

# ARCC

Canadian Centre  
for Applied Research  
in Cancer Control

# ARCC CONFERENCE 2016

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*Canada's Applied Research in Cancer Control Conference*

## CONFERENCE PROGRAM

**May 8 – 9, 2016 • Toronto, Ontario**

*Hilton Toronto*

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## ACKNOWLEDGEMENTS

### CONFERENCE COMMITTEE

Kelvin Chan  
Claire de Oliveira  
Eva Grunfeld  
Stuart Peacock

### ABSTRACT REVIEW COMMITTEE

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Lisa Masucci  
Helen McTaggart-Cowan  
Johnna Perdrizet  
Ruby Redmond-Misner  
Deirdre Weyman

### STUDENT AWARD WINNERS

Kelly Brennan  
Jason Hu  
Alyson Mahar  
Syeda Kinza Rizvi  
Sophie Roher

# WELCOME MESSAGE FROM THE CO-CHAIRS

## ARCC Conference 2016

### Welcome to Toronto for the 2016 Applied Research in Cancer Control (ARCC) Conference!

The ARCC Conference is a great opportunity to meet the applied cancer research community from across Canada and parts of the world. It features health economics, services, policy and ethics. This conference continues to generate growing interest and still remains the only conference solely focused on applied cancer control research in Canada.

We have an exciting conference planned this year with over 80 presentations and scientific posters. We encourage you to share your passion and interests with new people. In case you want to meet or connect with somebody at the conference and need help, please contact Rebecca Mercer, our Network Manager ([arcc@cancercare.on.ca](mailto:arcc@cancercare.on.ca)).

This year we will be examining the complex issue of sustainability of the cancer system, particularly through the lens of health human resources. We have an outstanding group of speakers at the conference this year. For those arriving earlier on Sunday, we offer you a fireside chat on knowledge translation, with input from a panel of experts. Don't miss the opportunity to have an informal discussion with knowledge translation experts Drs. Robin McLeod, Melissa Brouwers, and Jon Kerner. They will be on hand to answer your questions and provide insights to success. Our keynote address is presented by Dr. Michael Sherar, President and CEO of Cancer Care Ontario who will bring his insights and assessment of the many challenges facing the cancer system now and into the future. Our panel discussion will feature Drs. Doris Howell, Eshwar Kumar, and Jon Emery, each of whom will speak to the health human resource aspects of cancer system sustainability from their unique perspectives.

Many people contribute to the success of this conference. It is impossible to name them all but special thanks go out to our abstract review team, our judging team, our session chairs, and our logistical liaisons. Special thanks are certainly owed to Rebecca Mercer and Kim van der Hoek whose behind the scenes work is responsible for much of the conference experience.

We are very pleased to have been able to be a part of the 2016 ARCC Conference and are confident you will enjoy the program we have helped develop. We look forward to meeting and chatting with you during the conference, and thank you for supporting ARCC.

Thank you for joining us today and we hope you enjoy the conference!

#### **Dr. Claire de Oliveira, MA, PhD**

Co-Chair, 2016 ARCC Conference

Scientist/Health Economist, Centre for Addiction and Mental Health  
Assistant Professor, IHPME University of Toronto

#### **Dr. Eva Grunfeld, MD, DPhil, CCFP, FCFP**

Co-Chair, 2016 ARCC Conference

Director, Knowledge Translation Research, Health Services Research  
Program, Ontario Institute for Cancer Research

Giblon Professor and Vice-Chair (Research), Dept. of Family and  
Community Medicine

Professor, Dalla Lana School of Public Health

Professor, Institute for Health Policy, Management and Evaluation  
University of Toronto





## WELCOME MESSAGE FROM THE CO-DIRECTORS

### ARCC Conference 2016

#### Welcome to the 2016 Applied Research in Cancer Control (ARCC) Conference!

The ARCC Conference is an integral aspect of the applied cancer research community, featuring health economics, services, policy and ethics. We are proud to say that our conference continues to grow and remains the only conference focused solely on applied cancer control research in Canada. This year we are very pleased to have our Co-Chairs, Dr. Eva Grunfeld and Dr. Claire de Oliveira, help plan our program. Eva and Claire have done a wonderful job arranging an exciting program, and we want to extend our deepest thanks to them for their hard work this year.

ARCC is a valuable resource for the applied cancer community, enabling and enhancing applied research, capacity building, and community building in cancer control. In addition, our program area webinars, newsletters and online resources allow the ARCC community to be able to connect in a meaningful way. In the last year, we have expanded to over 750 members from all across the country, and we continue to grow every week. Joining ARCC is free, and we encourage you to join if you are not yet a member – you can join online at <http://cc-arcc.ca/join/> or email [ARCC@cancercare.on.ca](mailto:ARCC@cancercare.on.ca) for more information.

In late 2015 we said farewell to Dr. Jeffrey Hoch, who was a founding co-Director of ARCC. Jeff has taken on a new appointment at UC Davis, and we wish him continued success in his new role. At that time, we welcomed Dr. Kelvin Chan as the new ARCC co-Director, and we are very happy with how quickly he has taken to this new role, including providing valuable planning and guidance to the 2016 conference. We have also made some changes to our program structure in the past year, adding in a new “Survivorship” area to better align with the work our network is championing, and re-positioning research related to patients and families in each of the ARCC program areas as patients and families remain at the core of all the work we do.

We are grateful for the continuous and generous support of the Canadian Cancer Society (CCS), the Canadian Association for Health Services and Policy Research (CAHSPR) and our partner organizations.

Thank you for joining us in 2016 and we hope you enjoy the conference!

#### **Dr. Kelvin Chan**

ARCC Co-Director  
Cancer Care Ontario (CCO)

#### **Dr. Stuart Peacock**

ARCC Co-Director  
BC Cancer Agency (BCCA)



## PROGRAM AGENDA

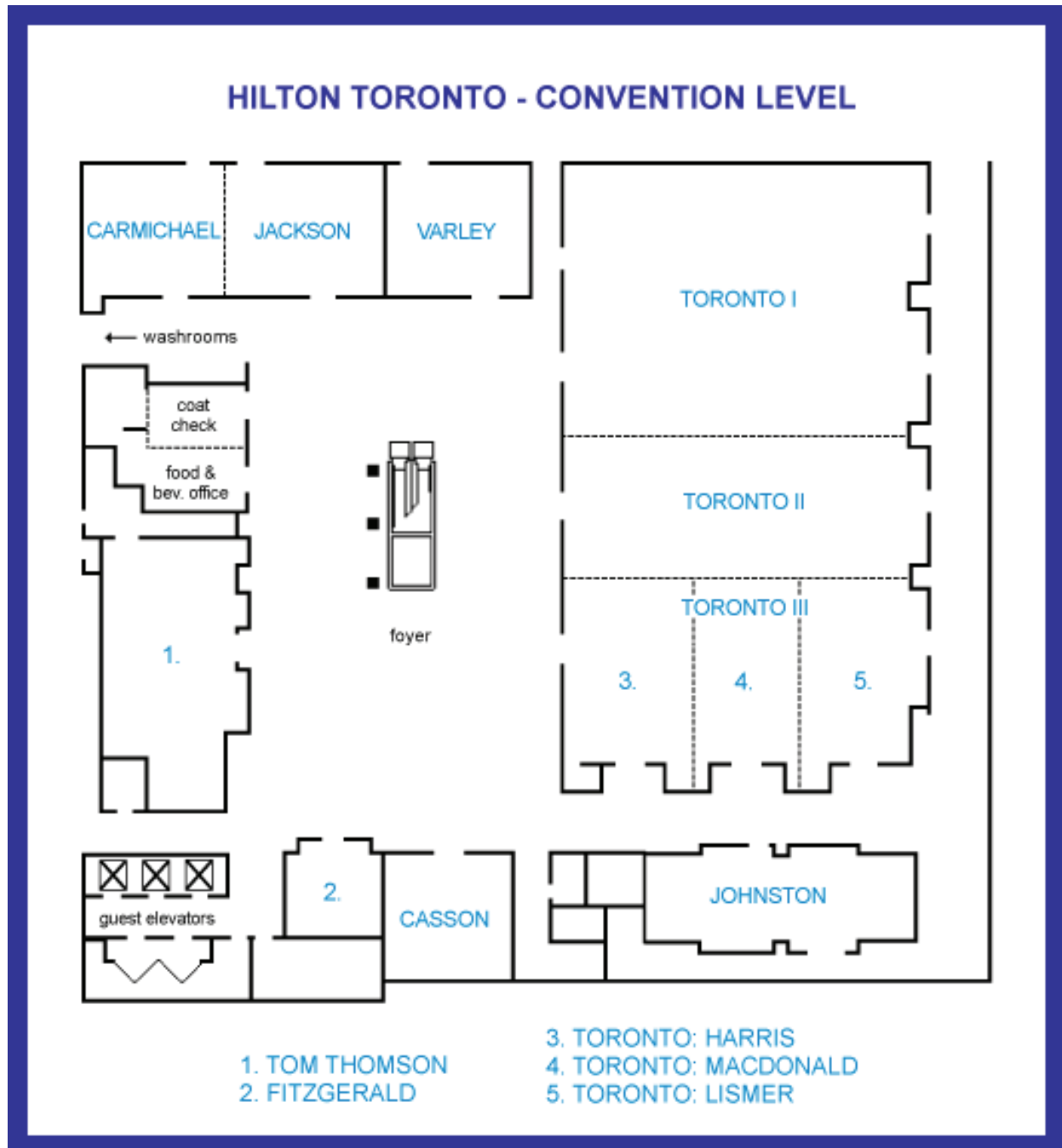
### Sunday, May 8, 2016 (Pre-Conference Day)

1:30pm – 3:30pm	<b>Fireside Chat: Knowledge Translation – How to make sure your work informs Policy</b> Moderated by <b>EVA GRUNFELD</b> , Director, KT-Net, HSRP/Vice-Chair, Research, DFCM, Ontario Institute for Cancer Research, University of Toronto Presented by <b>MELISSA BROUWERS</b> , Associate Professor and Health Services Research Lead in the Department of Oncology, McMaster University / <b>ROBIN MCLEOD</b> , Vice President, Cancer Care Ontario / <b>JON KERNER</b> , Expert Lead, Knowledge Mobilization and Evaluation, Canadian Partnership Against Cancer	<b>TOM THOMPSON</b>
4:00pm – 5:00pm	<b>Speed Networking (Pre-Registration Required)</b>	<b>CARMICHAEL/JACKSON</b>
5:00pm – 7:00pm	<b>Welcome Reception / Poster Abstracts Viewing</b>	<b>TORONTO III</b>

### Monday, May 9, 2016

7:30am – 8:30am	<b>Breakfast and Registration</b>	<b>CONVENTION LEVEL FOYER</b>
8:30am – 8:45am	<b>Welcome Remarks</b>	<b>TORONTO I &amp; II</b>
8:45am – 10:15am	<b>PLENARY PRESENTATION</b> <b>Perspectives on the sustainability of the cancer system with a focus on health human resources</b> Moderated by <b>CLAIRE DE OLIVEIRA</b> , MA PhD, Independent Scientist/Health Economist, Institute for Mental Health Policy Research, Centre for Addiction and Mental Health Presented by <b>MICHAEL SHERAR</b> , President & CEO, Cancer Care Ontario	<b>TORONTO I &amp; II</b>
10:15am – 10:30am	<b>Nutrition Break</b>	<b>CONVENTION LEVEL FOYER</b>
10:30am – 12:00pm	<b>CONCURRENT SESSIONS A</b>	
	<b>A1 COSTS OF CANCER CARE</b> Session chair: <b>CLAIRE DE OLIVEIRA</b>	<b>TORONTO I &amp; II</b>
	<b>A2 SPECIAL POPULATIONS IN CANCER RESEARCH</b> Session chair: <b>EVA GRUNFELD</b>	<b>CARMICHAEL</b>
	<b>A3 THE USE OF ADMINISTRATIVE DATA IN CANCER RESEARCH</b> Session chair: <b>WANRUDEE ISARANUWATCHAI</b>	<b>TOM THOMPSON</b>
12:00pm – 1:30pm	<b>Networking Lunch / Poster Viewing</b>	<b>TORONTO I, II, III</b>
1:30pm – 3:00pm	<b>CONCURRENT SESSIONS B</b>	
	<b>B1 CANCER CARE POLICY AND ECONOMICS</b> Session chair: <b>CHRISTOPHER J. LONGO</b>	<b>TORONTO I &amp; II</b>
	<b>B2 SURVIVORSHIP AND FOLLOW-UP CARE</b> Session chair: <b>SONYA CRESSMAN</b>	<b>CARMICHAEL</b>
	<b>B3 PATIENT-ORIENTED RESEARCH IN CANCER CARE</b> Session chair: <b>LISA BARBERA</b>	<b>TOM THOMPSON</b>
3:00pm – 3:15pm	<b>Nutrition Break</b>	<b>CONVENTION LEVEL FOYER</b>
3:15pm – 4:45pm	<b>PLENARY PRESENTATION – PANEL PRESENTATION</b> <b>A multidisciplinary approach to creating a sustainable cancer care system</b> Moderated by <b>EVA GRUNFELD</b> , Director, KT-Net, HSRP/Vice-Chair, Research, DFCM, Ontario Institute for Cancer Research, University of Toronto Presented by <b>JON EMERY</b> , Professor of Primary Care Cancer Research, University of Melbourne / <b>DORIS HOWELL</b> , Princess Margaret Cancer Cancer, University Health Network / <b>ESHWAR KUMAR</b> , Co-CEO of the New Brunswick Cancer Network	<b>TORONTO I &amp; II</b>
4:45pm – 5:00pm	<b>Poster Awards &amp; Closing Remarks</b>	<b>TORONTO I &amp; II</b>

## FLOORPLAN



## CONFERENCE COMMITTEE

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### **DR. KELVIN CHAN**

Dr. Kelvin Chan is a medical oncologist at Sunnybrook Odette Cancer Centre and an Assistant Professor at the University of Toronto. He is also a clinical epidemiologist with a focus in health economics, and a biostatistician. His research interests include health services research, health technology and drug assessments, economic evaluations, systematic review and meta-analysis including network meta-analysis. Professionally, he is interested in drug funding and reimbursement issues. He is a member of Ontario's Committee to Evaluate Drugs (CED) and the Ontario Steering Committee of Cancer Drugs (OSCCD). He is also the clinical lead of the Provincial Drug Reimbursement Programs (RPDP) at Cancer Care Ontario (CCO).

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### **DR. EVA GRUNFELD**

Dr. Eva Grunfeld is a leader in cancer health services and outcomes research. Her research focuses on evaluation and knowledge translation of cancer health services, covering the entire spectrum of cancer control activities. She is internationally recognized for making important contributions to the literature on cancer follow-up, and cancer survivorship. She is a physician scientist with the Ontario Institute of Cancer Research, Health Services Research Program and Director of the Knowledge Translation Research Network. At the same time she is the Giblon Professor and Director of Family Medicine Research at the Department of Family and Community Medicine, University of Toronto. From 2004 to 2008 she founded and directed the Cancer Outcomes Research Program at Cancer Care Nova Scotia and Dalhousie University.

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### **DR. CLAIRE DE OLIVEIRA**

Claire de Oliveira is an Independent Scientist and Health Economist at the Centre for Addiction and Mental Health (CAMH) and an Assistant Professor at the Institute of Health Policy, Management and Evaluation (IHPE) at the University of Toronto. She is also a collaborator at the Toronto Health Economics Technology Assessment Collaborative (THETA). Her main areas of cancer-related research include the development of costing methodology and the use of administrative health care data to measure health services utilization and costs. She also has extensive experience with regression modeling. Her active projects includes a large-scale CIHR-funded study that seeks to estimate the costs of cancer care for adults in British Columbia, Manitoba, Ontario, Quebec and Nova Scotia using linked administrative health care data. She is also involved in a similar study that involves the estimation of costs of pediatric cancer care in British Columbia and Ontario.

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### **DR. STUART PEACOCK**

Dr. Stuart Peacock holds the Leslie Diamond Chair in Cancer Survivorship and is a Professor in the Faculty of Health Sciences, Simon Fraser University. He is currently Co-Director of the Canadian Centre for Applied Research in Cancer Control (ARCC). ARCC is a pan-Canadian research centre providing interdisciplinary leadership in health economics, services, policy and ethics research. Stuart is also a Distinguished Scientist in Cancer Control Research at the BC Cancer Agency, a member of the Board of Directors of the Canadian Agency for Drugs and Technologies in Health, and past President of the International Society on Priorities in Health Care. He has held university positions in Canada, Australia and the UK. Over the past 20 years, Stuart's main research interests have focused on research into developing more effective cancer services, making health system funding decisions fairer and more transparent, and improving the quality of life of cancer patients and survivors.

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## INVITED SPEAKERS

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### **DR. MELISSA BROUWERS**

Melissa Brouwers is an Associate Professor and Health Services Research Lead in the Department of Oncology, McMaster University; Provincial Director of the Program in Evidence-based Care, Cancer Care Ontario; National Lead for the Capacity Enhancement Project of the Canadian Partnership Against Cancer; and KT Lead for The Canadian Centre for Applied Research in Cancer Control (ARCC). Dr. Brouwers holds a BSc in Psychology from the University of Toronto and an MA and PhD in Psychology from the University of Western Ontario. She is an active and leading member of various national and international research groups including a member of the Clinical Guidelines (CG) Action Group of the Canadian Partnership Against Cancer, and the Lead of the AGREE Research Enterprise (Principal Investigator of AGREE Next Steps Project, upcoming AGREE A3 Project and the AGREE Research Trust).

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### **PROF. JON EMERY**

Prof. Jon Emery is the Herman Professor of Primary Care Cancer Research at the University of Melbourne, a new Chair developed within the Victorian Comprehensive Cancer Centre. He is an NHMRC Practitioner Fellow, Director of the Cancer Australia Primary Care Collaborative Cancer Clinical Trials Group (PC4), and a Visiting Research Fellow at the University of Cambridge. He studied medicine at Cambridge and Oxford and obtained his DPhil at Oxford on computer decision support to assess cancer risk in general practice. His research focuses on the role of primary care across the cancer continuum, and primary care trials of complex interventions. He leads a parallel program of cancer research between Melbourne and Cambridge on cancer screening, risk assessment and early diagnosis. He has published over 170 papers and has been a Chief Investigator on research grants and awards totalling over \$AUD16 million and GBP11 million. He sits on several national advisory committees related to cancer screening and diagnosis, and cancer research.

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### **DR. DORIS HOWELL**

Dr. Doris Howell was trained as a health services researcher and is also focused on clinical intervention research. The goal of Dr. Howell's research program is to improve the patient's experience of cancer care, through health intervention research focused on better care delivery systems and clinical interventions for complex symptoms (fatigue, breathlessness, pain). Her main focus of intervention research is on understanding how psychological factors such as beliefs influence symptom response and adaptation to illness and how these might be modified through behavioral self-management interventions. Additionally, the efficacy and effectiveness of nurse-led behavioral self-management interventions in reducing symptom distress is a clinical research focus. Dr. Howell leads standards and guideline development and is a member of the national distress management implementation team under the Canadian Partnership Against Cancer. Dr. Howell has a leadership role in Cancer Care Ontario in Patient-Reported Outcomes.

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### **DR. JON KERNER**

Dr. Jon Kerner joined the Partnership in 2008 and currently serves as Expert Lead, Knowledge Mobilization and Evaluation. He also serves as Chair of the Knowledge Mobilization Steering Committee. Dr. Kerner's past roles with the Partnership include Senior Scientific Leader, Population Health and Knowledge Management; Senior Scientific Advisor, Knowledge Translation; and Chair of the Primary Prevention Advisory and Action Groups. Dr. Kerner obtained a Bachelor of Science from McGill University and his PhD in community psychology from New York University. He received post-doctoral training in cancer epidemiology, biostatistics and clinical trials design from the Johns Hopkins University School of Public Health. Prior to joining the Partnership, Dr. Kerner served as the Deputy Director for Research Dissemination and Diffusion of the Division of Cancer Control and Population Sciences at the U.S. National Cancer Institute. Before that he spent 20 years as a peer-reviewed and funded researcher at two National Cancer Institute-designated comprehensive cancer centres: Memorial Sloan Kettering Cancer Center and Georgetown University's Lombardi Cancer Center. His community-based cancer control research integrated behavioural science, cancer epidemiology, and health services research and the development of research, practice, and policy partnerships within low income and medically underserved communities. He served on numerous national grant review panels and was the first chair of the National Institutes of Health's (NIH) Community Prevention and Control Study Section (now the Community-Led Health Promotion Study Section).

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#### **DR. ESHWAR KUMAR**

Dr. Eshwar Kumar has been Co-CEO of the New Brunswick Cancer Network, a division of the New Brunswick Department of Health since 2005. He was Head of the Department of Oncology and Medical Director of the Oncology Program at the Atlantic Health Sciences Corporation, Saint John, NB, from June 1994 – March 2009. He is an Assistant Professor in the Department of Radiation Oncology at Dalhousie University, Halifax. A graduate of St Johns Medical College at Bangalore University, India, he obtained his Fellowship in Radiotherapy and Oncology from the Royal College of Radiologists, London, UK in 1982. He has been practicing as a Radiation Oncologist in Saint John, New Brunswick since 1984 with a special interest in the management of breast cancer, lymphomas, GU cancer and thyroid cancer. He is currently on the Board of Directors of the Canadian Association of Provincial Cancer Agencies (CAPCA) as well as the Board of Directors of Canadian Partnership Against Cancer (CPAC). He also serves as a surveyor for Accreditation Canada. He has been an active volunteer with the Canadian Cancer Society for over sixteen years and was the President of the New Brunswick division from 2007 – 2009. He has been on the National Board of the Canadian Cancer Society for the last six years.

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#### **DR. ROBIN MCLEOD**

As Vice-President, Clinical Programs and Quality Initiatives, works with clinical leaders across the province to improve the quality and coordination of cancer care. Previously, she served for 7 years as Surgical Lead, Quality and Knowledge Transfer. In that role, Robin led or co-led a number of initiatives including the regionalization of hepatobiliary pancreas and thoracic surgery in Ontario, the development of evidence-based guidelines in cancer surgery, the development of a gynecological oncology organizational guideline, and the development of quality-based procedure funding for cancer surgery. Robin received a BSc and MD from the University of Alberta. Following this, she completed training in general surgery at the University of Toronto, colorectal surgery at the Cleveland Clinic, and did training in clinical epidemiology at McMaster University before joining the faculty at the University of Toronto in 1985.

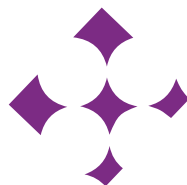
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#### **DR. MICHAEL SHERAR**

Dr. Michael Sherar is President and CEO of Cancer Care Ontario, a role he was appointed in 2011. From 2006 to 2011, he was the provincial agency's Vice-President, Planning and Regional Programs, leading the development of Regional Cancer Programs, including capital planning for cancer services across the province. Dr. Sherar is an Affiliate Scientist at the Techna Institute University Health Network where he carries out research and development of minimally invasive thermal therapy technologies for cancer including radiofrequency ablation. Dr. Sherar received a BA in Physics from Oxford University in 1985 and his PhD in Medical Biophysics from University of Toronto in 1989.

