relationship with mortality (e.g. late stage: HRimm=0.6, 95% CI=0.4-0.9). Never having been screened (e.g. HRearly,<50yrs=3.2, 95% CI=1.2-8.0) and screening at intervals longer than recommended (e.g. HRearly,<50yrs=2.5, 95% CI=1.5-4.2) were associated with increased mortality in both early- and late-stage patients across ages. Additionally, increased comorbidities were associated with increased mortality among those diagnosed with late-stage disease in both age groups.

Conclusion: No immigrant-based inequalities in survival were observed among women after adjusting for relevant covariates. However, sub-optimal screening history and comorbidities were associated with increased mortality.

54 - Identifying frailty in cancer survivors: patterns of cancer follow-up care and implications for personalized survivorship models

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Background: Cancer survivors may become frail as they age, resulting in complex needs best met by alternative and personalized care models. No studies have examined the use of health services by frail compared to non-frail cancer survivors or quantified frailty among Canadian cancer survivors. This study addressed that gap.

Methods: Using population-based linked administrative data, we conducted retrospective analyses. We identified cancer survivors from the provincial cancer registry diagnosed with stage I-III breast, colorectal, gynecologic, or prostate cancer between Jan 2006-Dec 2013. Using rules to identify frailty in administrative data, we estimated their burden of frailty. To describe how frailty differed by patient characteristics, we performed descriptive statistics and logistic regression. To compare the annual follow-up visit rate between non-frail and frail survivors, we used negative binomial regression. Finally, to describe the amount (low/medium/high) of follow-up visits provided to cancer survivors by a primary care physician (PCP), we used descriptive statistics and partial proportional odds.

Results: The prevalence of frailty was 17.7% within the cancer survivor cohort (n=10,176). Frail cancer survivors had a 28% higher annual cancer-related follow-up visit rate than non-frail survivors (incident rate ratio [IRR] 1.28, 95% CI 1.23-1.33). Of 10,000 survivors with at least one cancer-related follow-up visit, 2,487 (24.9%) had a high percentage (i.e., >=73%) of PCP visits. Compared to non-frail cancer survivors, frail survivors had 58% greater odds of having a high (versus low-medium) or medium-high (versus low) proportion of PCP visits (odds ratio [OR] 1.58, 95% CI 1.43-1.76).

Conclusions: This novel study identified a subset of Canadian cancer survivors with frailty. Compared with non-frail cancer survivors, frail survivors had more frequent follow-up visits and a higher proportion of follow-up visits to PCPs. Frailty may be one way to tailor cancer survivors' follow-up care pathways. Primary care is likely suitable for frail survivors' follow-up. Regardless, communication between specialists and PCPs regarding follow-up care transition is imperative. Future research should investigate the use of multidisciplinary primary care models amongst this population.

55 - Creating a multiply imputed value set for the EQ-5D-5L in Canada to account for parameter uncertainty to inform cancer drug funding decisions

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Introduction: Decisions on public reimbursement of cancer drugs rely heavily on the incremental cost effectiveness ratio (ICER) of an economic evaluation. The denominator of the ICER is the incremental quality adjusted life years (QALYs), the product of health utilities and survival. EQ-5D-5L collected in clinical trials is a main source for health utilities. Scoring the EQ-5D-5L conventionally overlooks state level parameter misspecification in the value set. Yet models with parameter misspecification have 95% credible intervals (CrI) exceeding its minimum important difference (0.037-0.056). Multiple imputation (MI) accounts for parameter misspecification in the value set. However, no valuation study has implemented this methodology.

Methods: Using the Canadian EQ-5D-5L valuation study (n = 1,073), we re-fit the original model, followed by models incorporating state-level misspecification. We compared models based on posterior predictive assessment-derived tail probabilities, and calibration of 95% CrI for out of sample predictions. Using the best fitting model, we took 100 draws from the posterior distribution to create 100 imputed value sets. We used these value sets to estimate the mean health utility and its associated standard error from two samples, 1) 1208 individuals from the Canadian general public, and 2) 401 women with breast cancer.

Results: The model with state-level misspecification performed the best (95% CrI coverage: 94%), whereas the original model performed the worst (95% CrI coverage: 12%). We used the model with state-level misspecification to create 100 imputed value sets. Using MI led to wider standard errors (SEs) for the estimated mean utilities compared with the original value set for both the Canadian general public (MI: 0.0091 original: 0.0035) and patients with breast cancer (MI: 0.0169, original: 0.0066).

Discussion and Conclusions: Our study provides 1) the first multiply imputed value sets for the EQ-5D-5L and 2) example code for other users to construct their own multiply imputed value sets. These imputed value sets can be applied to correctly account for EQ-5D-5L parameter uncertainty to improve cancer drug funding decisions.

56 - Revealing the hidden costs: Exploring the financial toxicity of hereditary cancer syndromes.

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Introduction: While financial toxicity is widely reported in cancer, limited research exists on the financial toxicity in hereditary cancer syndromes (HCS) which account for 10% of cases. This study explores the financial toxicity in two prevalent HCS: Hereditary Breast and Ovarian Cancer Syndrome (HBOC) and Lynch Syndrome (LS).

Methods: Patients across 3 provinces in Canada with a confirmed molecular diagnosis of HBOC or LS were invited to participate in semi-structured qualitative interviews. Interpretive description was used to analyze the data.

Results: Qualitative interviews were conducted with 73 patients (51 females, 21 males, 1 gender-diverse; age range 25-80yrs) diagnosed with HBOC (n= 39) or LS (n= 34). Participants described a range of financial toxicity. For many, accessing treatment and routine screenings within their province posed economic challenges. These difficulties mostly included travel costs and lost wages. Some patients faced substantial travel costs if travel to a distant medical facility or another province was required to access specialized equipment or health professionals (e.g., larger MRI machines). Other financial impacts of HSC included expenses for fertility preservation procedures, reconstructive surgeries, and psychotherapy. Concerns about unidentified financial prospects in the future weighed heavily on the minds of many participants. The possibility of being unable to return to their jobs due to health limitations, choosing a different career path, or the potential financial impact of their passing created financial uncertainty and strain. Participants often relied on their families to help cope with financial challenges. This involved sharing the costs, alternate living arrangements, family members accompanying them to medical appointments, and seeking assistance with childcare. The role of health advocates and supportive employers emerged as crucial factors in mitigating financial burdens.

Conclusion: Findings provide novel insights about the existence of financial toxicity for HCS in Canada, particularly regarding access to screening and treatment options, ongoing out-of-pocket expenses, and future economic uncertainties. Results highlight the need for the development of solutions to help address the financial toxicity of HCS.

