Increasing Efficiency in Canada's Healthcare System: The Transformative Potential of e-Technologies

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How to Bend the Cost Curve

Total health expenditure as a % of GDP

Source: CIHI, National Health Expenditure Trends, 2009

Is Canada Getting Value for Money?

Source: Calculated by the Commonwealth Fund based on the Commonwealth Fund 2004 and 2005 International Health Policy Surveys, the 2006 Commonwealth Fund International Survey of Primary Care Physicians, and the Commission on a High Performance Health System National Scorecard.

Canada’s aging population

Chronic conditions are more common in older people
Includes: arthritis, cancer, COPD, diabetes, heart disease, high blood pressure, and mood disorders

ER Use in Past Two Years

Any ER use
Used ER for condition treatable by regular doctor, if available

Source: 2008 Commonwealth Fund International Health Policy Survey of Sicker Adults.

Access to Doctor When Sick or Needed Care

Same-day appointment
0+ days wait or never able to get appointment

Source: 2008 Commonwealth Fund International Health Policy Survey of Sicker Adults.
Targeting Transformative Efficiency Gains with New Technologies

1. Patient Empowerment Tools
   1.1. Patient Empowerment Tools

2. Personalized Decision Support

3. Population Health Surveillance

Patient Empowerment

Increasing efficiency of contact: The “My Health Manager” patient-physician e-visit system

Supporting Disease Self-Management

Systematic Review of Telehealthcare: Reducing the Risk of Asthma-Related Hospital Admissions
Systematic Review of Telehealthcare: Improving HRQL in Asthma Patients

Cost-Minimization Analysis of Tele-homecare for COPD

Ameliorable ADE’s (51)
• Failure of physician to respond to medication-related symptoms - 32 (63%)
• Failure of patient to inform physician of symptoms – 19 (37%)

Preventable ADE’s (20)
• Selection of wrong drug – 9 (45%)
• Wrong dosage – 2 (10%)
• Wrong frequency of use – 2 (10%)
• Preventable by advanced systems of medication ordering – 7 (35%)

Opportunities to Prevent or Ameliorate Adverse Drug Events

N = 661

Ghandi et al. NEJM, April 2003

IVRS: Monitoring the Early Effects of Medication

ENROLLED (N = 496)

No problems with medication 263 (53.0%)
Problem with medication 233 (47.0%)
Adverse Drug Event 127 (26.6%)
Primary Non-Compliance 91 (18.3%)
Advice Requested 45 (9.1%)
### Personalized Decision Support

Using Individualized Risk Assessment Tools to Inform and Enhance Treatment Practices

### Systematic Review of the Effectiveness of Computerized Decision-Support on Quality of Care and Patient Outcomes

Garg et al. JAMA, March 9, 2005

<table>
<thead>
<tr>
<th>Improvement in Quality of Care</th>
<th>Number of Trials</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic Decision-Making</td>
<td>10</td>
<td>40%</td>
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<tr>
<td>Patient Care Reminder Systems</td>
<td>21</td>
<td>76%</td>
</tr>
<tr>
<td>Disease Management Decision-Support</td>
<td>37</td>
<td>62%</td>
</tr>
<tr>
<td>Drug Dosing</td>
<td>29</td>
<td>99%</td>
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<tr>
<th>Improvement in Patient Outcomes</th>
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<tr>
<td>All systems</td>
<td>52</td>
<td>13%</td>
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### Incorporating Epidemiological Science into Risk-Benefit Assessment

**LEUPS Risk Engine**

### Providing Immediate Feedback on the Consequences of a Change in Medication

**Intervention vs Control**

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Central</th>
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<tr>
<td>Starting Risk</td>
<td>3.0</td>
</tr>
<tr>
<td>Mean Reduction in Modifiable Risk After 6 Months</td>
<td>0.15</td>
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</table>
Daily Surveillance of ER Visits and Rescue Medication to Assess Asthma Control

Alert!

Analysis of Daily Downloads of Information from the Provincial Insurance Billing Data

Computerized Decision Support for Evidence-Based Asthma Management

Rate of Out-of-Control Asthma Episodes in the Intervention and Control Group

Out-of-Control at First Visit: 704 (15.8%)  In-control at First Visit: 3,743 (84.2%)

RR: 0.87  95% CI: 0.77, 0.99

RR: 1.00  95% CI: 0.74, 1.36

Out-of-Control at First Visit: 704 (15.8%)  In-control at First Visit: 3,743 (84.2%)

Population Health

Using e-Technologies to Improve Early Detection and Intervention

Electronic Lab Reporting: Improvements in Notifiable Disease Reporting Over Passive Surveillance Methods

Of 4785 unique cases

642 (20%) identified by traditional methods

4143 (87%) identified by ELR

Syndromic Surveillance: China’s Electronic Hospital Reporting System
Conclusions

Targeted e-Technologies Can Improve Efficiencies By:

1. Empowering patients to manage chronic conditions and provide more timely access to healthcare.
2. Providing person-specific decision support to reduce morbidity.
3. Monitoring infectious diseases to control outbreaks.

How to Bend the Cost Curve

Total health expenditure as a % of GDP, by country

Source: Commonwealth Fund National Scorecard on U.S. Health System Performance, 2006

Supporting outstanding health services and policy research: where to start?

Canada's aging population

Readmitted to Hospital or Went to ER from Complications During Recovery

Source: Statistics Canada. Estimates of Population, Canada, the Provinces and Territories (Persons).
CANSIM Table no. 051-0001; and Statistics Canada. Population Projections for Canada, Provinces and Territories (2005-2031). CANSIM table no. 052-0004

Source: 2008 Commonwealth Fund International Health Policy Survey of Sicker Adults.
Diabetes Who Received Recommended Preventive Care Services

Percentage of Total Health Care Spending on Pharmaceuticals, 1996 and 2006

Feasibility and Acceptability of IVRS (n=496)

Total Retail Drug Expenditure as a Percentage of Total Health Expenditure, Canada, 1985-2009

Automating the Completion of Adverse Event Reports Within the Patient’s Chart
Electronic Lab Reporting: Improvements in Notifiable Disease Reporting Over Passive Surveillance Methods

Timeliness
- Cases identified on average 7.9 days earlier by ELR
- More timely for 13 out of 16 conditions (81%)

Completeness
- ELR identified 4.4 times as many cases as spontaneous reporting
- Of 18 reporting fields:
  - 10 present more often in ELR
  - 5 present more often in spontaneous reports
  - 3 present equally in both methods