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ORAL PRESENTATIONS

GENERATING EVIDENCE FROM REAL-WORLD DATA: WHAT CAN WE LEARN AND HOW CAN THIS HELP

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Purpose: With the costs of cancer care continually rising, sustainability and accountability are becoming more important in system planning. Our group has been exploring ways in which real world data (RWD) can be used to generate real world evidence (RWE) to inform decision-making processes in the cancer space, in support of providing patients and their families with the most appropriate care.

Methods: To promote the generation and use of RWE, we established the CanREValue Collaboration. By providing a platform for stakeholders to discuss their needs and existing evidence gaps, the CanREValue collaboration will enable knowledge exchange, address policy relevant research questions, and develop a framework for the generation and use of RWE that will be relevant and useful to decision/policy-makers and payers.

Results: We will share results from three different real world studies to demonstrate the types of information that can be learned through the generation of RWE. First, we will demonstrate the safety, effectiveness, and cost-effectiveness of the addition of bevacizumab to first-line irinotecan-based chemotherapy among patients with metastatic colorectal cancer. Then, we will explore the association between baseline patient-reported outcomes, via ESAS, and overall survival in patients with advanced pancreatic cancer. Lastly, we will examine the effect of post-chemotherapy surgical resection on survival outcomes for patients with advanced pancreatic cancer.

Conclusion: The generation and use of RWE can help ensure that healthcare decision-makers are making the most informed decisions, promoting a sustainable and accessible cancer system for Canadians.

Keywords: real-world evidence; real-world data; comparative effectiveness; patient-reported outcomes

Themes: Value Determination, Economic Evaluation

USING SOCIAL MEDIA AND PSYCHOGRAPHIC DATA TO REACH WOMEN FOR BREAST CANCER SCREENING

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1. Cancer Care Ontario

Purpose: CCO uses Facebook ads to increase awareness of the Ontario Breast Screening Program. The purpose of this randomized controlled trial was to assess the comparative effectiveness of tailored and non-tailored Facebook ads targeted to women aged 50-59. Ad content was informed by the Environics Analytics' Social Values dataset.

Methods: Geospatial hotspot analyses identified areas in Ontario with significantly higher rates of 50-59 year old women overdue for breast cancer screening. Hamilton, Ottawa and Sudbury were selected for the campaign. Forward Sortation Areas (FSA) in each area were randomly assigned to receive either a tailored or non-tailored ad. Ads operationalized variables from the Environics Analytics Social Values data. The Facebook campaign ran from January 25, 2018 for a month.

Results: In all three areas, the tailored ads performed significantly better than the non-tailored ones. The click rate (# of clicks/# of reached) and the link click rate (# clicks to the campaign link/# of reached) on average were 1.7 times higher in FSAs receiving tailored compared to non-tailored messaging. Across all three areas women who received tailored ads were 1.65 times more likely to interact with the ad (like, share, comment).

Conclusions: The results of our RCT showed that Environics Analytics' data informed tailored ads generated more social media engagement (i.e., clicks, link clicks) than non-tailored ads. This study suggests that CCO can leverage a cost efficient, data and small area analysis driven approach to design social media campaigns that can effectively reach and engage screening eligible populations of women aged 50-59 in Ontario.

Keywords: randomized; geo-spatial; psychographic; screening

Themes: Person-Centred Care; Prevention of Chronic Disease; Population Health; Health Services Delivery

REDUCING THE IMPACT OF DISTANCE ON HEMATOPOIETIC CELL THERAPY PATIENTS

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Purpose: Hematopoietic Cell Therapy (HCT) patients experience travel challenges and high out-of-pocket costs due to the specialized care required. We conducted a mixed methods study to understand current patient support programs in Ontario and other jurisdictions and a cost analysis to inform the development of recommendations to reduce the impact of remoteness on HCT patients and caregivers.

Methods: Qualitative information on patient transportation and accommodation supports was gathered through informal and structured input from fourteen Ontario Regional Cancer Program Directors, Hematologists, Patient and Family Advisors and Indigenous Navigators. An environmental scan of medical travel assistance programs within Ontario and in other jurisdictions was performed. A scoping literature review was conducted of published studies focused on inequities in receipt of cancer care in countries with Universal Health care. HCT patient travel patterns to each of the transplant facilities in Ontario were obtained from analysis of Cancer Care Ontario data holdings.

Results: We found that travel assistance for cancer patients in Ontario varies considerably across the province, and that Ontario lags behind other jurisdictions. From the literature review, we know that patients may make different treatment decisions and have lower experience scores when they live far from the specialist centre. From the analysis of travel patterns for HCT patients, 4% to 79% of patients travel greater than 100km, depending on the HCT facility.

Conclusions: This study highlights the need to better support Ontario HCT patients. A proposal to support accommodations for HCT patients who travel greater than 100km was developed and funded for implementation in 2018/19.

Keywords: HCT; inequity; travel distance; out-of-pocket costs

Themes: Person-Centred Care; Equity; Health Services Delivery

MRI WAIT TIMES IN ONTARIO: A SIMULATION TOOL TO ASSIST LOCAL PLANNERS IN ALLOCATION OF MRI CAPACITY

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Purpose: To create a tool to help stakeholders examine impact of a number of factors on MRI wait times indicators at the hospital, regional, and provincial level.

Methods: With the Wait Time Information System (WTIS) as the primary data source, MRI demand was predicted for the next three years using time series analysis. A discrete-event simulation model was then built to represent the MRI system, including patient arrivals, booking, rescheduling, and service. The simulation model can run multiple iterations with randomness, outputting expected values for 90th percentile wait time, wait list size, and more for each facility in Ontario. Optimization is also used to recommend funding allocation within a subset of facilities in order to minimize wait times.

Results: The MRI demand forecast predicted an annual increase of 2.1% over the next 5 years, with an average mean absolute percentage error of 4.9% across all facilities. The simulation tool allows users to predict future MRI performance indicators using the forecast demand. Customized user scenarios can also be simulated to perform sensitivity analysis on the many input factors for MRI wait times.

Conclusions: Users of the tool are able to input future scenario parameters and examine predicted MRI performance indicators. This customizable scenario analysis allows planners to assess the impact of potential changes on wait times and develop business cases to fund various initiatives through showing value for money.

Keywords: simulation; forecasting; wait times; optimization; diagnostic imaging

Themes: Health System Improvements & Innovations; Value for Money; Health Services Delivery

COLON CANCER PATHWAY CONCORDANCE - EXPLORING REGIONAL VARIATION AND DISCORDANCE

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Purpose: Evidence-based pathway maps (pathways) have been developed by CCO for several disease sites. Pathway concordance quantifies agreement between “observed” and “reference” pathways. We examined regional variation in pathway concordance and identified sources of discordance along the care continuum for colon cancer patients in Ontario.

Methods: Stage II and III colon cancer patients diagnosed in 2012-2016 with up to four years follow up post diagnosis and their health care utilization were identified from administrative data. A metric based on Levenshtein distance algorithm was used to measure concordance between observed and reference pathways. Patients were grouped into tertiles of high, intermediate and low concordance to assess regional variation (LHINs). Frequencies of those elements of health care utilization contributing to discordance are reported.

Results: The proportion of individuals in the high concordance tertile varied across LHINs from 24% to 40% for stage II disease compared to 30% to 41% for stage III. Additional activity was more common than missing activity. Among those with the lowest concordance, 99.8% of patients had additional imaging tests, and 93% and 91% of patients with stage II and III, respectively, had additional consultations. The most common missing activity was endoscopy (25% in stage II, 29% in stage III), followed by imaging tests (11% in stage II, 13% in stage III).

Conclusions: Novel application of measurement of pathway concordance across the cancer continuum shows promising results in demonstrating regional variation in practice. This approach could be used to identify opportunities for quality improvement and measuring system performance.

Keywords: colon cancer; pathway concordance

Themes: Health System Improvements & Innovations; Best Evidence

IMPLEMENTING A PATIENT-REPORTED OUTCOME MEASURE FOR HEMODIALYSIS PATIENTS IN ROUTINE CLINICAL CARE: PERSPECTIVES OF PATIENTS AND CLINICIANS

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Purpose: The Edmonton Symptom Assessment System Revised: Renal (ESAS-r:Renal) is a patient reported outcome measure used to assess the symptom burden of people living with chronic kidney disease. This study aimed to examine patient and clinician perspectives of the implementation process and impact of ESAS-r:Renal on routine clinical care.

Methods: Eight in-facility hemodialysis units assessed 1,459 patients with ESAS-r:Renal every 4-6 weeks from April 2017-June 2018. Pre- and post-implementation surveys and interviews were conducted with patients and clinicians. The results were used to identify enablers and barriers to implementation and examine the perceived influence of ESAS-r:Renal on symptom management.

Results: Over 55% of patients participated in the pre- (n=727) and post- (n=579) implementation survey, while 71% (n=518) and 54% (n=323) of clinicians participated, respectively. Nine patients participated in an individual interview and 48 clinicians participated in group interviews. Patients and clinicians highly valued ESAS-r:Renal for ensuring symptoms are acknowledged by the care team, particularly psychosocial symptoms (e.g. anxiety and depression), and for standardizing the symptom assessment process. Eighty-six percent of clinicians agreed that ESAS-r:Renal ensures symptoms are not missed and serves as a useful starting point to assess patients' symptoms. Seventy-seven percent of patients reported that completing ESAS-r:Renal helped them feel more satisfied with their visit. Key inter-related barriers among clinicians included time/workload, screening frequency, and a lack of confidence to manage select symptoms.

Conclusions: It is feasible to incorporate a PROM into routine care for patients on hemodialysis with appropriate education, integration into existing clinical workflows, and strong clinical and administrative leadership support.

Keywords: symptom management; ESAS-r:Renal; patient reported outcomes

Themes: Person-Centred Care; Health Services Delivery

POSTER PRESENTATIONS

P1

EXAMINING SOCIO-DEMOGRAPHIC CHARACTERISTICS ASSOCIATED WITH A POSITIVE CANCER PATIENT EXPERIENCE

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Purpose: Your Voice Matters (YVM) is a 28-item cross-sectional patient experience survey for adult cancer outpatients undergoing treatment in Ontario. The purpose was to examine patient socio-demographic characteristic associations with positive YVM responses.

Methods: YVM was administered to eligible patients at 14 Centres in Ontario in 2017 (n=8,704). Respondents answered items on a five-point Likert scale (4 or 5 = positive response). A multivariable logistic regression was undertaken to examine socio-demographic characteristics associated with a positive patient experience ($p < .05$). Variables (reference group) included: disease site (heamatology), age group (65+), sex (female), rurality (urban), last visit type (consult), income quintile (highest) and immigration tercile (lowest).

Results: Results presented are all statistically significant. Patients were more likely to have a less positive experience if they had central nervous system, gastrointestinal, head and neck, and lung cancer; were between the ages of 18-39 years; were female; receiving chemotherapy; from a rural location; from a mid- and mid-high income quartile; and in the high- and middle- immigrant terciles, when compared to the reference group. Patient were more likely to have a more positive experience if they had skin cancer; were between the ages of 40-64 years; receiving radiation or a minor procedure; and were from the mid-low and low income quartile, when compared to the reference group.

Conclusions: The cancer patient experience varies by socio-demographic characteristics. Future quality improvement initiatives should consider examining demographic characteristics to better understand their populations to create more tailored approaches to improving the overall patient experience.

Keywords: patient experience; equity; cancer; quality improvement

Themes: Person-Centred Care; Health Services Delivery

P2

THE IMPLEMENTATION OF eCTAS IN ONTARIO: CONSISTENCY AND TIME

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Purpose: Timely and accurate emergency department (ED) triage is essential for patient safety. The 2010 Ontario Auditor General's report highlighted significant variation in assigning Canadian Triage and Acuity Scale (CTAS) levels. As such, the province engaged Cancer Care Ontario (CCO) to develop and implement a real-time electronic decision-support tool, eCTAS. This presentation will describe the implementation of eCTAS and current research and evaluation initiatives.

Methods: To develop eCTAS, CCO engaged key health systems partners, including triage nurses and patients, to understand the current state and define a solution design with a provincial lens while focusing on the patient journey. The eCTAS platform can capture triage documentation in real time, and provide integrated and intelligent triage decision support. The eCTAS implementation took a two-phase approach to roll out the various integration options.

