



Addressing high priority issues in cancer care

Ontario Institute for Cancer Research - Cancer Care Ontario
Health Services Research Network

SYNTHESIS
REPORT
2019

About the Health Services Research Network

The Health Services Research Network is a collaboration between the Ontario Institute for Cancer Research (OICR) and Cancer Care Ontario (CCO) to provide the knowledge needed to optimize the delivery of cancer services and to ensure appropriate dissemination of health service innovations and well-evaluated technologies. The Network's vision is to contribute to a future where fewer people develop cancer, those who do are diagnosed promptly and at earlier stages, treatment is safer, more equitable and of higher quality and the cancer system is economically sustainable.

About the Synthesis Report

Optimal cancer care across Ontario cannot be solely provided by a clinician or implemented by a researcher, enacted by a policy maker or attained by a patient. To improve the delivery of cancer services, we need to work together with stakeholders from across our rich cancer care ecosystem and involve them in prioritizing concerns, designing interventions and implementing solutions. For these reasons, OICR and CCO teamed up to co-create the OICR-CCO Health Services Research Network.

Now, a decade later, we present our second Synthesis Report with an additional 14 studies that have emerged from this network. These studies have addressed high priority issues in cancer care including the gap in follow up after a positive colorectal cancer screening test, and the challenges that cancer patients face with co-existing chronic conditions like diabetes. The studies have led to the development of new methods to determine the burden of cancer in Ontario, and new resources to facilitate health services research across the province. This report provides summaries of these studies and others and their impact to date. We look forward to further disseminating the resulting resources and knowledge over the coming years.

This report is intended for researchers and those involved with the delivery of cancer care, but anyone with an interest in cancer care could find the report valuable.

Sincerely,

Christine Williams, PhD

Deputy Director & Head of
Clinical Translation, OICR

Program Director, Health Services
Research Network

Eva Grunfeld, MD, DPhil, FCFP

Vice-Chair, Research, Department of Family and
Community Medicine, University of Toronto

Director, Knowledge Translation Research Network,
Health Services Research Network

Health Services Research Network studies

The following 14 studies addressed high-priority issues in cancer care. These studies used innovative approaches to enhance the organization and delivery of care in Ontario and to accelerate the translation of research into policy and practice.

Administrative databases for oncology case costing in Ontario	3
Improving the management of pain in cancer patients in Ontario	4
Ambulatory toxicity management (AToM)	5
cd-link: Reducing barriers to health research across the province	6
Improving chronic disease outcomes in cancer survivors.....	7
Improving follow-up of abnormal stool tests in Ontario	8
Increasing use of contralateral prophylactic mastectomy: A concern for over-aggressive treatment of early stage breast cancer patients.....	9
Building capacity for provincial reflex Lynch syndrome testing in Ontario	10
Are patient educational materials on cancer screening more effective when co-created with patients? A qualitative interview study and randomized controlled trial	11
Cancer symptom management by radiation therapists: Evaluating implementation of evidence-informed practice guides	12
CEASE: A novel electronic patient-directed knowledge translation tool to improve smoking cessation in cancer patients	13
A partnered approach to create a peer support strategy and promote shared decision-making with Inuit in their cancer care.....	14
Promoting the adoption of knowledge translation advancements to improve outcomes for people affected by cancer and cancer system performance	15
Testing a behavioural approach to improving cancer screening through increased use of the Cancer Care Ontario Screening Activity Report.....	16

Administrative databases for oncology case costing in Ontario

LED BY

Nicole Mittmann
Sunnybrook Research Institute

COLLABORATORS

Stephanie Cheng
ICES

Ning Liu
ICES

Soo Jin Seung
Health Outcomes and Pharma-
co-Economic Research Centre

Farah Saxena
ICES

Carlo DeAngelis
Sunnybrook Health Sciences Centre

Nicole Look Hong
ICES, Sunnybrook

Craig Earle
Canadian Partnership
Against Cancer

Matthew Cheung
ICES, Sunnybrook

Natasha Leighl
University Health Network

Natalie Coburn
ICES, Sunnybrook

William Evans
Juravinski Regional Cancer Centre

Maureen Trudeau
Sunnybrook Health Sciences Centre

Kelvin Chan
Cancer Care Ontario, ICES,
Sunnybrook Research Institute

Jeffrey Hoch
University of California Davis

Katie Dainty
North York General Hospital

Studying the cost of cancer is a complex, but understanding these costs helps inform health care policy decision-making, resource allocation and prioritization.

Dr. Nicole Mittmann *et al.* created two oncology-specific costing methodologies: one for cancer-related medications (Cancer Medication Costing Algorithm, CMCA) and one for radiation treatment (Cancer Radiation Costing Algorithm) for more specific, comprehensive cancer costing evaluations.

They used a bottom-up approach to determine the cost of treatment at the individual patient encounter level. Where individual health sector costs were not available, they used a top-down approach to allocate aggregated costs to each patient encounter. Direct treatment costs were calculated from the perspective of the Ontario public healthcare payer, so costs incurred by the individual patient or private insurers are not addressed. Person-level utilization data on treatment encounters are available in province-wide administrative databases maintained by the Ministry of Health and Long-Term Care (MOHLTC), the Canadian Institute for Health Information (CIHI) and Cancer Care Ontario (CCO).

Mittmann *et al.* used a similar methodology as those published by Wodchis *et al.* (2013), which pulled resources from a number administrative database sources and used provincial-level costing applied to those resources to generate a cost per patient. All datasets were linked using unique encoded identifiers and analyzed at ICES.

Mittmann's algorithms are now available for approved use by other researchers through ICES. Several analyses have already been conducted using these two novel algorithms, 15 of which have been published in peer-reviewed journals.