57 - Missed Opportunities in Supporting Informal Cancer Caregiver (and Patient) Health

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The number of informal cancer caregivers (ICC) is rising due to increased cancer prevalence and a shift towards home-based care. ICC have been shown to experience several physical, emotional, and social consequences secondary to caregiving leading to a reduced quality of life, an increased risk of all-cause mortality, and a reduced capacity to care for their loved ones. ICC and patient health are interrelated. Improving health outcomes for ICC may improve outcomes for patients and vice versa. Exercise appears to be a potent intervention to improve the physical and psychosocial health of ICC but research in this area is lacking. This study used an Interpretive Description approach to explore the needs, preferences, and opinions of ICC regarding exercise programs. Eight ICC participated in semi-structured interviews to share their experiences and views.

A throughline of missed opportunities to support ICC health with dyadic exercise programs underpinned three themes in the data: (1) No Time for Exercise, (2) Lack of Oncologist Support, and (3) Do It for Them. The ICC in the study sample were ready and willing to participate in dyadic exercise programs with their care recipients but lacked the opportunities and support to do so. The findings highlight missed opportunities that can be capitalized on to improve ICC (and patient) health.

These findings suggest that ICC (and patient) health could be better supported by including Qualified Exercise Professionals (kinesiologists, clinical exercise physiologists) in the multidisciplinary cancer care team; oncologists initiating conversations about exercise with ICC and patients in initial meetings, then referring them to QEPs; and including exercise programs for ICC and patients as part of standard care.

58 - Examining the impact of the COVID-19 pandemic on survival rates for individuals diagnosed with cancer in Manitoba, Canada

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Objectives: As a result of the COVID-19 pandemic, interventions were developed to reduce the risk of COVID-19 for individuals living with cancer. This study examined the impact of COVID-19 and these interventions on cancer survival for the most commonly diagnosed cancers in Manitoba, Canada.

Methods: To examine cancer survival rates prior to COVID-19 (January 2015 to December 2019) and after the start of COVID-19 (April 2020 to September 2021) an interrupted time series study design was used with quarterly survival rates. Royston-Parmar models were used to account for time-varying effects. Restricted mean survival times (RMST) were produced at 1-year for both the COVID-19 fitted values and the expected counterfactual values during the COVID-19 period. The delta between these two values represent the mean survival time lost or gained during the first year of follow-up post-diagnosis during the COVID-19 period. Models were adjusted for age, stage, and sex and the delta RMST values were compared to the unadjusted delta RMST.

Results: For breast cancer, survival decreased non-significantly in April to June 2020. For colon cancer, survival decreased non-significantly in July to September 2020 and April to June 2020 for individuals aged 50 to 74 and 75 and older, respectively. For individuals diagnosed with lung cancer aged 50 to 74, survival was lowest in April to June 2021 and highest in July to September 2021. For individuals diagnosed with lung cancer aged 75 and older, survival increased non-significantly in January to June 2021. The deficit or surplus in survival observed in the unadjusted analyses was reduced in the adjusted analyses.

Conclusion: There were no substantial changes in cancer survival due to the COVID-19 pandemic. The decreased survival in the unadjusted analyses for breast and colon cancer is not as apparent in the adjusted analyses and coincides with decreased screening and diagnostic testing. The increased survival for lung cancer coincides with decreased incidence. Individuals with poorer prognosis may have died of other causes before receiving a cancer diagnosis.

59 - Cost-utility anlaysis of CAR T-cell therapy for diffuse large B-cell lymphoma: a Canadian perspective

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Background: Chimeric antigen receptor (CAR) T-cell therapy is a novel cell therapy for treating non-Hodgkin's lymphoma. The development of CAR T-cell therapy has transformed oncology treatment by offering a potential cure. However, due to the high cost of these therapies, and the large number of eligible patients, decision-makers are faced with difficult funding decisions. Using recent clinical trial evidence, our objective was to assess the cost-effectiveness of tisagenlecleucel (tisa-cel) for adults with relapsed/refractory diffuse large B-cell lymphoma in Canada.

Methods: We developed a system-level individual-simulated discrete event simulation model to assess the costs and quality-adjusted life-years (QALYs) of tisa-cel compared to salvage chemotherapy. A Canadian healthcare payer perspective was used and outcomes were modelled over a lifetime horizon. Costs and outcomes were discounted at 1.5% annually, with costs reported in 2021 Canadian dollars. A probabilistic analysis was used, and model parameters were varied in one-way sensitivity analyses and scenario analyses.

Results: Tisa-cel led to an additional cost of $503,417 and additional effectiveness of 2.48 QALYs, with an incremental cost-effectiveness ratio of $202,991 compared to salvage chemotherapy. At a willingness-to-pay threshold of $100,000/QALY, tisa-cel had a 0% likelihood of being cost-effective. The model results were sensitive to the time horizon, the age of the cohort, discount rate, cost of the therapy, and the utility of the progression-free health state.

Conclusions: At the current drug price, tisa-cel was not cost-effective. These results heavily depend on assumptions regarding long-term survival. Further real-world evidence is needed to reduce uncertainty.

60 - Real-world safety and effectiveness of biosimilar trastuzumab in adjuvant HER2+ breast cancer patients in Ontario, Canada

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Background: Ontario publicly funds reference trastuzumab (Herceptin) and four trastuzumab biosimilars for adjuvant HER2+ breast cancer treatment. Clinical trials demonstrate biosimilar trastuzumab has similar efficacy and safety to Herceptin. Real-world studies are needed to confirm similar outcomes to support biosimilar uptake.

Objective: To assess the real-world safety and effectiveness of biosimilar trastuzumab compared to Herceptin for adjuvant HER2+ breast cancer treatment.

Methods: This was a population-based, retrospective, observational cohort study using administrative health data for Ontario patients with HER2+ breast cancer comparing patients who received neoadjuvant/adjuvant biosimilar trastuzumab between November 2019-June 2021 with patients who started Herceptin between June 2016-November 2019. Propensity score methods (PSM) were used to balance baseline characteristics between treatment groups. Safety outcomes included death within 30 days of last dose, direct hospital admission, hospital admission via emergency department (ED) visit leading to hospital admission, treatment discontinuation, and in-patient hospital admission for congestive heart failure (CHF) (a toxicity of interest for anti-HER2 therapy), measured using logistic or negative binomial regression. A subgroup analysis was conducted for treatment discontinuation. Overall survival (OS) was measured using Kaplan-Meier methods and Cox Proportional Hazards regression.

Results: 5071 patients with HER2+ breast cancer were treated with neoadjuvant/adjuvant trastuzumab between June 2016-June 2021. In the PSM cohort, there were no significant differences in the rate of hospital admission via ED, odds of treatment discontinuation, or the odds of in-patient admission for CHF. A significantly lower rate of direct hospital admission (RR: 0.87, 95% CI: 0.76-0.99, $p<0.05$) was identified. The subgroup analysis did not demonstrate different results from the primary analysis. There was no significant difference in survival (HR: 1.17, 95% CI: 0.68-2.00, $p>0.05$)

Discussion: Biosimilar trastuzumab demonstrated similar effectiveness and rates of ED visits leading to hospital admission, odds of treatment discontinuation, and odds of in-patient admission for CHF compared to Herceptin. The biosimilar group had a lower rate if ED visit leading to hospital admission. Additional analyses are required to determine the impact of clinical practice changes during the COVID-19 pandemic on these results.

