

Editorial

End-of-Life Care: the Role for Health Technology Assessment

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Our healthcare system is under stress — an aging population, patients living longer with chronic illness, and an increasing demand for services at the end of life contribute to escalating costs and utilization patterns.

In a recent national survey, more than 80% of respondents were concerned that the quality of health care will decline as a result of increased strain on our system as our population gets older. In Canada, the number of seniors 65 years and older is projected to

increase from 4.2 million to 9.8 million between 2005 and 2036. The majority of the 259,000 that die every year are seniors and in the next 25 years, this number will double to 425,000.

Healthcare is expensive. Canada now spends approximately 12% of its gross domestic product on healthcare. This is increasing, but is still less than the United States, at 17%.

There is an increase in health spending by age, with more than 40% of total health care spending accounted for by those 65 and older in Canada, yet this age group accounts for less than 20% of the total Canadian population. Past work has estimated that approximately 20% of all spending occurs during the last year of life in Canada. A recent report on cost drivers highlights that

increased spending is not merely due to age-based demographic changes but can largely be explained by increased use technological innovation. The US experience also teaches us that high resource use and high spending does not always lead to better outcomes or markers of population health.

Hospitals remain the provider of end-of-life care for 70% of Canadians and 1 in 5 hospitalized deaths are associated with high intensity of investigation and treatment in an intensive care unit (ICU). The provision of care at the end of life, often including aggressive technology-assisted monitoring and treatment in ICUs, is among the most expensive, consuming up to 1% of the GDP (or, 5-10% of the healthcare

See “End-of-life...” on next page

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2013 SYMPOSIUM
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Dr. Murray Krahn reflects on new and renewed funding and THETA's growing team

End-of-life: care is costly yet it often doesn't address patients' goals

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budget). Although the proportion of spending at end of life has remained somewhat constant, overall costs and resource use continue to rise.

The elderly tell us however that intensive hospital and ICU-based end-of-life care is not always what they desire. In a study of hospitalized elderly patients, 70% reported that their baseline quality of life was fair or poor and most wanted comfort measures as opposed to life-prolonging treatments; yet, 54% of these patients were admitted to ICUs at the end of life. In another study, at least half of seriously ill patients reported pain and many died after unwanted prolongation of their dying process in an ICU.

The health care system generally, and physicians specifically, often react to illness by prescribing a medication or ordering a CT scan, even when such actions likely have no near-term chance of benefit to patients. With universal concerns about sustainability of health care funding, we must critically examine our use expensive technology, especially so at the end of life. However, our default end-of-life care delivery focuses on intensive inpatient admissions. This care does not meet the goals of our elderly

patients, is expensive, and is a likely indicator of poor quality of care. Patients and health care providers require more information regarding the expected quality of care at the end of life and we urgently require research to understand and compare end-of-life care in the Canadian context.

On May 30 2013, THETA's 6th Annual Symposium at Casa Loma focused upon End-of-Life Care, and invited academic and clinical experts from across Canada, the US, and the UK, policy makers, the Ontario Medical Association, Health Quality Ontario, the Ontario Health Technology Advisory Committee (OHTAC) among others.

The symposium attracted a full house of attendees and speakers with an aim to stimulate dialogue, debate and action. Sessions focused upon costs of care and resource use in Canada at end of life - direct, indirect and out-of-pocket costs, cancer care spending, and comparisons with international jurisdictions.

Speakers addressed challenges underlying advance care planning in the US and Canada. Baroness Ilora Finlay, a pioneering palliative care physician and member of the UK House

of Lords took the audience through the UK system of palliative and end-of-life care, leaving the audience energized and ready to change our own system.

A number of emerging projects, from "Quality Dying Initiatives", to "How Do We Know When to Stop?", to "Gender Differences in End-of-Life Care" and "Research Conundrums in Canada and the UK" stimulated both discussion and debate. The day finished examining legal challenges due to discord between health care professionals and patients or families at the end of life; and, a healthcare reporter discussed how we can engage the public in an agenda to improve end-of-life care.

