

## At A Glance

June 2009

### Monthly highlights of ICES research findings for stakeholders

#### Heart attack patients not prioritized properly in Ontario emergency departments

Atzema C, Austin P, Tu J, Schull M. Emergency department triage of acute myocardial infarction patients and the effect on outcomes. *Ann Emerg Med.* 2009; 53(6): 736–745.

<b>Issue</b>	What is the association between emergency department (ED) triage of patients with acute myocardial infarction (AMI) and subsequent diagnostic and treatment delays?
<b>Study</b>	Analyzed the medical records of 3,081 patients admitted to 102 Ontario hospitals with AMI from July 2000 to March 2001. Patients' assigned score on the Canadian Triage and Acuity Scale (CTAS) was correlated with: time between arrival in the ED and electrocardiogram (ECG)—the most important diagnostic test for AMI—(door-to-ECG time); and time between arrival in the ED and fibrinolysis—time-sensitive clot-busting drug therapy—(door-to-needle time).
<b>Key Findings</b>	<ul style="list-style-type: none"><li>• Patients suspected of having a heart attack are supposed to be given a CTAS score of 1 or 2; however, 50.3% of patients who were ultimately found to be having an AMI were given a lower priority triage score (3, 4 or 5) when they presented to an ED.</li><li>• The median door-to-ECG time was 12 minutes (recommended benchmark is 10 minutes) and the median door-to-needle time was 40 minutes (recommended benchmark is 30 minutes).</li><li>• AMI patients assigned lower priority scores waited, on average, 4.4 minutes longer to receive an ECG and 15.1 minutes longer to receive fibrinolysis.</li><li>• Hospitals that treated very high volumes of AMI patients (more than 300 patients annually) were less likely to assign lower priority triage scores to these patients than low-volume centres.</li><li>• An estimated 11 lives per 1,000 patients treated for AMI are lost because of a low triage score, or approximately 100 Ontarians a year.</li></ul>
<b>Implications</b>	For patients with possible AMI, the triage process needs to be refined and improved. Future studies could evaluate patient- and hospital-level predictors of ED triage scores, the use of triage ECGs in the ED, and more standardized triage training.

#### Study forecasts considerable increase in Ontarians needing dialysis services

Quinn R, Laupacis A, Hux J, Moineddin R, Paterson M, Oliver M. Forecasting the need for dialysis services in Ontario, Canada to 2011. *Healthc Policy.* 2009; 4(4): e151–e161.

<b>Issue</b>	The number of patients with end-stage renal disease (ESRD) is growing rapidly; they are currently responsible for 5–7% of healthcare expenditures in developed countries. Projections of the demand for dialysis services by these patients are important to assist healthcare planners in forecasting the need for equipment, facilities and personnel. The acute dialysis population is often not taken into account.
<b>Study</b>	Identified all patients in Ontario who had at least one dialysis treatment between July 1998 and September 2005. At 90 days after initiation of therapy for renal failure, patients were categorized as either acute (alive and no longer requiring dialysis), chronic (alive and on dialysis), or dead. Time series modelling was used to forecast the predicted number of patients requiring dialysis to 2011.
<b>Key Findings</b>	<ul style="list-style-type: none"><li>• Of 31,679 new dialysis patients identified during the study period: 73% received hemodialysis as their initial treatment, 15% started on continuous renal replacement therapy, and 12% started on peritoneal dialysis; 62% started dialysis in hospital, of whom 27% died before discharge; and 63% went on to require treatment in an outpatient dialysis unit during follow-up.</li><li>• Between 1998 and 2005, the annual growth rate was 4.9% in the incident dialysis population and 7.2% in the prevalent dialysis population.</li><li>• At any given time, 3% of all patients being treated were those who started acute dialysis in hospital and had not yet been discharged.</li><li>• An estimated 4,000 new patients will require care in an outpatient dialysis unit in Ontario in 2010.</li></ul>
<b>Implications</b>	The annual increase in the incidence and prevalence rates of dialysis is considerable and will present a growing challenge to the healthcare system. Many ESRD registries exclude patients receiving acute dialysis. Although these patients represent only 3% of the dialysis population, they consume many more resources than chronic dialysis patients and should be included when planning for future ESRD resource requirements.

## Primary care reform not solving healthcare access for the poor and chronically ill

Glazier R, Klein-Geltink J, Kopp A, Sibley L. Capitation and enhanced fee-for-service models for primary care reform: *CMAJ*. 2009; 180(11): e72–e81.