Results: Province-wide implementation of eCTAS began in February 2017. The system is now active in over 66 EDs with 280,000 patients triaged per month and 2.5 million triages total. Compared with pre-launch data, there was an 18% improvement in interrater agreement and a 35 second difference in triage time post-eCTAS. The eCTAS Research Subcommittee has several other evaluation studies underway focusing on CTAS distribution and nurse satisfaction. This committee also oversees eCTAS-related data requests and research governance.

Conclusions: eCTAS is Canada's first cloud-based triage system. It is also Ontario's first real-time triage dataset that can enable early detection of disease outbreaks with real-time ED surge notifications. Future directions include potential partnerships for infection control surveillance and expansion opportunities for Emergency Medical Services.

Keywords: emergency health services; health service delivery; healthcare innovation; big data

Themes: Person-Centred Care; Value for Money; Health System Improvements & Innovations; Population Health; Health Services Delivery

P3

SUPPORTING SUCCESSFUL UPTAKE OF HOME DIALYSIS AT ONTARIO REGIONAL RENAL PROGRAMS: THE DEVELOPMENT AND DISSEMINATION OF A HOME DIALYSIS INSIGHTS REPORT

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Purpose: The Ontario Renal Network set a target for 28% of chronic dialysis patients to be dialyzing at home by 2019. Although this rate has been increasing since 2015, it has plateaued in the last two years, remaining at around 26%.

Methods: Measures were developed to describe critical events or processes that influence home dialysis uptake:

1. Home Dialysis Training Outcomes
 2. Attrition from Home Dialysis
 3. Home-to-Home Transitions - Peritoneal Dialysis (PD) to Home Hemodialysis (HHD)
- An informational report containing local results of these measures was distributed to Regional Renal Programs (RRP) to support identifying potential barriers for patients to start or remain on home dialysis. Reports were reviewed over a series of orientation webinars, and RRP had the opportunity to provide feedback on the effectiveness of the report.

Results: Key findings from the report included:

1. PD training success rates were high (Range: 82.4%-100%).
 2. HHD training success rates varied widely (Range: 56.3%-100%).
 3. Wide variation in PD and HHD technique failure rates; smaller programs generally having higher technique failure rates (PD Range: 0% to 20.7%, HHD Range: 0% to 44.4%).
 4. Utilization of home-to-home transitions was low in most programs (Range: 0.0% to 24.3%).
- RRPs indicated the reports were shared widely with stakeholders and have positively supported the identification of improvement opportunities for the uptake of home dialysis and local quality improvement efforts. Feedback included requests to receive reports on a regular basis.

Conclusions: Future opportunities include ongoing monitoring of training success and technique failure and increased education around home-to-home transitions.

Keywords: home dialysis attrition; home dialysis training; technique failure; home dialysis; renal

Themes: Health System Improvements & Innovations; Best Evidence; Improve patients' access to kidney care

P4

FUNDING METHODS AND HOSPITAL VARIATION IN INTENSIVE CARE UNIT UTILIZATION FOR COLORECTAL CANCER SURGERY

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Purpose: This study seeks to evaluate the variation in funding for colorectal cancer surgery Quality Based Procedure (QBP) cases due to intensive care unit (ICU) admissions and the extent to which this variation is unwarranted.

Methods: The cancer surgery QBP is remunerated based on the product of the hospital's average cost weight, volume and provincial price. The funding associated with ICU in the average cost weight was calculated stratified by hospital volume group. Logistic regression was used to assess the relationship between ICU use and hospital volume controlling for clinical characteristics. A propensity score model was developed to look at the relationship between ICU use and outcomes.

Results: The rate of ICU admissions by hospital ranged from less than 5% to over 80% of cases in 2015/16. Hospitals that performed 20-49 cases admitted 41% of patients to ICU on average and were paid \$2,614 for the ICU portion of their funding per case, while hospitals that performed >200 cases admitted 12% of patients to ICU and were paid \$835 per case. This variation in ICU use persists after controlling for patient characteristics (e.g. age, Charlson score) and outcomes (e.g. ED visits and readmissions). Hospital size was not associated with 90 day mortality.

Conclusions: There is substantial variation between hospitals in ICU admissions for colorectal cancer surgery patients, which cannot be fully explained by clinical factors, and is not associated with better outcomes. CCO funds hospitals at different rates due to variation in ICU use. This variation must be understood to ensure funding is being distributed appropriately.

Keywords: funding; cancer surgery; QBP; value for money; Intensive Care Unit (ICU)

Themes: Value for Money; Value Determination

P5

PRACTICE RECOMMENDATIONS FOR THE USE OF SEDATION IN ROUTINE HOSPITAL-BASED COLONOSCOPY

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Purpose: Colonoscopy is an essential tool for the diagnosis and treatment of many intestinal conditions. Patient discomfort during colonoscopy can lead to early termination of procedures and can reduce the willingness of patients to undergo future procedures. Although sedation improves the patient experience during colonoscopy, there is great jurisdictional variability in sedative practices. The objective of this study was to develop practice recommendations for the use of moderate and deep sedation in routine hospital-based colonoscopy to facilitate standardization of practice.

Methods: We recruited 32 multidisciplinary experts to participate in a modified Delphi process to establish consensus-based recommendations for the use of sedation in colonoscopy. Panel members participated in a values assessment survey followed by two rounds of anonymous online voting on preliminary practice recommendations. An in-person meeting was held between voting rounds to facilitate consensus-building. Consensus was defined as >60% agreement/disagreement with recommendation statements; >80% agreement/disagreement was considered indicative of strong consensus.

Results: Twenty-nine panelists participated in the values assessment survey. Panelists ranked all factors presented as important to the development of practice recommendations. The factor considered most important was patient safety. Patient satisfaction, procedural efficiency, and cost were considered less important. Strong consensus was achieved for all 9 practice recommendations presented to the panel. These recommendations included that all endoscopists be able to perform colonoscopy with moderate sedation, that an endoscopist and a single trained nurse are sufficient for performing colonoscopy with moderate sedation, and that anesthesia-provided deep sedation be used for select patients.

Conclusions: The recommendations presented in this study were agreed upon by a multidisciplinary group of experts and provided guidance for the use of sedation in routine hospital-based colonoscopy. Standardized sedation practices will promote safe, effective, and efficient colonoscopy for all patients.

Keywords: hospital-based colonoscopy, practice recommendations, modified-Delphi, sedation

Themes: Value for Money; Health Services Delivery

P6

SCREENING OUTCOMES IN HIGHER THAN AVERAGE RISK WOMEN REFERRED TO THE HIGH RISK ONTARIO BREAST SCREENING PROGRAM

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Purpose: This study examines screening outcomes among higher than average risk women referred to the High Risk Ontario Breast Screening Program (OBSP) and screened either through the OBSP or outside the OBSP.

Methods: Women 30-69 years referred to the High Risk OBSP from July 2011-June 2015, with imaging to June 2016, were identified and followed until December 2016. High risk eligibility criteria included: known genetic mutation, untested first-degree relative of a mutation carrier, family history of breast cancer and estimated lifetime risk $\geq 25\%$ or prior chest radiation therapy. For women screened through the OBSP, information on screening was obtained from data collected within the OBSP. For women screened outside the OBSP, imaging procedures were determined from record linkage to the Ontario Health Insurance Plan database. Breast cancers (BC) were identified from the OBSP or through linkage with the Ontario Cancer Registry. Cancer detection rates (CDR) were examined by screening modality within each cohort.

Results: Among 20,840 women referred with a final screening outcome, 9,143 met the high risk criteria and were screened with MRI and mammography (n=21,238 screens) with 272 BC detected (CDR:12.8/1,000;95%CI:11.6-14.2). There were 4,091 women not meeting risk criteria who were screened through the OBSP with mammography alone (n=8,168 screens) with 34 BC detected (CDR:4.2/1,000;95%CI:3.1-5.5). Among the remaining 7,606 women screened outside the OBSP, the majority of screens were mammography only (n=11,567) with 74 BC detected (CDR:6.4/1,000;95%CI:5.2-7.8). The majority of higher than average risk women not meeting risk criteria were screened appropriately with mammography alone either through or outside the OBSP and had lower cancer detection rates than high risk women.

Conclusions: The majority of higher than average risk women not meeting risk criteria were screened appropriately with mammography alone either through or outside the OBSP and had lower cancer detection rates than high risk women.

Keywords: high risk; magnetic resonance imaging (MRI); mammography; organized breast screening program; breast cancer

Themes: Prevention of Chronic Disease; Population Health; Health Services Delivery

P7

APPLYING A SILICA JOB EXPOSURE MATRIX TO THE OCCUPATIONAL DISEASE SURVEILLANCE SYSTEM (ODSS)

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Purpose: The Occupational Disease Surveillance System (ODSS) has estimated risks of cancer and occupational diseases for hundreds of occupations and industries in Ontario. Although these results could be very useful for targeting groups for prevention efforts, the exposures responsible for excesses are not always clear. To complement analyses by occupation/industry, we are using data from CAREX Canada to develop job exposure matrixes (JEMs), which provide more specific information about occupational exposures. As a test case, we applied a JEM to examine the relationship between silica and silicosis, a disease exclusively attributable to this exposure.

Methods: Workers in the ODSS were assigned an exposure level (high, medium, low, unexposed) and prevalence of exposure (proportion of workers exposed to silicosis in a particular group) from the JEM based on their occupation and industry of work. Silicosis risks were estimated for workers exposed to different concentrations of silica compared to those that were unexposed, and for groups with different proportions of exposed workers compared to groups with no exposed workers.

Results: There were 279 cases of silicosis among approximately 1.8 million workers. Groups with a high silica exposure concentration and those with a high proportion (50-100%) of exposed workers had 1.9-fold and 3-fold increased risks of silicosis, respectively. Groups with moderate and low exposure also had elevated risks compared to workers with no silica exposure.

Conclusions: While the JEM performed well with silicosis, it has been updated to reflect additional occupation-industry combinations with exposure. Results will be reproduced based on these modifications.

Keywords: surveillance; cohort; job exposure matrix; workers

Themes: Prevention of Chronic Disease; Population Health

P8

USE OF RECORD LINKAGE TO ENHANCE CANCER CONTROL EFFORTS: OPPORTUNITIES AND CHALLENGES

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Purpose: To elucidate the use of record linkages to increase knowledge about and to enhance cancer control in specific population groups.

Methods: Cancer registries are useful tools for monitoring patterns and trends of cancer in a population by sex, age, geography and type of cancer. However, the Ontario Cancer Registry, like most registries in Canada, does not include other variables, such as occupational exposures, racial/ethnic group or cancer treatments that permit surveillance that is more specific. Databases that include additional variables may be available for linkage to a cancer registry. Examples of linkages will be presented, and their limitations and important considerations discussed.

Results: Linkages have been successfully used to generate cancer incidence and/or survival rates and compare these with general population rates for many population groups, such as Ontario's First Nations and Métis, uranium miners and children born with congenital anomalies. The resulting information has informed policy, advocacy for change, etc. There are, however, issues and limitations associated with this approach, some of which have become more pronounced recently, including concerns about privacy; access to needed files and to linked data; quality and completeness of identifiers required for linkage, and important data elements (i.e. occupational exposure, First Nations status) and linkage process; interprovincial and international mobility; and cost. Examples of linkages will be provided, and limitations and challenges discussed.

Conclusions: Record linkage can be a powerful tool for improving information required for planning and monitoring cancer control policies and programs, but linkage practitioners should be aware of associated challenges and limitations.

Keywords: record linkage; surveillance; cancer registry; cancer control

Themes: Prevention of Chronic Disease; Population Health

P9

COMPREHENSIVE CANCER SURVIVAL BY SOCIOECONOMIC STATUS IN ONTARIO, CANADA, 2006-2011

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1. Cancer Care Ontario

Purpose: This project aims to monitor and report on relative survival by socioeconomic status (SES) to provide a mechanism for understanding the effectiveness of Ontario's cancer care system.

Methods: Relative survival rates (RSRs) by cancer type and age group were estimated for 229,934 Ontario adults (age 15-99) diagnosed between 2006 to 2011 with one of nine cancer types (breast, lung, colon and rectum combined, prostate, liver and intrahepatic bile duct, ovary, cervix, stomach and leukemia) using a complete survival analysis. Using the Pohar-Perme estimator, the 1-, 3- and 5-year RSRs with 95% confidence intervals were calculated by SES (measured by patients' neighborhood-level income quintile).

