



CCORT PULSE

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CCORT Objectives

- Improve the quality of cardiovascular care in Canada
- Work with local, provincial and national partners on policy-relevant research projects & knowledge exchange
- Train future leaders of cardiovascular outcomes research in Canada
- Make a measurable impact on the cardiovascular health of Canadians through research that changes clinical practice, health policy & patient outcomes

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CCORT Publishes New Series of 3 Articles on National Trends in Cardiovascular Care in Canada

CCORT recently launched a new series on national trends in cardiovascular care in Canada. The first three articles from the series were published in the CMAJ beginning in June, 2009. All three papers were widely reported by national media including the Globe and Mail, Toronto Star, CBC, CTV and Global National News—an overview of each study follows below.

i. National Trends in the Rates of Death and Hospital Admissions

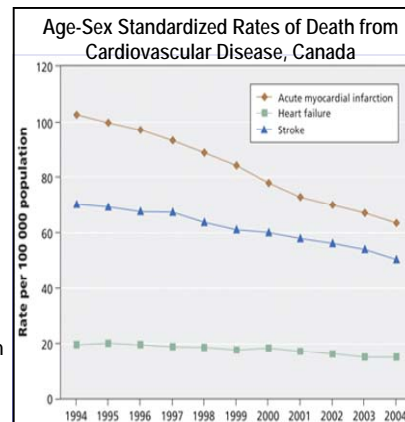
The first study in the series examined recent trends in the rates of hospital admissions and death for acute myocardial infarction (AMI), heart failure and stroke in Canada from 1994 to 2004.

During this time period, the overall age-sex standardized rate of death from cardiovascular disease declined by 30%, with the greatest decrease in mortality observed for AMI. Hospitalization rates for stroke and heart failure dropped by ~27%, while a more modest reduction was observed in the age-

sex standardized hospitalization rate for AMI.

This study also revealed, that as of 2000, more women than men are dying of heart disease in Canada.

"Historically, cardiovascular disease was considered a problem of middle-aged men," reported lead author, Dr. Jack Tu. "This highlights the need for increased investment in education and research on cardiovascular health and disease in women." (Tu JV et al. CMAJ 2009; 180(13):E118-E125)



ii. Long-Term Trends in Use of and Expenditures for Cardiovascular Medications in Canada

Drugs are the fastest-growing cost segment within the Canadian health-care system—where one in five prescriptions filled nationwide is for a cardiovascular medication.

In this second paper, CCORT investigators examined trends in prescribing and spending for cardiovascular medications in Canada between 1996 to 2006 and found **cardiovascular medication costs increased 200%**.

Total annual costs for cardiovascular medications exceeded \$5 billion in 2006, with statins (which lower cholesterol levels in the blood) accounting for almost 40 per cent of the total.

Use of newer medications such as angiotensin-receptor blockers (ARBs) and statins outpaced use of older medications such as nitrates, while patented medications outpaced generics.

Interprovincial comparisons revealed a declining east-to-west gradient for total drug expenditures, with greatest variability associated with newer drug classes.

Several factors are driving drug expenditures including rising drug costs, an aging and growing population, and increasing prevalence of cardiovascular disease risk factors. Cardiovascular drug expenditures are targeted to po-

tentially reach \$10.6 billion in Canada by 2020, if current trends prevail, raising questions as to sustainability of these levels of spending. Dr. Cynthia Jackevicius, lead author, notes

that "Cardiovascular medications provide many benefits and so it is important to ensure that medications are being used cost-effectively. Greater use of lower-cost generic medications and healthier lifestyle habits could potentially help slow the rate of increase in drug costs." (Jackevicius CA, et al. CMAJ 2009; 181(1-2):E19-E28)

iii. Trends in Risk Factors for Cardiovascular Disease in Canada

In the third article from the series, CCORT scientists studied national trends in heart disease and risk factors using self-reported survey data collected by Statistics Canada for the study period 1994 to 2005.

Study findings revealed that heart disease and certain key risk factors (hypertension, diabetes and obesity) have continued to increase in all age groups, particularly among younger respondents under age 50.

While the overall risk factor burden was higher among those of lower socioeconomic status, hypertension and obesity prevalence increased at a faster rate among higher-income Canadians.

The increasing prevalence of risk factors among younger Canadians is worrisome, as earlier onset of cardiovascular disease, typically seen in older age groups, can lead to greater life-years lost, and greater use of health care resources. Fur-

ther, the rising prevalence of risk factors has not yet stabilized, suggesting that this trend may continue to worsen over time.