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## CONCURRENT SESSION ABSTRACTS AT A GLANCE

### Morning Concurrent Session Abstracts – A (10:30am – 12:00pm)

<b>A1 COSTS OF CANCER CARE</b>		<b>TORONTO I &amp; II</b>
Session chair: <b>CLAIRE DE OLIVEIRA</b> , MA PhD, Independent Scientist/Health Economist, Institute for Mental Health Policy Research, Centre for Addiction and Mental Health		
<b>A1.1 Determining the Cost of Equipment and Supplies of Radiation Therapy Departments Using Management Information Systems Data</b>	Presented by <b>SOO JIN SEUNG</b> , Director, HOPE Research Centre	
<b>A1.2 Cost of targeted therapies in clear cell metastatic RCC : a real world evaluation</b>	Presented by <b>SARA NAZHA</b> , McGill University	
<b>A1.3 Economic Burden of Cancer Care in Canada: Trends from 2005-2008 and 2009-2012</b>	Presented by <b>SHARADA WEIR</b> , Scientist, Centre for Addiction and Mental Health	
<b>A1.4 Economic Evaluation of Smoking Cessation in the Regional Cancer Programs of Ontario: an Exploratory Analysis</b>	Presented by <b>SANDJAR DJALALOV</b> , Health Economist at Centre for Excellence in Economic Analysis Research (CLEAR), St. Michael's Hospital	
<b>A1.5 Exploring the Economic Components of Oncology Drug Reviews for Public Reimbursement</b>	Presented by <b>LISA MASUCCI</b> , Health Economist, St. Michael's Hospital	
<b>A2 SPECIAL POPULATIONS IN CANCER RESEARCH</b>		<b>CARMICHAEL</b>
Session chair: <b>EVA GRUNFELD</b> , Director, KT-Net, HSRP/Vice-Chair, Research, DFCM, Ontario Institute for Cancer Research, University of Toronto		
<b>A2.1 Comparing Cervical Cancer Stage of Diagnosis at Presentation in Immigrant Women and Long-Term Residents</b>	Presented by <b>TEJA VORUGANTI</b> , University of Toronto	
<b>A2.2 CARES: Improving breast and cervical screening among marginalized women through a multi-faceted community intervention</b>	Presented by <b>SHEILA DUNN</b> , MD, MSc, Associate Professor and Clinician Investigator, Department of Family and Community Medicine, University of Toronto	
<b>A2.3 Time Trends in Opioid Use in Cancer and Non-Cancer Patients: Observations from Administrative Data in 18-64 Year Olds</b>	Presented by <b>LISA BARBERA</b> , Radiation Oncologist, Sunnybrook Health Sciences Centre, Odette Cancer Centre	
<b>A2.4 What Can We Learn About Rare Cancers? An Example from Brain Tumours</b>	Presented by <b>FAITH DAVIS</b> , Professor and Vice Dean, School of Public Health, University of Alberta	
<b>A2.5 Incomplete cancer diagnosis and staging in individuals with a severe psychiatric illness: A cross-sectional study using population-based cancer registry data</b>	Presented by <b>ALYSON MAHAR</b> , PhD Candidate, Queen's University	
<b>A3 THE USE OF ADMINISTRATIVE DATA IN CANCER RESEARCH</b>		<b>TOM THOMPSON</b>
Session chair: <b>WANRUDEE ISARANUWATCHAI</b> , PhD, Health Economist - Canadian Centre for Applied Research in Cancer Control, St. Michael's Hospital, and Cancer Care Ontario, Assistant Professor - Institute of Health Policy, Management and Evaluation   University of Toronto		
<b>A3.1 CanIMPACT: Understanding complexities, variation, and disparities in the breast cancer care continuum in 5 Canadian provinces using administrative data</b>	Presented by <b>PATTI GROOME</b> , Epidemiologist, Queen's University	
<b>A3.2 Radiotherapy (RT) Utilization: Ensuring That All Ontarians Who Need Treatment, Receive It</b>	Presented by <b>MICHELLE ANG</b> , Senior Specialist, Cancer Care Ontario	
<b>A3.3 Trends in systemic therapy use and cost in British Columbia and Saskatchewan: The Saskatchewan experience</b>	Presented by <b>ANDREA CORONADO</b> , Health Economics Consultant, Saskatchewan Cancer Agency	
<b>A3.4 Predictors of receipt of adjuvant treatment for resected pancreatic adenocarcinoma at the population level</b>	Presented by <b>DANIEL KAGEDAN</b> , University of Toronto	
<b>A3.5 Identifying opportunities to improve quality of cancer care: An evaluation of the use of diagnostic imaging in women curatively treated for early breast cancer (EBC)</b>	Presented by <b>KATHERINE ENRIGHT</b> , Trillium Health Partners - Credit Valley Hospital	

## Afternoon Concurrent Session Abstracts – B (1:30pm – 3:00pm)

B1 CANCER CARE POLICY AND ECONOMICS	TORONTO I & II
Session chair: <b>CHRISTOPHER J. LONGO</b> , Associate Professor, Health Policy and Management, Director, Health Services Management (MBA), DeGroote School of Business, Member, Centre for Health Economics and Policy Analysis, McMaster University, Co-chair of the Health Technology Assessment Research program, Canadian Centre for Applied Research in Cancer Control (ARCC)	
<b>B1.1 Does clinical guidelines affect healthcare quality and populational health : case study</b> Presented by <b>NIZAR GHALI</b> , Health Economist, Laval University	
<b>B1.2 Do Survivors of Adolescent and Young Adult Cancer Value Follow-up Care? A Pilot Study using Willingness to Pay</b> Presented by <b>SAPNA KAUL</b> , Assistant Professor, University of Texas Medical Branch	
<b>B1.3 The impact of pCODR on cancer drug funding decisions</b> Presented by <b>AMIRRTHA SRIKANTHAN</b> , BC Cancer Agency, Vancouver Centre	
<b>B1.4 Using Administrative Health Care Data to Inform Cancer Care Policy in Canada: Successes, Challenges and Lessons Learned</b> Presented by <b>CLAIRE DE OLIVEIRA</b> , Health Economist, Centre for Addiction and Mental Health	
<b>B1.5 Examining low value practices in cancer control: A focus on surgery for Stage IV colorectal cancer and its potential impact on the health care system</b> Presented by <b>KIM TRAN</b> , Specialist, System Performance, Canadian Partnership Against Cancer	
B2 SURVIVORSHIP AND FOLLOW-UP CARE	CARMICHAEL
Session chair: <b>SONYA CRESSMAN</b> , Health Economist, Canadian Centre for Applied Research in Cancer Control	
<b>B2.1 An exploration of how male adolescents who had childhood cancer make sense of infertility as a long-term effect of cancer treatments</b> Presented by <b>SOPHIE ROHER</b> , Student, University of Toronto	
<b>B2.2 Routine follow-up care after curative treatment of head and neck cancer: An analysis of patients' information needs and preferences for organization of healthcare services</b> Presented by <b>KELLY BRENNAN</b> , MSc. Epidemiology student, Queen's University	
<b>B2.3 The ProCare Trial: a phase II randomised controlled trial of shared care for follow-up of men with prostate cancer</b> Presented by <b>JON EMERY</b> , Professor of Primary Care Cancer Research, University of Melbourne	
<b>B2.4 CanIMPACT: Canadian Team to Improve Community-based Cancer Care along the Continuum</b> Presented by <b>EVA GRUNFELD</b> , Director, Knowledge Translation Research, Health Services Research Program, Ontario Institute for Cancer Research	
<b>B2.5 Cancer in Ontario: Relative survival ratios and trends</b> Presented by <b>TANYA NAVANEELAN</b> , Epidemiologist, Cancer Care Ontario	
B3 PATIENT-ORIENTED RESEARCH IN CANCER CARE	TOM THOMPSON
Session chair: <b>LISA BARBERA</b> , Associate Professor, Department of Radiation Oncology, University of Toronto, Senior Scientist, Sunnybrook Research Institute, Adjunct Scientist, Institute for Clinical Evaluative Sciences, Clinical Lead, Patient Reported Outcomes, Cancer Care Ontario	
<b>B3.1 Identifying barriers to cervical cancer screening among South Asian Muslim immigrant women</b> Presented by <b>SYEDA KINZA RIZVI</b> , MSc Candidate, Research Assistant, University of Calgary	
<b>B3.2 Feasibility, acceptability and efficacy of a pro-active telephone intervention to improve toxicity management during chemotherapy</b> Presented by <b>MONIKA KRZYZANOWSKA</b> , Associate Professor, Princess Margaret Cancer Centre/University of Toronto	
<b>B3.3 Do the general population have a preference to avoid cancer? Results from a discrete choice experiment</b> Presented by <b>HELEN MCTAGGART-COWAN</b> , Canadian Centre for Applied Research in Cancer Control; British Columbia Cancer Agency	
<b>B3.4 Cancer Patients' Perceptions of Continued Smoking and Smoking Cessation</b> Presented by <b>DEVON ALTON</b> , Princess Margaret Cancer Center; University of Toronto	
<b>B3.5 Considering a public's perspective on disinvestment in cancer drug funding: Results from a deliberative public engagement event in Vancouver, British Columbia</b> Presented by <b>SARAH COSTA</b> , Health Economist, Canadian Centre for Applied Research in Cancer Control-BC Cancer Agency	

## CONCURRENT SESSION ABSTRACTS GUIDE

### Morning Concurrent Session Abstracts (A) (10:30am – 12:00pm)

#### A1 COSTS OF CANCER CARE

TORONTO I & II

Session chair: **CLAIRE DE OLIVEIRA**, MA PhD, Independent Scientist/Health Economist, Institute for Mental Health Policy Research, Centre for Addiction and Mental Health

##### A1.1 Determining the Cost of Equipment and Supplies of Radiation Therapy Departments Using Management Information Systems Data

Presented by **SOO JIN SEUNG**, Director, HOPE Research Centre

equipment and supplies. The objective of this study was to determine the cost of equipment and supplies of RT departments at Ontario institutions using management information systems (MIS) data. Methods: Costs were obtained from the 2012 MIS financial data using the primary account code for Radiation Oncology (71466), and secondary MIS codes for equipment (71000-79000, 94000) and supplies and miscellaneous (4\*\*\*\*, 6\*\*\*\*). RT visits were obtained from the 2012 National Ambulatory Care Reporting System (NACRS) using Canadian Classification of Health Interventions (CCI) codes 1.\*\*.27. Individuals without a valid Ontario Health Card number were excluded from the study. An RT visit was defined as a single patient-institution-day encounter. Total MIS costs were divided by the total number of RT visits, for an equipment and supplies cost per RT visit. Results: All costs are in 2012 Canadian dollars. The total equipment and supplies cost (\$51,783,346) were obtained for 19 radiation departments and the total number of RT visits (563,776) were obtained for 19 institutions across Ontario. Fourteen institutions had both MIS costs and RT visit information. There was wide variation in equipment and supplies cost per visit across the 14 institutions, from \$6.88 to \$196.68. The mean equipment and supplies cost per RT visit was \$100.43 ± \$54.69, and the median was \$102.46 (interquartile range: \$69.10 - \$133.44). Conclusions: This is the first attempt to calculate an average cost per RT visit for equipment and supplies using current MIS data. The authors have conducted similar analyses to determine RT personnel costs (in specific cancer types) and are working on developing a costing algorithm for RT cost per visit.

Co-Author(s): Nicole Mittmann, Cancer Care Ontario / Soo Jin Seung, HOPE Research Centre / Stephanie Cheng, Institute for Clinical Evaluative Sciences / Farah Rahman, Institute for Clinical Evaluative Sciences / Craig Earle, Institute for Clinical Evaluative Sciences

##### A1.2 Cost of targeted therapies in clear cell metastatic RCC : a real world evaluation

Presented by **SARA NAZHA**, McGill University

Kidney cancer accounts for 3 % of all cancers in Canada. This malignancy has seen an increasing incidence throughout the years due to the liberal use of imaging, thus a specific increase in early stages of the cancer. However 20% of patients have metastases at diagnosis and are mainly treated with surgery and pharmacotherapy. Targeted therapies are the standard of care of pharmacotherapy including 6 new funded therapies. The funding of these therapies is disparate between Canadian provinces mainly due to their high-cost and cost-effectiveness. The objective of our study is to evaluate the economic impact of targeted therapies for the treatment of clear cell metastatic RCC in Canada using real-world data through a Canadian database (CKCis) and Markov modelization. the CKCis (Canadian Kidney Cancer information system) database was used to derive the health-care utilization of targeted therapies in 3 lines of treatment. A Markov Model with micro simulations was build to simulate the history of patients with this disease and estimate the cost. Costs of targeted therapies were pulled from the RAMQ list of drug. The cost of targeted therapy for a median follow-up of 23 months was \$55,986. Using 2 lines of therapies cost in average \$83,314 for a median follow-up of 25 months. Few patients receive 3 lines of treatment, however this leads to an additional cost of \$16,764, totalling \$100,078. We observe a decrease in the number of patients throughout the treatment lines. 366 patients had one treatment line, 132 had two treatment lines and 33 patients had three treatment lines. Among patients receiving targeted therapies, 85% of patients received Sunitinib, 23.3% received Everolimus, 21.6% received pazopanib and 11.5% were treated with Axitinib. The cost associated with the treatment of clear cell metastatic RCC is substantial to the Canadian health budget given the small incidence of this urologic cancer. The findings of this study might inform decision-makers concerning budget planning and funding to provide health care services.

##### A1.3 Economic Burden of Cancer Care in Canada: Trends from 2005-2008 and 2009-2012

Presented by **SHARADA WEIR**, Scientist, Centre for Addiction and Mental Health

Objectives: Previous work has estimated the burden of cancer care in Canada but was unable to attribute all relevant costs to the disease. Our objective was to estimate the full direct burden of cancer care in Canada, from the third-party payer perspective, using the 'net cost' method. Approach: We used a 10 year prevalence-based net cost approach to undertake our analysis. First, patient-level, linkable data from Ontario were used to create per person estimates of cost by category (hospital care, physician care, and drug expenditures). Costs attributable to cancer were estimated by the net cost method, which calculates the difference in costs between cancer patients and non-cancer control subjects, matched on age, sex and non-cancer comorbidity. These estimates will be extrapolated to the rest of Canada using national data on relative total expenditures by category. Finally, these will be aggregated across provinces/territories to create national estimates. Results: Analyses are in progress and will be completed by March 2016. Results will be presented by year (2005-2012), cost category (hospital care, physician care, and drug expenditures), age group (0-14 years, 15-34 years, 35-54 years, 55-64 years, 65-74 years, and 75 years and older), sex (male/female), and province/territory. Sensitivity analyses will be included to assess the robustness of our findings to variations in assumptions regarding: (1) relative expenditures for cancer patients across provinces/territories used to create extrapolation factors, and (2) cancer incidence and mortality rates used to create 10-year cancer prevalence estimates by province/territory. We expect that our estimates will be higher than those produced previously, since we will capture costs associated with cancer diagnosis and treatment as well as those related to cancer sequelae. Conclusion: This analysis constitutes an improvement over previous cost-of-illness studies. We anticipate that the estimated cost of cancer care in Canada will be larger than previously thought. This information will be useful to decision makers interested in understanding the total burden of cancer on the health care system.

Co-Author(s): Claire de Oliveira, CAMH / Sharada Weir, CAMH / Jagadish Rangrej, ICES / Murray Krahn, University of Toronto/ THETA Collaborative / Nicole Mittmann, Cancer Care Ontario / Jeffrey Hoch, Canadian Centre for Applied Research in Cancer Control (ARCC) / Kelvin Chan, Sunnybrook / Stuart Peacock, BC Cancer Agency



#### A1.4 Economic Evaluation of Smoking Cessation in the Regional Cancer Programs of Ontario: an Exploratory Analysis

Presented by **SANDJAR DJALALOV**, Health Economist at Centre for Excellence in Economic Analysis Research (CLEAR), St. Michael's Hospital

**OBJECTIVE** Quitting smoking can improve cancer patient outcomes including reduced all-cause and cancer-specific mortality, reduced toxicity from treatment, decreased risk of disease recurrence and second primary cancers. The study objective was to evaluate the cost-effectiveness of smoking cessation programs (SCPs) implemented in the Regional Cancer Centers of Ontario. **APPROACH** A cost-effectiveness analysis was conducted using a Markov model from Ontario payer perspective to compare current standard of SCP including screening, advice and referral and "best practice" - current standard plus medications and follow-up. A hypothetical cohort of any type of cancer patients, who were receiving treatments and were current smokers, were followed and assessed for readiness to quit over their lifetime. Transition probabilities, mortality rates and utilities were obtained from the published literature. Cost parameters were obtained from standard Ontario costing sources. Probabilistic and deterministic sensitivity analyses were undertaken; costs and outcomes were discounted at 5%. **RESULTS** The SCP "best practice" was more effective and more costly than the current standard. For males, the incremental cost-effectiveness ratios (ICERs) of the SCP were \$17,029 per QALY gained and \$8,290 per life year gained. For females, the ICERs were \$17,242 per QALY gained and \$6,772 per life year gained. The model results were sensitive to the relative risk of mortality for former and current smokers, annual health care cost of cancer patients after diagnosis, discount rates, and smoking attributable cost. **CONCLUSIONS** Our results suggested that the "best practice" version of SCP could be economically attractive when compared to the current standard of SCP. The findings should be interpreted in light of the uncertainties and assumptions made. This study provides information on the "value for money" of SCPs which could be helpful to decision-makers and health providers.

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#### A1.5 Exploring the Economic Components of Oncology Drug Reviews for Public Reimbursement

Presented by **LISA MASUCCI**, Health Economist, St. Michael's Hospital

**Objectives:** The pan-Canadian Oncology Drug Review (pCODR) was established to guide Canadian decision-makers in their cancer drug funding decisions. pCODR's evidence-based evaluation includes a review of economic evidence and assessment of cost-effectiveness. Often there is a difference in opinion about cost-effectiveness estimates. Our research objectives were to 1) compare the incremental cost effectiveness ratios (ICER) submitted by manufacturers and the economic guidance panel (EGP) reviewers at pCODR and 2) assess predictors of positive funding recommendations. **Approach:** Publicly available Economic Guidance Reports published from July 2011 until June 2014 for drug reviews with a final funding recommendation (n=39) were independently examined by two study authors. Data were collected on issues identified by the economic reviewers, manufacturer's ICER, and EGP's ICER. Logistic regressions were conducted to assess associations between the ICER and the funding recommendation (positive versus negative, positive versus conditional, and negative versus conditional). **Results:** The economic review by the EGP produced a larger ICER than the submitter's in all but 3 instances. There was an inverse relationship observed between a positive recommendation and the magnitude of the ICER in the review. **Conclusion:** This research highlights opportunities for manufacturers to align their methods for conducting economic evaluations with pCODR as well as the potential association between the ICER and funding recommendations. Many factors may contribute to this pattern, such as clinical benefit, alignment with clinical values, and feasibility of adoption.

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### A2 SPECIAL POPULATIONS IN CANCER RESEARCH

CARMICHAEL

Session chair: **EVA GRUNFELD**, Director, KT-Net, HSRP/Vice-Chair, Research, DFCM, Ontario Institute for Cancer Research, University of Toronto

#### A2.1 Comparing Cervical Cancer Stage of Diagnosis at Presentation in Immigrant Women and Long-Term Residents

Presented by **TEJA VORUGANTI**, University of Toronto

**Objectives:** Cervical cancer is highly preventable with HPV vaccination and screening. Previous work has shown that immigrants are less likely to be screened than non-immigrants. The objective of this study was to examine whether immigrant women are more likely to present with later stage cervical cancer than long-term residents. **Approach:** We conducted a retrospective cohort study of women with cervical cancer diagnosed from 2010 to 2014 using administrative health data from the Canadian province of Ontario, comparing the odds of late stage diagnosis between immigrants and long-term residents. The outcome of interest was stage of cervical cancer diagnosis, defined as early (stage I) or late (stage II-IV). We compared immigrants and long-term residents on late vs. early stage adjusting for socioeconomic measures, comorbidities and healthcare utilization. We also confirmed results with a cohort from 2007-2012. **Results:** Complete staging data was available for 218 immigrants and 874 non-immigrants. We found no association between immigrant status and stage at diagnosis (adjusted odds ratio [OR]: 0.935, p value=0.739). Factors that did show significant association with later stage diagnosis were physician characteristics, whether a woman had been previously screened, or having visited a gynecologist in the past 3 years. These results were echoed in the 2007-2012 cohort (adjusted OR: 0.942, p value=0.6773). **Conclusion:** Our results show that immigrants are not more likely to be diagnosed with late stage cervical cancer compared to long-term residents. It may be that programs broadly aimed at immigrants should adopt a targeted approach to address the barriers and facilitators of higher-risk subgroups.

Co-Author(s): Teja Voruganti, University of Toronto / Rahim Moineddin, University of Toronto / Nathaniel Jembere, Institute of Clinical Evaluative Sciences / Laurie Elit, McMaster University / Eva Grunfeld, Ontario Institute for Cancer Research / Aisha Lofters, St. Michael's Hospital

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## **A2.2 CARES: Improving breast and cervical screening among marginalized women through a multi-faceted community intervention**

Presented by **SHEILA DUNN**, MD, MSc, Associate Professor and Clinician Investigator, Department of Family and Community Medicine, University of Toronto

**Objective:** Population screening for breast and cervical cancer reduces morbidity and mortality. However inequities in screening participation exist, with lower screening rates seen among newcomer and other marginalized women. **Cancer Awareness: Ready for Education and Screening (CARES)** was designed to improve knowledge and participation in breast and cervical screening among marginalized women in Toronto, Ontario. This study assessed cancer screening uptake among CARES participants. **Approach:** From May 2012 to October 2013, the CARES team worked with community agencies to deliver a multi-faceted community-based intervention that incorporated outreach through a network of community agencies, linguistically tailored group education sessions co-facilitated by peer leaders, facilitated access to screening, and follow-up phone calls. To evaluate the intervention, we conducted a case-control study, matching CARES participants aged 21-74 years to controls (3:1) based on age, screening status on the date of the intervention, and geography. We obtained dates of breast and cervical screening prior to and after the intervention from administrative data held by Cancer Care Ontario (CCO), and compared under/never screened women in CARES and control groups for screening occurring after the intervention date. **Results:** 2033 women attended 148 educational sessions conducted in 20 different languages. Over 80% of women were foreign-born, with the majority originating in South or East Asia. Of 623 CARES participants who provided consent to obtain CCO data, 372 were age eligible and could be linked to CCO datasets. The 118 CARES participants who were under/never screened for cervical cancer at enrollment had an odds ratio for subsequent Pap screening of 3.73 [95% CI 2.14-6.45] compared with their 344 matched controls. For the 99 participants who were under/never screened for breast cancer and their 287 matched controls, odds ratio for subsequent mammography was 3.63 [95% CI 2.14-6.18] for the CARES group. **Conclusion:** This multi-faceted intervention tailored to support the needs of marginalized women was successful in increasing breast and cervical cancer screening uptake.

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## **A2.3 Time Trends in Opioid Use in Cancer and Non-Cancer Patients: Observations from Administrative Data in 18-64 Year Olds**

Presented by **LISA BARBERA**, Radiation Oncologist, Sunnybrook Health Sciences Centre, Odette Cancer Centre

**Objective:** Opioid prescribing has been increasingly scrutinized in the non-cancer patient population due to concerns with morbidity, mortality and diversion. Resulting regulatory changes have decreased prescribing. As an unintended consequence, we hypothesized that cancer patients might be similarly impacted. **Approach:** Ontario residents 18-64 years eligible for government paid pharmacare (e.g. social assistance) were identified by the presence of any drug claim in 2004 to 2013. Eligible Ontarians were annually stratified into 3 groups: no cancer history, cancer diagnosis >5 years ago and cancer diagnosis ≤5 years ago. We evaluated time trends in 2 annual outcomes: (1)opioid prescription rate=total number of opioid pharmacare claims / total population, and (2)mean daily opioid dose (in morphine equivalents)=sum of patient's mean daily opioid doses in first 90 days of opioid therapy in each year / total patients with an opioid prescription in that year. **Results:** The number of 18-64 year olds eligible for the cohort increased each year with ~800,000 eligible in 2013 (3% recent cancer, 2% remote cancer). There were modest demographic differences among cancer groups. Across all years, overall opioid prescription rates were highest for those with recent cancer and lowest for those with no cancer. Prescription rates changed over time by +8%, +6% and -2% in the non-cancer, remote cancer and recent cancer groups respectively. Increases in long acting opioids and immediate release single agents, and decreases in long acting oxycodone and fentanyl prescriptions were observed in all cancer groups. The mean daily opioid dose increased for all patients receiving long acting oxycodone. However, between cancer groups, the mean daily dose was similar regardless of drug class. **Conclusion:** Regulatory measures have succeeded in decreasing prescription rates in some but not all drug classes. Changes over time in both outcomes were similar for all 3 groups, suggesting that factors influencing prescribing are affecting cancer and non-cancer patients similarly, possibly to the detriment of cancer patients (i.e. poor pain control).

