Advancing Safe Medication Practices

ISMP CANADA

Canadian Medication Incident Reporting and Analysis

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Presented with Support from Health Canada

Overview

- ISMP Canada CMIRPS Medication Incident Database
- Analysis Framework
- Types of incident analysis
  - Individual report analysis
  - Aggregate analysis
- Individual report analysis: An example
- Aggregate analysis: Three examples
- Conclusion

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ISMP Canada CMIRPS
Medication Incident Database

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Canadian Medication Incident Reporting and Prevention System (CMIRPS)

- Canadian Institute for Health Information
- Health Canada
- ISMP Canada responsibilities include interdisciplinary analysis that considers practice concerns, clinical significance, systems issues, and potential preventive measures.
  - Individual Practitioner Reporting Program (https://www.ismp-canada.org/err_report.htm)
  - Develop a national strategy for consumer reporting

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Analysis Framework

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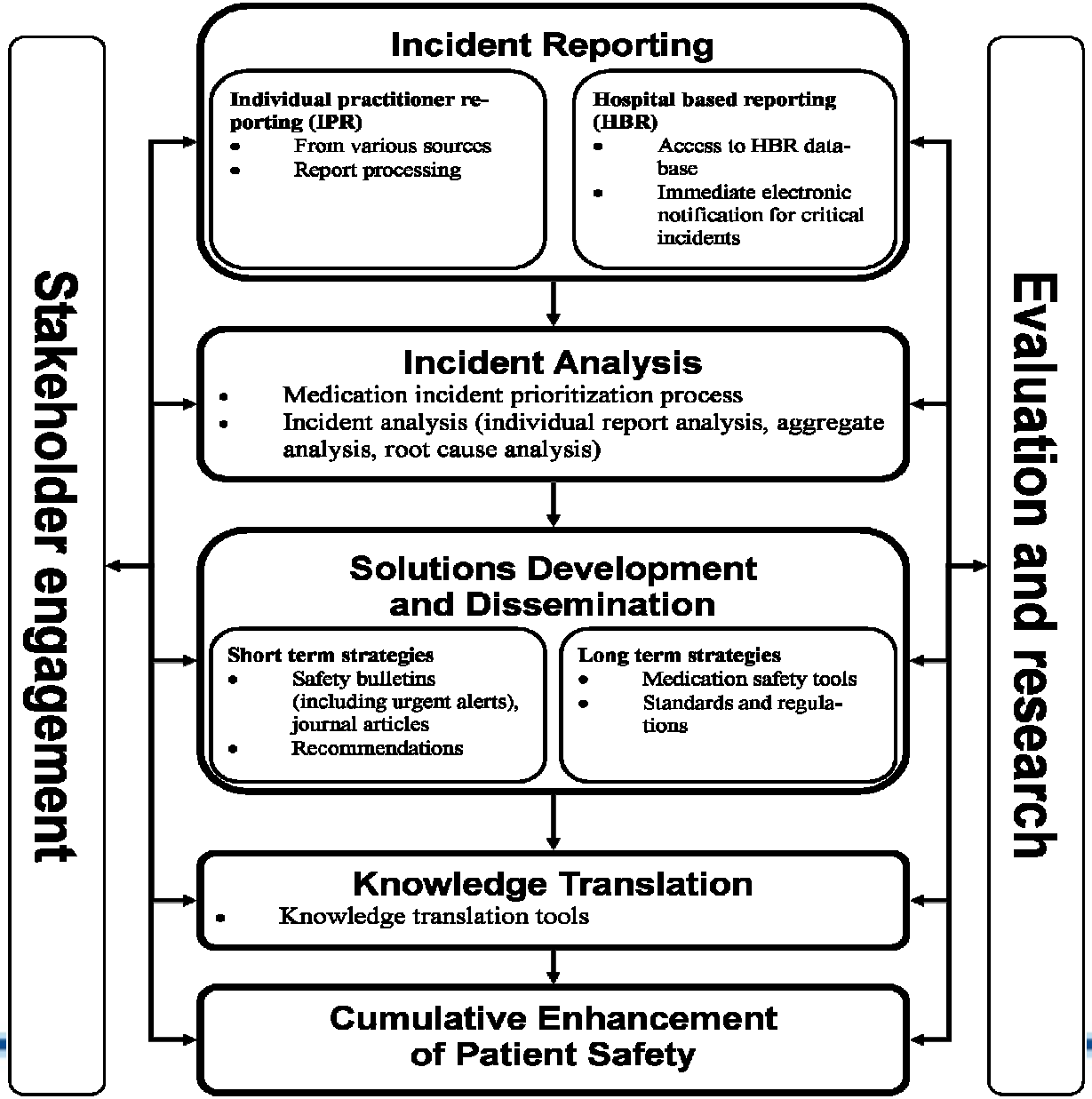
ISMP Canada CMIRPS Medication Incident Analysis and Learning Framework