Stemming and following from this day, Health Quality Ontario has convened an Expert Panel on End-of-Life Care. As well, the president of the Ontario Medical Association announced that End-of-Life Care would be an OMA quality improvement focus for 2013-2014. Such THETA-sparked and supported initiatives have therefore quickly led to more formal health technology assessment of the end of life care and will help to shape our approach to quality improvement over the coming years.

Message from the Director

Reflections about where we've been and where we're going

THETA started in August 2007, so we're now just over 6 years old, as an organization. Over the past 5 successful years, THETA has completed quite a few modeling studies and trials. Some of these have had a big impact, such as the TURN study, completed last year, which should result in about \$100-\$150m of annual savings in Ontario. However, over these years, THETA has experienced some significant staff turnover, and was recently denied a Large Scale Genome Canada award, despite making it to the final selection round.

On the brighter side, several new amazing people have joined our team. Val Rac MD PhD, who is our new Director of the Clinical Research Division and Associate Program Director, brings a lot of energy, proven research ability, and rigor to our program. Petros Pechlivanoglou PhD, a Health Economist, brings plenty of specific quantitative skills and useful experience, as well as a very positive spirit to our shop. Fiona Miller PhD, an Associate Professor at IHPME, is leading our new Health Policy and Ethics Division. Fiona is playing a much larger role in helping to lead THETA in new directions. Finally, Beate Sander has really helped out by leading our very successful THETA Rounds. THETA has also gotten started on some very cool projects through the MaRS-EXCITE collaborative.

In addition, THETA received a \$3m CFI grant, and will be using this to build capacity in trials and registries, as well as supporting new space. THETA's new home will likely be at the Toronto General Hospital, with renovations

expected to be completed sometime in Q3, 2014. And, of course, THETA was recently renewed by HQO, for which we are extremely thankful. This funding will be for five years (three years, with a two-year extension after review).

In the next few years, THETA has some things to do, such as:

- i. Develop and expand our focus on early Health Technology Assessment;
- ii. Increase our support through additional peer-reviewed funding;
- iii. Develop a university-wide collaborative program in HTA. Jeff Hoch has led a fabulous initiative at IHPME to build an HTA training program. Now we need to bring in the rest of the University; and
- iv. Convene a steering group of THETA investigators to provide overall strategic direction.

I hope to be talking to some of you about these initiatives over the next year!

Sincerely,
Murray Krahn, MD MSc FRCPC





New Projects

Clinical and Cost-Effectiveness of MedsCheck in Ontario Seniors

A mixed-methods study

PI: Krahn M. Collaborators: Rac V, Pechlivanoglou P, Abrahamyan L, Grootendorst P, Mitsakakis N, Bowen J, Priest S, Mahdi M, van Boven J.

Over the recent years the roles and the scope of practice of community pharmacists have been expanding in Canada towards providing more patient-centered care. In April 2007, Ontario launched the MedsCheck Annual review program – a medication review led by community pharmacists for patients taking at least three prescription medications for a chronic condition. In May 2013, the Blueprint for Pharmacy, a collaborative initiative led by the Canadian Pharmacists Association, granted THETA funding for the “Clinical and Cost-effectiveness of MedsCheck in Ontario seniors: A Mixed Methods Study” project.

Over the next two years, this study will apply both qualitative and quantitative research methods to evaluate the factors that affect the likelihood of receiving a pharmacist-led medication review, the effectiveness and cost-effectiveness of the program as well as pharmacist and patient behaviours, experiences and interactions. This study is one of the first attempts, in Canada and in the world, to estimate the clinical and cost-effectiveness of community based pharmacist medication reviews using a large, population-based cohort study design.

Study of Tumor RNA Disruption Assay™ (RDA) as a Predictive Tool for Response to Neoadjuvant Chemotherapy in Breast Cancer

A Prospective Mixed-Methods Study

Murray Krahn, Maureen E. Trudeau, Valeria E. Rac, Nicholas Mitsakakis, Petros Pechlivanoglou, Lusine Abrahamyan, Ba’ Pham, Steven Carcone, Josephine Wong

This is a new MOH-EXCITE project. The objective is to evaluate the association between tumor RNA Disruption Assay™ score measured 7-14 days after the first, second and third cycles of chemotherapy and pathological complete response at lumpectomy or mastectomy in breast cancer patients receiving neoadjuvant chemotherapy; and whether this association is strong enough to permit early prediction of non-responders to chemotherapy. It is a two-year study involving five cancer centres in Ontario.