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## **A2.4 What Can We Learn About Rare Cancers? An Example from Brain Tumours**

Presented by **FAITH DAVIS**, Professor and Vice Dean, School of Public Health, University of Alberta

Comprehensive surveillance information on rare cancers is not readily available as any province may have too few cases. We will summarize our experience in assessing information gaps, estimating survival and developing solutions for brain tumour data as an example of improving opportunities for clinical and health services research in rare cancers. A survey of cancer registry personnel, a scan of registry websites and a review of routine surveillance reports in all provinces was completed. Canadian Cancer Registry (CCR) data files (1992-2010) were accessed through Statistics Canada research data center. Survival analysis for brain cancer using data from 1992-2008 by province and tumour subtypes was conducted using Kaplan Meier estimates, Cox Proportional Hazards and time-specific generalized linear models. Ongoing work, funded by the Brain Tumour Foundation of Canada and Brain Canada, to implement standardized data acquisition and reporting will be described. Steps to achieve a comprehensive pan-Canadian brain tumour surveillance report will be outlined. The rationale and legislation for developing a brain tumour surveillance system including both malignant and benign brain tumours is in place, although funding to implement this has been limited. Once accomplished this system will include approximately twice the number of current cases. Support for standardized reporting and coding at the provincial cancer registry will provide complete and high quality incidence, mortality and survival data. In collaboration with provincial and national stakeholders, data from 5 provinces, reflecting 90% of all tumours, will be incorporated into the CCR for preparation of a comprehensive National Surveillance report. Survival estimates are consistent with previous literature although there is a need to explore underlying reasons for observed variation in survival rates by region. Current surveillance data on brain tumours is not comprehensive and not readily accessible for multi-regional research. Collaborative efforts on the part of cancer registry and neuro-oncology stakeholders will serve to enhance the quality and utility of this information for improving the overall patient experience. Similar pan-Canadian efforts for other rare cancers may be warranted.

**Co-Author(s):** Faith Davis, School of Public Health, University of Alberta / Yan Yuan, School of Public Health, University of Alberta

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## **A2.5 Incomplete cancer diagnosis and staging in individuals with a severe psychiatric illness: A cross-sectional study using population-based cancer registry data**

Presented by **ALYSON MAHAR**, PhD Candidate, Queen's University

Background: Advanced cancer stage at diagnosis is a potential explanation for high cancer mortality among patients with a severe psychiatric illness (SPI); however, studies are inconclusive. The exclusion of patients with missing stage data may be responsible for these uncertain conclusions, particularly if patients with SPI are more likely to present with missing stage data. Therefore, we investigated the relationship between an SPI history and an unknown stage of cancer at diagnosis to understand the possible clinical and research-related implications of missing data on this relationship. Methods: This was a population-based, cross-sectional study designed to use provincial administrative healthcare data. Individuals diagnosed with a colon or rectum cancer in Ontario between 04/01/2007 and 12/31/2013 were included. Hospitalization data, physician billing data, emergency room visit data, and cancer registry data were combined to measure SPI history and TNM cancer stage. A descriptive analysis of additional missing information at diagnosis, such as primary tumour site or, histology was performed. The association between an SPI history and unknown cancer stage was estimated using multiple log-binomial regression. Results: Individuals with an SPI history were significantly more likely to have higher frequencies of missing data, lower quality cancer data collected, and to have no record of evaluation for key cancer characteristics compared to individuals without a history of a mental illness. Patients with an inpatient SPI history were at the highest risk of a missing cancer stage, and 55% more likely to have a missing TNM stage at diagnosis compared to patients with no history (RR 1.55; 95% CI: 1.31-1.84; p-value: <0.0001). These results were robust to multiple sensitivity analyses. Conclusion: Cancer patients with SPI are less likely than patients without SPI to have complete cancer stage information at presentation. Incomplete and low quality cancer staging data likely undermines the quality of cancer care following initial diagnosis. Understanding why patients with an SPI are missing this information is a critical first step to providing excellent care to this vulnerable population.

Co-Author(s): Alyson Mahar, Queen's University / Paul Kurdyak, Centre for Addictions and Mental Health, Institute for Clinical Evaluative Sciences / Patti Groome, Queen's University

## **A3 THE USE OF ADMINISTRATIVE DATA IN CANCER RESEARCH**

**TOM THOMPSON**

Session chair: **WANRUDEE ISARANUWATCHAI**, PhD, Health Economist - Canadian Centre for Applied Research in Cancer Control, St. Michael's Hospital, and Cancer Care Ontario, Assistant Professor - Institute of Health Policy, Management and Evaluation | University of Toronto

## **A3.1 CanIMPACT: Understanding complexities, variation, and disparities in the breast cancer care continuum in 5 Canadian provinces using administrative data**

Presented by **PATTI GROOME**, Epidemiologist, Queen's University

Objective: CanIMPACT is a multi-province Canadian research team funded to understand the interplay between primary and oncology breast cancer care. A first step was to describe current practice and inter/intra-provincial care variation across the care continuum using provincial administrative health data. Here we describe the inter-provincial process and analysis plans. Approach: Our multi-disciplinary team includes five Canadian provinces: British Columbia, Alberta, Manitoba, Ontario and Nova Scotia. Cohorts consist of all breast cancers diagnosed from 2007 to at least 2011 in each of the five provinces. Common databases include cancer registries, census area-level income and rurality, outpatient physician claims, ambulatory care and inpatient hospitalizations. Other databases with laboratory, pharmacy, emergency services, and immigration data were available in some provinces. Common data elements across provincial datasets were identified, and a standardized methodology was developed. Results: Common data processing and analysis plans were finalized over 24 months; provinces refined details as per local context while maximizing methodological comparability. Basic descriptive analyses plus 18 phase-specific and 3 longitudinal analyses have been planned. Six plans for the diagnostic phase focus on identifying modifiable disparities in access and outcomes; 8 plans for the treatment phase focus on variation in chemotherapy treatment patterns, quality/safety, and utilization of primary care services; 4 plans for the survivorship phase focus on adherence to guidelines for follow-up breast cancer care, other chronic diseases and preventive care; 3 longitudinal analyses assess factors related to changes in utilization of chronic disease services over the cancer care continuum. Conclusions: We have shown it is feasible to develop and standardize data processing and analyses across multiple provinces to address important cancer care questions across the continuum. This work will inform comparisons and improvements in Canadian cancer care. This effort has also helped increase research capacity in health services research.

Co-Author(s): Patti Groome, Queen's University / Marcy Winget, Stanford School of Medicine / Li Jiang, Queen's University / Kathleen Decker, CancerCare Manitoba / Cynthia Kendall, Dalhousie University / Monika Krzyzanowska, University Health Network / Dongdong Li, BC Cancer Agency / Aisha Lofters, University Health Network / Mary McBride, BC Cancer Agency / Nicole Mittmann, Cancer Care Ontario / Rahim Moineddin, University Health Network / Geoff Porter, Dalhousie University / Donna Turner, CancerCare Manitoba / Robin Urquhart, Dalhousie University / Eva Grunfeld, University Health Network

## **A3.2 Radiotherapy (RT) Utilization: Ensuring That All Ontarians Who Need Treatment, Receive It**

Presented by **MICHELLE ANG**, Senior Specialist, Cancer Care Ontario

Objectives: RT plays an essential role in cancer management, symptom control and cure. Significant geographic variations in the proportion of patients treated with RT exists provincially, suggesting shortfalls in RT use. The objectives of this study were to provide actionable data to regional leadership to help identify local unmet RT needs. Approach: Using Ontario Cancer Registry and CCO's Activity Level Reporting data, the CCO project team, together with the Queen's Cancer Research Institute (QCRI), examined provincial annual RT utilization rates, defined by MacKillop in 2003, as the proportion of patients receiving at least one course of RT during the first year of diagnosis. Data (2009-2011) were analyzed by Local Health Integration Network (LHIN), cancer type and hospital (with ≥ 500 cancer patients diagnosed annually) of diagnosis. LHIN-specific reports were generated in consultation with senior administrators to determine the appropriate content, messaging and provided regional ranking and comparisons. Results: The observed provincial rate (29.9%) falls short of the current estimate of the appropriate rate (33.6%) indicating that approximately 2500 Ontario patients that would benefit from RT are not receiving it. Considerable inter-LHIN and intra-LHIN variation have been noted, and utilization variation based on hospital of diagnosis was also observed. For example the utilization rate for lung cancer varies from 30%-48% between two different university teaching hospitals within one LHIN. Conclusions: The construction and dissemination of utilization reports presents the opportunity for decision-makers to discover root causes of regional under-utilization. Hospital-level data will assist in determining where appropriate interventions are needed. Decreasing regional utilization variation and subsequently increasing overall rates will ensure that Ontario patients receive more equitable access to RT.

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### **A3.3 Trends in systemic therapy use and cost in British Columbia and Saskatchewan: The Saskatchewan experience**

Presented by **ANDREA CORONADO**, Health Economics Consultant, Saskatchewan Cancer Agency

Budget constraints are a growing concern among cancer care providers, who struggle to provide patients with the latest therapies such as oral anti-cancer drugs. Administrative health care data can provide useful information to measure systemic therapy costs appropriately and to compare cost patterns among jurisdictions. Thus, our objective was two-fold; 1) To describe trends in systemic therapy use and cost in British Columbia (BC) and Saskatchewan, by therapy type and cancer site, from 2006 to 2013 2) Create inter-provincial collaboration to strengthen health economics research capacity and interpret results as a collective. Using data from the BC Systemic Therapy program and Saskatchewan Cancer Agency (SCA) Pharmacy Database, we identified 64 systemic therapy drugs covered in both provinces, categorized by administration route ("oral" or "other"). Drug dispensing records were linked with patient data from the BC Cancer Registry and SCA Cancer Registry respectively using unique patient identifiers. Although data were linked and analyzed separately in each province, we developed a harmonized costing methodology to ensure comparable cost estimates between Saskatchewan and BC. In Saskatchewan, 23,804 patients received systemic therapy services between 2006 and 2013. During this period, the cost of anti-cancer systemic therapy increased dramatically, representing one third of the SCA 2013 expenses. Oral anti-cancer therapy costs steadily increased at 3.5% annually, compared to 1.8% for other anti-cancer drugs. Moreover, the overall crude growth in expenses surpassed the growth in number of prescriptions and patient volume during the observation period. A comparative analysis of cost drivers and trends between BC and Saskatchewan is currently underway, and will help to identify the main factors of the observed systemic therapy cost growth. By means of this study, we could establish a framework to successfully link administrative databases housed at SCA for health economic analyses, and provided new and accurate information of systemic therapy cost trends to decision makers in Saskatchewan.

Co-Author(s): Andrea Coronado, Saskatchewan Cancer Agency / Reka Pataky, Canadian Centre for Applied Research in Cancer Control / Darryl Boehm, Saskatchewan Cancer Agency / Stuart Peacock, Canadian Centre for Applied Research in Cancer Control / Riaz Alvi, Saskatchewan Cancer Agency

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### **A3.4 Predictors of receipt of adjuvant treatment for resected pancreatic adenocarcinoma at the population level**

Presented by **DANIEL KAGEDAN**, University of Toronto

Objectives: This study aims to describe patterns of adjuvant treatment utilization following curative-intent resection of pancreatic adenocarcinoma (PC) at the population level, and to identify independent predictors of receipt of adjuvant treatment. Approach: In this observational cohort study, patients undergoing PC resection in the province of Ontario (population 13 million) between 2005-2010 were identified using the provincial cancer registry, and linked to administrative databases that include all treatments received and outcomes experienced in the province. Patients were defined as having received chemotherapy (CT), chemoradiation (CRT), or observation (OBS). Clinicopathologic factors associated with receipt of CT, CRT, or OBS were identified by chi-square test. Logistic regression analyses were used to identify independent predictors of adjuvant versus OBS, and CT versus CRT. Results: Of the 397 patients included, 75.3% received adjuvant treatment (27.2% CRT, 48.1% CT) and 24.7% received OBS. Within a single-payer healthcare system with universal coverage of costs for CT and CRT, substantial variation by geographic region was observed. While the likelihood of receiving adjuvant treatment increased between 2005-2010 ( $p=0.002$ ), widespread variation was observed between the treating institutions ( $p=0.001$ ) on multivariate analysis. Younger age, positive lymph nodes, and positive surgical resection margins predicted increased likelihood of receiving adjuvant. Among patients receiving adjuvant treatment, positive margins and low comorbidity burden were associated with CRT over CT. Conclusions: Inter-institutional medical practice variation contributes significantly to differential patterns in rates of adjuvant treatment for PC. Further elucidation of this phenomenon, and the degree to which such variation is warranted, are needed.

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### **A3.5 Identifying opportunities to improve quality of cancer care: An evaluation of the use of diagnostic imaging in women curatively treated for early breast cancer (EBC)**

Presented by **KATHERINE ENRIGHT**, Trillium Health Partners - Credit Valley Hospital

Introduction: The overuse of imaging scans to detect recurrence in curatively treated EBC patients was recently identified as one of ASCO's top five opportunities to improve the quality of cancer care. We undertook a population-level assessment of the current practice of imaging in women treated for EBC. Methods: EBC patients diagnosed in Ontario, Canada between 01/2006 – and 12/2010 were identified from the Ontario Cancer Registry. Patient records were linked deterministically to provincial healthcare databases to provide comprehensive follow-up. We identified any advanced imaging scans (AIS) (computed tomography, bone scans) and basic imaging scans (BIS) during the first year after completion of curative treatment. Descriptive analyses were used to assess the impact of patient and provider characteristics on the likelihood of having AIS. Results: Of the 30,006 EBC patients included, 9,186 (30.6 %) had AIS in year one. In patients with AIS, the median number of scans was 2.5 (IQR 1-3). Older age, higher stage, comorbidity, chemotherapy (CT) exposure and having had staging investigations increased the likelihood of AIS ( $P < 0.001$ ). The majority of year one scans were ordered by medical oncologists (38%) followed by primary care physicians (23%), surgeons (13%) and emergency room physicians (7%). Conclusions While imaging is common in follow-up for EBC patients and appropriate for symptom driven investigation, the high rate of AIS use is an actionable target for quality improvement.

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## Afternoon Concurrent Session Abstracts – B (1:30pm – 3:00pm)

### B1 CANCER CARE POLICY AND ECONOMICS

TORONTO I & II

Session chair: **CHRISTOPHER J. LONGO**, Associate Professor, Health Policy and Management, Director, Health Services Management (MBA), DeGroote School of Business, Member, Centre for Health Economics and Policy Analysis, McMaster University, Co-chair of the Health Technology Assessment Research program, Canadian Centre for Applied Research in Cancer Control (ARCC)

#### B1.1 Does clinical guidelines affect healthcare quality and populational health : case study

Presented by **NIZAR GHALI**, Health Economist, Laval University

In Quebec, colonoscopies volumes have continued to rise in recent years in the absence of effective monitoring mechanism for the appropriateness and the quality of these exams. In 2010, November, Quebec Government introduced the colorectal cancer screening program in the objective to control for volume and cost imperfection. This program is based on clinical standards and was initiated for first group of institutions. One year later, Gouvernement add financial incentives for participant institutions. In this analysis, we want to assess for the causal effect of the two components of this program : clinical pathways and financial incentives. Especially we assess for the reform effect on healthcare quality and populational health in the context that medical remuneration is not directly dependent on this additional funding offered by the program. We have data on admissions episodes and deaths for 8 years. We use multistate model analog to difference in difference approach to estimate reform effect on the transition probability between different states for each patient. Our results shows that the reform reduced length of stay without deterioration in hospital mortality or readmission rate. The program also contributed to decrease the hospitalization rate and a less invasif treatment approach for colorectal surgeries. This is a sign of healthcare quality and population health improvement. We demonstrate in this analysis that physicians behaviour can be affected by both clinical standards and financial incentives even if offered to facilities.

Co-Author(s): Nizar Ghali, Laval University / Bernard Fortin, Laval University / Guy Lacroix, Laval University

#### B1.2 Do Survivors of Adolescent and Young Adult Cancer Value Follow-up Care? A Pilot Study using Willingness to Pay

Presented by **SAPNA KAUL**, Assistant Professor, University of Texas Medical Branch

Objectives: Survivors of adolescent and young adult (AYA) cancer, diagnosed ages 15-39 years, require life-long care to manage late effects that develop due to therapeutic exposures. Yet, research demonstrates that AYA survivors forego follow-up care. We examined determinants of survivors' willingness to pay (WTP; measure of value) for follow-up care. Approach: AYA survivors, currently 18 years and older, who had completed their primary therapy (N=200) were randomly identified by the statewide Utah Cancer Registry. Of these, 64 agreed to be contacted and 32 participated. We conducted 6 focus groups and 4 interviews from April-August 2015. All participants completed a mini-survey and responded to WTP questions. A double-bounded format was used to elicit participants' WTP for two payment mechanisms: one-time versus monthly contributions toward annual follow-up visits. Focus group transcripts were coded by 2 researchers (percent agreement=97.8%). An interval regression identified factors associated with WTP. Results: At least 1 day of poor physical health in the previous month was reported by 45% of participants. Yet, 40% reported having no routine medical visits in the previous year. WTP measures revealed that survivors were willing to pay more toward a monthly plan (\$50 per month, 95% Confidence Interval (CI): 32-76 (summing to \$600 annually)) than for one-time payment (\$357 annually, 95% CI: 255-573). For both the annual and monthly plans, females had a higher WTP than male survivors. Other factors such as self-reported health status and time of last visit also affected WTP. Over 50% of participants refused to pay one-time out of pocket payment for annual follow-up visits citing reasons including not having enough money, costly care, and ineffective follow-up care. Conclusions: AYA survivors' valuations of follow-up care depend on payment mechanisms and survivors care about the effectiveness of recommended care. Perhaps healthcare facilities should examine the effectiveness of alternative and flexible payment models (e.g., medical home model) to help vulnerable AYA survivors receive recommended care in a timely fashion.

Co-Author(s): Sapna Kaul, University of Texas Medical Branch / Rochelle Smits-Seemann, University of Utah / Eduardo Zamora University of Utah / Holly Spraker-Perlman, University of Utah / Kevin Boyle, Virginia Tech / Anne Kirchhoff, University of Utah

#### B1.3 The impact of pCODR on cancer drug funding decisions

Presented by **AMIRRTHA SRIKANTHAN**, BC Cancer Agency, Vancouver Centre

Introduction The pan-Canadian Oncology Drug Review (pCODR) was implemented in 2011 to address uneven drug coverage and lack of transparency with the various provincial cancer drug review processes in Canada. We evaluate the impact of pCODR on provincial decision concordance and time from Notice of Compliance (NOC) to drug funding. Methods: A retrospective review was undertaken. We identified new indications for cancer drugs between January 2003 and May 2014 using the Health Canada Drug Product Database. Provincial formulary listings for drug-funding dates and decisions between January 1, 2003 and December 31, 2014 were retrieved. Multiple linear models and quantile regressions were used to evaluate changes in time to decision-making before and after the implementation of pCODR. Agreement of decisions between provinces was evaluated using kappa statistics. Results: Data were available from 9 provinces (all Canadian provinces except Quebec). 88 indications representing 51 unique cancer drugs were identified. Two provinces did not have data available for all 88 indications at the time of data collection. There was a significant increase in inter-provincial concordance in drug funding decisions after pCODR implementation (Brennan-Prediger coefficient: pre-pCODR 0.54, post-pCODR 0.78, p-value=0.002). Nationwide, there was a significant decrease in the median number of days from Health Canada's NOC date to date of funding (522 to 393 days, p-value<0.001). Exploratory analyses excluding provinces with incomplete data did not change the results. Conclusion: The implementation of pCODR has resulted in greater concordance in cancer drug funding decisions across provinces and decreased time to funding decisions.

Co-Author(s): Amirrtha Srikanthan, BC Cancer Agency, Vancouver Centre / Helen Mai, CADTH - pan-Canadian Oncology Drug Review (pCODR) / Nianda Penner, CADTH - pan-Canadian Oncology Drug Review (pCODR) / Eitan Amir, Princess Margaret Cancer Centre - University Health Network / Andreas Laupacis, Li Ka Shing Knowledge Institute / Mona Sabharwal, CADTH - pan-Canadian Oncology Drug Review (pCODR) / Kelvin Chan, Division of Medical Oncology, Sunnybrook Odette Cancer Centre



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#### **B1.4 Using Administrative Health Care Data to Inform Cancer Care Policy in Canada: Successes, Challenges and Lessons Learned**

Presented by **CLAIRE DE OLIVEIRA**, Health Economist, Centre for Addiction and Mental Health

**Objectives:** Resource and cost issues are a growing concern in the health care field. In assessing the burden of cancer care, it is important to measure costs appropriately. Based on previous studies and work-in-progress, we discuss the successes, challenges and lessons learned in undertaking comparative costing analyses using Canadian data. **Approach:** Provinces can link population-based registries, clinical, and administrative data to measure costs for cancer patients. Measuring costs generally requires two components: utilization data (i.e. how many resources are used) and unit cost data (i.e. how much each health service costs). Existing cancer costing methods follow the guidelines of the Canadian Association for Drugs and Technology in Health; however, there is scope for inter-provincial variations. Due to privacy legislation, parallel analyses need to be conducted in each province. The creation of cross-provincial collaborations, such as the Canadian Cancer Costing Consortium, is of great importance within this context. **Results:** Conducting sound comparative analyses can be challenging as administrative data were not originally designed to support research. Data availability varies greatly across the country as well as the way these data are collected and recorded. Rigorous comparative analyses require identifying and measuring all variables in the same way, which is not trivial. Nonetheless, Canada is well-positioned to create and sustain data platforms for costing research. Recent work has highlighted potential areas that require inter-provincial harmonization. Comparing cancer-specific care, such as chemotherapy and radiation therapy, can be difficult as data are not recorded in a standard manner across provinces; furthermore, unit cost estimates are rarely available. Attention may also be required to appropriately capture costs with physician services. Comparison of hospitalization costs presents fewer challenges. **Conclusion:** We present suggestions on how best to harmonize inter-provincial costing analyses, in an effort toward building capacity in cancer control/costing across Canada. The resulting work will aid decision-makers on issues such as resource allocation and planning of future health care budgets, and provide insight on system efficiency/performance.

Co-Author(s): Claire de Oliveira, CAMH / Sharada Weir, CAMH / Murray Krahn, University of Toronto

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#### **B1.5 Examining low value practices in cancer control: A focus on surgery for Stage IV colorectal cancer and its potential impact on the health care system**

Presented by **KIM TRAN**, Specialist, System Performance, Canadian Partnership Against Cancer

**Objectives:** Choosing Wisely Canada has produced cancer-related recommendations describing practices that should be questioned because they are not supported by evidence, potentially harmful and frequently used in Canada. One recommendation is that extensive locoregional therapy should not be routinely used in most cancer situations where there is metastatic disease and minimal symptoms attributable to the primary tumour. Here, we describe colorectal resections for Stage IV colorectal cancer (CRC)—a proxy measure of the recommendation—and its impact on health system resources. **Approach:** Adult patients diagnosed with Stage IV CRC in 2013 were identified using data collected in five provincial cancer registries. Receipt of colorectal resection within one year of Stage IV diagnosis was identified through surgical procedure codes in the registry or by linking registry data to hospital/cancer centre data. The Canadian Partnership Against Cancer's Cancer Risk Management Model (CRMM) was used to develop microsimulation modelling scenarios that show the impact of selected cancer control interventions for Stage IV CRC. **Results:** In 2013, between 32.1% (Manitoba) and 58.3% (Prince Edward Island) of patients with Stage IV CRC received colorectal resections. The CRMM estimated that there were 4,371 patients with Stage IV CRC in 2013, 1,179 of whom had colorectal resections. If the number of colorectal resections could be reduced by 15%, by 2030 approximately 5,100 surgeries could be avoided, over \$120 million could be redirected to other health care services, and over 43,000 bed-days in the hospital and 11,000 hours of surgery time could be freed up for other patients (cumulatively). **Conclusions:** Measuring variations can help to identify opportunities for benchmarking, which can enhance alignment with evidence-based guidelines. It is important to note that surgery of the primary tumour is warranted in some cases where cure is possible or for palliation of symptoms. Further work is needed to understand the reasons for the variation observed and what amount of surgery for Stage IV CRC represents overuse of care that is not supported by evidence.