<b>Issue</b>	To address shortfalls in the delivery of primary health care, in 2001 Ontario introduced a capitation model that paid family physicians a flat rate per patient per year, based on the patient's age and sex. In 2003 an enhanced fee-for-service (FFS) model was introduced where, in addition to a set fee per medical service, family physicians could collect extra payments for providing after-hours care and doing prevention work. What effect have these reimbursement models had on physician behaviour and patient outcomes?
<b>Study</b>	Identified 4,060 primary care physicians belonging to either a capitation or FFS group between September 2005 and August 2006, and their three million enrolled patients. Practice characteristics and patterns of care were evaluated for both groups. Both urban and rural practices were considered.
<b>Key Findings</b>	Comprehensiveness of care and continuity of care were similar between the two groups. Compared with doctors who were paid per visit, doctors in the capitation group enrolled healthier patients, enrolled 30% fewer new patients who didn't previously have family doctors, and provided 32% less after-hours care. In addition, their patients had a 20% higher rate of emergency department visits.
<b>Implications</b>	Ontario's poor and chronically ill are the least likely to benefit from these reforms. While the capitation model provides an alternative to FFS practice, its incentives may need to be altered so that its benefits can be made available to all Ontarians.

## Mortality and hospitalization rates for cardiovascular diseases declining steadily in Canada

Tu J, Nardi L, Fang J, Liu J, Khalid L, Johansen H, for the Canadian Cardiovascular Outcomes Research Team. National trends in mortality and hospitalization rates for acute myocardial infarction, heart failure and stroke, 1994 to 2004. *CMAJ*. 2009; 180(13): e118–e125.

<b>Issue</b>	Cardiovascular and cerebrovascular disease mortality rates have been declining steadily in Canada for the past three decades. It is uncertain if hospitalization and mortality rates for acute myocardial infarction (AMI), heart failure and stroke are changing at similar rates.
<b>Study</b>	Analyzed death certificate data between 1994 and 2004 from the Canadian Mortality Database and identified deaths where the most responsible cause was AMI, heart failure or stroke. Age- and sex-standardized mortality rates and hospitalization rates were calculated for each condition.
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• Between 1994 and 2004, mortality rates in Canada declined as follows: cardiovascular disease, 30.0%; AMI, 38.1%; stroke, 28.2%; and heart failure, 23.5%.</li> <li>• Hospitalization rates for stroke and heart failure declined 27.6% and 27.2%, respectively, whereas AMI hospitalization rates fell only 9.2%. The absolute number of hospitalizations for AMI actually increased 16.1% from 1994 to 2004.</li> <li>• In 1994, men represented 50.7% of all cardiovascular deaths in Canada; by 2004, this trend had reversed with 50.5% of such deaths occurring in women.</li> </ul>
<b>Implications</b>	Awareness of these trends will serve to guide future health promotion efforts and healthcare planning and to determine future research and treatment priorities.

## Administrative data tool reveals more Ontario children being diagnosed with diabetes

Guttman A, Nakhla M, Henderson M, To T, Daneman D, Cauch-Dudek K, Wang X, Lam K, Hux J. Validation of a health administrative data algorithm for assessing the epidemiology of diabetes in Canadian children. *Pediatr Diabetes*. 2009 Jun 5; [Epub ahead of print].

<b>Issue</b>	What type of administrative health data provides the most specific definition of diabetes in Ontario children? What trends in the incidence and prevalence of pediatric diabetes does this definition reveal?
<b>Study</b>	Sampled hospital records of 700 children from 1994 to 2003 with a prior history of diabetes, and 300 randomly selected children with no diabetes records. The sensitivity and specificity of 16 different combinations of physician billing claims and hospitalizations over various periods of time were calculated and tested against known diabetes diagnoses from patient medical records.
<b>Key Findings</b>	The use of 4 physician claims and no hospitalizations over a 2-year period yielded the optimally specific and sensitive definition of pediatric diabetes. Using this definition, between 1994 and 2003 the incidence of diabetes in children rose from 24.5 per 100,000 to 32.3 per 100,000, and the prevalence rose from 177.5 per 100,000 to 241.5 per 100,000. From 1994 to 2004 there was an annual increase of approximately 3% in the rate of diabetes in children of all ages. The overall incidence rate differed by age (peaking in 10- to 14-year-olds) but not by sex.
<b>Implications</b>	Identification of a case definition of pediatric diabetes will facilitate further study of trends in diabetes incidence and in the use of health services and outcomes.