Dr. Nicole Mittmann

With the Health Services Research Network's support and the support of the Canadian Centre for Applied Research in Cancer Control (ARCC), Mittmann has led and published an eight-piece supplement on cancer costing in the journal *Current Oncology*, and established partnerships and collaborations with CCO, ARCC and other researchers.

PUBLICATIONS (SINCE 2015)

De Oliveira C *et al.* The economic burden of cancer care in Canada: a population-based cost study. *CMAJ Open*. 2018; 6(1): e1-e10.

Mittmann N *et al.* Examination of health system resources and costs associated with transitioning cancer survivors to primary care. *J Oncol Pract*. 2018; JOP1800275.

Look Hong NJ *et al.* Resource utilization and disaggregated cost analysis for initial treatment of melanoma. *J Cancer Policy*. 2018; 63-69.

Mittmann N *et al.* Population-based study to determine the health system costs of using the 21-gene assay. *J Clin Oncol*. 2018; 36(3): 238-243.

Hallet J *et al.* Patterns and drivers of costs for neuroendocrine tumors care: a comparative population-based analysis. *Ann Surg Oncol*. 2017; 24(11): 3312-3323.

Mittmann N *et al.* Importance of cost estimates and cost studies. *Curr Oncol*. 2016; 23(s1): s6.

Liu N *et al.* Phase-specific healthcare costs of cervical cancer: estimates from a population-based study. *Am J Obstet Gynecol*. 2016; 214(5): 615.

Rahman F *et al.* Radiation costing methodologies: a systematic review. *Curr Oncol*. 2016; 23(4): e392-e408.

Cheung MC *et al.* The impact of aggressive management and palliative care on end-of-life costs. *Cancer*. 2015; 121(18): 3307-15.

Improving the management of pain in cancer patients in Ontario



Dr. Lisa Barbera

Cancer adversely impacts the physical, psychosocial, and existential health of patients and addressing these issues is a critical component of their overall cancer care. Previous studies suggest that cancer patients tend to receive suboptimal treatment for many of their symptoms, including their pain. Previous research in Ontario has shown that up to 33% of cancer patients with severe pain do not receive opioids at the time of their pain assessment.

The main aim of this study was to explore the issue of undertreatment of pain in cancer patients, with intent to improve pain management of this patient population.

Dr. Lisa Barbera and collaborators linked and analyzed various provincial healthcare datasets at ICES to:

Explore the use of opioids in cancer survivors in Ontario

Barbera *et al.* found that opioid prescribing for cancer pain has decreased over time and that patients who use opioids continuously for five years following their diagnosis are more likely to continue using opioids after five years. While safe and appropriate pain management is an important survivorship issue, Barbera expects that accessing opioids will become more difficult, which may impact pain management for cancer patients.

Examine the impact of implementation of the Improving Patient Experience and Health Outcomes (iPEHOC) Patient Reported Outcome Measures (PROMs) on healthcare use, such as emergency department (ED) visits, hospitalizations, psychosocial oncology, palliative care visits, and opioid and anti-depression prescriptions

The group also discovered that among patients who received the iPEHOC intervention, there was a small reduction in ED, psychosocial oncology and palliative care visits, and a small increase in the rates of opioid and anti-depressant prescriptions relative to patients with no intervention. Implementation of PROMs in the everyday practices of clinicians is a major organizational change that requires the use of knowledge translation and facilitated change management approaches, which Barbera has continued to investigate.

Develop an algorithm to identify cancer patients who can benefit from early referral to palliative care

Barbera *et al.* also operationalized six major criteria, originally proposed by an international Delphi panel, to identify lung cancer patients who could benefit from early referral to palliative care. They propose that using this model for other common cancers may be a valuable tool to estimate the number of patients who might benefit from a palliative approach to care.

Barbera expects that these findings will help clinicians to ensure that cancer patients receive adequate pain management, and will also help in timely identification and referral of cancer patients who need multidisciplinary specialized supportive cancer care.

LED BY

Lisa Barbera

University of Calgary
Tom Baker Cancer Centre

COLLABORATORS

Rinku Sutradhar

ICES

Mary Ann O'Brien

University of Toronto

Hsien Seow

McMaster University

Deb Dudgeon

Queen's University

Clare Atzema

ICES

Craig Earle

Canadian Partnership Against Cancer

Doris Howell

University Health Network

Carlo DeAngelis

Sunnybrook Health Sciences Centre

Jonathan Sussman

McMaster University

PUBLICATIONS

Barbera L *et al.*

Factors associated with opioid use in long term cancer survivors. *J Pain Symptom Manage.* 2019; 58(1): 100-107.

Barbera L *et al.*

Comparison of opioid prescribing among cancer and noncancer patients aged 18-64: Analysis using administrative data. *J Pain Symptom Manage.* 2018; 56(1): 72-79.

Barbera L *et al.*

Opioid prescribing among cancer and non-cancer patients: Time trend analysis in the elderly using administrative data. *J Pain Symptom Manage.* 2017; 54(4): 484-492.

Barbera L *et al.*

Has province-wide symptom screening changed opioid prescribing rates in older patients with cancer? *J Oncol Pract.* 2017; 13(11): e927-e934.

Sutradhar R *et al.*

Cancer survivorship and opioid prescribing rates: A population-based matched cohort study among individuals with and without a history of cancer. *Cancer.* 2017; 123(21): 4286-4293.

Ambulatory Toxicity Management (AToM)

LED BY

Monika Krzyzanowska
University Health Network
ICES

Eva Grunfeld

University of Toronto
OICR

COLLABORATORS

Melanie Powis

University Health Network

Katherine Enright

Trillium Health Partners

Mark Levine

Ontario Clinical Oncology Group

Maureen Trudeau

Sunnybrook Health Sciences
Centre

Amna Husain

Temmy Latner Centre for Palliative
Care

Doris Howell

University Health Network

Jim Julian

Ontario Clinical Oncology Group

Rahim Moineddin

University of Toronto

Nicole Mittmann

Sunnybrook Research Institute

Mary Ann O'Brien

University of Toronto

Craig Earle

Canadian Partnership Against
Cancer

Acute care visits are very common among patients receiving chemotherapy, and the widespread need for these visits suggests suboptimal management of chemotherapy-related toxicities among the cancer patient population. This can result in significant stress on cancer patients, their caregivers and the healthcare system.