Co-Author(s): Kim Tran, Canadian Partnership Against Cancer / Rami Rahal, Canadian Partnership Against Cancer / Gina Lockwood, Canadian Partnership Against Cancer / Cheryl Louzado, Canadian Partnership Against Cancer / Jin Niu, Canadian Partnership Against Cancer / Heather Bryant, Canadian Partnership Against Cancer

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### **B2 SURVIVORSHIP AND FOLLOW-UP CARE**

**CARMICHAEL**

Session chair: **SONYA CRESSMAN**, Health Economist, Canadian Centre for Applied Research in Cancer Control

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#### **B2.1 An exploration of how male adolescents who had childhood cancer make sense of infertility as a long-term effect of cancer treatments**

Presented by **SOPHIE ROHER**, Student, University of Toronto

**Objective:** Clinical practice guidelines recommend that healthcare professionals (HCPs) discuss fertility preservation (FP) with cancer patients, however studies show that many HCPs do not initiate these discussions with male adolescents. Indeed, research examining male adolescents' perceptions of potential infertility and FP options is limited. This study examines how male adolescents who had childhood cancer understand infertility as a long-term effect of cancer treatments and explores how their experiences of cancer shape their self-concepts. **Approach:** This project utilizes a narrative analysis to examine 16 interviews with male adolescents (14-18 years old) who experienced childhood cancer. It was undertaken as part of a larger study examining parent, survivor, and provider perspectives about the potential of FP in prepubescent boys with cancer. This study applies Arthur Frank's three narrative typologies (restitution, quest, and chaos narratives) as a theoretical framework to examine how male adolescents who had childhood cancer understand and experience the possibility of infertility as a long-term effect of cancer treatments. **Results:** i) All three narrative types were evident in the interviews with a predominant emphasis on the restitution and quest narratives; ii) the narratives highlighted the important role of family in the adolescents' understanding and experience of infertility; iii) the narratives shed light on the importance of biological parenthood to the participants; and iv) questions about FP raised questions about selfhood and identity construction for all the participants irrespective of narrative type. This study demonstrates the complex relationship between illness and selfhood. It shows that the opportunity to discuss potential infertility and FP options with a doctor may have important consequences for the way childhood cancer patients come to see themselves and construct their identities. **Conclusion:** This study aims to inform FP and clinical practice guidelines for HCPs working with adolescents. The findings may be particularly relevant to future research examining the experience of adolescents who have experienced cancer, as well as support groups, awareness programs, and HCPs who work with adolescent cancer survivors and patients.

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**B2.2 Routine follow-up care after curative treatment of head and neck cancer: An analysis of patients' information needs and preferences for organization of healthcare services**

Presented by **KELLY BRENNAN**, MSc. Epidemiology student, Queen's University

**Objectives:** Evidence suggests that cancer patients' follow-up needs vary, indicating that a single follow-up regimen may not be suitable. The study objectives were to describe patients' follow-up needs and preferences, to identify which patient characteristics predict needs and preferences, and to evaluate how needs and preferences change over time. **Approach:** This prospective cohort study included 175 head and neck cancer patients who completed treatment between 2012 and 2013 in Kingston and London, ON. A survey was completed at follow-up appointments at one year and two years after treatment to collect information on patient characteristics, needs and preferences. Bivariate analyses were used to identify predictors individually, and ordinal logistic regression models were used to collectively study predictors of follow-up needs and preferences. Odds ratios and 95% confidence intervals were estimated. Needs and preferences at one and two year anniversaries were compared using the Wilcoxon-Mann-Whitney test. **Results:** A diverse range of information needs and preferences for follow-up care was found, with the exception of patients' need to receive information on their own prognosis (95.4%). Follow-up needs varied for undergoing tests, receiving information on healthy living, and having discussions on pain and fear. Preferences for the frequency of appointments and providers of care were mixed. Patient characteristics such as psychosocial measures (ECOG, anxiety, fear of recurrence, quality of life), attitudes towards follow-up (reassurance, communication, perceived disadvantages), demographics (age, sex, marital status), and clinical characteristics (alcohol consumption, T category) predicted needs and preferences for follow-up care ( $p < 0.05$ ). Significant reductions in needs and preferences for frequency of appointments were found as patients transitioned from one year to two years after treatment ( $p < 0.05$ ). **Conclusion:** Patient characteristics should be considered when planning alternative follow-up regimens to personalize care and better address individual patient needs where possible. Patients value their current follow-up care. Needs decline over time, though they do not diminish altogether. Delivering adequate patient education is crucial to ensure realistic expectations for follow-up care.

Co-Author(s): Kelly Brennan, Queen's University / Stephen Hall, Queen's University / John Yoo, Western University / Yingwei Peng, Queen's University / Deb Feldman-Stewart, Queen's University

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**B2.3 The ProCare Trial: a phase II randomised controlled trial of shared care for follow-up of men with prostate cancer**

Presented by **JON EMERY**, Professor of Primary Care Cancer Research, University of Melbourne

**Background:** There is a growing prevalence of prostate cancer survivors who require follow-up after treatment. This randomised phase II trial aimed to test the feasibility and provide estimates of efficacy of a model of shared care for men after completion of treatment for prostate cancer. **Methods:** Men who had completed surgery and/or radiotherapy for low to moderate risk prostate cancer within the previous eight weeks were eligible. Participants were randomised to usual care or shared care. Shared care entailed substituting two hospital visits with three visits in primary care, a survivorship care plan, recall and reminders, and screening for distress and unmet needs. Outcome measures included psychological distress, prostate cancer-specific quality of life, satisfaction and preferences for care and health care resource use. **Results:** 88 men were randomised (Shared Care  $n=45$ ; Usual Care  $n=43$ ). There were no clinically important or statistically significant differences between groups on distress, prostate cancer-specific quality of life, or satisfaction with care. Preferences for follow-up care models differed between groups ( $p=0.0007$ ), with a shared care model being preferred by 63% of intervention patients compared to 24% of controls after 12 months. There was high compliance with PSA monitoring in both groups. The shared care model was cheaper than usual care (Shared care \$1,411; Usual Care \$1,728; difference \$323 (plausible range \$91-554)). **Conclusion:** Well-structured shared care for men with low to moderate risk prostate cancer is feasible and appears to produce clinically comparable outcomes to standard care at lower cost.

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**B2.4 CanIMPACT: Canadian Team to Improve Community-based Cancer Care along the Continuum**

Presented by **EVA GRUNFELD**, Director, Knowledge Translation Research, Health Services Research Program, Ontario Institute for Cancer Research

**Objective:** Primary care Providers (PCPs) are the first and most frequent point of contact for cancer patients. Yet, coordination of care with cancer care is known to be problematic. CanIMPACT is a multidisciplinary pan-Canadian team with the overall goal to elucidate gaps in care, and develop and test strategies to improve integration and coordination. **Approach:** CanIMPACT has been funded by CIHR for a 5-year program of research. Phase I consisted of a mixed method approach involving: 1) multi-province population-based studies utilizing administrative health databases to describe variations and gaps in care; 2) qualitative studies to understand context; 3) environmental scan and systematic review to catalogue existing evidence and programs; 4) research on the evolving role of PCP in personalized medicine; 5) patient engagement through a Patient Advisory Committee; 6) development of a Gigamap visualization tool; and 7) a multi-stakeholder consultative workshop to determine direction for Phase II. **Results:** The multi-study results from Phase I will be presented. The outcomes of the pan-Canadian consultative workshop and proposed Phase II research will also be presented. **Conclusions:** CanIMPACT is the most comprehensive program of research to study primary care and cancer in Canada, and perhaps internationally.

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## B2.5 Cancer in Ontario: Relative survival ratios and trends

Presented by **TANYA NAVANEELAN**, Epidemiologist, Cancer Care Ontario

**Objectives:** The study was designed to illuminate the current and historical state of cancer survivorship in Ontario through the analysis of relative survival statistics. **Approach:** Data was taken from the Ontario Cancer Registry on all malignant cancer cases diagnosed between 1981 and 2012. Relative survival ratios (RSR) were calculated with SAS v.9.2 using the publicly available Dickman algorithm, with some minor adaptations, and the Ederer II approach to expected survival. Joinpoint regression was used for the trend analyses. Analysis was restricted to first primary cancers and cases diagnosed between the ages of 15 and 99. RSRs were estimated by the cohort method when complete follow-up data was available and the period method when it was not. **Results:** The five-year RSR for all cancers diagnosed between 2008 and 2012 in Ontario was 63.1%. Males had a significantly lower five year RSR (61.8%) than females (64.5%). Thyroid (98.6%), testis (96.1%) and prostate (95.2%) cancers had the highest RSRs while pancreas (9.0%), esophagus (14.9%) and lung (18.0%) cancers had the lowest. The greatest increases in survival between 1983-1987 and 2008-2012 were achieved in liver, pancreas and stomach cancers. Survival from most cancer types decreased with age, with the exception of female breast and testis cancer. Analysis by stage at diagnosis found significant decreases in survival with increasing stage. Three-year survival from colorectal cancer declined from 95.7% for those diagnosed at stage I to 19.6% for those diagnosed at stage IV. Survival from stage I cervical cancer was 96.4%, but declined to 69.8% for those diagnosed in stage II. Stage at diagnosis had a lower impact on prostate cancer. Three-year relative survival from stage I, II and III prostate cancer was over 100%. **Conclusion:** Survival statistics are a key indicator of the effectiveness of various cancer control programs including screening and prevention efforts and treatment. The results of this analysis will help to highlight cancer control success in Ontario as well as areas where improvement is still needed.

Co-Author(s): Tanya Navaneelan, Cancer Care Ontario / Saber Fallahpour, Cancer Care Ontario / Prithwish De, Cancer Care Ontario / Todd Norwood, Cancer Care Ontario

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## B3 PATIENT-ORIENTED RESEARCH IN CANCER CARE

**TOM THOMPSON**

Session chair: **LISA BARBERA**, Associate Professor, Department of Radiation Oncology, University of Toronto, Senior Scientist, Sunnybrook Research Institute, Adjunct Scientist, Institute for Clinical Evaluative Sciences, Clinical Lead, Patient Reported Outcomes, Cancer Care Ontario

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### B3.1 Identifying barriers to cervical cancer screening among South Asian Muslim immigrant women

Presented by **SYEDA KINZA RIZVI**, MSc Candidate, Research Assistant, University of Calgary

**Objectives:** We sought to identify the barriers to cervical cancer screening among South Asian Muslim immigrant women in Calgary. Understanding their ideas and needs will enable development of educational programs and services so they can benefit from screening and reduce the effect of this disease. **Approach:** Qualitative, semi-structured in-depth interviews, by purposive sampling, were conducted with South Asian Muslim immigrant women of Calgary who were unscreened or infrequently screened for cervical cancer. Thematic analysis was conducted for data analysis using Microsoft Word. **Results:** 18 women were interviewed and the majority (66%) never had a Pap test. Findings were categorized into five major themes: Attitude, knowledge & beliefs, healthcare seeking practices, experience with healthcare system & services, barriers and strategies to Pap testing. Major findings include: misunderstanding about Pap test reminders, strong preference for a female physician who also speaks their language, seeking symptomatic treatment not prevention, negative experiences with healthcare providers including painful Pap test experience. Major barriers involved: lack of knowledge about cervical cancer and the term cervix, fatalist beliefs, dependence on husband, transportation, language and unavailability of female physicians. Separate centers for Pap testing, awareness and encouragement by social workers and family physicians to get tested were strategies participants suggested. **Conclusion:** Different healthcare strategies are needed at the system and provider level to improve healthcare experience of these women and to promote cervical cancer screening. Providing female physicians, knowledge and resources such as transportation and a separate center, and screening reminders that explain the procedure and the disease in detail could potentially increase screening practices.

Co-Author(s): Syeda Kinza Rizvi, University of Calgary / James Dickinson, University of Calgary

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### B3.2 Feasibility, acceptability and efficacy of a pro-active telephone intervention to improve toxicity management during chemotherapy

Presented by **MONIKA KRZYZANOWSKA**, Associate Professor, Princess Margaret Cancer Centre/University of Toronto

**OBJECTIVES:** Chemotherapy (chemo) toxicity often peaks between clinic visits. Consequently, effective remote symptom management support is essential to optimize self-management and resource use during chemo. The aim of this study was to examine the feasibility, acceptability and effects of a telephone intervention on symptomatic toxicity and resource use during chemo for early stage breast cancer (EBC). **APPROACH:** A prospective study of telephone-based toxicity management among women receiving neo-adjuvant or adjuvant chemo for EBC was undertaken at one urban and one rural site in Ontario, Canada. The intervention consisted of two standardized calls by nurses assessing common toxicities after each chemo (call 1 within 3 days and call 2 within 8-10 days of Day 1 of each cycle). Primary outcome measures were feasibility and acceptability based on patient (pt) and clinician feedback. Efficacy was evaluated by self-reported emergency department visits and hospitalizations (ED+H). **RESULTS:** Between 09/2013 and 12/2014, 77 women with EBC were enrolled (mean age 55 years). Most commonly used regimens were AC-paclitaxel (58%) and FEC-docetaxel (16%). 78% of pts received primary GCSF prophylaxis. Adherence with calls was 84%; mean call duration was 9 minutes. The intervention was well received by both pts and clinicians. 97% of pts indicated they liked receiving the calls and 94% would recommend this protocol be offered to all pts receiving chemo. Clinicians and pts felt the calls reduced pt anxiety by providing just-in-time education and counselling. Twenty two (29%) pts reported at least one ED+H during chemo, lower than the historical rate of 44% for this population in Ontario. Challenges included introducing an intervention that involved both routine clinical personnel and research staff and incorporating the calls into existing work responsibilities. **CONCLUSION:** Telephone-based toxicity management during chemo is feasible, perceived as valuable by clinicians and pts, and may be associated with lower rates of acute care use. Larger scale evaluations of this approach focusing on effectiveness are warranted.

Co-Author(s): Monika Krzyzanowska, Princess Margaret Cancer Centre/University of Toronto / Cassandra McKay, CCO / Heekyung Han, Cancer Care Ontario / Sonal Gandhi, Sunnybrook Health Sciences Centre / Nicole Laferriere, Thunder Bay Regional Cancer Centre / Clare Atzema, Institute for Clinical Evaluative Sciences / Kelvin Chan, Sunnybrook Health Sciences Centre / Doris Howell, UHN / Vishal Kukreti, UHN / Yvonne Leung, UHN / Aliya Pardhan, Cancer Care Ontario / Sandra Mitchell, National Cancer Institute / Marla Nayer, Cancer Care Ontario / Mark Pasetka, Odette Cancer Centre / Jane Yao, Cancer Care Ontario / Erin Redwood, Cancer Care Ontario

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### B3.3 Do the general population have a preference to avoid cancer? Results from a discrete choice experiment

Presented by **HELEN MCTAGGART-COWAN**, Canadian Centre for Applied Research in Cancer Control; British Columbia Cancer Agency

**OBJECTIVES:** Policy decisions in cancer are increasingly being based on general population preferences for hypothetical health states. The states are generally not labelled as cancer to avoid eliciting negative emotions. This study explores the effect of cancer and other disease labels on general population preferences using a discrete choice experiment (DCE). **METHODS:** An online panel of general population respondents ( $n = 800$ ) was recruited to complete a DCE, designed to evaluate individuals' preferences for different health states pertaining to colorectal cancer, type 2 diabetes, and rheumatoid arthritis. Half the participants were randomly selected to complete a four-attribute DCE (health state before treatment, health state after treatment, duration of life, and disease type). The remaining participants completed an identical DCE except that disease type was excluded. For these respondents, after they completed each choice set they were asked if they would change their answers if the corresponding disease label was applied. **RESULTS:** Using a conditional logit model, relationships between personal utility and all attributes were in the hypothesized direction. There were no statistically significant differences in demographic characteristics between those completing either DCE version. When adjusted for the two versions, the labels associated with colorectal cancer ( $\beta = -0.40$ ,  $SE = 0.04$ ,  $p < 0$ ) and type 2 diabetes ( $\beta = 0.28$ ,  $SE = 0.04$ ,  $p < 0$ ) had significant disutility compared to rheumatoid arthritis. On average, the respondents were willing to forego 1.58 life years (95% CI: 1.30-1.87) for a scenario to be labelled as diabetes rather than rheumatoid arthritis. Similarly, they would be willing to forego 2.25 life years (95% CI: 1.99-2.57) for rheumatoid arthritis rather than colorectal cancer. **CONCLUSIONS:** A clear ordering effect was present such that general population respondents preferred to have diabetes over rheumatoid arthritis, and rheumatoid arthritis over colorectal cancer. This raises concerns of a possible cancer premium especially if responses on cancer-specific utility instruments are used for guiding difficult policy decisions.

Co-Author(s): Helen McTaggart-Cowan, Canadian Centre for Applied Research in Cancer Control; British Columbia Cancer Agency / Dean A. Regier, Canadian Centre for Applied Research in Cancer Control; British Columbia Cancer Agency; School of Population and Public Health, University of British Columbia / Stuart J. Peacock, Canadian Centre for Applied Research in Cancer Control; British Columbia Cancer Agency; Faculty of Health Sciences, Simon Fraser University

### B3.4 Cancer Patients' Perceptions of Continued Smoking and Smoking Cessation

Presented by **DEVON ALTON**, Princess Margaret Cancer Center; University of Toronto

**Objectives:** Continued smoking after a diagnosis of cancer leads to poorer treatment outcomes, survival, and quality-of-life. Here, we evaluated cancer patients' perceptions of the effects of continued smoking on quality-of-life, survival, and fatigue after a cancer diagnosis and the effects of these perceptions on smoking cessation. **Approach:** 985 cancer patients from all disease subsites from Princess Margaret Cancer Centre (Toronto, ON) completed a questionnaire between April 2014-January 2016 assessing for socio-demographic variables, smoking history, and perceptions of continued smoking on quality of life, survival, and fatigue. Clinico-pathological variables were obtained through a review of patients' charts. Multivariate logistic regression models were used to evaluate the association between patients' perceptions and smoking cessation after adjusting for significant co-variables. Multivariate modelling was also used to evaluate factors influencing patients' perceptions of smoking. **Results:** Among all patients, 230 (23%) smoked at diagnosis and 56% subsequently quit; 25% had lung and 30% had head and neck cancers. Most patients felt that continued smoking after a diagnosis of cancer negatively impacted quality-of-life (83%), survival (86%) and fatigue (83%). Current smokers were less likely to perceive that continued smoking was harmful compared to ex-smokers and never smokers ( $P < 0.001$ ). Among current smokers, perceiving that smoking negatively impacted quality-of-life ( $aOR = 3.00$ , 95% CI[1.51-5.98]), survival ( $aOR = 5.75$ [2.62-12.61]) and fatigue ( $aOR = 4.81$ [2.26-10.23]) were each strongly associated with smoking cessation. Patients who were married ( $aOR = 1.67$ [1.16-2.44]), smoked fewer pack-years ( $aOR = 0.98$ [0.98-0.99]) and had non-tobacco related cancers ( $aOR = 1.54$ [1.08-2.22]) more likely felt that smoking was harmful to quality-of-life; those with higher income ( $aOR = 3.23$ [1.72-6.25]) and fewer pack-years ( $aOR = 0.98$ [0.97-0.99]) more likely felt that smoking worsened survival. **Conclusion:** Cancer patients' perceptions of continued smoking after a cancer diagnosis are strongly associated with smoking cessation. Marital status, income, disease site, and pack-years were each found to be associated with patient perceptions of smoking, and should be considered when developing a smoking cessation program and when clinicians counsel patients regarding smoking cessation..

Co-Author(s): Devon Alton, University of Toronto / Yuyao Song, Ontario Cancer Institute / Jie Su, Princess Margaret Cancer Center / Delaram Farzanfar, Princess Margaret Cancer Centre / Olivia Krys, Princess Margaret Cancer Centre / Rahul Mohan, Ontario Cancer Institute / Tom Yoannidis, Wharton Head and Neck Program, Princess Margaret Cancer Centre / Robert Milne, Princess Margaret Cancer Centre / M Catherine Brown, Princess Margaret Cancer Centre; Ontario Cancer Institute / Ashlee Vennettilli, Princess Margaret Cancer Centre / Andrew Hope, Department of Radiation Oncology, Princess Margaret Cancer Centre / Doris Howell, Princess Margaret Cancer Centre / Jennifer Jones, Princess Margaret Cancer Centre; Ontario Cancer Institute / Peter Selby, Centre for Addiction and Mental Health / Wei Xu, Biostatistics, Princess Margaret Cancer Centre, University of Toronto / David Goldstein, Wharton Head and Neck Program, Princess Margaret Cancer Centre / Geoffrey Liu, Ontario Cancer Institute, Princess Margaret Cancer Centre / Lawson Eng, Division of Medical Oncology and Hematology, Princess Margaret Cancer Centre / Meredith Giuliani, Department of Radiation Oncology, Princess Margaret Cancer Centre

### B3.5 Considering a public's perspective on disinvestment in cancer drug funding: Results from a deliberative public engagement event in Vancouver, British Columbia

Presented by **SARAH COSTA**, Health Economist, Canadian Centre for Applied Research in Cancer Control-BC Cancer Agency

**Objectives:** Drug funding decisions are challenged by rising costs and availability of new treatments. Increasingly, health system leaders recognize that investments in new cancer drugs must be considered alongside decisions about disinvestment from less effective drugs. Genuine public engagement in this priority-setting process is important for establishing trustworthiness in these decisions. **Approach:** A public deliberation event was held over four days in September 2014 in British Columbia (BC), Canada, on the topic of funding for cancer drugs. Twenty-four participants were recruited based on BC census data. The objective of the event was to make collective recommendations to decision-makers about the principles that should guide funding decisions in BC. Recommendations were established through a process of structured deliberation and exchanging of participant views. Deliberative questions and decision aides were used to elicit participants' preferences as they made trade-offs between health outcomes, including increased quantity and quality of life, and cost savings. **Results:** Participants made 30 recommendations related to the funding of cancer drugs in BC. Qualitative thematic analysis was undertaken to identify key themes from the deliberations. Overall, participants demonstrated a strong capacity to engage in the decision tasks, while recognizing budgetary constraints. Several beliefs, including patient choice, fairness and equity, were found to guide participants' reasoning as they made their recommendations. When presented with a scenario comparing two hypothetical drugs with similar effectiveness, participants were reluctant to trade on these beliefs in exchange for a gain of cost savings. Instead, participants stressed the importance of demonstrating significant 'value for money' to support the trade-off. **Conclusion:** These results offer insight into what is acceptable to British Columbians with respect to disinvestment decisions for cancer drugs. Decision-making frameworks can include consideration of these beliefs, in addition to clinical- and cost-effectiveness evidence, to help ensure that disinvestment decisions are acceptable to British Columbians and healthcare organizations alike.

