

## EXECUTIVE SUMMARY

### Background and Introduction

Joint replacement and hip fracture patients accounted for approximately 50% of all inpatient rehabilitation cases<sup>1,2</sup> and approximately 67% of all inpatient musculoskeletal (MSK) rehabilitation cases<sup>3</sup> in Ontario in 1999-2000.<sup>4</sup> At that time, the Health Services Restructuring Commission (HSRC) reports raised concerns about an over-utilization of inpatient rehabilitation for joint replacement patients while Alternate Level of Care (ALC) initiatives<sup>5</sup> reported that the hip fracture population accounted for at least 15% of all Alternate Level of Care cases. In spite of this, the hip fracture and joint replacement populations have been treated homogeneously under the heading of MSK rehabilitation when it comes to delivering services.

With the inception of the Total Joint Network (TJN)<sup>6</sup> in 2005, the issues related to total joint replacement care are improving, offering opportunity to improve the orthopaedic landscape for populations such as hip fracture. Understanding the change that initiatives such as the Total Joint Network have been able to accomplish requires an understanding of the system prior to implementation of the change. For this reason, this document seeks to provide an overall understanding of the size and characteristics of the orthopaedic rehabilitation landscape for these populations in 2002-2003.<sup>7</sup>

The objectives of this report were therefore to:

- 1) Quantify and characterize the number of hip fracture, hip replacement and knee replacement patients who had records in the Discharge Abstract Database (DAD) and in the National Rehabilitation Reporting System (NRS) in 2002-2003, as well as for whom information was captured at the Community Care Access Centres (CCACs) of Toronto in 2003-2004.
- 2) Quantify and characterize the supply of inpatient rehabilitation services using the program and admission criteria information available from the GTA Rehab Network's *Rehab Finder* program and admission criteria database.
- 3) Use the data and analysis to provide recommendations for implementation by the GTA Rehab Network and for consideration by the Local Health Integrated Networks, the Ministry of Health and Long-Term Care, and program directors and administrators at GTA Rehab Network member organizations.

<sup>1</sup> Jaglal, S., Walker, J., Badley, E., Markel, F., Naglie, G., Steele, C., Verrier, M., Williams, J., *Epidemiological Variables and Utilization in Rehabilitation in Ontario* (2001).

<sup>2</sup> The figure was reconfirmed by CIHI's recent annual report on the National Rehabilitation Reporting System.

<sup>3</sup> This was calculated by exploring the total of all musculoskeletal diagnoses including amputations as the denominator to the number of hip fracture and joint replacement patients.

<sup>4</sup> Jaglal, S., Walker, J., Badley, E., Markel, F., Naglie, G., Steele, C., Verrier, M., Williams, J., *Epidemiological Variables and Utilization in Rehabilitation in Ontario* (2001).

<sup>5</sup> GTA Rehab Network, *Analysis of Alternative Levels of Care (ALC) Snapshots: Patients Awaiting Rehabilitation in ALC and Inpatient Rehabilitation Capacity* (Toronto, 2004).

<sup>6</sup> The TJN model of care enrolls patients in one of two streams: (a) 3 days in acute care followed by 7 days in inpatient rehab, or (b) 5 days in acute care with rehab delivered at home post-discharge.

<sup>7</sup> Another initiative led by Dr. Aileen Davis in partnership with the GTA Rehab Network will examine parts of the system from a more current perspective.

The data elements reported in this report are categorized by age and hospital group and include:

| Acute care (DAD)   | Rehabilitation (NRS)   | CCAC  | Supply ( <i>Rehab Finder</i> )   |
|--|--|---|--|
| <ul style="list-style-type: none"> <li>Number of cases</li> <li>Age distribution</li> <li>Length of stay</li> <li>Resource intensity weights</li> <li>Complexity levels</li> <li>Discharge locations and dispositions</li> </ul> | <ul style="list-style-type: none"> <li>Number of cases</li> <li>Age distribution</li> <li>Length of stay</li> <li>Admission, Discharge, and Change in FIM scores.</li> </ul> | <ul style="list-style-type: none"> <li>Units of service</li> <li>Types of services</li> <li>Number of clients</li> <li>Age and gender of clients</li> </ul> | <ul style="list-style-type: none"> <li>Location</li> <li>Bed numbers: general &amp; population specific</li> <li>Admission, exclusion, discharge criteria</li> <li>Program goals</li> <li>Special needs</li> </ul> |