61 - Clinical utility of all types of medically relevant secondary findings from genomic sequencing for cancer: An observational cohort study

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Introduction: The clinical adoption of genomic sequencing is complicated by secondary findings (SFs), medically relevant genetic variants unrelated to the primary indication. We characterized the clinical utility of all types of medically relevant SFs by evaluating yield and changes to patient management, in an adult cancer population.

Methods: Observational intervention study in an RCT (Incidental Genomics RCT, NCT03597165). Patients had genomic sequencing (GS) with return of primary cancer findings and option to learn multiple categories of SFs. Pathogenic and likely pathogenic variants were reported as SFs and returned by study genetic counselors (GC). GS reports and consult letters with recommendations from study GC and medical geneticist were sent to patients and their family doctors. Yield and clinical management changes were collected through chart review and patient-reported surveys up to 1 year after SF return.

Results: Participants (n=139) were 85.7% female, average 55.1 years old, and 60.7% White/European. Overall, 100% of participants had ≥1 SF reported; 98.5% had multiple SFs. Yield was highest for PGx variants (97.8% of participants), followed by carrier status (90.1%), common disease risk (89.4%), Mendelian (27.4%), medically actionable (15.2%), and early-onset neurodegenerative (2.6%) variants. 1.4% of participants had SFs in ACMG-recommended genes. Overall, 19.4% of participants had a change in medical management attributed to their SFs, mainly appointments with specialists (11.5%) and family doctors (8.6%). Management changes were completed among 47.6% (10/21) of patients with medically actionable findings (e.g., medical genetics consultation), 29.4% (10/34) with Mendelian findings (e.g., imaging), 66.7% (2/3) with early-onset neurodegenerative findings (e.g., medical genetics consultation), 1.7% (2/118) with carrier status findings (e.g., family doctor appointment), 2.2% (3/135) with PGx variants (e.g., medication change), and 2.2% (2/118) with common disease risk variants (e.g., ophthalmologist consultation).

Conclusions: SFs demonstrated clinical utility by prompting changes in patient management, including results that were not considered medically actionable. This implies potential benefits of returning a wide range of SFs; longer-term studies are needed to determine if management changes improve health outcomes.

62 - Psychological and behavioural outcomes of returning all clinically relevant secondary findings from genomic sequencing for cancer: Preliminary results from the Incidental Genomics RCT

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Introduction: Genomic sequencing (GS) is increasingly used in cancer care. Questions remain about which types of secondary findings (SFs) - results unrelated to the primary indication - should be returned. We conducted an RCT (NCT03597165) to evaluate outcomes and costs of returning all clinically relevant SFs among adult cancer patients. Here, we report preliminary findings on psychological and behavioural outcomes.

Methods: Participants in both arms had GS with cancer results returned. Intervention arm participants could learn SFs[CM1] . The primary outcome was distress (Hospital Anxiety and Depression Scale [HADS]) 2-weeks after return of results. Secondary outcomes included patient-reported medical (e.g., appointments, screening) and lifestyle behaviours (e.g., diet, exercise), 2 weeks, 6 weeks, 6 months, and 1-year post-return of results. HADS at 2-weeks was compared between arms with an ANCOVA model adjusting for baseline scores. Proportions of participants reporting medical and lifestyle behaviours were compared at all timepoints with chi-square tests.

Results: Participants (n=287) were 87.1% female, 57.5% White/European, and average 57.2 years old. The adjusted mean difference in HADS anxiety in the intervention arm compared to the control arm was -0.19 (95% CI -1.1, 0.68, p=0.7), implying less increase. The CI excludes the minimal clinically important difference (MCID: 2.5). The adjusted mean difference in HADS depression in the intervention arm compared to the control arm was 0.02 (95% CI -0.67, 0.71, p=0.96), with the CI also excluding the MCID (2.5). A difference in health behaviour uptake was not observed at 6 months. There was higher uptake of medical behaviours in the intervention arm at 6 weeks (14.8% vs. 3.1%, p=0.002). There was higher uptake of lifestyle behaviours in the intervention arm at 2 weeks (7.4% vs. 0%, p=0.002) and 12 months (4.4% vs. 0%, p=0.03).

Discussion: We did not find strong statistical evidence that returning SFs increased distress relative to primary findings only, however we found evidence that SFs led to higher health behaviour uptake. This suggests returning SFs is safe, and effective for influencing health behaviours.

63 - Environmental Metal Exposures and Breast Cancer Risk: A Prospective Study of Nationally Representative Canadian Data

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Introduction: The impact of metal exposure, either individually or as a mixture, on breast cancer risk remains unclear. This project evaluated the association between eight heavy and essential metals and breast cancer risk among Canadian women.

Objectives: Demographic information and concentrations of urinary or blood metal biomarkers from 2007-2017 of the Canadian Health Measures Survey (CHMS) were analyzed. Incident breast cancers were ascertained through linkage to the Canadian Cancer Registry. Metal exposure was described using weighted percentiles and categorized by tertiles. Cox proportional hazards regression was used to estimate hazard ratios (HR) and 95% confidence intervals (CI) for metal exposure and breast cancer risk. Quantile g-computation was used to estimate the joint association between metal exposure and breast cancer risk.

Results: This analysis included 5,100 women (mean age 44.6 years) with an average follow-up of 6.6 years. Higher urinary arsenic (> 13.0 µg/L) and cadmium (> 10.0 µg/L) had a significant increased risk of breast cancer ($HR_{\text{Arsenic T3 vs. T1}}$ = 2.05; 95%CI 1.05-3.94; $HR_{\text{Cadmium T3 vs. T1}}$ = 1.71; 95%CI 1.01 - 5.87). Analyses into the joint association between the metal exposure mixture and breast cancer risk are ongoing, and matrix results will be presented.

Conclusion: This represents the first evaluation of metal exposure and breast cancer risk in a nationally representative cohort. Our findings suggest that arsenic and cadmium, even at low levels, may be associated with an increased risk of breast cancer. These findings can inform population-level interventions to reduce the burden of cancer in Canada.

64 - Examining the association between ambient exposure to nitrogen dioxide and breast cancer risk among high-risk Canadian women

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Introduction: Air pollution, specifically nitrogen dioxide (NO_2), is a carcinogen associated with an increased risk of breast cancer risk among higher-risk populations. Whether this association exists among women with a pathogenic variant (mutation) in *BRCA1* or *BRCA2* is unknown. We conducted a prospective analysis of annual NO_2 exposure and breast cancer risk among Canadian *BRCA* mutation carriers.

Methods: Women with a *BRCA* mutation were identified from a longitudinal study that collects information on exposures and incident disease via biennial questionnaire. Annual NO_2 concentrations (ppb) were obtained through linkage to the Canadian Urban Environmental Health Research Consortium (CANUE). Hazard ratios (HR) and 95% confidence intervals (CI) for the association between NO_2 and risk were estimated using Cox proportional hazards regression.

