Backgrounder | October 2016

Technical Backgrounder for the Hospital Harm Measure

A new measure of hospital harm has been developed by the Canadian Institute for Health Information (CIHI) in partnership with the Canadian Patient Safety Institute (CPSI) to help stakeholders monitor their improvement efforts over time.

Hospitals, clinical experts, and experts in coding and data quality contributed to the development of the measure. It has gone through many steps, including

- Initial research and development (literature review, expert consultation, review of available data);
- Prototype testing with 7 pioneer hospitals;
- Consultation with the World Health Organization's Topic Advisory Group for Quality & Safety;
- Consultation with clinical experts to refine the clinical groups (modified Delphi survey);
- Data quality assessment (reabstraction study, chart review); and
- Data validation by hospitals.

Definition

Hospital harm captured by this measure is defined as **acute care hospitalizations with at least 1 occurrence of unintended harm during a hospital stay that could have been potentially prevented by implementing known evidence-informed practices**. The measure classifies harm into 31 actionable clinical groups so improvement efforts can be tracked both overall and for each specific clinical group.

The measure captures a range of harmful events, from "never events" — things that should never happen and are completely preventable (e.g., retained foreign body) — to events where implementing evidence-informed practices should reduce the incidence of harm but may not prevent every occurrence (e.g., aspiration pneumonia). While not all instances of harm captured by this measure may be prevented, adopting evidence-informed practices can help to reduce the rate of harm. Additional resources and information on actions that can be taken to reduce the risk of harm captured by this measure can be found in the *Hospital Harm Improvement Resource*, available on CPSI's website.

cpsi icsp
Canadian Patient Safety Institute
Institut canadien pour la sécurité des patients

CIHI ICIS
Canadian Institute for Health Information
Institut canadien d'information sur la santé

Scope of the Hospital Harm measure

The types of harm included in the measure are not reflective of all harm occurring in hospitals. Most hospitals have patient safety reporting and learning systems, and the Hospital Harm measure provides a complementary source of information to guide patient safety improvement efforts.

Harm is captured by this measure only when it

- Is identified as having occurred after admission and within the same hospital stay;
- Requires treatment or prolongs the hospital stay; and
- Is in 1 of the 31 clinical groups in the Hospital Harm Framework (see the figure).

The following are not captured:

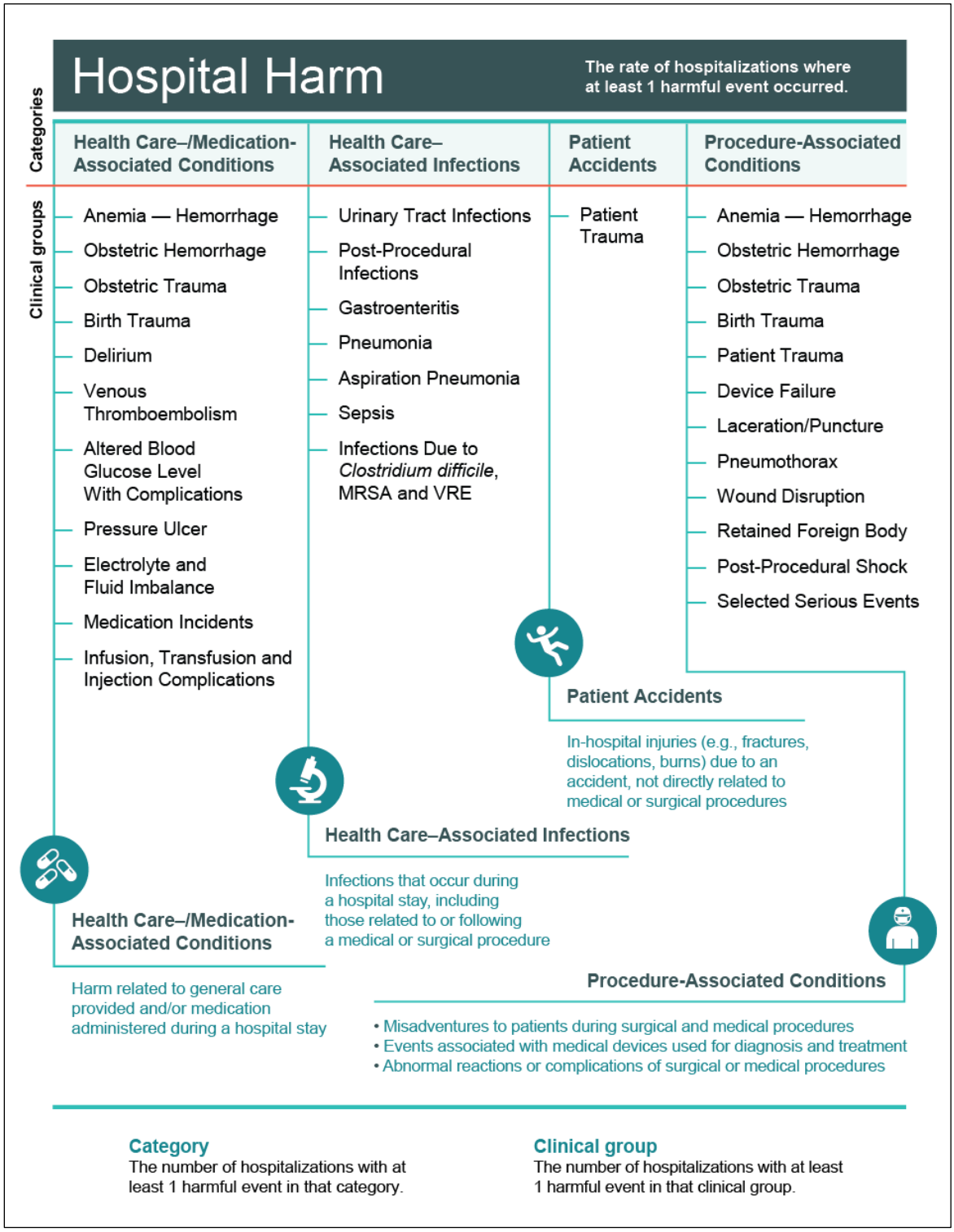
- Near misses — incidents that did not reach the patient (e.g., wrong dose of a medication that was caught before it was given to the patient);
- Incidents or events that reached the patient and could potentially have caused harm or injury but did not (e.g., a fall that did not result in injury);
- Harm that was undetected during the hospital stay but discovered on a subsequent emergency department visit or admission (e.g., an infection of a hip joint after joint replacement surgery that was diagnosed at a follow-up visit); and
- Harm to patients outside of acute inpatient care (e.g., harm that happens in other areas of a hospital, such as in the emergency department, outpatient clinics, rehabilitation or long-term care).