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Types of Incident Analysis

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Types of incident analysis

- Individual report analysis
  - High priority reports
  - Learnings shared via safety bulletins or alerts
- Aggregate analysis
  - Analysis of a cluster of reports involving common factors pre-defined for achieving a specific objective
  - Wider perspective (large number of reports analyzed)
  - Maximizes analysis efficiency

Individual Incident Analysis

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Individual incident analysis: An example

- **Reporting**
  - An 83-year-old resident of a long-term care facility, transferred to hospital for management of dehydration.
  - Medical history included dysphagia, cerebrovascular accident, and peripheral vascular disease.

- Reference: ISMPC Bulletin, Dec 30, 2007, Vol 7, No. 9

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Individual incident analysis: An example

- **Reporting (cont'd)**
  - In hospital, the following medication order was sent to the pharmacy: **"K-Lor 20 mEq, 2 packs po now and repeat in 4 hours".**
  - Order entered into the pharmacy information system, appeared on the medication profile as "POTASSIUM CHLORIDE 40 MEQ Q4H PO".
  - Same date for both start and stop dates, the notation "DC" appeared beside the second date, intended to communicate "discontinued".

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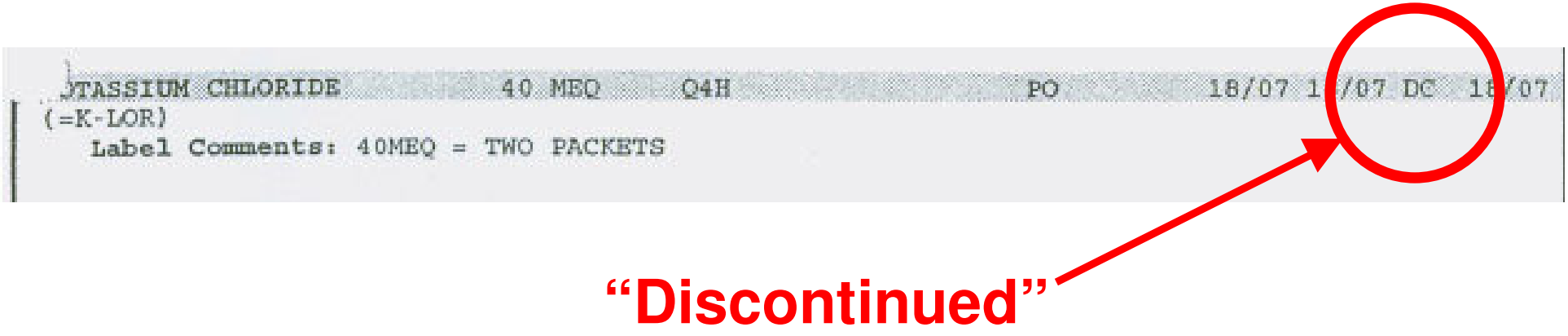
Individual incident analysis: An example

- **Reporting (cont'd)**
  - Excerpt from the hospital computer-generated pharmacy medication profile



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Individual incident analysis: An example

- **Reporting (cont'd)**
  - Two days later, the resident was discharged back to the long-term care facility.
  - Potassium chloride 40 mEq po q4h was included in the medication orders, and was administered for the next 17 days.

