ARCC
Canadian Centre
for Applied Research
in Cancer Control

ARCC CONFERENCE 2015

Canada's Applied Research in Cancer Control Conference

CONFERENCE PROGRAM

May 24 – 25, 2015 • Montréal, Québec

Hotel Bonaventure Montréal

www.cc-arcc.ca

Funding Partner

Canadian Cancer Society
Société canadienne du cancer

Founding Partners

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BC Cancer Agency
CARE + RESEARCH
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Canadian Association for Health Services and Policy Research
L'Association canadienne pour la recherche sur les services et les politiques de la santé

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JUDGING COMMITTEE

Chair:
Dr. Sylvie Lambert

Judges:
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Craig Earle
Wanrudee Isaranuwatchai
Chris Longo
Lisa Masucci
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Mona Sabharwal
Paulos Teckle

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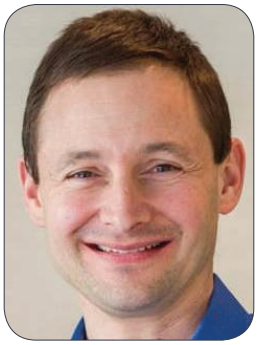
Rosie Thein
Jean Yong
Yvonne Bombard

STUDENT AWARD WINNERS

Ciara Pendrith
Daniel Jonathan Kagedan
Katherine Jensen
Linwei Wang
Ning Lui
Wyanne Law

MESSAGE FROM THE CO-DIRECTORS

Welcome to the 2015 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 expanded our scope to include an additional day of programming, and invited conference chairs, Dr. Alice Dragomir and Dr. Jean Rousseau, to help plan our program. Alice and Jean have done a wonderful job arranging and exciting program, and we want to extend our warmest thanks to them for their assistance this year.

ARCC is a 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 600 members from all across the country, and we continue to grow every week. Joining the ARCC network remains 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 for more information.

ARCC is supported by the Canadian Cancer Society Research Institute (CCSRI), and was established under a 5-year grant which ended in January, 2015. We are extremely happy that the CCSRI has since extended support for ARCC for an additional 5 years, which will allow us to continue to grow and develop, offering improved resources and increased networking opportunities for our members.

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.

Dr. Jeffrey Hoch
ARCC Co-Director
Cancer Care Ontario (CCO)

Dr. Stuart Peacock
ARCC Co-Director
BC Cancer Agency (BCCA)

MESSAGE FROM THE CO-CHAIRS

Welcome to Montréal for the 2015 Applied Research in Cancer Control (ARCC) Conference!

The fourth 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 79 presentations and scientific posters being shared. We encourage you to share your passion and interests with new people. This is the place! In case you want to meet or connect with somebody at the conference and you need help, please contact Rebecca Mercer, our Network Manager (ARCC@cancercare.on.ca).

This year we offer two great plenary sessions about major issues related to sustainability of the cancer system and the overdiagnosis and overtreatment of prostate cancer. For those who will arrive earlier on Sunday, we're offering you a fireside chat on cancer drug funding and access, with different perspectives. This additional day is the perfect opportunity to break the ice, to engage in our speed networking event, and mingle with presenters at the poster session.

Our plenary speakers and our guests at the fireside chat are an impressive cast. For the prostate cancer plenary, you'll have the opportunity to hear Andrew Loblaw, Rocco Rossi and Fernand Turcotte. The sustainability plenary will highlight Chantal Kroon, Craig Earle and Raghu Rajan. For the more informal Sunday afternoon exchange with the public, we will count on Charlotte Chamberlain and Mona Sabharwal.

Many people are contributing 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.

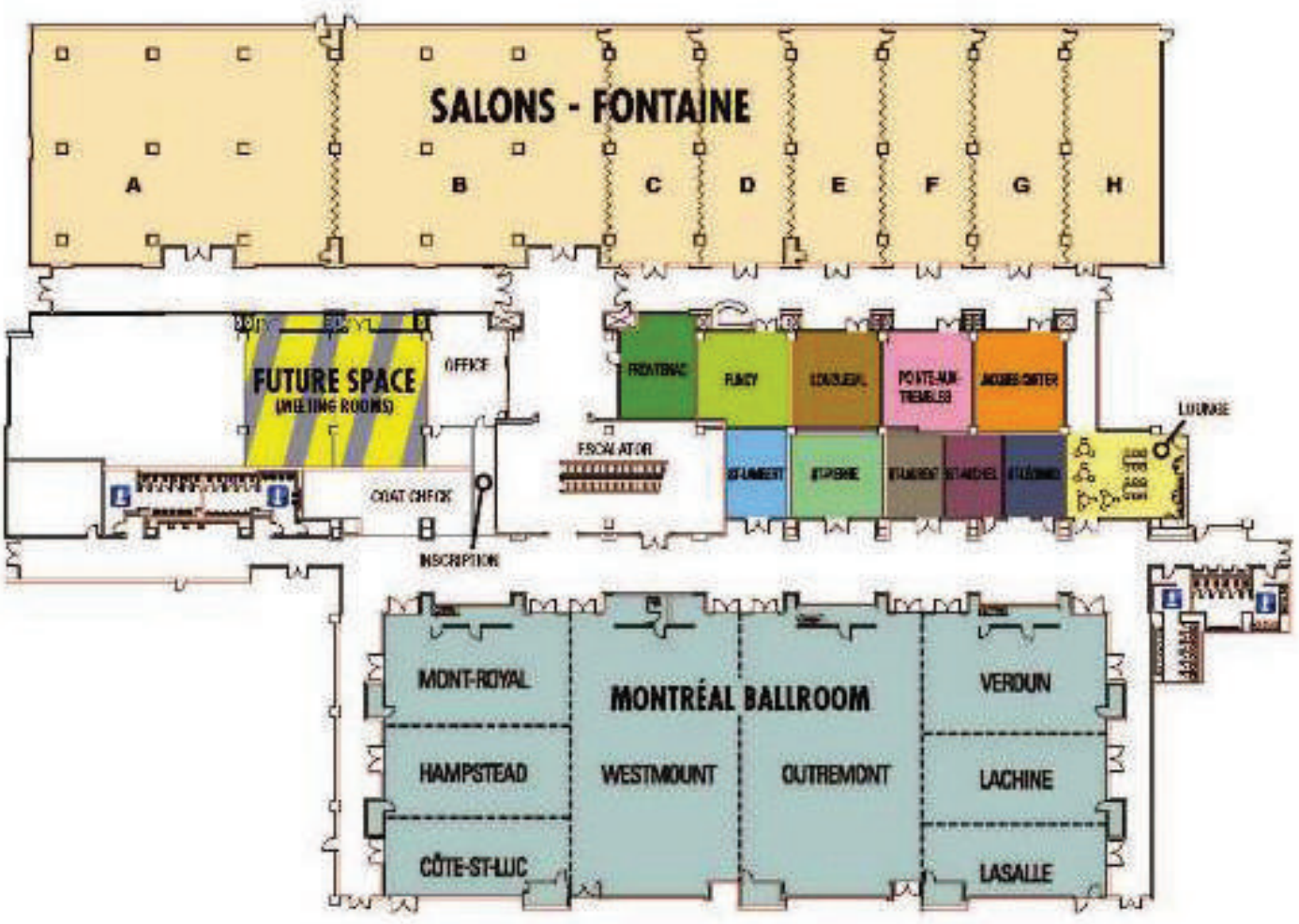
We are very pleased to have been able to be a part of the 2015 ARCC Conference and are confident you will enjoy the program we have helped develop. We look forward to meeting and chatting with you during the conference, and thank you for supporting ARCC.

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

Alice Dragomir, MSc, Ph.D.
Assistant Professor, Urology/Surgery, McGill University
Scientist, Health Economics and Outcomes Research, Research Institute of the McGill University Health Center

Jean Rousseau, Ph.D.
Scientific manager
Institut national de santé publique du Québec (INSPQ)

FLOORPLAN


SALONS - FONTAINE
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PROGRAM AT A GLANCE

ARCC Conference 2015 • May 24-25, 2015

Sunday, May 24, 2015 (Pre-Conference Day)

2:00pm – 3:30pm	FIRESIDE CHAT – Cancer Drug Funding and Access	Fontaine C
4:00pm – 5:00pm	SPEED NETWORKING	Fontaine E
5:00pm – 7:00pm	ARCC WELCOME RECEPTION / POSTER VIEWING	Fontaine AB

Monday, May 25, 2015

7:30am – 8:30am	REGISTRATION / BREAKFAST	Fontaine AB
8:30am – 8:35am	WELCOME FROM THE CO-DIRECTORS	Mont Royal
8:35am – 8:40am	WELCOME FROM THE CANADIAN CANCER SOCIETY	Mont Royal
8:40am – 10:15am	PLENARY PRESENTATION – Solution to overdiagnosis and overtreatment of prostate cancer: ending PSA screening or continuing PSA screening with increasing use of active surveillance? View from different perspectives	Mont Royal
10:15am – 10:35am	NUTRITION BREAK	Fontaine AB
10:35am – 12:05pm	CONCURRENT SESSIONS A	
A1	DRUG EVALUATION & POLICY MAKING	Mont Royal
A2	METHODOLOGY	Fontaine C
A3	PROSTATE CANCER	Fontaine D
12:05pm – 12:45pm	NETWORKING LUNCH	Fontaine AB
12:45pm – 1:30pm	POSTER VIEWING	Fontaine AB
1:30pm – 3:00pm	CONCURRENT SESSIONS B	
B1	COSTING OF THE CANCER SYSTEM	Mont Royal
B2	REAL LIFE DATA ON SCREENING, DIAGNOSIS, AND SURVIVAL	Fontaine C
B3	QUALITY IMPROVEMENT	Fontaine D
3:00pm – 3:30pm	NUTRITION BREAK	Fontaine AB
3:30pm – 5:00pm	PLENARY PRESENTATION – Sustainability: Issues for the Health System with a focus on Cancer	Mont Royal
5:00pm – 5:15pm	POSTER AWARDS & CLOSING REMARKS	Mont Royal

PROGRAM AGENDA

ARCC Conference 2015 • May 24-25, 2015

Sunday, May 24, 2015 (Pre-Conference Day)

2:00pm – 3:30pm	**FIRESIDE CHAT** **Cancer Drug Funding and Access** Hosted by **Jean Rousseau**, ARCC Conference Co-Chair ▪ **Mona Sabharwal**, PharmD, pCODR ▪ **Charlotte Chamberlain**, MRCP MFPH, University of Bristol	**Fontaine C**
4:00pm – 5:00pm	**SPEED NETWORKING**	**Fontaine E**
5:00pm – 7:00pm	**ARCC WELCOME RECEPTION / POSTER VIEWING** *(View Poster Presentations Guide on page 24)* Join your event hosts and fellow participants for a beverage, some light snacks and an opportunity to network in advance of the conference as well as view the poster presentations being displayed at the conference.	**Fontaine AB**

Monday, May 25, 2015

7:30am – 8:30am	**REGISTRATION / BREAKFAST**	**Fontaine AB**
8:30am – 8:35am	**WELCOME FROM THE CO-DIRECTORS** ▪ **Dr. Stuart Peacock**, Co-Director, ARCC	**Mont Royal**
8:35am – 8:40am	**WELCOME FROM THE CANADIAN CANCER SOCIETY** ▪ **Pamela Fralick**, President & CEO, Canadian Cancer Society	**Mont Royal**
8:40am – 10:15am	**PLENARY PRESENTATION** **Solution to overdiagnosis and overtreatment of prostate cancer: ending PSA screening or continuing PSA screening with increasing use of active surveillance? View from different perspectives** Chaired by **Dr. Alice Dragomir**, ARCC Conference Co-Chair ▪ **Dr. Andrew Loblaw,** Clinician-Scientist, Sunnybrook Research Institute ▪ **Mr. Rocco Rossi,** President & CEO, Prostate Cancer Canada ▪ **Dr. Fernand Turcotte,** Professor Emeritus, Université Laval	**Mont Royal**
10:15am – 10:35am	**NUTRITION BREAK**	**Fontaine AB**
10:35am – 12:05pm	**CONCURRENT SESSIONS A** *(View Concurrent Sessions Guide on page 12)*	
A1	**DRUG EVALUATION & POLICY MAKING** Chaired by **Dr. Dean Regier**, Sr. Health Economist, ARCC, BC Cancer Agency	**Mont Royal**
A2	**METHODOLOGY** Chaired by **Reka Pataky**, Health Economist & Data Lead, ARCC, BC Cancer Agency	**Fontaine C**
A3	**PROSTATE CANCER** Chaired by **Dr. Christopher J. Longo**, Associate Professor, Health Policy & Management, McMaster University	**Fontaine D**

12:05pm – 12:45pm		**NETWORKING LUNCH**	**Fontaine AB**
12:45pm – 1:30pm		**POSTER VIEWING** *(View Poster Presentations Guide on page 24)* View the poster presentations being displayed at the conference.	**Fontaine AB**
1:30pm – 3:00pm		**CONCURRENT SESSIONS B** *(View Concurrent Sessions Guide on page 12)*	
	B1	**COSTING OF THE CANCER SYSTEM** Chaired by **Ian Cromwell**, Health Economist, ARCC, BC Cancer Agency	**Mont Royal**
	B2	**REAL LIFE DATA ON SCREENING, DIAGNOSIS, AND SURVIVAL** Chaired by **Dr. Wanrudee Isaranuwatchai**, Health Economist, ARCC, Cancer Care Ontario	**Fontaine C**
	B3	**QUALITY IMPROVEMENT** Chaired by **Dr. Linda Rozmovits**, Sr. Research Associate, ARCC, Cancer Care Ontario	**Fontaine D**
3:00pm – 3:30pm		**NUTRITION BREAK**	**Fontaine AB**
3:30pm – 5:00pm		**PLENARY PRESENTATION** **Sustainability: Issues for the Health System with a focus on Cancer** Chaired by **Dr. Jean Rousseau**, ARCC Conference Co-Chair ▪ **Dr. Craig Earle**, Director – Health Services Research, OICR/CCO ▪ **Ms. Chantal Kroon**, Conseillère cadre, MSSS, Quebec ▪ **Dr. Raghu Rajan**, Associate Professor, McGill University	**Mont Royal**
5:00pm – 5:15pm		**POSTER AWARDS** Presented by **Dr. Sylvie Lambert**, ARCC Conference Judging Chair	**Mont Royal**
		CLOSING REMARKS Presented by **Dr. Jeffrey Hoch**, ARCC Co-Director	**Mont Royal**

CONFERENCE COMMITTEE

ALICE DRAGOMIR – CONFERENCE CO-CHAIR

Dr. Alice Dragomir is a Medical Scientist with the McGill University Health Centre and an Assistant Professor in the Division of Urology – Department of Surgery at McGill University. Alice's research focuses on improving the manner in which health care is delivered to patients with prostate cancer, and for ways to optimize cost allocation for services. Alice joined ARCC in 2013, and has recently committed to Associate member status.

JEAN ROUSSEAU – CONFERENCE CO-CHAIR

Dr. Jean Rousseau has been a scientific manager at the Institut national de santé publique du Québec (INSPQ) since 2008. At the INSPQ, Dr. Rousseau heads the unit Analyse des politiques de dépistage et lutte contre les maladies chroniques, which is mandated by the Québec Ministry of Health and Social Services to evaluate the implementation of prenatal, newborn and cancer screening programs in Québec. Jean's current research topics include economic evaluation modalities of screening programs and costing analysis of screening practices. Jean joined ARCC in 2012, and is an ARCC Investigator.

SYLVIE LAMBERT – CHAIR, JUDGING COMMITTEE

Dr. Lambert joined McGill University from Australia where she was a National Health and Medical Research Council (NHMRC) Research Fellow at the Translational Cancer Research Unit, Ingham Institute for Applied Medical Research, University of New South Wales. Her national and international standing in the area of patient education, information-seeking, caregiver research, sustainable self-management interventions, longitudinal research, and psychometrics are evidenced by high-quality publications, including winning several prizes for these and attracting highly competitive funding. Her most significant studies have included Australia's first longitudinal caregiver well-being study, and developing a self-directed coping skills training and self-management interventions for couples facing cancer called Coping-Together. Dr. Lambert now plans to expand the reach of Coping-Together to patients and caregivers with low literacy and from culturally and linguistically diverse backgrounds.

DR. JEFFREY HOCH – ARCC CO-DIRECTOR

Dr. Jeffrey Hoch received his PhD in health economics from the Johns Hopkins School of Public Health. He also holds a Masters in Economics from Johns Hopkins University, and a Bachelor of Arts degree in Quantitative Economics and Decision Sciences from the University of California at San Diego. An award winning teacher, Dr. Hoch has taught Health Economics and Economic Evaluation classes in Canada and internationally. In 2007, he was asked to develop and direct the Pharmacoeconomics Research Unit at Cancer Care Ontario. As Director of the unit, Dr. Hoch has pursued research making health economics more useful to decision makers. Special interests include health services research related to cancer, mental health, and other health issues affecting poor and vulnerable populations.

DR. STUART PEACOCK – ARCC CO-DIRECTOR

Dr. Stuart Peacock is 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 Deputy Head of Cancer Control Research at the BC Cancer Agency, an Associate Professor in the School of Population and Public Health at UBC, and President of the International Society on Priorities in Health Care. Previously he held positions at Monash University and the University of York, UK. Stuart's main research interests include priority setting methods, quality of life, and the economics of cancer control. He has acted as a consultant on priority setting methods to the World Health Organization and to governments in North and South America, Europe, Asia and Australia.

INVITED SPEAKERS

DR. CHARLOTTE CHAMBERLAIN

Dr Charlotte Chamberlain is a public health and palliative care doctor currently working at the University of Bristol and the Bristol Royal Infirmary. Dr Chamberlain trained in Medicine at the Royal Free and University College London Medical School and intercalated a degree in Global Health. Following a Masters in Epidemiology, at the London School of Hygiene and Tropical Medicine, Dr Chamberlain has pursued a career in public health medicine in the South West region of England (2008 to present day). She is currently completing a PhD on 'access to non-curative anti-cancer therapies on the NHS' funded by the National Institute for Health Research (UK) at the University of Bristol. Her research interests, around cancer at the end of life and balancing priorities in publicly-funded health systems, have informed the on-going debate about the rationale for the Cancer Drugs Fund in England.

DR. CRAIG EARLE, MD, MSC

Dr. Craig Earle s a medical oncologist specializing in gastrointestinal cancers at Sunnybrook's Odette Cancer Centre, the Director of Health Services Research for Cancer Care Ontario and the Ontario Institute for Cancer Research, a Professor of Medicine at the University of Toronto, and a Senior Scientist at the Institute for Clinical Evaluative Sciences. Dr. Earle originally trained and practiced in Ottawa, after which he spent 10 years between 1998 – 2008 in Boston at Harvard Medical School and the Harvard School of Public Health. While there, he was the founding Director of the Lance Armstrong Foundation Adult Survivorship Clinic at Dana-Farber Cancer Institute. He is currently Chair of the Ontario Steering Committee for Cancer Drug Programs. His personal research interests focus on evaluating and improving the quality of care received by patients with advanced cancer and cancer survivors, the effect of financial incentives on care delivery, and making linked de-identified administrative data more available for health research.

CHANTAL KROON, BSCN, MA

Chantal Kroon completed her bachelor's degree in Nursing at Laval University in 1990, and a Master's degree in Medical Law and Ethics at King's College, University of London, UK, in 1993. She served primarily as a clinician working with pediatric, adult, and elderly patients at University Hospitals (Quebec and Switzerland), in community health settings, and in long-term care facilities. She also taught nursing at college and university levels. For the past fifteen years, she has held management positions in the Quebec health network and at the Quebec Ministry of Health and Social Services (MSSS). She has been in charge of provincial mandates on issues related to chronic diseases, primary care services and service trajectory for elderly within the health network, including those who accessed it through emergency departments. She is currently responsible for provincial workforce planning in nursing, as well as initial and continuous training.

DR. ANDREW LOBLAW, MD, FRCPC, MSC

Dr. Andrew Loblaw is a Radiation Oncologist, Clinician Scientist, and dual Professor in the Department of Radiation Oncology and the Institute of Health Policy Management & Evaluation at the University of Toronto. He received a Bachelor of Science in Physics from the University of British Columbia and his Doctor of Medicine from Queen's University. He completed his specialty training in Radiation Oncology concurrent with a Masters degree in Clinical Epidemiology to graduate from Royal College's Clinician Investigator Program all at the University of Toronto. Dr. Loblaw's clinical practice and research interest focus on improving outcomes for men with prostate cancer and the healthcare system. He has a particularly interest in the design and conduct of clinical trials, the generation and dissemination of evidence-based guidelines and in image-guided radiotherapy. Dr. Loblaw is an Ontario Association of Radiation Oncology Clinician Scientist and a Scientist at the Sunnybrook Research Institute. He is Medical Director for Sunnybrook International's Prostate Cancer Centres of Excellence, the North American Editor for Clinical Oncology, the Co-Chair of the American Society of Clinical Oncology's Genitourinary Advisory Group, and Co-Chair of the GU group for Cancer Care Ontario's Program in Evidence-Based Care. He has authored over 150 peer-reviewed papers and has been awarded grant funding of over $17M.

DR. RAGHU RAJAN, MD, MSC

Dr. Raghu Rajan is a medical oncologist at the McGill University Health Centre with an interest in the management of colorectal cancer and genitourinary cancers, and serves as the disease site lead for lower gastrointestinal cancers at the MUHC. He is Associate Professor of Oncology and Medicine at McGill University, and chairs the Pharmacy and Therapeutics Committee of the MUHC. Dr. Rajan is a member of the Comité de l'evolution des pratiques en oncologie (CEPO) within INESSS and is also a member of the Programme de gestion thérapeutique des medicaments (PGTM), an initiative involving the five teaching hospitals in Quebec. After receiving his medical degree at the University of Manitoba and going through internship at McGill University, Dr. Rajan completed his training in internal medicine at the Mayo Graduate School of Medicine. He subsequently undertook subspecialty fellowships in haematology and medical oncology, as well as a Terry Fox research fellowship concurrent with a Master's degree in clinical epidemiology at McMaster University.

