Appendix A: Technical Notes for Waits for Hip Fracture Surgery

Part 1: Definitions, Data Sources, Case Selection and Methodology for Inpatient Wait Time for Hip Fracture Surgery

Definitions

**Benchmark:** hip fracture fixation within 48 hours (set by federal, provincial and territorial governments in December 2005).

In discussion with provinces and recognizing the limitations of the data, this benchmark has been interpreted as the percentage meeting the benchmark of 48 hours from inpatient admission.

**Inpatient hip fracture surgery wait segment/time:** the number of hours the patient waited, from the time of first inpatient admission with a hip fracture (index admission) to the time the patient received hip fracture repair surgery. **Note:** Waits were calculated only for patients who had a surgical repair.

**50th percentile:** the number of hours within which half of the patients in the sample received surgery and half were still waiting.

**90th percentile:** the number of hours within which 90% of the patients in the sample received surgery and 10% were still waiting.

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Who We Are

Established in 1994, CIHI is an independent, not-for-profit corporation that provides essential information on Canada’s health system and the health of Canadians. Funded by federal, provincial and territorial governments, we are guided by a Board of Directors made up of health leaders across the country.

Our Vision

To help improve Canada’s health system and the well-being of Canadians by being a leading source of unbiased, credible and comparable information that will enable health leaders to make better-informed decisions.

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Data Sources

Patients discharged from April 1, 2011, to September 30, 2011, from acute care facilities that submit to CIHI’s Discharge Abstract Database (DAD). Open-year data may not contain complete provincial/territorial submissions to CIHI. At the time of analysis, it is estimated CIHI had received 99% of abstracts, relative to 2010–2011 for the same time period. While provincial completeness is high, there may be distinct analytic impacts for provinces with slower submissions to CIHI. Additionally, open-year data will not have been subjected to the full cycle of quality validation, at both CIHI and the submitting facilities. Hospitals may still add, delete or correct records.

Quebec wait times for hip fracture repair are not included due to methodological differences in the data. For information on Quebec hip fracture wait times, see CIHI’s report Comparing Wait Times for Hip Fracture Repair in Quebec With Those in Other Jurisdictions.

The methodology used for this report differs from that used in previous Health Indicators reports. As of 2009–2010, inclusion of “time of intervention” is captured and allows for a more accurate estimate of wait times. For more information on Health Indicators methodology, see www.cihi.ca/indicators.

Methodology

Case Selection

Inclusions

- Males and females age 18 and older
- Discharged from acute care facilities
- Discharged with a hip fracture diagnosis (see code selection below) in the following scenarios:
  A. Main diagnosis was hip fracture (type M)
  B. Hip fractures were pre-admit comorbidities (type 1) or service transfers (types 1, W, X and Y)
  C. Main diagnosis was for rehabilitation (see code selection below) with a pre-admit hip fracture or service transfer (types 1, W, X and Y) and a hip replacement procedure (see code selection below)

Exclusions

- Patients with invalid health card numbers
- Fractures that occurred post-admission (type 2)

Episode Building

- Patients may be admitted to one hospital and transferred to another for further treatment. Linking all admissions together into a single episode of care allows us to see the entire acute portion of the pathway of care.
- A transfer is defined as a scenario when a patient is discharged from one acute facility and admitted to another within 24 hours, with all abstracts having a diagnosis of hip fracture.
Linkage is done by combining the health care number, gender and province issuing health care number to create a unique identifier for each patient and identifying all relevant acute care admissions.

**Time Calculations**

- Time to surgery is calculated as time from initial inpatient admission for a hip fracture to start time of surgical episode for a hip repair (may be a fixation or replacement).
- There are no time calculations done for patients with invalid date/time estimates in the admission date/time or surgical episode date/time variables.
- If the patient did not receive a hip repair in the time frame (April 1, 2011, to September 30, 2011), no time was calculated.

