Heart disease risk factors and death rates vary across Canada

Issue
While heart disease is the leading cause of mortality in Canada, few studies have examined the role that specific health region characteristics play in regional variations in heart disease risk factors and mortality.

Study
Examined the percentage of Canadians who had six important heart disease risk factors (smoking, obesity, physical inactivity, low income, diabetes, and hypertension) and the association of these risk factors with regional variations in heart disease mortality rates.

Key Findings
- Maritime provinces had higher rates than the national average for all six risk factors, while B.C. and Alberta had the lowest rates, on average.
- Newfoundland and Labrador had the highest mortality rate (321/100,000 population), while B.C. had the lowest mortality rate of all provinces (223/100,000 population).
- Health regions with high mortality not only had more people with traditional cardiac risk factors, but also had lower socioeconomic status and lower population density.

Implications
The findings reinforce the importance of following a lifestyle that decreases the risk of heart disease. Provinces, territories and health regions can use these results to develop health promotion programs and interventions that focus on risk factors that are problematic in their area.

Restrictions to provincial drug plan coverage have a major impact on drug use and expenditures

Issue
Annual double digit increases in drug plan spending have led several provinces to limit coverage for certain medications that are thought to have value only in specific circumstances. Little is known about how these policies affect provincial drug plan spending.

Study
Examined quarterly prescription drug claims and provincial drug plan costs for persons aged 65 years or over for oral non-steroidal anti-inflammatory drugs (NSAIDs) and neuroleptics in Ontario and BC before and after the approval of drugs in two new drug classes – COX-2 inhibitors [a type of NSAID] and atypical neuroleptics.

Key Findings
- In Ontario: COX-2 inhibitors were listed as Limited Use (LU) drugs – require that clinical criteria be met to justify the use of the drug, but no prior approval is needed. Atypical neuroleptics were listed as General Benefit (GB) – no restriction.
- In BC: Both classes of drugs were introduced as Special Authority (SA) – require pre-approval by the BC drug plan before prescriptions are paid.

Implications
Quarterly NSAID use per senior in Ontario rose by 70% in the year following approval of COX-2 inhibitors, leading to a near tripling of NSAID costs. There was virtually no increase in NSAID use or related provincial drug plan cost in BC. However, there was a rapid increase in NSAID prescriptions paid for outside BC's provincial plan (e.g., by private insurers and patients). Neuroleptic prescriptions per senior were fairly stable in BC, while usage nearly tripled in Ontario.

Benefit plan restrictions can have a significant impact on use and spending from provincial drug plans. Public drug coverage policies should be studied to improve our understanding of their effects on overall access and health outcomes.
### Volume of high-risk surgeries performed at hospitals unrelated to length of stay or readmission


**Issue**
There is growing interest in referring high-risk surgery patients to high-volume hospitals to reduce mortality. However, it is unknown whether these volume standards will also reduce resource use.

**Study**
Studied postoperative length of stay and 30-day readmission rate after 14 cardiovascular and cancer procedures using the 1994-1999 national Medicare database in the United States.

**Key Findings**
There was no consistent relationship between volume and length of stay or 30-day readmission. Postoperative length of stay ranged from 3.4 days (carotid endarterectomy) to 19.6 days (esophagectomy). The 30-day readmission rate ranged from 9.9% (nephrectomy) to 22.2% (mitral valve replacement).

**Implications**
The nature of the surgical procedures themselves is a more important determinant of length of stay and 30-day readmission rate than hospital volume.

### Better evidence needed to support PET use in evaluating Alzheimer's disease


**Issue**
Positron emission tomography (PET) has been promoted as a means of improving the diagnosis of Alzheimer’s disease (AD), but the evidence to support its value is unclear.

**Study**
Conducted a systematic review of 16 original articles and seven health technology assessment (HTA) reports to assess the evidence regarding the use of PET in evaluating AD.

**Key Findings**
Several common limitations to the studies published in this field were identified:
- Many studies examined patients with advanced AD that would be relatively straightforward to diagnose.
- Most studies attempted to differentiate patients with AD from younger control subjects. The value of such controls is uncertain.
- There were few subjects included in most of the studies reviewed.

**Implications**
PET studies should be designed to examine the value of an initial PET scan in diagnosing early, undifferentiated AD in older adults, and the role of PET in predicting the progression of the disease.

### One type of heparin is better for treating acute coronary syndromes in rural hospital settings


**Issue**
The use of low-molecular-weight heparin (LMWH) over unfractionated heparin (UFH) in the treatment of acute coronary syndromes (ACS) may be a more cost effective option and result in improved outcomes for patients. However, it has been difficult to evaluate LMWH in the rural hospital setting.