Results: Inequalities were observed between income groups across age groups and different cancer types. For most cancer types, survival was higher in higher income groups, but this trend was not consistently observed in adolescents and young adults (age 15-44). For example, lung cancer patients aged 15-44 in the middle income quintile (Q3) consistently had the highest RSR compared with patients in other income quintiles, while the RSR for patients in the highest income quintile (Q5) was not significantly different than the RSRs for patients in the other three income quintiles (Q1, Q2 and Q4).

Conclusions: Disparities in cancer survival persist in Ontario across income groups. Adolescents and young adults with cancer are a unique group of patients in terms of the biology of their cancers and their cancer journey. These findings can inform evidence-based recommendations to reduce premature deaths and improve cancer survival in Ontario.

Keywords: relative survival; socioeconomic status; inequalities.

Themes: Health System Improvements & Innovations; Population Health

P10

NEIGHBOURHOOD-LEVEL ACCESS TO ON- AND OFF-PREMISE ALCOHOL OUTLETS IN TORONTO AND ALCOHOL CONSUMPTION EXCEEDING CANCER PREVENTION RECOMMENDED LIMITS

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Purpose: To quantify neighbourhood access to on-premise and off-premise alcohol outlets in Toronto, and to determine associations with neighbourhood prevalence of alcohol consumption in excess of cancer prevention recommended limits.

Methods: Alcohol outlets were geocoded and analyzed with Census dissemination area (DA, average population: 400-700 people) sex-specific consumption estimates. The prevalence was compared in DAs with and without nearby outlets, and by the Euclidean distance to the nearest outlet. The Ontario Marginalization Index (ON-Marg) was used to analyze alcohol outlet measures by socioeconomic status (SES).

Results: The mean number of alcohol outlets per DA was 1.2 (SD: 4.2) and 0.1 (SD: 0.3) for on- and off-premise outlets, respectively. For on-premise outlets, male and female consumption was higher for neighbourhoods with one or more outlet versus having no outlet (males: 8.0% (SD 2.3%) vs. 6.6% (SD 2.0%); females: 8.4% (SD 3.4%) vs. 6.5% (SD 3.0%), respectively. When the nearest off- premise outlet was within 500m, the prevalence among males was 8.5% (SD: 2.1%), and decreased to 5.6% (SD: 1.2%) when the nearest outlet was over 1 km away. The corresponding estimates for females were 9.3% (SD: 3.1%) and 4.9% (SD: 1.7%), respectively. Trend tests indicated differences in outlet measures by SES.

Conclusions: There is evidence of a gradient in neighbourhood-level alcohol outlet access by SES and alcohol consumption. Spatial regression models will be used to further examine these relationships. The results are expected to help inform targeted public health programs and policies directed at reducing alcohol consumption.

Keywords: spatial epidemiology; built environment; alcohol; chronic disease prevention

Themes: Prevention of Chronic Disease; Population Health

P11

BEHIND THE NUMBERS: CLINICIAN RESPONSES TO OPEN-ENDED SURVEY QUESTIONS EVALUATING THE IMPLEMENTATION OF A PATIENT REPORTED OUTCOME FOR PROSTATE CANCER

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Purpose: The Expanded Prostate Cancer Index Composite for Clinical Practice (EPIC-CP) is a prostate cancer-specific patient reported outcome measure. It was implemented in 14 Ontario regional cancer centres (RCCs) followed by an early evaluation. Open-ended questions, a key component of evaluation surveys, allowed participants to share experience not otherwise captured. The purpose of this presentation is to report select quantitative and open-ended evaluation survey findings identifying clinician challenges and improvement recommendations.

Methods: Surveys were designed to capture clinician experience utilizing EPIC-CP in practice and were distributed to eligible clinicians approximately three months post-implementation. Descriptive statistics were calculated for quantitative findings. Results for open-ended questions were analyzed to identify common themes, and, where appropriate, filtered by companion quantitative response or clinician type.

Results: Respondents (n=161) included nurses, physicians and radiation therapists representing all sites. Clinicians reported issues with EPIC-CP utilization (49% always/mostly talk to patients about scores; 37% use scores in clinical decision-making) and challenges addressing certain symptoms (55% are very/moderately confident addressing sexual function issues). When asked about associated resource needs, nurses and physicians requested clinical education prioritizing sexual function including increased awareness of referral options. Radiation Therapists were divided between those requesting education regarding sexual function management versus those questioning appropriateness of its inclusion in their clinical role.

Conclusions: Early evaluation showed moderate clinical utilization of EPIC-CP which may partially be explained by clinician discomfort and deficiency in addressing sexual function issues. Evaluation next-steps include a 12-month post-implementation survey and in-depth stakeholder interviews to further understand reported challenges.

Keywords: patient reported outcomes; prostate cancer; evaluation; qualitative; EPIC

Themes: Person-Centred Care; Health System Improvements & Innovations; Health Services Delivery

P12

TREATMENT AND TRAVEL PATTERNS FOR ONTARIO PATIENTS DIAGNOSED WITH PRIMARY BRAIN CANCERS

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Purpose: There is a new World Health Organization (WHO) system for classifying glioblastoma and new evidence-based guideline recommendations on the diagnosis and treatment of adult astrocytic and oligodendroglial gliomas. The guideline recommends that patients with glioblastoma should be treated with surgery and adjuvant chemoradiation. In this study, we examine practice patterns for primary brain cancers and associated patient travel patterns to receive treatment in Ontario.

Methods: Diagnostic and treatment patterns were examined using administrative databases at Cancer Care Ontario. Patients were identified from the Ontario Cancer Registry as having a malignant primary brain cancer (ICD-O-3 topography C710-C719) from 2010-2016.

Results: Glioblastoma accounted for 3177/4861 (65%) of all incident brain cancers in the province. Between 2010 and 2016, the incidence of glioblastomas rose (predominantly among older patients), while that of other histological groups remained stable. The proportion of glioblastoma patients treated with surgery and adjuvant chemoradiation increased from 50% in 2010 to 67% in 2016 with a concomitant decline in surgery and adjuvant radiation alone (26% in 2010 to 10% in 2016). Unless they were situated near a larger center, patients traversed LHIN boundaries to receive treatment. The 1-year overall survival was 41% and 75% for patients with glioblastomas and other histologies, respectively, with no improvement over the study period.

Conclusions: Glioblastoma patients are increasingly being treated according to guideline recommendations (surgery plus adjuvant chemoradiation). However, many patients must travel to access treatment. Providing care closer to home may improve quality of life given that these patients often have significant morbidity and a very limited life expectancy.

Keywords: brain cancer; glioblastoma; travel; diagnosis; treatment; access; guidelines

Themes: Health System Improvements & Innovations; Health Services Delivery

P13

MEASURING PATIENT REPORTED DEPRESSION IN CANCER PATIENTS: COMPARING THE EDMONTON SYMPTOM ASSESSMENT SYSTEM (ESAS-R) DEPRESSION QUESTION AND PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

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Purpose: Ontario cancer patients are screened for depression through a single question on ESAS-r. The current method of depression screening may be insufficient, and a multi-dimensional depression PROM, such as PHQ-9, is needed to improve accuracy in identifying and assessing depression. The objective of this work is to assess concordance between the ESAS-r depression item and PHQ-9 in identifying mild, moderate and severe depression in cancer patients.

Methods: Since 2015, outpatients in four Ontario Cancer Centres were offered to complete PHQ-9 following a score of two or above on the ESAS-r depression question. For this concordance analysis, only patients who completed both measures on the same day were included (n=7275). Patient responses were grouped by ESAS-r depression category (mild, moderate, and severe). PHQ-9 depression categories were then mapped within ESAS-r categories.

Results: Results showed a high degree of concordance between the ESAS-r depression item and PHQ-9 for patients who reported no or mild depression (80%). There was a fair degree of concordance amongst patients who reported severe depression (62%). ESAS-r scores in the moderate range (4-8) had little concordance with PHQ-9 scores (< 50%). The majority of patients overestimated their symptom severity on the ESAS-r depression question.

Conclusions: The ESAS-r depression question may be a reasonable screening measure for patients experiencing no, mild or very severe depression. However, patients with scores in the moderate to high range on ESAS-r depression need further assessment in order to identify cases where intervention is necessary. These patients would benefit from completing a multi-dimensional PROM such as PHQ-9.

Keywords: patient reported outcomes; symptom screening; secondary screening; depression

Themes: Person-Centred Care; Health Services Delivery; Best Evidence

P14

PHARMACOECONOMIC ANALYSIS OF FIRST-LINE TREATMENT WITH CRIZOTINIB IN ROS1-REARRANGED ADVANCED NON-SMALL CELL LUNG CANCER IN CANADA

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Purpose: While no comparative data exist for crizotinib in ROS1+ non-small cell lung cancer (NSCLC), studies have suggested there may be benefit with this targeted agent. The objective of this study was to assess the cost-effectiveness of crizotinib compared to standard of care with platinum-doublet chemotherapy for first-line treatment of ROS1+ advanced NSCLC.

Methods: A decision analytic model for ROS1 testing and five health state Markov model were developed in Microsoft Excel based on a 10-year time horizon from the perspective of the publicly-funded health care system. Given a lack of comparative data and small study sample sizes, crizotinib or chemotherapy studies were identified and time-to-event data from digitized Kaplan-Meier PFS curves were aggregated to pool evidence. Costs of drugs, treatment administration, monitoring, adverse events and palliative care were included. Safety and quality-of-life data were obtained from a trial of crizotinib in ALK+ advanced NSCLC patients (PROFILE 1014). Scenario and sensitivity analyses were conducted to explore uncertainty.

Results: In the base-case probabilistic analysis, crizotinib produced additional (discounted) 0.885 life-years and 0.772 quality-adjusted life-years (QALYs) at an incremental cost of \$238,077, producing an ICER of \$273,286/QALY gained. All scenario analyses produced consistent implications. A scenario assuming efficacy equivalent to the ALK+ NSCLC population showed a slightly more favorable cost-effectiveness profile for crizotinib.

Conclusions: Available data appear to support superior activity of crizotinib compared to chemotherapy in ROS1+ advanced NSCLC. At the list price, crizotinib was not cost-effective at commonly accepted willingness-to-pay thresholds across a wide range of sensitivity analyses.

Keywords: crizotinib; ROS1; cost-effectiveness; pharmacoeconomics; NSCLC

Themes: Value for Money; Pharmacoeconomic analysis; Value Determination

P15

SUPPORTING QUALITY IMPROVEMENT IN PALLIATIVE CARE: A SET OF REPORTING PRODUCTS TO MEASURE QUALITY OUTCOMES ACROSS SECTORS AT THE PROVINCIAL, LHIN AND LHIN SUB-REGIONAL LEVELS

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Purpose: Since its launch, the Ontario Palliative Care Network (OPCN) has collaborated with system partners to describe the current state of palliative care in Ontario and identify measures to monitor system change. As outlined in the OPCN Action Plan 1: 2017-2020, continued provincial and regional measurement and reporting will support consistent approaches to planning and quality improvement, and measure the impact of implementing the Action Plan.

Methods: Four system-level measures (SLM) were identified during the development of the Action Plan. Targets were set jointly by each Local Health Integration Network (LHIN) and regional cancer program. Supporting measures were developed to support regional quality improvement efforts with more granular, timely data. These supporting measures were selected through a modified Delphi process. The result was 18 outcome measures indicating quality across healthcare sectors and providers. Each measure aligns to a SLM and meets the criteria of a good measure.

Results: Through extensive engagement with end-users, a comprehensive set of system-level and supporting measures was developed to support OPCN partners in their quality improvement initiatives and to measure progress against the Action Plan. These measures are reported through a coordinated set of reporting products. The reports were designed in collaboration with an information designer, taking into consideration purpose and audience. The resulting report templates are easy to use and interpret.

Conclusions: For the first time in Ontario, regions are receiving insights into cross-sector outcome measures on palliative care at the provincial, LHIN and LHIN sub-region levels that allow for inter-region comparison and measurement for improvement.

Keywords: palliative care; quality improvement; quality measurement; information design

Themes: Health System Improvements & Innovations; Integrated Care; Health Services Delivery; Integrate patient care throughout the kidney care journey

P16

THE NEED FOR PROTON BEAM THERAPY IN ONTARIO

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Purpose: Currently, Canada is the only G8 country without a hospital-based proton beam therapy (PBT) facility. Experience from other G8 countries estimates that approximately 10% of all patients who receive curative intent radiation treatment (RT) should be considered for PBT. To determine accurate demand for PBT in Ontario, a more robust estimate of the need for PBT is required.