As well, for methodological reasons, data from Quebec and patients with selected mental health diagnoses is excluded from this measure.

Measure framework

The Hospital Harm Framework is composed of a broad range of harmful events. These have been organized into 4 categories of harm: Health Care–/Medication-Associated Conditions, Health Care–Associated Infections, Patient Accidents and Procedure-Associated Conditions. The 4 categories of harm are further broken down into 31 clinical groups. These groups are linked to evidence-informed practices that can reduce the likelihood of the occurrence of harm. These 31 clinical groups provide a level of specificity that can help hospitals identify priorities for improvement. A description of the 4 categories and what's included in each is provided in the appendix.

Figure Hospital Harm Framework



Counting Occurrences of Harm

At each level of the Hospital Harm Framework (clinical group, category and overall measure), the number of hospital stays with *at least 1* occurrence of harm are counted.[i] For example, if a patient experiences more than 1 type of harmful event (e.g., pneumonia and a fall), each event would be counted once within its respective clinical group but only once in the overall rate of hospital harm. Thus the measure provides both an overall sense of how often patients experience at least 1 harmful event as well as the ability to see the frequency with which the different types of harmful events are occurring.

Data source

A key advantage of this measure is that it uses existing data already being submitted to CIHI's Discharge Abstract Database (DAD) — no additional data collection is needed to calculate the measure. The DAD captures administrative, clinical and demographic information on hospital discharges across Canada (excluding Quebec). It is well established, has common standards for data collection and has built-in methods for auditing and assuring data quality.

Harm captured by this measure is identified by diagnosis and intervention codes,[ii] as well as by additional information that conveys the timing of the harm (pre- or post-admission). The diagnosis codes included in the measure are for post-admission diagnoses that are significant enough to affect care (as evidenced by the physician's documentation and outlined by CIHI's coding standards). This information allows for identification of harmful events and their timing.

Next steps

CIHI and CPSI are committed to working with stakeholders across the country to ensure that this measure is a useful tool for monitoring and improving patient safety in acute care facilities. Work will continue to understand and improve both the data and the underlying documentation and coding processes behind the measure. Investigation into the feasibility of developing this measure into a comparable indicator will also continue.

Some of the challenges around developing a comparable indicator include the following:

- A hospital's harm rate is subject to coding bias, so hospitals with better documentation may have higher rates.
- Hospitals that have more patients with highly complex conditions may not be fully risk-adjusted.
- All occurrences of harm, regardless of severity or type, are considered to be of the same weight in terms of contributing to a hospital's overall rate.

i. Each harmful event is captured in only 1 clinical group, with the exception of infections due to methicillin-resistant *Staphylococcus aureus* (MRSA) or vancomycin-resistant enterococci (VRE). These infections could be captured in multiple clinical groups (e.g., a urinary tract infection due to MRSA is captured in both the **Urinary Tract Infections** and **Infections Due to *Clostridium difficile*, MRSA or VRE** clinical groups).

ii. Interventions and diagnoses are coded using the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada (ICD-10-CA) and the Canadian Classification of Health Interventions (CCI) codes, per the Canadian Coding Standards.