Home Sleep Study for the Diagnosis of Obstructive Sleep Apnea

A Pragmatic Randomized Controlled Trial

Valeria Rac, Merrick Zwarenstein, Lusine Abrahamyan, Tetyana Kendzerska, David Chartash, Petros Pechlivanoglou, Ba’ Pham, Nicholas Mitsakakis, Steven Carcone, Suzanne Chung, Murray Krahn

This study will assess the clinical and cost-effectiveness of management of obstructive sleep apnea (OSA) after diagnosis based on a home sleep study compared to management of OSA after diagnosis based on in-laboratory sleep study with polysomnography. The study

will include approximately 300 Ontario residents referred to sleep clinics with symptoms suggestive of OSA.

The protocol has recently been finalized and we are now in the process of REB submission and finalizing our case report form and data management processes.



Project Updates

Pressure Ulcer Multi-disciplinary Teams via Telemedicine (PUMTT)

A Cluster Pragmatic Randomised Controlled Trial in Long-term Care

Murray Krahn, Valeria E. Rac, Nicholas Mitsakakis, Mike Paulden, Ba’ Pham, Ann-Sylvia Brooker, Steven Carcone, Josephine Wong

The PUMTT KT Seminar for result dissemination and knowledge translation was held on October 7th, 2013 at the Terence Donnelly Centre. Our healthcare partners in the twelve long term care facilities and our funders were in attendance. Autumn is harvest time. It is the best season to share the fruits of our research with our collaborators and to show our sincere appreciation for their contributions to this important study. During the event, THETA explored research questions from the perspective of our long term care partners and fostered opportunities for future academic-community collaboration to improve long-term care service.

Continued on next page



Wound Interdisciplinary Teams (WIT)

A Community-Based Pragmatic Randomised Controlled Trial

Research Team: Murray Krahn, Valeria Rac, Kevin Woo, Shabbir Alibhai, Eva Haratsidis, Paul Grootendorst, Nicholas Mitsakakis, Mike Paulden, Ba Pham, David Urbach, Walter Wodchis, Merrick Zwarenstein, Josephine Wong

Data collection has completed. Analyses of the quantitative, qualitative and economic data are now in progress. A research steering committee meeting was held on September 3rd to discuss all issues with data analyses.

We would like to take this opportunity to express our gratitude to all our community partners: Toronto Central CCAC managers and case managers, nursing agency managers and nurses and Calea Clinic managers and nurses, who have given us staunch support during recruitment and data collection. Special thanks have to be given to all the nurses who tried hard to send in the digital wound photos every month. As a small token of our appreciation, a certificate will be sent out to every member of our community partners.

Ontario Stroke Unit Study

Research Team: Murray Krahn, Mark Bayley, Moira Kapral, Valeria Rac, Luciano Ieraci, Gabrielle van der Velde, Ruth Hall, Linda Kelloway, Iris Fan

The Ontario Stroke Unit (OSUN) Study has currently interviewed 23 of the 32 identified stroke units. We will be presenting at the Canadian Stroke Congress in Montreal on October 18 as a poster viewing and mini oral presentation. The poster title is: "Stroke Units in Ontario: The Ontario Stroke Unit (OSUN) Study Survey."

Development of an Economic Policy Model for Hepatitis C Drug Pipeline

Research Team: Murray Krahn, William W.L. Wong, Hong-Anh Tu, Wendong Chen, Jordan Feld, Kristen Chelak, Karen M Lee, Julie Blouin