## Limitations

The limitations in this report are associated with either the scope or the nature of the available databases. Perhaps the most important is the use of 2002-2003 data, which may not be fully representative of the current landscape. In addition, there are coding issues and data collection inconsistencies across databases. For the supply database, the availability of services is for MSK in general so the number of beds is over-reported relative to the number of joint replacement and hip fracture cases. In addition, the scope of this report precludes consideration of outpatient programs as well as consideration of expected growth rates. Finally, the report does not contain an analysis of the GTA/905 CCAC data and the data for the CCACs of Toronto relates to 2003-2004.

## Key Findings

*Table i: Overall summary of acute care patient data as explored in the report (2002-2003)<sup>8</sup>*

|  | Hip Fracture <sup>9</sup> | Hip Replacement <sup>10</sup> | Knee Replacement |
|--|---------------------------|-------------------------------|------------------|
| Total acute care cases   | 2,827                     | 3,723                         | 4,959            |
| % of patients over the age of 86                                 | 33%                       | 3%                            | 2%               |
| % of patients aged 66-85   | 53%                       | 57%                           | 61%              |
| % of patients aged 19-65   | 13%                       | 40%                           | 37%              |
| RIW <sup>11</sup> (average) of acute care patients               | 2.4-2.5                   | 2.4-2.8                       | 2.2-2.4          |
| % of patients - no complexities (CIHI designated)                | 45%                       | 65%                           | 67%              |
| Length of stay <sup>12</sup> (average)                           | 9-15 days                 | 6-8 days                      | 5-6.5 days       |
| % discharged to another facility <sup>13</sup> (rehab, CCC, etc) | 46%                       | 51%                           | 55%              |
| % discharged home without formal support                         | 16%                       | 21%                           | 23%              |
| % discharged to home with formal support                         | 7%                        | 11%                           | 9%               |
| % discharge to LTC   | 26%                       | 6%                            | 4%               |

<sup>8</sup> Please see full report for greater detail, explanatory notes, limitations, and data by age and hospital group.

<sup>9</sup> Includes all hip fracture patients, including those who have had a joint replacement in order to treat the fracture.

<sup>10</sup> Does not include hip fracture patients who have had a joint replacement.

<sup>11</sup> Range relates to the discharge location of the patient.

<sup>12</sup> Depends on discharge destination. ALOS is longest for people discharged home with support.

<sup>13</sup> Full report provides a breakdown by hospital group and age group.

**Table ii: Summary of inpatient rehabilitation data explored in the report (2002-2003)<sup>14</sup>**

|   | Hip Fracture <sup>15</sup>  | Hip Replacement <sup>16</sup>   | Knee Replacement   |
|---|---|---|--|
| Total rehabilitation cases                          | 1,016   | 1,654   | 2,045  |
| % of acute of acute care cases in 02-03             | 36%   | 44%   | 41%  |
| % of patients over the age of 86                    | 34%   | 8%  | 5%   |
| % of patients aged 66-85                            | 60%   | 65%   | 67%  |
| % of patients aged 19-65                            | 6%  | 27%   | 27%  |
| Average rehabilitation length of stay <sup>17</sup> | 30 days   | 19 days   | 15 days  |
| Average admission FIM score                         | 81  | 91  | 97   |
| Average discharge FIM score <sup>18</sup>           | 93  | 105   | 110  |
| Average FIM change (discharge-admission)            | 12  | 14  | 13   |
| FIM elements that change >2 points                  | <ul style="list-style-type: none"> <li>• Dressing lower body</li> <li>• Locomotion</li> <li>• Locomotion - stairs</li> <li>• Transfer - shower</li> </ul> | <ul style="list-style-type: none"> <li>• Locomotion</li> <li>• Locomotion - stairs</li> <li>• Dressing lower body</li> <li>• Transfer - shower</li> </ul> | <ul style="list-style-type: none"> <li>• Locomotion</li> <li>• Locomotion - stairs</li> <li>• Transfer</li> <li>• Transfer - shower</li> <li>• Dressing lower body</li> <li>• Bathing</li> </ul> |