To address this concern, Drs. Monika Krzyzanowska and Eva Grunfeld explored both web-based apps and proactive telephone interventions for patients undergoing chemotherapy. They developed an app, called 'Bridges', to help patients navigate their symptoms. The team refined their design through two rounds of usability testing, incorporating toxicity tracking, self-management advice and health care provider communication functionalities.

Krzyzanowska *et al.* also conducted a pragmatic, cluster-randomized controlled trial (pcRCT) evaluating the impact of proactive telephone toxicity management on acute care visits, patient reported outcomes and cost in patients receiving chemotherapy for early stage breast cancer. They undertook end-of-study interviews to understand implementation, sustainability and scalability issues. During the pilot testing, the intervention was well received by clinicians and patients. Fewer emergency department visits occurred in intervention patients relative to controls but no difference in hospitalization rate was observed; results of the pcRCT are pending.

Lastly, they used administrative data to develop a prediction model to identify patients at high risk of having an acute care visit within 30 days of initiating systemic therapy for common cancers. Four characteristics that were found to be predictive were: cancer type-regimen, age, emergency department visit in the prior year and palliative-intent radiation in the prior 60 days. This prediction score could be incorporated at the point of care to select patients to target for future preventative interventions.

This project has the potential to impact both patient- and system-level outcomes. Given the prevalence of acute care visits in cancer patients receiving chemotherapy, these findings will be of interest in Ontario, as well as across Canada and internationally.



Dr. Monika Krzyzanowska



Dr. Eva Grunfeld

PUBLICATIONS

Krzyzanowska MK *et al.* Ambulatory Toxicity Management (AToM): Results of a pilot study of a pro-active, telephone-based intervention to improve toxicity management during chemotherapy for breast cancer. *Pilot Feasibility Study*. 2019; 5: 39.

Prince RM *et al.* Building "bridges": Use of participatory design to create an electronic tool to improve management of chemotherapy toxicities. *J Med Internet Res*. 2019; 21(3): e9958.

Grant RC *et al.* Predicting acute care use following initiation of systemic therapy for solid tumours. 2018 ASCO Quality Symposium Library. *J Clin Oncol*. 2018; 36: (s30; 6).

cd-link: Reducing barriers to health research across the province

Ontario has some of the most comprehensive health information databases in the world. But for years these data have been accessible to only a select handful of researchers, and only under strictly controlled conditions. These conditions ensured the data were secure, but also limited researchers' ability to study Ontario's healthcare system to improve it and provide better treatment strategies for patients.

Dr. Craig Earle led the development of a data-release program at ICES that for the first time allowed researchers at academic institutions in Ontario direct access to de-identified cancer data from anywhere in the province. This project, known as cd-link, is designed to link administrative datasets relevant to cancer health services research and provide privacy legislation-compliant data to researchers for the betterment of Ontario's health services.



Dr. Craig Earle

"cd-link brings the creativity of the wider research community to bear on the data as opposed to just a few people. The more we are able to study our health care system the more transparent it becomes, and ultimately the better health care system we'll have."

With cd-link access, researchers from across Ontario have leveraged these rich datasets to perform numerous analyses for many unique projects that have resulted in publications, theses, and other scholarly products. The approach has been expanded by ICES' Data and Analytic Services platform to include all disease types and to accommodate researchers outside of Ontario.

Sample cd-link projects

- Exploring the impact of regionalization activities on patients undergoing high-risk, resource-intensive cancer surgery in Canada
- The profile and trajectory of persons with brain tumours and other acquired brain injury across the continuum of health care
- End-of-life cancer care and the impact of a palliative clinic for residents of Sudbury-Manitoulin district who died from cancer
- Melanoma - stage at presentation and differential survival: An urban versus rural population comparison using the ICES Database in Ontario
- Effectiveness and tolerability of systemic therapies in elderly cancer patients
- Anticholinergic prescriptions following treatment of localized prostate cancer
- Rates of hospital readmission following esophagostomy
- Effects of cancer patients in emergency rooms

LED BY

Craig Earle

Canadian Partnership
Against Cancer

COLLABORATORS

Sola Dokun

OICR

Refik Saskin

ICES

CD-LINK PUBLICATIONS

Conlon et al.

Access to palliative care for cancer patients living in northern and rural environment in Ontario, Canada: The effects of geographic region and rurality on end-of-life care in a population-based decedent cancer cohort. *Clin Med Insights Oncol.* 2019.

Thein HH et al.

Estimates and predictors of health care costs of esophageal adenocarcinoma: a population-based cohort study. *BMC Cancer.* 2018; 18(1): 694.

Richard PO et al.

Impact of oral hypoglycemic agents on mortality among diabetic patients with non-muscle-invasive bladder cancer: A population-based analysis. *Can Urol Assoc J.* 2018; 12(6): 203-210.

Thein HH et al.

Effects of socioeconomic status on esophageal adenocarcinoma stage at diagnosis, receipt of treatment, and survival: A population-based cohort study. *PLoS One.* 2017; 12(10): e0186350.

Chan V et al.

Sex-specific predictors of inpatient rehabilitation outcomes after traumatic brain injury. *Arch Phys Med Rehabil.* 2016; 97(6): 885-91.

Stock D et al.

Determinants of admission to inpatient rehabilitation among acute care survivors of hypoxic-ischemic brain injury: A prospective population-wide cohort study. *Arch Phys Med Rehabil.* 2016; 97(6): 885-91.

Conlon M et al.