Methods: A step-wise approach was taken to estimate the need for PBT services: 1) identified clinical indications for PBT with a clinical Expert Panel; 2) estimated percentage of curative RT patients that would benefit from PBT; 3) applied percentages to RT data to estimate the need for PBT. Data was gathered from program level reporting and published literature. Expert opinion and consensus further informed decision making.

Results: 13 clinical practice groups for which PBT could have potential benefit were identified. Using these groups along with the Expert Panel estimates and RT activity data, the need for PBT was estimated to be 6.0% of patients treated with curative intent photon-based radiation therapy, with a lower bound of 1.4% and an upper bound of 16.5%.

Conclusions: In lieu of published data and need estimates within the Canadian context, using the described approach, the need for PBT was estimated. This methodology can be applied in other jurisdictions that do not currently have a PBT facility.

Keywords: proton therapy; need estimate; consensus; demand

Themes: Person-Centred Care; Health System Improvements & Innovations; Population Health; Best Evidence

P17

SOCIO-DEMOGRAPHIC FACTORS RELATED TO BINGE DRINKING IN ONTARIO

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Purpose: Alcohol consumption is causally related to cancer, trauma, and other social harms. Alcohol binge drinking may harm the individual or those around them and may increase the risk of cancer. In order to identify at-risk individuals or groups for prevention opportunities, this study examined socio-demographic factors associated with binge drinking in Ontario.

Methods: This study analyzed 47,294 Ontario respondents to the 2015-2017 Canadian Community Health Survey. Alcohol binge drinking was defined as consuming at least five (males) or four (females) alcoholic drinks on one occasion. Binge drinking in the past year among adults (ages 18 and over) was examined in relation to age, sex, residence, education, household income, immigration, sexual orientation, marital status, employment status, self-perceived mental health, and households with children less than 18 years old. The associations between binge drinking and socio-demographic factors were assessed using bivariate analyses and multiple logistic regression.

Results: Using data from 2015-2017, socio-demographic factors that increased odds of binge drinking among Ontario adults included: lesser education (Odds Ratio (OR)=1.67 (95% confidence interval=1.56,1.79)); higher household income quintile (OR=1.45 (1.36,1.55)); Canadian-born (OR=1.35 (1.22,1.49)); male (OR=1.28 (1.24,1.34)); poorer mental health (OR=1.18 (1.11,1.27)); rural residence (OR=1.12 (1.07, 1,17)); single marital status (OR=1.07 (1.05,1.17)); and households with no children less than 18 years old (OR=1.05 (1.001,1.11)).

Conclusions: As evidence builds between binge drinking and negative health outcomes, socio-demographic factors that influence the odds of binge drinking can help inform effective brief interventions during medical screening or treatment and provide valuable information for potential prevention policies and programs.

Keywords: binge drinking; alcohol; socio-demographic factors

Themes: Prevention of Chronic Disease; Population Health

P18

ONTARIO FAMILIAL COLORECTAL CANCER REGISTRY: INDIGENOUS FINDINGS

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Purpose: Colorectal cancer incidence is significantly higher among First Nations people compared to other people in Ontario. Data from Ontario illustrates an increase in incidence over time among First Nations people, and a decrease in incidence among other people in Ontario. The aim is to describe colorectal cancer risk factors prevalence rates among Indigenous cases who were recruited in the Ontario Familial Colorectal Cancer Registry (OFCCR), a research resource.

Methods: Data on Indigenous colorectal cancer cases recruited by the OFCCR during 1999-2007 were used to assess prevalence estimates for modifiable risk factors and screening (pre-diagnosis). Self-reported questionnaires were used by the OFCCR to collect risk factor and screening history.

Results: There were 66 colorectal cancer cases who self-identified as either First Nations or Inuit. Over half (53%) were females. The median age of diagnosis was 53 with 45% of cases being diagnosed at 50 years or earlier. Seventy percent of cases were ever-smokers, 71% were overweight or obese and 18% had diabetes at time of cancer diagnosis. Only 23% of cases had at least 5 servings of fruit and vegetables per day.

Conclusions: Although colorectal cancer is the second most common cancer among First Nations people, there is limited data describing cancer risk and screening behaviours among cases in Ontario. This analyses provides some preliminary insight into the prevalence of risk factors among First Nations people. Next, we plan to compare this with controls, non-Indigenous cases of the OFCCR and also with the general population estimates.

Keywords: Indigenous; colorectal cancer; risk factors; case-control

Themes: Prevention of Chronic Disease; Population Health

P19

EVALUATION OF THE INDIGENOUS RELATIONSHIP AND CULTURAL SAFETY COURSES AMONG A SAMPLE OF INDIGENOUS SERVICES CANADA NURSES

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Purpose: In 2015, Cancer Care Ontario launched the Indigenous Relationship and Cultural Safety (IRCS) courses, which stress the importance for healthcare professionals to understand and apply First Nations, Inuit, and Métis (FNIM) cultural safety to provide effective person-centred care. The courses address a key recommendation from the Truth and Reconciliation Commission of Canada report, to provide skills-based training in cultural competency, conflict resolution, human rights and anti-racism.

Methods: The objective of the evaluation is to validate the tool to assess: if the delivery mechanism is appropriate and feasible; if participants acquire an increased knowledge of the courses' contents; and if positive change in how healthcare practice is delivered is perceived to have resulted. After the IRCS courses were mandated for Indigenous Services Canada (ISC) nurses, an anonymous survey was delivered and a focus group was conducted at a regional meeting. The responses from the surveys were gathered in an excel spreadsheet for analyses and the focus group data were analyzed for key themes.

Results: All of the nurses in attendance completed the survey (n=22) and a portion participated in the focus group (n=8). Our evaluation demonstrated that free, online, module formatted courses were appropriate and relevant for ISC nurses (81%); the courses increased the knowledge about FNIM people (72%); and the nurses have/will apply what they learned in their practice (82%).

Conclusions: There has been an increasing movement for regions and organizations in Canada to complete cultural competency training. Our evaluation demonstrated that free, online, module formatted courses were successful at meeting learning objectives.

Keywords: Indigenous; cultural competency; nurse; eLearning education; evaluation

Themes: Health System Improvements & Innovations; Health Services Delivery

P20

REAL-WORLD EFFECTIVENESS AND SAFETY OF SECOND-LINE IPILIMUMAB IN PATIENTS WITH METASTATIC MELANOMA: A POPULATION-BASED STUDY IN ONTARIO, CANADA

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Purpose: In Ontario, second-line ipilimumab has been publicly funded for unresectable stage III/IV metastatic melanoma (MM) since 2012. We studied the real-world effectiveness and safety of second-line ipilimumab in MM patients.

Methods: Patients diagnosed with melanoma from Jan 2006-Mar 2015 were identified from Ontario Cancer Registry and linked to administrative data for demographic and treatment information. We compared second-line ipilimumab to controls who had second-line chemotherapy or targeted treatments prior to 2012, excluding patients who had first or second-line immunotherapy. Inverse probability of treatment weighting (IPTW) was used to balance baseline confounders between groups. Overall survival (OS) was assessed using Kaplan-Meier curves and hazard ratios (HR) from Cox regression. We studied specialist visits and diagnoses from hospital records. Hospital visits were categorized as chemotherapy related (during second-line treatment + 30 days) or immunotherapy related (during second-line treatment + 90 days). Safety endpoints were assessed with rate ratios (RR) from negative binomial regression.

Results: We identified 329 MM patients who had received second-line treatment. Ipilimumab was associated with improved OS (HR=0.62; 95% CI: 0.49-0.78). Patients treated with ipilimumab had higher rates of chemotherapy (RR = 2.5; 95% CI: 1.6 - 3.9) and immunotherapy-related (RR = 2.2; 95% CI: 1.5 - 3.3) hospitalization. Additionally, IPI patients also had more visits to specialists involved in immunotherapy toxicity managements (23.5% vs 13.7%; p=0.04).

Conclusions: In the real-world, we observed survival benefits associated with second-line ipilimumab. However, there was more healthcare utilization suggestive of increased toxicity compared with non-ipilimumab treatment.

Keywords: real-world effectiveness; real-world safety; second-line ipilimumab; metastatic melanoma

Themes: Value for Money; Real-world evidence; Value Determination

P21

IMPLEMENTATION OF PHASE ONE OF THE ACCESS TO KIDNEY TRANSPLANTATION AND LIVING DONATION STRATEGY

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Purpose: In Fall 2017, the Ontario Renal Network (ORN), in partnership with Trillium Gift of Life Network (TGLN), launched a strategy to increase the annual rate of living kidney donor transplants in Ontario by at least 20% by 2021. The Access to Kidney Transplantation and Living Donation (AKT) Strategy has four pillars: (1) quality improvement, (2) data, (3) Transplant Ambassadors, and (4) education.

Methods: Using a two-arm parallel group cluster randomized trial design, 26 Regional Renal Programs were randomly allocated into two groups. The AKT Strategy was implemented using a phased approach, where 13 of 26 selected sites were invited to participate in local quality improvement activities designed to improve transplant-related processes (e.g., referral), educate patients about kidney transplantation with a strong emphasis on living kidney donation, and connect patients with individuals who have lived experience of receiving a kidney transplant or being a living kidney donor.

Results: Regional Renal Programs have made significant progress adopting the four pillars of the strategy, aimed at reaching the provincial goal. For example, all 13 sites have established quality improvement teams, Transplant Ambassadors are present at each site, and 11 sites have implemented Explore Transplant Ontario educational tools.

Conclusions: The AKT Strategy is a multi-pronged approach aimed at increasing living donor kidney transplantation in Ontario. The poster will describe the four pillars of the Strategy and key learnings to date.

Keywords: kidney transplant; living donation

Themes: Person-Centred Care; Value for Money; Integrated Care; Health System Improvements & Innovations; Health Services Delivery; Empower and support patients and family members to be active in their care; Integrate patient care throughout the kidney care journey; Improve patients' access to kidney care

P22

CCO'S COSTING INFRASTRUCTURE: RESULTS FOR A COLORECTAL CANCER SURGERY COHORT

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Purpose: This study presents the health system costs associated with a cohort of colorectal cancer surgery patients in the year following surgery. The purpose of the study is to demonstrate the capabilities of CCO's costing infrastructure to assess costs in the healthcare system.

Methods: A cohort of colorectal cancer surgery patients diagnosed in 2012 - 2016 was identified. The cohort was stratified by cases whose surgery was planned and those that were urgent/emergent. Using CCO's costing infrastructure the costs associated with the care received by these patients across the health system in the year following surgery were calculated. Summary statistics were run on costs by sector for the planned and urgent cases.

Results: Summary statistics including average, minimum, maximum and standard deviation of total costs for each health sector will be presented by surgery type (e.g. planned, urgent) and geographic region. The sectors covered will include inpatient admissions (acute, rehabilitation and complex continuing care), day surgery, ED visits, cancer treatments, dialysis treatments, Ontario drug benefits claims, long-term care, home care, OHIP claims and new drug funding program costs. Differences in costs by surgery type will be highlighted to compare the average resources used by each patient group in the year following surgery.

Conclusions: The results from this study demonstrate the possibilities available to CCO in assessing costs for patient groups across the health care system. The small study example highlights the types of questions that the costing infrastructure can be leveraged to answer and presents the typical output available from the dataset.

Keywords: value for money; costing; colorectal cancer surgery

Themes: Value for Money; Value Determination

P23

PROPOFOL VERSUS MIDAZOLAM WITH OR WITHOUT SHORT-ACTING OPIOIDS FOR SEDATION IN COLONOSCOPY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF SAFETY, SATISFACTION, AND EFFICIENCY OUTCOMES

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Purpose: Propofol is increasingly being used for sedation in colonoscopy; however, its benefits over midazolam (+/- short-acting opioids) are not well quantified. The objective of this study was to compare safety, satisfaction, and efficiency outcomes of propofol versus midazolam (+/- short-acting opioids) in patients undergoing colonoscopy.

Methods: We systematically searched MEDLINE, Embase, and the Cochrane library (to July 30, 2018) for randomized controlled trials of colonoscopies performed with propofol versus midazolam (+/- short-acting opioids). We pooled odds ratios for cardiorespiratory outcomes using mixed-effects conditional logistic models. We pooled standardized mean differences (SMD) for patient and endoscopist satisfaction and efficiency outcomes using random-effects models.

