National System for Incident Reporting:
An innovative approach to information management

CPSI Forum, April 29, 2009
Presentation Objectives

• Setting the context
  – Canadian Institute for Health Information – Who we are
  – Canadian Medication Incident Reporting and Prevention System
    • What is CIHI’s role

• Attributes, benefits and features of NSIR

• Preliminary results of the national pilot test

• The road ahead – activities and timelines
CIHI Mandate

• To coordinate, develop, maintain and disseminate health information in Canada

• To provide accurate and timely information for:
  – Sound health policy
  – Effective management of health system
  – Public awareness about factors affecting good health
CMIRPS Program

Purpose
To support local risk management and quality improvement activities through the sharing of medication incident data

A program envisioned to
- Collect, analyze and share medication incident data;
- Disseminate timely and targeted information to reduce risk of recurrence;
- Support information on preferred practices in safe medication use; and
- Focus on the prevention of future incidents
Collaborative Approach

• Key Collaborators
  – Health Canada;
  – CIHI; and
  – Institute for Safe Medication Practices Canada (ISMP Canada)
  – With input from the Canadian Patient Safety Institute (CPSI)

• Collaborative approach to development
  – Pan-Canadian Advisory Committee established in 2004/05
  – Operations committee consisted of CIHI, Health Canada, ISMP Canada and CPSI
  – CIHI hosted an invitational workshop in Nov 2004 to establish information priorities and key system attributes
NSIR Attributes

Stakeholder consultation and environmental scan indicated the hospital-based reporting system should be:

- Pan-Canadian in scope;
- Focused on acute care hospitals;
- Voluntary;
- Anonymous in reporting to protect patient, provider and facility;
- Web-based with no cost for hospitals/RHAs to participate;
- Inclusive of near-miss and rare events.

Begins to establish Canadian standards for incident reporting.
CIHI Data Standard

• Aligns well with evolving incident reporting systems
  – e.g. WHO ICPS, BC PSLS, SK CIMS

• 32 data elements
  – 9 mandatory, 3 conditionally mandatory, 20 optional

• Most data elements are codified to facilitate analysis; text fields included for event description

• Data Domains
  ✓ Incident Impact
  ✓ Incident Discovery
  ✓ Patient Characteristics
  ✓ Medication Incident Details
  ✓ Drug Product Information
  ✓ Investigation and Findings
NSIR Features

- Data Entry Interface that mimics paper collection form
- Integrated Drug Product Database with more than 5,500 products
- Communication Tool to facilitate non-identifying discussion between participating organizations
- Analytical Tool to enable local analysis of own data and data from other participating organizations
- Data repository of all medication incidents
High-Level Data Flow

Participating Hospitals/RHAs
Med Incident Occurs > Reported Internally > Internal Review Completed

ISMP Canada
Notices, Root Cause Analysis

Data Repository
(maintained by CIHI)

Other Orgs with access agreements

CIHI
Analysis, Ad hoc requests
## Evaluation Components

<table>
<thead>
<tr>
<th>Evaluation Component</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Acceptance Testing (internal)</td>
<td>2007 and 2008</td>
</tr>
<tr>
<td>Usability Testing (external)</td>
<td></td>
</tr>
<tr>
<td>National Pilot Test</td>
<td>Nov 2008-Feb 2009</td>
</tr>
<tr>
<td>External Field Review</td>
<td>Feb 2009</td>
</tr>
<tr>
<td>ISMP Canada Feedback</td>
<td>May 2009</td>
</tr>
<tr>
<td>Data Quality Assessment</td>
<td>Apr-Jul 2009</td>
</tr>
</tbody>
</table>
CIHI National Pilot Test

- Nov 2008 - Feb 2009
- 18 sites in 5 jurisdictions
- 635 released incident records
# Apparent Outcome of Medication Incident