**Table iii: Summary of data from the Toronto Community Care Access Centres (2003-2004)<sup>19</sup>**

|  |     |
|--|-----|
| Number of cases (hip fracture and joint replacements) <sup>20</sup>          | 251 |
| % Hip fracture of total cases  | 66% |
| % Hip replacement of total cases   | 21% |
| % Knee replacement of total cases  | 11% |
| % of all hip fracture and joint replacement patients receiving physiotherapy | 53% |
| % of all hip fracture and joint replacement patients receiving nursing       | 50% |
| % of all hip fracture and joint replacement patients receiving homemaking    | 50% |

<sup>14</sup> Please see full report for greater detail, explanatory notes, limitations, and data by age and hospital group.

<sup>15</sup> This figure includes all hip fracture patients who have had a joint replacement in order to treat the fracture.

<sup>16</sup> Includes revisions.

<sup>17</sup> This includes outliers. Modal length of stay for patients at the Toronto community hospitals and GTA/905 hospitals is actually much closer to 10-12 days and modal length of stay for rehabilitation centres varies between 8-30 days depending on age group.

<sup>18</sup> The admission FIM scores vary greatly by hospital and age grouping. See breakdown in body of report for more detail.

<sup>19</sup> CCAC data from the 905 CCACs was not obtained in a format that could be used for this report.

<sup>20</sup> Knee replacement code: 9341, V436; Hip replacement codes: 9359, V346; Hip fracture codes: 8200, 8208.

**Table iv: Supply of musculoskeletal rehabilitation services in the GTA (Rehab Finder, 2005)**

|   | Rehabilitation Centres | Toronto Hospitals   | 905 Hospitals        |
|---|------------------------|---------------------|----------------------|
| Number (No.) of general beds used for MSK                     | 10                     | 88                  | 206                  |
| Number of beds dedicated to MSK only                          | 261                    | 54                  | 13                   |
| Maximum average length of stay listed for beds                | 28                     | 7                   | 14                   |
| Crude estimate of patient cases, given capacity <sup>21</sup> | 2,066 <sup>22</sup>    | 1,711 <sup>23</sup> | 1,632+ <sup>24</sup> |
| No. of programs for inpatient MSK rehab                       | 6                      | 8                   | 6                    |
| No. of programs described as "complex MSK"                    | 2                      | 0                   | 2                    |
| No. of beds for non weight bearing patients                   | 75                     | 0                   | 0                    |
| No. of beds for maximum 30 min. tolerance <sup>25</sup>       | 98                     | 30                  | 29                   |
| No. of beds taking patients with NG tubes                     | 63                     | 28                  | 173                  |
| No. of beds taking patients who wander                        | 63                     | 0                   | 63                   |
| No. of beds for patients with behaviour issues                | 63                     | 20                  | 0                    |
| No. of beds for patients with psychiatric issues              | 249                    | 28                  | 63                   |
| No. of beds taking tracheostomies                             | 100                    | 20                  | 125                  |
| No. of beds with continuous oxygen                            | 145                    | 20                  | 206                  |
| No. of beds accepting internal & external referrals           | 271                    | 20                  | 138                  |

### Recommendations, Actions and Implications:

The analysis of the data presented in this initiative as well as discussions with individuals from across the system has led to seven major recommendations and eighteen actions that are required in order to achieve them. The recommendations are listed briefly here (not in priority order) and then are explained and *operationalized* in the paragraphs that follow.