"These findings highlight the importance of primary prevention initiatives beginning early in life. Raising awareness of the benefits of healthy diet and physical activity will be critical to stem further increases in cardiovascular disease", noted Dr. Douglas Lee, lead author. (Lee DS, et al. CMAJ 2009; 181:E55-E66)



CCORT PROFILE—Maria Chiu, MSc, PhD (candidate)

Maria completed an Honours Bachelor of Science degree in Human Biology, Mathematics and Zoology, and a Bachelor of Education degree before earning her Master of Science degree in Epidemiology from the University of Toronto. She is currently a PhD student in the Institute of Medical Science, University of Toronto, under the supervision of Dr. Jack Tu.



Maria began working with CCORT in 2006 as an analyst and became a CCORT Doctoral Fellow in 2007/08. That

same year, she received the prestigious Frederick Banting and Charles Best Canada Graduate Scholarship from the Canadian Institutes of Health Research. Her doctoral thesis, *Race, Ethnicity and Cardiovascular Health (REACH)*, aims to examine racial/

ethnic differences in cardiovascular risk factors and diseases at a population level in Ontario.

Maria's publications can be found in leading journals such as the *New England Journal of Medicine*, (*Tu JV, Bowen J, Chiu M et al. Effectiveness and safety of drug-eluting stents in Ontario. N Engl J Med 2007; 357(14):1393-1402.*), *American Heart Journal*, and the *Journal of the American College of Cardiology*. In 2009, her paper entitled *Paclitaxel versus sirolimus stents in diabetic and nondiabetic patients* was published in *Circulation Cardiovascular Quality and Outcomes*. Most recently, she has been working with Doug Lee and others on the new CCORT series paper looking at trends in CVD risk factors among Canadians (*Lee D, Chiu M, Manuel D, et al. Trends in Risk Factors for Cardiovascular Disease in Canada: Temporal, Sociodemographic and Geographic Factors. CMAJ 2009; 181:E55-E66*).

Maria reports that "CCORT has exposed me to the many facets of cardiovascular health research and inspired me to think outside the box. Being a part of this multidisciplinary and dynamic team has truly enriched my graduate experience."

Annual Student Research Day

Six CCORT students attended the 9th annual Student Research Day on June 24 held, for the 2nd consecutive year, in Calgary, Alberta. This event was conducted in conjunction with the annual meeting of the Alberta Provincial Project for Outcomes Assessment in Coronary Heart Disease (APPROACH). Students presented their research topics and received feedback from CCORT investigators and their peers.

Student projects addressed several areas of cardiovascular research including:

- Neurocognitive Risk Factors for Functional Recovery in Older Cardiac Patients.
- The Impact of Obesity on Health Related Revascularization for Coronary Artery Disease.
- Optimizing Performance Feedback for Primary Care, a Mixed Methods Approach

- Another look at ECGs—Validation of ECG Interpretations
- Untreated Atrial Fibrillation Patients

The day's activities also included a workshop focused on tactics and strategies for effective dissemination of research results. CCORT scientists and students shared best practices for journal papers, posters and oral presentations.

Special thanks to our host, Senior CCORT Scientist, Dr. William Ghali and his team.



Student Day 2009—Calgary L-R Noah Ivers, Elizabeth Freiheit, Lusine Abrahamyan, Celia Lai, Alka Patel, Billie Jean Martin, Kevin Lam, Dr. William Ghali, Dr. Jack Tu

Did You Know...

....there were over 5,000 fewer deaths from cardiovascular disease in 2004 than in 1994 in Canada, despite a population increase of more than 14% over the same time period. (Tu JV et al. CMAJ 2009; 180(13):E118-E125)

....the mean cost of an individual cardiovascular prescription increased by 14.2% between 1996 and 2006, while overall growth in expenditures for cardiovascular medications exceeded 200%. (Jackevicius CA, et al. CMAJ 2009; 181(1-2):E19-E28)

....the age and sex-adjusted self-reported prevalence of hypertension in Canada among individuals aged 12 years and older rose by 77% between 1994 and 2005. (Lee DS, et al. CMAJ 2009; 181:E55-E66)





CCORT makes the rounds—Publications

2009

Atzema CL, Austin PC, Tu JV, Schull MJ. Emergency department triage of acute myocardial infarction patients and the effect on outcomes. *Ann Emerg Med* 2009; 53 (6):736-745.

Chiu M, Ko DT, Austin PC et al. Paclitaxel Versus Sirolimus Stents in Diabetic and Non-diabetic Patients. *Circulation: Cardiovascular Quality and Outcomes* 2009; 2:96-107.