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## POSTER ABSTRACTS AT A GLANCE

(Posters will be displayed in TORONTO III)

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2	<b>Do the American Society of Clinical Oncology (ASCO) and the European Society of Medical Oncology (ESMO) frameworks measure the same construct of value?</b> Presented by <b>VANESSA ARCIERO</b> , Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto / <b>ERICA MCDONALD</b> , Research Assistant, Odette Cancer Centre, Sunnybrook Health Sciences Centre
3	<b>Development and Validation of the Models of Care Approach to the Design and Delivery of Cancer Services</b> Presented by <b>HASMIK BEGLARYAN</b> , Manager, Models of Care, Cancer Care Ontario
4	<b>A knowledge translation tool for the development and appraisal of health systems guidance: The AGREE-HS</b> Presented by <b>MELISSA BROUWERS</b> , Associate Professor and Health Services Research Lead in the Department of Oncology, McMaster University
5	<b>A model for collaborative cancer system performance reporting using colorectal cancer indicator development as an example</b> Presented by <b>JENNIFER CHADDER</b> , Specialist, System Performance, Canadian Partnership Against Cancer
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## POSTER ABSTRACTS GUIDE

(Posters will be displayed in TORONTO III)

BOARD	POSTER ABSTRACTS
	HEALTH SYSTEMS, SERVICES, AND POLICY
1	<p><b>Triangulation as a Strategy in Quality Improvement: Leveraging Multiple Data Sources and Perspectives to Inform Strategic Directions in Cancer Symptom Reporting and Management in Ontario</b></p> <p>Presented by <b>HEIDI AMERNIC</b>, Research Associate, Cancer Care Ontario</p> <p>Objectives: Patient reported outcome (PRO) measures enable cancer patients to report symptoms to their clinical team. The provincial PRO program has implemented two measures, with the goal of expanding its scope and reach. The objective was to identify priorities to inform a system-level strategic framework guiding PROs implementation and symptom management. Approach: Cancer symptom reporting and management involves complex, coordinated processes that depend on engagement and participation of multiple stakeholders. Using a triangulation approach, quantitative and qualitative data was collected from multiple sources and perspectives including: clinician attitudinal data from a Provincial study; patient experience data from an annual Provincial survey; current state assessment of all Ontario Regional Cancer Centres; two in-person multi-stakeholder events including patient and family advisors; and lessons learned from existing PROs implementation. Data were reviewed, synthesized, and discussed at a multi-stakeholder strategic planning workshop revealing key themes which informed framework priority areas. Results: Key findings informed a strategic framework guiding cancer symptom reporting and management in Ontario for the next four years. Priority areas included: (1) New PROs implementation and sustainability; (2) patient and family engagement; (3) symptom management and interdisciplinary teams; (4) technology; and (5) research and improvement. A triangulation approach enhanced confidence that key target areas reflected stakeholder needs. Conclusion: A triangulation approach ensured that the strategic framework reflected themes important to all, especially patients and families. Multi-stakeholder involvement in strategic planning fosters stakeholder engagement in future improvement initiatives.</p> <p>Co-Author(s): Heidi Amernic, Cancer Care Ontario / Zahra Ismail, Cancer Care Ontario / Gillian Hurwitz, Cancer Care Ontario / Nicole Montgomery, Cancer Care Ontario / Sarah Stevens / Wenonah Mahase / Michelle Lenarduzzi, Optimus SBR / Rachel Steger, Optimus SBR / Lesley Moody, Cancer Care Ontario / Lisa Barbera, Cancer Care Ontario</p>
2	<p><b>Do the American Society of Clinical Oncology (ASCO) and the European Society of Medical Oncology (ESMO) frameworks measure the same construct of value?</b></p> <p>Presented by <b>VANESSA ARCIERO</b>, Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto / <b>ERICA MCDONALD</b>, Research Assistant, Odette Cancer Centre, Sunnybrook Health Sciences Centre</p> <p>Objectives: ASCO and ESMO have recently established their own value frameworks based on expert consensus. It is unknown whether the two unique frameworks measure similar constructs of value, and how they relate to the conventional standard measure of quality-adjusted life year (QALY). Approach: Clinical trials of drugs approved by the Food and Drug Administration, European Medicinal Agency and Health Canada between 2006 and August 2015, and drugs considered for funding by the pan-Canadian Oncology Drug Review (pCODR) were identified. Three authors independently calculated ASCO and ESMO value scores; discrepancies were reviewed and resolved by consensus. Based on the ESMO framework, hematology drugs were excluded. When publicly available, incremental QALYs were obtained from the National Institute of Clinical Excellence (NICE) and pCODR. Concurrent construct validity between the value frameworks, with the incremental QALY, were measured by the Spearman correlation coefficient. Results: 112 clinical trials were identified resulting in 113 ASCO value scores, 100 ESMO value scores, 18 NICE incremental QALYs and 52 pCODR incremental QALYs. The median ASCO score was 24 (IQR 16-33, min -4, max 80) with a maximum ASCO value score of 130. The median ESMO score was 3 (IQR 2-3) with a maximum ESMO score of 5. The correlation coefficient between ASCO and ESMO values scores was 0.41 (95%CI: 0.23-0.57). Some drugs had high ESMO scores but low ASCO scores, and vice versa. The correlation coefficients between the ASCO value framework and incremental QALYs were 0.45 and 0.26 for NICE and pCODR respectively; those between the ESMO value framework and incremental QALYs were 0.14 and 0.13 for NICE and pCODR respectively. Conclusions: For many recently approved drugs ASCO and ESMO scores were relatively low. The weak/moderate correlation between ASCO and ESMO frameworks, and between the frameworks and incremental QALYs suggest different "constructs" of value are measured. In drugs with "divergent" ASCO and ESMO scores, alternate approaches to value assessment are required.</p> <p>Co-Author(s): Erica McDonald, Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto / Vanessa Arciero, Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto / Matthew Cheung, Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto / Mahin Qureshy, Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto / Sierra Cheng, Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto / Mona Sabharwal, pan-Canadian Oncology Drug Review at CADTH / Alexandra Chambers, pan-Canadian Oncology Drug Review at CADTH / Dolly Han, pan-Canadian Oncology Drug Review at CADTH / Kelley-Anne Sabarre, pan-Canadian Oncology Drug Review / Kelvin Chan, Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto</p>

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### 3 Development and Validation of the Models of Care Approach to the Design and Delivery of Cancer Services

Presented by **HASMIK BEGLARYAN**, Manager, Models of Care, Cancer Care Ontario

**Objectives:** In 2011, Cancer Care Ontario identified the development and implementation of innovative models of care as a strategic objective to improve cancer system sustainability. The first objective of the new Models of Care Program was to establish a consistent approach to identifying, implementing, and evaluating models of care. **Approach:** We conducted a review of published and grey literature to identify how other jurisdictions defined 'models of care,' and their approach to implementing and evaluating new models. A series of stakeholder consultations with health services researchers, administrators, and clinicians were used to assess the face validity of the findings. The preliminary results were then validated through implementation of a series of new models of care, including a Clinical Specialist Radiation Therapist model, primary well follow-up care model, and ambulatory models of care for symptom management of patients in active treatment. **Results:** In taking a models of care perspective, one approaches the design and delivery of cancer services with consideration of patient needs and clinical best practice to determine how services should be organized and integrated across sectors, professions and settings. A framework was developed to help system planners think about models of care, outlining the goals of adopting a models of care approach, the models of care work cycle, and how models of care are identified and described. To support the evaluation of new models of care, a program logic model was constructed, guided by the theory behind implementing new models of care. The overall framework and program logic model were, and continue to be, tested and refined as new models are identified, implemented, and evaluated. **Conclusion:** Although the concept of models of care is not new, there is little guidance on how to describe and adopt new models of care in the cancer setting. Results of this work can be used to provide researchers and administrators a consistent approach to introducing new models of care for researchers and organizations.

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### 4 A knowledge translation tool for the development and appraisal of health systems guidance: The AGREE-HS

Presented by **MELISSA BROUWERS**, Associate Professor and Health Services Research Lead in the Department of Oncology, McMaster University

**Objectives:** Health Systems Guidance (HSG) documents are systematically developed statements intended to assist with optimizing health system performance and efficiency. Resources to direct the development and use of HSG are limited. The purpose of this study was to create a tool to aid in the development, reporting, and appraisal of HSG. **Approach:** A multi-staged approach was used for this study. First, a critical interpretive synthesis was conducted to identify candidate items for the HSG tool from the literature. Next, a survey was distributed to health system researchers and decision-makers across the six World Health Organization regions to evaluate the candidate items, assess the appropriateness of their descriptions, and identify potential missing components. Finally, a second international survey was conducted to evaluate the usability of the draft HSG tool and to evaluate the feasibility of its application. **Results:** Thirty candidate items for the HSG tool were identified in the critical interpretive analysis, classified under the following domains: process principles, content, and context principles. Favourable survey results led to the creation of a draft version of the tool, called "Appraisal for Guidelines for Research and Evaluation for Health Systems" (AGREE-HS). Results of the second survey indicated that participants generally agreed that the AGREE-HS items were easy to understand and to apply, and that the tool would direct development, reporting, and appraisal of HSG. Feedback from the survey and consensus of the research team resulted in the current version of the AGREE-HS tool comprising 32 items within 4 domains. **Conclusion:** The AGREE-HS supports the development, reporting, and appraisal of HSG and will facilitate informed decision-making among HSG developers and cancer health system policymakers. Further usability and validity testing of the AGREE-HS tool is planned. Application of the AGREE-HS will ultimately help to strengthen cancer health systems.

**Co-Author(s):** Denis Ako-Arrey, McMaster University / Melissa Brouwers, McMaster University / John Lavis, McMaster University / Ivan Florez, McMaster University / Mita Giacomini, McMaster University

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### 5 A model for collaborative cancer system performance reporting using colorectal cancer indicator development as an example

Presented by **JENNIFER CHADDER**, Specialist, System Performance, Canadian Partnership Against Cancer

The Canadian Partnership Against Cancer's System Performance Initiative measures pan-Canadian cancer system performance and identifies opportunities for system improvement. Here, we describe how the collaborative System Performance model works and why it is unique, using the progressive development of colorectal cancer indicators as an example. To measure and report on cancer system performance, the Canadian Partnership Against Cancer has introduced a novel process to work collaboratively with provincial and territorial partners, as well as subject matter experts across the country, to develop a suite of pan-Canadian performance indicators. This process involves: identifying gaps in knowledge and performance variations across the country; determining what needs to be measured to fill gaps; and progressively developing detailed indicators to understand observed variations and trends over time. Data are reported annually using data from our partners, including provincial cancer agencies and Statistics Canada. Initially, reporting on colorectal cancer focused on high level outcomes: incidence, mortality and survival. Together with partners and experts, these results were examined to identify variations in colorectal cancer outcomes across the country. This enabled us to unpack the story of colorectal cancer in Canada by collaboratively and progressively developing new indicators to understand how screening, diagnosis and treatment contribute to observed variations. This story can be told through the full suite of colorectal cancer indicators, which now includes: a) Self-reported screening rates; b) Diagnosis wait times; c) Removal and examination of 12 or more lymph nodes in colon resections; d) Pre-operative radiation therapy for rectal cancer patients; e) Incidence – overall and by stage; f) Mortality; and g) Survival – overall, by stage and by socioeconomic status. Galvanizing pan-Canadian collaboration across the cancer control system is a unique and effective model for tackling questions in cancer control, as can be demonstrated by work done on colorectal cancer indicators. This model could be applied to other situations where performance measurement would inform opportunities for system-level improvement.

**Co-Author(s):** Jennifer Chadder, Canadian Partnership Against Cancer / Rami Rahal, Canadian Partnership Against Cancer / Heather Bryant, Canadian Partnership Against Cancer

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**6 Adolescent and Young Adult (AYA) Cancer: Principles of Care**

Presented by **SONJA DE PAUW**, Canadian Task Force on Adolescents and Young Adults with Cancer

**Objective:** 1) To summarize the current literature available related to active cancer care for adolescent and young adults with cancer (15-29 years of age) and outline recommended principles of care, 2) To identify barriers to optimal care and 3) To suggest specific system changes to overcome these barriers in the Canadian context. **Approach:** Adolescents and young adults (AYA) with cancer receiving active care face a number of barriers to optimal care. The Canadian Task Force on AYA with Cancer convened a working group in 2013 to address active care issues. Existing guidance documents were identified and reviewed. Four systematic searches were carried out in Ovid for English-language publications between 2009 and 2014. Papers were reviewed and assigned to three critical domains of care for AYA including medical, psychosocial and research as well as possible system changes. These 4 areas formed the basis of the guidance document. **Results:** The searches yielded 3475 citations which were reviewed by group members and reduced to 395 articles. Relevant articles were identified for each topic: medical 94, system 124, psychosocial 155 and social 22. Group members were assigned to each topic based on expertise. Each team of 2 was responsible for reviewing articles in their topic and identifying barriers and solutions. Issues identified included: low levels of awareness about cancer in AYA, lack of fertility preservation services, low rates of accrual to clinical trials and lack of screening for distress. Many of the barriers identified in AYA active care can be addressed through simple system changes such as flexibility with appointment scheduling. **Conclusions:** AYA in active cancer treatment face multiple barriers to optimal age-specific care. Increasing awareness of these barriers is important, since system changes can reduce the effect of many of these barriers. As recommended changes are adopted, metrics will be required to evaluate the effectiveness of interventions at improving outcomes.

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**7 A multi-level program evaluation of True NTH Canada; A program to improve the quality of life for men affected by prostate cancer**

Presented by **EVELYN ELIAS**, Masters student, Cancer Care Ontario

**Objectives:** TrueNTH is a 3-year care intervention program designed to improve the quality of life and experience of men with prostate cancer, their partners, families and caregivers. It is funded globally by the Movember Foundation and administered in Canada by Prostate Cancer Canada (PCC), with 10 funded implementation projects country-wide. **Approach:** Teams across Canada have come together to create a national network where shared learning is a primary focus. Cancer Care Ontario is partnering with PCC to evaluate the implementation of True NTH in Canada. A multi-level program evaluation has been developed using a modified RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework to examine implementation at the local and national levels and potential for widespread scalability and spread. Quantitative data on uptake and participant outcomes will be collected through standardized templates on an annual basis. Key informant interviews will be conducted in the final year of the initiative to gather information on adoption, implementation and maintenance of the programs. **Results:** Findings are expected to shed light on the extent to which interventions were able to reach their target populations; how well programs were embedded into usual care; and critical factors that will enable program sustainability and spread. The barriers and facilitators of implementation will also be identified and examined. **Conclusion:** This evaluation will demonstrate how a modified RE-AIM framework can be adapted to a multi themed, multi-site, real-world program implementation. Guided by this framework, the results of this evaluation will generate meaningful and useful lessons to optimize sustainability and scalability of this important initiative.

**Co-Author(s):** Evelyn Elias, Cancer Care Ontario / Julie Gilbert, Cancer Care Ontario / Matthew George, Cancer Care Ontario

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**8 Setting quality improvement priorities for women receiving systemic therapy (ST) for early stage breast cancer (EBC) using population level administrative data**

Presented by **KATHERINE ENRIGHT**, Trillium Health Partners - Credit Valley Hospital

**Background:** Routine evaluation of evidence informed quality measures (QM) can drive improvement in cancer systems by highlighting potential gaps in care. Targeting quality improvement at QMs that demonstrate substantial variation has the potential to make the largest impact on quality at a population level. We aimed to use variation in performance to set priorities for improving the quality of ST for women with EBC. **Methods:** EBC cases diagnosed 2006 – 2010 in Ontario, Canada were identified in the Ontario Cancer Registry and linked deterministically to multiple health care databases. A panel of QMs, previously developed to be operationalized for administrative data, was applied to reflect the quality of ST. Each QM was evaluated in all patients who met the inclusion criteria for the individual measure. QMs were ranked based on institutional variation in performance using the mean absolute difference (MAD). **Results:** We identified 28,303 patients, treated at 84 institutions. The performance of each QM was evaluated. Timely receipt of ST, febrile neutropenia (FN) secondary prophylaxis, emergency room visits or hospitalizations, receipt of hormonal therapy (HT) and the use of surveillance imaging represented the 5 QM that demonstrated the greatest variation. **Conclusion:** Considerable institutional-level variation highlights potentially actionable areas of improvement.

**Co-Author(s):** Katherine Enright, Trillium Health Partners - Credit Valley Hospital / Alejandro Gonzalez, Institute for Clinical Evaluative Sciences / Melanie Powis, Princess Margaret Cancer Centre / Nathan Taback, University of Toronto / Christopher Booth, Kingston Regional Cancer Centre / Maureen Trudeau, Sunnybrook Odette Cancer Centre / Monika Krzyzanowska, Princess Margaret Cancer Centre

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## 9 Assessing adherence to colon cancer pathway and its association with survival using a population-based cohort study

Presented by **KATHARINA FORSTER**, Program Lead, Cancer Care Ontario

Cancer Care Ontario developed pathways based on best available evidence for the colon cancer care continuum. The objective of this study is to assess the adherence of actual clinical care with pathway-defined care for patients with Stages II and III colon cancer, its relation to survival, as well as measurements of how “close” observed paths are to evidence-based pathways. Stage II and III colon cancer patients diagnosed in 2010 were identified using the Ontario Cancer Registry. Health utilization information was identified using multiple administrative databases. Descriptive analysis and clinical expertise were used to identify decision rules to define adherence along the colon cancer pathway. These rules incorporated factors such as type, interval, sequencing, and timing of specific interventions (i.e. imaging, endoscopies, surgeries, consults and chemotherapy) associated with adherence. They were used for classifying patients into adherence “groups,” which were visualized using decision trees. Predictors of overall survival and adherence were identified and compared between groups. Patient-level comparison of observed paths and CRC pathways was performed using distance metrics based on existing sequence comparison algorithms. 68.4% of Stage II patients (n=1025) were adherent (diagnostic endoscopy, CT abdomen, and surgical resection in sequence) and 60.8% of Stage III patients (n=1028) were adherent (diagnostic endoscopy, CT abdomen, surgical resection, and medical oncologist consultation in sequence). As more procedures and decision rules were added to the model, adherence decreased. Four-year survival of patients adherent to the clinical pathway was significantly higher than non-adherent patients (78.1% vs. 60.7%,  $p<0.0001$ ). All distance metrics were found to represent the pathways consistently, however, not all metrics were able to discriminate how “close” patients were to evidence-based pathways equally well. Overall, pathway adherence was 68.4% for Stage II and 60.8% for Stage III colon cancer patients. Adherence was associated with higher survival. Our findings can be used to inform the evaluation of health system performance and outcomes spanning the cancer care continuum, including transitions in care and to help identify opportunities for improvement.

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## 10 Differences in the breast cancer diagnostic process across stage groups in Ontario, Canada

Presented by **PATTI GROOME**, Epidemiologist, Queen's University

Objectives: Early diagnosis leads to better cancer survival and short diagnostic intervals reduce patient anxiety. We are studying factors that prolong the breast cancer diagnostic process in Ontario, Canada. Approach: This is a retrospective study of all patients diagnosed 2007-2011 (n=33,752). We linked data from Cancer Care Ontario and the Institute for Clinical Evaluative Sciences including: Ontario Cancer Registry, physician claims, ambulatory, ER visits, and hospital discharges. Detection method (screening versus symptomatic) was determined using Screening Program and claims data. The diagnostic interval is the time from first relevant health care encounter to the definitive diagnosis. Elements of the diagnostic interval include: use of imaging, biopsy, and the number of encounters and providers. Results: 30.6% were screen-diagnosed and the median diagnostic interval was 40 days (IQR 21-80). The interval was 32 days in screened and 45 in symptomatic patients. The diagnostic interval was longer for stage I patients at 47 days compared to stage II (37 days), stage III (33 days) or stage IV (22 days). Only 44% of Stage IV patients were diagnosed via biopsy (vs 61%) and the symptomatic stage IV subgroup less likely to have breast imaging (61% vs 96%). 26% of stage IV patients saw 0-1 provider while 8% of stage I patients saw  $\geq 6$ . 19% of stage I patients had  $\geq 10$  encounters overall (vs 15%) and 28% had  $>1$  mammogram (vs 14%). Effects on diagnostic interval are similar in screened and symptomatic groups. Conclusion: Shorter diagnostic intervals in stage IV are associated with a more direct diagnostic path. We will present results quantifying the number of days attributable to the diagnostic elements. Understanding the impact of elements of the diagnostic process provide targets for improvement of its length.

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**11 10-Year Assessment of the Quarterly Performance Review Process in the Ontario Cancer System**

Presented by **YIDAN XIE**, Manager, Regional Programs and Performance Management, Cancer Care Ontario

**Objective:** Cancer Care Ontario (CCO) has been engaging the Regional Cancer Programs in a Quarterly Performance Review (QPR) process since 2004/05 as a means of holding regions accountable for quality requirements and addressing issues. An evaluation conducted in 2015 assessed stakeholder perspectives on the benefits and challenges of the process. **Approach:** Internal (CCO) and external (Regional Cancer Programs) QPR stakeholders were identified and invited to participate in an evaluation of the QPR process through surveys and committee meeting discussions. Internal participants (16 survey respondents; 30 meeting participants) included Provincial Clinical Leads, Directors, and Program Managers. External participants (72 survey respondents; 28 meeting participants) included Regional Vice Presidents, Directors, Regional Clinical Leads, and Managers. Participants were asked to identify the benefits, challenges, and unmet needs of each component of the QPRs: meetings and reports. Follow-up discussions were held amongst senior stakeholders to share results and come to agreement on next steps. **Results:** There was broad endorsement for the role of the QPRs in holding the Regional Cancer Programs accountable for the quality of their programs and in bringing attention to issues and successes. Although both internal and external stakeholders identified challenges with the extensive scope and time limitations of the performance meetings, differences were uncovered in terms of the needs of these two groups. Internal stakeholders were more likely to feel that an in-depth focus on key issues would be of greater benefit, while external stakeholders did not endorse the application of a more focused approach. For them, the value of bringing their whole teams (and all regional partners) together to foster a shared sense of accountability and understanding of the issues outweighed the inherent challenges. **Conclusion:** Regional Cancer Program support for CCO's Quarterly Performance Review process is high, and despite challenges, there is not an appetite for significant changes. Internal stakeholders do have performance management needs that are not being met by the process, and additional work is underway to identify solutions.

Co-Author(s): Victoria Hagens, Cancer Care Ontario / Matthew George, Cancer Care Ontario / Yidan Xie, Cancer Care Ontario / Garth Matheson, Cancer Care Ontario

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**12 Evaluation of the Expanded Prostate Cancer Index Composite for Clinical Practice (EPIC-CP) tool; Acceptability, feasibility and potential role in enhancing clinical care of men with early-stage prostate cancer**

Presented by **FARZANA HAJI**, Lead, Symptom Management, Cancer Care Ontario

**Objective:** The purpose of this multi-site study was to test feasibility of implementing the Expanded Prostate Cancer Index Composite for Clinical Practice (EPIC-CP) symptom tool in routine ambulatory care and evaluate its acceptability and role in customizing care from the perspective of patients and clinicians. **Approach:** This feasibility study recruited prostate cancer patients from four cancer centres between November 2014 and June 2015. Eligible patients were those attending radiation or surgical oncology consultation, follow-up, or on-treatment review. Patient participants completed the EPIC-CP symptom reporting tool, results of which were reviewed as part of the clinical encounter with nurse and/or physician. Experience with the tool was evaluated from the patient perspective through a 9-item Patient Exit Survey; and from the provider perspective, through semi-structured qualitative interviews. **Results:** A total of 287 Patient Exit Surveys were completed. Patients averaged 2.8 EPIC-CP screens during the study. Missing data across all 16 items ranging from 0.5% (bowel function) to 9.5% (orgasm quality). Eighty-two percent (82%) of patients were willing to complete similar questionnaires at future clinic visits. Only a few patients (3.5%) felt that the EPIC-CP tool did not help with their clinical encounter, and only 4% felt that the content should not include questions about sexual functioning. Thematic analysis from provider interviews revealed that the EPIC-CP tool captures essential prostate-specific effects that facilitated person-centered communication and customization of interventions. Targeted clinical education and resources for patients were also seen as necessary tools to encourage uptake and a quality response to EPIC-CP scores. **Conclusion:** EPIC-CP is highly endorsed by healthcare practitioners and by prostate patients across consultation and follow-up visits, and across four diverse cancer centres. The EPIC-CP tool captures prostate-specific symptom information that assists in enhancing clinical care and symptom management. Provincial roll-out of this tool as a standard of care is recommended. Completed with the EPIC Investigators Group.

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**13 Ontario's Approach to tackling Drug Funding Sustainability**

Presented by **HASINA JAMAL**, Lead, Policy, Cancer Care Ontario

**Objectives:** The annual growth rate of cancer drug spending has increased by 10-20% since 2010, exceeding other therapeutic categories and is expected to continue to grow significantly faster than expenditures in other areas. The Cancer Quality Council of Ontario (CQCO) and Cancer Care Ontario (CCO) embarked on a journey to systematically address this challenge. **Approach:** The CQCO and CCO focused on identifying and reviewing the critical success factors of a sustainable drug reimbursement program with international, pan-Canadian and internal input. Recognizing that drug funding sustainability is a challenge faced by health systems worldwide, the scope of this work was broadened from a provincial focus to one that was relevant across the Canadian context. **Results:** This work resulted in CQCO providing a core set of recommendations for CCO (with potential relevance to other reimbursement programs) to maximize the effectiveness of cancer drug use and support overall system sustainability in a patient-centred way. The recommendations included: 1. Transparency in drug funding decisions; 2. Refinement of the algorithm and priority setting for review of drug submissions; 3. Development of process to incorporate current best evidence to support system sustainability; 4. Development of a consistent approach to gathering and analyzing real world evidence (RWE); 5. Incorporating RWE into funding decisions and downstream re-evaluation; 6. Development of a consistent process for disinvestment and renegotiation of prices with buy-in from public, patients and clinicians; and 7. Development of a provincial process to maximize harmonization in cancer drug funding coverage decisions. **Conclusion:** CCO is determining an action plan based on the above recommendations and developing partnerships to support successful implementation to improve sustainability in regards to cancer drug funding.