Access to oncology consultation in a cancer cohort in northeastern Ontario. *Curr Oncol.* 2015; 22(2): e69-75.

Improving chronic disease outcomes in cancer survivors

LED BY

Lorraine Lipscombe

Women's College Research Institute

COLLABORATORS

Ilana Lega

Women's College Research Institute

Peter Austin

ICES

Monika Krzyzanowska

University Health Network

ICES

Etan Amir

University Health Network

Erin Worndl

University of Toronto

Karen Tu

University of Toronto

Liisa Jaakkimainen

Sunnybrook Hospital

Judy Qiang

University of Toronto

Kinwah Fung

ICES

Hadas Fischer

ICES

Simron Singh

Sunnybrook Hospital

PUBLICATIONS

Worndl E et al.

Preventable diabetic complications after a cancer diagnosis in patients with diabetes: a population-based cohort study. *JNCI Cancer Spectrum*. 2018; 2(1).

Lega I et al.

The impact of diabetes on breast cancer treatments and outcomes: a population-based study. *Diabetes Care*. 2018; 41(4): 755-761.

Lipscombe LL et al.

The association between diabetes and breast cancer stage at diagnosis: A population based study. *Breast Cancer Res Treat*. 2015; 150(3): 613-20.

Research shows that cancer patients with co-existing chronic conditions like diabetes have lower survival and worse outcomes, both for the cancer and their chronic condition. Dr. Lorraine Lipscombe set out to identify potential healthcare gaps in patients with diabetes and cancer as possible reasons for their poorer outcomes.

Lipscombe et al. used Ontario healthcare databases to identify patients with diabetes and cancer. They compared cancer treatments and outcomes between cancer patients with and without diabetes, as well as diabetes outcomes between diabetes patients with and without cancer.

They found that women with diabetes receive comparable cancer treatments and have similar chemotoxicity rates as women without diabetes. Despite this, women with diabetes present with a more advanced stage of breast cancer and have a lower cancer-specific and all-cause survival, despite following screening guidelines. This indicates a need to modify breast cancer screening guidelines for women with diabetes.

In contrast, patients with colorectal cancer and diabetes had similar cancer stage and cancer-specific survival but lower all-cause survival as those without diabetes, suggesting that a greater focus on diabetes care for colorectal cancer patients is needed.

"We know that control of other chronic diseases like diabetes can be disrupted while patients are undergoing cancer treatment regimens, which can lead to serious complications for both conditions. These complications can be avoided with dedicated support and close management of concurrent conditions during this period."



Dr. Lorraine Lipscombe

For patients with diabetes who have been newly diagnosed with cancer, Lipscombe et al. found a higher risk of preventable diabetic complications in the first year after cancer diagnosis but comparable outcomes and diabetes quality of care thereafter. These findings show that the first year after cancer diagnosis represents a healthcare period in which the needs of diabetes patients are not being adequately met, supporting the need for interventions to improve diabetes care in patients undergoing acute cancer treatment.

Improving follow-up of abnormal stool tests in Ontario

Colorectal cancer (CRC) is the second leading cause of cancer-related death in Canada. CRC is amenable to early detection, and diagnosis at an earlier stage portends an improved prognosis. Fecal occult blood testing (FOBT) is an easy, at home stool test and is the preferred initial CRC screening test in Canada and in other jurisdictions. FOBT has been shown to reduce CRC-related mortality. However, only colonoscopy can provide a definitive diagnosis of CRC, thus it is critical that persons with abnormal FOBT have a follow-up colonoscopy. Currently in Ontario, primary care providers (PCPs) are responsible for organizing the follow-up colonoscopy. In Ontario, the proportion of persons with abnormal FOBT who have follow-up colonoscopy falls below levels in comparable programs around the world. Ontario urgently needs to implement strategies to improve colonoscopy follow-up after abnormal FOBT.

In the first phase of this project, Dr. Jill Tinmouth *et al.* evaluated possible ways to improve follow-up using a literature review and interviews with patients, PCPs, staff from screening and follow-up programs and other key informants. Based on these data, they worked with Cancer Care Ontario to develop a pilot to assess the feasibility of follow-up using four possible interventions: Full patient navigation including booking of colonoscopy by an RN at a Diagnostic Assessment Program, partial (lite) navigation involving a supportive conversation with the navigator (PCP organizes colonoscopy), physician reminders of patients lacking follow-up at four months post abnormal result, and physician reminders plus a request for patient status update at four months.



Dr. Jill Tinmouth

“This project integrated rigorous evaluation and policy development, where researchers and policy-makers collaborated to design and conduct work that has the potential to improve the delivery of colorectal cancer screening for Ontarians.”

The benefits and challenges of each intervention were described using qualitative and quantitative methods. The Medical Research Council process evaluation framework was used to guide interpretation. The collaborative group convened two knowledge translation stakeholder meetings where findings were reviewed and the interventions were ranked and discussed. Participants felt that full patient navigation was the best approach for Ontario. The key challenges, the timeline for and the iterative steps necessary to implement full navigation were identified.

LED BY

Jill Tinmouth

Sunnybrook Research Institute
University of Toronto
Cancer Care Ontario

COLLABORATORS

Linda Rabeneck

Cancer Care Ontario

Lawrence Paszat

ICES

Nancy Baxter

St. Michael's Hospital
Cancer Care Ontario

Diego Llovet

Cancer Care Ontario

Rinku Sutradhar

ICES

Nicole Mittmann

Sunnybrook Research Institute

Catherine Dube

Cancer Care Ontario

Gillian Bromfield

Cancer Care Ontario

Bronwen McCurdy

Cancer Care Ontario

Aimee Langan

Cancer Care Ontario

Melissa Coulson

Cancer Care Ontario

Leah Bennett

Cancer Care Ontario

Shazia Hassan

Sunnybrook Research Institute

Mardie Serenity

Cancer Care Ontario

PUBLICATIONS

Llovet D *et al.*

Reasons for lack of follow-up colonoscopy among persons with a positive fecal occult blood test result: a qualitative study. *Am J Gastroenterol.* 2018; 113(12): 1872-1880.