Huynh T, Perron S, O'Loughlin J et al. Comparison of Primary Percutaneous Coronary Intervention and Fibrinolytic Therapy in ST-Segment Elevation Myocardial Infarction. Bayesian Hierarchical Meta-Analyses of Randomized Controlled Trials and Observational Studies. *Circulation* 2009; 119(24):3101-3109.

Jackevicius CA, Cox JL, Carreon D et al. Long-term trends in use of and expenditures for cardiovascular medications in Canada. *CMAJ* 2009; 181(1-2):E19-E28.

Juurink DN, Gomes T, Ko DT et al. A population-based study of the drug interaction between proton pump inhibitors and clopidogrel. *CMAJ* 2009. [Epub ahead of print]

Lee DS, Gona P, Vasan RS et al. Relation of disease pathogenesis and risk factors to heart failure with preserved or reduced ejection fraction: Insights from the Framingham Heart Study of the National Heart, Lung, and Blood Institute. *Circulation* 2009; 119 (24):3070-3077.

Lee DS, Chiu M, Manuel DG et al. Trends in risk factors for cardiovascular disease in Canada: temporal, socio-demographic and geographic factors. *CMAJ* 2009.

Lee DS, Austin PC, Stukel TA et al. "Dose-dependent" impact of recurrent cardiac events on mortality in patients with heart failure. *Am J Med* 2009; 122(2):162-169.

McCandless LC, Gustafson P, Austin PC. Bayesian propensity score analysis for observational data. *Stat Med* 2009; 28(1):94-112.

Philpott AC, Southern DA, Clement FM et al. Long-term outcomes of patients receiving drug-eluting stents. *CMAJ* 2009; 180(2):167-174.

Tu JV, Nardi L, Fang J, Liu J, Khalid L, Johansen H. National trends in rates of death and hospital admissions related to acute myocardial infarction, heart failure and stroke, 1994-2004. *CMAJ* 2009; 180(13):E118-E125.

2008

Austin PC. R and S-PLUS produced different classification trees for predicting patient mortality. *J Clin Epidemiol* 2008; 61(12):1222-1226.

Austin PC. Assessing balance in measured baseline covariates when using many-to-one matching on the propensity-score. *Pharmacoepidemiol Drug Saf* 2008; 17(12):1218-1225.

Austin PC. Goodness-of-fit diagnostics for the propensity score model when estimating treatment effects using covariate adjustment with the propensity score. *Pharmacoepidemiol Drug Saf* 2008; 17(12):1202-1217.

Ko DT, Wijeyesundera HC, Zhu X, Richards J, Tu JV. Canadian quality indicators for percutaneous coronary interventions. *Can J Cardiol* 2008; 24(12):899-903.

Tu JV, Ko DT. Ecological Studies and Cardiovascular Outcomes Research. *Circulation* 2008; 118(24):2588-2593.

Woo KS, Ghali WA, Southern DA, Tu JV, Parsons G, Graham MM. Feasibility of determining myocardial infarction type from medical record review. *Can J Cardiol* 2008; 24 (2):115-117.

2009-2010 CALENDAR



October 24-28, 2009

Canadian Cardiovascular Congress, Edmonton, Alberta

<http://www.cardiocongress.org>

November 15-18, 2009

AHA — Scientific Sessions, Orlando, Florida

<http://scientificsessions.americanheart.org/portal/scientificsessions/ss/>

February 23-26, 2010

International Stroke Conference, San Antonio, Texas

<http://www.americanheart.org/presenter.jhtml?identifier=3067536>

March 2-6, 2010

Joint Conference-50th Cardiovascular Disease Epidemiology and Prevention & Nutrition, Physical Activity and Metabolism-2010, San Francisco, CA

<http://www.americanheart.org/presenter.jhtml?identifier=3065525>

May 19-21, 2010

Quality of Care and Outcomes Research in Cardiovascular Disease and Stroke Conference 2010, Washington, DC

<http://www.americanheart.org/presenter.jhtml?identifier=3057695>

NOTEWORTHY

WELCOME

Nicole Boom recently joined CCORT, Toronto as a Project Manager. Nicole has a MSc in Epidemiology and Community Medicine and was most recently with the Canadian Partnership Against Cancer.

SO LONG

Tara O'Neill, Research Administrative Assistant, recently began maternity leave. Our thanks and best wishes to Tara. **Heather Childs** will be covering Tara's leave.

Tezeta Mitiku, Project Manager, working on the EMR project, has left CCORT to begin medical school. Best of luck, Tezeta.

FAREWELL

Michelle Mattern, Project Manager, has taken a position at Humber College, Toronto. We wish her much success.

To send newsletter comments and contributions, contact Nicole Boom at nicole.boom@ices.on.ca