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Individual incident analysis: An example

- **Reporting (cont'd)**
  - At that time, the resident was readmitted to hospital with diagnoses of hyperkalemia (potassium level > 9 mmol/L), dehydration, acute renal failure, and elevation of the white blood cell count.
  - The resident did poorly and subsequently died.

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Individual incident analysis: An example

- **Information gathering:**
  - Gathering additional details about the actual incident
  - Database/literature search to identify similar events reported nationally and internationally
  - Review of applicable standards of practice, current best practice guidelines or evidence based medicine
  - Review of labelling / packaging / equipment involved in the incident

Individual incident analysis: An example

- **Event Analysis:**
  - Development of an understanding of the sequence of events
  - Identification of local analysis findings
  - Determination of contributing factors and root causes (failure modes) in the process(es) involved

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Individual incident analysis: An example

- **Contributing factor identified**
  - The discontinued potassium chloride order listed on the hospital pharmacy medication profile was misinterpreted as a current order.
  - The discrepancy between the computer-generated pharmacy medication profile (which included the discontinued potassium order) and a handwritten nursing discharge record listing current medications (which did not include potassium) was not identified.

Individual incident analysis: An example

- **Contributing factor identified (cont'd)**
  - Attending physician, community pharmacist, and nurses did not identify the high daily dose of potassium.
  - No serum electrolytes were ordered or recorded during the readmission to the long-term care facility.
  - No interdisciplinary review of the resident's medications during the 17 days after return to the long-term care facility.

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Individual incident analysis: *An example*

- **Recommendations**
  - Implement medication reconciliation at all transitions of care
  - Review forms and communication processes to ensure that the information provided is clear and unambiguous
  - On admission, obtain a complete and accurate list of current medications, by reviewing and comparing all available information sources.

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Individual incident analysis: An example

- **Recommendations (cont'd)**
  - In addition to regularly scheduled medication reviews in long-term care facilities, develop criteria for additional medication reviews to be performed
  - Standardize processes and communications for patient transfers within a region or province.

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The Institute for Safe Medication Practices Canada (ISMP Canada) is an independent national nonprofit agency established for the collection and analysis of medication error reports and the development of recommendations for the enhancement of patient safety.

The Healthcare Insurance Reciprocal of Canada (HIROC) is a member-owned expert provider of professional and general liability coverage and risk management support.

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Medication Reconciliation and Medication Review: Complementary Processes for Medication Safety in Long-Term Care

A well-designed medication-use system has various built-in safeguards that work together to enhance safety. If the system is appropriately designed, an error that goes undetected by one safeguard will be detected by a subsequent safeguard. Medication reconciliation and medication review are two examples of complementary system processes that function together in this way. Medication reconciliation is intended to prevent medication errors at transition points in patient care, whereas medication review is intended to address drug-related problems arising over time.

The following case exemplifies an undetected medication incident that may have contributed to the death of a resident in a long-term care facility.

> An 83-year-old resident of a long-term care facility was transferred to hospital for management of dehydration. The resident's medical history included dysphagia, cerebrovascular accident, and

Contributing Factors

The following factors were identified as possibly contributing to this sentinel event:

- The discontinued potassium chloride order listed on the hospital pharmacy medication profile was misinterpreted as a current order.
- The discrepancy between the computer-generated pharmacy medication profile (which included the discontinued potassium order) and a handwritten nursing discharge record listing current medications and time of last dose administration (which did not include potassium) was not identified.
- The attending physician, community pharmacist, and nurses did not identify the high daily dose of potassium as a potential problem when implementing the new medication orders.