Results: This analysis included 1,129 women. After a mean follow-up of 7.1 years, 125 incident breast cancers were identified. The median annual NO_2 concentration was 13.0 ppb (range 0.2 - 43.8), indicative of low exposure. There was a significant association between increasing NO_2 exposure and breast cancer risk; each 10.8-ppb increase was associated with a 21% increased risk (HR= 1.21, 95%CI 1.01 - 1.43; *P*-trend =0.04). Although not statistically significant, women above the geometric mean of NO_2 (13.1 ppb) had a 47% increased breast cancer risk (95%CI 1.00- 2.51).

Significance: This is the first report of NO_2 exposure and breast cancer risk in *BRCA* mutation carriers and suggests a potential etiologic role of environmental exposures. We will continue to leverage administrative databases to delineate the relationship between environmental toxins and cancer risk.

65 - Accelerating access to promising pediatric cancer therapies in Canada: Comparing international approaches to regulation and reimbursement

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Background

Existing policies on cancer drug regulation, HTA, and funding in most health systems rarely account for the unique needs of children, resulting in significant access constraints. The relevance of innovative therapies for pediatric oncology is rapidly expanding, as are rising costs of the same, exacerbating pre-existing barriers along the therapeutic development pipeline. Our study sought to understand the policy and regulatory challenges related to the evaluation and reimbursement of innovative cancer therapies for children.

Methods

Data was gathered through in-depth interviews with experts (representing decision-makers in regulatory, HTA, and clinical settings) and analysis of policy documents. We identified the governance, legislative and regulatory environments across Canada, the European Union and the United Kingdom and compared policy approaches, with a focus on pediatric oncology and rare disease drugs. Drawing on HTA scholarship and policy theory, a critical interpretive approach guided analysis.

Results

Health systems globally are grappling with allocative challenges presented by precision and innovative cancer therapies, which are compounded by unique evidentiary and ethical considerations in the pediatric space (e.g., ubiquity of rare disease, trial enrolment complexities). Policies that address the distinct socio-biological, economic, and ethical dimensions of precision child health are lacking. We describe distinct jurisdictional approaches to a similar set of challenges and identify how policy contexts (governance structures, stakeholders, values) impact access. We synthesize how stakeholders in each jurisdiction experience barriers in access to high-cost and innovative oncology therapies, and propose solutions (e.g., carrot and stick drug development incentives, harmonized evidence review pathways, expanded and upstream stakeholder engagement).

Conclusions

This work illuminates a shared set of challenges ripe for collaborative efforts at policy reform. Canada has an opportunity to learn from the international policy landscape where formal mechanisms to integrate pediatric and precision medicine into drug regulation and HTA processes are more established. We hope to provide Canadian policymakers with evidence-informed considerations for the design and implementation of policies to govern fair and sustainable access to innovative oncology therapies for children.

66 - Investigating the Association Between Asbestos Exposure and Breast Cancer Risk in Atlantic Canada

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Breast cancer is a prevalent chronic disease affecting women worldwide, including in Canada. While several factors contribute to its occurrence, such as age, obesity, smoking, alcohol consumption, exercise habits, and reproductive-related factors, the association between asbestos exposure, a fibrous mineral previously used in fireproofing and insulation, and breast cancer is less established compared to other cancers. This research aims to address this knowledge gap by examining the association between asbestos exposure and breast cancer onset among women in Atlantic Canada. The study utilizes data from the Atlantic Partnership for Tomorrow's Health (PATH) cohort, which is a prospective study initiated in 2009. From a sample of 12,179 cancer-free females, 8,160 participants who responded to questions related to asbestos exposure were included in the analysis. During the first follow-up (2016-2018), 141 self-reported incident cases of breast cancer were identified. Multiple logistic regression, including multiple imputation for missing values, was performed to examine the association between self-reported asbestos exposure lasting at least one year at home or work and the risk of breast cancer. Covariates, including age, smoking history, education, and menopausal status, were included to account for potential confounding effects. Our results suggest a positive association between asbestos exposure at work (OR = 2.43, 95% CI: 1.23 - 4.82) and the risk of breast cancer in postmenopausal women, adjusting for covariates. These findings not only contribute to the existing literature but also aid in the development of prevention and early detection interventions addressing the impact of asbestos exposure on breast cancer in Atlantic Canada. By shedding light on these risks, our research enhances understanding and facilitates targeted efforts to minimize asbestos-related risks and improve the health outcomes of women in the region.

67 - International comparisons of health technology assessment and reimbursement outcomes for oncology drugs with regulatory review through Project Orbis

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OBJECTIVES: Project Orbis is an international regulatory collaboration led by the US Food and Drug Administration (FDA) Oncology Center of Excellence. It represents a framework for concurrent submission and review of oncology products, with the aim to give patients faster access to promising cancer treatments. However, products with limited clinical evidence can pose challenges for health technology assessment (HTA) and public-payer decisions. We examined HTA and reimbursement outcomes for Project Orbis drugs reviewed in Canada and other jurisdictions globally from program inception in 2019 to end of 2022.

METHODS: We identified all Project Orbis drugs approved by Project Orbis partner jurisdictions: Canada, Australia, and UK. We collected all related HTA recommendations and reimbursement outcomes for the three countries plus two other EU jurisdictions: France and Germany until Mar/2023. Using publicly available information, we collected clinical details that might affect decision-making, including level of evidence assessed and disease context to identify trends. We determined concordance in regulatory approvals, HTA recommendations and funding across jurisdictions and compared timelines where possible.

RESULTS: Most drug-indications approved through Project Orbis by the US were approved by Canada (49, 72%), or Australia (42, 62%). International consistency was more limited, with 37 (55%) approved by both Canada and Australia, and 11 (16%) by Canada, Australia and UK. Only 30% of approved drug-indications had completed HTA in Canada within 6 months of regulatory approval despite availability of parallel regulatory-HTA review. Of drug-indications with Canadian and Australian approvals and 6+ months follow-up, 68% had initial HTA outcomes across both jurisdictions.

CONCLUSION: There is wide variability in HTA outcomes and reimbursement for drugs approved through Project Orbis in jurisdictions around the world. We highlight the importance of considering the health system context when assessing and comparing HTA recommendations and reimbursement decision-making internationally.

