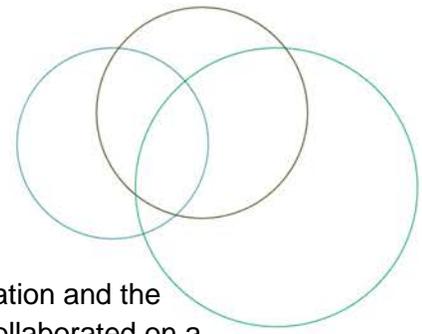


HOSPITAL HARM IMPROVEMENT RESOURCE

# Medication Incidents



## ACKNOWLEDGEMENTS



The Canadian Institute for Health Information and the Canadian Patient Safety Institute have collaborated on a body of work to address gaps in measuring harm and to support patient safety improvement efforts in Canadian hospitals.

The Hospital Harm Improvement Resource was developed by the Canadian Patient Safety Institute to complement the Hospital Harm measure developed by the Canadian Institute for Health Information. It links measurement and improvement by providing resources that will support patient safety improvement efforts.



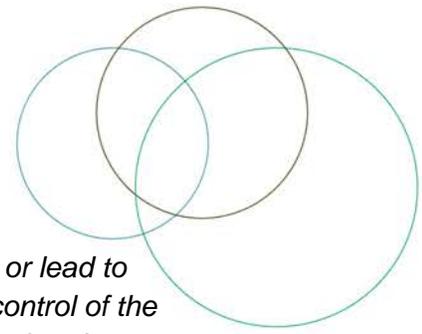


**DISCHARGE ABSTRACT DATABASE (DAD) CODES INCLUDED IN THIS CLINICAL CATEGORY:**

**A10: Medication Incidents**

<b>Concept</b>	Medication-related events involving incorrect administration or dosage of medications identified during a hospital stay.
<b>Notes</b>	This clinical group does not include events caused by medications in therapeutic use.
<b>Selection criteria</b>	
T36–T50	Identified as diagnosis type (2)
<b>Codes</b>	<b>Code descriptions</b>
T36.–	Poisoning by systemic antibiotics
T37.–	Poisoning by other systemic anti-infectives and antiparasitics
T38.–	Poisoning by hormones and their synthetic substitutes and antagonists, not elsewhere classified
T39.–	Poisoning by nonopioid analgesics, antipyretics and antirheumatics
T40.–	Poisoning by narcotics and psychodysleptics (hallucinogens)
T41.–	Poisoning by anesthetics and therapeutic gases
T42.–	Poisoning by antiepileptic, sedative-hypnotic and antiparkinsonism drugs
T43.–	Poisoning by psychotropic drugs, not elsewhere classified
T44.–	Poisoning by drugs primarily affecting the autonomic nervous system
T45.–	Poisoning by primarily systemic and hematological agents, not elsewhere classified
T46.–	Poisoning by agents primarily affecting the cardiovascular system
T47.–	Poisoning by agents primarily affecting the gastrointestinal system
T48.–	Poisoning by agents primarily acting on smooth and skeletal muscles and the respiratory system
T49.–	Poisoning by topical agents primarily affecting skin and mucous membrane and by ophthalmological, otorhinolaryngological and dental drugs
T50.–	Poisoning by diuretics and other and unspecified drugs, medicaments and biological substances





## OVERVIEW AND IMPLICATIONS

Medication incidents are defined as: *“any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer. Medication incidents may be related to professional practice, drug products, procedures, and systems, and include prescribing, order communication, product labeling/packaging/nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use”* (ISMP Canada, Definitions 2016). Medication safety is a shared responsibility among the healthcare team members, staff, and organizational leadership.

In the Canadian Adverse Events Study, drug- and fluid-related events were the second-most common type of adverse event (Baker et al., 2004). The Institute of Medicine (IOM) Committee on Identifying and Preventing Medication Errors estimated that at least 1.5 million preventable adverse drug events (ADEs) occur each year in the United States (Aspden et al. 2006). The Institute of Medicine report, *To Err is Human: Building a Safer Health System*, identified medication events as the most common type of adverse event in healthcare and highlighted that in the U.S., preventable medication events resulted in up to 7,000 deaths per year in hospitals and tens of thousands more in outpatient facilities.