**Study**
One part of the study reviewed all randomized controlled trials (RCTs) of LMWH for outcomes applicable to a rural hospital setting. The other part compared the cost differences of UFH and LMWH treatment for all ACS patients admitted to a rural Ontario hospital in 1999.

**Key Findings**
LMWH is as clinically effective as UFH in the treatment of ACS in a rural setting. The estimated cost of the LMWH dalteparin ($65 per admission) was less than for UFH ($110 per admission).

**Implications**
LMWH is the heparin of choice for the treatment of ACS in a rural setting. The methods used in this study may be a practical approach for evaluating other health interventions in a rural setting.

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What effects do provincial drug plan coverage policies for new drugs have on patterns of use and cost?

November 2003
What effects do provincial drug plan policies for new drugs have on patterns of use and cost?

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ISSUE

Concern over the cost and appropriate use of new drugs has led provincial drug plans to look at various policies for drug coverage. While some drugs are covered as a general benefit (GB), and will be routinely paid for, others are covered only when information is provided to demonstrate use in specific clinical situations. This information is transmitted to the drug plan by 1) codes written on the prescription, as is done for Ontario's limited use (LU) program, or 2) through a more complex process that involves obtaining drug plan approval before a prescription is filled, as is done for special authority (SA) programs in British Columbia and Ontario. Little is known about how these policies affect drug utilization or cost.

More information on specific policies can be obtained at:
www.gov.on.ca/health/english/program/drugs/odbf/odbf_mn.html and

STUDY

This study examined the use of two new classes of drugs – cyclo-oxygenase-2 (COX-2) inhibitors and atypical neuroleptics – prescribed to persons aged 65 years and older under different drug coverage policies in Ontario and British Columbia (BC). Cyclo-oxygenase-2 (COX-2) inhibitors (a type of non-steroidal anti-inflammatory drug or NSAID) and atypical neuroleptics are more costly than their predecessors.

NSAIDs

Non-steroidal anti-inflammatory drugs (NSAIDs) are widely prescribed for the treatment of inflammation and pain associated with arthritis and other musculoskeletal conditions, and are among the most commonly used medications in the world. While NSAIDs have many benefits, some users experience gastrointestinal side effects and a few develop serious complications, such as ulcers, often without pain or other warning symptoms.

COX-2 inhibitors were approved for use in Canada in 1999, based on studies suggesting fewer upper gastrointestinal side effects when compared with therapy using conventional NSAIDs. In Ontario and BC, conventional NSAIDs are covered as GB drugs. In Ontario, two COX-2 inhibitors are covered under the LU program and one is GB; while in BC, they are covered as SA drugs.

Neuroleptics

Neuroleptics or “antipsychotics” were developed primarily to treat symptoms of schizophrenia and related psychotic disorders, although they are also used for short-term management of behavioural disturbances, such as verbal or physical aggression or agitation in patients with severe dementia. A new generation of antipsychotics, called “atypical” neuroleptics, was introduced in Canada in the early 1990s, promising fewer side effects than conventional neuroleptics. Side effects of greatest concern in the elderly are sedation and postural hypotension, associated with an increased risk of falls.

Among the atypical neuroleptics available in Canada (clozapine, olanzapine, risperidone, and quetiapine), only risperidone is approved for the treatment of behavioural and psychological...
symptoms of dementia (BPSD). Conventional and atypical neuroleptics are listed as GB in Ontario. In contrast, in BC, conventional neuroleptics are listed as GB, and atypical neuroleptics are now either SA or GB.

**Analysis**

Drug claims data were used to study oral NSAID and neuroleptic prescriptions to persons aged 65 years or over that were paid for by provincial drug plans, and excluded prescriptions paid for by federal or private insurance plans or by patients themselves. In a separate analysis, BC's PharmaNet database was used to add information about the number of NSAID prescriptions to seniors paid for by sources other than BC's provincial drug plan.

**Findings**

**NSAIDs**

In Ontario, quarterly oral NSAID use per senior rose by 70% in the year following approval of COX-2 inhibitors (celecoxib and rofecoxib) as LU products (*Figure 1*), leading to a near tripling of quarterly NSAID costs (*Figure 2*). In contrast, there was virtually no increase in NSAID utilization or provincial drug plan cost per senior when COX-2 inhibitors were granted SA status in BC. These results highlight the impact of the early, rapid uptake of COX-2 inhibitors in Ontario versus an apparently lower, more sustained level of use among BC seniors, as reflected by prescriptions paid by the provincial drug plans.