Results: Nine studies of 1,427 patients met inclusion criteria. There were no significant differences in cardiorespiratory outcomes between sedative groups. Patient satisfaction was high in both groups, with most patients reporting willingness to undergo a future colonoscopy with the same sedative regimen. In meta-analysis, patients sedated with propofol had greater satisfaction than those sedated with midazolam (+/- short-acting opioids) (SMD 0.54; 95%CI: 0.30-0.79); however, there was considerable heterogeneity. Procedure time was similar between groups (SMD 0.15; 95%CI: 0.04-0.27). Recovery time was shorter in the propofol group (SMD 0.41; 95%CI: 0.08-0.74). The median difference in recovery time was 3 minutes 6 seconds shorter in patients sedated with propofol.

Conclusions: Both propofol and midazolam (+/- short-acting opioids) result in high patient satisfaction and appear safe for use in colonoscopy. There are marginal benefits to propofol, including improvements in satisfaction and recovery time.

Keywords: colonoscopy; sedation; propofol; midazolam; patient satisfaction

Themes: Value for Money; Health Services Delivery

P24

SURVEILLANCE OF RAYNAUD'S SYNDROME AMONG ONTARIO WORKERS: RESULTS FROM THE OCCUPATIONAL DISEASE SURVEILLANCE SYSTEM (ODSS)

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Purpose: To assess the risk of Raynaud's Syndrome (RS) among Ontario workers using a novel approach based on the linkage of administrative databases.

Methods: The Occupational Disease Surveillance System was established to detect work-related diseases and contains information on 2,190,246 Ontario workers identified from the Workplace Safety and Insurance Board's accepted time-loss compensation claimants (1983-2016). Cases were identified in the Ontario Health Insurance Plan (OHIP) records (1999-2016) with 2+ (ICD9 443) eClaims and National Ambulatory Care Reporting System (NACRS) records (2006-2016) with 1+ (ICD10 G56.0) eClaims. Workers were followed from cohort entry until diagnosis, age 65, emigration, death, or end of follow-up. Age- and sex-adjusted Cox proportional hazard models estimated hazard ratios (HR) and 95% confidence intervals (CI).

Results: Among the 1,666,236 workers, 30,166 and 890 newly diagnosed cases were identified in OHIP and NACRS respectively. Results from OHIP suggested an elevated risk of RS among workers in mining and quarrying (HR 1.44, 95% CI 1.26-1.64), sawmill sawyers (HR 1.42, 95% CI 1.01-1.99) and metal forging (HR 1.53, 95% CI 1.20-1.95). Results from NACRS showed an increased risk of RS among workers in mining and quarrying (HR 2.82, 95% CI 1.51-5.28), mechanics and repairers (HR 6.13, 95% CI 5.10-7.37) and chemical products industries (HR 1.87, 95% CI 1.12-3.12).

Conclusions: Observed risks may be attributed to workplace exposures including whole body vibration or hand-arm vibration due to the use of vibratory tools. The findings from this study will support occupational disease prevention and risk reduction strategies, and inform compensation policies in Ontario.

Keywords: occupational disease; surveillance; hand-arm vibration

Themes: Prevention of Chronic Disease; Population Health

P25

IMPLEMENTING A PROVINCIAL LUNG CANCER SCREENING PILOT: LEVERAGING EXPERTISE FROM THE CANCER IMAGING PROGRAM TO PLAN FOR A PROVINCIAL PROGRAM

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Purpose: Previously developed organized screening programs for lung cancer using low-dose computed tomography (LDCT), standard imaging techniques, and reporting has been shown to detect cancers at an earlier stage. CCO's CIP was brought to provide expertise in radiology policy, with the objective of developing and implementing quality standards for LDCT delivery and reporting in an Ontario pilot.

Methods: The CIP led clinical expert panels and working groups consisting of speciality clinicians, scientific leads and health policy workers to develop evidence informed consensus recommendations, creating facility and personnel standards, lung nodule scoring and follow up criteria (adapted from the American College of Radiology's LungRADs™), and a highly structured LDCT reporting template. Strategies for jurisdictional implementation and oversight were created, and iterative feedback incorporated. Tailored workshops were created to train radiologists about these standards. LDCT scan double read and peer review adjudication processes were developed to ensure resolution of scan interpretation discrepancies.

Results: Defined quality radiology parameters became screening pilot policies. Comprehensive explanatory notes and a radiology quality assurance manual containing clinical and technical expertise were created, supporting pilot program integration into hospitals. Annual assessments ensure standards adherence. Workshops delivered created new clinical networks for lung screening. 1309 radiology QA policy-compliant LDCTs have been performed across pilot sites from June 2017-March 2018. Radiologist feedback from double read processes has impacted pilot policies, allowing modifications of lung scoring follow up criteria, and improving patient follow up processes.

Conclusions: The development of an organized lung cancer screening program requires expert knowledge to ensure standardized LDCT scans and reporting across pilot sites. Using previous experience, the CIP's specialized imaging knowledge ensured best imaging practice integration. The resulting framework will hopefully be able to be scaled provincially and can be adapted to other lung cancer screening sites as needed.

Keywords: screening; radiology; collaboration

Themes: Prevention of Chronic Disease; Health System Improvements & Innovations; Population Health

P26

DATA BURDEN: EXPLORING HOW CURRENT DATA COLLECTION PRACTICES CREATE WORK

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Purpose: Hospitals submit data for quality improvement, funding, or research purposes to multiple organizations such as CCO, the Canadian Institute for Health Informatics, and clinical trials groups. To mitigate the reporting burden on hospitals due to multiple reporting requirements, numerous reporting standards and the elements within them were reviewed to uncover opportunities for efficiency, within the surgical operative note.

Methods: Two independent reviewers conducted an analysis of the Canadian Partnership Against Cancer (CPAC) Lung Cancer Surgery data elements and compared them to seven data sets identified through internal discussion at CCO, requirements review, and focus groups with regional facilities. Each data element was evaluated to be a 1:1 map to CPAC, 1:* [one to many] map, or no map. Unique Identifiers were used to map the elements. The reviewers conducted iterative error checking and sought clinician review where necessary.

Results: There was significant data overlap between the seven different data sets and CPAC varying between 8% and 82%. The CPAC Lung Cancer Surgery data elements mapped strongly to the lung specific data sets, but had fewer common elements between data sets that covered a broader focus such as all surgical procedures.

Conclusions: While many reporting standards requirements exist, the overlap between these highlight an opportunity for automated data submission to alleviate reporting burden for hospitals. Synoptic reporting can be a tool to enable automated data submissions by ensuring that the data is collected discretely and used repeatedly without human intervention.

Keywords: synoptic reporting; informatics; standard terminology; big data; data capture

Themes: Health System Improvements & Innovations; Integrated Care; Health Services Delivery

P27

THE ROLE OF DIAGNOSTIC ASSESSMENT PROGRAMS ON THE EFFICIENCY OF THE DIAGNOSIS AND TREATMENT OF PATIENTS WITH LUNG CANCER

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Purpose: Diagnostic Assessment Programs (DAPs) have been implemented to improve the efficiency of the lung cancer patient journey. The purpose of this study is to assess whether DAPs provide more timely care, better access to care, and better overall survival for Ontarians with lung cancer.

Methods: Patients diagnosed with primary lung cancer from 2014-2016 were identified from the Ontario Cancer Registry. Using administrative databases at Cancer Care Ontario, we identified the earliest visit associated with the lung cancer diagnosis, the date of diagnosis, the date treatment started, and the use of various diagnostic tests and specialist consults.

Results: DAP patients were younger, healthier, and lived closer to a DAP. Significant variability by LHIN of residence was observed. DAP patients were more likely to have had a chest CT, chest x-ray, bronchoscopy, endobronchial ultrasound, biopsy, a surgical consult, a radiation oncology consult, and a brain MRI (regardless of stage), but less likely to have an internal medicine consult or an abdominal CT. DAP patients were also more likely to receive treatment, depending on stage. After adjusting for case mix, DAP patients had a shorter time from diagnosis until treatment by a mean 11.7 days (95% CI 10, 13.4), but DAP patients did not have better survival than non-DAP patients [HR 0.99 (0.94-1.04)]. Patients with delayed treatment had better overall survival [HR 0.81 (0.79-0.82) per 30-day], suggesting appropriate triaging.

Conclusions: DAPs provided better access to care and more timely treatment, but did not affect overall survival. An earlier referral to a DAP is warranted.

Keywords: lung cancer; diagnostic assessment; treatment; efficiency

Themes: Health System Improvements & Innovations; Health Services Delivery

P28

THE IMPACT OF RARITY ON ONCOLOGY HEALTH TECHNOLOGY ASSESSMENT (HTA) AND FUNDING IN ONTARIO: A REVIEW OF PCODR RECOMMENDATIONS FROM 2012-2017

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Purpose: The pan-Canadian Oncology Drug Review (pCODR) evaluates new cancer drugs for public funding recommendations. While pCODR's deliberative framework evaluates overall clinical benefit and includes considerations for exceptional circumstances, rarity of indication is not explicitly addressed. Given the high unmet need that typically accompanies these indications, we explored the impact of rarity on oncology HTA recommendations and funding decisions.

Methods: We examined pCODR submissions with final recommendations from 2012-2017. Incidence rates were calculated using pCODR recommendation reports and statistics from the Canadian Cancer Society. Indications were classified as rare if the incidence rate was lower than 1/100,000 diagnoses, a definition referenced by the Canadian Agency for Drugs and Technologies in Health. Each pCODR final report was examined for the funding recommendation/justification, level of supporting evidence (presence of a randomized control trial (RCT)), and time to funding in Ontario (if applicable).

Results: Of the 96 pCODR reviews examined, 14.6% were classified as rare indications per above criteria. While the frequency of positive funding recommendations were similar between rare and non-rare indication (78.6% vs 78%), rare indications were less likely to be presented with evidence from RCT (50% vs 89%). The average time to funding was 322 and 268 days for rare and non-rare indications, respectively.

Conclusions: Rare indications appear to be associated with weaker clinical evidence and longer time to funding. There appears to be no association between rarity and positive funding recommendations. Further work will evaluate factors associated with positive recommendations and the real-world treatment utilization of funded rare indications.

Keywords: HTA; rarity; funding; pCODR; evidence

Themes: Health System Improvements & Innovations; Health Services Delivery; Value Determination

P29

BUILDING CAPITAL INFRASTRUCTURE WITHIN ONTARIO BY TRANSFORMING DATA INTO ACTIONABLE INSIGHTS

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Purpose: To share System & Infrastructure Planning team's experience in building planning tools to support capacity planning and citing examples from the development and implementation of the Radiation Treatment Capital Investment Strategy 2018.

Methods: The Radiation Treatment Capital Investment Strategy 2018 involved three main steps: planning principles developed with a person-centered approach, model metrics validated with the latest available data, and knowledge translation materials tailored for specific leadership audiences. Patient and Family Advisors helped create person-centered planning principles and ensured these principles came through in the report. Planning model metrics were tested and updated using data from Activity Level Reporting for treatment information and CCO's Surveillance Unit's census division level incidence forecasts. The methodology was discussed for methodological soundness and clinical relevance by the working group of internal and external partners. Knowledge translation tools were developed with an active listening approach with each senior leadership team's articulated needs for change and understanding.

Results: Diverse types of partnerships with subject matter experts from administration, analytics and clinical experience were involved in the strategy design steps, which allowed for increased confidence in the actionable recommendations. Data was transformed into an agile provincial planning model, which utilized familiar intuitive metrics. These agile models supported senior leadership conversations between organizations in a timely manner.

Conclusions: Three main factors are essential to translate strategic recommendations into actionable changes: person-centered planning principles to ground the direction of action; diverse partners for evidence-generation and validation; and an agile provincial planning model used alongside active listening to address local context specific questions.

Keywords: knowledge translation; capacity planning; infrastructure planning; planning principles; agile model

Themes: Person-Centred Care; Health System Improvements & Innovations; Value for Money; Health Services Delivery; Best Evidence

P30

IRON INTAKE, OXIDATIVE STRESS-RELATED GENES, AND BREAST CANCER RISK

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Purpose: To evaluate associations between iron intake and breast cancer risk, and whether these associations are modified by genetic polymorphisms in antioxidant enzymes, manganese superoxide dismutase (MnSOD) and glutathione S-transferases M1 (GSTM1) and T1 (GSTT1). Modifiable iron intake may have implications for cancer prevention.

Methods: A population-based case-control study recruited 3,030 breast cancer cases identified from the Ontario Cancer Registry and 3,402 controls from random-digit dialing. Iron intake from foods and supplements was assessed using a 178-item food frequency questionnaire. Multivariable logistic regression analyses were performed to estimate associations among all women and by menopausal and hormone receptor [estrogen receptor (ER)/progesterone receptor (PR)] status. Among women providing DNA, interactions between iron intake and genetic polymorphisms were assessed using likelihood-ratio test.