**Code Selection**

**Hip fracture**

ICD-10: S72.0^, S72.1^ or S72.2^

**Hip repair**

CCI: 1VA74^, 1VA53^, 1VC74^ or 1SQ53^

**Rehabilitation**

ICD-10: Z50.1^, Z50.8^, Z50.9^, Z54.0^, Z54.4^, Z54.7^, Z54.8^ or Z54.9^
Part 2: Definitions, Data Sources and Methodology for Emergency Department Wait Time for Hip Fracture Surgery

Definitions That Differ From Part 1

**Benchmark**: hip fracture fixation within 48 hours (set by federal, provincial and territorial governments in December 2005).

This benchmark has been interpreted as

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\text{Percentage Meeting Benchmark of 48 Hours From ED Admission} = \frac{\text{The number of hip fracture patients, age 18 and older, who underwent hip fracture surgery within 48 hours of the time of admission to the ED}}{\text{The total number of hip fracture patients, age 18 and older, who received hip fracture surgery}}
\]

**Emergency department hip fracture surgery wait time**: measured in hours from the time of first registration in an ED with a hip fracture (index admission) to the time when hip surgery was received.

**Note**: Waits were calculated for patients who had a surgical repair only.

Data Sources

Patients discharged from April 1, 2011, to September 30, 2011, from Ontario and Alberta emergency care facilities that submit to CIHI's National Ambulatory Care Reporting System (NACRS), as well as to DAD, as indicated in Part 1. Open-year data may not contain complete provincial/territorial submissions to CIHI. At the time of analysis, CIHI had received 102% of abstracts, relative to 2010–2011 for the same time period. While provincial completeness is high, open-year data will not have been subjected to the full cycle of quality validation, at both CIHI and the submitting facilities. Hospitals may still add, delete or correct records.

Methodology

This methodology for ED wait times for hip fracture surgery builds on previous estimates of inpatient wait times for hip fracture surgery by measuring time spent in the ED by patients in Ontario and Alberta. This data is not available for other provinces in NACRS.

Our base sample is patients admitted to an Ontario or Alberta acute care facility with a hip fracture and repair as previously identified (see Part 1 for code selection). The next step is to identify any immediately preceding visits made by sample patients to an Ontario or Alberta ED, which will provide the ED portion of the wait.
Emergency Department Definition

Ontario and Alberta EDs were defined by their MIS functional centre codes, as follows:

- Patients admitted to an emergency department ambulatory care group (includes MIS functional centres starting with 71310, 72310 or 73310); and
- Unscheduled ED visits.

Transfers/Episode Building

- Patients may be admitted to one ED and transferred to another. Linking all admissions together into a single episode of care allows us to see the entire ED portion of the pathway of care.
- A transfer is defined as a scenario when a patient is discharged from one ED and admitted to another within 24 hours.

Linkage From DAD to NACRS

- Patients are identified in DAD and NACRS using a personal identifier created using the first 10 digits of the health care number, gender and the province issuing health care number.
- The ED record is considered related to the inpatient admission for hip fracture if the patient is discharged from the ED 24 hours or less prior to the inpatient admission.

Note: Abstracts were excluded if they indicated that patients entered through the ED but there were no matching ED episodes, as the pathway of care was incomplete.

Time Calculations

- Overall wait time was calculated as time patient first registered in ED (index ED admission) to start time of surgical repair.
- Portion of time spent in ED was calculated as time patient first registered in ED (index ED admission) to time of inpatient admission.
- Portion of time spent in acute care was calculated as time from inpatient admission to start time of surgical repair.
Appendix B: Calculating the All-Canada Estimates

Part A: Calculating All-Canada Percentage Meeting Benchmark

The national percentage meeting benchmark estimates was calculated as follows:

National percentage meeting benchmark = \( \frac{\text{Total patients meeting benchmark for each province}^*}{\text{Total procedures performed}} \)

Note
* Estimated by provincially submitted volumes and percentage meeting benchmark.

Part B: Calculating All-Canada Median and 90th Percentile Waits

The national estimate for the 50th and 90th percentiles was calculated using a weighted average of provincial submissions. Weights were calculated using provincially submitted surgical volumes.