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**14 Population-based mammography screening is not an effective breast cancer control strategy**

Presented by **ANNE KEARNEY**, Associate Professor, Memorial University School of Nursing

**Objectives:** Organized mammography screening programs for women 40-70+ have been established in all provinces and two territories in Canada. However, there is now good evidence the harms of population-based mammography screening outweigh the benefits. It is time for policy and decision makers to plan for a coherent national approach to discontinue population-based mammography screening. **Approach:** This presentation is based on critical appraisal of research evidence including the 2013 Cochrane Collaboration systematic review of mammography screening and the 2014 Canadian National Breast Screening Study (CNBSS) 25-year follow up. Results from large observational studies in countries with widespread mammography screening will also be presented. **Results:** There is no reliable evidence population-based mammography screening reduces mortality but good evidence of harm by overdiagnosis (up to 54%) with associated unnecessary treatment, false positive findings (up to 60% after 10 screens), and significant psychological distress. The authors of the Cochrane Collaboration review and the CNBSS conclude it is time to reconsider current population-based mammography screening. The Cochrane Collaboration considers their review to be stable and have no plans to update it. It is time to shift to an individualized approach for the early detection of breast cancer, especially for women at higher risk or presenting with suspicious findings. While this policy shift is occurring, women should receive balanced information about potential benefits and harms of mammography screening to make an informed decision. **Conclusion:** A pan-Canadian coordinated strategy to end population-based mammography screening is needed, including coherent communication to health professionals and the public, especially targeted women. This is not an easy policy and practice shift as much has been invested in the development and promotion of organized breast screening programs in Canada.

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**15 Using A Modified Delphi Process To Identify Quality Indicators For The Provincial Sarcoma Services Program**

Presented by **CASSANDRA MCKAY**, Functional Lead, Cancer Care Ontario

**Objective:** The appropriate investigation, management and rehabilitation of patients with sarcoma require a high degree of coordination among healthcare disciplines. The Provincial Sarcoma Services Plan provides an overview of how adult sarcoma services are organized in Ontario. In order to measure the implementation of the Plan and the quality of sarcoma services across the care continuum, there was a need to identify key quality indicators (QI). **Approach:** A modified Delphi process was used to identify QIs relevant to sarcoma care in Ontario. Potential QIs were identified through a systematic literature review and were suggested by Working Group members. Clinicians, administrators and allied health professionals involved in sarcoma care across the province participated in two electronic questionnaires to assess identified indicators on five criteria: usefulness, validity, action-ability, discrimination and feasibility. An Expert Panel meeting was held to deliberate the results and identify and prioritize the key QIs based on criticality for the Program. **Results:** Twenty possible QIs were identified through a literature review and 89 potential QIs were suggested by working group participants. Through the modified Delphi process, eight top ranked indicators, classified as Tier One Indicators, were identified as the most critical for evaluating the quality of the sarcoma services in Ontario. These eight indicators covered multiple domains of the disease spectrum (number of QIs in parentheses): overall treatment related wait-time measures (n=2), overall process measure (n=1), pathology (n=2), surgery (n=1), and overall patient outcomes (n=2). **Conclusion:** A systematic, consensus-based approach was used to determine relevant QIs for the Sarcoma Program. The eight Tier One QIs will provide a means of evaluating the quality of sarcoma care as outlined in the Provincial Sarcoma Services Plan in an effort to provide coordinated access to expert, multidisciplinary sarcoma care. The next step will be to establish the methodology, including defining benchmarks, for measuring each QI.

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**16 Comparing the health and economic outcomes of opportunistic lung cancer screening vs. Organized lung screening using the cancer risk management model (CRMM)**

Presented by **SAIMA MEMON**, Analyst, Canadian Partnership Against Cancer

To compare health and economic impacts of pan-Canadian annual organized low-dose computerized tomography (LDCT) lung cancer screening versus annual opportunistic LDCT screening using the Cancer Risk Management Model (CRMM v 2.2). We simulated plausible scenarios of organized and opportunistic screening using the CRMM-Lung Cancer module, a validated model calibrated to major outcomes of the US National Lung Cancer Screening Trial (NLST). Microsimulations incorporated Canada-specific demographics, cancer risk factors, cancer registry data, screening/diagnostic/treatment algorithms and costs, and health utilities. Key assumptions were: 30% and 60% screening participation; 30 pack-year smoking history; NLST-based compliance and follow-up criteria; ages 40-84 (opportunistic) and 55-74 (organized screening). All measures were projected 20 years (2016-2036). Incremental cost-effectiveness ratios were calculated for life-time costs and quality-adjusted life years (QALYs), from a public payer perspective and discounted at 3%. There was no appreciable projected difference in lung cancer incidence or mortality between the scenarios at either participation rates. Organized screening generated on average fewer invasive diagnostic procedures for false positives annually than opportunistic screening, 400 less at 30% participation and 780 less at 60%. Compared to a "No Screening" base case, screening and treatment cumulative costs over 20 years for organized screening at 30% participation resulted in additional costs of \$70 million compared to \$120 million in opportunistic screening. At 60% these costs rose to \$140 million and \$230 million respectively. The incremental cost-effectiveness ratio (ICER) at 30% participation was \$72,000/QALY and \$56,000/QALY respectively. At 60%, ICERS were \$70,000/QALY and \$55,000/QALY respectively. All costs are in 2008 Canadian dollars. In the scenarios modelled in the CRMM- Lung Cancer Module, opportunistic lung cancer screening is projected to be more costly and less cost-effective than organized screening in Canada in the next 20 years. If indirect costs and harms are incorporated, opportunistic screening may be even less cost-effective than projected here.

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**17 Multidisciplinary Cancer Conferences in Ontario**

Presented by **KAREN NGUYEN**, Lead, Quality, Cancer Care Ontario

Multidisciplinary Cancer Conferences (MCCs) are regularly scheduled meetings or videoconferences where healthcare providers from various disciplines ensure that all appropriate tests, all suitable treatment options and the most appropriate treatment recommendations are generated for each cancer patient. Patients whose cases are reviewed at an MCC are more likely to receive treatment according to guidelines, and are perceived by healthcare professionals as improving communication, efficiency and education, as well as enhancing professional relationships. The Surgical Oncology Program (SOP) at Cancer Care Ontario (CCO) released an evidence-based standards document in 2006 on the structure and function of MCCs. In fiscal year of 2010/2011, only 37% of MCCs met the standards criteria set out by Cancer Care Ontario; this has now grown to 79% in FY14/15 with well over 50 hospitals across Ontario participating or hosting their own MCCs. The number of disease sites, MCCs and participating hospitals continues to grow, contributing to quality care across Ontario.

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**18 Establishing Achievable Benchmarks for Quality Improvement in Systemic Therapy for Early Stage Breast Cancer**

Presented by **MELANIE POWIS**, Research Associate, Princess Margaret Cancer Centre

**Objectives:** Setting realistic targets for performance on quality indicators (QI) is a consistent challenge in quality improvement. The purpose of this study was to utilize administrative data to define achievable targets for QI for systemic therapy (ST) delivery in the early stage breast cancer (EBC) population based on best performers. **Approach:** Deterministically linked administrative healthcare databases were used to identify EBC cases diagnosed 2006 – 2010 in Ontario, Canada. Panel of previously established QIs for systemic therapy was applied to patients who met eligibility criteria for the individual indicators. Institutions with less than 10 eligible patients for a specific indicator were excluded. An empiric benchmark was defined as the value of the indicator for which the proportion of patients meeting the indicator from institutions accounted for the top decile of eligible patients. **Results:** We identified 28,303 EBC patients who received surgery with curative intent within 12 months of diagnosis of stage I-III breast cancer, of which 12,252 received adjuvant chemotherapy. The vast majority of centres were found to under-perform relative to the calculated achievable benchmark; top performing institutions varied by indicator. The greatest variation between overall rate for the indicator and the benchmark was observed for use of computerized provider order entry (CPOE), timely receipt of systemic therapy, emergency department visits and hospitalizations, and use of secondary prophylaxis for febrile neutropenia. **Conclusion:** Many institutions fell considerably below the benchmark. Further analysis of institution-level drivers of high quality care is required to help characterize high performing institutions.

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**19 Building 'bridges': Use of participatory design to create an electronic tool to improve management of chemotherapy toxicities**

Presented by **REBECCA PRINCE**, Princess Margaret Cancer Centre, University of Toronto

**Objectives:** There is growing interest in leveraging technology to solve clinical problems in healthcare. Patients (pts) receiving chemotherapy have high symptom needs that can negatively impact quality of life and healthcare utilization. We sought to develop a prototype of an electronic tool to facilitate remote management of chemotherapy toxicities (toxicity module). **Approach:** Our participatory design method consisted of user needs assessment through ethnographic field study (EFS) and focus groups (FG). Thematic analysis through ideation sessions and time-of-day exercises allowed identification of overarching issues. These themes informed iterative development of a tablet-based prototype, which was user-tested and refined over 2 rounds. Oncology pts, caregivers, and health care providers (HCPs) including oncologists, oncology nurses, and primary care physicians participated in all stages of ethnography and testing. **Results:** Fifteen pts with a variety of tumor types, 1 caregiver, and 12 HCPs participated in the needs assessment. Most themes were common to both pts and HCPs: gaps and barriers in the current system, need for decision aids, improved communication and options in care delivery, and secure access to credible information in a timely manner and integration into existing systems. Additionally, pts identified missed opportunities, care not meeting their needs, feeling overwhelmed and anxious and wanting to be more empowered; HCPs identified accountability as an issue. These themes informed development of a tablet-based prototype called 'bridges' which includes symptom tracking, self-management advice, and HCP communication. The module was well received during usability testing with 10 pts and 11 HCPs, but challenges were recognized including integration of the tool into existing workflows and care teams, provision of standardized symptom management advice, privacy and consent issues, and the need for patient specific information. **Conclusion:** An electronic tool that integrates just-in-time self-management advice and HCP support into routine care may address some of the gaps in the current system for managing chemotherapy toxicities.

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**20 Development of System Performance Indicators in the Care of Adolescents and Young Adults with Cancer**

Presented by **CHARLENE RAE**, Research co-ordinator, McMaster University

**OBJECTIVE:** To develop a framework for identifying consensus-based indicators to monitor and evaluate the performance of cancer control systems pertaining to adolescents and young adults (AYAs, ages 15-39 years) in Canada. **APPROACH:** AYA with cancer often have different outcomes related to their cancer journey than children or adults with cancer. Metrics are required to address issues unique to AYAs with cancer, related to their age and developmental stage. A stakeholder group has been convened by the Canadian Task Force on AYAs with Cancer to develop and report on AYA-specific cancer indicators. An environmental scan of the literature was undertaken, modifying the search strategy utilized by the Pediatric Oncology Group of Ontario (POGO) to develop childhood cancer indicators. The literature guided both the development of the framework and methods for identifying indicators. **RESULTS:** The framework was based on principles and recommendations for AYA cancer control from the Task Force's 2010 stakeholder workshop. The principal areas include: active care, survivorship, palliation, psychosocial, research, awareness, prevention and education. Methods for indicator development were adapted from those utilized by POGO. A brainstorming exercise informed by clinical literature and team correspondence led to the creation of a comprehensive list of indicators. The list will be refined using a survey that will assess proposed indicators using three criteria: importance, relevance, and usability. Participants will also rank the top two indicators in each of the identified principal areas of the framework. A consensus meeting will be held to review results and produce a final ranked list of indicators. **CONCLUSIONS:** Involvement of multiple stakeholder groups in this process will ensure a comprehensive set of indicators, and enhance uptake of the indicators into practice. The metrics developed will identify opportunities to improve quality of care and benchmarks to achieve short-, medium-, and long-term outcome-improvement goals in AYA cancer control in Canada.

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**21 Current State of Clinical Trials Accrual of Adolescents and Young Adults with Cancer in Canada**

Presented by **LESLEIGH ABBOTT**, Research co-ordinator, McMaster University

**OBJECTIVE:** Canadian national data on accrual of adolescents and young adults (AYAs) with cancer to clinical trials has not been collected to date. The objective was to determine accrual of AYAs with cancer to clinical trials in Canada, through identification of relevant available data sources, with the goal of facilitating improvements. **APPROACH:** The Canadian Task Force on Adolescents and Young Adults with Cancer established a Clinical Trial Accrual Working Group in 2013 to develop and assess a comprehensive list of potential data sources for clinical trial accrual of Canadian AYAs, defined as 15-29 years of age. Data sources used in analyses included: British Columbia Childhood, Adolescent, Young Adult Cancer Survivorship Research Program (BC-CAYACs), Alberta Cancer Registry, Ontario Institute for Cancer Research (OICR), Pediatric Oncology Group of Ontario Networked Information System (POGOnis), and CancerCare Manitoba Epidemiology Department. A retrospective review was conducted at three Ontario centres and findings compared with OICR data. **RESULTS:** No single source of cancer clinical trial accrual data exists nationally that includes age at enrolment. BC-CAYACs (15-24 years) and POGOnis (15-19 years) provide the most comprehensive data on AYAs. Reported accrual of AYAs with cancer to interventional clinical trials in Canada, presented as a proportion of incident cases by province, ranged from 0.4% to 12.2% across British Columbia, Alberta, Manitoba and Ontario, the only provinces where such data could be readily obtained. Records are not standardized with different sources focusing on different disease types and age cut-offs. Accrual was greater in teenagers, than for those aged 20 years and over. While results have not been formally validated, data review at three Ontario centres confirmed low accrual as reported to OICR. **Conclusions:** This index based on available data suggests AYA accrual to clinical trials in Canada is unacceptably low. Strategies are required to increase the proportion of AYA patients enrolling in cancer clinical trials. A national data centre would enable determination of accrual rates accurately while fostering recruitment and enrolment.

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**22 Characterizing the Utilization of the Trillium Drug Program by an Oncology Patient Population**

Presented by **SOO JIN SEUNG**, Director, HOPE Research Centre

**Objectives:** The Trillium Drug Program (TDP) was developed for Ontarians who require financial assistance for perscription drug costs. With the rise in cancer incidence and anti-neoplastic drug costs, the aim of this study was to analyze a patient population with a cancer diagnosis and their TDP use. **Methods:** Individuals with a cancer diagnosis from 2000-2009 were ascertained from the Ontario Cancer Registry (OCR). The Ontario Drug Benefit (ODB) database was used to identify TDP claims with plancode "T" "F". Patients were then grouped in the following categories for analysis (age at diagnosis): (1) no TDP claims and age < 65; (2) no TDP claims and age ≥ 65; (3) first TDP claim before diagnosis; (4) first TDP claim on or after diagnosis. A 3-year lookback window was used to determine claim history. Baseline characteristics and demographics of the patient population in each TDP usage group were then examined. **Results:** There were 525,820 individuals in the cancer cohort, 238,554 (45.4%) of which were <65 years at diagnosis. The vast majority (98.5%) of these cancer patients were never on the TDP. However, the 7,853 TDP individuals (both before and after cancer diagnosis) were fairly evenly distributed across income quintiles. Of the 5,407 TDP individuals with a claim after cancer diagnosis, 4,654 were <65 years. This TDP cohort's average age was 61.4 years, 53.5% were male and 23.2% had prostate cancer. Their first TDP claim came on average 1,604 days (4.4 years) after cancer diagnosis. **Conclusions:** This is the first attempt to characterize TDP in oncology so it is difficult to assess whether or not our results confirm that the TDP is being underutilized. The authors plan to conduct further analysis to determine further characteristics of TDP utilization over time and across cancer disease sites.

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**23 Impact of the 21-gene Recurrence Score® assay on the adjuvant treatment of breast cancer patients with 1-3 positive lymph nodes in an academic centre in Ontario**

Presented by **SOFIA TORRES**, Medical Oncology Clinical Fellow, Sunnybrook Odette Cancer Centre

**Objective:** To characterize how the results of the Recurrence Score® (RS) assay impact the decision making processes of medical oncologists and patients in an academic centre in Ontario. **Approach:** Prospective study including 70 patients with estrogen-receptor positive (ER+), HER2-negative early stage breast cancer (EBC) and 1-3 positive lymph nodes (LN+). Treatment recommendations for adjuvant therapy, as well as the physician's level of confidence in their recommendation, were evaluated before and after the RS assay. We also evaluated whether the results of the RS affected patients' treatment preferences, their level of confidence on treatment choices and the actual treatment administered. Here we report the results for the first 50 patients, enrolled from October 2014 to December 2015. **Results:** Mean patients' age was 61. Tumor size was  $\leq 2$  cm in 46% of patients,  $>2-5$  cm in 44% and  $>5$  cm in 10%. Tumors were grade 1 in 24% of patients, grade 2 in 50% and grade 3 in 26%. RS was low ( $<18$ ) in 52% of cases, intermediate (RS 18-30) in 38% and high ( $\geq 31$ ) in 10%. Treatment recommendations changed in 35% of patients. The most significant change was in the group with a low RS ( $<18$ ), with 48% of the recommendations changing from upfront chemotherapy (CT) pre-assay, to endocrine therapy only post-assay. Physicians' and patients' confidence in the recommendations/ choices increased in 46% and 65% of cases, respectively. Upfront chemotherapy (CT) was recommended to 75% of patients pre-assay, 43% ultimately received CT. **Conclusions:** The RS assay resulted in a substantial decrease in the number of LN+ patients who received CT and in an increase of the physicians' and patients' confidence in the adjuvant treatment recommendations. Currently, the assay is only reimbursed by the provincial single payer Ontario Health Ministry for node-negative EBC.

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**24 A System Dynamics Model for Wait Times and Bed Capacity for Stem Cell Transplantation in Ontario**

Presented by **JONATHAN WANG**, Functional Manager, Capacity Planning, Cancer Care Ontario

**Objectives:** Cancer Care Ontario (CCO) is responsible for planning stem cell transplant (SCT) services in Ontario. The objective of this project is to develop a capacity planning model to investigate the effects on wait times of adding extra bed capacity for allogeneic transplant (ALLOSCT) in SCT centres. **Approach:** A high-level process flow diagram was generated to understand patient flow at one hospital and validated through consultation. This flow diagram was used to construct a system dynamics model to simulate patient flow. The model was parameterized with data from CCO, Discharge Abstract Database, hospital and clinical expert input. The effects at six months were projected for five scenarios: 1) current state; 2) increase bed capacity by 1; or 3) 2 beds; 4) increasing patient demand by 20; 5) combination of scenario 3 and 4. ALLOSCT procedures require special hospital rooms for up to 3 months. **Results:** The addition of 1 ALLOSCT bed resulted in a reduction of 22% and 11% to the ALLOSCT wait times and wait lists, respectively. The addition of 2 beds resulted in a reduction of 38% and 22% to the wait times and wait lists, respectively. If the demand increases by 20 patients per year, the addition of 2 beds resulted in a reduction of 16% in the wait times and while the wait list may experience a brief reduction, after 6 months, the wait list size will have increased by 9% as a result of the increased demand. **Conclusion:** Using a system dynamics model, we are able to quantify the relationship between ALLOSCT bed capacity and wait times at a SCT centre. This model can be used to estimate the ALLOSCT bed requirements for all sites in Ontario needed to meet an established provincial benchmark.

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**25 Developing a disease pathway map for the diagnostic process of soft tissue sarcomas**

Presented by **AMANDA WONG**, Specialist, Program, Cancer Care Ontario

**Objective:** Sarcomas are rare, affect all age groups and may arise in any part of the body. In Ontario, there are approximately 1,000 adult cases annually. The majority of cases occur in the soft tissues. Appropriate investigation, management and rehabilitation of patients with sarcoma require a high degree of coordination among healthcare disciplines. Timely and appropriate referral is needed to prevent misdiagnosis, delayed diagnosis and inappropriate treatment. **Approach:** Cancer Care Ontario's Sarcoma Services Steering Committee recommended the development of a disease pathway map to facilitate appropriate and timely diagnosis. Disease pathway maps have the potential to improve the quality of care, while optimizing the utilization of resources. Literature and jurisdictional scans were performed to inform the initial draft. A multidisciplinary working group of clinicians (including primary care physicians, radiologists and pathologists) further developed the pathway to fit the demands of practice in Ontario. **Results:** A disease pathway map that clarifies the indicators of soft-tissue sarcomas and directs care accordingly was created. The Pathway also outlines imaging and pathology to confirm a diagnosis, and recommend consultation and referral points. The user is directed to services outlined within the Provincial Sarcoma Services Plan. The Pathway has been broadly distributed and presented to over 19,400 clinicians and administrators through various channels, including relevant professional groups. **Conclusion:** The Soft Tissue Sarcoma Diagnosis Pathway provides clarity on the diagnostic process and facilitates a province-wide, multidisciplinary approach to provide sarcoma care in Ontario. An ongoing program of education to increase awareness is needed in order to promote accessibility, efficiency and quality care to patients with soft tissue sarcoma. Moving forward, quality indicators for the Sarcoma Program will be used to measure the overall impact and implementation.

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**26 A population-based study of standard dose versus reduced dose racemic leucovorin in adjuvant colorectal cancer treatment**

Presented by **KELVIN CHAN**, Co-Director, Canadian Centre for Applied Research in Cancer Control

**Purpose:** In the adjuvant colorectal cancer chemotherapy regimen of Oxaliplatin, bolus and infusional 5-FU and leucovorin (FOLFOX), the standard dose of leucovorin is either 400 mg/m<sup>2</sup> (racemic) or 200 mg/m<sup>2</sup> (levo-leucovorin) per cycle. Unintentional use of 200 mg/m<sup>2</sup> of racemic leucovorin has been reported, but the impact on patients was unclear. This study compares overall survival (OS) and toxicity of patients receiving 400 mg/m<sup>2</sup> (standard dose) vs. 200 mg/m<sup>2</sup> (reduced dose) of racemic leucovorin. **Methods:** Patients who received adjuvant FOLFOX in Ontario from 2007-2014 were identified from provincial drug funding data and linked to various administrative databases to ascertain baseline characteristics, health service utilization, and outcomes. Cox and logistic regression models were constructed to examine the OS and toxicities of standard versus reduced dose. **Results:** 5,506 patients were identified. 845 (15%) patients received reduced dose racemic leucovorin, and were more likely to be Stage III, to have waited longer after surgery for treatment, and to live farther from their treatment center. The reduced dose group did not have worse OS than the standard dose group (HR=0.90, 95% CI: 0.56-1.44) with a 5-year OS of 79% vs. 77%. The reduced dose group had similar emergency room (ER) visits and hospitalizations during treatment when compared to the standard dose group. **Conclusions:** Patients who received reduced dose racemic leucovorin did not experience detectably worse OS, and had similar toxicity with respect to ER visits and hospitalizations. This finding provides reassurance as this unintentional under-dosing of racemic leucovorin may not be uncommon.

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**27 Performance Status as a Predictive Factor for Systemic Therapies: A Systematic Review**

Presented by **SIERRA CHENG**, Student, Sunnybrook Health Sciences Centre

**Objectives:** Whether patients (pts) with high and low PS derive different net clinical benefit from systemic therapies is unclear and could impact pCODR funding recommendations. We aimed to examine the frequency of PS subgroup analysis reporting and whether PS is a predictive factor of the efficacy or toxicity of systemic therapies. **Approach:** A systematic review was conducted of randomized controlled trials (RCTs) cited as clinical efficacy evidence for drug approvals between 2006 and August 2015 by the Food and Drug Administration, the European Medicines Agency and Health Canada. Two independent reviewers reviewed and extracted data from RCTs with overall survival (OS) and/or progression-free survival (PFS) primary endpoints which also reported PS subgroup analyses. The frequency of reporting of PS subgroup analysis for efficacy and toxicity was calculated. PS were dichotomized into high and low subgroups. Meta-analyses of OS/PFS based on PS subgroups and meta-regressions were performed using random-effects models. **Results:** One hundred and ten RCTs were identified. Net clinical benefit could not be fully determined because none of the RCTs reported PS subgroup analyses for toxicities and only 66 (60%) reported PS subgroup analyses for efficacy. These 66 RCTs included 23,262 pts in the high PS group and 19,484 pts in the low PS group with 50 testing targeted agents, 11 chemotherapies, four hormone therapies and one chemotherapy-targeted agent conjugate. Pooled HRs for high and low PS subgroups were 0.65 (95% CI 0.61-0.70) and 0.66 (95% CI 0.61-0.71), respectively, with no subgroup differences ( $p = 0.74$ ,  $I^2=0\%$ ). Sensitivity analyses based on specific drug type or cancer type as well as only PFS or OS HRs all showed similar results. **Conclusions:** Pts with borderline low PS appear to derive similar relative efficacy benefit from systemic therapy as pts with high PS for the range of PS included in current RCTs. Subgroup analyses of toxicities based on PS and more inclusion of pts with borderline low PS in RCTs should be considered.