Results: Among all women, intakes of dietary, supplemental, and total iron were not associated with breast cancer risk, overall or by ER/PR status. Among premenopausal women, an increased risk of ER-PR- breast cancer was found for dietary (ORQ5vsQ1=1.4; 95% CI: 0.9-2.4) and total (ORQ5vsQ1=1.8; 1.1-2.9) iron intake (Ptrend<0.05). Supplemental iron intake was associated with reduced postmenopausal breast cancer risk (OR=0.7; 0.5-0.9). Among women with deletions in the GSTM1/T1 loci, dietary iron intake was positively associated with breast cancer risk (ORQ5vsQ1=2.1; 1.1-4.2), whereas null/inverse associations were found among women with other GSTM1/T1 genotypes (Pinteraction<0.05).

Conclusions: Iron intake may increase the risk of premenopausal ER-PR- breast cancer. Associations between iron intake and breast cancer risk may be modified by inherited oxidative stress-related genetic polymorphisms. As iron intake is modifiable, findings may have implications for cancer prevention.

Keywords: breast cancer; iron intake; genetic polymorphisms; oxidative stress

Themes: Prevention of Chronic Disease; Population Health

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LINKING POPULATION-BASED SURVEY AND CANCER REGISTRY DATA TO EXAMINE THE ASSOCIATION BETWEEN BEHAVIOURS CONSISTENT WITH CANCER PREVENTION RECOMMENDATIONS AND CANCER RISK IN ONTARIO

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Purpose: In 2007, the World Cancer Research Fund (WCRF) and American Institute for Cancer Research (AICR) published recommendations to reduce cancer risk through diet and physical activity. Our objective is to examine the association between self-reported behaviour consistent with WCRF/AICR recommendations for body fatness, physical activity, vegetable/fruit consumption, and alcohol intake and the risk of all cancers combined and specific cancer types in Ontario.

Methods: The study cohort consists of Ontarians surveyed between 2000 and 2008 using the Canadian Community Health Survey (CCHS), whose cancer outcomes will be obtained from the Ontario Cancer Registry (OCR) and other health administrative databases. Individuals will be assessed for behaviours consistent with WCRF/AICR recommendations based on their responses to CCHS questions and the association of these behaviours with subsequent cancer risk will be assessed using multivariable Cox proportional hazard regression models.

Results: After all exclusion criteria were applied, the cohort contains 113,909 individuals, of which 9,121 (8.0%) had a diagnosis of cancer during the study follow-up period. Hazard ratios will be estimated and presented at CCO Research Day to describe the cancer risk for individuals reporting behaviour consistent with the WCRF/AICR recommendations and those reporting behaviour not consistent with the recommendations.

Conclusions: WCRF/AICR recommendations were developed as the basis for primary cancer prevention, both for individuals and population-wide policies and programs. The current study will quantify the difference in cancer risk between individuals who do and do not adhere to selected WCRF/AICR recommendations for the first time in a Canadian population.

Keywords: cancer prevention; diet; physical activity

Themes: Prevention of Chronic Disease; Population Health

ADDITIONAL ABSTRACT SUBMISSIONS

REAL-WORLD EFFECTIVENESS AND SAFETY OF ADDING BEVACIZUMAB TO FIRST-LINE IRINOTECAN-BASED CHEMOTHERAPY IN PATIENTS WITH METASTATIC COLORECTAL CANCER: POPULATION-BASED RETROSPECTIVE COHORT STUDIES IN THREE PROVINCES

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Purpose: We assessed real-world comparative effectiveness and safety of adding bevacizumab to first-line irinotecan-based chemotherapy among patients with metastatic colorectal cancer (mCRC) in Ontario (ON), British Columbia (BC), and Saskatchewan (SK).

Methods: Patients diagnosed with CRC who received publicly-funded bevacizumab and/or irinotecan from 2000-2016 were identified from provincial registries. Patients who received first-line bevacizumab + irinotecan-based chemotherapy (treated) were matched one-to-one by propensity score to either patients who received first-line irinotecan-based chemotherapy in contemporaneous or historical cohort (prior to bevacizumab funding), adjusting for baseline demographic and clinical characteristics. Overall survival (OS) was assessed using Kaplan-Meier curves and hazard ratios (HRs) using Cox models (adjusting for baseline covariates and subsequent treatments). Rate ratio (RRs) of all-cause hospitalization during first-line treatment + 30 days was examined using negative binomial regression models.

Results: We identified 12,112, 2,977, and 1,161 mCRC patients who received first-line irinotecan-based chemotherapy in ON, BC, and SK, respectively. Median OS for the treated group (ON=18.2; BC=19.7; SK=20.2) is significantly greater than contemporaneous (ON=9.0; BC=11.3; SK=12.5) or historical (ON=13.6; BC=14.5; SK=13.9) controls. The treated group is associated with a significantly reduced risk of mortality compared to contemporaneous (HR: 0.48 to 0.52) and historical controls (HR: 0.46 to 0.70). All-cause hospitalization rates were significantly lower for treated group in all provinces (Contemporaneous: RR=0.49 to 0.65; Historical: RR=0.60 to 0.75).

Conclusions: Addition of bevacizumab to first-line irinotecan-based chemotherapy for mCRC was associated with improved survival, lower risk of mortality, and reduced all-cause hospitalization rates when compared to first-line irinotecan-based chemotherapy alone.

Keywords: real-world effectiveness; real-world safety; bevacizumab; metastatic colorectal cancer

Themes: Value for Money; Real-world evidence; Value Determination

EVOLVING PATIENT & FAMILY ENGAGEMENT

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Purpose: Patient engagement is mechanism to facilitate person-centred care. Evidence suggests patient engagement results in better health outcomes and experience, and lower healthcare costs. While patient engagement is not new to healthcare, there are gaps to engaging public, patient and family advisors at a macro-level. As such, stakeholder consultations were conducted to develop a macro-level engagement framework.

Methods: The development of the framework consisted of three-steps: 1) formation of a steering committee made up of Cancer Care Patient and Family Advisors (n=11) and staff (n=5), 2) consultations with patient and family advisors, staff, external organizations via interviews (n=36), focus groups (n=7), and online surveys (n=153), and 3) a review of the literature to explore innovative engagement approaches. Qualitative data was organized and independently coded by four individuals using inductive methods. Discrepancies were discussed and resolved among these individuals. Themes and sub-themes were developed.

Results: There were 5 themes and 3 sub-themes that emerged. Themes included; 1) respect, 2) sincerity, 3) accessibility, 4) responsiveness and 5) equity. Sub-themes included: 1) tailored and co-designed engagements, 2) evaluating and sharing engagement outcomes and 3) creating innovative channels to enable broader participation. When examining the literature, key findings were: the use of public citizens in decision-making, investment in digital platforms, applying user-design concepts to program development, widening diversity and balancing priority setting power.

Conclusions: Together, the findings from the consultations and review of literature will be combined in order to develop an Engagement Strategic Framework. This will allow for more meaningful engagement of advisors at the macro-level.

Keywords: patient and family engagement; public engagement; qualitative research; framework development

Themes: Person-Centred Care; Health Services Delivery

HEALTH EQUITY DATA AND TOOLS: REGIONAL CANCER PROGRAM NEEDS ASSESSMENT

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Purpose: Through the Ontario Cancer Plan, Cancer Care Ontario committed to providing information and tools to support the Regional Cancer Programs (RCPs) in identifying and reducing inequities in cancer services. In this study, we conducted a needs assessment to inform the development of new tools and data to meet regional needs.

Methods: Semi-structured interviews were conducted with leadership from seven of fourteen RCPs. Interview questions examined the RCPs knowledge of inequities in cancer prevention and care in their regions. Interviewees were asked about their region's priority research questions related to health equity and on the data requirements for addressing these questions locally. A summary of the findings was generated and circulated to all fourteen regions for additional input and validation.

Results: The most common cancer care related inequities, as well as perceived barriers to acting on those inequities, were identified. RCPs were interested in the distribution of social determinants of health (SDoH) at the LHIN, region and neighbourhood level. Both area level and individual level data were identified as important. Additional themes regarding screening of patients for SDoH, use of health equity impact assessments, community partnerships and the roles that Cancer Care Ontario and the RCPs play in reducing inequities in the province were examined.

Conclusions: Despite differences between Ontario's 14 RCPs in population and geography, this needs assessment identified recurring themes for data and tools to examine equity in cancer services. These results will inform initiatives to support the identification and reduction of inequities across cancer services throughout the province.

Keywords: equity; data; needs assessment; regional cancer programs

Themes: Person-Centred Care; Prevention of Chronic Disease; Equity; Population Health; Health Services Delivery

ARE POPULATION-BASED PATIENT-REPORTED OUTCOMES ASSOCIATED WITH OVERALL SURVIVAL IN PATIENTS WITH ADVANCED PANCREATIC CANCER?

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Purpose: Advanced pancreatic cancer (APC) patients often have substantial symptom burden. In Ontario, patients routinely complete the Edmonton Symptom Assessment Scale (ESAS), which screens for 9 symptoms (scale: 0-10), in cancer clinics. We explored the association between baseline patient-reported outcomes, via ESAS, and overall survival (OS).

Methods: APC patients with ESAS records prior to receiving publicly-funded drugs from November 2008 - March 2016 were retrospectively identified from Cancer Care Ontario's administrative databases. We examined 3 composite ESAS scores: Total Symptom Distress Score (TSDS: 9 symptoms), Physical Symptom Score (PHS: 6/9 symptoms), and Psychological Symptom Score (PSS: 2/9 symptoms); Composite scores greater than defined thresholds (TSDS = 36, PHS = 24, PSS = 8) were considered as high symptom burden. Crude OS was assessed using Kaplan-Meier method. Hazard ratios (HRs) were assessed using multivariable Cox models to adjust for baseline characteristics. Analysis was repeated in a sub-cohort with ECOG status and metastasis.

Results: We identified 2,199 APC patients (mean age 64 years, 55% male) with ESAS records prior to receiving chemotherapy. Crude median survival was 4.5 and 7.3 months for high and low TSDS, respectively. High TSDS was associated with lower OS (HR = 1.47, 95% CI: 1.33, 1.63). In the sub-cohort (n=393) with ECOG status and metastasis, high TSDS was also associated with lower OS (HR = 1.34, 95% CI: 1.04, 1.73). Similar trends were observed for PHS and PSS. When PHS and PSS were included in Cox model, only PHS remained significant.

Conclusions: Higher burden of patient-reported outcome at baseline was associated with reduced OS among APC patients. The effect was prominent for physical symptoms, even after adjusting for treatment, metastasis and ECOG status.

Keywords: real-world survival; patient reported outcome; ESAS; advanced pancreatic cancer

Themes: Value for Money; Real-world evidence; Value Determination

CREATING PATIENT EDUCATION TO HELP PATIENTS UNDERSTAND THE VALUE OF PATIENT REPORTED OUTCOMES (PROS): APPLICATION OF THE 3WS AND AN H FRAMEWORK

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Purpose: Cancer Care Ontario (CCO) collects PROs at over 70 hospitals that provide cancer treatment; PROs help patients report symptoms and quality of life. Evidence suggests PROs improve patient experience/outcomes of care; however regular completion of PROs varies across the province. Some patients do not understand how PROs can be used to benefit their care. The objective of this work is: 1) to apply the framework 3Ws and an H to develop patient education on the value of PROs; and 2) assess stakeholder perception on the usefulness of applying this framework to create high-quality patient education.

Methods: 3Ws and an H is a theory-based method designed to guide the development of patient education resources. Informed by adult learning theory, it outlines a method of building content based on healthcare providers' answers to the following questions: (1) Who is the resource for? (2) Why should they read it? (3) What exactly do they want/need to know and (4) How can the content best engage the learner? The method has a built in process to determine what is most important to patients about the topic. A small sample of patients and experts were surveyed on PROs. This data was prioritized to help inform the content of the resource. Subsequently, the working group was sent a short survey asking about their experience on using the 3Ws and H process.

Results: The analysis of expert and patient feedback recommended the patient education include: (1) what PROs are; (2) how PROs are helpful to patients; (3) how they can complete PROs; and (4) what clinicians do with PRO data. The protocol developed an engaging resource to meet patient's informational needs. Overall, the working group indicated that the 3Ws and an H framework helped focus the content; X out of Y working group members indicated that they felt the framework facilitated the creation of high quality patient education.