MR. ROCCO ROSSI, BA, MA

A successful entrepreneur and business executive, champion fundraiser, and dedicated public servant, Rocco Rossi is currently President and CEO of Prostate Cancer Canada. As CEO of the Heart and Stroke Foundation – one of Canada's largest non-profit organizations – from 2004 to 2009, Rossi oversaw four consecutive years of record fundraising raising over $500 million in total and launching many new, life-saving initiatives. His passion for public policy has led him to stand for election both for the position of Mayor of Toronto and for MPP. Mr. Rossi has held senior positions at the Boston Consulting Group, TORSTAR, Labatt/Interbrew and MGI Software. A past board member of United Way of Greater Toronto and other charities, Mr. Rossi has been an active community builder. In fact, in 2012 he was awarded the Queen's Jubilee Medal for his Philanthropic and Community service. A dedicated adventurer, Rocco has walked the legendary Camino de Santiago 7 times, cycled the 1900 km length of Yonge Street from Rainy River to Toronto, kayaked the 500 km from Toronto to Ottawa, and climbed to Everest Base Camp. Mr. Rossi has a BA (Hons) in political science from McGill University and a Masters of Arts in politics from Princeton University. He is married to his wife of 27-years, Rhonnie, and they have a 25-year-old son, Domenic John, who attends OISE in Toronto where he is working on his Masters in Teaching.

DR. MONA SABHARWAL

Dr. Mona Sabharwal is the inaugural Executive Director of the pan-Canadian Oncology Drug Review (pCODR). In this leadership role, she had responsibility to implement and operationalize a new national initiative, engaging a broad spectrum of decision makers and stakeholder, establishing a new standard for how pharmaceutical HTA is conducted in Canada and leading to pCODR's successful launch in July 2011. In April 2014, she successfully implemented the operational integration of pCODR into CADTH and is now leading Phase 2 of the transfer which will be looking at policy alignment of pCODR and the Common Drug Review programs. She has worked in drug technology assessment and formulary management, in both British Columbia and Ontario, for approximately 20 years. Before joining pCODR, she was the Senior Manager for Drug Programs Management with the Ontario Ministry of Health and Long-Term Care. In this role, she had operational oversight of the drug submission and evaluation process for Ontario's public drug programs. Dr. Sabharwal is a registered pharmacist with experience in both community and hospital pharmacy practice. She has also conducted practice-based research focused on finding concrete ways to improve the delivery of pharmacist-based professional services. She obtained both her Bachelor of Science in Pharmacy and her Doctor of Pharmacy from the University of Toronto.

DR. FERNAND TURCOTTE, MD, MPH, FRCPC

Dr. Fernand Turcotte is professor emeritus of preventive medicine and public health at Université Laval. As a co-founder of the department of social and preventive medicine, most of his research activities have borne on the prevention of chronic diseases associated with toxic exposures either in the workplace or in the general environment. The evaluation of prevention strategies is a field to which he has made contributions. He has been involved for three decades in the shaping of public policies required to improve the protection of the health of the nation, in tobacco control and exposure to asbestos. Dr. Turcotte have completed my studies in medicine at the U of Montreal school of medicine (1967) and his Master in Public Health at Harvard University (1971). Dr. Turcotte has taught at Université Laval for all my career (1971-2005).

CONCURRENT SESSIONS AT A GLANCE

Concurrent Sessions A (10:35am – 12:05pm)

A1	**DRUG EVALUATION & POLICY MAKING**	**Mont Royal**
	Chaired by **Dr. Dean Regier**, Sr. Health Economist, ARCC, BC Cancer Agency	
A1.1	**Use of linked health administrative data to support policy change for child cancer survivor care**	
	Presented by **Mary McBride** Distinguished Scientist, BC Cancer Agency	
A1.2	**Engaging the public on funding for cancer drugs: results from a public deliberation event on priority setting and cancer drug funding in Vancouver, BC**	
	Presented by **Colene Bentley** Health Service Research Associate, ARCC - BC Cancer Agency	
A1.3	**Cancer Formulary Recommendations in Canada - A Revealed Preferences Analysis**	
	Presented by **Dominika Wranik** Dalhousie University	
A1.4	**AN ASSESSMENT OF THE PAN-CANADIAN ONCOLOGY DRUG REVIEW ECONOMIC EVALUATIONS: INSIGHTS FOR SUBMITTERS AND REVIEWERS**	
	Presented by **Lisa Masucci** Health Economist, St. Michael's Hospital	
A1.5	**Managing uncertainty in policy decision making about cancer control: A qualitative study of Canadian policymakers**	
	Presented by **Michelle Driedger** Professor, University of Manitoba	
A2	**METHODOLOGY**	**Fontaine C**
	Chaired by **Reka Pataky**, Health Economist & Data Lead, ARCC, BC Cancer Agency	
A2.1	**Estimating Uncertainty Impact in Fixed-value Decision Model Parameters – An Example in Genome-Guided Oral Premalignant Lesions**	
	Presented by **Ian Cromwell** Health Economist, ARCC, BC Cancer Agency	
A2.2	**MICRO-COSTING OF HIGH-THROUGHPUT GENOMIC ASSAYS USING A TIME-MOTION APPROACH**	
	Presented by **Sarah Costa** Health Economist, ARCC-BC	
A2.3	**Utilizing Iterative Benefits Evaluation to Develop and Improve an Electronic Navigational Tool for Cancer Diagnostic Testing: A Model for Strategically Shaping the e-Health Landscape.**	
	Presented by **Melissa Kaan** Group Manager, Diagnostic Assessment Programs Cancer Care Ontario	
A2.4	**Integrating Care for Cancer Patients – Health Care Utilization across levels of Complexity**	
	Presented by **Marnie MacKinnon** Director, Integrated Care, Cancer Care Ontario; **Erin Arthurs**, Senior Analyst, Cancer Care Ontario	
A2.5	**THE PROTECTIVE EFFECTS OF SOCIAL RELATIONSHIPS ON MORTALITY: IS THERE SOMETHING DIFFERENT ABOUT CANCER?**	
	Presented by **James Iveniuk** University of Chicago	
A3	**PROSTATE CANCER**	**Fontaine D**
	Chaired by **Dr. Christopher J. Longo**, Associate Professor, Health Policy & Management, McMaster University	
A3.1	**Castration-Resistant Prostate Cancer (CRPC): evaluation of the quality of care and disease management in real-life setting**	
	Presented by **Halima Lahcene** MSc student, University of Montreal	
A3.2	**Cost-effectiveness of multiparametric MRI and targeted biopsy in diagnosing prostate cancer**	
	Presented by **Alice Dragomir** Assistant Professor, McGill University	
A3.3	**Cost-Effectiveness of Prostate Cancer Management Strategies in Canada**	
	Presented by **Chiranjeev Sanyal** McGill University	
A3.4	**Use of docetaxel and abiraterone in the management of castration-resistant prostate cancer in Quebec: a real-world cost-effectiveness study**	
	Presented by **Joice Rocha** Urology, Department of Surgery, McGill University Health Center	
A3.5	**Understanding Readmission Rates following Radical Prostatectomy**	
	Presented by **Jacqueline Gregory** Senior Analyst, Canadian Institute for Health Information	

Concurrent Sessions B (1:30pm – 3:00pm)

B1	**COSTING OF THE CANCER SYSTEM**	**Mont Royal**
	Chaired by **Ian Cromwell**, Health Economist, ARCC, BC Cancer Agency	
B1.1	**Health system costs of the Pre-diagnosis Phase in Neuroendocrine Tumours**	
	Presented by **Simron Singh** Medical Oncologist, Odette Cancer Centre; **Nicole Mittman** Assistant Professor Department of Pharmacology, HOPE Research Centre	
B1.2	**Comparing phase-based costs of cancer care in British Columbia and Ontario**	
	Presented by **Reka Pataky** Health Economist and Data Lead, ARCC, BC Cancer Agency	
B1.3	**Estimating the net costs of cancer care before and after diagnosis for childhood cancer in Ontario**	
	Presented by **Claire de Oliveira** Independent Scientist/Health Economist, CAMH	
B1.4	**Costs of Cervical Cancer Treatment: Estimates from Ontario, Canada**	
	Presented by **Ciara Pendrith** Western University	
B1.5	**A time-trend economic analysis of cancer drug trials**	
	Presented by **Sonya Cressman** Health Economist, ARCC, BC Cancer Agency	
B2	**REAL LIFE DATA ON SCREENING, DIAGNOSIS, AND SURVIVAL**	**Fontaine C**
	Chaired by **Dr. Wanrudee Isaranuwatchai**, Health Economist, ARCC, Cancer Care Ontario	
B2.1	**Breast cancer subtypes and screening mammography sensitivity**	
	Presented by **Linda Perron** Médecin spécialiste, Institut national de santé publique du Québec	
B2.2	**Using administrative data to estimate time to breast cancer diagnosis and percent of screen-detected breast cancers – A validation study**	
	Presented by **Yan Yuan** University of Alberta	
B2.3	**Treatment of taxane acute pain syndrome (TAPS) in patients receiving taxane chemotherapy for breast and prostate cancers – a systematic review and network analysis**	
	Presented by **Ricardo Fernandes** The Ottawa Hospital Cancer Centre; **Mark Clemons** Ottawa Hospital Cancer Centre	
B2.4	**Predictors of Actual Survival in Resected Pancreatic Adenocarcinoma: A Population-Level Analysis**	
	Presented by **Daniel Kagedan** University of Toronto	
B2.5	**Phase-specific health care costs of cervical cancer: estimates from a population-based study**	
	Presented by **Ning Liu** PhD Student, University of Toronto	
B3	**QUALITY IMPROVEMENT**	**Fontaine D**
	Chaired by **Dr. Linda Rozmovits**, Sr. Research Associate, ARCC, Cancer Care Ontario	
B3.1	**Evaluating the Impact of PET Scanning for Lymphoma Patients: Development of the Ontario PET Lymphoma Staging Registries**	
	Presented by **Pamela MacCrostie** Project Coordinator, Cancer Care Ontario	
B3. 2	**Target Setting for Palliative Care Wait Times at Ontario Regional Cancer Centres**	
	Presented by **Victoria Zwicker** Sr Policy Advisor, Cancer Care Ontario	
B3. 3	**Do we need to improve the coordination of multidisciplinary care for patients with head and neck cancer? An investigation of unplanned hospital emergency department visits by patients with oropharyngeal cancer in Ontario**	
	Presented by **Elizabeth Lockhart** Team Lead, Quality, Cancer Care Ontario	
B3. 4	**Optimizing the Design of a Population-Based Reflex Testing Program for Lynch Syndrome in Ontario: Health Care Providers' Perspectives**	
	Presented by **Yvonne Bombard** Scientist & Assistant Professor, Li Ka Shing Knowledge Institute of St. Michaels Hospital	
B3. 5	**Thinking Differently About The Kids: An Innovative Approach to Improve Care Provided to pediatric Patients Undergoing External Beam Radiation Therapy**	
	Presented by **Katherine Jensen** Radiation Therapist, University of Calgary/Alberta Health Services	

CONCURRENT SESSIONS GUIDE

Concurrent Sessions A (10:35am – 12:05pm)

A1 DRUG EVALUATION & POLICY MAKING **Mont Royal**

Chaired by **Dr. Dean Regier**, Sr. Health Economist, ARCC, BC Cancer Agency

A1.1 Use of linked health administrative data to support policy change for child cancer survivor care

Presented by **Mary McBride** Distinguished Scientist, BC Cancer Agency

Currently, follow-up of adult-age childhood cancer survivors in British Columbia (BC) occurs mainly in the primary care setting, with little coordination and support. Linked person-based, longitudinal databases were accessed to inform a working group charged to provide recommendations to the BC Ministry of Health for strategies to meet the ongoing healthcare needs of this population. A BC Cancer Agency/BC Children's Hospital Working Group was formed, comprising clinical, administrative, survivor and research members, to: define and describe the population and measurable outcomes; review BC research, review global best practice guidelines and models of care; conduct an environmental scan of current supports; identify gaps in care; identify potential strategies to improve outcomes for the population; and provide recommendations and a business case for implementation. Results from the BC Childhood, Adolescent, Young Adult Cancer Survivor (CAYACS) Research Program were used in a needs assessment (providing demographic information on the size of the adult-age survivor population, age range and regional distribution; summarizing the extent and patterns of ongoing health issues of survivors, and their determinants); evaluation of current ongoing healthcare demand and costs of care; identification of gaps in care, and, for program planning, determination of the size and characteristics of four risk subgroups based on level of risk. This information informed a risk-stratified set of models of care and a business case for implementation. Linked cohort, clinical, and health administrative data can be used to inform development of strategies to improve cancer survivor care, not just for childhood survivors, but also for survivors of cancer in adulthood. These data platforms can also be used to monitor uptake and patient outcomes after implementation.

Co-Author(s): Laura Game, BC Cancer Agency / Fiona Walks, BC Cancer Agency / Patti Byron, BC Children's Hospital / Karen Blain, BC Cancer Agency

A1.2 Engaging the public on funding for cancer drugs: results from a public deliberation event on priority setting and cancer drug funding in Vancouver, BC

Presented by **Colene Bentley** Health Service Research Associate, ARCC - BC Cancer Agency

Decision-makers struggle to regard the public as reliable policy consultants. Public engagement methods help mitigate these challenges through deliberative processes directed towards producing informed, collective solutions to policy dilemmas. We employed deliberative methods to produce reasonable values-based statements for decision-makers on priority setting and the high cost of cancer drugs. Decision makers at the pan-Canadian Oncology Drug Review, BC Cancer Agency, Canadian Cancer Society, and BC Ministry of Health helped identify specific policy questions for the deliberation event held in Vancouver in September 2014. Twenty-four individuals from the BC general public were recruited to the deliberation. Over two weekends, participants engaged in a process of learning about cancer drug funding and the need for tradeoffs from expert speakers, an information booklet, a website, and in dialogue with one another. Quality of life, quantity of life, disinvestment, and trustworthy governance were deliberation topics. All sessions were audio recorded and transcribed. The explicit result of this collective deliberation was several recommendations for cancer policy. Analysis of selected recommendations will be presented at the conference. Each recommendation was formulated and ratified by participants. Consensus was not the objective of the deliberation; instead, the nature and degree of disagreement was explored collectively and documented by the moderator and research team so as to inform policy action more fully. Participants formally delivered their recommendations to a panel of senior decision makers on the final day of the event. Prominent decision makers and stakeholders attended the event as observers. Immediate feedback from decision makers and observers was very positive, indicating trust in decisions reached as a result of this method. It is anticipated that results from the deliberative event will be used to inform policy-making in British Columbia on decisions that affect cancer drug funding.

Co-Author(s): Sarah Costa, The Canadian Centre for Applied Research in Cancer Control, BC Cancer Agency / Dean Regier, Canadian Centre for Applied Research in Cancer Control , BC Cancer Agency, the University of British Columbia / Michael Burgess, Professor and Chair in Biomedical Ethics, University of British Columbia / Stuart Peacock, University of British Columbia, Canadian Centre for Applied Research in Cancer Control, BC Cancer Agency

A1.3 Cancer Formulary Recommendations in Canada - A Revealed Preferences Analysis

Presented by **Dominika Wranik** Dalhousie University

The pan-Canadian Oncology Drug Review (pCODR) recommends the addition of new cancer drugs to provincial formularies. Each pCODR review considers four dimensions of value: clinical benefit, economic evaluations, patient-based values, and adoption feasibility. Our study objective is to assess the extent to which each of these dimensions influences the recommendations. We quantified the four dimensions on the basis of reports on pCODR deliberations up to June 2014 (n=42).Variables included relative and absolute survival gain, incremental cost-effectiveness ratio (ICER), and flags indicating unmet need or an oral drug. Reports did not provide consistent criteria for how patient-based values and adoption feasibility were assessed, and as such these concepts remain vague and elusive. Using a revealed preferences framework, we used a multinomial logit model to assess the influence of these variables on the decision to approve or reject a drug, relative to a conditional approval. The strongest predictor of the pCODR recommendation was the economic evaluation. An ICER lower than $150,000 significantly increased the likelihood of a drug being approved across several model specifications. Conditional approvals were often issued when the price (or ICER) were perceived as too high. Addressing an unmet need also appeared to increase the likelihood of approval, although this factor did not achieve conventional significance. No other factors appeared statistically significant. The power of the analysis was limited, as there was minimal variability among a number of the variables, and the sample size was small. The analysis of the pCODR reports reveals that the committee has a preference for more cost-effective drugs. The concepts of patient-values and feasibility are recognized as important factors to consider, but their full and consistent consideration is hampered by the lack of well-defined indicators.

Co-Author(s): Chris Skedgel, University of East Anglia / Jeffrey Hoch, Canadian Centre for Applied Research in Cancer Control / Min Hu, Dalhousie University / Anna von Maltzahn, Dalhousie University

A1.4 AN ASSESSMENT OF THE PAN-CANADIAN ONCOLOGY DRUG REVIEW ECONOMIC EVALUATIONS: INSIGHTS FOR SUBMITTERS AND REVIEWERS

Presented by **Lisa Masucci** Health Economist, St. Michael's Hospital

The pan-Canadian Oncology Drug Review (pCODR) was established in 2011 to assess cancer drugs and make recommendations to guide the provinces and territories (excluding Quebec) in their drug funding decisions. Their evidence-based evaluation includes a review of the economic evidence and assessment of the cost-effectiveness. The objective of this research was to identify patterns and insights from the methodological issues frequently reported by the economic reviewers. Publicly available Economic Guidance Reports published between July 2011 (inception) and June 2014, with a final funding recommendation (n=34) were independently examined by two authors. Both authors abstracted the major issues found within the reports and together developed a list of nine main categories to encompass those issues. Each issue was also categorized based on the economic reviewer's actions with respect to the issue: addressed to improve the estimations, explored to understand uncertainty, or unresolved/unresolvable. The reported incremental cost-effectiveness ratios (ICERs) and final funding recommendations were also collected. The most commonly reported issues involved costing and drug wastage (53% of the reviews), time horizon chosen (53%), (resulting from overestimated survival outcomes), and model structure (39%). Several types of issues were identified that usually could not be resolved, e.g., quality of the clinical data or uncertainty with the indirect comparison estimates. Categories that could be easily resolved included issues dealing with costing and wastage or choice of utility estimates. Relationships between types of issues, ICERs and recommendations were also assessed. These findings can be useful to submitters and reviewers for continuous improvement and consistency in economic modeling, reporting, and decision-making.

Co-Author(s): Lisa Masucci, St. Michael's Hospital, Centre for Leadership in Economic Analysis Research / Jaclyn Beca, St. Michael's Hospital, Centre for Leadership in Economic Analysis Research / Mona Sabharwal, pan Canadian Oncology Review / Jeffrey Hoch, St. Michael's Hospital, Centre for Leadership in Economic Analysis Research; Pharmacoeconomics Research Unit Cancer Care Ontario

A1.5 Managing uncertainty in policy decision making about cancer control: A qualitative study of Canadian policymakers

Presented by **Michelle Driedger** Professor, University of Manitoba

Policy decisions about cancer screening, prevention, and treatments must often be made in an environment of complex uncertainty about clinical evidence, clinician support, patient uptake, cost-effectiveness, implementation requirements, and a host of other sources. This study explored how policymakers manage uncertainty when making decisions about cancer control initiatives. This research was conducted as part of a mixed methods study about the management of various kinds and sources of uncertainty in decision making about breast and prostate cancer screening, the approval and funding of expensive cancer drugs, and school-based HPV vaccination programs. Qualitative key informant (KI) interviews were conducted with senior officials (n =29) who make decisions about or influence cancer control policy in various organizations in the Canadian cancer control system, including cancer care agencies (n = 11), ministries of health (n = 8), organizations that develop recommendations or guidelines (n = 7), and patient advocacy organizations (n = 3) between December 2012 and February 2014. Individually, most KIs used a limited number of informal approaches to deal with uncertainty, but when aggregated, these approaches amounted to a large and heterogeneous collection of tools. In general, KIs responsible for drug policy had the most sophisticated uncertainty management strategies. The two most common were pricing negotiations (e.g., obtaining a lower price to reduce uncertainty about a drug's cost-effectiveness) and formulary management (e.g., conditional approval strategies to allow the collection of additional evidence to attempt to resolve residual uncertainty, and/or limiting the use of a drug to very specific patient populations). Other strategies used in various scenarios included economic analyses, relying on expert group advice, and engaging with and cultivating the support of stakeholder groups before implementing or changing policies. The study is now developing and testing practical tools to help policymakers manage uncertainty, make more transparent and defensible decisions, and ultimately improve cancer control in Canada.