A study by Lucian Leape and colleagues identified the frequency of occurrence of error at each stage of the hospital medication use process: prescribing 39 per cent, order processing and transcription 12 per cent, dispensing 11 per cent and administration 38 per cent. Nearly half of the prescribing errors were intercepted by nurses and pharmacists and about one third of transcription errors were identified and corrected prior to administration. However, only two per cent of errors occurring at the administration stage were intercepted (Leape et al. 1995). Several more recent studies have assessed the prevalence of medication incidents and cost to the health care system (Bell et al. 2011; Bishop et al. 2015; Scales et al. 2016; Lee et al. 2010).

### High Alert Medications

High-alert (or high-hazard) medications are medications that bear a heightened risk of causing significant patient harm when they are used in error. The Institute for Safe Medication Practices (ISMP) reports that, although mistakes may not be more common in the use of these medications, when errors do occur, the impact on the patient can be significant (ISMP 2011). Examples of high-alert medications include anticoagulants, hypoglycemic agents, opioids, concentrated electrolytes, cancer chemotherapy and paralyzing agents. For a complete list, see [ISMP High-Alert Medications in Acute Care Settings](#). Known safe practices can reduce the potential for harm as per IHI’s “Implement High Alert Medication Safety Processes” (IHI 2012).





## Medication Reconciliation

Communicating effectively about medications is a critical component of delivering safe care. By identifying and resolving medication discrepancies, the likelihood of adverse events occurring within health care organizations across the continuum of care will be reduced (Accreditation Canada et al. 2012).

Medication reconciliation is a three-step process in which healthcare providers work together with patients, families and care providers to ensure accurate and comprehensive medication information is communicated consistently across transitions of care (*Safer Healthcare Now!* 2017). Medication reconciliation requires a systematic and comprehensive review of all the medications a patient is taking to ensure that medications being added, changed or discontinued are carefully evaluated. It is an essential component of medication management and will inform and enable prescribers to make the most appropriate prescribing decisions for the patient. The literature regarding the potential impact of medication reconciliation continues to expand. The reconciling process has been demonstrated to be a powerful strategy to reduce ADEs as patients move from one level of care to another (Alex et al. 2016; Boockvar et al. 2011; Egnik et al. 2010; Vira et al. 2006; Whittington, Cohen 2004; Rozich et al. 2004; Mekonned et al. 2016; Michels, Meisel 2003).

## Never Events (Canadian Patient Safety Institute, 2015)

[A Never Events Report for Hospital Care in Canada](#) includes *Five Pharmaceutical Never Events* that result in serious patient harm or death, and that can be prevented by using organizational checks and balances:

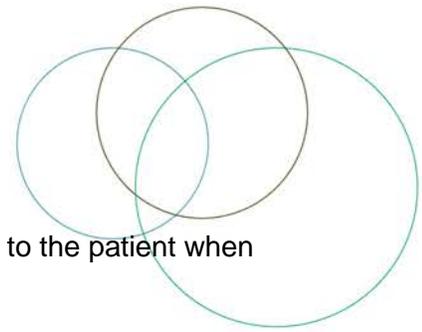
- Wrong-route administration of chemotherapy agents, such as vincristine administered intrathecally (injected into the spinal canal).
- Intravenous administration of a concentrated potassium solution.
- Inadvertent injection of epinephrine intended for topical use.
- Overdose of hydromorphone by administration of a higher-concentration solution than intended (e.g., 10 times the dosage by drawing from a 10 mg/mL solution instead of a 1 mg/mL solution, or not accounting for needed dilution/ dosage adjustment).
- Neuromuscular blockade without sedation, airway control and ventilation capability.

Capturing information about the incidence of never events and sharing the learning from reviews of incidents will be key to following system safety progress over time.

## GOAL

To prevent medication-related events involving incorrect administration or dosage of medications during a hospital stay.





## IMPORTANCE TO PATIENTS AND FAMILIES

Patients and families can play an important role in reducing errors and harm to the patient when they understand what medications the patient is taking and why (IHI, 2012).

### Patient Story

#### One son-in-law's pursuit to change the system

Claire Friedman was not the typical mother-in-law of sitcoms and punchlines. She was active, vibrant and loved by friends and family. So when Bernie Weinstein walked into the hospital that day in 2002 and saw his mother-in-law restrained in a chair, he was shocked.

## CLINICAL AND SYSTEM REVIEWS, INCIDENT ANALYSES

Given the broad range of potential causes of medication incidents, clinical and system reviews should be conducted to identify potential causes and determine appropriate recommendations.