Conclusions: The 3 Ws and an H method successfully informed the creation of a patient education tool which will be used to demonstrate the value of PROs in their care. Secondly, the evaluation of the 3 Ws and an H supported the usefulness of the method in creating patient education.

Keywords: patient education; patient reported outcomes; person centred care

Themes: Person-Centred Care; Population Health; Health Services Delivery

TOWARDS AN UNDERSTANDING OF BURNOUT IN THE ONTARIO CANCER SYSTEM

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Purpose: Clinician burnout has implications for provider wellbeing as well as patient safety and quality-of-care. CCO has made addressing burnout in the cancer system a priority on its Person Centered Care agenda and requires the development of a robust province wide strategy. Two foundational pieces of this work include a review of the existing evidence and an analysis of related policies. We will describe how these inputs contribute to our understanding of the current state of oncology provider burnout and how they will influence provincial strategy.

Methods: We conducted a systematic literature review on risk factors and potential strategies to reduce burnout in oncology. A policy analysis determined the basic elements of policies targeting burnout and how they address its core drivers in Canada and other jurisdictions.

Results: Burnout is a systems level issue, driven by factors such as increased administrative burdens and a culture not attuned to clinician wellness. Policies typically target organization and system level settings, and often focus on planning/assessment and educational strategies. There is a gap between existing evidence (early bias towards studying individual focused interventions) and current policies that call for system level strategies to ameliorate high levels of burnout. Currently there is minimal Canadian and oncology specific data. There is a need for rigorous assessment in the province to understand local risk factors and impediments to action.

Conclusions: CCO's burnout strategy relies on a strong understanding of current best practice and drivers specific to our cancer system. The development of partnerships and leveraging existing expertise will be key.

Keywords: wellness; burnout; clinician; strategy; person centred care

Themes: Person-Centred Care; Health System Improvements & Innovations; Health Services Delivery; Best Evidence

A SYSTEMATIC REVIEW OF RISK AND PROTECTIVE FACTORS FOR COLORECTAL CANCER IN INDIGENOUS POPULATIONS

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Purpose: Colorectal cancer (CRC) is the second most commonly diagnosed cancer in females and the third in males, with around 1.4 million new cases and 693,900 deaths estimated to have occurred worldwide in 2012. Indigenous populations worldwide experience significant disparities in health and CRC, which could be the result of various factors including a higher prevalence of known risk factors associated with CRC, such as tobacco smoking. We propose to examine the literature to investigate any risk or protective factors that influence CRC in Indigenous populations in Canada and abroad.

Methods: English articles, from 1930 to August 2018, were identified and reviewed from various bibliographic databases (PubMed, Medline, EMBASE, and PsycInfo) using keywords related to 1) CRC and 2) Indigenous populations in North America, Australia, New Zealand and Circumpolar regions.

Results: Title and abstract review of 1594 studies yielded in 230 studies that investigated CRC in an Indigenous population. After full-text review, 10 studies related to risk and protective factors of CRC were included in the final systematic review. Selected studies investigated three Indigenous populations (Sami, Native American, Native Hawaiian), and various risk/protective factors such as nutrition, tobacco use, nonsteroidal anti-inflammatory drug use, and hormone replacement therapy use.

Conclusions: This study will provide an overview of the risk and protective factors of CRC in Indigenous populations by critiquing and synthesizing existing data on this topic. Future researchers will be able to utilize this review to identify gaps in the field and to potentially tailor prevention interventions accordingly.

Keywords: aboriginal; indigenous; colorectal cancer; risk factors; systematic review

Themes: Prevention of Chronic Disease; Population Health

REGIONAL VARIATION IN DIAGNOSTIC AND TREATMENT PROCEDURES FOR MESOTHELIOMA IN ONTARIO, CANADA

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Purpose: The incidence of malignant pleural mesothelioma (MPM) is expected to rise over the next 20 years due to latent asbestos exposure. MPM has poor survival and its diagnosis remains a challenge. The purpose of this study was to estimate the incidence of MPM in Ontario and to examine regional differences in diagnosis, treatment, and survival.

Methods: Patients were identified from the Ontario Cancer Registry as having a malignant carcinoma of the pleura (ICD-O-3 topography C38.4) with mesothelial histology (ICD-O-3 histology 9050-9055) between 2007 and 2016. Diagnostic and treatment patterns were examined using various administrative databases at Cancer Care Ontario.

Results: The number of incident cases rose from 149 in 2007 to 197 in 2016, a 32% increase (N=1503). There was no evidence of a plateau. Most intrathoracic or mediastinal lymph node biopsies were performed in Toronto Central and Champlain, while lung or pleural biopsies were more evenly distributed across the province. Forty-five percent of all extrapleural pneumonectomies were performed in Toronto Central (on average 19 per year), requiring patients to travel to receive this treatment. Variation in practice by patients' LHIN of residence was observed for receipt of extrapleural pneumonectomies, decortication pneumonectomies, and talc pleurodeses. Overall survival was 42% after 1-year of follow-up and 20% after 2-years of follow-up, with little evidence of improvement over time.

Conclusions: The overall survival of patients with MPM remains low. As a relatively rare cancer with a steadily increasing incidence, there is opportunity to improve the diagnosis and treatment of patients with MPM.

Keywords: mesothelioma; diagnosis; treatment; access

Themes: Health System Improvements & Innovations; Health Services Delivery

DRIVING ACCOUNTABILITY IN ASSISTED PERITONEAL DIALYSIS HOME CARE THROUGH INTEGRATED FUNDING

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Purpose: Integrated funding models, which seek improved accountability through streamlined funding, are potential drivers of more equitable and effective models of healthcare delivery. Aligned with the Ontario Ministry of Health and Long-Term Care's bundled-care strategy, the Ontario Renal Network is implementing Integrated Dialysis Care Models (IDC), aimed at improving patient experience with and access to assisted peritoneal dialysis (aPD) delivered in homes and long-term care homes. CKD funding for aPD, which previously encouraged siloed care, will be available to hospital-based Renal Programs, empowering them with greater accountability for renal services and quality outcomes across care settings.

IDC models aim to:

1. Support patients' uptake and length-of-stay on home dialysis;
2. Promote positive patient experiences;
3. Reduce variation in access; and
4. Support value-for-money with evidence-based funding recommendations.

Methods: Implementation is phased, beginning FY2018/19. Early Adopters, selected through an Expression of Interest, participate in a Quality Committee supporting implementation and evaluation.

The IDC evaluation framework consists of two parts:

- 1) 'Implementation evaluation' identifies enablers and challenges, and recommendations for scale.
- 2) 'Monitoring and outcomes evaluation' measures impact of the models to the system and against their objectives, while assessing funding options.

Results: Keen interest – 9 of 26 Programs selected to implement. Regional collaboration and knowledge sharing regarding aPD pathways and opportunities. Reduced infection rates. Community provider capacity in rural areas remains challenging. Complex homecare reporting requirements.

Conclusions: Improved quality outcomes in early results suggests improved accountability. Systemic challenges remain however, for which innovative solutions continue to be sought.

Keywords: integrated care; bundled funding; home care; assisted PD

Themes: Person-Centred Care; Health System Improvements & Innovations; Value for Money; Integrated Care; Quality Based Procedure (QBP) Funding; Health Services Delivery; Value Determination; Improve patients' access to kidney care

RISK OF RECURRENCE FOLLOWING TREATMENT FOR CIN 3 AND AIS OF THE CERVIX

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Purpose: To evaluate recurrence risk of CIN3+ and AIS+ in a large population cohort of women previously treated for CIN3/AIS.

Methods: Administrative data from cancer and cervical cytology registries and physician billing data for procedures in Ontario, Canada, identified all women with a diagnosis of CIN 3 or AIS from 2006-2010. Recurrence rate 1-5 years post treatment was defined as a biopsy finding of CIN3/AIS or retreatment. Logistic regression was used to determine odds of recurrence.

Results: 19,448 women underwent treatment for CIN3 (n=17,109) and AIS (n=600). The recurrence rate over 5 years was greater for AIS (12.8%) compared to CIN3 (8.8%) (OR 1.5; p=0.003). Post treatment risk of recurrence for CIN3 after 1, 2, or 3+ normal Paps was 7.5%, 6.0% and 5.9% respectively; recurrence with 1, 2 or 3+ abnormal Paps was 15.6%, 27.5% and 41.1%, respectively. Post treatment risk of recurrence for AIS after 1, 2, or 3+ normal Paps was 17.8%, 9.5% and 9.1% respectively; recurrence with 1, 2 or 3+ abnormal Paps was 11.1%, 18.2% and 20.0% respectively. Age decile above 21-29 (OR 1.6 to 3.3; p<0.0005) and subsequent Pap abnormality (OR 1.5 to 8.9; p<0.0016) were associated with greater recurrence. Two normal Paps have the same predictive effect as 3 or more normal Pap results (OR 1.0; p=0.93).

Conclusions: Age and post-treatment Pap smears are associated with risk of recurrence and can inform subsequent screening frequency. In addition, HPV exit testing may also improve NPV for discharge from colposcopy.

Keywords: pap; recurrence; HPV

Themes: Person-Centred Care; Health System Improvements & Innovations; Population Health

CCO'S CONTRACT & FUNDING MANAGEMENT TEAM: GROWTH AND THE USE OF LEAN TO IMPROVE EFFICIENCY

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1. Cancer Care Ontario

Purpose: CCO's Contract & Funding Management (CFM) team operates a robust contract management system, which enables effective administration of funding to healthcare organizations and supports quality improvement and accountability across the province. CFM has increasingly applied process improvement methodology to further efficiency of operations.

Methods: Between 2012/13-2017/18, oversight grew from 371-607 agreements (64% increase) and \$400M-\$1.6B (300% increase). The number of clinical programs requiring contracts and complexity of funding models included within the contracts also increased. In order to manage growth in volume, scope and complexity, process improvement methodology (e.g. LEAN principles and tools) has been applied to reduce duplication and streamline the agreement process.

Results:

Process improvements:

1. Quality Based Procedure-Cancer Surgery Agreement and Complex Malignant Hematology Agreement - in both cases, four programs were consolidated into one agreement; 66% (170 to 60) and 58% (40 to 17) fewer separate agreements respectively.
2. Consolidation of year-end settlements - 40% fewer communications sent to hospitals (despite increase in number of agreements included in process); all settlement communications sent within 1 month, rather than throughout three fiscal quarters.

Additional impacts:

1. As agreements are informed by clinical and administrative input from CCO and external stakeholders, it can be assumed that partners experienced related efficiencies as fewer reviews are required.
2. Efficiencies allow additional time for CFM to focus on further process improvements, partner experience, and quality of agreements.

Conclusions: A commitment to process improvement with stakeholders in mind has enabled CCO's CFM team to accommodate significant growth in oversight while maintaining high quality products and fiscal accountability.

Keywords: accountability; growth; agreements; efficiency; improvement

Themes: Health System Improvements & Innovations; Value for Money; Value Determination

DEVELOPING AN ONCOLOGY SPECIFIC CAREGIVER SUPPORT FRAMEWORK

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2. Scarborough Health Network

3. Collaborative Aging

Purpose: The Psychosocial Oncology (PSO) Program at CCO is developing an oncology specific caregiver support framework for healthcare providers and administrators. It will serve as a best-practice guide for caregiver support, setting out expectations for the provision of appropriate supports and processes. This work is the result of a formative evaluation on caregiver support conducted in 2017 with the Regional Cancer Programs, which demonstrated some gaps in services and understanding caregiver needs.

Methods: Expertise was leveraged from the development process of the Central LHIN caregiver support framework, including leveraging consultations, co-design work, and input from framework development experts. A literature search was conducted focusing on the main components from the Central LHIN framework and their applicability to oncology, as well as best practices in oncology related to caregiver support. A working group was formed comprising of PSO specialists, patients, and caregivers from across Ontario. The group met over a 5 month period, using a consensus process drawing upon clinical and lived experience to adapt the Central LHIN framework to oncology.

Results: Feedback and consensus decisions from the adaptation process will result in the development of a conceptual framework to guide improved supports for caregivers in oncology settings. The visual representation of the framework in a logic model format will provide a succinct tool to aid in the operationalization of oncology caregiver support.

Conclusions: This work attempts to standardize and improve caregiver support in oncology settings in Ontario, through adaptation of an existing evidence based framework. Next steps include dissemination, knowledge translation and measurement.