- 1: Invest in real time mechanisms for matching patient need to musculoskeletal rehabilitation programs
- 2: Optimize existing inpatient rehabilitation bed capacity to better serve vulnerable or underserved populations
- 3: Differentiate simple from complex rehabilitation and general from specialized rehabilitation beds
- 4: Discuss with CIHI the possibility of a reduced FIM dataset since many of the FIM elements are not relevant to joint replacements or hip fractures.
- 5: Develop, in collaboration with CIHI, a cross continuum dataset for MSK rehab that provides organizations with the demographics and outcomes for the patient experience across the continuum
- 6: Standardize the service delivery approach in order to achieve consistency in utilization of resources/outcomes.
- 7: Consolidate services to achieve critical mass, optimize outcomes and ensure access for all patients.

<sup>21</sup> This calculation is based on the total number of beds for MSK (not only total joint and hip fracture) x 261 days/year (assumption of five-day operation per week)/minimum listed length of stay and assuming 85% occupancy. It is noted that the five-day operating assumption does not hold for many organizations.

<sup>22</sup> For the rehabilitation centres ALOS is 28 days.

<sup>23</sup> This does not include capacity available by virtue of the 88 beds which are also available for MSK but shared with other populations, so the calculation is based on only 54 beds while an additional 88 are actually available but not dedicated to MSK. We also assume five-day/week operation and 85% occupancy. For this group of hospitals, ALOS is 7 days.

<sup>24</sup> Because the GTA/905 hospitals have no designated MSK beds (general rehab beds only), we estimated 50% of general rehab beds dedicated to hip fracture and joint replacement patients, based on the work by Jaglal, Walker, et al. We also assume a 7-day/week operation and 85% occupancy. For this group of hospitals, ALOS is 14 days.

<sup>25</sup> This refers to the number of minutes that a patient is able to tolerate therapy.

### **Recommendation 1: Invest in real time mechanisms for matching supply and demand**

In the Greater Toronto Area and possibly across Ontario, we need to develop better mechanisms for tracking the characteristics of both patients and programs. Our study has shown it to be very difficult to match, either qualitatively or quantitatively, supply and demand for orthopaedic rehabilitation. This issue can be addressed by developing program descriptors that are designed deliberately to match the most important patient characteristics. In this manner, confidence can be developed in the calculations that are required to ascertain whether there is an appropriate match between system capacity and patient need and to clearly identify where surplus/gaps exist.

- **Action 1.1:** Develop standard patient grouping language, programs, and service descriptions that acknowledge the heterogeneity of the musculoskeletal rehabilitation group and enables better matching of supply and demand.
- **Action 1.2:** Develop an electronic referral and wait list system that would enable the tracking of referrals in order to understand access issues and gaps.
- **Action 1.3:** Clarify and differentiate the use of general and specialized beds.

### **Recommendation 2: Optimize existing inpatient rehabilitation bed capacity**

The crude calculations presented in this report show an estimated capacity of the current musculoskeletal inpatient rehabilitation system (which includes all MSK diagnoses in addition to hip fracture and joint replacements) to be approximately 6,000 patients a year.<sup>26</sup> Since many of the joint replacement patients are now being transferred to home care rehabilitation, opportunity exists to relieve alternate level of care and patient flow pressures by converting the use of some of these rehabilitation beds for more complex patients. A possible example of a population that could benefit from such a transition is the hip fracture population since approximately 26% of patients are discharged to a long-term care facility and nearly 15% of ALC cases<sup>27</sup> are hip fracture cases.

- **Action 2.1:** Explore service delivery requirements for underserved and vulnerable populations or populations that are awaiting rehabilitation with a view to converting usage of inpatient rehabilitation beds from joint replacement care to other types of more complex rehabilitation care.

