Hospital Report e-Scorecard 2006: **Rehabilitation Clinical Utilization and Outcomes Technical Summary**

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Overview

The Hospital Report e-Scorecard 2006: Rehabilitation Clinical Utilization and Outcomes data templates provide stakeholders with a better understanding of the clinical performance of hospitals with designated rehabilitation beds in Ontario. Indicators in these data templates can be used for both quality improvement and accountability purposes. These indicators reflect elements of clinical success and efficiency during the rehabilitation stay from admission to discharge and give a broad picture of performance. Outcomes represent changes in a client's health status that can be attributed to the care they have received.

The Clinical Utilization and Outcomes Technical Summary presents detailed information regarding the methodology for the Hospital Report e-Scorecard 2006: Rehabilitation Clinical Utilization and Outcomes data templates. Sex-stratified data are provided at the provincial level, local health integration network (LHIN) level, and hospital level in the e-Scorecard. The primary data source for indicators in this quadrant is the National Rehabilitation Reporting System (NRS), which was developed by the Canadian Institute for Health Information (CIHI). Data submission to the NRS was mandated for designated rehabilitation beds in Ontario in October 2002, providing for province-wide inpatient rehabilitation clinical utilization and outcomes indicators for all hospitals in 2006. In Ontario, the NRS contains data on adult clients (primarily 18 years and over) receiving care in designated rehabilitation beds. The focus is on clients who have a time-limited episode of service, individualized and documented rehabilitation plans, predicted discharge date, and expected improvements in functional status.

Methodology

Data Source

The primary assessment instrument used in the NRS is the FIM[TM][1] instrument. The FIM[TM] instrument is a proprietary instrument used to measure functional independence at admission and discharge. It is comprised of 18 items (13 motor items and 5 cognitive items) that are rated on a seven level scale representing gradations from independent (7) to dependent (1) function, for an overall maximum score of 126 (18 items x 7). The FIM[TM] instrument is a measure of disability, and looks at the caregiver burden associated with the level of disability. The overall FIM[TM] instrument score can be broken down into motor and cognitive subscales to provide further detail on identifying areas of functional loss. Data are collected at admission to and discharge from hospitals for each rehabilitation visit, with the option of collecting data three to six months following discharge from inpatient rehabilitation. Admission data must be completed within 72

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[1] The 18-item FIM[TM] instrument referenced herein is the property of Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities, Inc.

hours after admission and data must be collected within 72 hours before discharge from the rehabilitation program. Follow-up assessment data are collected between 80 and 180 days after discharge from the program if the hospital decides to collect data for this component of the data set. Data on socio-demographic information, rehabilitation length of stay, and pre-admittance and post-discharge living arrangements included in the NRS are derived from a variety of sources including the chart, other staff, the client, or family members.

Selection of Cases – Inclusion Criteria

The data included in the e-Scorecard 2006 are based on 26,121 records with complete admission and discharge FIM^{TM} instrument information for the period April 1, 2004 to March 31, 2005. Data collected for initial rehabilitation, continuing rehabilitation, short stay evaluation, and re-admissions are included. Records where sex was not clearly identified as either male or female were excluded.

Unlike acute care discharges that classify clients according to diagnostic codes, each client in the NRS is classified into a Rehabilitation Client Group (RCG)[2], which includes those with impairments, activity limitations, and/or participation restrictions associated with the 17 groupings in the table below (Table 1). In the NRS, RCGs are collected at a greater level of detail than these 17 categories providing more specific information about the condition, such as the type of stroke or orthopaedic condition. This higher level RCG is a mandatory field. In the e-Scorecard, information is provided for all 17 RCGs combined; this group is referred to as "All RCGs". From the 17 RCG categories, information is also provided for Total Stroke and Total Orthopaedic Conditions. Total Orthopaedic Conditions are further subdivided into Post Hip Fracture and Post Hip and Knee Replacement. Total Stroke and Total Orthopaedic Conditions were chosen as the primary RCGs to report because they represent 68% of all inpatient rehabilitation discharges from Ontario hospitals.

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[2] Rehabilitation Client Groups (RCGs) referenced herein are adapted with permission from the UDSMR impairment codes. Copyright © 1997 Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities, Inc., all rights reserved.

Table 1. Number of Ontario Discharges from April 1, 2004 to March 31, 2005 with Complete Admission and Discharge FIM^{TM} Instrument Data by RCG and by Sex.

