

At A Glance

February 2009

Monthly highlights of ICES research findings for stakeholders

Acid suppressants increase heart attack risk for patients taking popular cardiac drug

Juurink D, Gomes T, Ko D, Szmítok P, Austin P, Tu J, Henry D, Kopp A, Mamdani M. A population-based study of the drug interaction between proton pump inhibitors and clopidogrel. *CMAJ*. 2009 Jan 28; [Epub ahead of print].

Issue	Clinicians lack real-world information about the risk of prescribing the common cardiac drug clopidogrel in combination with a class of widely-used acid-lowering medications called proton pump inhibitors. PPIs may interfere with clopidogrel's blood-thinning ability, thereby increasing a cardiac patient's risk for reinfarction.
Study	Linked prescription drug claims and hospital admissions of 13,636 patients aged 66 or older who began taking clopidogrel after discharge for treatment of acute myocardial infarction (AMI) between April 2002 and December 2007. Patients were tracked for 90 days after discharge or until readmission for AMI.
Key Findings	Over the six years, 734 patients were rehospitalized with AMI. The PPIs omeprazole, lansoprazole and rabeprazole were associated with a 40% increased risk of reinfarction within 90 days of hospital discharge. Approximately 7.4% of readmissions occurred as a result of therapy with these agents. The PPI pantoprazole and medications called H ₂ receptor antagonists were found to have no association with AMI readmission.
Implications	These findings highlight an extremely common and completely avoidable drug interaction in a population at high risk of reinfarction. Physicians should selectively prescribe pantoprazole in patients receiving clopidogrel who require treatment with a PPI.

Study measures impact of recurring hospitalizations for heart failure on mortality

Lee D, Austin P, Stukel T, Alter D, Chong A, Parker J, Tu J. "Dose-dependent" impact of recurrent cardiac events on mortality in patients with heart failure. *Am J Med*. 2009; 122(2): 162-169.e1.

Issue	A costly aspect of heart failure care is hospitalization which may recur frequently after the condition's onset. The relationship between recurrent cardiac hospitalizations on mortality has not been measured.
Study	Identified 9,138 heart failure patients with onset between April 1999 and March 2001 in Ontario and compared survival to March 2006 in those with and without recurrent heart failure or cardiovascular events.
Key Findings	Recurrent heart failure events occurred 1, 2, 3, and 4 or more times in 25.7%, 11.2%, 5.5% and 6.5% of patients, respectively. Cardiovascular readmissions occurred 1, 2, 3, and 4 or more times in 27.6%, 16.5%, 10.7% and 18.3% of patients, respectively. Compared to those without recurrent heart failure events, mortality rates for 1, 2, 3, and 4 or more heart failure events were 2.41, 3.00, 4.00, and 5.16, respectively. Compared to those without cardiovascular events, mortality rates for 1, 2, 3, and 4 or more cardiovascular events were 3.33, 4.61, 6.29, and 8.95, respectively.
Implications	The risk of death increases progressively and independently with each heart failure or cardiovascular event. Clinicians should determine the number of prior hospitalizations during which heart failure and cardiac events occurred, because it is a simple but powerful predictor of prognosis.

Cardiac rehabilitation services provide significant survival benefit to committed users

Alter D, Oh P, Chong A. Relationship between cardiac rehabilitation and survival after acute cardiac hospitalization within a universal health care system. *Eur J Cardiovasc Prev Rehabil*. 2009 Jan 21; [Epub ahead of print].