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**28 A cost-effectiveness evaluation of Ibrutinib for diffuse large B-cell lymphoma (DLBCL) in British Columbia**

Presented by **SARAH COSTA**, Health Economist, Canadian Centre for Applied Research in Cancer Control-BC Cancer Agency

**OBJECTIVES:** Classifying diffuse large B-cell lymphoma (DLBCL) into prognostic subgroups allows for personalized cancer control strategies. The economic impact of stratified treatment based on accurate subgroup identification remains unknown. We conducted a cost-effectiveness analysis of offering Ibrutinib to eligible patients using standard immunohistochemistry (IHC) and gene expression profiling (GEP) classification methods. **APPROACH:** Standard IHC methods tend to misclassify 10-15% of DLBCL patients into binary-based subgroups, while GEP is more precise but comparatively more costly. Using Markov models, we examined the cost-effectiveness of offering Ibrutinib to GEP-classified subgroups compared to: (1) IHC-based binary assignment, and (2) standard care for all patients. Costs and effectiveness of standard care were based on a retrospective cohort of DLBCL patients previously treated in British Columbia (BC). Costs and effectiveness data for Ibrutinib were derived from the literature. Scenarios were analyzed over a 15-year time horizon, and the primary endpoint was cost per life-year gained (LYG). **RESULTS:** We found that Ibrutinib offered to DLBCL subgroups assigned using GEP may be cost effective compared to standard IHC methods. The potential for cost savings was estimated to be \$4,956/patient (95% confidence interval [CI]: -\$1,932 – \$11,844), with a non-statistically significant difference in effectiveness. The cost-effectiveness of offering Ibrutinib to GEP-assigned subgroups compared to standard care was only found to be favourable if the likelihood of relapse is reduced by 60% or more. At 60% reduction in relapse, the incremental cost-effectiveness ratio (ICER) was estimated at \$68,435/LYG (95% CI: \$53,048 – \$98,275), falling below a willingness-to-pay threshold of \$100,000/LYG. In contrast, a 20% reduction resulted in an ICER of \$212,125/LYG (95% CI: \$130,652 – \$553,921). All costs are reported in 2015 Canadian dollars. **CONCLUSION:** Our analysis revealed that accurate identification of DLBCL subgroups, using GEP, that benefit from Ibrutinib results in cost savings. In contrast, when Ibrutinib was compared to standard care, it was only found to be cost-effective at substantial (i.e., > 60%) improvements in treatment effectiveness.

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**29 Economic evidence for the cost-effectiveness of high-risk lung cancer screening**

Presented by **SONYA CRESSMAN**, Health Economist, ARCC-BCCA

**Objectives:** To develop a decision analytic model to evaluate the cost-effectiveness of offering lung cancer screening to Canadians with a calculated risk of developing lung cancer that is greater than 2% over three years. **Approach:** We used based on evidence from the Pan-Canadian early detection of lung cancer study and a large, American, randomized controlled trial (the National Lung Cancer Screening trial) as inputs to a cost-effectiveness model. Screening was offered only to high-risk individuals who qualify for lung cancer screening based on a risk prediction calculator. A decision-tree plus markov modelling approach was taken to determine the expected difference in cost and outcomes of screening high-risk individuals for lung cancer using a 30 year, life-time horizon. **Results:** Selecting high-risk individuals before screening reduced the number needed to screen by 50% in the Canadian study and 80% in the American study. The base case incremental cost effectiveness ratio was \$10 212 per quality-adjusted life year gained for screening versus standard care. Variation in non-lung cancer mortality rates, smoking status and screening costs and quality of life would decrease cost-effectiveness, marginally, while rising drug costs and increased survival time for non-curative treatment improved the cost-effectiveness of screening. The cost-effectiveness of screening versus standard care was insensitive to all other key parameters in deterministic and probabilistic analysis. **Conclusions:** Screening high-risk individuals with low dose computed tomography is likely to be considered a cost-effective cancer intervention and could offer overall cost savings if the prices paid for drugs that treat lung cancer increases five-fold over the next ten years.

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**30 Estimating the effect of time on patient-derived measures of quality of life and health state utility**

Presented by **IAN CROMWELL**, Health Economist, Canadian Centre for Applied Research in Cancer Control

**Introduction:** Quality of life (QoL) and health state utility measures are often measured at a single point in time. Incorporating such cross-sectional estimates into decision models requires modelers to assume that patients do not adapt to disease, or that respondents to survey instruments are taking adaptation into account. Repeated QoL and/or utility measurement within a patient population may allow us to observe the effect that time has on these important outcomes. **Methods:** A population of 411 patients treated for early-stage oral malignancies (squamous cell carcinoma or high-grade interepithelial lesions) were administered the EQ-5D and the head/neck module of the FACT QoL instrument at baseline (before surgical treatment), and 1.5, 3, and 24 months after treatment. These data were used to fit random effects regression models. Demographic variables (age, sex, ethnicity, smoking, history of cancer) and disease-related variables (disease grade, location of primary tumour, characteristics of surgery) were included as covariates in the models. **Results:** Average EQ-5D scores (max = 1.0) were 0.65, 0.65, 0.64, and 0.62 when measured at baseline, six weeks, 3 months, and 24 months respectively. Average FACT-HN scores (max = 156) were 120, 118, 122, and 125 respectively. The random effects model found that time, family history of cancer, and the need for skin graft during surgery were significantly associated with utility, while only time was significantly associated with FACT-HN scores. Intraclass correlation was 0.46 and 0.37 for the EQ-5D and FACT-HN respectively. **Conclusion:** Work in this population is ongoing. Significant covariates in the regression models may help identify clinically-relevant subgroups within the population, while the coefficients can be used to estimate changes in utility/QoL over time. Such estimates may allow decision models to incorporate disease adaptation into cost-utility analyses.

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**31 Treatment patterns in castration-resistant prostate cancer in Quebec: impact of initial primary treatment**

Presented by **JASON HU**, MSc Student, McGill University

**Objectives:** Management of castration-resistant prostate cancer (CRPC) has become very complex. Little is known about the impact of initial treatment for prostate cancer on patterns of care in the CRPC phase. Our study aimed to analyze treatment patterns in CRPC in Quebec by initial treatment received. **Approach:** The cohort selected patients with evidence of CRPC from Jan 2001 to June 2013 from the public healthcare insurance programs (Régie de l'Assurance Maladie du Québec (RAMQ) and Med-Echo databases). Multivariate logistic regression was used to measure associations between initial primary treatment and patterns of care in CRPC, adjusted for many covariates including comorbidities in the 1-year period prior to CRPC. **Results:** Our cohort consists of 2898 patients. Initial treatment for PCa was radical prostatectomy (RP) in 713 patients (24.6%), external-beam radiotherapy (EBRT) in 465 patients (16.1%), and androgen deprivation therapy (ADT) in 1720 (59.4%). Median age at CRPC was 77.0, 75.0 and 74.0 in the ADT, EBRT and RP groups respectively. In multivariate analysis, RP (OR: 1.30, 95%CI: 1.06-1.61) was associated with greater use of bone-targeted therapy compared to ADT patients. EBRT was associated with greater chemotherapy use (OR: 1.73, 95%CI: 1.33-2.25) compared to ADT patients. Both local treatments were associated with use of palliative radiation versus ADT patients (OR-EBRT: 1.78, 95%CI: 1.39-2.28; OR-RP: 1.37, 95%CI: 1.10-1.71). A significant decrease in usage for CRPC treatments was observed for older patients (OR-age between 0.94 and 0.98). **Conclusion:** Using a population-based approach, the type of initial primary treatment was associated with certain treatment patterns in the CRPC phase in our cohort.

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**32 Castration-resistant prostate cancer patients in Quebec: Medication use in the last year of life**

Presented by **JASON HU**, MSc Student, McGill University

**Objectives:** The current management of metastatic castration-resistant prostate cancer (mCRPC) has become very complex with the approval of several new drugs. The study objective was to describe medication use in the last year of life of patients dying of prostate cancer in Quebec. **Approach:** The study cohort consists of patients that received medical or surgical castration, became castration resistant and died between January 2001 and July 2013 in Quebec. CRPC was defined as patients who received chemotherapy, abiraterone (Abi), palliative radiotherapy, bone-targeted therapy (BTT) or an anti-androgen. For each patient in the study cohort, medication use (CRPC-related and overall) was identified from the RAMQ pharmaceutical database by 12-, 6-, 3- and 1- month periods prior to death. **Results:** The cohort consists of 1,692 patients who died of CRPC. Of the patients receiving BTT at any time, 54.4%, 73.7%, 80.8% and 89.8% received a prescription in the 1-, 3-, 6- and 12-month period before death. Among those receiving Abi at any time, the corresponding figures were: 49.1%, 65.7%, 79.9% and 96.5%, respectively. The percentage of patients receiving androgen deprivation therapy (ADT) in the 1-, 3-, 6- and 12-month period before death were: 10.7%, 59.6%, 74.8% and 83.6%, respectively. The median number of prescriptions per month was 7.1 in the last 12 months of life, 7.8 in the last 6 months, 8.7 in the last 3 months, and 1.7 in the last month of life, respectively. **Conclusion:** In the CRPC group, a large proportion of patients maintained their medications in their last months of life. Persistent ADT, BTT, and Abi during the last few months of life are common, associated with significant costs yet debatable benefit.

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**33 Systematic review of economic evaluations of smoking cessation programs in the oncology setting**

Presented by **WANRUDEE ISARANUWATCHAI**, Research Scientist, St. Michael's Hospital, Canadian Centre for Applied Research in Cancer Control

**PURPOSE.** Smoking is a known health risk, especially for cancer. Evidence shows that cancer patients who continue to smoke have poorer outcomes. Smoking cessation programs (SCPs) following a cancer diagnosis are being implemented, but the costs relative to their benefits is currently unclear. To address this knowledge gap, we are conducting a systematic review of economic evaluations of SCPs in the oncology setting. **METHODS.** We searched MEDLINE, EMBASE, EconLit, CINAHL, PsycINFO, Web of Science, the Cochrane Library, and grey literature. The outcome of interest is the incremental net benefit or the incremental cost-effectiveness ratio. Pairs of reviewers independently conducted screening of titles, abstracts, and full-text articles. Discrepancies were resolved through discussion. The quality of the economic evaluations will be assessed using Drummond's 10-item checklist. **RESULTS.** We identified 2,955 abstracts where only 1 full-text article met the inclusion criteria. Specifically, the study evaluated the cost-effectiveness of a formal SCP for patients with early stage non-small cell lung cancer. The article reported that a SCP could be cost-effective depending on the decision-maker's budget or willingness-to-pay. **CONCLUSIONS.** This systematic review highlighted a gap in the literature concerning economic evaluations of SCPs in the oncology setting. Given the significant health and economic burden of cancer and the diverse and expensive treatment options available, in addition to the clinical benefits evidence, information on economic evaluations of SCPs could represent vital piece of evidence (on the value for money) to assist the decision-making process and should be incorporated in future research.

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**34 Cetuximab (Cmab) plus Irinotecan (I) versus Panitumumab (Pmab) in patients with refractory metastatic colorectal cancer (mCRC) in Ontario**

Presented by **KATARZYNA JERZAK**, Fellow, University of Toronto

**Objectives:** In the BOND trial (Cunningham et al, NEJM 2004) for refractory mCRC, the addition of I to an EGFR antibody improved tumor response rate and time to progression but not overall survival (OS). We assessed the "real world" efficacy and toxicity of combination versus monotherapy in an Ontario-based population study. **Approach:** In Ontario, public funding is available for either Cmab + I combination or Pmab monotherapy only in pts with refractory non-mutated KRAS mCRC. All pts diagnosed before Dec 2012 and treated with an EGFR antibody for mCRC were identified from the Ontario drug database and linked to the Ontario Cancer Registry and other administrative databases to ascertain baseline characteristics, health services utilization and outcomes. Multivariable Cox and logistic models were constructed to compare the time to treatment discontinuation, OS, ED or hospital visits between Cmab+I and Pmab, adjusting for observable confounders using propensity score methods. **Results:** 1081 pts were identified (Cmab+I: 278, Pmab: 803); median age: 60 (21.1% >age 70), 36.4% female, 36.2% rectal cancer and 60.1% stage IV at presentation. After adjusting for confounders (including age, gender, year of diagnosis, stage at presentation, duration of prior treatment in 1st and 2nd line, previous liver resection, rural residence and income quintile), the use of Cmab+I as compared to Pmab alone was associated with a prolonged time to treatment discontinuation [median: 3.5 mos vs. 2.8 mos, HR 0.63, 95%CI 0.53-0.75, p<0.001] and an improved OS compared to Pmab alone [median: 8.8 mos vs. 5.9 mos, HR 0.62, 95% CI 0.53-0.73, p0.05. **Conclusions:** "Real world" data suggest a possible OS benefit with Cmab+I compared to Pmab alone, without increased toxicity. Pts age ≥70 appear to experience similar benefit and toxicity from combination therapy. These results suggest a need for adequately powered randomized trials to compare Cmab+I and Pmab like the ongoing ICECREAM study.

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**35 An Economic Evaluation Protocol of the Prostate Cancer Canada Sexual Health and Rehabilitation eClinic (SHARe-C)**

Presented by **LISA MASUCCI**, Health Economist, St. Michael's Hospital

**Objectives:** The Sexual Health and Rehabilitation eClinic (SHARe-C) is a web-based pilot program offered to patients/couples who undergo treatment for localized prostate cancer. SHARe-C aims to improve sexual function and to support the maintenance of intimacy. The objective of this research is to describe a protocol for conducting an economic analysis of the SHARe-C program in Canada. **Approach:** An economic analysis will be carried out alongside a prospective cohort study consisting of five pilot program sites across Canada (Nova Scotia Cancer Centre, Princess Margaret Cancer Centre, Tom Baker Cancer Centre, Saskatoon Cancer Centre, and Vancouver General Hospital). The economic evaluation will consist of both a cost-effectiveness analysis and cost-utility analysis. The primary effectiveness outcome will be the patient's quality-adjusted life-years which is measured using the EQ-5D-5L and the Patient-Oriented Prostate Utility Scale. Cost measures include resources to implement and monitor the program. The economic evaluation will be conducted from the perspective of a third party payer with a two-year time horizon. **Results:** The findings will include an incremental cost-effectiveness ratio (ICER), which is defined as the difference in costs between the intervention and usual care divided by the difference in effects. This estimate will represent the additional cost of the SHARe-C program compared to usual care to achieve one more QALY. In addition, using a net benefit regression framework, we will report the net benefit of SHARe-C compared to usual care. We will use the cost-effectiveness acceptability curve (CEAC) to present the uncertainty of the findings. The results of this economic evaluation may be helpful to others who are interested in adopting this program in their area and want to know the economic feasibility. **Conclusion:** The SHARe-C program will provide support to men with prostate cancer who are dealing with the side effects of treatment. Understanding the economic impact of the SHARe-C program may assist both policy- and decision-makers in deciding whether to implement the program within their defined budget.

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**36 Multi-site implementation of patient-reported outcome measures for personalized care and patient activation in symptom management**

Presented by **NICOLE MONTGOMERY**, Coordinator, Cancer Care Ontario

**Background:** The Improving Patient Experience and Health Outcomes Collaborative (iPEHOC) is a multi-site quality improvement initiative in six cancer programs across Quebec, Ontario and remote Aboriginal clinics. The goal of iPEHOC is to facilitate the uptake of a standardized core set of patient-reported outcome measures (PROMs) for personalized treatment planning and patient activation in routine cancer care. **Methods:** The iPEHOC computerized system includes a tailored patient assessment of PROMs for symptoms of pain (BPI), fatigue (CFS), depression (PHQ-9) and anxiety (GAD-7), with a graphic output for customizing care in the clinical encounter. These symptoms were selected for PROMs implementation given their prevalence and impact on patients. Data is collected from electronically to evaluate the implementation of PROMs and symptom severity in each area. The iPEHOC intervention also includes standardized case-based education to enhance integration of PROMs for use in collaborative treatment planning and patient activation to improve symptom outcomes. iPEHOC was implemented in sites with different stages of readiness, models of care, and patient population complexity. Sites tracked participation in education and knowledge translation activities through a standardized reporting tool. **Results:** Preliminary results reveal screening rates across sites ranging from 56% - 100%, with 38% - 70% of patients triggering at least one additional PROM. Averaged across all of the pilot sites 42%, 32%, 59%, and 95% of patients scored within the moderate to severe range on PROMs for depression, anxiety, pain interference and, fatigue respectively. Clinical teams from all of the participating sites have attended inter-disciplinary education sessions and ongoing case-based learning sessions on the use of PRO data. iPEHOC sites reported lessons learned regarding implementation. **Conclusion:** Routine collection and clinical uptake of PROM data in clinical care is feasible with attention paid to organizational alignment as well as the use of integrated knowledge translation that engages key stakeholders and case-based training. The use of best practices in change management can transcend differing organizational contexts and cancer care delivery systems to improve patient experience.

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**37 Estimating the costs of intensity-modulated and 3D conformal radiotherapy in Ontario**

Presented by **RUBY REDMOND-MISNER**, Research Associate, Cancer Care Ontario

**Objectives:** Radiotherapy is a common treatment for many cancers, but up-to-date estimates of the cost of radiotherapy are lacking. This study estimates the unit cost of intensity-modulated radiotherapy (IMRT) and three-dimensional conformal radiotherapy (3DCRT) in Ontario, Canada. **Approach:** An activity-based costing model was developed to estimate the costs of IMRT and 3DCRT in prostate cancer. It included the costs of equipment, staff and supporting infrastructure. The framework was subsequently adapted to estimate cost of radiotherapy in breast cancer and head and neck cancer. We also tested different scenarios by varying program maturity and the use of Volumetric Modulated Arc Therapy (VMAT) alongside IMRT. **Results:** From the perspective of the health care system, treating prostate cancer with IMRT and 3DCRT cost \$14,520 and \$13,501 per patient, respectively. The cost of radiotherapy ranged from \$5,289 to \$16,085, and was sensitive to analytical perspective, radiation technique and disease site. Head and neck cancer was the most costly, which was driven by treatment complexity and fractions per treatment. While IMRT was more costly than 3DCRT, its cost will likely decrease over time as programs mature and with the incorporation of VMAT. **Conclusion:** Our costing model can be modified to estimate the costs of 3DCRT and IMRT for different disease sites and settings. The results demonstrate the important role of capital costs in radiotherapy cost and that future analyses of IMRT cost should consider how VMAT impacts on time consumption.

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**38 Estimating hazard ratios from published Kaplan-Meier survival curves**

Presented by **RONAK SALUJA**, Sunnybrook Health Sciences Centre

**Objectives:** Hazard ratios (HRs) are commonly required for aggregate data meta-analysis but are inconsistently reported in clinical trials. Consequently, statistical methods have been developed to derive HRs from published Kaplan-Meier (KM) survival curves. The objective of this study was to evaluate the accuracy/reliability of the commonly used graphical methods. **Approach:** Methods by Guyot (BMC Med Res Methodol., 2012) and Williamson (Stat Med., 2002) were compared to the traditionally used Parmar method (Stat Med., 1998). HRs and their variances were estimated from KM curves published by pivotal clinical trials extracted from the pan-Canadian Oncology Drug Review (pCODR) database. The reconstructed HRs were compared to reported HR values with root mean square error (RMSE), mean absolute error (MAE) and standard error (SE) of natural log (ln) HR. Reproducibility of the methods was assessed using the Intra-class Correlation Coefficient (ICC). Agreement between the reconstructed and reported HRs was measured using the Bland-Altman method. **Results:** 70 KM curves were extracted from 38 included trials. RMSE between reconstructed and reported ln HRs was 0.027, 0.052 and 0.076 for Guyot, Williamson and Parmar respectively. MAE values were 0.018, 0.038 and 0.051. The average % change of SE of ln HR was 0.749, 5.45 and 5.88. In similar order, ICC between reviewers was 0.997, 0.978 and 0.973. Bland-Altman plots revealed minimal bias and good agreement between the reconstructed and reported HRs for all methods. **Conclusions:** All methods had high reproducibility and agreement. Guyot's method was most accurate with the lowest RMSE, MAE and % change in SE. Due to its ease of use, the Williamson method may also be a good alternative. This study provides validation of methods for HR extraction from survival curves.

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**KNOWLEDGE TRANSLATION**

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**39 A novel methodology for comparing standard of care interventions in cancer patients - The Rethinking Clinical Trials (REaCT) Program**

Presented by **SASHA MAZZARELLO**, Medical Oncologist, The Ottawa Hospital Cancer Centre and The Ottawa Hospital Research Institute

**Objectives:** Conducting clinical trials is cumbersome and expensive, and the majority of studies focus on either the development of new agents or new indications for established agents. Pragmatic trials comparing standard of care interventions are rarely performed, leaving many important and practical questions neglected. Innovative methodologies and approaches are needed. **Approach:** We have identified elements to enhance pragmatic studies comparing standard of care interventions: 1) Is the question clinically relevant to providers and patients? 2) Ensuring equipoise exists through surveys of knowledge users and systematic reviews; 3) Appropriate study design and simple, easily defined meaningful endpoints 4) Research Ethics Board approval 5) Use of an integrated consent model (ICM) incorporating oral consent; 6) Web-based randomization in the clinic; 7) Real-time electronic data capture and management and 8) Regular team feedback. **Results:** Since September 2014, we have piloted 3 pragmatic trials that contain these elements to compare standard of care interventions in breast cancer patients. 1. REaCT-TC: compares growth factor support or ciprofloxacin for primary prophylaxis for febrile neutropenia (FN); 2. REaCT-G: compares 5, 7 or 10 days of filgrastim for primary prophylaxis for FN; 3. REaCT-Magee: evaluates whether using a Magee score (a simple surrogate of Oncotype Dx derived from standard pathology variables) reduces the ordering of Oncotype Dx. To date, 205 patients have been randomized in REaCT trials. We have enhanced participation with the ICM process and logistical issues with the web-based randomization system. Patient and physician compliance has been excellent. Indeed, 45/51 (88%) of surveyed patients were completely satisfied with the ICM process. **Conclusion:** Given that the current clinical trials model is inefficient for comparison of standard of care interventions, our proposed model contains elements that can be used either alone or in combination. Hopefully this will increase patient accrual, encourage physician participation, and use resources efficiently and effectively to answer important clinical questions.

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**40 Lessons from an evaluation of KT-Net's grant competition: Challenges with collaborative research between researchers and Cancer Care Ontario knowledge users**

Presented by **MARY ANN O'BRIEN**, University of Toronto

**Purpose:** The goals of the Knowledge Translation Research Network (KT-Net) are to advance knowledge translation (KT) science and build capacity in cancer KT research. Accordingly, KT-Net holds grant competitions aligned with the priorities of the Ontario Institute for Cancer Research and Cancer Care Ontario (CCO). We evaluated the impact of four competitions. **Methods:** An evaluation framework adapted from CIHR guided the design and analysis. Semi-structured telephone interviews were conducted with Principal Investigators who applied for KT-Net funding between 2009 and 2012, stakeholders, knowledge users, and experts in KT. Relevant documents including reports of funded studies were reviewed. The transcripts from the audio-recorded interviews were coded independently by two team members. The constant comparative method was used in the analysis. NVivo software was used to store data and facilitate the analysis. **Results:** Thirty-seven individuals were invited to participate; 20 (54%) agreed. Findings indicate that KT-Net grant competitions are a unique funding program for KT-specific cancer research, encouraging innovative inquiry specifically relevant to cancer. The competitions have provided new KT researchers with an opportunity to gain capacity in KT and leverage funding. Researchers perceived knowledge user involvement as a unique facilitator to achieving outcomes on KT-Net studies. However, upon study completion, ambiguity may exist around the knowledge user's role in the uptake and promotion of study findings. Researcher and stakeholders suggested that KT-Net and CCO could take a greater role in not only promoting results but also brokering the researcher – knowledge user partnerships in KT-Net studies. **Conclusion:** Stronger links between KT-Net and CCO are needed to optimize the application of KT-Net funded research relevant to CCO's strategic objectives. Clearer expectations of the role of knowledge users, their link to organizational governance and decision making, and mechanisms to resolve role ambiguity should be considered.