RCG	Females	Males
Orthopaedic Conditions	9,823	4,369
Stroke	1,831	1,936
Medically Complex	1,023	778
Debility	554	407
Pulmonary	421	308
Cardiac	420	368
Brain Dysfunction	328	551
Neurological Conditions	295	284
Amputation of Limb	236	593
Spinal Cord Dysfunction	229	376
Pain Syndromes	192	91
Arthritis	154	75
Major Multiple Trauma	116	199
Other Disabling Impairments	84	45
Burns	10	10
Congenital Deformities	8	*
Developmental Disabilities	*	*

Source: NRS, CIHI 2004-2005

Note: *Indicates data suppressed due to privacy concerns.

Hospital Participation

Since participation in the NRS is mandated by the Ontario Ministry of Health and Long-Term Care, the Clinical Utilization and Outcomes data templates include data from all 54 corporations with designated rehabilitation beds for the period April 1, 2004, to March 31, 2005. Data from all of these 54 corporations with designated rehabilitation beds were used to calculate provincial and LHIN means. In the e-Scorecard, corporate and site level data are broken down by sex for both the indicators and components. Provincial and LHIN level data are broken down by sex for the indicators only.

Indicator Definitions

There are two main types of indicators calculated for the Rehabilitation Clinical Utilization and Outcomes data templates - those that measure service utilization and those that measure functional outcomes. The two indicators in the e-Scorecard that measure service utilization are:
- Average Days Waiting for Admission to Rehabilitation; and
- Average Active Rehabilitation Length of Stay.

The four indicators in the e-Scorecard that measure clinical outcomes using the FIM^{TM} instrument are:
- Average Total Function Change;
- Average Motor Function Change;
- Average Cognitive Function Change; and
- Length of Stay Efficiency.

In the e-Scorecard, all six indicators are reported for each of the following RCG groups: All RCGs; Total Stroke; Total Orthopaedic Conditions; Post Hip Fracture; and Post Hip and Knee Replacement. The indicator definitions as well as the formulae for indicator calculation at the hospital level are presented in the table below (Table 2). As noted previously, only episodes with complete admission and discharge FIM^{TM} instrument data are included. The total number of clients (n) was based on the total number of episodes and was therefore constant for all six indicators for individual hospital sites/corporations.

Table 2. Indicator Definitions and Formulae at the Hospital Level

Indicator Name	Indicator Definition and Formula
Average Days Waiting for Admission to Rehabilitation	Definition: The average days waiting for admission to rehabilitation is the average number of days between the Date Ready for Admission and the Date of Admission to rehabilitation. It is a measure for the length of time clients are waiting for a rehabilitation bed and identifies whether wait time is adversely affecting length of stay in acute care. Formula*: Average days waiting for admission to rehabilitation = Sum[Admission date – Date ready for admission]/n
Average Active Rehabilitation Length of Stay	Definition: The average active rehabilitation length of stay is the number of days between the date on which the client is admitted to the rehabilitation facility and the date on which the client is discharged from the rehabilitation facility, minus any service interruption days and days waiting for discharge from inpatient rehabilitation. Formula**: Average active rehabilitation length of stay = Sum[(Discharge date – admission date) – Service interruption days – Waiting days for discharge from inpatient rehabilitation]/n
Average Total Function Change	Definition: The average total function change is the average difference between the sum of all 18 elements on the FIM^{TM} instrument at discharge and the sum of all 18 elements on the FIM^{TM} instrument at admission. Formula: Average total function change = Sum[Discharge total function score – Admission total function score]/n
Average Motor Function Change	Definition: The average motor function change is the average difference between the sum of all 13 elements on the FIM^{TM} instrument that measure motor activities at discharge from and admission to an inpatient rehabilitation facility. Formula: Average motor function change = Sum[Discharge FIM^{TM} instrument motor score – Admission FIM^{TM} instrument motor score]/n
Average Cognitive Function Change	Definition: The average cognitive function change is the average difference between the sum of all 5 elements on the FIM^{TM} instrument that measure cognitive actifities at discharge from and admission to an inpatient rehabilitation facility. Formula: Average cognitive function change = Sum[Discharge FIM^{TM} instrument cognitive score – Admission FIM^{TM} instrument cognitive score]/n
Length of Stay Efficiency	Definition: Length of stay efficiency is the average change in total function score per day of clients participating in a rehabilitation program where the total function score is the total score as measured by the FIM^{TM} instrument. LOS efficiency is calculated for each individual client by dividing the individual's total function score gain by that individual's length of stay, then averaging the individual rates across all clients. Formula***: Length of stay efficiency = Sum[Total function change/Length of stay]/n

*If the 'Ready for Admission Date' was missing, then 'Ready for Admission Date' was set equal to 'Admission Date'.

**If there were no service interruption dates recorded, then the value for 'Service interruption days' was set equal to zero.