<table>
<thead>
<tr>
<th>Apparent Outcome</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Error</td>
<td>8.0%</td>
</tr>
<tr>
<td>Category A</td>
<td></td>
</tr>
<tr>
<td>Error (No Harm)</td>
<td></td>
</tr>
<tr>
<td>Category B</td>
<td>15.6%</td>
</tr>
<tr>
<td>Category C</td>
<td>64.4%</td>
</tr>
<tr>
<td>Category D</td>
<td>9.1%</td>
</tr>
<tr>
<td>Error (Harm)</td>
<td></td>
</tr>
<tr>
<td>Category E</td>
<td>2.5%</td>
</tr>
<tr>
<td>Category F</td>
<td>0.2%</td>
</tr>
<tr>
<td>Category G</td>
<td>0.0%</td>
</tr>
<tr>
<td>Category H</td>
<td>0.2%</td>
</tr>
<tr>
<td>Error (Death)</td>
<td></td>
</tr>
<tr>
<td>Category I</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

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Data as of March 6, 2009

Preliminary results – do not share or distribute
Type of Medication Incident

- Top 3 types of medication incident

<table>
<thead>
<tr>
<th>Type of Medication Incident</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose omission</td>
<td>30.4%</td>
</tr>
<tr>
<td>Incorrect dose</td>
<td>17.6%</td>
</tr>
<tr>
<td>Incorrect drug</td>
<td>11.0%</td>
</tr>
<tr>
<td>Total</td>
<td>59.1%</td>
</tr>
</tbody>
</table>

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# Stages in Medication-Use System

<table>
<thead>
<tr>
<th>Stage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administering</td>
<td>336</td>
</tr>
<tr>
<td>Transcribing</td>
<td>214</td>
</tr>
<tr>
<td>Preparing/dispensing</td>
<td>126</td>
</tr>
<tr>
<td>Monitoring</td>
<td>36</td>
</tr>
<tr>
<td>Prescribing</td>
<td>21</td>
</tr>
<tr>
<td>Selecting/procuring/storing</td>
<td>16</td>
</tr>
<tr>
<td>Advising/counseling</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>753</strong></td>
</tr>
</tbody>
</table>

- *Stage in Medication-Use System* is a multi-select data element
- 753 stages coded in 635 incident records
- 86% of records indicated 1 stage only; 97% indicated 1 or 2 stages

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Data as of March 6, 2009
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## Drugs Most Frequently Coded

<table>
<thead>
<tr>
<th>Generic Drug Name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin*†</td>
<td></td>
</tr>
<tr>
<td>Hydromorphone hcl*†</td>
<td></td>
</tr>
<tr>
<td>Heparin Sodium*†</td>
<td></td>
</tr>
<tr>
<td>Metoprolol Tartrate†</td>
<td></td>
</tr>
<tr>
<td>Morphine Sulfate*†</td>
<td></td>
</tr>
<tr>
<td>Combination products with 4 active ingredients or more</td>
<td></td>
</tr>
<tr>
<td>Acetaminophen</td>
<td></td>
</tr>
<tr>
<td>Potassium Chloride*</td>
<td></td>
</tr>
<tr>
<td>Furosemide†</td>
<td></td>
</tr>
<tr>
<td>Warfarin Sodium*†</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>

- Top 10 represents 29% of all drugs

**Note**
- † Drugs most frequently categorized as causing harm through medication error (ISMP Canada, February 24, 2006).
- Data as of March 6, 2009
- Preliminary results – do not share or distribute
Top Contributing Factors¹

- **Performance deficit** *: 37.2%
- **Communication - written**: 10.8%
- **Physical environment** **: 10.7%
- **Staffing factors**: 9.3%
- **Human considerations** ***: 4.8%
- **Workload**: 3.9%
- **Communication - verbal**: 3.5%
- **Knowledge deficit**: 2.6%
- **Drug product confusion**: 2.5%
- **Other contributing factors**: 2.1%

Data based on 635 incidents with 1610 contributing factors coded.

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* Performance deficit includes calculation error, drug preparation error, human error, transcription inaccuracy, etc.
** Physical environment includes distractions, lighting, noise level, workflow design, etc.
*** Human considerations include fatigue, stress, etc.

Data as of March 6, 2009
Preliminary results – do not share or distribute
The Road Ahead
Planned Activities

- Evaluation activities
- Post pilot enhancements
- Consider alignment with WHO’s International Classification for Patient Safety (ICPS)
- CIHI’s Privacy Impact Assessment
- NSIR National Roll-Out
NSIR National Roll-Out

- Fall 2009 recruitment for spring 2010 start
- Updated education & client support materials
- Vendor engagement
- Batch functionality
Questions?