More information

For more information, please send an email to hsp@cihi.ca.

Appendix: Clinical group descriptions

Health Care–/Medication-Associated Conditions

This category includes harm related to general care provided and/or medication administered during a hospital stay.

Clinical group	Description
Anemia — Hemorrhage	Hemorrhagic anemia or hemorrhagic disorders related to the health care delivered or use of anticoagulants for treatment
Obstetric Hemorrhage	Hemorrhage from the pelvic area, genital tract or perineum following vaginal delivery without instrument that requires a blood transfusion
Obstetric Trauma	Third- or fourth-degree perineal lacerations or other obstetric injuries to pelvic organs during a vaginal delivery without instrument
Birth Trauma	Injuries to the newborn during vaginal delivery without instrument
Delirium	Temporary disturbance in consciousness with changes in cognition
Venous Thromboembolism	Embolism, thrombosis, phlebitis or thrombophlebitis of the pulmonary vein or other veins (excluding superficial veins)
Altered Blood Glucose Level With Complications	Lactic acidosis or hypoglycemia in diabetic and non-diabetic patients
Pressure Ulcer	Any stage of pressure ulcer
Electrolyte and Fluid Imbalance	Electrolyte, fluid or acid–base imbalance
Medication Incidents	Medication-related events involving incorrect administration of medications or dosage
Infusion, Transfusion and Injection Complications	Complications from infusions, transfusions and injections, including those related to therapeutic substances or procedures

Health Care–Associated Infections

This category includes infections that occur during a hospital stay, including those related to or following a medical or surgical procedure.

Clinical group	Description
Urinary Tract Infections	Urinary tract infection
Post-Procedural Infections	Infections associated with a medical or surgical procedure (e.g., a surgical site infection or infection following an injection)
Gastroenteritis	Gastrointestinal infections, excluding infections due to *Clostridium difficile*
Pneumonia	Pneumonia, excluding aspiration pneumonia
Aspiration Pneumonia	Inflammation and infection of the lungs caused by aspiration of solids or liquids
Sepsis	Sepsis identified during a hospital stay, excluding neonatal sepsis
Infections Due to *Clostridium difficile*, MRSA or VRE	Bacterial infections due to *Clostridium difficile* (*C. difficile*), methicillin-resistant *Staphylococcus aureus* (MRSA) or vancomycin-resistant enterococci (VRE)

Patient Accidents

This category includes in-hospital injuries (e.g., fractures, dislocations, burns) that happen to a patient and are due to a patient accident, not directly related to medical or surgical procedures.

Clinical group	Description
Patient Trauma	Injuries such as fractures, dislocations, burns, etc., due to an accident, not related to medical or surgical procedures (e.g., injuries as the result of a patient fall or transfer from bed to chair)

Procedure-Associated Conditions

This category includes conditions associated with medical or surgical procedures. These include events associated with medical devices used for diagnosis and treatment, abnormal reactions or complications of surgical or medical procedures, or other misadventures to patients during surgical and medical procedures.

Clinical group	Description
Anemia — Hemorrhage	Hemorrhage or hemorrhagic anemia associated with a medical or surgical procedure
Obstetric Hemorrhage	Hemorrhage from the pelvic area, genital tract, perineum or surgical incision after an instrument-assisted delivery or Caesarean section delivery that requires a blood transfusion
Obstetric Trauma	Lacerations of third degree or greater severity, or other obstetric injury to pelvic organs during an instrument-assisted vaginal delivery
Birth Trauma	Injuries to the newborn during an instrument-assisted or Caesarean section delivery
Patient Trauma	Injuries, such as fractures, dislocations, burns, etc., associated with a medical or surgical procedure

Clinical group	Description
Device Failure	Mechanical complications of devices, catheters, grafts, implants or prostheses associated with a medical or surgical procedure
Laceration/Puncture	Unintentional or accidental cut, puncture or perforation during a medical or surgical procedure
Pneumothorax	Pneumothorax associated with a medical or surgical procedure
Wound Disruption	Disruption of surgical or obstetric wound
Retained Foreign Body	Foreign object or substance unintentionally left in the body during a medical or surgical procedure
Post-Procedural Shock	Shock during or resulting from a procedure
Selected Serious Events	Failure of sterile precautions, failure in suture or ligature during surgical operation, wrong placement of endotracheal tube or performance of an inappropriate operation