68 - Understanding how the lives and experiences of South Asian women impact uptake of cervical screening: A concept mapping study

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Cervical cancer is highly preventable with appropriate and timely screening. In Ontario, Canada, South Asian women have some of the lowest screening rates in the province. The objectives of this work are to identify factors that impact the decision-making process for South Asian women to get screened or not to get screened for cervical cancer. Through the process of Concept Mapping (CM), this study will also identify participants perspectives on both the importance and feasibility of addressing identified factors to further encourage cervical screening. CM is a participant-driven and semi-qualitative method that produces a conceptual framework that reflects how a group views a particular topic. This study engages South Asian women in the Greater Toronto area, community champions, people who work in organizations that serve South Asian women, and healthcare providers. The first step involved brainstorming ideas for the conceptual framework, using the focal prompt “One thing about the lives and experiences of South Asian women that influence their decision, in a positive or negative way, to get screened (i.e. a Pap test or HPV test) for cervical cancer is...” In the fall of 2022, over 50 participants took part in this brainstorming round, with the sorting and rating rounds beginning in the Spring of 2023. Here, we present findings from the sorting and rating rounds. The maps will provide a framework that can be used to guide action planning and program development while the rating data will be used to identify the areas of most impact.

69 - Evaluating the Impact of an After-Hours Toxicity Management Support Service on Emergency Department Utilization for Patients on Cancer Treatment in Ontario

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Emergency department (ED) visits and hospitalizations are common among patients receiving cancer treatments. Patients are often told to go to the ED after-hours due to the lack of alternative models for timely toxicity management support. Following the success of an initial pilot, Ontario Health (Cancer Care Ontario) (OH-CCO) entered into a partnership with CareChart Digital Health (CareChart) to launch a provincial after-hours toxicity management telephone support line for patients receiving cancer treatments. The goal of the service is to decrease ED utilization through enhanced toxicity management, and to advance person-centred care through improved coordination and communication. Since 2018, a team of specialized oncology nurses have supported patients across 74 hospitals after hours (evenings, weekends, holidays), using evidence-based teletriage tools including the pan-Canadian Oncology Symptom Triage and Remote Support (COSTaRS) practice guides. Nurses manage most calls with self-management strategies and 24% of calls are re-directed to the ED.

OH-CCO evaluated the success of CareChart using Ontario's administrative datasets in a comparative cohort study. Patients treated prior to implementation of the service (Cohort 1, n= 32,395) were compared to patients treated after implementation (Cohort 2, n=19,653), using a zero-inflated negative binomial regression model. Included covariates were sex, age, stage, disease site, Charlson comorbidity index, neighbourhood income quintile, urban/rural, north/non-north residence, and diagnosis year. The model estimated an annual reduction of more than 5,200 ED visits (26%) due to factors not included in the model (i.e., CareChart and other factors). Using a macro costing methodology, savings from reduced ED visits were estimated. Hospital-based average cost per weighted case from the Ontario Cost Distribution Methodology (OCDM) was used to estimate annual savings in ED costs of $3.8M. Findings support that the CareChart service has been successful in helping avoid unnecessary ED use and delivers value to the health system in Ontario.

70 - A pilot project for lung cancer screening with low-dose computed tomography in the province of Quebec, Canada: selected results of the first screening round

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Objective: A pilot project of lung cancer screening, aiming to enroll 3200 participants to undergo low-dose computed tomography (LDCT) at 1-year interval in combination with a tobacco cessation intervention, was initiated in Quebec. The purpose of this study is to assess selected indicators of LDCT screening performance and smoking cessation intervention for the first round of screening in the project.

Methods: An admissibility criterion of a PLCO score ≥ 2% was chosen among other eligibility criteria. A centralised database was created for the pilot project which collects prospectively data from time of reference to the pilot project (first contact of referred participants) until diagnosis (for the first two rounds). Data were linked to the SMOKERS database to assess the smoking cessation intervention among screening participants.

Results: Between June 2021 and November 2022, 3,200 participants were screened for the first round, of which 72.9% were currently or recently smoking, 55.1% were male and 19.6% < 60 years old. The average participants PLCO score was 5.2% (median 4%, interquartile range: 2.6%-6.2%). For the first round of screening, 3199/3200 had a non-missing lung-RADS result: 2,757 (86.2%) had a negative result (Lung-RADS 1 and 2), 223 (7.0%) had an undetermined result (Lung- RADS 3) and 219 (6.8%) had a positive lung-RADS (133 with a lung-RADS 4A, 51 and 35 with a Lung-RADS 4B and 4X respectively). Incidental findings necessitating follow-up were identified in 790 (24.7%) participants. Preliminary results for participants with ≥12 months follow-up show detection rate (>1.5%) and proportion of early stage cancers (71.4%) reaching prespecified targets. Acceptance of a smoking cessation intervention was 64.9%.

Conclusions: The first round of screening show that recall rates, incidental findings rates, preliminary detection rates and stage TNM distribution of detected cancers are within prespecified target values. Acceptance of the smoking cessation intervention was, however, lower than the predetermined target.

71 - Do patient-reported symptoms improve the ability to predict three-year survival among patients with esophageal cancer treated with resection? A study using linked administrative and patient-reported outcomes data

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Esophageal cancer is an aggressive disease with significant symptom burden and a 5-year survival rate of 16%. Current survival prediction tools at the time of surgery do not integrate information on patient-reported outcomes, including symptoms such as pain or nausea, which may provide prognostic value. Thus, this study aims to determine whether patient-reported symptoms can improve the ability to prognosticate among resected esophageal cancer patients. This was a population-based cohort study using administrative datasets from ICES. Ontario patients who underwent esophageal cancer resection between December 31 2006 to June 30 2016 and reported first post-operative ESAS assessment within 3 months (January 1 2007 to September 30 2016) were eligible. Cox proportional hazard models were used to predict 3-year mortality risk following the first post-operative ESAS assessment. We compared the performance of an externally validated pathology model, which included details of the patient, disease, and pathology, with two models including individual-level Edmonton Symptom Assessment System (ESAS) data. One model included ESAS scores for each individual symptom while the other used total ESAS scores. Model performance was estimated with a c-statistic (discrimination) and by plotting calibration-in-the-large, with additional assessment of calibration across different patient subgroups. Among the ESAS models, 717 patients were included with a median age of 64, 81.7% males, and 88.8% with adenocarcinoma. We observed no major differences in the c-statistic (0.709 vs 0.716 vs 0.710) and overall calibration (0.551 vs 0.547 vs 0.546) across the pathology, individual-ESAS, and total-ESAS models, respectively. However, when comparing subgroups of high symptom burdens of anxiety, poor appetite, drowsiness, shortness of breath, nausea, pain, and wellbeing, both ESAS models overestimated the predicted 3-year mortality risk. Overall, our findings demonstrate that the addition of ESAS data to a model containing demographic, clinical, and pathology data does not add benefit to the prediction of 3-year survival in esophageal cancer patients treated with resection. ESAS may have limited prognostic value for this early-stage, highly selected cancer population and/or for predicting long-term mortality.

72 - Key characteristics of a dyadic approach to self-management: Implications for intervention design and delivery

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Objectives/Purpose

Caregivers are often the primary source of physical, emotional, and practical support for those living with cancer. Frequently undertaken with limited access to support services, caregiving can be overwhelming, leading to physical and psychological burden. One promising cost-effective avenue to support caregivers is dyadic self-management interventions through which the needs of both the patient and the caregiver are targeted. Based on the findings of six studies conducted by our team, the aim of the presentation is to outline essential characteristics of dyadic self-management to the successful delivery of such interventions.