Co-Author(s): Gary Annable, University of Manitoba / Melissa Brouwers, McMaster University

A2 METHODOLOGY **Fontaine C**

Chaired by **Reka Pataky**, Health Economist & Data Lead, ARCC, BC Cancer Agency

A2.1 Estimating Uncertainty Impact in Fixed-value Decision Model Parameters – An Example in Genome-Guided Oral Premalignant Lesions

Presented by **Ian Cromwell** Health Economist, ARCC, BC Cancer Agency

To use of threshold analysis to explore the effect of parameter uncertainty in decision model parameters with fixed values (i.e., parameters with zero uncertainty, e.g., fee-for-service items). We used a model of genomic screening for oral premalignant lesion (OPL) management in BC. A health state transition model was constructed that evaluated the cost-effectiveness of using a genomic assay to schedule pre-cancer screening appointments for a hypothetical cohort of people with OPLs. We used cost and survival data from BC, including fee-for-service values from the Medical Services Plan (MSP). MSP costs by definition do not vary between patients, but the model was most sensitive to changes in these parameters. Threshold analysis was used to estimate the impact of hypothetical changes in these values. The assay dominated standard care (cost less, was more effective). Probabilistic Sensitivity Analysis (PSA) showed that this result was robust to likely changes in all model parameters; however, the model was sensitive to changes in the cost of doctor's visits, biopsy, and follow-up appointments. Cost thresholds were found for each of these non-varying parameter estimates, allowing the results to be more applicable outside BC. Threshold analysis is a useful supplement to probabilistic sensitivity analysis, and is especially important in cases in which there is no statistical uncertainty around potentially-sensitive model parameters, of the kind commonly found in fee-for-service jurisdictions in many parts of Canada.

Co-Author(s): Ian Cromwell, Canadian Centre for Applied Research in Cancer Control / Dean Regier, Canadian Centre for Applied Research in Cancer Control / Stuart Peacock, Canadian Centre for Applied Research in Cancer Control / Catherine Poh, British Columbia Cancer Agency

A2.2 MICRO-COSTING OF HIGH-THROUGHPUT GENOMIC ASSAYS USING A TIME-MOTION APPROACH

Presented by **Sarah Costa** Health Economist, ARCC-BC

Personalized medicine has the potential to improve clinical outcomes in cancer patients. However, economic evaluations of genomic technologies are challenged by a lack of available comprehensive cost data. We undertook a micro-costing study to derive resource utilization estimates of high-throughput genomic assays in the context of lymphoma patient management. Tissue and blood samples were analyzed for eligible patients who were diagnosed with selected lymphomas in the province of British Columbia (BC), Canada. A time-motion study was used to collect timing and resource estimates for sample preparation and quality assessment, molecular cytogenetic analysis (i.e., fluorescence in situ hybridization [FISH]), digital gene expression profiling (i.e., NanoString Technologies), and targeted sequencing. Data were collected over a 3-month period at the BC Cancer Agency's Centre for Lymphoid Cancer. A bottom-up costing approach was used to allocate capital and equipment, labour, and supplies/reagent costs at a per sample level. Assays are divided into a number of procedures, each of which was observed and timed separately. A total of 299 samples representing 98 patients was analyzed over 16 procedures, with an average of 19 samples (range: [3-48]) observed per procedure. Mean hands-on time per sample varied: 95.1 minutes/sample for sample preparation and quality assessment; 224.7 minutes/sample for FISH; 11.5 minutes/sample for NanoString analysis; and 122.5 minutes/sample for targeted sequencing. Current results show a combined per sample cost estimate of $1797.80 CAD. Capital and equipment costs are the major cost drivers, accounting for 38.8% of per sample costs, followed by supplies/reagents (37.1%), and labour (24.1%). As high-throughput genomic technologies become increasingly used in medical decision-making, the need for economic evaluations is crucial. The estimates derived from this study will be used to inform priority-setting in BC of applying these technologies to inform routine clinical practice.

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A2.3 Utilizing Iterative Benefits Evaluation to Develop and Improve an Electronic Navigational Tool for Cancer Diagnostic Testing: A Model for Strategically Shaping the e-Health Landscape.

Presented by **Melissa Kaan** Group Manager, Diagnostic Assessment Programs Cancer Care Ontario

The Diagnostic Assessment Program-Electronic Pathway Solution (DAP-EPS) is a navigational tool for patients undergoing cancer testing, care providers and staff. Since its launch, the DAP–EPS has undergone two cycles of evaluation while being continuously monitored to identify strengths and challenges to guide improvement efforts. The two phases of Benefits Evaluation (BE) were undertaken to assess adoption of the DAP-EPS and examine its value in supporting patients and providers within organized diagnostic assessment programs. The evaluations utilized a mix of quantitative and qualitative approaches to examine uptake, quality of the tool and benefits realization. Data collection methods have included: usability testing in a controlled environment; analysis of use statistics; user satisfaction surveys; and user interviews. Findings from each of the two evaluations have iteratively been incorporated into the tool's development, improvement plans and roadmaps for future implementation. By the end of October 2014, the DAP-EPS had tracked 22,785 patient/family logins. The tool had been used by 1,929 patients and family members, 33 administrative DAP staff, 39 nurses and 81 physicians and other clinicians. Between June 2011 and October 2014, patients' use increased on average by 46 new patient users per month. Following the first cycle of evaluation, a portal redesign corresponded to a 20% increase in patient satisfaction; after redesign, 81% found it easy to use and 78% said it helped improve their knowledge. Interviews revealed that patients liked knowing that they had access to their appointment schedules and logistics concerning their tests. DAP staff reported that the DAP-EPS enhanced communication and was a valuable information repository and workflow management tool. Iterative Benefits Evaluation of the DAP-EPS has provided continuous insight into how the DAP-EPS can be improved to better meet the needs of patients, providers and staff. This model of iterative evaluation can also be applied at the system level to help shape the e-health landscape in Ontario.

Co-Author(s): Julie Gilbert, Cancer Care Ontario / Sarah Wheeler, Cancer Care Ontario / Ann Thomas, Cancer Care Ontario / Sabrina Padewski, Cancer Care Ontario / Felicia Ulloa, Cancer Care Ontario / Claire Holloway, Cancer Care Ontario

A2.4 Integrating Care for Cancer Patients – Health Care Utilization across levels of Complexity

Presented by **Marnie MacKinnon** Director, Integrated Care, Cancer Care Ontario; **Erin Arthurs**, Senior Analyst, Cancer Care Ontario

This project was intended to define and quantify complexity among patients with cancer, in order to identify opportunities for improved integrated care between the cancer system and other care providers. With patient complexity defined through health system utilization, we sought to describe the trajectories of cancer care in Ontario. A retrospective study of 88,749 adults, newly diagnosed with cancer between 2009 and 2010 was conducted using Ontario administrative data. Resource intensity as defined by the cost of total healthcare use per year was used as a proxy for patient complexity and categorized as either 'low' or 'high' depending on the percentile of total healthcare costs. Patients were grouped into care trajectories based on: complexity before and after treatment, and whether they survived or died following/during treatment. Clinical characteristics including cancer site and stage, multimorbidity, and health system utilization measures were compared across trajectories. Five of the care trajectories were examined in detail and represented 70% of the cohort. The complexity analysis showed that while one third of the cohort died during or following their treatment and one third completed their treatment as low users of the system, another third of these patients exited the cancer system as high users. Patients with high post-treatment complexity or who died during cancer treatment generally tended to be older, have higher severity of cancer staging, have a greater number of comorbid chronic conditions, a greater number of physician visits per month and number of unique specialists in their circle of care as well as a larger proportion of patients who were emergency department users. Provincially there has been a particular focus on improving the care of high cost patients. A significant proportion of cancer patients are defined as high users of the healthcare system and thus require an integrated approach between primary care and cancer specialists, particularly among patients that are more complex.

Co-Author(s): Walter Wodchis, Institute of Health Policy, Management and Evaluation - University of Toronto / Jonathan Sussman, Department of Oncology, Division of Radiation Oncology - McMaster University / Marnie MacKinnon, Cancer Care Ontario / Erin Arthurs, Cancer Care Ontario

A2.5 **THE PROTECTIVE EFFECTS OF SOCIAL RELATIONSHIPS ON MORTALITY: IS THERE SOMETHING DIFFERENT ABOUT CANCER?**

Presented by **James Iveniuk** University of Chicago

Positive social relationships may reduce the risk of dying from cancer, however, it is not clear which social factors are most protective. Therefore this paper investigates the associations between various social factors and death from cancer, comparing cancer death to other causes of death. Data come from a nationally representative, longitudinal survey of older adults (N=3005), with data collected in 2005 and 2010. Outcomes are all-cause and specific-cause mortality at five-year follow-up. Predictors were social network characteristics (size, density, time spent, etc.), and measures of the subjective/emotional content of relationships (e.g.closeness to confidants, subject's feelings of loneliness, etc.). All-cause mortality and specific-cause mortality were predicted by logit and m-logit models respectively, using multiple imputation with chained equations. I find that social network size, participation in social organizations (religious services, volunteering, local meetings), marriage, and emotional closeness to confidants all have comparable associations with reduced all-cause mortality risk. Loneliness was not associated with dying from cancer, but was associated with increased risk of dying from other health conditions. These results persisted in the context of demographic controls (i.e. age, gender, ethnicity, education) and behavioral controls (i.e. smoking, drinking, exercising). Previous studies examining the protective effects of social connectedness on mortality may be limited by not considering the cause of death. I close with implications for the care of cancer patients, and the importance of social relationships for health outcomes.

A3 **PROSTATE CANCER** **Fontaine D**

Chaired by **Dr. Christopher J. Longo**, Associate Professor, Health Policy & Management, McMaster University

A3.1 **Castration-Resistant Prostate Cancer (CRPC): evaluation of the quality of care and disease management in real-life setting**

Presented by **Halima LAHCENE** MSc student, University of Montreal

The contemporary management of Castration-Resistant Prostate Cancer (CRPC) is very complex and is susceptible to be associated with a suboptimal quality of care and with a significant yet presently unknown survival. Unfortunately, little is known about the quality of care, treatment pathways and clinical outcomes of CRPC in the current real-life setting. This study aims to analyze quality of care by measuring adherence to Canadian clinical guidelines for the management of CRPC. It also aims to evaluate healthcare services utilization (including treatment sequences) in the real-life setting of the CRPC. The study cohort was constructed of patients treated for CRPC at the McGill University Health Center (MUHC) from 2012 to 2014. Individual information on medications, imaging and laboratory tests, medical visits and interventions, emergency visits and hospitalisations were collected. Quality of care was assessed by evaluating clinicians' adherence to Canadian clinical guidelines for CRPC management published in 2013 and other quality of care indicators. Preliminary analysis of 93 patients indicates that the median age is 74 years old. The most common first line treatments were anti-androgens (AAs), docetaxel and abiraterone. The Median Treatment Duration (MTD) of 1st line treatment was 6.0 months (mean 11.8 ± 12.2). Patients treated with abiraterone (10.8%) have a MTD of 5.0 months (mean 5.0 ± 1.4). Those treated with docetaxel (20.4%) have a median number of cycles of 6 (mean 6.1 ± 2.5). Patients treated with AAs (61.3%) have a MTD of 9 months (mean 11.9 ± 9.6). 95.7% of patients received abiraterone at any time point, and 62.4% of those have received it post-docetaxel. 92.0% of 75 patients had an ECOG performance status ≤ 1. 28.2% of patients had initial metastasis. 50.5% of patients with bone metastasis have received palliative radiation and 66.0 % of patients have received bone-targeted therapy (denosumab or zoledronic acid). Results indicate that current management of CRPC patients in the MUHC differs from the recommendations of Canadian clinical guidelines for CRPC. Further analyses will allow identifying factors that are associated with this difference in practice patterns.

Co-Author(s): Armen Aprikian, University of McGill / Marie Vanhuyse, University of McGill / Jason Hu, University of Mcgill / Alice Dragomir, University of McGill

A3.2 **Cost-effectiveness of multiparametric MRI and targeted biopsy in diagnosing prostate cancer**

Presented by **Alice Dragomir** Assistant Professor, McGill University

Transrectal US-guided biopsy (TRUSGB) is the recommended approach to diagnose prostate cancer (PCa). Overdiagnosis and sampling errors represent major limitations. Multiparametric MRI accurately identifies PCa lesions within the prostate. Targeted biopsy (MRGTB) detects significant PCa in a higher proportion of men and reduces the diagnosis of insignificant PCa. Costs and technical limitations still prevent MRGTB from becoming the new standard in PCa diagnosis. The goal of the present study was to assess whether the added costs of MRI outweigh the benefits of MRGTB in a cost-utility model. A Markov model was developed to estimate the incremental cost-effectiveness ratio (ICER) over 10-, 15- and 20 years. The model takes into account probability of men harboring PCa, diagnostic accuracy of both procedures and probability of being assigned to the various treatment options was created. Direct medical costs were included. ICER below $50,000/quality adjusted life year gained (QALY) was considered as cost-effective. Following standard TRUSGB pathway, calculated cumulative effects at 5-, 10-, 15- and 20-years were 4.25, 7.17, 9.03 and 10.09 QALY, respectively. Cumulative effects in the MRGTB pathway were 4.29, 7.26, 9.17 and 10.26 QALY, respectively. Costs related to the TRUSGB strategy were $8,027, $11,406, $14,883 and $17,587 at 5, 10, 15 and 20 years, respectively, as compared to $7,231, $10,450, $13,267 and $15,400 for the MRGTB strategy. At 5-, 10-, 15- and 20 years, the MRGTB was established dominant strategy. The incorporation of MRI and MRGTB in PCa diagnosis and management represents a cost-effective measure at 5-, 10-, 15- and 20 years after initial diagnosis.

Co-Author(s): Alice Dragomir, McGill University / Yannick Cerantola / Simon Tanguay, McGill University / Franck Bladou, McGill University / Armen Aprikian, McGill University / Wassim Kassouf, McGill University

A3.3 Cost-Effectiveness of Prostate Cancer Management Strategies in Canada

Presented by **Chiranjeev Sanyal** McGill University

Prostate cancer (PCa) is the most common non-skin cancer among men in developed countries. Several novel management strategies have been adopted by healthcare systems to manage PCa. The objectives were to assess direct health care costs and QALYs associated with PCa management strategies in Quebec, Canada from diagnosis to end-of-life. A validated Markov Montel Carlo model was use to predict lifetime direct costs and QALYs from the perspective of the Quebec health care system. Health states modeled by risk at diagnosis were: active surveillance (AS), initial treatments (radical prostatectomy or radiation therapy), PCa recurrence, PCa recurrence free, metastatic castrate resistant prostate cancer (mCRPC) and death (cause specific/other causes). Treatment trajectories were based on state transition probabilities derived from the literature. Unit costs were amassed from Regie de l'Assurance Maladie du Quebec (RAMQ), Ministere de la Sante et des Services Sociaux (MSSS), Montreal General Hospital pharmacy list, and published literature. Total cost per patient for the overall cohort increased from $17034 at 5 year to $22072 and $26407 at 10 and 15 year, respectively. Further, results indicated influence of risk group on total cost with high risk accrued maximum cost followed by intermediate, and low. AS conferred most QALYs (13.1 years) and was the least costly strategy ($11267) for low risk. For intermediate and high risk, radical prostatectomy and radiation therapy with androgen deprivation conferred most QALYs and were least costly strategies; $20843, 11.6 years and $86560, 10.1 years, respectively. Public healthcare system in Canada and elsewhere are operating under economic constrains to allocate finite health care resources to maximize health at population level. To improve efficiency of the health care delivery relative cost and QALY conferred by management strategies would be paramount for decision making and patient care.

Co-Author(s): Simone Chevalier, McGill University / Armen Aprikian, McGill University / Fabio Cury, McGill University / Alice Dragomir, McGill University

A3.4 Use of docetaxel and abiraterone in the management of castration-resistant prostate cancer in Quebec: a real-world cost-effectiveness study

Presented by **Joice Rocha** Urology, Department of Surgery, McGill University Health Center

Management of castration-resistant prostate cancer (CRPC) has evolved considerably in the last decade. This study focus on two therapies that showed survival benefits in phase-III trials, docetaxel (Doc) and abiraterone acetate (Abi). We aimed to evaluate the cost-effectiveness and survival impact of Doc and Abi in the management of CRPC. Study cohort was selected from the Régie de l'Assurance Maladie du Québec (RAMQ) and Med-Echo databases. It consisted of patients with CRPC starting chemotherapy or Abi treatments in 2002-2013. Survival was evaluated by Kaplan-Maier and by log-rank test for the difference in survival between pre-Doc (2002-2005, N=215) vs Doc (2008-2011, N=316) and pre-Abi (2009-2010; N=115, Doc only) and Abi (2012-2013, N=69; Abi+Doc,) eras. Drug exposures and survival was evaluated by cox proportional hazards model adjusted for co-variables. The incremental cost-effectiveness ratio (ICER) was obtained by dividing changes in the primary therapy costs and survival. Survival was significantly increased in the Doc vs pre-Doc and in the Abi vs pre-Abi era, with respectively 5.89 and 3.79 months survival increment ($p<0.001$). The use of Doc and Abi also altered the risk of death when compared to the previously used standard of care. The adjusted hazard ratios for pre-Doc vs Doc periods was 1.41 (95%CI 1.17-1.77), and pre-Abi vs Abi era was 1.32 (95%CI 0.98-1.78). The newer drugs present cost increments when compared to standard of care in preceding periods, which were C$18,720 for Doc and C$45,970 for Abi per patient during the study period. Finally, the ICER was C$30,271 and C$145,569 per life-year gained for each Doc and Abi eras. Our real-world study indicates that introduction of Abi and previously of Doc resulted in a survival benefit when compared to the earlier standard of care, similarly to what was observed in clinical trials. This was accompanied by an ICER of C$30,271 and C$145,569 respectively to each Doc and Abi study periods.

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A3.5 Understanding Readmission Rates following Radical Prostatectomy

Presented by **Jacqueline Gregory** Senior Analyst, Canadian Institute for Health Information

The Canadian Institute for Health Information (CIHI) recently released a report that describes trends in surgery for prostate cancer in Canada, with a focus on radical prostatectomy (RP), a potentially curative surgical intervention. This presentation describes the factors that influence the risk of 30-day unplanned readmission following a radical prostatectomy. Patients who had a radical prostatectomy in Canada between 2009/10 and 2011/12 were identified using inpatient and day surgery hospital data from CIHI. Of these patients, we identified those who had an unplanned readmission within 30-days of their surgical discharge. Logistic regression with interaction terms was performed to study factors influencing 30-day unplanned readmission following a radical prostatectomy. Potential factors included were age at time of surgery, charlson index, hospital volume, surgical approach, and length of stay for RP. The national 30-day unplanned readmission rate following a radical prostatectomy is 3.8%, with provincial rates ranging from 1.8% in Newfoundland to 6.8% in Saskatchewan. The logistic regression model found that the older a man is at the time of surgery, the more likely he is to have a 30-day unplanned readmission. As the length of stay increases, a man is more likely to have an unplanned readmission following an open surgery compared to a robotic surgery. In addition, as length of stay increases, a man is more likely to be readmitted for hospitals with larger volumes. Finally, as hospital volume increases, a man is more likely to be readmitted following a robotic surgery than an open surgery. Some readmissions are unavoidable; however they can be an indicator of quality of care or a lack of coordination of care services. The identification of some potential factors that increase the chance of 30-day unplanned readmissions following a radical prostatectomy will assist in the planning of care for these patients.

CONCURRENT SESSIONS GUIDE

Concurrent Sessions B (1:30pm – 3:00pm)

B1 **COSTING OF THE CANCER SYSTEM** **Mont Royal**

Chaired by **Ian Cromwell**, Health Economist, ARCC, BC Cancer Agency

B1.1 **Health system costs of the Pre-diagnosis Phase in Neuroendocrine Tumours**

Presented by **Simron Singh** Medical Oncologist, Odette Cancer Centre; **Nicole Mittman**, Assistant Professor Department of Pharmacology, HOPE Research Centre

Despite a rising incidence, neuroendocrine tumours (NET) remain a poorly understood malignancy, with diagnostic delays of up to seven years. Little is known about processes of care during this period. We sought to define pre-diagnostic costs in NETs management. Adult Ontario residents with a first diagnosis of a NET between April 2004 and March 2012 were identified using ICD-O/9 codes. A comparative cohort of colon cancer (CC) patients was created with 1:3 match on age, gender, Charlson comorbidity score, year of diagnosis, socio-economic status, and rural living, was created. Costs (CAN$2012) were applied to health system resources, including hospital, outpatient, emergency department, diagnostics, physician and medications costs, for the pre-diagnostic phase (2 years prior to 180 days after diagnosis date). Overall mean cost per patient with 95% confidence interval (CI) of the pre-diagnostic phase was determined. We included 3,355 NET and 9,320 matched CC cases with available pre-diagnostic resource consumption data. Median age-at-diagnosis was 62.0 (inter-quartile range-IQR: 54-72) years for NET and 64 (55-73) years for CC ($p<0.01$). Female patients constituted 51.7% of NET and 50.9% of CC cohorts ($p=0.443$). Mean overall cost per-patient was higher for NET, with $5,877 (95%CI: $5,398-$6,357) compared to $5,368 ($5,102-$5,633) ($p=0.058$). NET cost-drivers were physician encounters (28.6%) and hospitalization (27.0%), with 79.5% of costs being non-drug related. Physician encounters ($1,681 vs. $1,328; $p<0.01$), emergency department ($272 vs. $194; $p<0.01$), and laboratory ($192 vs. $169; $p<0.01$) mean costs were higher in the NET cohort. Hospitalization and physician encounters drive higher NET pre-diagnostic costs. Higher physician encounters, emergency department, and laboratory costs outline the lack of standardization and resource consuming nature of NET diagnostic process. Further insight into patterns of care and costs relationship is needed to establish timely diagnosis enablers.