Occurrences of harm are often complex with many contributing factors. Organizations need to:

1. Measure and monitor the types and frequency of these occurrences.
2. Use appropriate analytical methods to understand the contributing factors.
3. Identify and implement solutions or interventions that are designed to prevent recurrence and reduce risk of harm.
4. Have mechanisms in place to mitigate consequences of harm when it occurs.

To develop a more in-depth understanding of the care delivered to patients, chart audits, incident analyses and prospective analyses can be helpful in identifying quality improvement opportunities. Links to key resources for [conducting chart audits](#) and [analysis methods](#) are included in the [Hospital Harm Improvement Resources Introduction](#).

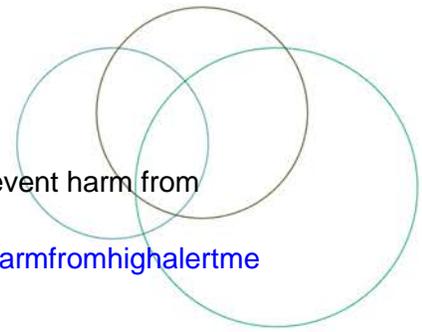
If your review reveals that your medication incidents are linked to specific processes, you may find these resources helpful:

- Institute for Healthcare Improvement (IHI). [www.ihl.org](http://www.ihl.org)
  - How-to Guide: *Prevent harm from high-alert medications*. 2012. <http://www.ihl.org/resources/Pages/Tools/HowtoGuidePreventHarmfromHighAlertMedications.aspx>
  - Institute for Healthcare Improvement (IHI). How-to Guide: Prevent harm from high-alert medications — pediatric supplement. <http://www.ihl.org/resources/Pages/Tools/HowtoGuidePreventHarmfromHighAlertMedicationsPediatricSupplement.aspx>



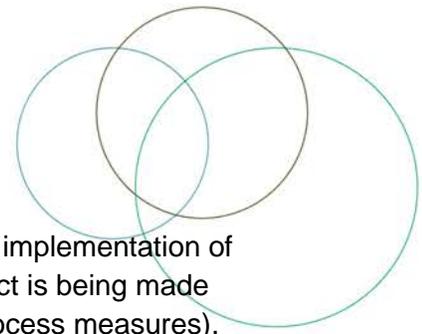
## HOSPITAL HARM IMPROVEMENT RESOURCE

### Medication Incidents



- Institute for Healthcare Improvement (IHI). How-to Guide: Prevent harm from high-alert medications — rural hospitals supplement. 2008.  
<http://www.ihl.org/resources/pages/tools/howtoguidepreventharmfromhighalertmedicationsruralhospitalssupplement.aspx>
- Improve core processes for administering medications. 2020.  
<http://www.ihl.org/resources/Pages/Changes/ImproveCoreProcessesforAdministeringMedications.aspx>
- Improve core processes for dispensing medications. 2020.  
<http://www.ihl.org/resources/Pages/Changes/ImproveCoreProcessesforDispensingMedications.aspx>
- Improve core processes for ordering medications. 2020.  
<http://www.ihl.org/resources/Pages/Changes/ImproveCoreProcessesforOrderingMedications.aspx>
- Institute for Safe Medication Practices Canada. <https://www.ismp-canada.org/>
  - Cross County MedRec Check-up. <https://www.ismp-canada.org/medrec/map/>
  - ISMP list of high-alert medications in acute care settings. 2018.  
<http://ismp.org/Tools/highalertmedications.pdf>
  - Medication safety self-assessment (MSSA). <https://www.ismp-canada.org/mssa.htm>
- Canadian Patient Safety Institute. <https://www.patientsafetyinstitute.ca>
  - Medication Safety  
<https://www.patientsafetyinstitute.ca/en/topic/pages/medication-safety.aspx>
  - Medication Reconciliation  
[https://www.patientsafetyinstitute.ca/en/Topic/Pages/medication-reconciliation-\(med-rec\).aspx](https://www.patientsafetyinstitute.ca/en/Topic/Pages/medication-reconciliation-(med-rec).aspx)
  - *Safer Healthcare Now!* Medication Reconciliation Getting Started Kit. Canadian Patient Safety Institute; 2017.  
<http://www.patientsafetyinstitute.ca/en/toolsResources/Pages/Med-Rec-resources-getting-started-kit.aspx>
- The National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) <https://www.nccmerp.org/>
- National Institute for Health and Care Excellence (NICE) <https://www.nice.org.uk>
  - Medicines and Prescribing Centre. *NICE guidelines: Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes.*  
<http://www.nice.org.uk/guidance/NG5/>





## MEASURES

Vital to quality improvement is measurement, and this applies specifically to implementation of interventions. The chosen measures will help to determine whether an impact is being made (primary outcome), whether the intervention is actually being carried out (process measures), and whether any unintended consequences ensue (balancing measures). In selecting measures, consider the following:

Whenever possible, use measures you are already collecting for other programs.