Methods

Three qualitative studies and three pilot trials (two RCTs, one SMART) have been conducted in developing two self-management interventions for adults with cancer and their caregivers: TEMPO and Coping-Together. These interventions support dyads in learning evidence-based skills needed for the self-management of cancer. Semi-structured interviews were conducted across studies and data on the process of dyadic self-management were analyzed using thematic analysis.

Results

Overall, patients and caregivers used and benefitted from the interventions differently. Whereas dyads approached implementing coping skills jointly, they also wished to work on individual self-management needs. These often pertained to symptom management for patients and communication skills for caregivers. These findings indicate that flexibility is required to address individual and dyadic goals. Intervention tailoring was also critical as participants' dyadic approach evolved over time. However, more content made specifically for caregivers emphasizing how they can set their own goals is needed across interventions, as it was reported that they struggled to focus on their individual needs. Establishing self-regulatory skills (e.g., goal setting, self-monitoring) for both members of the dyad was a key process facilitated by our dyadic interventions.

Conclusion and Clinical Implications

Given the complexity of dyadic intervention, elucidating the characteristics of dyadic self-management allows healthcare professionals to intervene more efficiently and appropriately. In better understanding specifics of how dyads approach self-management, these findings may also inform the development of future dyadic self-management interventions.

73 - External validation of a population-based prediction model for three-year survival in people with resected esophageal and gastroesophageal junction cancer

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Clinical prediction tools offer an accessible way to combine diverse information and create personalized survival predictions for patients and providers. Existing prediction tools for survival in esophageal cancer have had limited clinical utility because they do not adhere to best practices for model development and validation. Our study aims to develop and externally validate a prediction model for 3-year survival following surgical resection for esophageal and gastroesophageal junction (GEJ) cancers. Our prediction model was derived using administrative population-based datasets housed at ICES. We included Ontario patients with esophageal or GEJ cancer who received an esophagectomy or esophago-gastrectomy between 2004 and 2016 with a pathology report available. Cox proportional hazards models were fit to predict the risk of mortality within 3 years following resection. Our prediction model included patient, disease, and pathology specimen variables (i.e. age, sex, histology, neoadjuvant therapies, comorbidities, T stage, lymph nodes). We performed an external validation of our model in a separate patient cohort in Manitoba who received esophageal or GEJ cancer resection between 2004 and 2017 using population-based data from the Manitoba Centre for Health Policy. We compared the internal and external calibration and discrimination of the model with calibration-in-the-large plots and c-statistics. Model development included 2124 patients in Ontario with 80% males, median age of 66, and 80% diagnosed with adenocarcinoma. The external validation model included 318 patients with similar population distribution. On internal validation, the calibration plot slope was 1.02 and intercept was -0.01, and optimism-corrected c-statistic 0.77. In comparison, the external validation reported a calibration plot slope of 1.11 and an intercept 0.005, and the c-statistic 0.73. Our model demonstrated strong and accurate prognostic ability in an external population, which provides evidence for generalizability and therefore may be suitable for application in real-world clinical care. Future work to develop an interface to communicate risk for use by providers and esophageal and GEJ cancer patients for a personalized understanding of 3-year prognosis is needed.

74 - Using genomic heterogeneity to inform therapeutic decisions for metastatic colorectal cancer: an application of the Value of Heterogeneity framework

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Mutations in *KRAS* and *NRAS* are associated with poor response to cetuximab and panitumumab, two anti-EGFR antibodies for metastatic colorectal cancer (mCRC). Our objective was to evaluate the use of *KRAS* and *NRAS* mutation status to inform third-line anti-EGFR therapy for mCRC in British Columbia (BC), using the value of heterogeneity (VOH) framework.

We used administrative data to identify mCRC patients who were potentially eligible for third-line therapy in 2006-2019. We compared three stratification policies that were in place during the study period: the unstratified decision, where anti-EGFR therapy was not offered (2006-2009); stratification by *KRAS* mutation status (2009-2016); and stratification by *KRAS+NRAS* mutation status (2016-2019). We used inverse probability of treatment weighting, using propensity scores estimated from generalized boosted models, to balance covariates across the three groups. Cost and survival time were calculated using a 3-year time horizon and adjusted for censoring. Bootstrapping was conducted to characterize uncertainty. Mean and incremental NMB were calculated at a range of threshold values. Using the VOH framework, the value of using *KRAS* or *NRAS* mutation status in treatment selection was calculated as the difference in net monetary benefit (NMB) between the stratified and unstratified (or less stratified) decisions.

We included 2,664 patients in the analysis. At $100,000/LYG, offering anti-EGFR therapy to *KRAS* wild-type patients provides a VOH of $1,565 per patient; further stratification on *NRAS* provides additional VOH of $594. Mean testing cost for *KRAS* only or *KRAS+NRAS* is $215 and $713 respectively; the VOH exceeds the testing cost under both scenarios. Resolving subgroup-specific uncertainty in the *KRAS* and *KRAS+NRAS* decision could provide additional value.

Stratification of anti-EGFR therapy by *KRAS* and *NRAS* provides value at $100,000/LYG. There is diminishing marginal value and increasing marginal costs as the decision becomes more stratified. The VOH framework can illustrate the value of subgroup-specific decisions in a comprehensive way than conventional analysis.

75 - Ethical issues experienced in relationships between patients and other team members developing a strategy for meaningful patient engagement in cancer research funding

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Fostering good relationships in research teams involving patients is important for achieving meaningful patient engagement in research, and its potential benefits. Emerging evidence suggests, however, that ethical issues (such as mutual respect, trust, reciprocity, power imbalances and tokenism) may be encountered in these relationships. Better understanding of these ethical issues from diverse perspectives is needed if good relationships are to be fostered. Our qualitative study aims to better understand ethical issues experienced in relationships between patients and others (i.e., researchers, staff) when developing a strategy for meaningful patient engagement at the Canadian Cancer Society (CCS), the largest charitable funder of cancer research in Canada.

Twenty-four eligible participants (10 patients, 3 researchers, 11 staff members) were invited to participate in a semi-structured interview online about interacting with or as a patient in the strategy's development. A constructionist reflexive thematic analysis was used to actively develop themes, which were also shaped by a relational ethics lens and reflections from patients, researchers, and staff engaging in cancer research.

In March-June 2023, 13 participants (including 7 patients) with diverse characteristics were recruited. Two preliminary themes were developed: ***1) Solidarity in pursuing shared hopes***: Participants described how shared hopes to mitigate power imbalances intertwined with solidarity they felt with each other, leadership at CCS, and equity-deserving groups; ***2) Having mutual respect for persons*****:** Participants expressed valuing who each other were beyond titles and roles, and their different forms of knowing (e.g., scientific and experiential knowledge, emotional intelligence, professional expertise) as equally worthy.