Increasing use of contralateral prophylactic mastectomy: A concern for over-aggressive treatment of early stage breast cancer patients

LED BY

Janet Squires

University of Ottawa
The Ottawa Hospital Research
Institute (OHRI)

Angel Arnaout

University of Ottawa, OHRI

COLLABORATORS

Dawn Stacey

University of Ottawa, OHRI

Ian Graham

University of Ottawa, OHRI

Mark Clemons

University of Ottawa, OHRI

Jeremy Grimshaw

University of Ottawa, OHRI

Jing Zhang

University of Ottawa, OHRI

Jean-Michel Caudrelier

University of Ottawa, OHRI

PUBLICATIONS

Squires JE *et al.*

Exploring reasons for overuse of contralateral prophylactic mastectomy in Canada. *Curr Oncol.* 2019; 26(4).

Squires JE *et al.*

A patient decision aid for contralateral prophylactic mastectomy for use in the consultation: A feasibility study. *Curr Oncol.* 2019; 26(2): 1718-7729.

Contralateral prophylactic mastectomy (CPM), the removal of the opposite healthy breast in women undergoing surgery for early stage unilateral breast cancer, has been increasing in Canada and internationally despite lack of supportive evidence.

Drs. Janet Squires and Angel Arnaout set out to identify why women with unilateral breast cancer opt for CPM and to develop a knowledge translation intervention to ensure CPM is only used when necessary.

They conducted interviews with 74 key informants across Canada, including oncology surgeons, plastic surgeons, medical and radiation oncologists, nurses and women diagnosed with a low-risk, unilateral breast cancer. To address the identified barriers to CPM, they developed a consultation decision aid and assessed its feasibility in future clinical practice through consultations with 39 healthcare professionals and 12 breast cancer survivors across Canada.

In this study, they identified 58 factors influencing the use of CPM. Healthcare professionals identified more factors discouraging the use of CPM than encouraging its use while women with breast cancer identified more factors encouraging CPM use than discouraging its use. The most common factor encouraging CPM identified by healthcare professionals was lack of awareness of existing evidence/guidelines for the appropriate use of CPM, while for women with breast cancer, the factor most likely influencing their decision for CPM was wanting better aesthetic outcomes. Both healthcare professionals and women with breast cancer discussed the importance of, and need for support in the decision-making process. Almost all participants (98%) felt the decision aid developed by Squires and Arnaout would prepare women to make better decisions with respect to whether or not to have a CPM. The decision aid was also ranked as highly usable, with 73% of participants stating they would be willing to share or use the tool.

"This tool holds promise as a strategy for identifying when CPM is unnecessary and reducing this burden on the healthcare system."



Drs. Angel Arnaout and Janet Squires

The research group developed an acceptable, usable and clear evidence-based knowledge translation tool to support shared decision-making for clinicians and women with low-risk unilateral breast cancer who are deciding whether to undergo CPM. Squires and Arnaout will be rolling out this decision-making tool across The Ottawa Hospital and further evaluating its impact.

Building capacity for provincial reflex Lynch syndrome testing in Ontario

Lynch cancer family syndrome (LS) is a common hereditary syndrome that is associated with a genetic predisposition to different cancer types but there is no routine program for identifying patients with LS in Ontario who may benefit from genetic counselling and genetic testing.

Dr. Nancy Baxter and collaborators set out to develop a plan to implement an LS screening program across the province that would include genetic testing. To inform the development of this plan, they first reviewed existing LS screening programs by interviewing 26 stakeholders including program directors, genetic counsellors and medical oncologists. To understand the current resources for LS screening in Ontario, Baxter *et al.* also interviewed more than two dozen experts from different areas, including genetics, pathology and surgery, as well as stakeholders from Cancer Care Ontario, the Ministry of Health and Long-term Care, the Canadian Partnership Against Cancer, and the High-Risk Ontario Breast Screening Program. They then conducted a stakeholder meeting with more than 40 representatives from across Ontario to devise strategies for successful implementation and to present their study findings.



Dr. Nancy Baxter

“A coordinated approach to system-level identification and management of patients with Lynch syndrome is needed to have an impact on risk for patients and their families in Ontario.”

Baxter found that stakeholders anticipate a new plan would face challenges with funding, resources, training, education and consistency of reporting. To help navigate patients through a potential testing pathway, stakeholders recommend including standardized templates for communicating results to patients and dedicating central coordinators to facilitate patient flow through the pathway. They also recommend increasing the level of administrative support, educating leads, providing resources to remote areas and utilizing standardized reports. Stakeholders were supportive of Baxter’s proposed pathway and provided key recommendations at the system, provider and patient level. Alongside key stakeholders, Baxter will continue working to move this plan into action across Ontario to help identify patients with LS and better manage their disease.

LED BY

Nancy Baxter

St. Michael’s Hospital
Cancer Care Ontario

COLLABORATORS

Linda Rabeneck

Cancer Care Ontario

Anna Gagliardi

University Health Network

Erin Kennedy

University of Toronto

Jill Tinmouth

University of Toronto
Sunnybrook Research Institute
Cancer Care Ontario

Aaron Pollett

University of Toronto

Steven Gallinger

University Health Network
Mount Sinai Hospital

June Carroll

University of Toronto

Yvonne Bombard

St. Michael’s Hospital

PUBLICATIONS

Palter VN *et al.*

A framework to build capacity for a reflex-testing program for Lynch syndrome. *Genet Med.* 2019; 21(6): 1381-1389.

Palter VN *et al.*

Learning by example: An international perspective on reflex-testing for Lynch syndrome. *Ann Surg Onc.* 2019; 26: 425-36.