- Evaluate your choice of measures in terms of the usefulness of the final results and the resources required to obtain them; try to maximize the former while minimizing the latter.
- Try to include both process and outcome measures in your measurement scheme.
- You may use different measures or modify the measures described below to make them more appropriate and/or useful to your particular setting. However, be aware that modifying measures may limit the comparability of your results to others.
- Posting measure results within your hospital is a great way to keep your teams motivated and aware of progress. Try to include measures that your team will find meaningful and exciting (IHI, 2012).

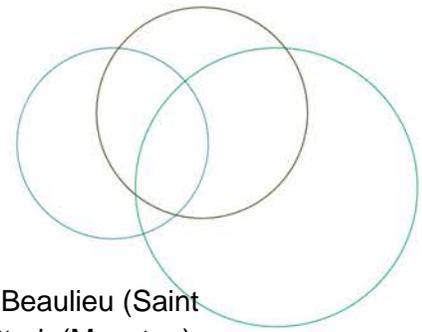
## GLOBAL PATIENT SAFETY ALERTS

[Global Patient Safety Alerts](#) (GPSA) provides access and the opportunity to learn from other organizations about specific patient safety incidents including alerts, advisories, recommendations and solutions for improving care and preventing incidents. Learning from the experience of other organizations can accelerate improvement.

### Recommended search terms:

- Adverse drug event
- High alert medication
- Medication
- Medication administration
- Medication dispensing
- Medication error
- Medication incident
- Medication orders
- Medication overdose
- Preventable adverse drug event





## MEDICATION INCIDENTS PREVENTION SUCCESS STORIES

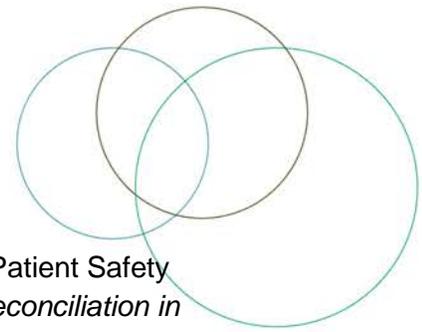
### Implementing MedRec at Horizon Health Network

At Horizon Health Network (Horizon), the Patient Safety Consultants: Diane Beaulieu (Saint John), John Glidden (Miramichi), Paula Pickard (Fredericton), and Melissa Stark (Moncton) are ambassadors for patient safety in their respective areas. They are passionate in assisting staff and teams with the implementation of medication reconciliation (MedRec). As a means to maintain the momentum for MedRec, they acknowledge and commend the staff for their hard work and dedication with this patient safety initiative. They recognize that quality MedRec can be unsuccessful if it is not kept at the forefront. However through persistence and use of a quality improvement framework which includes conducting small tests of change, constant monitoring, and evaluation - MedRec processes are becoming established and embedded in Horizon's organizational culture. .... (Canadian Patient Safety Institute 2015).

### Toolkit for Safe Implementation of Insulin Pens

Insulin safety is a key priority nationally for healthcare organizations, the Institute for Safe Medication Practice (ISMP) Canada and provincial governments. There is a growing interest in the adoption of insulin pens in the hospital setting as a means to improve insulin administration safety and ensure continuity of insulin product use by the patient from the community to the hospital setting and at discharge... (Health Standards Organization 2015).



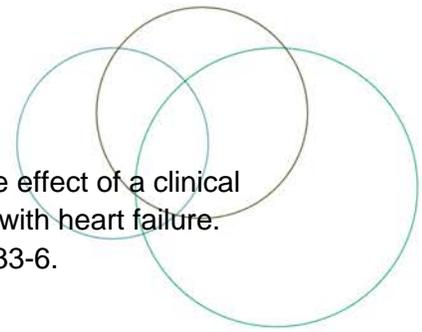


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**HOSPITAL HARM IMPROVEMENT RESOURCE**  
**Medication Incidents**



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