To download the bulletin: http://www.ismp-canada.org/download/ISMPCSB2007-09MedRec.pdf

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Aggregate Analysis

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Aggregate analysis

- A process by which analysis is conducted on a cluster of reports involving common factors that are pre-defined for achieving a specific objective. (e.g. drug class, age category, drug)
- Multiple perspectives (many cases analyzed)
- Maximize analysis efficiency

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Aggregate analysis

- Quantitative analysis
  - Descriptive statistics
  - Provides a "snapshot" of the data
- Qualitative analysis
  - Analysis of the narrative data-fields
  - Identification of common themes and potential contributing factors

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Aggregate analysis: Three examples

- Incident grouping by drug class:
  - Psychotheraputic medications
  - Antineoplastic agents
- Incident grouping by a specific drug:
  - International Medication Safety Network (IMSN): Fentanyl patch incidents aggregate analysis

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Psychotherapeutic medications

- AHFS Category: Antidepressants and Antipsychotics
- Sample of reports (n=42) with an outcome of "Harm" (n=39) or "Death" (n=3)

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Example findings of interest:

Type of Incident	Reported Contributing Factors
Incorrect medication	• Look-alike/sound-alike medication names ➢ Luvox and lovenox ➢ Carbamazepine and chlorpromazine ➢ Apodoxy and Apodoxepin
Incorrect patient	• Pre-pouring medications
Overdose	• Drug-drug interactions • Drug-disease interactions • Adverse drug effects can mimic illness
Other	• Complex orders due to cross-tapering; • PRN orders requiring subjective assessments

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Antineoplastic agents

- AHFS Category: Antineoplastic Agents
- Sample of reports (n=36) with an outcome of "Harm" (n=34) or "Death" (n=2)
- Sources:
  - Community Hospitals
  - Specialty hospitals
  - Teaching Hospitals

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Example findings of interest:

Type of Incident	Reported Contributing Factors

Incorrect dose/frequency	• Transcription errors
	  ➢ e.g. transcription by ward clerk
	  ➢ e.g. misread iOD as TID
	• Incorrect BSA calculation

Incorrect rate/dose omission	• Complexity of protocols and variety of administration sets/devices ➢ e.g. line remained clamped
Drug monitoring	• Chemo administered although blood work indicated to "hold" • Complicated treatment protocols (variation in treatment schedules) • Interstitial /extravasation risks for harm

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Fentanyl patch incidents analysis

- IMSN undertook this multi-centered analysis to gain an in-depth understanding of fentanyl patch-related incidents and potential contributing factors

- Data received from 4 countries (including Canada)

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Fentanyl patch incidents analysis

- Included 1076 fentanyl patch incidents

- 4 main themes identified (patient's perspective)
  - **Too much, too soon:** dose or frequency too high
  - **Too little, too late:** dose or frequency too low
  - **Don't need (shouldn't get):** Inappropriate patient
  - **Other**