Bombard Y *et al.*

Universal tumor screening for Lynch syndrome: Health-care providers’ perspectives. *Genet Med.* 2017; 19: 568-74.

Are patient educational materials on cancer screening more effective when co-created with patients?

A qualitative interview study and randomized controlled trial

LED BY

Sharon Straus

St. Michael's Hospital
University of Toronto

COLLABORATORS

Nadia Bashir

St. Michael's Hospital

Julia Moore

St. Michael's Hospital

Danica Buckland

St. Michael's Hospital

Myanca Rodrigues

St. Michael's Hospital

Marcello Tonelli

University of Calgary

Brett Thombs

Jewish General Hospital
McGill University

Neil Bell

University of Alberta

Wanrudee Isaranuwatchai

St. Michael's Hospital

Tony Peng

St. Michael's Hospital

Dan Shilman

St. Michael's Hospital

PUBLICATIONS

Bashir NY *et al.*

Are patient education materials about cancer screening more effective when co-created with patients? A qualitative interview study and randomized controlled trial. *Curr Oncol.* 2019; 26(2): 124-136.

Patient education materials (PEMs) are central to many cancer screening guidelines and shared decision-making practices. It is thought that involving patients in PEM development may generate materials that better address key patient barriers to the uptake of cancer screening recommendations. Because co-creation may require more time and resources than traditional approaches, it is important to determine whether co-creation of PEMs with patients adds value. Dr. Sharon Straus and collaborators compared a prostate cancer screening PEM that was co-created by patients and one that was developed by experts for their effectiveness with respect to patient decisional conflict and intention to be screened. They also compared the two PEMs with respect to screening knowledge and screening preferences, PEM usability and PEM preferences on the part of patients.

“Although co-creation might yield patient resources that have an effect on screening-related decisional conflict, intention, knowledge, and preferences, the effect might not be greater than the effect achieved by PEMs developed primarily by experts.”



Dr. Sharon Straus

Straus' study had three phases. First, English-speaking men aged 40 years and older from Ontario with no prior diagnosis of prostate cancer were interviewed to understand patient barriers to prostate cancer screening. Second, a PEM development committee of patients, researchers, and clinicians co-created a new PEM on prostate cancer screening based on these findings. Third, a different group of patients completed a survey and viewed either the co-created PEM (intervention) or an expert-created PEM (control). The study team compared patients' prostate cancer screening decisional conflict and intention to undergo screening after viewing the PEM.

Results from the study showed no differences between the co-created and expert-created PEMs when measuring conflict about screening decisions, knowledge about prostate cancer, and patients' plans to be screened. However, results also showed that the co-created PEM was rated as being more usable and was preferred by patients. Thus, the study group recommends that PEM developers choose the method that best fits their goals and resources.

Cancer symptom management by radiation therapists: Evaluating implementation of evidence-informed practice guides

Adults undergoing radiation treatment often experience treatment-related symptoms that can pose safety concerns and lead to unnecessary treatment delays. As the first line of contact for these patients, Medical Radiation Therapists (MRTs) play a key role in managing these symptoms, yet little is known about the use of evidence-based tools by MRTs to guide symptom management. In this study, Dr. Dawn Stacey and collaborators explored current symptom management practices by MRTs, potential factors influencing the use of the COSTaRS (pan-Canadian Oncology Symptom Triage and Remote Support) practice guides, and adaptations or strategies required to facilitate their routine use.

Since 2008, Dr. Stacey has led a group of researchers and nurses in the development and implementation of the COSTaRS practice guides for nurses in varying cancer care settings. Recently, MRTs and radiation-specialized nurses identified the potential to integrate these user-friendly evidence-based tools to guide symptom management practice in the radiation therapy setting.



Dr. Dawn Stacey

“To ensure that symptoms are assessed and triaged in a safe and timely manner for patients receiving cancer treatment, it is essential that we identify how to better integrate symptom practice guides into routine practice.”

Guided by the Knowledge to Action Framework (K2A), Stacey *et al.* conducted interviews and a barriers survey in the radiation therapy department of a large cancer centre in eastern Ontario to determine current symptom management practices and perceived factors influencing use of the practice guides.

The team interviewed 14 MRTs and surveyed 58 MRTs, finding that only 53% MRTs reported using provincial practice guidelines and patient pamphlets. The MRTs agreed that the COSTaRS practice guides are a high quality resource that can support symptom management, but they identified potential barriers to properly implementing them that are specific to the radiation therapy setting including: a lack of time given stringent 15-minute treatment scheduling, unclear fit with scope of practice, disparate focus on site-specific symptoms relevant to the anatomic area receiving radiation treatment, and lack of medication knowledge. In response, the study group created a simpler version of the practice guides and integrated this version into the electronic health record.

Further work is needed to identify adaptations to the symptom practice guides and to the MRT workflow that will allow successful uptake of the symptom practice guides into routine practice. Additionally, there is a need to clarify the MRT role in symptom management within the interprofessional team context.

The team is continuing this work at this centre to address these barriers so that the hundreds of patients undergoing radiation treatment there every day get the best care they need.

LED BY

Dawn Stacey

University of Ottawa
Ottawa Hospital Research Institute

COLLABORATORS

Doris Howell

University Health Network

Craig Kuziemy

University of Ottawa

Kelly Linden

The Ottawa Hospital

Lisa Barbera

University of Calgary
Tom Baker Cancer Centre

Andre Patry

The Ottawa Hospital

Kristopher Dennis

The Ottawa Hospital

Lynne Jolicoeur

The Ottawa Hospital

Julie Renaud

The Ottawa Hospital

Amber Killam

The Ottawa Hospital

Jennifer Newton

The Ottawa Hospital

Barbara Ballantyne

Health Sciences North

Freya Kelly

University of Ottawa

Claire Ludwig

University of Ottawa

Carly Henry

University of Ottawa

Meg Carley

Ottawa Hospital Research Institute

PUBLICATIONS

Ludwig C *et al.*

Factors influencing the use by radiation therapists of cancer symptom guides: a mixed-methods study. *Curr Oncol.* 2019; 26(1): 56-64.