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**41 Association between immigration status & cervical cancer screening: Systematic review & meta-analysis**

Presented by **SYEDA KINZA RIZVI**, MSc Candidate, Research Assistant, University of Calgary

**Background:** In developed countries, much invasive cervical cancer, and the highest mortality rates occur in women who never had a Pap test. Immigrants appear less likely to have been screened for cervical cancer than non-immigrants. Education, marital status, income, primary care provider characteristics, acculturation, and women's knowledge and beliefs about cervical cancer screening seem to be associated with low levels of screening among immigrants. **Objective:** We aimed to determine the magnitude of association between immigration status and cervical cancer screening (ever been screened) among women in developed countries. **Approach:** The search used guidelines of the Center for Reviews and Dissemination, using a combination of keywords related to cervical cancer and screening. Data was extracted using the 2009 PRISMA checklist. The Newcastle-Ottawa Quality Assessment Scale was used for confounding and quality assessment. **Results:** From 7426 citations, ten articles were included in the systematic review and eight in meta-analysis. The studies were published between 2001 to 2013 from Australia, UK, USA, Canada & Spain. Immigrants are less than half as likely to have ever been screened as non-immigrants in Canada (pooled OR = 0.44; 95% CI: 0.386- 0.511), Spain (OR = 0.41; 95% CI: 0.365-0.467), and Australia (OR = 0.44; 0.376-0.508). In the UK, the ratio is worse (OR = 0.23; 0.210-0.244). In the USA, the trend was similar but not significant (pooled OR = 0.62; 0.190-2.083). Demographics showed immigrants are less likely to be educated, have lower income and are uninsured. Women born in Asia had lower odds of ever being screened compared to other immigrant groups. **Conclusion:** A statistically significant association was found between immigration status and cervical cancer screening but there are limitations due to data reporting. Efforts to increase cervical cancer screening should focus on newly arrived immigrants, immigrants with low levels of education, with low household annual income, and particularly from Asian background. Improving access to care is important to increase cervical screening practices among immigrant populations.

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**42 Communities of Practice: A knowledge transfer and exchange model for improving quality of care in radiation treatment**

Presented by **CARINA SIMNICEANU**, Specialist-Policy, Radiation Treatment Program, Cancer Care Ontario

**OBJECTIVES:** Cancer Care Ontario's (CCO) Radiation Treatment Program (RTP) has established several Communities of Practice (CoPs), focused on improving radiation treatment (RT) quality and safety. CoPs – professionals with common areas of practice – identify quality issues, develop improvement initiatives, and drive adoption of practice recommendations through knowledge transfer and exchange (KTE) activities. **APPROACH:** To date, the RTP has established 7 CoPs: 4 intra-disciplinary (Radiation Therapy, Medical Physics, Advanced Practice Radiation Therapy, Radiation Safety) and 3 inter-disciplinary (Head and Neck (H&N), Gynecological (GYNE) and Lung Cancer). Employing KTE concepts, CoPs share best practices, drive the implementation of practice recommendations/guidelines, and ultimately standardize and improve quality of care. KTE activities include the development of guidance documents and implementation tools (toolkits/checklists), presentation of CoP work at conferences, and facilitation of dynamic workshops. Key audiences for CoP activities are clinicians in the cancer centres, CCO/RTP leadership, and RT professionals in other jurisdictions. **RESULTS:** To date, CoPs have developed CCO-endorsed guidance documents (4) and practical implementation tools (5). An additional 20 knowledge products are currently in preparation. Members have delivered numerous KTE presentations of various types [inter-CoP (4), international (4), national (5)] and hosted 33 workshops. Evaluation demonstrates that CoP guidance documents have enabled: Improved safety (use of safety straps in RT delivery<sup>1</sup>) (37 total downloads); Standardization of care (RT plan evaluation guidance and a common nomenclature system<sup>1</sup>) (93, 113 total downloads respectively); and Support for infrastructure improvements (recommendation for additional Magnetic Resonance-guided brachytherapy units<sup>1</sup>) (148 total downloads). In the most established CoP (HN), activities have improved alignment with recommended practice (40%-50% absolute increases) and enhanced inter-regional communication and collaboration (89%), knowledge transfer/exchange (91%), and professional networking (92%). **CONCLUSIONS:** Through effectively engaging in KTE activities, CoPs can be a highly successful model for improving quality of care. Future work will focus on employing evaluation metrics across all CoPs to continue to gauge the impact of the groups' activities.

Co-Author(s): Elizabeth Lockhart, Cancer Care Ontario

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**43 Radiation Incident Safety Committee: An Initiative for the Improvement of Safety within Radiation Treatment**

Presented by **CARINA SIMNICEANU**, Specialist-Policy, Radiation Treatment Program, Cancer Care Ontario

**OBJECTIVES:** The Radiation Treatment Program (RTP) at Cancer Care Ontario (CCO) established a Radiation Incident Safety Committee (RISC) in 2006 with the goal of disseminating radiation incidents and supporting knowledge sharing of incident safety information across regional radiation programs. **APPROACH:** The RTP has recruited Primary Radiation Incident Leads (RILs) from each regional radiation program to ensure full regional representation. The RILs participate in quarterly teleconferences, annual meetings, incident dissemination, and knowledge sharing activities. Distinct processes have been established for critical and non-critical (major, serious, minor) incidents to ensure timely dissemination, knowledge sharing and development of safety recommendations. Incident dissemination processes have been aligned with incident severity, where critical incidents are disseminated by the RTP within 48 hours and non-critical incidents rates are submitted by the regional radiation programs to the RTP on a quarterly basis. **RESULTS:** To date, RISC has made significant achievements in regards to enhancing the safety of radiation treatment (RT) delivery in Ontario through: Establishing a robust process for the provincial collection and dissemination of critical and non-critical radiation incidents; Modifying provincial reporting practice with the aim of strengthening incident data collection to aid the identification of potential corrective actions and learning; Participating in quarterly teleconferences and an annual in-person meeting to share critical incidents and safety recommendations; Commencing the development of centre-specific incident learning rounds to help support knowledge sharing and process improvements; and Working closely with the Canadian Institute for Health Information (CIHI) to develop a taxonomy and pilot the National System for Incident Reporting in Radiation Therapy (NSIR-RT). **CONCLUSIONS:** The observed impacts and gains confirm that RISC is highly effective for improving safety within RT. Future directions will be focused on implementation of NSIR-RT which will facilitate data collection and improve analysis. This effort will ultimately lead to make more significant impacts on safety.

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**44 Factors affecting the implementation of a regional guideline for completion axillary lymph node dissection: A qualitative study of physician opinions**

Presented by **MIRIAM TSAO**, MD, Department of Surgery, McMaster University

**Objectives:** In 2012 a regional guideline for completion axillary lymph node dissection (cALND) after positive sentinel lymph node biopsy was created to address variation in surgical practice. Our study explores the views and experiences of physicians in the implementation of a guideline to individual practice. **Approach:** The Pathman framework (awareness, agreement, adoption and adherence) informed the interview guide design and analysis. Semi-structured interviews were conducted with medical oncologists (MO), radiation oncologists (RO) and surgeons (S) and were transcribed verbatim. Main ideas were coded independently by 2 members of the study team, and disagreements were resolved through consensus. **Results:** Twenty-eight physicians (5 MO; 6 RO; 17 S) of 41 (68% of those approached) agreed to be interviewed. Ten of 11 (91%) hospital sites (54% community; 46% academic) and all 4 cancer clinics within the region were represented. Twenty-seven physicians (96%) were aware of the guideline, with all physicians reporting agreement and general adherence to the guideline. Most physicians felt nodal factors (ratio of positive nodes, extranodal extension, size of nodal metastases), age and patient preference were key components of the cALND decision. Nodal factors specifically were identified as a cause of non-adherence to guideline recommendations. Physicians from all disciplines perceived that the guideline helped to unify care within the region, although there were concerns that the guideline could be applied too rigidly, preventing individual decision-making. **Conclusion:** Physicians identified breast cancer as an increasingly complex and multidisciplinary issue. The regional guideline was viewed as beneficial in standardizing care and improving communication, while individual patient factors and controversial supporting evidence may hinder its implementation.

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**SURVIVORSHIP**

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**45 Long-term Cardiovascular Outcomes and Overall Survival of Early-Stage Breast Cancer Patients with Early Discontinuation of Trastuzumab: A Population-based Study**

Presented by **INNA GONG**, University of Toronto

**Objective:** We critically examined long-term cardiovascular (CV) outcomes and overall survival (OS) of breast cancer (BC) patients who had cardiotoxicity during adjuvant trastuzumab treatment requiring discontinuation in a population-based sample. **Approach:** This was a retrospective cohort of early-stage BC patients diagnosed before 2010 and treated with trastuzumab in Ontario. Patients were stratified based on trastuzumab doses received: early discontinuation as 1-8 or 9-15,  $\geq 16$  as completion. Time-dependent multivariable Cox models (adjusting for cardiac risk factors, comorbidities, stage and chemotherapies received) and propensity score methods were used to analyze the primary endpoint OS, and the following secondary composite endpoints: hospitalization/emergency room visit for heart failure (HF) or death; non-HF CV event (myocardial infarction, stroke) or death; clinically significant relapse (initiation of palliative systemic therapy  $>90$  days after last trastuzumab dose) or death. **Results:** Of the 3134 women (83%  $<65$  years old), 6%, 10%, and 85% received 1-8, 9-15, and  $\geq 16$  doses, respectively. Over 5-year median follow-up, early trastuzumab discontinuation was associated with more HF/death (1-8 doses HR 4.0, 95%CI 2.7-6.0; 9-15 doses HR 2.97, 95%CI 2.1-4.3), non-HF/death (1-8 doses HR 4.3, 95%CI 3.0-6.1; 9-15 doses HR 3.1, 95%CI 2.2-4.4), clinically significant relapse/death (1-8 doses HR 3.1, 95%CI 2.2-4.4; 9-15 doses HR 2.4, 95%CI 1.8-3.3), and importantly, lower OS (77%, 80%, 93%;  $p<0.001$ ). Early discontinuation (1-8 doses HR 2.41, 95%CI 1.5-3.8; 9-15 doses HR 2.9, 95%CI 2.0-4.1) and clinically significant relapse (HR 34.0, 95%CI 24.9-46.6) were both independent predictors of mortality. Of note, early discontinuation remained a critical independent predictor of OS even after adjusting for incident HF. **Conclusions:** Early trastuzumab discontinuation, a marker of cardiotoxicity, is a powerful independent predictor of adverse cardiac events and clinically significant relapse, both likely contributing to poor overall survival. Both optimal cancer and cardiovascular treatment strategies are needed for to improve the outcome of these high-risk patients.

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**46 Efficacy and safety of Regorafenib compared to TAS-102 for refractory metastatic colorectal cancer**

Presented by **ANA BEATRIZ KINUPE ABRAHAO**, MD, Sunnybrook Health Sciences Centre

Recent studies have shown Regorafenib (R) and TAS-102 (TAS) to be superior to placebo (P) in refractory metastatic colorectal cancer (mCRC). However, no studies have directly compared R with TAS. We aimed to compare the efficacy and safety of R compared with TAS using indirect comparison methods. Method: We conducted a systematic review using PubMed, Medline, Embase, Scopus and Cochrane database to identify published and unpublished studies up to November 2015 for randomized controlled trials (RCTs) for patients with mCRC, involving Regorafenib or TAS-102. Data including overall survival (OS), progression-free survival (PFS) and toxicity (Tox) were extracted. Pairwise direct meta-analyses (R vs. P and TAS vs. P) and indirect comparison (R vs. TAS) using network meta-analyses methods (R package "netmeta") to preserve randomization were performed. Results: 914 citations were initially identified among which 3 RCTs fulfilled eligibility criteria (CORRECT, CONCUR and TAS-102) involving 1,764 patients (R: 641, TAS: 534, P: 589). Subgroups of patients (1,659) who had not received prior R or TAS were used to performed meta-analyses for efficacy. Indirect analysis of OS between R vs TAS showed HR/OR 1.02 (95% CI 0.80-1.32), and PFS showed HR/OR 0.96 (95% CI 0.76-1.21). All grades toxicity R vs TAS showed HR/OR 2.46 (0.99-6.08) and toxicity  $\geq 3$  HR/OR 3.40 (95% CI 2.14-5.42). Conclusion: In this indirect comparison, R and TAS appeared to have similar efficacy. However, R appears to have more toxicity compared to TAS. Post-approval real world data focusing on the comparative toxicity of R and TAS is warranted.

Co-Author(s): Ana Beatriz Kinupe Abrahao, Sunnybrook Health Sciences Centre / Yoo-Joung Ko, Sunnybrook Health Sciences Centre / Kelvin Chan, Sunnybrook Health Sciences Centre

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**47 Long-term outcomes following level three axillary lymph node dissection for breast cancer**

Presented by **HEATHER POUSHAY**, Resident, Sunnybrook Health Sciences Centre

Axillary lymph node dissection (ALND) for node positive breast cancer traditionally includes levels I and II. Data remains limited regarding outcomes following level III ALND for patients with level III nodal metastasis. We sought to assess the oncological outcomes of patients with breast cancer undergoing level III ALND. Methods: We performed a retrospective cohort study including all patients undergoing level III ALND from 2004-2014 at a tertiary care cancer centre. Primary outcomes were overall and recurrence free survival (OS and RFS) and time to recurrence (TTR). Pre-operative (clinical examination and imaging) and intra-operative (surgeon assessment) clinical diagnosis of malignant LNs were distinguished. Kaplan-Meier methods were used to compute survival curves. Results: Of 21 patients undergoing level III ALND, 18 had a mastectomy and three a lumpectomy. Additional therapy included chemotherapy in all patients, radiation in 16, and hormonal therapy in 13. Thirteen (61.9%) patients were diagnosed pre-operatively and received NAT. Two of these patients had complete pathologic response, six residual level III lymph node (LN) disease, three disease limited to level I and II, and two had no nodal disease but residual primary tumor. Among eight patients diagnosed intra-operatively, all had metastatic disease in level III LNs. All eight received adjuvant treatment (AT). At 34-month median follow-up, actuarial 5-year OS was 67.5% (95%CI: 55.0-80.0%) and 5-year RFS was 47.4% (95%CI: 34.5-60.3%). At last follow-up, 13 (66.7%) patients were alive, including two (9.5%) with disease and 11 (52.4%) without disease. Eight patients (38.1%) developed distant recurrences. One (4.8%) patient developed local recurrence and four months later was found to have distant metastasis. Median TTR was 5 months (range: 1-36 months). Fewer patients who received NAT recurred (31% vs. 62%). Conclusion: Level III ALND dissection provides good local control and may potentially prolong overall survival. Intra-operative identification of malignant level III LNs was accurate.

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**48 Fertility Discussions with Young Women with Cancer: Health Care professionals perspectives**

Presented by **AMANDA SISSONS**, University of Toronto, St. Michael's Hospital

Objectives: Impaired fertility can be a devastating side effect of cancer treatment for young women of childbearing age. However, many healthcare providers (HCPs) do not discuss fertility options with their patients. We conducted an in-depth qualitative study to identify factors influencing HCP's fertility discussions with newly diagnosed young women with cancer. Approach: Semi-structured interviews were conducted with HCPs providing oncology care to young women to examine the experiences with, barriers to and perspective on counseling young women about fertility. Purposive sampling identified suitable candidates for recruitment from various academic and regional cancer centres across Canada. Data collection and analysis was an iterative and inductive process taking place concurrently. Constant comparative analysis was used to organize and analyze the data. Results: Data saturation was achieved after 22 interviews consisting of medical and surgical oncologists, obstetricians and gynecologists, fertility specialists, and clinical nurse specialists. A number of themes emerged including, 1) HCPs' unfamiliarity with fertility preservation methods, 2) Uncertainty of evidence, such as, uncertainty about risks of infertility from cancer treatments and fertility outcomes 3) Conflicting views on who should initiate fertility discussions and make referrals, for example, surgical oncologists stated that their primary focus was on removing the cancer rather providing information on future care 4) physician perceptions of patient's ability to access fertility preservation due to financial constraints. Conclusions: Despite the release of the American Society of Clinical Oncology (ASCO) recommendations to practicing oncologists about available fertility preservation methods, many HCPs are not providing fertility counselling to their patients. Our research indicates that HCPs face a number of important barriers to conducting fertility discussions.

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**49 Sustainable Implementation Survivorship Care Plans: Pilot Study**

Presented by **FRANCES WONG**, Chief Physician, Fraser Valley and Abbotsford Cancer Centres, British Columbia Cancer Agency

**Objectives:** The study objectives are to compare two approaches of survivorship care plan (SCP) implementation for patients discharged from active treatment or follow up, and to provide evidence-based guidance to BC Cancer Agency (BCCA) operation leaders to consider when planning for the implementation of survivorship care. **Approach:** Forty-one breast cancer patients were recruited, 20 starting adjuvant therapy (experimental arm), and 21 at discharge (conventional arm). Participants take part in an SCP appointment with a Breast Cancer Care Nurse following discharge, during which they review a treatment summary and other relevant information to assist in their transition to community care. Experimental arm participants were asked to self-complete their summaries, while conventional arm participants had their summaries completed by the Cancer Care Nurse. Checklists and questionnaires provide data on patients' understanding of their treatment and satisfaction with their treatment experience. Experimental participants completed checklists throughout treatment; conventional participants only at discharge. **Results:** Of the discharged patients, the experimental arm participants reported having a better knowledge of their disease and treatment. Patients do not universally know the name of their cancer at discharge, and conventional patients even less (45% vs. 63% of experimental arm patients). The questionnaires revealed that experimental participants expressed more satisfaction with their care, information provided and communication with health care staff both before and after discharge than conventional arm participants. Conventional patients noted dissatisfaction most strongly in the lack of health and resource information provided before discharge. Only 6 of 17 of discharging experimental arm participants self-completed their treatment summaries (35%). Consequently, nursing time spent per patient was similar for both study arms (80 minutes experimental, 100 minutes conventional). **Conclusion:** Participants were satisfied with the interactive SCP appointment, but completing the treatment summary was considered low priority to many. Prompting patients throughout treatment with basic care questions may assist with self-reflection and information-seeking, resulting in better understanding. A simplified discharge appointment without a prepared summary may be a sustainable solution.

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**SOCIETAL VALUES AND PUBLIC ENGAGEMENT**

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**50 Identifying the most effective multi-attribute utility instruments to guide cancer funding decisions in Canada**

Presented by **HELEN MCTAGGART-COWAN**, Canadian Centre for Applied Research in Cancer Control; British Columbia Cancer Agency

**Introduction:** Recently, two internationally valid cancer-specific multi-attribute utility instruments, the QLU-C10D and the FACTU-8D, were developed to guide cancer funding decisions. Thus, we aim to (1) determine the Canadian-based population utility weights using responses on the new instruments; and (2) apply the obtained Canadian utilities to pre-existing cancer trials. **Methods:** For Phase 1, a representative sample of the Canadian general population will value either the QLU-C10D or the FACTU-8D health state classification systems using an online discrete choice experiment (DCE). By taking the ratio of the marginal utilities between the investigated health state and full health, a utility for a health state will be estimated. For Phase 2, the Canadian utilities for both the QLU-C10D and the FACTU-8D will then be applied to pre-existing cancer trials consisting of QLQ-C30 and FACT-G responses. This will allow us to retrospectively conduct cost-utility analysis for cancer trials that were missing utility information. **Results:** The objective of this presentation is to describe the design of the study; no results will be presented. **Conclusions:** By obtaining Canadian population-based utility weights for two widely used cancer-specific quality of life instruments, comparative evaluation of novel and existing cancer treatments can be conducted. This will be important as cost-utility analysis can be calculated for retrospective clinical trials that only included quality of life information.

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**51 How do the social determinants of health influence care across the breast cancer continuum?**

Presented by **AMBREEN SAYANI**, PhD Candidate, York University

**Objectives:** Increasing austerity measures in Canada have resulted in higher levels of income inequality, poverty, homelessness and precarious working conditions. Whilst we are aware that the social determinants of health (SDH), i.e., living and working conditions, directly influence cancer-risk and survival, how does the shrinking social safety net impact women's risk, survival, and quality of life or death from breast cancer? **Analysis:** The cancer care continuum is a conceptual pathway that represents the journey from cancer prevention through to detection, treatment, survival and/ or end-of-life care. However, an analysis of the health inequities across the Breast Cancer Care Continuum (BCCC) systematically demonstrates that despite universal health coverage across Canada, cancer-related outcomes are strongly influenced by the SDH, and intersect in the following ways: (i) Breast cancer risk increases with exposure to environmental hazards and certain lifestyle behaviors. However these choices are ultimately constrained by social circumstances such as income and education. (ii) Universal availability of health services forms just one element of access to care. Job security, transportation, child care, cultural and educational barriers must all be overcome to make a universal service such as screening utilizable by all. (iii) Treatment for cancer is increasingly being delivered as an out-patient service, and as such has become increasingly dependent on the individual and their ability to pay for medications or acquire them through employment-based drug plans. (iv) Despite the fact that end-of-life care is a very personal decision; it is strongly influenced by the financial independence of the caregiver and social support services. **Conclusion:** The SDH are intricately linked with cancer, cancer-free survival, and a comfortable death; and withdrawal of the State from funding in key social services at a time when medical services are increasingly being delivered outside the hospital setting creates an overwhelming burden of responsibility on the individual. Unless proactive measures are taken to reduce social inequalities the health equity gap between rich and poor breast cancer patients will continue to increase.

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**52 Provincial elections and timing of cancer drug funding**

Presented by **AMIRRTHA SRIKANTHAN**, BC Cancer Agency, Vancouver Centre

Background: Concerns have been raised regarding the potential influence of political pressures on drug funding decisions. We evaluate the temporal relationship between cancer drug funding and provincial elections in nine Canadian provinces. Methods: We identified new indications for cancer drugs between January 2003 and December 2012. The dates of provincial official funding dates and provincial election dates between January 1, 2003 and December 31, 2014 were retrieved. The probability of drug funding announcements in the 60-day period preceding provincial elections was evaluated using binomial probability distribution analysis. Results: Data were available from 9 provinces (all Canadian provinces except Quebec). Sixty-nine indications comprising 39 individual drugs were identified. Variation in the availability of funding dates was identified. Two provinces did not have data available for all 69 indications at the time of data collection. Across the nine provinces, the number of funded indications during the 60-day period preceding elections ranged from 0 to 3; however, no difference in the proportion of indications funded pre-election was identified. Additional analyses also failed to demonstrate any significant associations for the 90-day interval prior to elections, or the 60- and 90-day intervals following elections. Conclusion: There was no clear temporal relationship between provincial election dates and funding decisions in this recent sample of Canadian cancer drugs.

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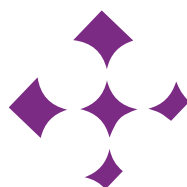
**53 Are we ready to integrate cancer prevention into cancer care? Findings from Alberta**

Presented by **SAKSHI KAPOOR**, Scientist, Alberta Cancer Prevention Legacy Fund, Alberta Health Services

Objective: Cancer prevention manoeuvres i.e. tobacco and alcohol use, diet, exercise, and screening are often considered primary care interventions. Integration of cancer prevention throughout the care continuum is necessary for improved outcomes. This survey aims to describe barriers and opportunities for prevention in oncology clinical practices in Alberta. Approach: An online survey was sent to oncology nurses and physicians in Alberta. Bivariate associations were tested using a Chi-Square test of independence (p-value <0.05 considered significant). Multinomial logistic regression was used to determine predictors of cancer prevention forecasting. Results: We received responses from 163 oncology care providers (79% nurses and 21% physicians). Maximum representation was from breast, gastrointestinal and lung cancer practitioners. Majority (72%) were from urban settings and had worked in cancer care for 5 years or longer. Equal proportions had received continuing education on cancer screening and prevention. Respondents predicted increased integration of counseling on diet, physical activity and tobacco use in the coming 5 years. Most respondents felt that it was their role to recommend prevention interventions and were comfortable in that role. Barriers to integration of prevention in oncology were lack of capacity and space. Practitioners with more experience, formal training and continuing education on prevention were more likely to refer patients and reported greater comfort with prevention activities. Conclusion: Oncology practitioners foresee a greater integration of prevention in cancer care and seem willing to take it on. Continuing education and training and years of experience are the key enablers while lack of capacity and space are the main barriers.

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