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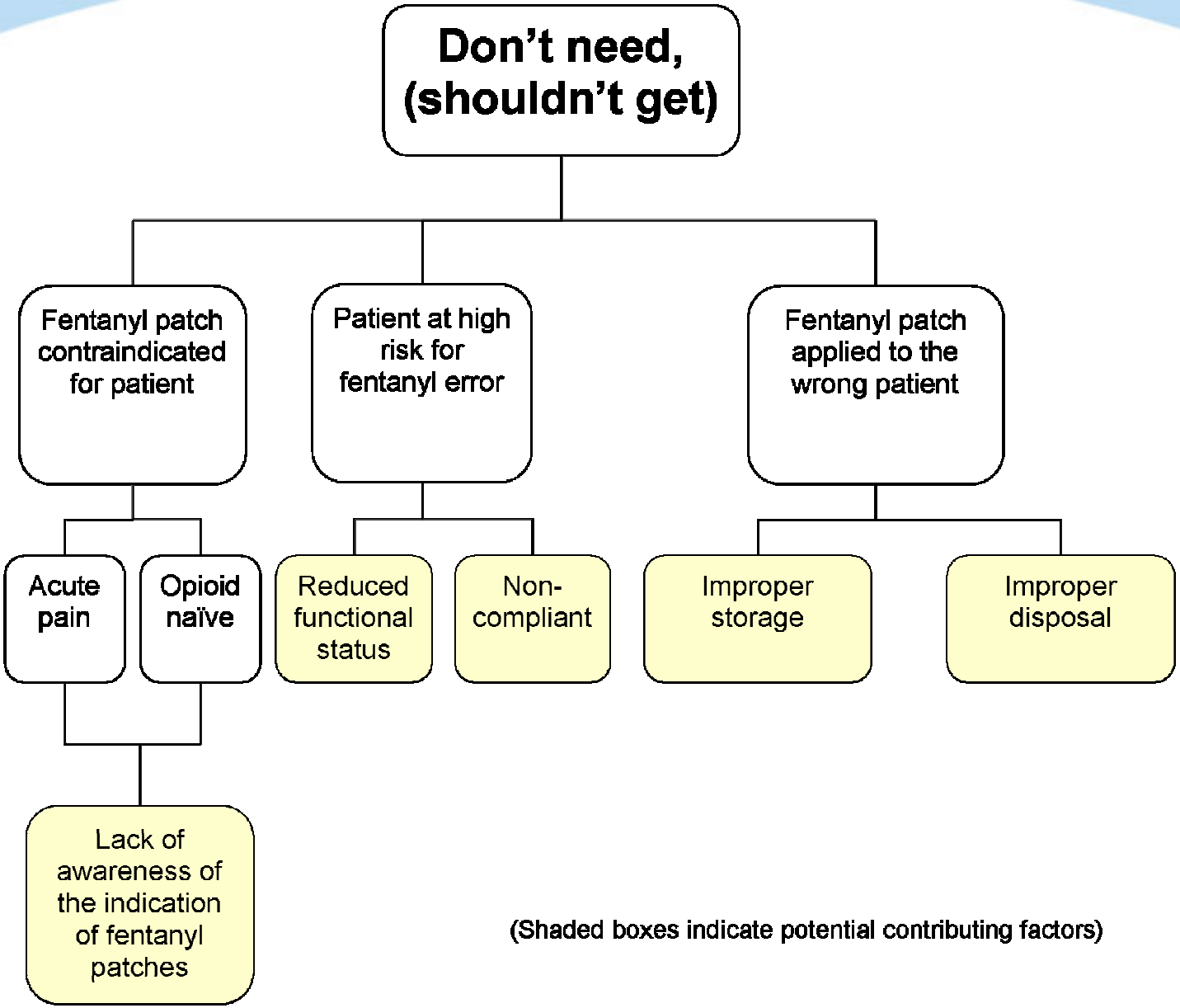

(Shaded boxes indicate potential contributing factors)

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Fentanyl patch incidents analysis

- Lack of awareness of indication:

"A 14 year old boy was prescribed duragesic 25 for throat pain due to infectious mononucleosis. He was found in a respiratory arrest 14 hours after the first and only patch was applied. Resuscitative efforts were unsuccessful."

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Fentanyl patch incidents analysis

- 21 potential contributing factors identified
- Consolidated to 6 areas of medication systems improvement
  - **Critical information** (e.g., inadequate knowledge on the part of health care practitioners)
  - **Patient education**
  - **Complexities of administration**
  - **Communication (ordering and transcription)**
  - **Product design**
  - **Interfaces of care** (e.g, fentanyl patches not recognized at interfaces of care)

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Next steps

- Consumer reporting and learning
  - Eventual inclusion of consumer reporting part of the original CMIRPS vision
  - The individual practitioner reporting component of CMIRPS has already accepted reports from consumers
  - Now ready to move forward with a strengthened and coordinated approach to consumer reporting and learning.
  - A Consumer Reporting and Learning Strategy is in development, stakeholder consultation started

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Conclusion

- Reports ➔ Analysis ➔ Solutions development ➔ Dissemination
- Different types of analysis / examples
  - Complementary nature
- Quality of analysis greatly depends on the quantity / quality of incidents received
  - Reports rich in detail ➔ High quality solutions

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Report a medication incident to ISMP Canada

www.ismp-canada.org

or by telephone

416-733-3131

1-866-544-7672 (1-866-54 ISMPC)

ISMP Canada is a key partner in the Canadian Medication Incident Reporting and Prevention System (CMIRPS)

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Questions?

Contact:

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