If meaningful patient engagement in cancer research is to be achieved, evidence-based resources are needed to support relationship building between patients and others (e.g., researchers, research funders). Findings offer valuable insights to inform future development of these resources.

76 - Healthcare providers' experiences with oncofertility preservation and identification of potential barriers to oncofertility preservation

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Treatment-related infertility is a common side-effect of cancer treatment and an important survivorship issue for patients. However, practitioner-initiated fertility counselling prior to commencing cancer therapy occurs in less than half of clinical encounters, resulting in decreased utilization of fertility preservation (FP) services. In the United States and some cities in Canada, dedicated FP programs exist to address this gap. However, an equivalent service does not exist in British Columbia (B.C.). The purpose of this research is to perform a needs assessment and baseline evaluation of what is currently being done for fertility preservation (FP) in B.C. via a survey-based study. A survey created via Checkbox software was distributed in March of 2023 via email to practitioners identified within the B.C. Cancer Agency who are involved in treating paediatric and adult cancers that can impact fertility. The survey consisted of sliding scale and open-ended questions covering various aspects related to fertility preservation, including knowledge, attitudes, current practices, and perceived barriers. To date, 78 responses have been collected with projected survey collection end-time of June 2023. The respondents represent diverse specialties, including general practice, oncology, and reproductive health and include healthcare practitioners such as nurse practitioners, general practitioners, specialists, and social workers. Descriptive and statistical analysis will be conducted on the results of the surveys in addition to thematic analysis of open-ended responses. The results from this study will inform implementation strategies for a potential organized future FP program in B.C. The findings from this study can help address gaps in education and awareness among healthcare providers. Additionally, identified barriers may emphasize the necessity for improved structures, resources, and financial support to enhance accessibility to FP services across the province. Future research can include implementation of focus groups to understand the current practices and barriers to fertility preservation as well as identify stakeholders that can develop targeted interventions and strategies to improve access, education and support for patients.

77 - Early economic evaluation of Therapeutic Inducers of Natural Killer cell Killing for acute lymphoblastic leukemia patients undergoing allogeneic hematopoietic stem cell transplantation: A work in progress

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Plasmacytoid dendritic cells are the sentinel of the immune system. Their analogs, Therapeutic Inducers of Natural Killer cell Killing (ThINKK), have shown to improve outcomes of leukemia treatments in animal models. ThINKK's "off-the-shelf" feature and decreased toxicity in comparison to other novel cell therapies could also potentially translate into significant cost savings for the health system. ThINKK is now in an early stage of development for clinical use, and this raises a key question - *Is ThINKK likely to provide value for money?*

This study aims to conduct an early economic evaluation of ThinKK for patients with acute lymphoblastic leukemia undergoing allogeneic hematopoietic stem cell transplantation and the two objectives are to perform:

1. Headroom analysis and obtain a maximum reimbursable price ceiling for ThINKK; and

2. Value of information (VOI) analysis to identify outcomes that should be focused on in future research on ThINKK.

The headroom analysis will be performed from the perspective of the producer of the therapy. This means the full cost of research and development, manufacturing, bringing to market, and overhead margin must be considered when calculating the cost of the technology. If the estimated total cost of ThINKK is less than the price ceiling (given a particular willingness-to-pay threshold), then it is worthwhile to proceed with the product's development. Furthermore, at such early stages of the development of technology, a key challenge is the limited evidence on costs and effectiveness. The VOI analysis can help determine those areas of evidence which may influence the cost-effectiveness findings.

The conference presentation will include the results of the headroom analysis in the form of a maximum reimbursable price ceiling for ThINKK. The results of VOI analysis will include the expected value of perfect information, which will reflect an upper bound of the value of conducting future research, and the expected value of partial perfect information, which could be valuable for choosing the areas of evidence that will have the greatest pay-off to decision makers.

78 - Understanding the health system costs of leukemia and lymphoma care in Ontario - a real-world population-based descriptive analysis.

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High-quality clinical and translational research has made significant advances in the treatment of leukemia and lymphoma, leading to a marked increase in the survival rates of patients living with these cancers. However, at the same time, it is critical to have up-to-date and accurate cost estimates related to these treatments. Our study aims to address this gap by estimating the overall health system costs associated with leukemia and lymphoma care in Ontario.

We performed a population-based, descriptive study to assess costs, from the public payer perspective, incurred by patients diagnosed with leukemia (n= 26,846) and lymphoma (n=47,255) as their primary cancer between January 1, 2005, and Dec 31, 2019. To estimate the health system costs of cancer care, a phase-based approach was adopted, following established guidelines as well as examining cost trajectories for patients with different survival times. The four phases were: the pre-diagnosis phase, initial phase, continuing phase, and terminal phase. The lifetime costs for leukemia and lymphoma were estimated using a phase-based modeling approach accounting for censoring.

Inpatient care costs were the leading contributor to the overall costs across all phases. It accounted for over 50% of the costs during the initial phase of leukemia care and during the terminal phase for both lymphoma and leukemia. During the pre-diagnosis phase, physician costs accounted for one-quarter of the costs for lymphoma and 19.5% of the costs for leukemias. The lifetime cost estimates varied widely, from a high of $695,329 for acute lymphocytic leukemia to a low of $232,534 for chronic lymphocytic leukemia. Acute myeloid and monocytic leukemia had a lifetime cost of $390,861 and the corresponding value for chronic myeloid leukemia was $373,618. The lifetime costs of the two subtypes of lymphomas were relatively lower at $292,684 for non-Hodgkin lymphoma and $243,147 for Hodgkin lymphoma.

Costs of leukemia and lymphoma vary substantially by the cancer subtype and the phase of care. The study also highlights the key drivers of the costs.

79 - Cost of diagnosing patients with malignant central nervous system tumours in Canada.

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OBJECTIVE: The economic burden of cancer care in Canada is estimated to be 26.2 billion in 2021. We investigated the cost of care associated with central nervous system (CNS) cancer diagnoses across provinces.

METHODS: The Canadian Institute for Health Information provided data on inpatient/ambulatory visits with a CNS cancer diagnosis from 2010-2014 and the annual cost of hospital-based encounters for those patients in the three years preceding diagnosis. Combining the cost of cancer diagnosis visit (CDV) and the cost for the period preceding diagnosis, we estimated the total cost of care. We used median regression to compare provinces, adjusting for age, sex, CNS sub-site, and CDV type (inpatient/ambulatory).