The project is funded by the Canadian Agency for Drugs and Technologies in Health (CADTH). CADTH is an independent, not-for-profit agency that delivers timely, evidence-based information to health care leaders about the effectiveness and efficiency of health technologies. Most importantly, they are the agency that perform common drug review (CDR), CDR is a pan-Canadian process for conducting objective, rigorous reviews of the clinical, cost-effectiveness, and patient evidence for drugs. The result of the CDR also provides formulary listing recommendations to Canada's publicly funded drug plans. In 2011, treatment of chronic hepatitis C (CHC) has been revolutionized by the arrival of the first generation of direct-acting antiviral agents (DAA), boceprevir and telaprevir. Adding boceprevir or telaprevir to the standard care regimen of pegylated interferon and ribavirin significantly improves (sustained virologic response) (SVR), from approximately 45% to around 75% of patients at present, with genotype 1 infection. There are at least five additional DAA, which are currently under development, and expected to receive regulatory approval in the next few years. Several agents are currently finishing phase III trials, including simeprevir and sofosbuvir. Other oral agents such as BI 201335 and daclatasvir are expected to closely follow. The objective of this study is to build a flexible model platform that can evaluate the cost-effectiveness of CHC drugs and drug regimens that will be

brought forward to the Common Drug Review for evaluation in the next few years.

Cost-Effectiveness of Screening Hepatitis C in Canada

Research Team: Murray Krahn, William W.L. Wong, Hong-Anh Tu, Wendong Chen, Jordan Feld, Tom Wong, Ping Yan, Dana Paquette

The project is funded by the public health agency of Canada (PHAC), PHAC has been created to deliver on the Government of Canada's commitment to help protect the health and safety of all Canadians. Its activities focus on preventing chronic diseases, like cancer and heart disease, preventing injuries and responding to public health emergencies and infectious disease outbreaks. One of their mandates is to prevent and control infectious diseases, thus they are responsible to make Hepatitis C virus (HCV) screening statement. In the U.S.A, currently revised screening recommendations have already included persons who are born during 1945 – 1965. However, none of this statement has been made in Canada. Universal screening or screening for CHC among some high-risk groups in Canada seems to be a plausible strategy. However, the potential health effects, costs, and cost-effectiveness of implementing a universal or selective hepatitis C screening program remain unknown. The objective of this study is to build a model that can project the health and economic effects of various screening strategies for CHC conducted in different populations in Canada, and help the agency to make an interim statement on HCV screening.

... Gallery



On May 29-30, THETA hosted its sixth annual Symposium and its fourth annual Knowledge to Policy Day. Both events took place at Casa Loma in Toronto.

A special thank you to all of our speakers!

Presentations are available on THETA's website.



Research Grants and Awards

Transformation of Indigenous Primary Healthcare Delivery (FORGE AHEAD): Community-Driven Innovations and Strategic Scale-up Toolkits

CIHR Community-Based Primary Health Care Team Grant: \$2,500,000 (2013-2018)

PI: S. Harris. Co-investigators: D. Barre, O. Bhattacharyya, D. Dannenbaum, K. Dawson, R. Dyck, J. Episkenew, M. Green, A. Hanley, B. Lavallee, A. Macaulay, A. McComber, M. Parry, S. Reichert, J. Salsberg, A. Thind, S. Tobe, E. Toth, A. Walsh, J. Wortman, M. Zwarenstein, E. Baxter, L. Houle, T. Jacobs, K. Kandukur, R. Littlechild, I. McComb, H. McDonald, D. Montour, J. Morach, M. Nose, T. O'Keefe, D. Redmond, D. Spade, C. Tischer & S. Zeiler.

An RCT and economic analysis of three exercise delivery methods in men with prostate cancer on ADT

CIHR: \$781,091 (October 2013-September 2018)

Alibhai SMH, Culos-Reed SN, Krahn M, Lukka H, Matthew A, Ritvo P, Sabiston C, Santa Mina D, Segal R, Tomlinson G, Warde P.

Clinical and Cost-Effectiveness of MedsCheck in Ontario Seniors: A Mixed Methods Study

The Canadian Pharmacists Association, Operating Grant: \$236,628

PI: Krahn M. Collaborators: Rac V, Pechlivanoglou P, Abrahamyan L, Grootendorst P, Mitsakakis N, Bowen J, Priest S, Mahdi M, van Boven J.

A phase II RCT of strategies to reduce fractures and improve bone health in men on ADT

The Canadian Cancer Society Research Institute Innovation Grant: \$198,186 (August 2013 – July 2015)

Alibhai SMH, Jones J, Cheung AM, Tomlinson G, Warde P.