Keywords: psychosocial oncology; caregiver; caregiver support; framework; logic model

Themes: Person-Centred Care; Health System Improvements & Innovations; Health Services Delivery

DEVELOPMENT OF SMALL AREA INDICATORS FOR SOCIAL DETERMINANTS OF HEALTH WITH MEASURES OF UNCERTAINTY

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2. Dalla Lana School of Public Health, University of Toronto

Purpose: This study aimed to develop area-based social determinants of health (SDOH) indicators to quantify the relative contributions of key variables while accounting for spatial dependence and providing measures of uncertainty. A goal was to provide estimates consistent with SDOH indicators [e.g. Ontario Marginalization Index (ON-Marg)].

Methods: A scoping review of Canadian SDOH indicators identified Census-based education, income, unemployment, living alone and visible minority status as key variables. A Bayesian spatial model with a shared component formulation was fit to the variables in urban (Toronto) and urban-rural (Lambton County) regions. Exceedance probabilities (>0.8) for the posterior samples were computed against the region means to provide measures of uncertainty. Pearson correlation coefficients compared the new indicators to ON-Marg. Stratified analyses were conducted for the indicators and area-based prevalence of health-related behaviours.

Results: The shared component provided a multi-dimensional SDOH indicator, but variable-specific indicators were important. Increased marginalization surrounded central Toronto and the shared component explained 100% (rounding), 52% and 23% of the spatial variation in income, unemployment and living alone, respectively. In Lambton county, increased marginalization occurred mostly in central Sarnia. In each region, the shared component had the highest correlation with ON-Marg material deprivation (Lambton $r=0.78$; Toronto $r=0.70$; both $p<.001$) but otherwise differed. Preliminary analyses of marginalization associations with health-related behaviours show non-linear relationships with alcohol consumption and positive associations with tobacco smoking.

Conclusions: A Bayesian approach to develop SDOH indicators provides estimates consistent with ON-Marg using five (vs. 18) variables, provides measures of uncertainty and quantifies spatial variation to understand their distribution better.

Keywords: social determinants of health; statistical model; spatial analysis

Themes: Prevention of Chronic Disease; Population Health

LINK, MONITOR, STRATEGIZE: FIRST NATIONS, INUIT, METIS PEOPLES' CANCER BURDEN IN CANADA - A RESEARCH PROTOCOL

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Purpose: Surveillance of cancer among First Nations, Inuit and Métis (FNIM) in Ontario and across the country is sparse. Existing evidence regarding cancer outcomes is limited owing to the lack of FNIM identifiers in routinely collected health administration databases. Generally, the combined effect of increasing cancer incidence and minimal improvement in survival over time has led cancer to become one of the leading causes of death in these populations.

Methods: Studies of cancer outcomes in FNIM in Canada have been confronted with a common set of limitations that have restricted the generalizability, validity and usefulness of their findings. The analysis of the 2006 Canadian Census Health and Environment Cohort (CanCHEC) created by Statistics Canada by linking the 2006 Census of Canada to the Canadian Cancer Registry and Canadian Mortality Database will provide us with an unprecedented opportunity to examine cancer incidence, mortality, survival, age- and stage at diagnosis and childhood cancer in each FNIM populations.

Results: Regional work has demonstrated poorer cancer survival among FNIM due partly from late stage diagnoses and young (pre-screening guidelines) age at cancer onset. To examine these determinants of cancer outcomes and better understand cancer characteristics among these populations may support cancer risk factor disparities and prevention efforts.

Conclusions: This work will address critical issues identified by Indigenous communities, cancer agencies and our prior work.

Keywords: First Nations, Inuit and Métis (FNIM); Ontario; Canada; cancer outcomes

Themes: Prevention of Chronic Disease; Population Health; Best Evidence

MEDICATIONS USED ROUTINELY IN PRIMARY CARE TO BE DOSE ADJUSTED OR AVOIDED IN PEOPLE WITH CHRONIC KIDNEY DISEASE: RESULTS OF A MODIFIED DELPHI STUDY

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Purpose: Chronic kidney disease (CKD) affects up to 18% of those over the age of 65. Potentially inappropriate medication prescribing in people with CKD is common. The objective of this study was to develop a pragmatic list of medications used in primary care that required dose-adjustment or avoidance in people with CKD, using a modified Delphi panel and consensus workshop approach involving a panel of experts.

Methods: We conducted a comprehensive literature search to identify potential medications, and refined the list based on prescribing frequency in Ontario, Canada. A group of 17 experts participated in a three-round modified Delphi panel to identify medications for inclusion. A subsequent consensus workshop of eight experts reviewed this list to produce a final pragmatic list for primary care.

Results: After consideration of provincial prescribing information, 59 medications were included for consideration by the Delphi panel, with a further 10 medications added after the initial round. Upon completion of the three rounds, 66 unique medications remained; 63 requiring dose adjustment and 16 medications requiring avoidance in one or more eGFR categories. The consensus workshop reduced this list further to 24 medications that must be dose-adjusted or avoided, including baclofen, metformin, and digoxin, as well as the newer SGLT2 inhibitor agents.

Conclusions: A final list of 24 medications was developed that requires dose-adjustment or avoidance in people with CKD; this list includes many that had not been previously identified. Knowledge translation strategies will be required to ensure broad dissemination and uptake of this new information.

Keywords: drugs; family medicine; nephrology; primary care; pharmacology and toxicology

Themes: Health System Improvements & Innovations; Best Evidence; Integrate patient care throughout the kidney care journey

UTILIZATION OF SALVAGE CHEMOTHERAPY FOR RELAPSED OR REFRACTORY (R/R) AGGRESSIVE LYMPHOMA IN ONTARIO

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Purpose: The randomized controlled trial LY.12 demonstrated gemcitabine, dexamethasone and cisplatin (GDP) resulted in similar transplantation rate and survival, less toxicity, and superior quality of life compared to dexamethasone, cytarabine and cisplatin (DHAP) for patients with R/R aggressive lymphoma. In Ontario, both regimens are publicly funded. We examined outpatient chemotherapy data for R/R aggressive lymphoma patients in Ontario to determine utilization of salvage chemotherapy regimens and costed each regimen to determine financial implications.

Methods: Cancer Care Ontario's (CCO) datasets were used to determine the utilization of outpatient salvage chemotherapy for Ontario patients with R/R aggressive lymphoma previously treated with rituximab in fiscal years (FY) 2015/16-16/17. We looked at patients treated with single agent chemotherapy: GDP, DHAP or ICE (ifosfamide, carboplatin and etoposide). We costed the GDP and DHAP regimens using the CCO formulary and LY.12 dose.

Results: Of 152 patients treated in FY 15/16, 115 (76%) patients received GDP alone, 8 (5%) received DHAP alone and 9 (6%) received ICE alone. Of the 116 patients treated in FY16/17, 91 (78%) of patients received GDP, 5 (4%) received DHAP and 6 (5%) received ICE alone. The remainder received combination chemotherapy. The cost of 3 cycles of GDP and DHAP was \$568.35 and \$1,869.53 respectively.

Conclusions: Our results indicate that the majority of patients in Ontario treated for R/R lymphoma between 2015 and 2017 received GDP alone as outpatient salvage chemotherapy, which offers cost saving opportunities in Ontario. As treatment can be given in the inpatient setting, further research is needed to understand these treatment patterns.

Keywords: lymphoma; utilization; rituximab; funding; GDP

Themes: Value for Money; Utilization trends; Population Health

OCCUPATIONAL DISEASE SURVEILLANCE OF IDIOPATHIC PULMONARY FIBROSIS AND SILICOSIS IN ONTARIO

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Purpose: As part of the Occupational Disease Surveillance System (ODSS), this project examined the risks of idiopathic pulmonary fibrosis (IPF) and silicosis within occupations and industries in Ontario. Both conditions are non-malignant fibrotic lung diseases. Silicosis is caused by inhalation of silica dust. Less is known about the occupational etiology of IPF.

Methods: Accepted Worker Safety Insurance Board (WSIB) claims were used to identify Ontario workers. Physician billing, hospital discharge, and emergency department visit data sources were linked to the accepted WSIB claims allowing investigators to follow Ontario workers for IPF and silicosis, as well as other health outcomes. Age and sex-adjusted Cox proportional hazard models were used to generate hazard ratios (HRs) and 95% confidence intervals (CI) for occupational and industry groups using a rolling cohort referent.

Results: Workers within mining industries were at increased risks for both IPF and silicosis. Workers in the forestry industry were at an elevated risk of IPF. Drilling and blasting, HR: 2.05 (95% CI: 1.22-3.47); metal processing occupations, HR: 1.33 (95% CI: 1.02-1.75); and elemental laboring, including pulp and papermaking, HR: 3.23 (95% CI: 1.54-6.78) were at an increased risk of IPF. Increased risks of silicosis were observed in drilling and blasting occupations and metal processing.

Conclusions: The surveillance of occupational diseases is essential if we are to understand how disease trends are shifting. Our findings support the possibility of IPF as an occupationally related disease. Results pertaining to silicosis were expected and serve as a flag for the disproportional burden of this disease incurred by mining workers.

Keywords: surveillance; occupational; IPF; silicosis

Themes: Prevention of Chronic Disease; Chronic disease surveillance; Population Health

WAIT TIMES FOR DIAGNOSIS TO INDUCTION CHEMOTHERAPY TREATMENT FOR ACUTE LEUKEMIA IN ONTARIO

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Purpose: Acute leukemia care requires timely confirmation of diagnosis and initiation of induction chemotherapy treatment to prevent poor clinical outcomes, including death. However, an ideal wait time target does not exist. Cancer Care Ontario (CCO) led the development and implementation of a measure to ensure patients have timely access to acute leukemia care with the best possible outcomes.

Methods: A literature review was conducted to inform the selection of appropriate wait time intervals and targets by the Acute Leukemia Advisory Committee at CCO. Data was submitted to CCO by Acute Leukemia Service Sites for newly diagnosed patients with acute leukemia who received induction chemotherapy in Ontario between October 2017 and September 2018. Results were analyzed by treatment site, patient region of residence and provincially.

Results: The literature search resulted in a review of 11 articles, which yielded contradictory results. The Committee recommended an initial target of 5 calendar days from diagnosis to initiation of induction chemotherapy. 56% of 343 cases met this target, with overall median of 5 days. Median wait times during the study period remained stable. Quarterly reporting and discussion of results with sites is underway. This has led to practice change and development of a community of practice to standardize referral processes to improve efficiency. A benchmark for performance improvement is being developed.

Conclusions: The use of performance management is an important component of provincial oversight for acute leukemia care. Providing stakeholders and partners with access to results drives improvements. Linkage to clinical outcomes is planned for the future.

Keywords: acute leukemia; wait time; diagnosis; treatment

Themes: Health System Improvements & Innovations; Integrated Care; Health Services Delivery; Best Evidence

BUILDING PSYCHOSOCIAL ONCOLOGY SERVICES INTO THE NEW PROVINCIAL FUNDING MODEL FOR RADIATION THERAPY

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2. Scarborough Health Network

Purpose: Cancer Care Ontario is currently developing a new funding model for radiation therapy, which will ensure that funding more closely follows the patient along the treatment journey. In order to build PSO services into the funding model, it is necessary to quantify patient needs for these services, and to estimate the cost of these services based on patient needs. The approach for this work was built on Cancer Care Ontario's prior experience in building PSO services into the provincial funding model for systemic therapy.

Methods: Expert PSO clinicians from across the province formed six discipline-specific expert panels: social work, psychology, nutrition, physiotherapy, occupational therapy, and speech language pathology. For each cancer type and phase of the radiation treatment journey, experts were asked to identify: 1) proportion of patients who require their services, 2) length of an average visit, and 3) average number of visits required. Online surveys were used to generate estimates as a starting point for discussion. Evidence and best practice was used to inform the expert decision making.

Results: The expert consensus estimates will be used to calculate an average “cost” for PSO services for patients undergoing radiation therapy. Given that a similar model is in place for patients receiving systemic therapy, this work will result in more comprehensive and holistic PSO funding allocation for cancer patients in the province.

Conclusions: This work is a novel approach to quantify and attach a cost to PSO needs for this population. Next steps include leveraging this work to initiate health human resources capacity planning for PSO services in Ontario, as well as ongoing data collection to understand local investments in PSO.

Keywords: psychosocial oncology; funding models; cost; radiation therapy

Themes: Health System Improvements & Innovations; Health Services Delivery

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