CEASE: A novel electronic patient-directed knowledge translation tool to improve smoking cessation in cancer patients

LED BY

Jennifer Jones

University Health Network

Meredith Giuliani

University Health Network

COLLABORATORS

Geoffrey Liu

University Health Network

Wei Xu

University Health Network

Tran Truong

University Health Network

Mihaela Dirlea

University Health Network

Peter Selby

Centre for Addiction and Mental Health

Janet Papadakos

University Health Network

Nazek Abdelmutti

University Health Network

David Goldstein

University Health Network

Lawson Eng

University Health Network

Dongyang Yang

University Health Network

PUBLICATIONS

Giuliani ME *et al.*

Implementation of a novel electronic patient-directed smoking cessation platform for cancer patients: interrupted time series analysis. *J Med Internet Res.* 2019; 21(4): e11735.

Continued smoking in cancer patients after diagnosis results in decreased treatment efficacy and reduced survival, yet routine tobacco use screening and referral to smoking cessation treatment have not been widely implemented in the cancer setting. At the Princess Margaret Cancer Centre, a paper-based tobacco use screening program for new cancer patients was started in 2013 resulting in moderate screen rates but low referral rates. In response, Jones and Giuliani developed a patient directed electronic smoking cessation platform (Smoking Cessation e-referral System or CEASE) to promote smoking screening and referral.



Dr. Jennifer Jones

“CEASE is an innovative tool to improve smoking screening in patients with cancer and can be implemented in both a time and cost-effective manner.”

In this study, the research group used multiple enabling and reinforcing strategies to facilitate the implementation of CEASE and evaluate its impact. They compared the impact of CEASE on screening rates, referrals offered, and referrals accepted relative to the previous paper-based screening program. They also assessed a sub-sample of smokers and recent quitters to compare the effect of CEASE on subsequent contact with smoking cessation programs and quit attempts.



Dr. Meredith Giuliani

“CEASE resulted in improvements in overall smoking screening and referral rates in newly diagnosed cancer patients.”

The CEASE platform was successfully implemented across all 14 ambulatory clinics at the Princess Margaret Cancer Centre. Screening rates increased from 44.3% using the paper-based approach to 65.7% using CEASE, and referrals offered to smokers who indicated interest in quitting increased from 18.6% to 98.8%. Accepted referrals decreased from 41% to 20%, though the overall proportion of referrals generated from total current/recent tobacco users increased from 7.7% to 20.2%. At one month post-screening, there was no significant difference in the proportion of participants that was currently using tobacco and had not changed use in the past four weeks (28.6% pre, 28.9% post). However, patient contact with the referral program increased from 0% to 78% in the post-CEASE cohort.

A partnered approach to create a peer support strategy and promote shared decision-making with Inuit in their cancer care

Inuit face high cancer risks and may not find the current health care system easy to use. Inuit have asked for support in making health care decisions to help them get the best health care possible. A way to help people make difficult health decisions is through a practice called shared decision-making. Ian Graham, Alethea Kewayosh, Janet Jull and partners have created a peer support strategy to promote shared decision-making with Inuit to ensure their voices are heard in their cancer care.



Dr. Ian Graham

“An integrated knowledge translation approach among partners was key to developing a shared decision-making strategy for use by Inuit in cancer care.”

The study team used a partnered approach called integrated knowledge translation and worked with stakeholder partners in the cancer care system to ensure what was learned would be useful. The study partners were: Inuit community members and organizations, health care providers, university researchers and other stakeholders including advisory support from the Joint Ontario Indigenous Cancer Committee, the Cancer Care Ontario Indigenous Navigator team, the Regional Indigenous Cancer Leads, the Indigenous Cancer Control Unit staff, The Ottawa Hospital Aboriginal Program team, Tungasuvvingat Inuit and community members at Larga Baffin. The team interviewed peer-support workers and community members with a cancer diagnosis who had used the peer support strategy.

Together, the research group created a shared decision-making strategy, a way to help people prepare to talk with their health care providers about what is important to them in their cancer care. The shared decision-making strategy is for both peer-support workers and community members.

The strategy involves training about shared decision-making for Inuit peer-support workers, and a booklet with questions that peer-support workers and community members can use together to talk about what matters to community members in their cancer care and to prepare for discussions with healthcare providers. Through interviews about the strategy, the study team identified six key themes:

- Inuit with cancer face challenges in the system
- It is good to talk about what is important to me
- The booklet makes it easy to talk about what is important
- The booklet needs to be used by Inuit early in the cancer care journey
- The booklet helps peer support workers to engage with a client
- The booklet helps peer support workers to talk about what is important

The interviewed study partners found the strategy to be useful and feasible to implement and the study partners look forward to implementing these strategies.

LED BY

Ian Graham

The Ottawa Hospital
University of Ottawa

Alethea Kewayosh

Cancer Care Ontario

COLLABORATORS

Janet Jull

Queen's University
The Ottawa Hospital

Alexandra Hizaka

Tungasuvvingat Inuit

Amanda Sheppard

Cancer Care Ontario

Paula Doering

The Ottawa Hospital

G Joudain

Ottawa Health Services Network

Judy Plourde

Ottawa Health Services Network

Danielle Dorschner

Ottawa Health Services Network

Inuit Medical Interpreter Team

Ottawa Health Services Network

Michelle Rand

Cancer Care Ontario

Mara Habash

Cancer Care Ontario

PUBLICATIONS

Jull J et al.

An integrated knowledge translation approach to develop a shared decision making strategy for use by Inuit in cancer care: A qualitative study. *Curr Oncol.* 2019; 26(3): 192-204.