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B1.2 **Comparing phase-based costs of cancer care in British Columbia and Ontario**

Presented by **Reka Pataky** Health Economist and Data Lead, ARCC, BC Cancer Agency

With the costs of cancer care rising, understanding resource use patterns across health services, over the course of disease, and between provinces is necessary to inform efficient healthcare policies. Our objective was to estimate and compare the phase-based costs of cancer care in British Columbia (BC) and Ontario. From the BC and Ontario Cancer Registries, we identified population-based cohorts of adult cancer cases, and linked administrative data for acute care, physician services, pharmaceuticals, home and community care, and cancer care to calculate mean costs for four phases of care for 21 different cancer sites. In BC, the BC Cancer Agency, BC Ministry of Health, and BC Vital Statistics Agency approved access to and use of data facilitated by Population Data BC. In Ontario, data from Cancer Care Ontario and the Ontario Ministry of Health and Long-Term Care were linked to data at the Institute for Clinical Evaluative Studies. We first developed a harmonized costing methodology to ensure comparable cost estimates between BC and Ontario. Mean costs follow similar patterns across phases (pre-diagnosis, initial care, terminal care, and continuing care) and cancer sites in both provinces. Terminal phase costs, for the last year of life, are highest, ranging from roughly $34,000 to $90,000, followed by initial phase costs, for the first 6 months after diagnosis, ranging from $3000 to $43,000. There is wide variation across cancer sites; however, in both provinces costs for melanoma are consistently low across phases, while myeloma and brain cancer are consistently high. Cost differences between provinces vary across health service sectors, representing a combination of true differences in service cost and differences arising from the data available. With this study we are advancing the understanding of cancer costs by using population-based longitudinal data and to evaluate costs across health services, across provinces, and over time. Administrative data are an invaluable tool for such comparative analysis, provided robust harmonized methods are used.

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B1.3 **Estimating the net costs of cancer care before and after diagnosis for childhood cancer in Ontario**

Presented by **Claire de Oliveira** Independent Scientist/Health Economist, CAMH

Substantial work has been done to estimate the costs of cancer care in adulthood; however, few studies have measured the costs of childhood cancer care. We estimated net costs of care for all childhood cancers (combined) in Ontario for the 90 days prior to diagnosis and the first year post-diagnosis in 2012 dollars. We used the Pediatric Oncology Group of Ontario Network Information System (POGONIS) and the Ontario Cancer Registry to identify all children (0-14 years) diagnosed with cancer in Ontario between 1995 and 2010 (N=4,396). We identified 3 controls per case, matched by year and month of birth, sex, rurality and comorbidity. We linked subjects to administrative health care databases, and obtained therapy data from POGONIS. Net costs (i.e., cost difference between cases and non-cancer controls) were estimated utilizing generalized estimating equations for the two identified periods, by type of health care service consumed, and stratified by patient survival status. Mean net total costs of care attributable to cancer were $5808 and $123,432, representing 92% and 99% of total cost respectively. Approximately 7.5% of the patient cohort died within one year after diagnosis; total net costs were higher for these patients compared to those that survived beyond one year ($8,324 and $166,119 vs $5,605 and $119,979). Total net costs in both the pre- and post-diagnosis periods were predominately attributable to costs associated with inpatient hospitalizations (76% and 82%, respectively). This finding was consistent among patients who lived less than one year and those who lived more than one year, although those with a shorter survival time had a slightly higher proportion of costs attributable to inpatient hospitalizations. The costs of childhood cancer care in Ontario are substantial and mostly due to inpatient hospitalizations. These estimates will help inform policy-makers' decisions regarding resource allocation for childhood cancer diagnosis and management, and can serve as important input for economic evaluations.

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B1.4 **Costs of Cervical Cancer Treatment: Estimates from Ontario, Canada**

Presented by **Ciara Pendrith** Western University

The objectives of this study were to estimate the overall and specific medical care costs of treating cervical cancer in the first three years following diagnosis. We compared the estimated costs with and without accounting for censoring. Incident cases of cervical cancer between 2007 and 2010 were identified from the Ontario Cancer Registry and costs were estimated from administrative databases. Three cost estimation methods were used: a) naïve estimator (simple mean); b) simple weighted estimator; and c) improved estimator. The simple weighted estimator is the mean of all cases that die or are observed until the end of the study period weighted by the Kaplan-Meier probability of not being censored. The improved estimator is the sum of the simple weighted estimator and an efficiency term reflecting the mean cost of individuals censored during the study period. The study cohort included 784 cases and the mean overall healthcare cost was $40,231 (standard error [SE] $1,356) in the first year post-diagnosis. Costs in year one ranged from $35,759 (SE $1,351) among those who survived at least a year to $66,250 (SE $4,084) among those who died within a year. Three years following diagnosis, the mean overall cost was $35,700 (SE $1,239) using the naïve estimator, $39,995 (SE $1,513) using the simple weighted estimator and $59,314 (SE $2,898) using the improved estimator. Inpatient hospitalizations and cancer-related care were the two greatest drivers of the cancer treatment costs. We found that the estimated mean costs that did not account censoring were consistently underestimated, highlighting the importance of accounting for censoring while estimating the costs of cervical cancer. Our cost estimates would be useful for estimating the economic burden of cervical cancer and cost-effectiveness of cervical cancer screening strategies.

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B1.5 **A time-trend economic analysis of cancer drug trials**

Presented by **Sonya Cressman** Health Economist, ARCC, BC Cancer Agency

Scientific advances have led to the discovery of novel treatment approaches with high prices. The cost to fund high-cost drugs may threaten the sustainability of drug budgets in different healthcare systems. In oncology, there is fear that health benefit gains are diminishing over time while the economic evidence to support funding decisions is too limited. To assess the additional costs and benefits gained from oncology drugs over time, we used treatment protocols and efficacy results from the US, Food and Drug Administration records to calculate cost-effectiveness ratios for drugs approved to treat first and second-line metastatic or advanced breast, colorectal and non-small cell lung cancer between the years 1994-2013. We assessed reimbursement recommendations reached by Health Technology Assessment agencies in the UK, Australia and Canada. Cost-effectiveness ratios were calculated for 50 drugs approved by the US regulator. The more recent approvals were based upon surrogate efficacy outcomes and were extremely high in costs, often triple the costs of drugs approved in previous years. Over time, the effectiveness gains have increased for some cancer indications; however, for other indications (non-small cell lung and second-line colorectal cancer) the magnitude of gains in effectiveness decreased. Reimbursement recommendations for drugs with the highest cost-effectiveness ratios were the most inconsistent. Evaluation of the clinical benefits that oncology drugs offer as a function of their cost has become highly complex and for some clinical indications, health benefits are diminishing over time. There is an urgent need for better evidence from oncology drug trials and systematic processes to inform funding decisions.

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B2 REAL LIFE DATA ON SCREENING, DIAGNOSIS, AND SURVIVAL — Fontaine C

Chaired by **Dr. Wanrudee Isaranuwatchai**, Health Economist, ARCC, Cancer Care Ontario

B2.1 Breast cancer subtypes and screening mammography sensitivity

Presented by **Linda Perron** Médecin spécialiste, Institut national de santé publique du Québec

By comparing interval with screen-detected cancers, the study aims to determine if screening mammography sensitivity varies according to breast cancer (BC) receptor status (oestrogen-receptors (ER), progesterone-receptors (PR), HER2-overexpression (HER2)) and subtypes (Luminal A, Luminal B, HER2-enriched, Triple-negative (TPN)). It also assesses the hypothesis that tumour aggressiveness mediates these relations. The study included 858 Quebec Breast Screening Program (PQDCS) participants, aged 50 to 71 years, diagnosed with an invasive BC between 2003 and 2007 at the Deschênes-Fabia Breast Centre (CMSDF) in Quebec City. Women and tumour characteristics were retrieved from the CMSDF registry. Receptor status and tumour subtypes among interval cancers were compared to that among screen-detected cancers. Logistic regression was used to adjust for the potential confounders' age at diagnosis, age at first birth, family BC history, hormone therapy use, breast density and BMI. Grade was integrated in the regression models as an intermediate variable between tumour types and mode of detection. Through PQDCS during the 2003-2007 period, 596 screen-detected and 262 interval cancers were diagnosed at CMSDF. The odds of being an interval cancer, were 2.7 (95% CI: 1.8-4.0) for ER-negative compared to ER-positive tumours, 1.8 (95% CI: 1.3-2.5) for PR-negative compared to PR-positive tumours and 2.4 (95% CI: 1.4-3.9) for HER2-positive compared to HER2-negative tumours. Integrating histological grade into the multivariate logistic models attenuated considerably these odds except for HER2 status. Compared to Luminal A, Luminal B (OR: 2.0, 95% CI: 1.1-3.9), HER2-enriched (OR: 4.6, 95% CI: 2.1-10.1) and TPN (OR: 2.8, 95% CI: 1.7-4.7) subtypes were all more frequent in interval than screen-detected cancer. Again, integrating histological grade into the logistic model attenuated considerably odds except for the HER2-enriched subtype. Screening mammography appears less effective in detecting ER-negative, PR-negative, HER2-positive tumours and the aggressive HER2-enriched and TPN subtypes. Grade could be an important mediator in most of these tumour types - screening sensitivity relations. Strategies aiming at optimizing the detection of aggressive tumour types are required for further gains in BC mortality reduction.

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B2.2 Using administrative data to estimate time to breast cancer diagnosis and percent of screen-detected breast cancers – A validation study

Presented by **Yan Yuan** University of Alberta

Appropriate use of administrative data enables the assessment of care quality at the population level. Our objective was to develop/validate methods for assessing quality of breast cancer diagnostic care using administrative data, specifically by identifying relevant medical tests to estimate the percentage screen/symptom-detected cancers and time to diagnosis. Two databases were created for all women diagnosed with a first-ever breast cancer in years 2007-2010 in Alberta, Canada, with dates of medical tests received in years 2006-2010. One purchased database had test results and was used to determine the "true" first relevant test of a cancer diagnosis. The other free administrative database had test types but no test results. ROC curves and concordance rates were used to assess estimates of percent screen/symptom-detected breast cancers; Log-Rank Test was used to assess time to diagnosis obtained from the two databases. Using a look-back period of 4-6 months from cancer diagnosis to identify relevant tests resulted in over 94% concordance, sensitivity and specificity for classifying patients into screen/symptom-detected group; good agreement between the distributions of time to diagnosis was also achieved. Our findings support the use of administrative data to accurately identify relevant tests for assessing the quality of breast cancer diagnostic care.

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B2.3 Treatment of taxane acute pain syndrome (TAPS) in patients receiving taxane chemotherapy for breast and prostate cancers – a systematic review and network analysis

Presented by **Ricardo Fernandes** The Ottawa Hospital Cancer Centre; **Mark Clemons** Ottawa Hospital Cancer Centre

Performing a systematic review to identify all treatment strategies for treating patient with TAPS that have been assessed in the context of randomized controlled trials; Presenting the range of different strategies identified and mapping their network geometry and summarizing their study characteristics to scope out the evidence base available for management strategies for TAPS; Methods: A systematic review of trials reporting the treatment of TAPS in patients undergoing chemotherapy for breast and prostate cancers was performed. Embase, Ovid Medline(R), and the Cochrane Central Register of Controlled Trials were searched. Medline search was peer reviewed. Outcome measures included: treatment type and response of myalgias, arthralgias, pain and quality of life measures. Of 1608 unique citations initially identified, 4 studies were included in the final analysis. Randomized placebo-controlled trials (273 patients) and retrospective studies (10 patients) were included. Agents investigated were: gabapentin (300 mg orally tid), amifostine (910mg/m2 intravenously), glutathione (1.5g/m2 intravenously) and glutamine (10 grams orally tid). Sample sizes ranged from 10 to 195. Pain response rates for each agent were: gabapentin (90%), amifostine (36%- 95% CI, 16% to 61%). Response to glutathione and glutamine were no different from placebo. Two trials reported quality of life outcomes. No statistical differences between the two arms studied with regards to symptom-distress scale scores and pain questionnaire items were disclosed. Despite being a common side effect of taxane chemotherapy with significant effects on patient quality of life and compliance with treatment, TAPS remains poorly researched and few studies evaluate its optimal management. Standardized tools for the evaluation of TAPS are needed. More studies are required to prospectively compare treatment strategies and potentially identify risk factors of TAPS.

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B2.4 **Predictors of Actual Survival in Resected Pancreatic Adenocarcinoma: A Population-Level Analysis**

Presented by **Daniel Kagedan** University of Toronto

Among patients diagnosed with pancreatic adenocarcinoma, numerous clinicopathologic factors have prognostic value following curative-intent resection. We sought to assess actual survival following resection and to determine factors predictive of survival on a population level. Patients undergoing resection for pancreatic adenocarcinoma between 2005-10 were identified within the provincial cancer registry and administrative databases that include actual survival for all patients in Ontario, Canada (population 13 million). We fully abstracted pathology reports for 473. Kaplan-Meier survival analysis and Cox proportional hazards multivariate regression were performed to determine the clinicopathologic variables associated with decreased survival. The actual 1-, 3-, and 5-year survival rates were 65%, 23%, and 15% respectively, with median survival 1.48 years. Follow-up time ranged from 2.07-7.22 years, and 377 (79.7%) were censored for death before the end of follow-up. Multivariate regression revealed the following variables to be negatively associated with survival: age > 70 ($p=0.001$), T stage ($p<0.01$), nodal metastasis ($p<0.001$), tumor grade ($p<0.001$), positive margin status ($p<0.01$), lymphovascular invasion ($p<0.001$), lymph node positivity ratio > 0.2 ($p <0.001$). Patients with multivisceral or major vascular resections, and patients with low socioeconomic status did not have worse survival. Receiving treatment at a high-volume hepatopancreatobiliary center was associated with improved survival (HR = 0.49, 95%CI = 0.36-0.67, $p<0.0001$). Advanced age, positive margins, and histopathologic tumor characteristics predict poor prognosis, and undergoing more extensive resection does not worsen survival. Receiving treatment at a hepatopancreatobiliary centre improves survival. In a publicly-funded healthcare system, poor socioeconomic status does not worsen survival.

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B2.5 **Phase-specific health care costs of cervical cancer: estimates from a population-based study**

Presented by **Ning Liu** PhD Student, University of Toronto

This study uses individual patient level data to obtain a comprehensive estimate on the economic burden of managing cervical cancer in the province of Ontario, identifying main cost drivers and predictors. Cervical cancer patients diagnosed between 2005 and 2009 in Ontario were propensity-score matched to 5 non-cancer controls on demographics, and comorbidities. Both cases and the non-cancer comparison group were followed up to March 31 2013. Health care costs paid for by the MOHLTC were estimated using linked administrative data. The cost-of-illness technique was employed to estimate the incremental costs associated with cervical cancer in four phases (pre-diagnosis, initial care, continuing care, and terminal care), using generalized estimating equations. Cost drivers in each phase were identified by calculating the percentage of total cost each resource accounted for. Predictors of higher costs were explored using multivariate regression models. The total incremental costs for managing cervical cancer were $C362 in the pre-diagnosis phase, $C17,610 in the initial phase, $C3,794 per year in the continuing phase and $C51,944 in the terminal phase. Inpatient care accounted for 31%, 28% and 53% of total health care cost in the initial, continuing and terminal phase, respectively. Radiation therapy accounted for 29% of the initial care costs, and physician service ranked the first in both the continuing phase (25%) and the second in the terminal phase (13%). Advanced age, advanced cancer stage at diagnosis, and comorbidities were significant predictors of higher costs in most care phases. Aggregate costs of care for cervical cancer are substantial and vary by cancer stage, phase of care, patient age at diagnosis, and comorbidities before diagnosis. This study provides baseline data for economic analyses of prevention, screening, and treatment of cervical cancer in the Canadian setting.

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B3 **QUALITY IMPROVEMENT** **Fontaine D**

Chaired by **Dr. Linda Rozmovits**, Sr. Research Associate, ARCC, Cancer Care Ontario

B3.1 **Evaluating the Impact of PET Scanning for Lymphoma Patients: Development of the Ontario PET Lymphoma Staging Registries**

Presented by **Pamela MacCrostie** Project Coordinator, Cancer Care Ontario

The Positron Emission Tomography (PET) Lymphoma Staging Registries were added to Ontario's PET program to strengthen evidence around clinical utility. The data will be used in concert with existing literature to inform funding decisions for PET in staging limited-stage Hodgkin's (HL), non-Hodgkin's (NHL), nodal follicular or other indolent NHLs. A review of the literature on PET in lymphoma found limited evidence that PET impacts patient management when used for staging limited-stage HL, NHL, nodal follicular and other indolent NHLs. A Registry was recommended to strengthen evidence for the Ontario context while providing streamlined patient access. Analyses of previous PET Registries have faced challenges when determining whether the PET scan impacted patient management. Thus, data collection for the Lymphoma Staging Registries was designed to include information on treatment intent both before and after the scan. Processes to improve post-scan submission rates from referring physicians were developed to ensure complete data. Uptake of the use of PET as part of the Registries has been rapid, with approximately 400 patients enrolled within the first eighteen months of the launch date (May 2013). The vast majority of enrolled patients (~90%) have aggressive histology disease (HL or NHL), with the remainder (~10%) presenting with indolent forms of lymphoma. Initial rates of return of the post-scan treatment plan submitted by the referring physicians were low (35-50%). Outreach, including a Program Newsletter and dissemination of information through the (Hematology) Disease Site Group, has had a positive impact on enrollment and data submission. Currently, initial post-scan data submission on the impact of a PET scan on treatment planning is ~70%; after targeted outreach to the referring physician, this rate improves to 80%. Analysis comparing the pre-PET proposed treatment and the post-PET actual treatment will confirm if staging lymphoma patients (with aggressive and/or indolent histology) with PET significantly impacts patient management. This data will be assessed in conjunction with analysis of administrative data as well as existing literature to inform funding recommendations.

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B3. 2 **Target Setting for Palliative Care Wait Times at Ontario Regional Cancer Centres**

Presented by **Victoria Zwicker** Sr Policy Advisor, Cancer Care Ontario

A palliative care wait time indicator has been developed as a performance measure for Ontario Regional Cancer Centres (RCCs). The objective of this work was to identify a wait time benchmark (maximum acceptable wait time) and provincial target against which current performance can be compared. An environmental scan and a scan of the literature were conducted to identify existing wait time standards. In addition, palliative care triaging tools and wait time standards from RCCs were collected. A consensus panel of palliative care clinicians, patient and family advisors, and RCC administrators was convened to identify a benchmark and target for the percentage of patients who should be seen within the benchmark wait time. The environmental scan and literature review found no existing standards or benchmarks for outpatient palliative care services. However, there are a number of triaging tools and wait time standards in use at RCCs for these services. Taking these existing tools and wait time standards into consideration, the consensus panel identified a wait time benchmark (14 days) and a provincial target (80 per cent) for Ontario RCCs. This work will highlight gaps in access to outpatient oncology palliative care in Ontario, and is part of an emerging effort to measure the quality of palliative care across the health system. Learnings from this work can support performance measurement efforts in other areas of palliative care delivery in Ontario.

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B3. 3 **Do we need to improve the coordination of multidisciplinary care for patients with head and neck cancer? An investigation of unplanned hospital emergency department visits by patients with oropharyngeal cancer in Ontario**

Presented by **Elizabeth Lockhart** Team Lead, Quality, Cancer Care Ontario

The acute toxicity of combined modality treatment for oropharyngeal cancer is well recognized and highlights the need for intensive supportive care in the management of this patient population. This study aimed to further understand the clinical care needs of these patients while they are undergoing treatment. Radiation therapy (RT) with or without concurrent chemotherapy is the standard of care for patients with oropharyngeal cancer. A Cancer Care Ontario (CCO) guideline emphasizes the need for a multidisciplinary approach, including surgical, medical and radiation oncologists and supportive care professionals, for this population. To assess the availability of appropriate supportive care, the number and causes of patients' visits to the emergency department (ED) during a course RT were examined. Patients with oropharyngeal cancer receiving radical RT in Ontario (2011-2014) were identified and linked to an administrative dataset which provided information regarding patients' ED use during the same time period. Between 2011-2013, 998 Ontario patients had radical RT (+/- concurrent chemotherapy) for oropharyngeal cancer of which 273 (27.4%; range 26% to 32%) visited an ED at least once during their treatment. Between 2012-2014, of 1103 patients, approximately 27.7% (range 19% to 36%) visited an ED during a course of RT. Reasons for visits included neutropenia, fever and infections (typically related to chemotherapy) as well as dehydration, nausea and vomiting. Due to data coding limitations, reasons for some ED visits were not available (18%). Analysis of the timing of ED visits provided additional detail regarding the availability of supportive care. The results suggest that supportive care needs of this population are not being regularly met. Further work is necessary to understand the reasons for ED visits and causes of regional variation. Improved coordination of care and further investment in quality improvement in this area may be warranted.

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B3. 4 **Optimizing the Design of a Population-Based Reflex Testing Program for Lynch Syndrome in Ontario: Health Care Providers' Perspectives**

Presented by **Yvonne Bombard** Scientist & Assistant Professor, Li Ka Shing Knowledge Institute of St. Michaels Hospital

Lynch syndrome (LS) is a relatively common genetic syndrome, which increases the risk of colorectal and endometrial cancers. Reflex testing can identify at-risk relatives but is performed on an ad-hoc basis with variation in access. We explored providers' experiences managing LS to inform the design of Ontario's reflex testing program. We conducted qualitative interviews with Ontario health care providers (HCPs) with experience managing LS patients or a special interest in colorectal cancer (CRC) screening. Participants included CRC surgeons (n=6), general surgeons (n=5), genetic counsellors (n=7), medical oncologists (n=2), primary care providers (n=3) and a gastroenterologist. We also interviewed 3 key informants from the newborn screening program to gain additional insights on information provision, consent/opt-out, result notification and support for subsequent options. Participants constituted a convenience sample recruited through referrals from the research team supplemented by snowball sampling. Qualitative data were analyzed using content analysis and constant comparison techniques. HCPs experiences and perceptions of current practice pointed to inconsistent management of suspected LS patients. Reflex testing of colorectal tumours was ordered by a variety of HCPs, or was conducted at pathologists' discretion. Often, IHC testing was conducted after a genetics referral. There were long wait times for genetics consults in some centres. Some patients declined genetics referrals because they were in active treatment while others were deterred by complex paperwork. HCPs believed that some patients declined genetics appointments out of fear or avoidance. Long intervals could elapse before referring clinicians became aware that patients did not have their genetics consult. Participants felt that LS is not well understood in the broader medical community and communication between various services involved in care is not optimized. These results support the need for a coordinated reflex testing program and highlight opportunities to optimize delivery of care for LS. Implementation of reflex testing of colorectal tumours will reduce inconsistencies in referrals and is envisioned as the first step in developing a province-wide organized approach to screen for LS.