A phase II RCT and economic analysis of three exercise delivery methods in men with prostate cancer on ADT.

Prostate Cancer Canada Movember Discovery Grant: \$195,796 (July 2013 – June 2015)

Alibhai SMH, Culos-Reed SN, Krahn M, Matthew A, Ritvo P, Sabiston C, Santa Mina D, Segal R, Tomlinson G, Warde P.

A Multi-Centre, Pilot Randomized Controlled Trial to Examine the Effects of Prehabilitation on Functional Outcomes and Quality of Life after Radical Prostatectomy

Prostate Cancer Canada Movember Discovery Grant: \$176,068.75 (July 2013-June 2015)

PI: Matthew AG. Co-investigators: Santa Mina D, Clarke H, Alibhai SMH, Ritvo P, Finelli A, Wijeyesundera D, Tanguay S, Aprikian A, Gillis C, Trachtenberg J, Carli F.

RiseTx: A feasibility study examining the effectiveness of a mobile intervention for reducing sitting time in prostate cancer survivors

Prostate Cancer Canada Movember Discovery Grant: \$168,441 (July 2013-June 2015)

PI: Faulkner GE. Co-investigators: Sabiston C, Arbour-Nicitopoulos KP, Alibhai SMH, Jones

Active surveillance for low-risk prostate cancer: a population-level analysis of uptake, practice patterns and barriers to adoption.

Prostate Cancer Canada Movember Discovery Grant: \$138,213 (July 2013 – June 2015)

PI: Finelli A. Co-PIs: Alibhai SMH, Kulkarni G, Hamilton R, Klotz L, Fleshner NE.

An integrated multi-faceted knowledge translation intervention

to improve bone health in men receiving androgen deprivation therapy for prostate cancer

The Canadian Cancer Society Research Institute Knowledge to Action Grant: \$99,919 (August 2013 – July 2015)

PI: Jones J. Co-PIs: Alibhai SMH, Catton C, Catton P, Warde P.

What is the role of comorbidity, frailty and functional status in the decision-making process for older adults with cancer and their family members, cancer specialist, and family physician?

The Canadian Cancer Society Research Institute Innovation Grant: \$74,722 (August 2013 – July 2015)

PI: Puts M. Co-investigators: Alibhai SMH, Amir E, Fitch M, Howell D, Joshua A, Krzyzanowska A, Leighl N, Tourangeau A, Warde P.

Does the Speed of Sternal Retraction during Cardiac Surgery affect Postoperative Pain Outcomes: A Randomized Controlled Trial

Southeastern Ontario Medical Association (SEAMO) Innovation Fund: \$66,000 (2013-2015)

PIs: T. Saha, D. Petsikas. Co-Investigators: M. Parry, A. Hamilton, D. Payne, E. VanDenKerkhof & B. Milne.

An intervention to improve healthy bone behaviours in prostate cancer patients on androgen deprivation therapy.

Canadian Association of Radiation Oncology ACURA Uro-Oncologic Radiation Award: \$20,000 (October 2013-September 2014)

Tsang D, Alibhai SMH (supervisor), Jones J, Catton C.

In the Spotlight

THETA's summer students

Mengzhu Jiang

Mengzhu Jiang recently completed a summer studentship at THETA. She holds an MSc in Epidemiology from McGill University and is currently studying medicine at the University of Toronto. Her interest in health technology assessment stems from the desire to bridge research and policy in order shape the health care system to better meet the needs of communities. Her previous work includes the evaluation of health technologies from clinical and health service perspectives. At THETA, she undertook the economic analysis of the WIT study, a randomized pragmatic trial aimed at evaluating the effectiveness and cost-effectiveness of systematic referral and comprehensive primary care in wound healing compared to usual care.



at RESCU, Victoria served as Summer Student Representative for the Keenan Research Student Association and has since continued to volunteer there, managing research ethics board renewals for the PREDICT study. Victoria also was a Volunteer Supervisor at Mackenzie Health Hospital for several years.