Jull J et al.

Tailoring and field-testing the use of a knowledge translation peer support shared decision-making strategy to enhance participation of First Nations, Inuit and Métis people in decisions about their cancer care: A study protocol. *BMC Res Involv Engagem.* 2018; 1(4):6.

Promoting the adoption of knowledge translation advancements to improve outcomes for people affected by cancer and cancer system performance

LED BY

Melissa Brouwers
University of Ottawa

Robin McLeod
Cancer Care Ontario

Ralph Meyer
Hamilton Health Sciences

COLLABORATORS

Jeremy Grimshaw
The Ottawa Hospital
University of Ottawa

Mark Levine
Escarpment Cancer Research
Institute

Greg Pond
McMaster University

Hsien Seow
McMaster University

Jonathan Sussman
McMaster University

PRESENTATIONS

Brouwers M et al.
Knowledge translation interventions for the implementation of guidelines: A targeted review. *Guidelines International Network (G-I-N) 2018 Conference*; Manchester, UK; 2018.
Presenter: Karen Spithoff.

Cancer Care Ontario's (CCO) Program in Evidence-based Care has developed evidence-based practice guidelines (PEBC PGs) to help ensure that patients across Ontario are receiving the best cancer care. These guidelines, however, are not always applied in practice. Dr. Melissa Brouwers and collaborators set out to address this concern and find new ways to engage healthcare stakeholders in proper guideline use through knowledge translation interventions (KTIs).

The study group first distributed an electronic survey to Ontario clinicians seeking their feedback on PEBC PGs. Results from 250 survey respondents showed that most clinicians agree that PEBC PGs are easy to apply and relevant to the Ontario cancer care context, and that they contribute to improved patient outcomes and a better cancer care system.

The group also performed a comprehensive search and analysis of KTIs in the Cochrane Effective Practice and Organisation of Care (EPOC) database, Health Systems Evidence database, and *Implementation Science*. The interventions that were both relevant and potentially effective in the Ontario cancer care context were curated in an online KTI resource for knowledge users. This resource now contains 17 evidence-based KTIs and relevant metadata, including evidence about their effectiveness, the contexts where they have been studied, and suggestions on how to put them into practice.

The study group then conducted provincial and regional focus group sessions to assess the usability, feasibility, and contextual relevance of the KTI resource contents.

Brouwers et al. identified new interventions that could improve guideline use for the betterment of care across Ontario and developed an online resource of KTIs that can be used as a basis for future knowledge translation initiatives.



Dr. Melissa Brouwers

Testing a behavioural approach to improving cancer screening through increased use of the Cancer Care Ontario Screening Activity Report

Many Ontarians do not get all the screening tests they should for cervical, breast, and colon cancer. Family doctors can play a critical role in facilitating screening tests, especially if they know which patients are due for screening. Cancer Care Ontario's Screening Activity Report provides exactly this information to family doctors, helping them identify their patients who are overdue for screening. Unfortunately, less than half of family doctors regularly use the report even though they get monthly email reminders. One possible reason is that the monthly email reminders are too easy for family doctors to miss or dismiss. This study used the science of behaviour change to create new, persuasive reminders to encourage family doctors to use their Screening Activity Report.



Dr. Noah Ivers

"This project shows the potential of implementation science laboratories in which health service organizations partner with scientists to improve health system performance while also conducting rigorous, generalizable research."

A research group, led by Dr. Noah Ivers, met with family doctors in Toronto and Kingston to co-create email content. This content incorporated one or more of three behaviour change techniques: anticipated regret, material incentive, and problem solving. A province-wide experiment compared eight different email versions to determine which approaches were the most successful at attracting family doctors to access the Screening Activity Report and to help patients who were overdue for cancer screening tests. After these changes were implemented, family doctors were interviewed again to gain further insights into identifying which patients are overdue for screening and taking appropriate action.

The group found that emails featuring anticipated regret led to slightly more report use compared to emails without this content, and emails with problem-solving content were associated with a 0.3% increase in cervical cancer screening, representing 7,568 more patients being screened if this association is true. The research group's interview findings emphasized the important role of emails as reminders but also the potential for the Screening Activity Report to better integrate with other primary care practice management tools. Researchers worked collaboratively with Cancer Care Ontario team members throughout the project and the findings will inform the province's strategy to support cancer screening in primary care.

LED BY

Noah Ivers

Women's College Hospital

COLLABORATORS

Caroline Bravo

Cancer Care Ontario

Petra de Heer

Cancer Care Ontario

Diego Llovet

Cancer Care Ontario

Shama Umar

Cancer Care Ontario

Jeremy Grimshaw

The Ottawa Hospital

Justin Presseau

The Ottawa Hospital

Monica Taljaard

The Ottawa Hospital

Jill Tinmouth

Sunnybrook Research Institute
University of Toronto
Cancer Care Ontario

Selma Chipenda-Dansokho

Université Laval

Gratianne Vaissou

Université Laval

Holly Witteman

Université Laval

Zachary Bouck

Women's College Research Institute

Laura Desveaux

Women's College Research Institute

Marianne Saragosa

Women's College Research Institute

PUBLICATIONS

Vaissou G et al.

Testing email content to encourage physicians to access an audit and feedback tool: a factorial randomized experiment. *Curr Oncol.* 2019; 26(3): 205-216.

Vaissou G et al.

Testing behavior change techniques to encourage primary care physicians to access cancer screening audit and feedback reports: Protocol for a factorial randomized experiment of email content. *JMIR Res Protoc.* 2018; 7(2): e11.

Bravo C et al.

The process of designing emails aimed to increase family physicians' use of an online audit and feedback tool to improve cancer screening rates. *JMIR Hum Factors.* 2018; 5(3): e25.



Funding provided by the
Government of Ontario