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B3. 5 **Thinking Differently About The Kids: An Innovative Approach to Improve Care Provided to pediatric Patients Undergoing External Beam Radiation Therapy**

Presented by **Katherine Jensen** Radiation Therapist, University of Calgary/Alberta Health Services

This research summary reports the changes made to a Canadian radiation therapy treatment program for pediatric patients undergoing external beam radiation therapy between 2009-2012. Sedation versus non-sedation of patients, use of play therapy and audio visual aids alongside a modified approach to educating pediatric patients and family members are reported. A literature search was conducted to investigate the process and approach Canadian cancer centers implemented to provide external beam radiation therapy to pediatric cancer patients. Following review of the literature search a Canadian cancer radiation oncology department developed a pediatric working group and identified two areas for internal review and evaluation. The process used to sedate versus non-sedate pediatric patients was reviewed and changed and the play therapy, use of audio visual aids and educational process used for pediatric patients was changed. The presence of a radiation therapist at the new patient pediatric consult resulted in positive changes to how children and family members understood the external beam radiation therapy process. In addition the implementation of the Patient care pathway assessment tool helped to determine those pediatric patients that require sedation and those that do not. Play therapy techniques implemented prior to external beam radiation therapy and the implementation of the use of audio visual aids during treatment reduced the necessity of sedation for a significant number of pediatric patients. Between the years 2009-2012 14 pediatric patients underwent external beam radiation therapy without the use of sedation. Implementation of a patient care pathway assessment tool, play therapy prior to treatment and use of audio visual aids during treatment resulted in an innovative approach to the treatment of pediatric patients.

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POSTER PRESENTATIONS AT A GLANCE

The poster presentations will be displayed in Fontaine AB

HEALTH SYSTEMS, SERVICE & POLICY	
1	**Improving Patient Safety through Standardized Pre-Printed Orders for Take-home Chemotherapy** Presented by **Nita Lakhani** Pharmacist, Drug Formulary, CPQI, Cancer Care Ontario
2	**Health services utilization in the end-of-life phase of patients dying of prostate cancer in Quebec between 2001 and 2013** Presented by **Jason Hu** MSc Student, McGill University
3	**Improving the quality and safety of radiation treatment: Implementing radiation oncology peer review at a jurisdictional level in Ontario** Presented by **Lindsay Reddeman** Senior Analyst, Radiation Treatment Program, Cancer Care Ontario
4	**Population based analysis of breast cancer diagnosis in Alberta** Presented by **Yan Yuan** University of Alberta
5	**Locally advanced colorectal cancer - A population-based study of factors associated with relative excess risk of death** Presented by **Linda Perron** Médecin spécialiste, Institut national de santé publique du Québec
6	**Treatment of castration-resistant prostate cancer in a real-life setting in Quebec** Presented by **Joice Rocha** Ph.D., Urology, Department of Surgery, McGill University Health Center
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Presented by **Desre Kramer** Staff scientist and Associate Director, Occupational Cancer Research Centre, Cancer Care Ontario

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Presented by **Linwei Wang** Master Student, University of Alberta, School of Public Health

POSTER PRESENTATIONS GUIDE

The poster presentations will be displayed in Fontaine AB

HEALTH SYSTEMS, SERVICE & POLICY

1 **Improving Patient Safety through Standardized Pre-Printed Orders for Take-home Chemotherapy**

Presented by **Nita Lakhani** Pharmacist, Drug Formulary, CPQI, Cancer Care Ontario

Cancer Care Ontario (CCO) has set a provincial goal to eliminate hand-written and verbal take-home chemotherapy orders from systemic treatment facilities by June 30, 2015. While computerized physician order entry (CPOE) remains the gold standard, pre-printed orders (PPOs) standardize prescribing where CPOE is not available. The objective was to identify key components and develop standardized PPOs for take-home chemotherapy included in evidence-informed regimens. A Canadian environmental scan of available PPOs for take-home chemotherapy was conducted. The literature was searched for relevant articles and guidelines. Legislative organizations (Ontario College of Pharmacists and College of Physicians and Surgeons of Ontario) and expert groups (Canadian Association of Provincial Cancer Agencies, Institute for Safe Medication Practices Canada, others) were consulted. Identified PPO key components were vetted through two CCO working groups and the Systemic Treatment Provincial Leadership team for review and feedback. PPOs were created by modifying an existing template with permission from an Ontario hospital. They were edited for content, usability and formatting by a pharmacist team and reviewed via a consultative process by CCO Disease Site Group leads. The following PPO key components were deemed essential to facilitate safe dispensing of take-home chemotherapy: hospital, patient, prescriber and document identifiers, allergy status, chemotherapy protocol and dosing schedule, dose modifications, height, weight, body surface area (as appropriate), supportive care medications (as required), drug coverage (if applicable) and clinical verification section. 150 generic PPOs for take-home chemotherapy were developed and posted on CCO's Drug Formulary website in November 2014. Facilities were informed of the availability of PPOs and instructed how to customize these generic forms with their institution-specific information. Identification of key components facilitated the creation of standardized PPOs for take-home chemotherapy. This work should help systemic treatment facilities improve their CPOE systems and/or customize their PPOs to ensure safe dispensing. The eventual goal is to eliminate hand-written and verbal chemotherapy orders, ultimately improving patient safety.

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2 **Health services utilization in the end-of-life phase of patients dying of prostate cancer in Quebec between 2001 and 2013**

Presented by **Jason Hu** MSc Student, McGill University

The study objective was to describe health services utilization at the end-of-life phase in castration-resistant prostate cancer (CRPC) by type of initial treatment (radiotherapy (RT) or radical prostatectomy (RP)) received for localized disease. The study cohort consists of patients aged 60-75 years that received medical or surgical castration treatment, became castration resistant and died from CRPC between January 2001 and July 2013 in Quebec. For each patient, healthcare services use, hospitalizations and associated direct medical costs specific to each intervention, medical visits and treatments related to PCa were identified from RAMQ and Med-Echo databases in the 2-year period prior to death. Kaplan-Meier analysis was used to evaluate overall survival by initial treatment. The general linear model was used to compare direct medical cost and number of days of hospitalization by initial treatment. A number of 681 and 692 patients died of prostate cancer in the study period and had received RT or RP as initial treatment respectively. The median survival were 80.7 months (95%CI: 76 to 85) in the RT group and 85.1 months (95%CI: 78 to 88) in the RP group. In the RT group 26.8% of patients received chemotherapy only, 2.6% received abiraterone without prior chemotherapy and 51.4% received palliative radiation without prior chemotherapy or abiraterone. In the RP group, the figures are: 32.3%, 1.8% and 31.6% respectively. Over the last 2-year period of life, an average of 39 days (RT) and 35 days (RP) of hospitaliation were observed (p=0.07). In addition, the mean direct medical cost was $5,647 and $5,019, respectively (p=0.0008). Several variations of clinical practice over the end-of-life period have been observed between the RT and RP groups.

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3 **Improving the quality and safety of radiation treatment: Implementing radiation oncology peer review at a jurisdictional level in Ontario**

Presented by **Lindsay Reddeman** Senior Analyst, Radiation Treatment Program, Cancer Care Ontario

Radiation oncology peer review (PR) – the evaluation of radiation treatment (RT) plan elements by a second radiation oncologist – is a key component of quality assurance in radiation medicine. Recognizing the importance of PR in ensuring treatment quality, Cancer Care Ontario (CCO) undertook an initiative to increase PR activities in Ontario. The initiative was launched in 2012 following an assessment that identified considerable variation in PR activities across Ontario's 14 cancer centres. A multi-professional project team was established to lead the initiative, conducting site visits to promote peer review at the centres and providing guidance on the organization of peer review activities. The education/training, methods, and a centralized reporting infrastructure were developed in collaboration with centres over a one-year ramp-up phase and centres had access to patient-level data for audit purposes. Two key metrics were monitored: (1) the proportion of radical RT plans peer reviewed and (2) timing of peer review. The PR initiative is ongoing and has had several successes to date. In year-one of the initiative (2013-14), the target for percentage of radical RT plans to be peer reviewed was set at 50%, with the intent that 100% of plans will be peer reviewed within the next 3 to 5 years. The actual percentage of RT plans peer reviewed across centres during 2013-14 exceeded that target to reach 57%. However, considerable variation still exists in performance between centres and in the timing of PR. PR is now recognized as an important quality metric in Ontario – PR data is available to the centres through CCO quarterly performance and is reported publicly through the Cancer System Quality Index. CCO's PR initiative demonstrates that it is possible to substantially increase PR activities at a jurisdictional level. Key success factors include: a dedicated project team, buy-in from leadership and frontline staff at the centres, confidence in data quality, investment in education and training, and commitment to public reporting.

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4 **Population based analysis of breast cancer diagnosis in Alberta**

Presented by **Yan Yuan** University of Alberta

Understanding the factors affecting mode and timeliness of breast cancer diagnosis is important to optimizing patient experiences and outcomes. The study objectives were to identify factors related to the length of the diagnostic interval and assess how they vary by mode of diagnosis: screen or symptom detection. All female residents of Alberta diagnosed with breast cancer in years 2004~2010 were identified from the Alberta Cancer Registry. Data were linked to Physician Claims and screening program databases. Using a previously validated method, screen-detected patients were identified by having a screening mammogram within 6-months of diagnosis: screening mammogram date defined the start of the diagnostic interval. Remaining patients were symptom-detected: the start of their diagnostic interval was the most proximal family physician visit prior to their first diagnostic test. Quantile regression was conducted to identify the effect that factors had on the time to diagnostic by detection mode. 4747 (38%) breast cancers were screen-detected and 7280 (62%) were symptom-detected. In the screen-eligible population, 2857 (47%) were screen-detected and 3189 (53%) were symptom-detected. Health region and age at diagnosis had the largest impact on cancer detection mode. The median diagnostic interval for screen and symptom-detected cancers was 19 and 21 days, respectively. The variation by health region, however, was large ranging from a median of 4 to 37 days for screen-detected patients and from 16 to 33 days for symptom-detected patients. Cancer stage was inversely associated with the diagnostic interval for symptom-detected cancers, but not with the screen-detected cancers. The significant variation by health region in both the percentage of women with screen-detected cancer and the length of the diagnostic interval for screen and symptom-detected breast cancers suggests there are important differences in local breast cancer diagnostic care coordination. These will be discussed in greater detail.

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5 **Locally advanced colorectal cancer - A population-based study of factors associated with relative excess risk of death**

Presented by **Linda Perron** Médecin spécialiste, Institut national de santé publique du Québec

This study documents treatment guideline adherence and survival among Quebec locally advanced (LA) colorectal cancer (CRC) patients aged < and ≥ 70 years who had a curative intent tumour resection. It also estimates the impact of treatment guideline adherence, socio-demographic and clinico-pathological variables on the risk of CRC death. In a random sample of surgically treated stage II-III rectal and III colon cancer patients declared to Quebec cancer registry in 1998 and 2003, we measured guideline adherence, relative survival up to 10 years after surgery and performed multivariate modelling of the relative excess risk of death according to treatment, socio-demographic and clinico-pathological features including diagnostic year, sex, age, hospital cancer caseload, clinical trial enrolment, tumour location, T and N stage, grade, vascular and nervous invasion, emergency surgery, margin and radial margin status, lymph node examined and positive lymph node ratio. Information was extracted from medical records and administrative health databases. Of LA CRC patients alive 30 days post-surgery, 45.2% were ≥ 70 years. Proportion who received chemotherapy/chemoradiation was 81.3 % and 42.0 % among those < and ≥ 70 years. Relative survival (RS) was 67.7% (95%CI: 65.8-69.6) and 61.2% (95%CI: 58.3-64.0) 5 and 10 years post-surgery. Among patients < and ≥ 70 years, 5-year RS was 70.4% (95% CI: 68.0-72.6) and 64.6% (95% CI: 61.3-67.8). In multivariate analysis, treatment concordant with guidelines was associated with a relative excess risk of death of 0.41 (95% CI: 0.27-0.60); a magnitude of effect consistent across age-groups. Cancer location, T-stage, N-stage, grade, vascular invasion and emergency surgery were all independently associated with an increased risk of CRC death. Age-based treatment disparity emphasise the need to gain understanding of elderly CRC patients management. The relative impact on LA CRC death rate of guideline adherence and prevalent clinicopathological feature of disease progression underscores the need for early cancer detection and rapid health care trajectory in suspected and confirmed CRC cases.

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6 **Treatment of castration-resistant prostate cancer in a real-life setting in Quebec**

Presented by **Joice Rocha** Ph.D., Urology, Department of Surgery, McGill University Health Center

Systemic treatment of castration-resistant prostate (CRPC) has evolved considerably in the last decade. Our study aimed to analyze healthcare services utilization, clinical outcomes and survival trends in the Quebec management of CRPC in a current real-life setting. The study cohort consisted of 6,927 patients with evidence of CRPC from January/2001 to July/2013, selected from the Régie de l'Assurance Maladie du Québec (RAMQ) databases. Survival was evaluated by Kaplan-Meier and the difference in survival between pre-Doc and Doc (2002-2005 vs 2008-2011) era by log-rank test. The association between Doc exposure and survival was evaluated by Cox proportional hazards model adjusted for several co-variables. In our study cohort, the overall distribution of first line therapy was: 17.6% chemotherapy, 47.5% maximal androgen blockade (MAB) alone, and 3.1% Abiraterone. Androgen targeted therapies (MAB and Abiraterone) were the treatment of choice for the elderly population (mean age 78.8±7 and 78±7, respectively), while chemotherapy was offered to younger patients (mean age 72 ±7.3). The use of chemotherapy was increased in the Doc (23.6%) vs pre-Doc (15.2%) periods. Survival in the Doc group was significantly improved with an average of 5.89 months increment ($p<0.001$) and a 59% reduction in the risk of death when compared to the previous standard chemotherapy (HR1.41; 95%CI 1.17-1.77 pre-Doc vs Doc era). Chemotherapy usage increased in the Doc era but is still limited to a minority. In our study, age seems to impact therapy selection. Use of Doc resulted in improved survival, similarly to clinical trial results. These findings are encouraging and suggest that the increase survival observed with newly approved CRPC drugs in phase-III studies may also translate in real-life outcomes.

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7 **Using Canadian administrative data to understand the interplay between primary and oncology care for breast cancer patients during pre-diagnosis, treatment and survivorship: a CanIMPACT Study**

Presented by **Patti Groome** Professor, Queen's University

Objectives: CanIMPACT is a multi-province Canadian research team funded to identify and address key issues faced by cancer patients and providers at the intersection of primary and specialist oncology care. One stream of inquiry uses administrative data to quantify factors during pre-diagnosis, treatment, and survivorship. Approach: Breast cancer patient data in five provincial cancer registries will be linked to data from Physician Claims, Hospital Inpatient and Outpatient Data, and cancer clinic medical records. The key data sources are comparable across provinces with preliminary work ensuring data comparability. Study outcomes include the pre-diagnostic interval length, emergency department (ED) use and hospitalizations associated with adjuvant chemotherapy, health utilization in 1-4 years post-diagnosis, and care patterns across specialist and primary care. Outcomes will be compared across provinces and factors associated with inter- and intra-provincial differences studied. Factors include co-morbidities, socio-economic and immigrant status, rural/Northern residence, and primary care continuity. Results: Through preliminary work we have established provincial data availability, finalized the core questions, and developed data acquisition and processing parameters for each province. Secondary questions that fewer provinces will be able to answer are also being identified. Conclusion: Results will address many existing information gaps that can be used to improve transition care points for cancer patients. Importantly, results will be combined with those of a CanIMPACT qualitative study to inform the design of a pragmatic randomized trial focused on improving coordination and quality of care.

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8 **Developing a Capacity Planning Model for Positron Emission Tomography Scans in Ontario**

Presented by **Jonathan Wang** Senior Analyst, Cancer Care Ontario

Cancer Care Ontario (CCO) is responsible for planning Positron Emission Tomography (PET) services in Ontario. The objective of this project is to develop a capacity planning model to make recommendations for the location of future permanent PET sites in the province. A model was developed to evaluate the operational viability of potential sites to provide timely, evidence-based care administered as close to home as possible while ensuring quality standards are met and that services are economically viable. We estimated the demand from historical data, comparing it to established thresholds for capacity and quality assurance considerations. Using the existing case costing data, we estimated the volume threshold for economic viability. The model was applied to potential sites in Sudbury, Kingston and Barrie and allowed us to examine the volume/cost impact to existing sites as a result of the referral shifts. Our analysis indicates that the volume of scans in a community needs to be between 700-1000 scans per year to be financially and operationally viable (based on 50-150 operating days per year), using case costing information from existing sites and the current reimbursement scheme from the Ministry of Health. The capacity at a site was based on a maximum of 15 scans per day for 50-150 operating days per year, which is a capacity of 750-2250 scans per year. To maintain the expertise of the physicians at the new site, it was estimated that 450 scans per year were required based on quality practice guidelines from the Society of Nuclear Medicine. The estimated demand for Sudbury, Kingston and Barrie is 561, 464 and 403, respectively. None of the sites considered would be able to sustain a PET center at their location due to insufficient demand. Sudbury's current demand makes it the most likely candidate in the province for a permanent PET site as it is likely to exceed the threshold in a few years.

Co-Author(s): Deanna Langer, Cancer Care Ontario / Peter Bevan, McMaster University / Douglas Hussey, University Health Network / Ur Metser, University Health Network

9 **Examining the use of an advanced practice (AP) radiation therapy (RT) role, the Clinical Specialist Radiation Therapist (CSRT) A new model of care**

Presented by **Michelle Ang** Policy Research Analyst, Cancer Care Ontario

With the objective of improving quality of care, system efficiency and sustainability, Cancer Care Ontario (CCO) in collaboration with the Ontario Ministry of Health and Long-Term Care is developing innovative models of care. One model has established an advanced practice (AP) role, further developing and leveraging radiation therapy (RT) expertise. In 2004, Ontario's Ministry of Health and Long-Term Care funded a pilot project, examining whether introduction of Clinical Specialist Radiation Therapists (CSRTs) could transform the current RT models of care and optimize the use of health human resources in this domain. The overall goal was to enable CSRTs to assume responsibility for certain key radiation medicine activities traditionally performed by radiation oncologists (RO), while maintaining and improving access and the patient experience, implementing quality initiatives and increasing capacity. This would support the long-term sustainability of the cancer system, aligning incentives and accountability with quality and access goals for cancer patients. 24 active CSRTs became integrated members of RT departments in 9 provincial cancer centres. Concordance study results show that CSRTs can develop assigned competencies. Data from numerous studies demonstrate that CSRTs directly impact the efficiency/operations of team clinics, decreasing wait times and increasing capacity (1-16 additional patients/month). Indirect time savings are also gained through the assumption of some functions normally completed by ROs such as patient education, contouring and technical set up (average: 10.6 hours/month; range: 1 – 50 hours/month). Furthermore, CSRTs are shown to improve the quality of care through improving patient experience and outcomes, and improving provider experiences through increased therapist and supervisor satisfaction. CSRTs also engage in various research, innovation and knowledge translation projects which enhance the quality and efficiency of their role. The development of the CSRT role in Ontario cancer centres demonstrates how non-traditional, creative system solutions can lead to more streamlined models of care thus improving patients' quality of care. The program is currently working towards formalizing the role through collaboration with the national professional association for radiation therapists.

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10 **Cervical Cancer Screening in Ontario's Primary Healthcare Practice Models: The Influence of Financial Incentives**

Presented by **Ciara Pendrith** Western University

To compare cervical cancer screening rates of physicians' patients in three primary care practice models in Ontario, which differ by remuneration and financial incentive eligibility. The following models were compared: fee-for-service (FFS) without incentives; Family Health Group (FHG; FFS with incentives); and Family Health Organization (FHO; capitation with incentives). We conducted a population-based cross-sectional analysis to assess the influence of incentive eligibility and remuneration on cervical cancer screening rates across the three models. The data for this study came from the health administrative databases held at the Institute for Clinical Evaluative Sciences. Screening rates were assessed from claims data using a validated billing code algorithm. Fractional logit regression models were fit to the data to predict screening rates after adjusting for patient and physician characteristics. Bonuses paid to physicians were ascertained from claims data and used to assess the overall costs of delivering cervical cancer screening. We compared the cervical cancer screening participation rates of 7,298 physicians' patient populations. Overall 80% of women had at least one Pap smear between 2009 and 2011. Cervical cancer screening rates in the traditional FFS and FHG models were 74% and 82%, respectively. The screening rate was 80% among physicians practicing in the FHO. The cost of screening was lowest in the traditional FFS model and highest in the FHO where more physicians claimed a bonus. We found significant differences in cervical cancer screening rates across practice models in Ontario. Cervical screening rates were significantly higher in models eligible for incentives (FHG and FHO) than FFS. The rate for the FHG was higher than the FHO -- though the difference was modest it was statistically significant.