Issue	The benefits of cardiac rehabilitation (CR) services such as individualized exercise programs, education seminars and lifestyle counselling to real-world populations in a universal health care system are unclear.
Study	Compared long-term survival of 2,042 participants enrolled in a one-year CR program at the Toronto Rehabilitation Institute with 2,042 matched controls (non-participants) after an acute cardiac hospitalization in Ontario between 1999 and 2003. Matching was based on factors such as age, sex, socioeconomic status, geographical region, and number and type of previous cardiac and non-cardiac hospitalizations.
Key Findings	The average observation period was 5.2 years. In total, 66.8% of CR participants completed the program (i.e., attended at least 26 of 36 appointments and received a final assessment at one year). Long-term mortality was 51% lower among participants (2.6% vs. 5.1%). There were no significant survival differences between nonparticipants and those who participated in but did not complete the CR program.
Implications	Given the survival benefit associated with CR, increased program capacity and greater implementation of automated referral mechanisms may be warranted.

Study finds a 10-year decline in Ontario hospitalizations for traumatic brain injury

Colantonio A, Croxford R, Farooq S, Laporte A, Coyte P. Trends in hospitalization associated with traumatic brain injury in a publicly insured population, 1992-2002. *J Trauma*. 2009; 66(1): 179-183.

Issue	There are no recent peer-reviewed reports on hospitalization trends for traumatic brain injury (TBI) based on large populations in Canada.
Study	Analyzed health data on all patients discharged from Ontario hospitals with a diagnosis of TBI between April 1992 and March 2002. Associations between age, sex, cause of injury, severity level and in-hospital mortality were correlated.
Key Findings	<ul style="list-style-type: none"> • Between 1992/93 and 2001/02 the number of TBI hospitalizations per year fell from 8,831 to 5,999. • In 1992/93, 96% of patients with a TBI were discharged alive compared to 92.5% in 2001/02. • During the 10-year period, hospitalization rates fell steeply among children and young adults but remained stable among adults aged 66 and older. This trend resulted in a dramatic increase in the median age of hospitalized TBI patients from 24 years in 1992/93 to 41 years in 2001/02. • Motor vehicle crashes accounted for 61% of TBIs in adults aged 26–35 years and 5% of TBIs in adults aged 86 and older. Falls accounted for 13% of TBIs in young adults aged 16–25 years and 90% of TBIs in adults aged 86 and older. • The probability of in-hospital death increased with increasing age.
Implications	This study provides baseline information which is useful for health system planning and resource allocation, and for targeting and evaluating prevention measures. For example, the decrease in TBI admissions observed for young people may be attributed to provincial initiatives aimed at injury prevention, such as the introduction of a license suspension law for intoxicated drivers, government-mandated helmet use for cyclists under age 18, and a two-stage licensing system for new drivers. Additional studies are needed to capture TBIs from visits to emergency departments and doctors' offices, and health service use after the initial hospitalization.

Electronic archiving systems have little impact on the frequency of duplicate diagnostic imaging

You J, Yun L, Tu J. Impact of picture archiving communication systems on rates of duplicate imaging: a before-after study. *BMC Health Serv Res*. 2008; 8:234.

Issue	Few studies have evaluated the reduction in redundant imaging associated with the implementation of picture archiving communication systems (PACS) dedicated to the electronic storage, retrieval and presentation of medical images.
Study	Analyzed health insurance claims to determine whether the introduction of PACS at 10 Ontario hospitals between June 2004 and December 2005 reduced the frequency of duplicate imaging examinations, including chest and abdominal X-rays and computed tomography of the abdomen/pelvis, head and chest. Retesting frequency was examined at 7, 30 and 60 days after a given index test.
Key Findings	Overall frequencies of duplicate imaging were 2.7% within 7 days of an imaging test, 6.7% within 30 days and 9.8% within 60 days. Comparing the 12 months before and after the introduction of PACS, absolute reductions in the frequency of duplicate X-rays using 7-, 30- and 60-day timeframes were 0.2%, 0.6% and 0.9%, respectively.
Implications	The overall frequency of duplicate imaging examinations is relatively low. The introduction of PACS did not lead to large absolute reductions in duplicate imaging; however, reducing duplicate imaging is only one of many potential benefits of PACS. Independent evaluation of these electronic medical systems should be conducted to confirm widely held beliefs of their potential benefits.