Enhancing the effectiveness of health care for Ontarians through research

ICES Institute for Clinical Evaluative Sciences

At A Glance

December 2010

Monthly highlights of ICES research findings for stakeholders

Teenage male drivers with behavior disorders more likely to be involved in a car crash

Redelmeier D, Chan W, Lu H. Road trauma in teenage male youth with childhood disruptive behavior disorders: a population based analysis. *PLoS Med.* 2010; 7(11): e1000369.

Issue What is the association between disruptive behavior disorders, including attention deficit hyperactivity disorder, conduct disorder and oppositional defiant disorder, and the risk of serious road trauma in teenage males?

Study Identified males aged 16–19 hospitalized in Ontario for road trauma (cases) or appendicitis (controls) between April 2002 and March 2009 and determined prior psychiatric diagnoses for each individual in the previous decade.

Key Findings Overall, 3,421 patients were admitted for road trauma and 3,812 for appendicitis. A history of disruptive behavior disorders was more frequent among trauma patients than controls (22.4% and 17.4%, respectively), equal to a one-third increase in the relative risk of road trauma (which is similar to the relative risk among individuals treated for epilepsy). The risk explained about one in 20 crashes, was apparent years before the event, extended to those who died, and persisted among those involved as pedestrians.

Implications The increased risk for male teens might be mitigated with better awareness and treatment of behavior disorders. Programs addressing such disorders should be considered to prevent injuries.

Extremely large birth weight linked to higher asthma risk

To T, Guan J, Wang C, Radhakrishnan D, McLimont S, Latycheva O, Gershon A. Is large birth weight associated with asthma risk in early childhood? *Arch Dis Child*. 2010 Sep 23 [Epub ahead of print].

Issue Previous studies have linked lower birth weight to subsequent development of asthma. What is the association between large birth weight and the risk of developing asthma in early childhood?

Study Identified all single live births in Ontario between April 1995 and March 2001 and followed them until March 2007 or until they developed an outcome of interest, died or reached their sixth birthday. Their birth weight was categorized as low (less than 2.5 kg), normal (2.5–4.5 kg), large (4.6–6.5 kg) or extremely large (more than 6.5 kg). The primary outcome was the diagnosis of asthma.

Key Findings Of the 687,194 infants studied, 138,889 (19.9%) received a diagnosis of asthma by age six. Compared with normal-birth-weight infants, large-birth-weight infants had a slightly lower risk for asthma and related hospitalizations and ED visits. However, there was a trend toward a high risk of asthma among infants with an extremely large-birth-weight.

Implications Interventions to reduce the incidence of extreme large birth weight may help reduce the risk of asthma.

Specialized heart failure clinics a cost-effective model of care for ambulatory patients

Wijeysundera H, Machado M, Wang X, van der Velde G, Sikich N, Witteman W, Tu J, Lee D, Goodman S, Petrella R, O'Flaherty M, Capewell S, Krahn M. Cost-effectiveness of specialized multidisciplinary heart failure clinics in Ontario, Canada. *Value Health*. 2010; 13(8):915–21.

Issue Are specialized multidisciplinary heart failure (HF) clinics a cost-effective model of care delivery for the long-term management of HF patients in Ontario?

Study Calculated treatment costs and survival rates for 16,443 patients discharged from Ontario hospitals in 2005 for HF (the standard care cohort) and compared these to a hypothetical HF clinic cohort using the same 16,443 patients, with treatment costs based on an existing HF clinic in Toronto.

Key Findings HF clinics were associated with a 29% reduction in all-cause mortality but a 12% increase in hospitalizations. The cost of care in HF clinics was estimated to be $624 per patient per year. Over a 12-year time horizon, the projected life expectancy of HF clinic patients was 3.91 years compared to 3.21 years for standard care patients. The 12-year cumulative cost per patient in the HF clinic group was $66,532 vs. $53,638 in the standard care group. HF clinics cost $18,259 for each additional life-year gained.

Implications Specialized heart failure clinics are a cost-effective intervention with substantial mortality benefits. These results reinforce Canadian practice guideline recommendations that complex HF patients be treated at such clinics.

Financial barriers may increase the number of ER visits for children with asthma

Ungar W, Paterson M, Gomes T, Bikangaga P, Gold M, To T, Kozyrskyj A. Relationship of asthma management, socioeconomic status, and medication insurance characteristics to exacerbation frequency in children with asthma. *Ann Allergy Asthma Immunol*. 2010 Nov 22 [Epub ahead of print].

Issue Among children with asthma, less than 25% have their condition well controlled. What factors are associated with asthma exacerbation causing emergency department (ED) visits or hospitalizations?

Study Collected sociodemographic data on 490 children aged 1–18 with asthma in Ontario between November 2000 and March 2003. Sampling was designed to include patients residing in urban and suburban areas, representing a range of asthma severity and experiencing diverse levels of asthma management.

Key Findings

- Younger age, previous emergency visits, nebulizer use, pet ownership, and receipt of asthma education but not an action plan were significantly associated with more frequent exacerbations.
- In the full cohort, children with high income adequacy had 28% fewer exacerbations than did children with low income adequacy.
- Among those with drug insurance, girls had 26% fewer exacerbations than did boys, and children with food, drug or insect allergies had 52% more exacerbations than did children without allergies.
- The exacerbation rate increased by 14% for every 1% increase in the proportion of income spent on prescriptions asthma medications.
- Children of families with high income adequacy (a measure that combines household income with family size) had 28% fewer severe asthma attacks than children with low income adequacy.

Implications Given the movement toward increased cost-sharing in drug plans, further research is needed to evaluate the effects of diverse cost-sharing mechanisms.

Interfacility transfer to trauma centres has higher mortality risk than direct transport

Haas B, Gomez, D, Zagorski B, Stukel T, Rubenfeld G, Nathens A. Survival of the fittest: the hidden cost of undertriage of major trauma. *J Am Coll Surg*. 2010; 211 (6): 804–11.

Issue Many patients are transported to the emergency department (ED) of a non-trauma centre after injury and subsequently require transfer to a trauma centre for definitive care. What is the mortality cost associated with this undertriage?

Study Identified all adults aged 18 and older presenting to any ED (trauma centre or non-trauma centre) in Ontario with a severe injury between July 2002 and December 2007. Patients were stratified into the Undertriage cohort (patients triaged initially to a non-trauma centre) and the Direct Transfer cohort (patients transported directly from the scene of injury to a trauma centre). Mortality at 30 days was measured for both groups.

Key Findings Among 11,398 severely injured patients, 66% were transported directly to a trauma centre, 30% were transferred from a non-trauma centre, and 4% died before transfer (22% of all deaths). Thirty-day mortality was 24% higher in the Undertriage cohort than in the Direct Transfer cohort.

Implications Improving field triage of trauma patients should be a priority. In addition, efforts must be made to reduce transfer times and to expedite the transfer process among patients living in remote regions where direct transport to a trauma centre is impossible.