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11 **Providing better care together: The Acute Leukemia Shared-Care Program**

Presented by **Amanda Wong** Project Coordinator, Cancer Care Ontario

Following the release of the Adult Acute Leukemia Services Plan for the Greater Toronto Area: Recommendations Report, the Acute Leukemia Shared-Care Program was developed. Acute leukemia is a rapidly progressive disease requiring timely, intensive and complex treatment. After the acute phase of illness, patients require close monitoring and ongoing out-patient care. Historically, this care has been highly centralized. The Shared-Care Program is intended to reduce the burden on centralized specialized resources and on patients travelling long distances frequently for routine care. The Program is a collaborative initiative between Princess Margaret Cancer Centre and Partner Cancer Centres. It enables the delivery of timely, safe and high-quality care for adult leukemia patients at Cancer Centres closer to home in between visits to Princess Margaret for specialist care through a shared-care model. The Acute Leukemia Implementation Steering Committee, struck by Cancer Care Ontario (CCO), leads the development of tools, materials and a communications strategy to support the Program. Cancer Centres are supported by a full complement of resources to provide coordinated,high-quality care. An in-person training day for physicians, nurses and pharmacists was well received and evaluation results show that attendees found it useful and look forward to similar opportunities in the future. Peer clinicians are supported through one-on-one mentorship. Online resources such as a ListServ for collaborative discussion and a SharePoint website are also available to provide clinical tools, contact information and communication channels to facilitate and standardize the shared-care of patients. A comprehensive offering of patient materials and targeted stakeholder communications are included. Record sharing strategies between Centres have been identified. CCO will continue to work with regional partners to provide additional support and use learnings from the Program to inform future enhancements and expansion. Evaluation strategies will look at both patient and provider experiences, as well as uptake and resource utilization.

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12 **Leveraging Competition for Quality Improvement in the Canadian Context**

Presented by **Victoria Hagens** Manager, Regional Programs and Performance Management, Cancer Care Ontario

As the provincial agency responsible for continually improving cancer services, Cancer Care Ontario (CCO) has a robust performance management system rooted in the Ontario Cancer Plan. One effective means of promoting quality improvement has been to foster healthy competition among the Regional Cancer Programs (RCPs) through the Regional Performance Scorecard. The Regional Performance Scorecard is comprised of about 15 performance indicators, selected annually through a priority and target setting process involving the clinical and administrative leadership of the cancer system, as well as patient and family advisors. Indicators and targets are selected based on their prioritization in the Ontario Cancer Plan and vetted against a set of criteria to ensure that they can be effectively used for performance management purposes. The scorecard is produced quarterly, measuring the performance of the RCPs against mutually agreed-upon provincial targets, and ranking the RCPs against one another in an overall summary of performance. The Scorecard results are reviewed each quarter by the leadership of the RCPs and CCO, as well as the CEOs and Boards of Directors of the cancer center hospitals. Performance against the provincial targets is closely monitored, and thresholds for poor and declining performance are used to trigger escalation. Anecdotal evidence suggests that the RCPs are keenly aware of their rank in relation to their peers, and in some cases the Scorecard rank is tied to the compensation packages of the programs' executive leadership. Since 2006-07, 12 out of 34 indicators used in the Scorecard were later retired because the targets were achieved provincially, and of the 13 indicators currently in use, 7 have shown statistically significant improvement over the previous year. The apparent effectiveness of the Scorecard suggests that a collaborative approach, grounded in mutually agreed-upon priorities, can leverage healthy competition to meet quality goals.

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13 **Pilot Implementation of Survivorship Care Plans-an Update**

Presented by **Frances Wong** BC Cancer Agency

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 develop a framework for guiding BC Cancer Agency (BCCA) operation leaders when considering the implementation of survivorship care planning. Forty breast cancer patients are being recruited, 20 starting adjuvant therapy (experimental arm), and 20 at discharge (conventional arm). All participants take part in an SCP appointment following discharge, during which a treatment summary and other relevant information to assist in their transition to community care are provided. Experimental arm participants self-complete their summaries, while conventional arm participants have their summaries completed by the Breast Cancer Nurse. Checklists and questionnaires provide data on patients' understanding of their treatment and care as well as satisfaction with their cancer centre experience. To date, 34 patients are participating-17 for each arm. Analysis of discharged patients shows that experimental arm participants have a better knowledge of their disease and treatment at discharge. Few conventional arm patients knew the name of their cancer at discharge (46% vs. 75% of experimental arm patients). Discharged conventional arm participants reported low satisfaction with information provided by BCCA staff on self-care and support resources before discharge, and with communication, information, and support provided by the family physician after discharge. Only 46% of discharging experimental arm participants self-completed their treatment summaries. Reasons for non-completion included that it caused them anxiety, and that it was lower priority than other tasks. While many participants were satisfied with the experience of the SCP appointment, there was a low rate of compliance from the experimental participants in self-completing their summaries. We may need to consider a different method of implementing SCPs that is both useful for patients and which conserves BCCA resources.

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HEALTH TECHNOLOGY ASSESSMENT

14 **Conducting economic evaluations to inform policy in Ontario: Example of docetaxel for treatment of castrate-sensitive prostate cancer**

Presented by **Jaclyn Beca** Manager, Pharmacoeconomics Research Unit, Cancer Care Ontario

The CHAARTED trial was an Eastern Cooperative Oncology Group (ECOG) phase III trial first presented at the 2014 ASCO Annual Meeting. The trial demonstrated 17-month overall survival benefit when the chemotherapy drug docetaxel was added to conventional androgen deprivation therapy for treatment of high-volume metastatic castrate-sensitive prostate cancer. In Ontario, both clinical benefit and cost-effectiveness must be addressed in a formal funding request for a drug to be considered for public reimbursement. The aim of this study was to assess the cost-effectiveness of this intervention to help provincial decision-makers appraise this new therapeutic approach A model was built to assess the cost-effectiveness of docetaxel + ADT compared to conventional ADT alone for treatment of high-volume mCSPC based on the presented clinical trial data. The Kaplan Meier survival curves were used directly to calculate the time in castrate-sensitive and castrate-resistant metastatic prostate cancer health states. Utilities were identified from the published literature. Costs were reported in 2014 Canadian dollars and costs and effects were discounted at 5% per year. The public payer perspective was considered over a lifetime time horizon. The docetaxel + ADT intervention cost an additional $12,783 and produced 0.71 quality-adjusted life years compared to conventional ADT alone. The incremental cost-effectiveness ratio for this intervention was $18,084/QALY gained. The intervention was evaluated in the absence of final published data, using best estimates as well as very conservative assumptions to validate the robustness of the findings. The model was most sensitive to the relative probabilities of progression between treatment groups, the utility of the mCSPC state and health state costs. Ontario's reimbursement decision-making process includes consideration of both clinical evidence and value-for-money. In a circumstance where clear health gains have been established but value-for-money had not yet been demonstrated, the economic evaluation substantiated the intervention as both clinically beneficial and economically attractive. The analysis provided valuable insights to support timely and responsive evidence-based decision-making.

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15 **pCODR experience with Progression Free Survival in Assessing Treatment Clinical Benefit**

Presented by **Alexandra Chambers**

Progression-free survival (PFS) is increasingly used as the primary endpoint over the gold standard of overall survival (OS) in oncology clinical trials; this leads to uncertainty about OS benefit, for which PFS may be an unreliable surrogate. Regulatory agencies are increasingly accepting PFS as an efficacy measure. The objective of this review was to evaluate the experience of pCODR with PFS as a primary endpoint. A retrospective analysis of pCODR Expert Review Committee (pERC) Final Recommendations and Clinical Guidance Reports publicly posted (January 2012 - September 2014) was conducted to identify applications for funding where PFS benefit was demonstrated but OS benefit was unknown, and to examine pCODR's approach to assessing net clinical benefit in this situation. The perspectives from pERC, Clinical Guidance Panels and patient advocacy groups were examined. Eighteen applications met the above criteria. Disease sites included haematologic malignancies and cancers of the pancreas, kidney and lung. Factors considered on a case-by-case basis by Guidance Panels and pERC included: the likelihood of definitive information on OS becoming available; the likelihood of crossover or post-progression lines of treatment confounding appraisal of OS; the magnitude of PFS benefit; consistency with results of other trials; the line of therapy (curative or metastatic); the availability of other treatments; the evidence for impact on quality of life; the morbidity associated with the treatment. pERC also considered the perspective of patients (input from the relevant patient advocacy groups) and clinicians (input from the guidance panel). pERC considered that there was meaningful clinical benefit in fifteen of the eighteen applications. pERC's final recommendations were based on its full deliberative framework, incorporating net clinical benefit, alignment with patient values, economic evaluation, and adoption feasibility. Despite lack of consensus of the validity of PFS as a surrogate for OS benefit, pCODR has considerable experience in determining the value of PFS on a case-by-case basis when assessing the net clinical benefit of novel treatments. Clinical benefit was evaluated by pCODR's multi-dimensional framework encompassing effectiveness, safety, burden of illness, and need.

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16 **Estimate the clinical and economic impact of urologists' adherence to the follow-up guidelines after radical or partial nephrectomy for localized and locally advanced renal cell carcinoma in Canada**

Presented by **Alice Dragomir** Assistant Professor, McGill University

Surgical resection (radical or partial nephrectomy) remains the most effective therapy for clinically localized renal cell carcinoma RCC. Surveillance protocols after surgical resection varies depending on the risk of recurrence or development of metastasis. The objective was to estimate the clinical and economic impact of urologists' adherence to the Canadian Urology Association (CUA) guidelines related to the follow-up after radical or partial nephrectomy in Canada as approved in 2009. The study cohort was based on the Canadian Kidney Cancer Information System including six Canadian provinces. Our cohort includes patients having had radical or partial nephrectomy between Jan2011 and Jan2014. Kaplan-Meier method was used to evaluate the recurrence rate by urologists' adherence to the CUA follow-up guidelines. Cox proportional hazard model was used to evaluate association between time to recurrence and adherence level adjusted for pathological stage. A cohort of 1,030 patients with an average age of 61 years old has been selected. The mean follow-up was 12 months. During the follow-up, 34.7% of patients had the exact number of abdominal CT or ultrasound tests as dictated by the CUA guidelines, whereas 58.9% of patients had more tests and 6.5% less tests, respectively. Two-year recurrence rate was 27% in patients with more abdominal CT or ultrasound than recommended by guidelines, and 20% in the others (p-value < 0.0001). When adjusted for pathological stage, a hazard ratio of 3.1 (95%CI: 2.1-4.5) was estimated for patients with more abdominal CT or ultrasound than recommended by guidelines compared to the others. At a Canadian level the mean observed cost of surveillance of each annual cohort was estimated at $3,8M while the expected cost following CUA guidelines was estimated at $1,2M, over a mean follow-up of 12 months. The results suggest that clinicians have performed a more intense surveillance in patients with poor clinical outcomes. Further analysis should be performed after a longer duration of follow-up to evaluate survival in these patients. A more intense surveillance increased the economic burden of follow-up after radical or partial nephrectomy at the Canadian level.

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17 **A cost-effectiveness analysis of intra-lesional IL-2 for the treatment of unresectable in-transit melanoma**

Presented by **Jaclyn Beca** Manager, Pharmacoeconomics Research Unit, Cancer Care Ontario

Unresectable in-transit metastases from melanoma are a challenging clinical scenario where a variety of regional and systemic treatment options exist, though clinical evidence on comparative effectiveness is limited. Recent single arm phase II trials have evaluated intra-lesional interleukin-2 (IL-2) in this setting and have observed pathologic complete response (pCR) in 30-50% of patients with minimal side effects. Patients with a pCR have prolonged progression free survival. As treatment can be provided in an out-patient clinic and at low cost, it may avoid or delay other more costly, inconvenient or toxic options. This analysis assesses the cost-effectiveness of intra-lesional IL-2 compared to usual care to treat patients with unresectable in-transit melanoma. A Markov model was used to evaluate the cost-effectiveness of intra-lesional IL-2 based on published literature. Usual care included isolated limb infusion, radiation and systemic therapies. It was conservatively assumed that all patients progress to usual care after progression or recurrence with IL-2. Utilities for advanced melanoma were obtained from the literature. The public payer perspective was considered over a 10 year horizon, with costs reported in 2014 Canadian dollars (CAD). Costs and effects were discounted at 5% per year. Deterministic and probabilistic sensitivity analyses were undertaken to address uncertainty in parameters. The IL-2 strategy produced an extra 0.36 quality-adjusted life years and saved $5,074 CAD per person compared to usual care in the base case. The model was most sensitive to outcomes for patients using systemic therapies upfront, and response/progression rates for patients using IL-2. The IL-2 strategy was less costly than usual care in 94% and more effective in 71% of the simulations. IL-2 was both less costly and more effective (dominant) in 69% of simulations. The use of intra-lesional IL-2 appears to be economically attractive. Although results suggest uncertainty in comparative effectiveness between IL-2 and usual care, very few simulations occurred where the IL-2 strategy was more costly. IL-2 appears to be a cost-effective therapeutic option.

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18 **A literature review of economic evaluations of smoking cessation programs in the oncology setting**

Presented by **Wanrudee Isaranuwatchai** Health Economist, Cancer Care Ontario

The study objective is to conduct a literature review of economic evaluations of smoking cessation programs undertaken in the oncology setting. This project addresses a knowledge gap related to the costs and benefits of smoking cessation programs offered to cancer patients. Our study population is adult (aged ≥18 years) cancer patients. The interventions of interest are smoking cessation programs: non-pharmacological, pharmacological, or multicomponent interventions. Comparators include usual care or the absence of a smoking cessation program. Our primary outcome of interest is the incremental net benefit or the incremental cost-effectiveness ratio. In order to be included, the study must be a full economic evaluation (i.e., cost-effectiveness analysis, cost-utility analysis, cost-benefit analysis, or cost-minimization analysis). Potential publications will be screened: Level 1 screening will assess titles and abstracts, and, from those that are deemed relevant, Level 2 screening will assess the full-text articles. The quality of the economic evaluations will be assessed using Drummond's 10-item checklist. From the search, 1,013 potential publications were identified. The following information will be reported: study characteristics (e.g., year and country of conduct, year of publication, sample size, population, intervention, comparator, clinical outcome, study design, perspective, type of economic evaluation, time horizon); participant characteristics (e.g., age, sex, type of cancer); and economic evaluation results (e.g., incremental cost, incremental effect, cost-effectiveness estimate, and measure of uncertainty). The study quality will also be reported for descriptive purposes. Given the significant health and economic burden of cancer and the diverse and expensive treatment options available, this review will contribute to our understanding of the value for money of smoking cessation programs in oncology patients and provide information that could inform current and future smoking cessation initiatives such as Cancer Care Ontario's program, which aim to maximize the health benefits to cancer patients.

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19 **A data-driven model to support health human resource (HHR) prediction and planning**

Presented by **Junell D'Souza** Planning Officer, Cancer Care Ontario

Share a data-driven model and approach for health human resource (HHR) planning. A multi-disciplinary working group, including clinical, administrative and data experts, oversaw the model development. The group developed a conceptual model framework as an initial step based on demand and supply concepts. The model is built on 'workload units', which are measurable activities representing physicians' clinical work. Expected workload units were estimated using historic utilization data, relative intensity of visit types, and cancer projections which are based on incidence and prevalence. Supply data was obtained through a census and full time equivalents were adjusted to reflect physicians' clinical capacity. Several levers were built into the model. Model levers allowed different planning scenarios to be tested (e.g. models of care, patient flow patterns). The model informed the requirement and regional allocation for a clinical specialty for future years. Success factors included: robust data assets, assembling key expertise, understanding assumptions, an iterative approach, managing scope, and validating intermediate outputs. The model will be evaluated and refined to reflect future care practices and other health system initiatives. The model allows for extensive customization and can be leveraged for other HHR.

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20 **Estimating Long-Term Cancer Costs of Cancer Care in Ontario**

Presented by **Claire de Oliveira** Independent Scientist/Health Economist, CAMH

Cost estimates of cancer care are useful to inform and help formulate national cancer programs and policies. We estimated phase-specific, 5-year and lifetime net costs of care for the 21 most prevalent cancers, and remaining tumour sites combined, in Ontario. We selected patients diagnosed with cancer between 1997 and 2007 at >19 years of age, with valid ICD-O and histology codes, who survived >30 days after diagnosis, and had no second cancer within 90 days of the initial cancer, from the Ontario Cancer Registry (N= 402,399). We linked these patients to administrative health care databases at the Institute for Clinical and Evaluative Sciences, and radiation therapy data from Cancer Care Ontario. Net costs (i.e., difference in costs between cancer patients and equivalent non-cancer control subjects) were estimated by phase of care and applied to 5- and 25-year cancer survival curves to estimate 5-year and lifetime costs of care. Mean net costs of care were highest in the initial and terminal phases of care and lowest in the pre-diagnosis phase followed by the continuing phase of care. In particular, phase-specific costs were, on average, lowest for melanoma and highest for brain cancer. Inpatient hospitalizations comprised the largest portion of the cost. Mean 5-year net costs varied substantially: from less than $25,000 for melanoma, thyroid, and testicular cancers to more than $60,000 for multiple myeloma and leukemia. Lifetime costs also varied quite a bit, ranging from less than $65,000 for lung, liver and melanoma to over $110,000 for lymphoma, multiple myeloma and leukemia. Our results show that costs of cancer care in Ontario are substantial and vary by tumour site and time horizon of analysis. These cost estimates will provide an important input for future cancer-related economic evaluations and are of value to researchers and policy makers.

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21 **RESOURCE UTILIZATION AND COSTS OF MANAGING PATIENTS WITH ADVANCED METASTATIC MELANOMA: A POPULATION BASED STUDY**

Presented by **Nicole Mittman** Assistant Professor Department of Pharmacology, HOPE Research Centre

The burden of advanced Metastatic Melanoma (MM) is not well known. An analysis to determine the utilization of health care services and costs from a public payer perspective was conducted. Through the CD-Link program, we identified a cohort (2005-2012) of individuals with a diagnosis of melanoma (ICD-9 code=172). Advanced MM was generated by defining a cohort with a combination of at least one palliative, one medical oncology and one hospitalization code. The types of health system services utilized by this population were clustered into hospitalization, palliation, physician medical visits, medication, homecare, laboratory, diagnostics and other resources. Ontario costs were obtained from publicly provincial sources ($CAN 2013). Overall utilization rates and costs, and disaggregated costs, were determined. There were 2,748 individuals with advanced MM. The majority (66%) of individuals were male over 65 years of age. Less than 45% of the cohort was still alive 3 years after the advanced MM diagnosis. Individuals incurred an estimated average cost of $37,489, ranging from $3,722 to $882,775. Cost drivers were hospitalization ($24,600), physician visits ($4,699), diagnostics ($3,194), and medications ($2,268). The average yearly cost per subject over the time horizon was $6,551. The first year after diagnosis was the most expensive year at $15,830, followed by $8,166 in year 2. Cost drivers in advanced MM cohort were hospitalizations, physician visits and diagnostics. New treatments were not yet used in this cohort. The overall total cost of the cohort was $103 million over the entire time frame of the analysis.

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22 **The impact of aggressive management and palliative care on cancer costs in the final month of life**

Presented by **Nicole Mittman** Assistant Professor Department of Pharmacology, HOPE Research Centre

A significant share of the cost of cancer care is concentrated in the end-of-life period. Although quality measures of aggressive treatment guide optimal care during this timeframe, little is known whether these metrics affect costs of care. The relationship between palliative care, aggressiveness of care, and costs warrants further evaluation. We used population data to identify a cohort of patients who died of cancer in Ontario, Canada (2005 to 2009). Individuals were categorized as having received aggressive end-of-life care or not, according to quality measures related to acute institutional care or chemotherapy administration in the end-of-life period. Costs (2009 $CAN) were collected over the last month of life by linking health system administrative databases. Multivariable quantile regression was used to identify predictors of increased costs. Among 107,253 patients, the mean per-patient cost over the final month was $18,131 for patients receiving aggressive care and $12,678 for patients receiving non-aggressive care. Patients who received chemotherapy in the last 2 weeks of life also sustained higher costs compared to those who did not. For individuals receiving end-of-life care in the highest cost quintile, early and repeated palliative care consultation was associated with reduced mean per-patient costs. On multivariable analysis, chemotherapy in the 2 weeks of life remained predictive of increased costs (median increase $536) whereas access to palliation remained predictive for lower costs (median decrease $418). Cancer patients who receive aggressive end-of-life care incur 43% higher costs than those managed non-aggressively. Palliative consultation may partially offset these costs and offer resultant savings.

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23 **Generating Costing Algorithms for Oncology Drugs using Administrative Databases**

Presented by **Nicole Mittman** Assistant Professor Department of Pharmacology, HOPE Research Centre

To generate costing algorithms for treatment and supportive drugs in oncology using provincial (Ontario) administrative databases. A cohort of women diagnosed with breast cancer (BC) (ICD-9 174.x) was identified from the Ontario Cancer Registry (2007-2012). Firstly, the Ontario Drug Benefit Formulary (ODBF), New Drug Funding Program (NDFP) and Activity Level Reporting (ALR) databases will be used in which clinicians will identify BC-specific treatment (chemotherapies and hormonal therapies) and supportive (four classes) drugs. Secondly, overall and per patient drug utilization will be determined. Thirdly, unit costs will be applied to calculate the overall drug, per drug and per drug class costs. Lastly, costing algorithms will be generated to conduct costing analyses. We identified 39,655 women diagnosed with BC. Preliminary results have identified BC-specific drugs in both the ODBF and NDFP databases while the ALR database analysis is underway. All chemotherapies and hormonal therapies have been identified as well as anti-nausea, pain (opioid and non-opioid), anti-infectives, and blood products for supportive drugs. Outputs will include patient cases with at least one treatment or supportive drug being utilized. Iterative test outputs for utilization and costs are being proposed that include means, medians and ranges. We plan to generate costing algorithms for oncology drugs in BC and later colorectal cancer. These costing algorithms will allow for the calculation of oncology treatment and supportive drug costs in different cancer cohorts.