***Length of stay = Discharge date – Admission date – Total service interruption days

Data Analysis

All analyses were performed using SAS Version 9.01 . Means of the indicators were calculated at three levels: provincial; LHIN; and hospital. The E-scorecard includes hospital corporation and site-level indicator means and components by sex and age group. Averages for a sex difference category, defined as the ratio (F-M)/F, are included.

Verification Procedures

Prior to finalizing the data to be presented in the e-Scorecard, each participating hospital was asked to verify their data. Since many hospitals did not have the capability in-house to statistically analyze their NRS data they were asked to verify their data by referring to their CIHI Reports 2A and 2B from April 1, 2004 to March 31, 2005. The following data were verified: total number of cases with completed admission and discharge FIM^{TM} instrument data; average age; percent males; percent females; average admission function score; average discharge function score; average motor function change; average cognitive function change; average days waiting for admission to rehabilitation; and average active rehabilitation length of stay.

Some indicators could not be independently verified by the hospitals due to differences in methodologies or reporting categories. For instance, the length of stay efficiency indicator could not be verified against the CIHI report because of differences in the calculations used in the e-Scorecard and by CIHI. In November 2005, CIHI changed the calculation for the length of stay efficiency indicator so that it aligns with the calculation used for the Hospital Report e-Scorecard. Admission and discharge cognitive function scores are not provided in the NRS Q4 2004 Format B report and, therefore, were not verifiable in the same manner. Lastly, hip and knee replacements are reported separately in the CIHI quarterly report whereas in the e-Scorecard these categories are combined and thus not verifiable in the same manner.

Performance Classification

Hospitals were compared with the provincial average and classified into the following three categories based on their performance: above average; average; and below average. A score of above average performance or below average performance means that the hospital's score was statistically different than the average score for all participating hospitals. Colors were used to indicate performance as follows:
  * Green - the hospital's score reflected above average performance
  * Yellow - the hospital's score reflected average performance
  * Red - the hospital's score reflected below average performance.

For each hospital, the mean and the corresponding 95 percent confidence intervals for each of the six key indicators were calculated for the following RCG classifications: All

RCGs; Total Stroke; Total Orthopaedic Conditions; Post Hip Fracture; and Post Hip and Knee Replacement.

For all of the indicators, an above average performance classification is desirable. For *Average total function change, Average motor function change, Average cognitive function change,* and *Length of stay efficiency* a comparatively higher indicator score is desirable, while for *Average active rehabilitation length of stay* and *Average days waiting for admission to rehabilitation*, a comparatively lower indicator score is desirable.

A performance classification of above average was assigned when the hospital's entire 95% confidence interval exceeded the mean provincial score for the following indicators: *Average total function change, Average motor function change, Average cognitive function change*, and *Length of stay efficiency*. For example, for *Average total function change*, a performance classification of above average was assigned when the lower bound of the hospital's 95% confidence interval exceeded the mean provincial score. A performance classification of above average was assigned when the hospital's entire 95% confidence interval was less than the mean provincial score for the following indicators: *Average active rehabilitation length of stay* and *Average days waiting for admission to rehabilitation.*

A performance classification of below average had to satisfy two conditions. First, a performance classification of below average was assigned when the hospital's entire 95% confidence interval was lower than the mean provincial score for the following indicators: *Average total function change, Average motor function change, Average cognitive function change*, and *Length of stay efficiency*. A performance classification of below average was assigned when the hospital's entire 95% confidence interval was more than the mean provincial score for the following indicators: *Average active rehabilitation length of stay* and *Average days waiting for admission to rehabilitation.* Second, a performance classification of below average was assigned when the hospital's mean score was less than the mean score for every hospital that was rated as average for the following indicators: *Average total function change, Average motor function change, Average cognitive function change*, and *Length of stay efficiency*. A performance classification of below average was assigned when the hospital's mean score was greater than the mean score for every hospital that was rated as average for the following indicators: *Average active rehabilitation length of stay* and *Average days waiting for admission to rehabilitation.* If the hospital met the first criterion but not the second, the hospital's performance was classified as average.

A performance classification of average was also assigned when the mean provincial score fell within the hospital's 95% confidence interval for that indicator. No performance classifications are provided for the Clinical and Utilization Outcomes indicators stratified by sex.

Identifying High Performing "Benchmark" Hospitals

High performing "benchmark" hospitals were not identified in the Hospital Reports e-Scorecard 2006: Rehabilitation Clinical Utilization and Outcomes.

Risk Adjustment

Similar to the e-Scorecard 2005, unadjusted values are presented in the Hospital Report e-Scorecard 2006: Rehabilitation Clinical Utilization and Outcomes.