This past summer, Victoria was involved with several studies at THETA, including RNADx for breast cancer, OSUN, and ApneaDx for obstructive sleep apnea. Specific tasks included, data collection and data cleaning, drafting consent forms, as well as assisting in the development of the new THETA website. In addition, Victoria continued work on the systematic review entitled, "Gender Differences in Access to Key Post Arrest Care Interventions for Out of Hospital Cardiac Arrest Patients" – a project which is now nearing completion.

Outside of the healthcare setting, Victoria is heavily involved in student government and focuses her efforts toward facilitating social change through various organizations in the University community. In addition, Victoria enjoys reading and continues to train as a Royal Conservatory pianist.

For the upcoming year, Victoria will be working with Dr. Michael Cusimano in the Department of Neurosurgery at St. Michael's Hospital, and looks forward to pursuing graduate school in the near future.

David Chartash



As part of his masters degree in clinical engineering at the University of Toronto, David was working on the early health technology

assessment economic analysis component for the MaRS Excellence in Clinical Innovation and Technology Evaluation program.

David currently is a doctoral fellow at the Regenstrief Institute, working towards a PhD in Health Informatics at the Indiana University School of Informatics and Computing.

His research interests include the information theory surrounding classification of clinical diagnostic performance and the use of health technology assessment to advance hospital operations and technology.

Victoria Sparrow-Downes



Victoria is currently an honours student at York University pursuing a double-major in Psychology (B.Sc.) and Women's Studies (B.A.)

at York University. Victoria initially got involved with research at RESCU, a research group affiliated with St. Michael's Hospital, working under the supervision of Dr. Valeria Rac. Her experience at RESCU was her first exposure to the collaborative nature of science, and helped spark her interest in gender-specific analyses and the development of a more gender-focused healthcare system. During her time



THETA Rounds

theta
Quarterly

Friday, November 8, 2013

Leslie Dan Pharmacy Building
Room 850, University of Toronto
Heather Taffet Gold, PhD

Adoption and cost effectiveness
of breast cancer radiotherapy
technologies: Quantitative and
qualitative evaluation

Friday, November 29, 2013

Stuart Hogarth, PhD

From Papanicolaou to Papilloma: the
corporatisation of cancer screening in-
novation

Friday, December 13, 2013

Ahmed Bayoumi, MD, MSc, FRCPC

Friday, January 17, 2014

Ester Moher, PhD

Friday, January 31, 2014

Ivar Kristiansen, PhD

Friday, February 14, 2014

Shannon Cope, MS

Friday, March 7, 2014

David Moher, PhD

Friday, March 21, 2014

Valeria Rac, MD, Ph

Friday, April 4, 201

Friday, April 25, 201

Friday, May 9, 2014

Louise Russell, PhD

Friday, May 21, 2014

Updates: www.theta.utoronto.ca

Welcome, Suzanne!

Suzanne Chung has recently joined THETA as a Research Associate. She completed her Bachelor's Degrees in Fine Art & Art History at Nova Scotia College of Arts and Design University and Education at University of Western Ontario. Her clinical research training includes, Good Clinical Practice Audits (GCP) and SoCRA "Certified Clinical Research Associate" (CCRA)

She has experience in large clinical trials involving pre-hospital and in-hospital research studies. She was a part of the Resuscitation Outcome Consortium (ROC) Toronto network within Rescu, a research program focusing on interventions that improve outcomes for patients who suffer life threatening trauma and cardiac emergencies in the out of hospital setting. She has also worked on multi-centre clinical research for patients with Atrial Fibrillation/Flutter in Emergency care in 10 Greater Toronto Area hospitals and recently, a quality assurance study for management of Atrial Fibrillation/Flutter in AF Clinics and General Cardiologists. Suzanne's expertise lies in study launch, REB, data management and team



collaboration. Her research interests are in the area of atrial fibrillation, atrial flutter, sleep apnea, sudden death, out of hospital cardiac arrest, clinical trials, field evaluation, data management, quality assurance and knowledge translation. An avid foodie, when not working she can be found sampling the latest food trend and posting on her Instagram.

THANK YOU FOR READING THETA QUARTERLY

We welcome your comments.

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