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24 **Patient Navigation in Cancer Care: is there any evidence of cost-effectiveness?**

Presented by **Lisa Parvin** University of British Columbia

Objectives: The purpose of this study was to identify the best cost-effectiveness measures for the evaluation of a prostate cancer specific peer navigation pilot program in BC and ON. The objectives of this review were to establish data requirements for program and economic evaluation during project implementation and delivery . Approach: A comprehensive literature review was undertaken. Following the Cochrane guidelines, three databases (Pubmed, Google Scholar, Web of Science) were searched followed by hand search of the relevant references. Due to gaps in cost-effectiveness research in this field, search strategies were kept broad (Patient navigation and economic evaluation) and research with cancer and other target patients were included to optimize the number of captured articles. Using the epidemiological and economic domains of the Knowledge Exchange-Decision Support tool (KE-DS)* to establish inclusion/ exclusion criteria, 20 potential articles were retrieved. Result: Of the twelve reviewed articles, five used societal perspective. Other perspectives included were provider (two), health system (one) and healthcare payer (one). Based on the types of costs measured, societal perspective was assumed for the ones where it was unspecified. For economic evaluation, most of the articles either compared their interventions with usual care or with other navigation models. Depending on the stage of cancer continuum and the perspective used, associated costs and effectiveness measures were evaluated ranging from number of people screened or stage of diagnosis (cancer screening interventions) to quality of life (cancer treatment interventions). Using these data, Incremental cost effectiveness ratio (ICER), Return on Investment (ROI) or cost utility were measured, among others, for economic evaluation. Conclusion: This literature review suggests ICER to be the most reliable way to measure cost-effectiveness for such pilots with cost measures from societal perspective, (e.g. cost of training/recruitment of navigators, maintaining navigation program, etc.) and effect of intervention measured by patient's quality of life outcome using QALYs. *http://med-fom-spph.sites.olt.ubc.ca/files/2013/11/KEDS_Toolkit_Nov2010.pdf

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KNOWLEDGE TRANSLATION

25 **Communities of Practice: A model for improving quality of care in radiation treatment**

Presented by **Elizabeth Lockhart** Team Lead, Quality, Radiation Treatment Program, Cancer Care Ontario

The Radiation Treatment Program (RTP) at Cancer Care Ontario (CCO) has established several intra- and inter-disciplinary Communities of Practice (CoP) s, with the goal of improving radiation treatment (RT) quality and safety in Ontario. To date, the RTP has established 5 CoPs: 2 intra-disciplinary (Radiation Therapy and Medical Physics) and 3 inter-disciplinary (Head and Neck (H&N), Gynecological (GYNE) and Lung Cancer). CoP member recruiting is conducted with the aim of securing engagement from all centres to ensure full representation of regional diversity across the province and to facilitate adoption of best practices in all Regional Cancer Programs. CoPs are operationally supported with funding and resources provided by the RTP, but are led and driven by members, who undertake the identification of key quality issues and selection of corresponding quality improvement initiatives to pursue. To date, the RTP CoPs have made significant achievements in enhancing the overall quality and safety of RT delivery in Ontario by developing consensus advice documents that promote and enable: Improved RT safety (RT CoP – use of safety straps in radiation therapy delivery); Adoption of best practices (H&N – RT treatment plan evaluation guidance, Medical Physics – physics treatment plan checking guidelines, RT – image guidance on treatment unit); Increased support for infrastructure improvements (GYNE – recommendation report for Magnetic Resonance(MR)-guided brachytherapy) In addition to concrete work products developed by the CoPs, there has been increased communication, knowledge transfer/exchange and the development of strong professional networks between centres. The observed impacts and gains noted confirm that CoPs can be a highly effective model for improving quality of care. The establishment of CoPs should be considered for quality improvement in other areas of the cancer system.

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26 **A Mobile App for Primary Care Providers: Cancer Care Ontario's Cancer Screening App**

Presented by **Zeinab El-masri** Sr. Analyst, Cancer Care Ontario

To track and measure uptake and usage of the Ontario Cancer Screening App to inform future app design and dissemination plans. Three online tools, Google Analytics, Distimo, and App Annie, were used to gather and analyze quantitative and qualitative data to inform the uptake and usage reports. Since launch to December 2014, there have been more than 5,800 app downloads across the world, 57% of which are in Canada. The iOS platform generated over 1,900 iOS users in Canada. Ninety percent of iOS app users are from Ontario, spread across 138 towns/cities. The average Ontarian iOS user viewed 2.86 screens, spending an average of 5 minutes per screen. Fifty-four percent of Ontario iOS app users are returning users. There is a correlation between provincial dissemination efforts and a peak in downloads. The results indicate that there is uptake of the app and that it is generating returning users within Ontario. The iOS platform being the most popular aligns with existing literature. The results also indicate that disseminations are reaching the target audience and that some routes are more effective than others.

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27 **A systematic review of the incidence of taxane acute pain syndrome (TAPS) in patient receiving taxane-based chemotherapy for breast and prostate cancers**

Presented by **Ricardo Fernandes** M.D., Ottawa Hospital Cancer Centre

What is the incidence of taxane acute pain syndrome in breast and prostate cancer patients undergoing docetaxel chemotherapy? What are the risk factors for TAPS (metastatic vs early stage disease, single agent vs combination agent, age, breast vs. prostate cancer, male vs. female, dose (100mg/m2 for breast etc, type of pain score used) ? A systematic review was performed to evaluate the incidence of TAPS in patients undergoing taxane chemotherapy for breast and prostate cancer. An electronic literature search was performed to seek relevant citations from Embase Classic and Embase, Ovid Medline(R) in-process & other non-indexed citations and Ovid Medline(R). Reviewers independently screened citations and full text articles, respectively. Of 821 unique citations initially identified by the electronic search, after two screens forty-eight studies (n=) were identified for the final analysis. Sample sizes ranged from 14 to 2091. Information on outcomes including concurrent steroid administration, rate and reasons of chemotherapy discontinuation, dose and type of analgesia, quality of life assessment and results were not consistently available. The majority of the trials were randomized and patient populations were considered heterogeneous. Our systematic review quantifies TAPS incidence across breast and prostate cancer patients undergoing taxanes treatment. This allows our incidence measures to be used by clinicians when deciding between chemotherapy regimens and types. Specifically, our results may contribute to explaining the risks of developing TAPS and its likely natural history. Finally, it is confirmed that we do need a standardized approach to the diagnosis of TAPS in order to improve its reporting among patients and physicians.

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28 **A National Rectal Cancer Quality Initiative: A Novel Approach to System Improvement**

Presented by **Gunita Mitera** Quality Initiatives Specialist, Canadian Partnership Against Cancer

Despite evidence, guidelines and standards, variation in clinical practice in cancer care persists. For rectal cancer treatment, there are well established quality practices. Yet, significant variations across Canada persist. To address this quality gap, this pan-Canadian initiative uses multi-disciplinary and patient developed national quality indicators to drive local quality improvement initiatives to accelerate meaningful change in the cancer system. Through consensus, quality indicators were developed with input from surgeons, radiologists, radiation oncologists, medical oncologists, pathologists and patient/family advisors from 8 high volume Canadian cancer centres. Gold standard protocols, targets and benchmarks were established. Barriers and facilitators to data collection and implementation of local quality initiatives address each quality indicator at the local centres were determined though in-person and teleconference discussions. A series of audit and feedback reports, along with forming a communities of practice to allow for on-going knowledge exchange activities to support implementation at each centre will occur over the next year. 57 pan-Canadian quality indicators have been developed with multi-disciplinary input. Of these, 12 were related to multi-disciplinary cancer conference, 10 were pathology, 14 were radiation oncology, 10 radiology, 6 pre-treatment assessment, and 5 surgery processes. The 10 most important issues from the patient perspective were also identified. Every 3 months, each of the cancer centre site leads for each discipline will present local results to their colleagues, obtain feedback and discuss further strategies to improve uptake of each quality practice. Ongoing engagement among site leads will present further opportunities to identify and overcome barriers to uptake and implementation. Data is expected to be collected prospectively from a minimum of 1000 rectal cancer patients to inform the audit and feedback process, measure performance and identify areas for improvement. Pan-Canadian quality indicators have been developed by engaging a multi-disciplinary group of physicians that treat rectal cancer and patients and families affected with rectal cancer. Though local champions leading the audit and feedback process, it is hoping that locally tailored quality improvement initiatives will help close this quality gap.

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29 **REthinking Clinical Trials (REACT) in Ontario: Evaluating the Feasibility of using an Integrated Consent Model to Compare Standard of Care Treatments**

Presented by **Mark Clemons** Ottawa Hospital Research Institute

For a number of diverse reasons, accrual to cancer clinical trials in Ontario is now less than 4%. The REthinking Clinical Trials (REACT) program was established for comparing standard of care treatments using a pragmatic trials model that integrates oral consent processes with electronic data capture. Taxotere-cyclophosphamide (TC) chemotherapy for breast cancer is given with primary febrile neutropenia (FN) prophylaxis (ciprofloxacin or G-CSF). Despite significant differences in cost, root of administration and toxicity no prospective trial has compared ciprofloxacin with G-CSF. Patients receiving TC chemotherapy are informed about the study using an oral consent script and randomized to ciprofloxacin or G-CSF using an on-line program in the clinic. Outcome data is captured electronically. Primary outcome: feasibility of REACT approach using a composite of: time to open study, patient accrual, treatment compliance and patient satisfaction. Secondary outcomes: FN and hospitalization rates. The study underwent 2 full REB submissions, resulting in changes to: protocol (12%), consent script (67%) and administrative concerns (21%). For Versions 1, 2, 3 and 4 of the consent script, the REB has requested: 17, 6, 13 and 2 text changes, respectively. REB approval took 3 months. Between September 2014-February 2015, of 52 patients receiving TC, attended by 8 medical oncologists, 38 (73%) patients have been approached for the study and 32/38 (84%) agreed to randomization. Median age: 61 years (range 42-84). Physicians/patient adherence to treatment allocation is excellent. Collection of FN, hospital admissions and C.difficle rates is ongoing. End of study survey shows patients have been "completely satisfied" with the REACT process. With continued falling accrual, new models for clinical trials are urgently needed. As with most trials, REB changes reflect content more than concept. Patients and physicians are satisfied with the new model and accrual is good. With wider implementation the REACT paradigm could significantly benefit both patients and society.

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30 **Advancing evidence-based dietary assessment in Canada to enhance cancer prevention and survivorship research**

Presented by **Sharon Kirkpatrick** Assistant Professor, University of Waterloo

High-quality assessment of dietary intake is fundamental to research to identify strategies for reducing the nutrition-related burden of cancer. The objective of this initiative is to improve the translation and application of evidence on dietary assessment to enhance the elucidation of the role of diet in cancer etiology and survival. This work was undertaken by the Partnership for Advancing Nutritional and Dietary Assessment in Canada (PANDA-C), a recently created network of nutrition researchers with experience developing and evaluating dietary assessment instruments. To provide a foundation for action, a scoping review to characterize measures used to assess diet in Canadian research was conducted using Medline, PubMed, PsycINFO and CINAHL. The review will be complemented by an environmental scan. These efforts will inform a broader initiative to engage a range of stakeholders in identifying barriers to uptake of the existing evidence on dietary assessment in research relevant to cancer prevention and survivorship. The scoping review elicited 2358 articles published between August 2009 and August 2014 based on search terms designed to capture Canadian research and the two main concepts of diet/nutrition and assessment/measurement. After screening the articles to identify those that included the assessment of dietary intake among free-living Canadian populations, 660 were identified for further evaluation. A closer examination of 200 articles that reported on dietary intakes among adults suggests large variation in tools used to assess diet, including both detailed short-term methods such as 24-hour recalls and longer-term approaches such as food frequency questionnaires. Tools utilized include those developed and/or adapted for Canada and those developed elsewhere (e.g. United States). Although some articles report on validity of tools, many do not. The findings of the scoping review will inform an agenda for action to support high quality dietary assessment in Canadian cancer research through knowledge translation and capacity building. Ultimately, our results will facilitate the identification and evaluation of promising dietary strategies for cancer prevention and survival.

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31 **Synoptic Radiology Reporting as a tool for knowledge translation and exchange - development to implementation**

Presented by **Priyanka Jain** Project Coordinator, Cancer Care Ontario

To improve the quality of reporting and enhance communication between radiologists and referring physicians, the Cancer Imaging Program at Cancer Care Ontario has a goal of provincial-wide synoptic radiology reports. A multi-disciplinary approach to development and implementation of these reports promotes knowledge exchange and spurs cultural transformation through early engagement. Synoptic reports produced by CCO are developed within a multi-disciplinary working group. The CT Lung for Cancer Staging Template was developed by radiologists, surgeons, pathologists, and oncologists. The working group met both in person and virtually to review the evidence to guide which items should be on the template and to ensure the report would provide the information required by referring physicians. After the template was developed by the working group, an internal and external review was conducted by radiologists, referring physicians, and patient/family advisors. The template was modified via group consensus. By including all stakeholders from the beginning, development of the report was a key knowledge exchange activity. For example, surgeons on the working group requested that certain lymph node information affecting patient management be included in the synoptic report. Having a multi-disciplinary group allowed for that knowledge to be readily communicated and implemented. Early engagement with stakeholders also promotes the use of synoptic reports as a knowledge exchange tool. It allows for the effective sharing of information between clinicians as the information is standardized and structured. Moreover, synoptic reports can also be a tool for translating knowledge to patients. By giving them reports that are easier to read and standardized across radiologists, it provides them with key clinical information to engage meaningfully with their physicians. Synoptic radiology reports are a key tool in knowledge exchange in both development and implementation. They are an effective tool for communicating key information between radiologists, referring physicians, and patients, ensuring that the right information is exchanged in a structured format to make timely clinical decisions.

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32 **Leveraging TRA data to assess potential asbestos exposure in Ontario**

Presented by **Sheila Kalenge** Research Associate, Cancer Care Ontario

The Ontario Toxics Reduction Act's goal is to reduce population exposures. It was modeled after the 1989 Massachusetts Toxic Use Reduction Act that successfully reduced industrial carcinogen use and creation. This study leverages existing TRA data to assess potential asbestos exposure. The Ontario TRA (2010) requires select manufacturing and mining companies that are already reporting emissions federally to additionally track, account, and report the use and creation of 360 substances. For this study, toxics use and release data were abstracted from the Ontario TRA database for the years 2010-2012. Trend analysis was restricted to asbestos. Supplementary data were abstracted from the toxics reduction plan summaries of the select facilities. GIS maps were generated to characterize the distribution of asbestos reporting facilities in Ontario. No facilities reported creation while 11 of 819 facilities reported using asbestos (n=3), having products containing asbestos (n=1) or storing asbestos off site in landfills (n=9). The amount of asbestos used ranged from < 1 to over 100 tonnes and that disposed ranged from1.4 -138 tonnes (average 50 tonnes). 75% of these facilities were in the Eerie St. Clair Local health integration network (south eastern Ontario). These facilities employ on average 1066 (range 14-5341) employees. Only 4 facilities proposed to identify options to manage asbestos or had existing programs for remediation. The number of facilities that reported dropped to 8 in the consequent years, and reported asbestos use and disposal in landfills decreased for 6 of the 8 facilities Asbestos is still being used in some manufacturing/mineral processing facilities. History has revealed that everywhere asbestos has been used; it leaves behind asbestos-related cancers. This study highlights the practicality of the TRA in tracking potential exposure to carcinogens and assessing progress

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PATIENTS & FAMILIES

33 **Differences in Patient Quality of Life for Leukemia Treatment Strategies**

Presented by **Emily McPherson** Health Economist, ARCC

Quality of life (QoL) is crucial to consider when taking treatment decisions with toxic side-effects, but QOL data for cancer patients is difficult to collect because the patients are so ill. We aim to determine the minimally clinically important difference (MCID) in QoL for patients with acute myeloid leukemia/myelodysplastic syndrome. Using data collected in a pan-Canadian QoL study for patients with acute myeloid leukemia/myelodysplastic syndrome we administered two QoL surveys: the EQ-5D and FACT-leukemia. Data on QoL were collected at baseline and again at three months. Responses to the EQ-5D were transformed into per patient utility scores using UK tariffs. Analysis focuses on patients who had complete QOL data at baseline as well after three months of starting treatment. We will use both anchor-based and distribution-based approaches to assess the MCID for the entire cohort and for three treatment strategies – consolidation chemotherapy, stem cell transplant (SCT) or palliation. By the time of the conference we will have analyzed data for 10 chemotherapy, 10 SCT and 10 palliation patients to produce estimated MCID ranges for EQ-5D and FACT. As therapeutic delivery methods improve, e.g., offering chemotherapy in the outpatient setting, improvements in patient QoL are predicted to follow. MCID can help target our investment by going beyond statistical significance to determine the level of change in QoL that will be meaningful to patients.

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34 **Preferences of cancer patients on method of collecting patient reported outcomes using the Edmonton Symptom Assessment System (ESAS)-Distress Assessment Response Tool (DART)**

Presented by **Wyanne Law** Medical Student, Princess Margaret Cancer Centre

Capturing patient reported outcomes (PRO) in cancer clinical care can streamline appointments, allowing patients to take ownership of their care. We determined the preferred methods and circumstances for patients to complete a PRO questionnaire, the Edmonton Symptom Assessment System-Distress Assessment Response Tool (ESAS-DART), in a large Canadian cancer centre. 467 adult cancer patients across diverse disease sites were surveyed using paper or electronic questionnaires before follow-up for cancer management. DART, a clinically used PRO tool expanded from ESAS at Princess Margaret Cancer Center, screens for symptoms experienced by patients. We determined proportions of patients who preferred to complete DART via an app on their electronic devices and those who found it helpful if primary caregivers assisted or provided input. Using univariate and multivariate logistic regression models, we evaluated association of sociodemographic and clinicopathological covariates with patient survey administration preferences. We used Cohen's kappa coefficient to check correlation between outcomes. Median (SD) age of cancer patients surveyed was 58 (15.4) years; 24% had breast cancer, 17% gastrointestinal, 11% genito-urinary cancer, 6% lung cancer, 14% hematological cancer, and 28% had other types of cancers. 47% preferred not to complete DART electronically prior to their appointment. Univariate analyses found such patients were more likely older (OR=1.9, 95% CI=1.2-3.1, $p<0.01$). 42% did not find caregiver assistance useful, and these patients tended to be Caucasian (vs others; OR= 3.1, 95% CI=1.7-5.6, $p<0.001$) and mainly spoke English at home (vs other languages; OR= 4.5, 95% CI=1.2-17, $p<0.03$). Multivariate analyses showed that ethnicity ($p<0.02$) and language ($p<0.05$) were independent predictors of preference for caregiver support. There was marginal agreement between preference of survey administration method and caregiver involvement ($\kappa=0.25$, CI=0.13-0.36). Almost half, particularly older patients, did not prefer to complete DART electronically. A significant minority, mainly Caucasian and those who conversed in English at home, did not find caregiver assistance to be helpful. Knowledge translation strategies for implementing widespread use of PROs for health outcomes analyses should consider these issues.

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35 **Advanced basal cell carcinoma (aBCC) patients' health value from physicians' perspective**

Presented by **Pooyeh Graili** Health Economist, SMH

To know Patients' value is crucial for the health system to maximize patient satisfaction and efficient allocation of scarce resources. Considering the prevalence of basal cell carcinoma, aBCC patients' health value is decisive. The objective is to identify the health value of patients with aBCC based on physicians' experience. A qualitative research was conducted through an in depth semi-structured interview. Key influenced physicians (KIP) of dermatology, oncology and plastic surgery fields were included to be interviewed because the majority of aBCC patients were referred to one of these specialists. Snowball sampling technique was one of the methods employed in this study. The other technique was the inclusion of recommended interviewees, preferably recommended by more than one colleague. The combination of these two techniques could increase the probability of recruiting the right KIP. Manifest content analysis was used to analyze the transcribed data of each group of specialists separately. Two themes emerged during the analysis of interviews within each group of KIPs. Health Related Quality Of Life (HRQOL) and the Quality Of Life (QOL) of patients were the themes. Similar categories were identified through the analysis of the data within each group. Those included Physiological, psychological and economic impacts. Some differences were addressed within the classified sub-categories. More importantly there were some similarities included confidence, cosmetic, local/systemic symptoms and cost/time were identified within each group. These subcategories were found based on the codes obtained from the transcriptions of the interviews within each group of KIPs. Cosmetic concern, confidence, cost/time and local/systemic symptoms endorsed by all groups of KIPs should be considered among the outcomes of aBCC treatment in the effectiveness studies, cost-effectiveness studies and the future HRQOL measurement tools. These outcomes should be validated through a quantitative research prior to using in the clinical trials.

36 **A Systematic Review of Interventions to Improve Sexual Dysfunction in Cancer Patients and Survivors**

Presented by **Jacqueline Liberty** Research Associate, Cancer Care Ontario

To date, there is little guidance available for healthcare providers on how to address sexual dysfunction in cancer patients. As such the frequency and duration of sexual dysfunction remains high in this population. The purpose of this study is to identify effective interventions for addressing sexual dysfunction in cancer patients and survivors to help guide the development of clinical practice guidelines. We conducted a systematic review of intervention studies using Ovid Medline, Embase, CINAHL, PsychINFO and Cochrane Database. Articles were included if they evaluated an intervention designed to improve the physical, emotional, or relational aspects of sexual function in cancer patients or survivors. Our search strategy identified 3361 references, of which 81 articles met the inclusion criteria for our review. These included five different types of interventions (i.e. pharmacological, psychosocial, physical therapy, therapeutic devices, and combination treatments) across four disease sites (i.e. breast, gynecological, prostate, and colorectal). Key findings will be presented with an emphasis on effective and promising interventions that may be used to address specific symptoms related to sexual dysfunction. Although interventions exist to address sexual dysfunction in cancer patients, the breadth and quality of evidence is still lacking in some areas. Findings of this review may be used to guide and enhance supportive care services for cancer patients.