*Figure 3* replicates *Figure 1* for a subset of NSAIDs (See Notes, *Figure 3* for details.), and gives data on prescriptions paid for by sources other than BC's provincial drug plan. Before the introduction of COX-2 inhibitors, there was little payment outside the provincial plan for NSAIDs for the elderly. When COX-2 inhibitors were released, covered only under a restrictive SA policy in BC, there was a rapid increase in NSAID prescriptions paid for outside the provincial plan. Total utilization under and outside the provincial plan in BC was still much lower than under the Ontario provincial plan. These findings underline the usefulness of BC's PharmaNet data in helping drug plan managers to understand the potential consequences of public benefit plan restrictions on overall access.

Different drug coverage policies for COX-2 inhibitors in Ontario and BC has led to markedly different patterns of overall use of, and cost to, public plans. Further research is required to quantify whether the greater use of COX-2 inhibitors has improved the health of Ontarians.

**Neuroleptics**

In BC, where atypical neuroleptics were initially granted SA status, quarterly neuroleptic prescriptions paid for by the provincial government remained relatively stable (*Figure 4*). At the same time, from April 1997 to September 2002 the ratio of prescriptions for conventional to atypical neuroleptics fell in BC from 3.6 (4,399/1,369) to 0.2 (1,933/9,433) and quarterly plan spending on neuroleptics grew from $0.70 to $3.01 per senior (or about $0.10 per senior per quarter, *Figure 5*). Thus, even without increased use, a gradual shift from conventional to predominantly atypical neuroleptics has led to substantial growth in drug plan spending in BC.

These findings contrast with a near tripling of the rate of neuroleptic prescriptions and a cost growth of $0.20 per senior per quarter in Ontario, where atypical neuroleptics are available without restriction. Over the same period, the ratio of prescriptions for conventional to atypical neuroleptics fell in Ontario from 11.9 (78,795/6,608) to 0.2 (46,352/224,287), and provincial drug
plan spending on neuroleptics increased six-fold (from $0.77 per senior per quarter to $5.15). Thus, the combination of increased use and a relatively larger shift toward atypical neuroleptics has resulted in even greater cost growth in Ontario, than in BC. Here, atypical neuroleptic prescription accelerated after the introduction of quetiapine, and then again after Health Canada's approval of risperidone for BPSD (Figure 4). Similar changes were not observed in BC when, for example, risperidone and quetiapine were reclassified from SA to GB. These results suggest that factors other than plan design, such as promotional activity, may also be implicated. Studies are needed to determine the levels of “off-plan” use of atypical neuroleptics, and to assess the incremental risks and benefits of increased use in seniors.

CONCLUSIONS

Drug coverage policies have a marked impact on utilization and spending from provincial drug plans. More restrictive policies may shift costs to private insurers and consumers. The effect of such policies on overall access and health outcomes warrants further study.
Fig 2. Quarterly Oral NSAID Cost to the Provincial Drug Plans in Ontario and BC

Notes: 1) Reference-based pricing in effect for NSAIDs in BC. 2) The per prescription copayment was increased from the dispensing fee (up to an annual maximum of $200) to $25 max. (and an annual max. of $275).

Ontario
- $13.30 per Senior (Total: $20.1 mil)
- Celecoxib & Rofecoxib approved as LU products in Ontario

BC
- $1.43 per Senior (Total: $0.75 mil)
- Celecoxib & Rofecoxib approved as SA products in BC

New co-payment policy in BC

Fig 3. Quarterly Oral NSAID Prescriptions per Senior by Province and Payer

Notes: 1) This figure incorporates prescriptions for celecoxib, diclofenac, diclofenac-misoprostol, etodolac, ibuprofen, meloxicam, nabumetone, naproxen, and rofecoxib; which represent about 85% of prescriptions for oral NSAIDs during the study period. 2) Data for off-plan use not available for Ontario.

Ontario
- Prescriptions Paid by the Provincial Drug Plan

BC
- All Prescriptions
- Celecoxib & Rofecoxib approved as SA products in BC

Celecoxib & Rofecoxib approved as卢 products in Ontario

Celecoxib launched in Canada

Rofecoxib launched in Canada

New co-payment policy in BC
Notes: 1) Risperidone was approved as an SA product in BC and a GB in Ontario in 1994. 2) BPSD = behavioural and psychological symptoms of dementia

Fig 5. Quarterly Neuroleptic Cost to the Provincial Drug Plans in Ontario and BC

Notes: 1) Risperidone was approved as an SA product in BC and a GB in Ontario in 1994. 2) BPSD = behavioural and psychological symptoms of dementia

Fig 4. Quarterly Neuroleptic Prescriptions Paid by the Provincial Drug Plans in Ontario & BC

Notes: 1) Risperidone was approved as an SA product in BC and a GB in Ontario in 1994. 2) BPSD = behavioural and psychological symptoms of dementia