RESULTS: We limited the analysis to provinces with complete data (n=1132, Alberta; n=3768, Ontario). The median total CNS tumour diagnosis cost was 9.5k (IQR:1.9-20.9k) in Alberta with 41% inpatient CDV, and 10.0k (IQR:2.0-16.8k) in Ontario with 58% inpatient CDV. There was no difference in total or CDV cost by sex. There was no variation in cost by CNS sub-site, except for meningeal tumours, which cost 1.8k (95%CI:0.5-3.1k) more than diagnoses at other sub-sites. t. Compared to Ontario, the median total cost of diagnosing pediatric patients (0-14 years) in Alberta was 17.9K (95%CI:15.4-20.5k) and 3.5K (95%CI:1.2-5.8k) higher for diagnostic periods culminating in inpatient and ambulatory CDV, respectively. For all other age groups, Alberta's median total costs were 6.3k (95%CI: 5.5-7.1k) and 0.9k (95%CI: 0.2-1.7k) higher for the inpatient and ambulatory CDV types, respectively. Alberta and Ontario had similar median costs for ambulatory CDV while Alberta's median cost for inpatient CDV was 4.5k (95%CI:4.3-4.8k) higher.

CONCLUSION: This analysis is limited by including only costs associated with hospital-based encounters, and may capture encounters unrelated to CNS diagnosis. For CNS cancer diagnosis, Alberta incurred a higher cost than Ontario, especially when diagnosis occurred during hospital admission and for pediatric patients.

81 - Development of a HTA value assessment framework for pediatric health technologies using multi-criteria decision analysis

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Background: Health technology assessments (HTAs) to determine precision oncology drug funding do not systematically account for the circumstances and needs of infants, children, and adolescents. To inform and complement traditional HTA decision-making in Canada, we aimed to develop and test a child-tailored value assessment framework based on a multi-criteria decision analysis (MCDA) model.

Methods: We initiated construction of an additive MCDA model by using deliberative public engagement of Canadians (n=43) to generate preliminary value assessment criteria. Through a modified-Delphi process with stakeholders having broad disciplinary and geographic variation (n=24), we refined the criteria and developed associated weights through ranking. We developed a 4-point scoring rubric, accompanied by scoring guidelines. We grouped aggregate scores into drug prioritization levels, with suggestions for associated funding recommendations. Three clinical specialists independently assessed the usability and apprehensibility of the framework by test-scoring nine precision therapies with pediatric indications. Their feedback was used to further refine the framework. Analyses included descriptive statistics, thematic analysis, and exploratory disagreement indices (DI) and intraclass correlation coefficients.

Results: Public engagement yielded 16 candidate criteria; the 14 highest-ranked proceeded to the modified-Delphi stage. They were refined to the following 10, based on absolute importance and relevance and agreed importance (median DI=0.34): Effectiveness, Child-specific Health-related Quality-of-Life (hrQOL), Disease Severity, Unmet Need, Therapeutic Safety, Equity, Family Impacts, Life-course Development, Rarity, Fair-Share-of-Life. The test-scoring resulted in adjusted criteria definitions and scoring guidelines, including addition of a scale for qualitative hrQOL data. Four drugs were scored as “high priority” or “priority” for funding by all reviewers (dinutuximab, larotrectinib, blinatumomab, dabrafenib.) Testers advised that accompanying drug-specific evidence be developed to guide future reviewers using the assessment framework.

Conclusions: We developed a societally responsive, transparent, and coherent value assessment framework that is child-tailored to inform evaluation of child health technologies. Application of this framework in real-world HTA contexts could improve the relevance and quality of assessments of novel technologies for children in Canada and comparable health systems.

82 - Online Module of iCanWork: A 10-Step Program to Support Cancer Survivors' Return to Work

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Background: Despite the perceived usefulness of guidance from healthcare professionals regarding return to work (RTW) after cancer, there is a lack of readily available training for professionals who support cancer survivors in this area. This abstract describes an online accredited e-module for primary care providers, developed empirically and guided theoretically by a vocational rehabilitation model for cancer survivors, and presented with the iCanWork 10-step intervention to guide and support cancer survivors in their return to work (RTW) process.

Methodology: The e-module includes essential components such as the assessment of health and work-related factors, addressing challenges and barriers, and facilitating the return to work.

Impact on Practice: iCanWork is a standardized, evidence-based approach that addresses barriers to RTW and work maintenance, improves work ability, and promotes cancer survivors' confidence in returning to work.

Results: The online module was completed by over 90 healthcare professionals, primarily family physicians and nurse practitioners. Evaluation feedback indicated high relevance and effectiveness in understanding the transition of cancer survivors towards returning to work. Three family physicians reported using and testing the iCanWork return to work intervention with one patient each, finding it highly effective in guiding their role and supporting cancer survivors in their return to work.

Conclusion: The online module, with its 10-step iCanWork return to work intervention, demonstrated significant value and positive outcomes in guiding healthcare professionals and supporting cancer survivors in their return to work journey. The findings highlight the module's relevance, effectiveness, and potential for enhancing the understanding and implementation of successful return to work strategies for cancer survivors.

83 - iCanWork Pilot Study: A Multidisciplinary Work-Focused Approach to Enhance Health-Related Quality of Life, Work Ability, and RTW of Cancer Survivors

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Background: iCanWork is a comprehensive intervention that emphasizes a multidisciplinary, vocational rehabilitation-led, and work-focused approach to increase cancer survivors' work ability, health-related quality of life, and RTW rates.

Objective: Evaluate the feasibility, acceptability, and preliminary efficacy of iCanWork as a web-based multidisciplinary intervention.

Methods: Twenty-four adult cancer survivors with paid employment at the time of diagnosis and a job to return to were included in the study. In contrast to the control group, the intervention group received professional consultations. At baseline, 2 months, and 4 months post-study, questionnaires were administered.

Results: In comparison to the control group, the intervention group demonstrated statistically significant improvements in work ability, health-related quality of life, and RTW rates.

Conclusion: Positive results from the pilot study warrant further testing of iCanWork in the form of a randomized controlled trial.

84 - Development and Validation of the “Cancer Return to Work Assessment Scale”: CReW

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Background: Existing return to work (RTW) tools for cancer survivors lack a comprehensive focus on work-related factors that can facilitate or impede RTW and work maintenance. This abstract describes the development and validation of the Cancer Return to Work (CReW) scale, which aims to measure cancer survivors' concerns regarding their ability to return to work and maintain employment following their cancer diagnosis.

Methods: In Phase I, RTW experts identified 16 factors associated with RTW and work maintenance for cancer survivors. Two phases of data collection involving a total of 655 cancer survivors were used to validate the CReW scale.

Results: The CReW scale demonstrated construct validity and reliability, and its four-factor structure was revealed. It consists of 15 items distributed across four distinct subscales: symptom severity (F1) with 6 items, workplace accommodations (F2) with 4 items, meaning of work (F3) with 3 items, and Coping (F4) - utilizing RTW as a means of coping with cancer - with 2 items, including cancer-related symptoms, workplace accommodations, the meaning of work, and working as a means of coping.

Conclusion: The CReW Scale, designed to measure cancer survivors' concerns about their ability to return to work and maintain employment after cancer, is a validated instrument for clinicians to identify facilitators and barriers to work reintegration and maintenance. This research contributes to the existing literature on return to work scales for this population, enhancing our understanding of the specific concerns faced by cancer survivors in relation to work.