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37 **What does satisfaction with wait times mean to cancer patients?**

Presented by **Dana Ryan** Memorial University of Newfoundland

In our surveys of cancer patients, we found inconsistent correlations between length of wait time and level of satisfaction. If not the length of time itself, what explains patients' satisfaction with wait times for cancer care? We conducted qualitative interviews with 60 breast, prostate, lung or colorectal cancer patients to explore the reasons behind patients' satisfaction or dissatisfaction with their wait time experiences. From our larger survey sample, we purposefully recruited patients that were classified as either satisfied or unsatisfied, based on their survey responses. We asked patients about their wait time experiences and the reasons behind their (dis)satisfaction. Interview transcripts were coded using a thematic approach. A patient's satisfaction or dissatisfaction with wait times for cancer care related to their experiences with: physicians' responsiveness to symptoms, quality of information provided by physicians, timely ordering of tests and relaying of test results, assistance navigating the health system, communication between providers, coordination in scheduling appointments, expressions/demonstrations of empathy and concern, and a shared sense of urgency between patient and providers. Providers' willingness to "troubleshoot" and acknowledge errors/delays were particularly influential in a patient's overall perception of their wait times. While patients' wait-related satisfaction was generally based on multiple interactions with different providers, positive or negative experiences with a single provider, often (but not always) the family physician, had a substantial impact on their overall satisfaction or dissatisfaction with wait time experiences.

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38 **Preferential access to cancer care? Patient experiences of efforts to reduce wait times**

Presented by **Dana Ryan** Memorial University of Newfoundland

Preferential access was the focus of a recent public inquiry in Alberta. However, there are few studies that document how patients, their families, or their caregivers attempt to influence wait times. We use qualitative interviews to examine the experiences of cancer patients in Newfoundland and Labrador. We conducted qualitative interviews with 60 breast, prostate, lung or colorectal cancer patients to explore efforts (by the patients or their proxies) to improve the timeliness of care. We examined the period from the onset of symptoms to the start of treatment at the cancer clinic. Interview transcripts were coded using a thematic approach. The interviews were conducted as part of a larger study examining patients' wait times and wait-related satisfaction for cancer care. Efforts by patients to reduce waits included insisting on having tests to investigate symptoms, following up on test results, and arranging appointments themselves. Efforts by family and friends included advocating for the patient or coordinating care, particularly if they felt that the patient was not getting timely or well-coordinated care. Efforts by members of the health care team included writing letters to advocate for priority services or expedited appointments, obtaining additional information to assist in treatment choices, and ordering tests in advance. In all instances, study participants believed that these actions resulted in more timely care. Patients believed that the "insider knowledge" of health professionals (whether friends, family members or members of the care team) was particularly valuable to them in reducing delays. Efforts to reduce wait times were commonplace, but not as insidious as the term "preferential access" suggests. Rather than queue jumping per se, patients described efforts to ensure needed care was well-coordinated and provided with minimal avoidable delays.

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39 **Information and its impact on co-survivors of cancer patients**

Presented by **Violet D'Souza** Post Doctoral fellow, University of Montreal

To investigate and compare levels of anxiety, depression, satisfaction with information provision and cancer-related knowledge in partners of patients with HNC receiving a Multimode Comprehensive Tailored Information Package (MCTIP) and partners of patients with HNC receiving ad hoc information provision. A non-randomized, controlled trial was conducted with partners of HNC patients. Participants were partners of HNC patients recruited at two academic hospitals in Montreal. The test-participants received the MCTIP, while the control-participants received normal information provision. All participants were evaluated using the Hospital Anxiety and Depression Scale (HADS), Satisfaction with Cancer Information Profile (SCIP) and a cancer knowledge questionnaire at baseline, and three and six months later. Data were analyzed using descriptive statistics to describe the general characteristics of the sample, T test and chi square test to compare group differences, and mixed model analysis to test the impact of the intervention. A total of 31 partners of HNC patients participated in this study and completed all the evaluations. The partners in the test group experienced significantly lower levels of anxiety ($p = 0.001$) and depression ($p= 0.003$) and were more satisfied ($p=0.002$) with cancer information than partners in the control group. Providing tailored information seems to have positive outcomes regarding anxiety, depression, and satisfaction in partners of HNC patients.

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40 **Is more homecare nursing associated with fewer hospitalizations at the end of life?: A multi-provincial cancer cohort study**

Presented by **Erin O'Leary** Research Coordinator, McMaster University

Home is an important setting to deliver palliative cancer care. However, little research has described the effectiveness of home nursing services to reduce hospitalizations. We conducted a retrospective cohort study of end-of-life cancer decedents in Ontario (ON), Nova Scotia (NS) and British Columbia (BC) between 2004 and 2009. Each province linked administrative databases to examine the association between homecare nursing rate on hospitalization rate in the subsequent week during the last six months of life, controlling for other covariates. We dichotomized homecare nursing into standard and palliative care intent. Our cohort included 83,827 cancer decedents. Approximately 55% of decedents were older than 70 and the most common disease site was lung cancer. Nearly 85% of the cohort had at least one hospital admission in the last six months of life. Receiving palliative compared to standard homecare nursing significantly reduced a patient's hospitalization rate by 34%, 33% and 17% in ON, BC, and NS. In the last month of life, patients having a standard nursing rate of greater than five hours compared to one hour per week had a significantly lower hospitalization (relative reduction of 15-23%) across the three provinces. Our study showed a protective effect of nursing with a palliative intent on hospitalization across the last six months of life and of standard nursing in the last month of life. That the trends were similar across three provinces strengthens the generalizability that providing homecare nursing reduces hospitalizations at end of life.

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41 **Sustainable Action for Improved Outcomes in Adolescents and Young Adults (AYA) with Cancer in Canada – The Canadian Task Force (TF) on AYA with Cancer: 2015 and Beyond**

Presented by **Sonja De Pauw** Coordinator, Task Force on Adolescent and Young Adult (AYA) Cancer

AYA with cancer are a population whose unique needs are not being met adequately in Canada. The goal of the TF is to facilitate enhancement of their care. This will require establishment of multidisciplinary clinical programs, appropriately trained healthcare professionals, a systems improvement approach, continuous engagement of stakeholders, and ongoing evaluation. The TF was established in 2008 with the support of the Canadian Partnership Against Cancer and C17 (the consortium of all Canadian pediatric oncology programs). AYA with cancer have unique needs related to their maturational stage and the biology of their cancer. Two stakeholder workshops resulted in specific recommendations for improving the care of AYA with cancer and a Framework for Action on their implementation. Current working groups are addressing active and follow-up care guidance, clinical trial accrual, screening for psychosocial distress, and secondary prevention. Six Regional Action Partnerships are addressing requisite changes at the provincial level to improve care. Six key components for sustainable and effective cancer control in AYA have been identified: improving active therapy; meeting psycho-social needs; enhancing palliative care; increasing surveillance of survivors; promoting research and associated metrics; stimulating awareness and advocacy. A new defined, accountable governance structure and function to succeed the TF must be created, as well as an effective pan-Canadian operational entity. Collaborative and purposeful action by all stakeholders must take place, and will be the focus of the third international workshop. A continuous system performance measurement, analysis, synthesis and planning capability will be required. Effective communication and awareness strategies will be needed. An integrated knowledge-to-action (KTA) framework will ensure formulation and evaluation of interventional policies and practices to improve care for AYA with cancer in Canada. The TF will continue to work with an alliance of stakeholders as it transitions to a new entity with a sustainable governance structure and function to continue improving care and outcomes for AYA with cancer and AYA survivors of cancer in childhood, adolescence and young adult life in Canada.

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SOCIETAL VALUES & PUBLIC ENGAGEMENT

42 **Cancer Drug Shortages: System Lessons from Recent Cases**

Presented by **Amanda Chan** Project Coordinator, Cancer Care Ontario

Drug supply issues (shortages) are a recurrent issue that can threaten good patient care. Usually unanticipated, shortages disrupt hospital workflow, generate administrative and financial burdens, and challenge standard clinical practices. This study evaluates the management of three cancer drug shortages in Ontario to identify opportunities to minimize patient impact and the overall disruption Three shortages were reviewed: (1) trastuzumab, where Canadian supply constraints led the need to import a foreign supply; (2) Bacillus Calmette-Guérin (BCG), where a world-wide shortage necessitated rationing and dose reduction; and (3) paclitaxel, where the revocation of a Canadian establishment license led to a dramatic price increase in the acquisition cost to hospitals. We examined each shortage from a health-system perspective, considering management by regulators, manufacturers, the provincial cancer agency, and hospitals/cancer centres. The different approaches were assessed for their perceived effectiveness in terms of patient impact and system cost. Factors that were found to contribute to successful approaches included early engagement with all parties, collaborative and transparent communication between stakeholders, early and sustained clinician engagement. There continues to be a large burden placed on front-line health providers resulting in significant workload effects. There is a need to develop a standardized approach that defines the accountabilities of all relevant players in the healthcare system. Policy options should also consider minimum standards for advanced notifications and formalized information dissemination strategies to affected parties in order to facilitate thoughtful and systematic planning.

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43 **Inequalities in access to treatment on the Cancer Drugs Fund in England**

Presented by **Charlotte Chamberlain** University of Bristol, School of Social and Community Medicine

The English Cancer Drugs Fund (CDF) aims to increase access to high-cost cancer drugs in order to improve cancer survival for all patients with advanced stage cancers. Our objective was to investigate whether access to the CDF was associated with Index of Multiple Deprivation(IMD), age, sex and NHS healthcare area(HA). The CDF funds high-cost cancer drugs which are not in routine use in the English National Health Service (NHS) because their cost-effectiveness has not been proven. Advanced (stage IV) cancer patients and haematological cancer patients who were potentially eligible for CDF drugs were identified through the South West England Cancer Registry (CR=reference population) and were compared with patients who had received drugs via the CDF. Proportions of patients in each IMD quintile, age group, sex and cancer network were compared using Chi-squared tests. Cox regression was used to analyse time-to-treatment adjusted for age, sex, cancer type and cancer network. 3,193 people received treatment on the CDF in 2011-2013 in the South West region of England (cancer population 27,917 (2012)). Haematological (808), colorectal (650) and prostate (529) cancers were most commonly treated. Older patients and women were under-represented in the CDF, compared with the reference population: colorectal cancer patients age ≥80 years (6.9% CDF, 30.1% CR, [difference=23.2% (95% CI 20.2%-26.2%)]; female melanoma patients (CDF 36%, CR 49%, [difference=11.9% (3.1%-20.7%)]. The most deprived quintile was over-represented in the CDF population for prostate cancer: 10.6% CDF, 6.7% CR, [difference=3.9% (0.7%-7.0%)]. Median time-to-treatment was 15.8 days with evidence of faster time-to-treatment for Dorset HA (HR 1.40 (95% CI 1.15-1.70, P=0.001, median 9.9 days). There appears to be inequality of access to the CDF by age, sex and deprivation for many cancers types. The age effect may be partially accounted for by greater comorbidities with increasing age. Higher proportions of deprived patients in the CDF may reflect later stage at diagnosis for deprived groups.

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44 **Awareness to Taking Action: How did a community raise awareness and take action on behalf of workers who have been exposed to asbestos**

Presented by **Desre Kramer** Staff scientist and Associate Director, Occupational Cancer Research Centre, Cancer Care Ontario

What motivates employers to take steps to reduce worker exposure to hazards? Although awareness of the health impacts of occupational exposures is necessary for change, it is not enough. This qualitative case-study explored the factors present in a community that helped initiate change within industry to reduce occupational exposures. The fulcrums of community change that led to reduced occupational asbestos exposure were investigated in Sarnia ON. 30 Sarnia community members including local politicians, labour and industry representatives were interviewed on what they thought was needed to make change at the community level following awareness of existing exposures. The study and analysis was guided by a 'Dimensions of community change' model. Supplementary data was abstracted from literature. Interviews were digitally recorded, transcribed, thematically analyzed, aggregated and anonymized. The findings from this study address whether the model dimensions are sufficient for any community to address reduced occupational exposures. The data analysis revealed that all the behavioral manifestations of community capacity cited in the change model were present in the Sarnia community: awareness backed by credible research, leadership, networked groups, resources, occupational and environmental legislative changes, shared values, beliefs and opinions, community perseverance, and a skilled leader supported by an institution. The study revealed that although the above factors were present in Sarnia, these findings are not necessarily generalizable for other communities. External environmental factors like globalization, automation, and economic climate were also identified as barriers towards this change. Sarnia progressed because of two proximal organizational "fulcrums of change". There was strong leadership supported by a central organization that brought together many community groups, and social organizational networks. The creation of a victim's group that epitomizes the social and personal cost and damage of occupational exposures was also pivotal

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45 **Social values in the assessment of health technologies for childhood cancer**

Presented by **Avram Denburg** MD, MSc, FRCPC, McMaster University/The Hospital for Sick Children

Current HTA models and processes do not account for the unique evidentiary and ethical dimensions of child health, compromising their application to child health technologies. This research maps the normative dimensions of child health and social policy to provide a foundation for critical empirical study of HTA in children. This research anticipates a larger mixed methods study on social values in the assessment of novel health technologies for childhood cancer. It comprises a structured literature review on the normative dimensions of health policy-making for children, with a view to development of synthetic constructs for testing in the subsequent qualitative and quantitative components of the project. The work surveys diverse literatures to map the ethical, socio-cultural and epistemic foundations of child health and social policy, in search of novel concepts, theories, and methods relevant to the understanding and adjudication of HTA for children. The literature review exposed a relative paucity of explicit analyses of the normative foundations of child health and social policy. A few key themes cut across diverse policy domains: risk and resilience, prevention and precaution, rule of rescue, vulnerability and protection, future potential and life-course perspectives. Reification of select synthetic constructs in an exploratory, mixed methods study will examine the relevance and relative priority of values attached to these themes among diverse stakeholders involved in or impacted by HTA for childhood cancer technologies. Inquiry into the social values that inform child health and social policy-making exposes unique normative and evidentiary considerations that justify the consideration of distinct HTA processes and metrics for children. Further empirical research on the nature and role of social values in the assessment of child health technologies is warranted.

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46 **Attitude to health risk in the Canadian Population**

Presented by **Nick Bansback** Assistant Professor, University of British Columbia

Risk is a ubiquitous part of health care. Understanding how people respond to risks is important for predicting how populations make health decisions. The objective of this work was to provide preliminary descriptive insights into the attitude to health risk in the Canadian population and factors associated with heterogeneity in risk-attitude. A large market research panel was used to survey (in English and French) a representative sample of the Canadian general population, reflecting the age, gender and geography of the country. The survey included the Health-Risk Attitude Scale, which predicts how a person resolves risky health decisions related to treatment, prevention of disease, and health related behaviour. In addition, participants numeracy and risk understanding was assessed along with income band and level of education. Responses were summarised and the independent associations between demographics, numeracy, risk understanding and risk attitude were explored in multivariable models. 6781 respondents provided answers to the survey. As expected, people tended to be risk averse but there was considerable heterogeneity. There appeared to be a geographical difference in risk, with those in the East of Canada reporting a more risk-seeking attitude than those in the West. The multivariable model found significant gradients of a risk-averse attitude with increasing age and preference for/ability to use numerical information ($p<0.001$). Francophones appeared to be more risk-averse than English speaking respondents ($p<0.001$), and males appeared to be more risk-seeking than females ($p<0.001$) Overall Canadians appear to be slightly averse to health risks, but a sizeable, identifiable, group of risk takers exist. In the context of the demand for patient-centred care, a greater appreciation of the heterogeneity in preferences for risk is important for policy-decision making, and helps target certain health interventions to different patient groups.

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47 **Identifying a "representative public": recruiting for demographic and values diversity for a public engagement event on priority setting and cancer drug funding in Vancouver, BC**

Presented by **Dean Regier** Senior Health Economist, ARCC-BCCA

Decision-makers want to include public values in priority-setting decisions, yet identifying a "representative public" remains a persistent challenge. Current public engagement recruitment methods use demographic diversity to proxy experiential diversity. Our objective was to develop a novel recruitment strategy to recruit a representative public based on values and experiential diversity. A research firm recruited 80 individuals representative of the BC public, stratified by age, sex, geography, ethnicity, chronic disease experience, parenthood, income and education. Subjects completed a preference-based discrete-choice experiment to evaluate their utility values for health states after disease diagnosis. Latent class analysis of the preference data was employed to account for health state preference heterogeneity using the concept of "class membership". A recruitment algorithm was developed to identify a "mini public" of 30 subjects (from N=80). The algorithm was constructed such that the identified subjects were representative of values diversity (via class membership) and experiential diversity (via demographics). 80 subjects completed all 16 tasks included in the discrete-choice experiment questionnaire. The latent class statistical analysis determined that 4 "classes" of membership were necessary to characterize preference heterogeneity. In each class, utility values for the attributes describing various health states had a statistically significant effect on respondents' preferences. A Chi-squared test demonstrated that there were no statistically significant differences between the invited mini public (n=30) and population sample (n=80). Of the 30 subjects invited to the public engagement event, 24 attended the two weekend event in Vancouver, BC. Chi-squared analysis determined no statistical difference between the "actual" mini public and the BC general public. Current public engagement recruitment methods use demographic diversity to proxy for experiential diversity. However, demographic characteristics are unreliable indicators of value. We applied the discrete-choice experiment method and developed a recruitment algorithm to recruit a mini-public. We conclude that event participants constituted a "representative public" of the BC population.

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48 **A Process to Identify Research Priorities in a Multisector Group**

Presented by **Michelle Reid** Cancer Prevention Centre, UBC

In this study, a diverse set of stakeholders identified priorities for worksite wellness research. A structured group problem solving methodology was used to identify and rank research ideas. Participants were attendees at a worksite wellness workshop. They were asked: What are the highest priority research questions regarding worksite wellness: i.e., what questions need to be answered to make worksite wellness programs more widely implemented? The nominal group process provided data to answer this question. This technique uses a structured multistep process: (1) individual silent generation of ideas, (2) round robin presentation of all responses without critical commentary or feedback, (3) group discussion to clarify ideas and combine similar ideas, and (4) voting and ranking. The discussion was recorded and transcribed to retain details about the ideas generated. 37 people participated in the priority setting exercise. They came from government, health care, private industry, non-governmental organizations and academia. 40 distinct research questions emerged initially. Discussion generated two themes: program characteristics (specifically, attrition and sustainability, measurements and indicators, targeted programs for specific populations, new technologies, and built environment); and organizational issues (specifically, meeting needs of the workforce, creating a culture of wellness, and building leadership for program support). Individuals selected their top priority using an anonymous electronic voting system. Measurement was the highest program research priority, endorsed by 38% of respondents: e.g., what are core measures of effectiveness? Workforce needs was the highest organizational research priority, endorsed by 47%: e.g., what do workers need and what do they want? The nominal group process proved to be an effective way of identifying research priorities in a diverse group where many individuals did not know one another. Advantages of this approach include considering all opinions, allowing each person an equal and private vote, and identifying priorities quickly.

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49 **Inequality by Race/Ethnicity in Survival Improvement of Children with Acute Lymphoblastic Leukemia in the United States and Canada**

Presented by **Linwei Wang** Master Student, University of Alberta, School of Public Health

Childhood acute lymphoblastic leukemia (ALL) survival improved dramatically from 5-year survival of 15% in 1960s to over 80% in late 1990s; whether the ongoing improvement has nullified inequalities in ALL survival between children of different race/ethnicity groups and whether there is inequality between US and Canadian children is unknown. Children aged 0-19 years with a first primary malignant ALL diagnosed in 1975-2010 in one of nine original cancer registries in the Surveillance, Epidemiology and End Results program (SEER) were included. Race/ethnicity was classified as non-Hispanic White, non-Hispanic Black, Hispanic, Asian/Pacific Islander (API), and American Indian/Alaska Native (AIAN). Age was categorized as <1, 1-9 and 10-19 years. Kaplan-Meier methods were used to estimate overall 5-year survival. Multivariable Cox regression analyses were applied to estimate hazard ratios (HRs) and their 95% confidence intervals (CI) by prognosis groups and diagnostic periods. Canadian survival statistics were obtained from the Canadian Cancer Registry's publications. Survival improved in each race/ethnicity over past 3.5 decades with different magnitudes, resulting in change of inequalities patterns. Compared to White children, adjusting for age and sex, the ALL-related-mortality hazard ratio (HR) in Black children dropped to 1.21 (95% CI, 0.74-1.96) in 2000-2010 from the largest inequality in 1984-1991 (HR=2.09, 95% CI, 1.57-2.79). In Hispanic children, the HR increased from 1.28 (95% CI, 0.98-1.66) in 1975-1983 to 1.95 (95% CI, 1.48, 2.58) in 2000-2010. API and AIAN children had HRs of 1.39 (95% CI, 0.92-2.11) and 2.31 (95% CI, 1.13-4.74), respectively, in 2000-2010, which did not change as greatly. Canadian children had five-year survival of 84% in 1994-1998 and 91% in 2004-2008, comparing to US-SEER White children of the same period (87% and 93%, respectively). Survival inequalities in children of different race/ethnicity remain appreciable in the US. While survival improvement over a decade between 1990s and 2000s appears similar between US White and Canadian children, the absolute 5-year survival remains slightly lower in Canadian children. Proper interventions need to be developed to reduce the inequalities.

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NOTES

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