### **Recommendation 3: Differentiate simple and complex musculoskeletal patients/programs and general from specialized rehabilitation beds.**

Hip fracture and joint replacement care are currently consolidated in general musculoskeletal programs. This report has shown important differences in the functional and demographic characteristics of these patients. As more joint replacements are sent home as a result of the Total Joint Network protocol, opportunity exists to shift the rehabilitation program focus to accommodate more complex musculoskeletal patients. Our study showed that very few programs in the GTA are available for complex musculoskeletal cases and that those that are available differ in terms of their service offerings. Similarly in the community setting, professional rehabilitation services and personal support services are differentiated. According to discussions with CCAC representatives, many home care patients have

<sup>26</sup> This calculation is very crude and based on the total number of beds for MSK x 261 days/year (assumption of 5-day/week operation)/minimum listed length of stay and assuming 85% occupancy. It should be noted that comparing this calculation to the number of joint replacements and hip fractures is problematic because there are other MSK populations using the MSK beds in addition to the joint replacement and hip fracture population. It should also be noted that some of the assumptions, i.e. 5-day operation, are considered problematic.

<sup>27</sup> GTA Rehab Network, *Analysis of Alternate Level of Care (ALC) Snapshots: Patients Awaiting Rehabilitation in ALC and Inpatient Rehabilitation Capacity* (May 2004).

multiple co-morbidities and are complex from a medical perspective. Differentiating where and when complex services are required, what they entail and how many patients need them, in both the community and hospital settings is required.

- **Action 3.1:** Conduct a study to describe the program components of complex musculoskeletal rehabilitation both in the hospital and in the home care setting. This study would then provide the key elements of a complex MSK program, which could facilitate funding and service planning and utilization of MSK beds for other purposes.
- **Action 3.2:** Explore the complex rehabilitation or medical needs of patients who are sent for home care rehabilitation and the use of each of the professional and homemaking services offered to hip fracture and joint replacement patients.

**Recommendation 4: Discuss the potential of a reduced FIM set with CIHI since not all indicators are relevant to hip fracture and joint replacement rehabilitation.**

Use of the FIM tool to assess rehabilitation performance for hip fracture and joint replacement patients, based on the 2002-2003 data appears problematic from this report for two reasons. First, for nearly 5,000 rehabilitation patients, only 4-6 of the FIM elements exhibit a change upon discharge. While this could reflect the inability of rehabilitation to have a measurable impact on hip fracture and joint replacement patients, it is more likely to reflect a lack of suitability of the tool for measuring rehabilitation outcomes for these populations.<sup>28</sup> Given the size of these populations and the findings of this report, using the FIM data to determine funding could also result in adverse consequences for these populations. In addition, for many organizations, we see a small decrease in FIM scores between admission and discharge. This could be due to a measurement error, but should be investigated.

- **Action 4.1:** Hold an outcome measurement session to determine specific outcome measures for MSK rehabilitation. These should include outcome measures suitable for tracking patients' progress from acute to rehabilitation and to the home.
- **Action 4.2:** Discuss with CIHI and JPPC the FIM findings from this report and explore the possibility of a reduced dataset for hip fracture and joint replacement patients.
- **Action 4.3:** Conduct further exploration to determine why the FIM scores from some hospitals appear to decrease from admission to discharge.

**Recommendation 5: Develop cross continuum dataset for musculoskeletal rehabilitation in collaboration with CIHI**

Our learnings from the use of four different databases on the musculoskeletal population indicate significant scope for reducing data collection burdens while improving the quality and coordination of information across the system. Opportunity exists especially between the National Rehabilitation Reporting System and the Discharge Abstract Database to discuss a cross continuum dataset for each patient. This will facilitate record linkage and analysis. It may also reduce data collection requirements.

- **Action 5.1:** Hold a consensus session to determine a meaningful dataset for the continuum of care for population groups within the musculoskeletal rehabilitation.
- **Action 5.2:** Discuss with the Canadian Institute for Health Information, the feasibility of providing Network member organizations with data linked reports that span from acute care to rehabilitation.

<sup>28</sup> At the Veterans Health Administration (VHA) in the United States, medical centres are mandated to use the FIM tool to measure and track rehabilitation outcomes for new stroke, lower-extremity amputees and traumatic brain injury (TBI) patients only.

### **Recommendation 6: Standardize the service delivery approach in order to achieve consistency in utilization of resources/outcomes**

This study has shown regional and program variations in the length of stay and outcomes for each of the joint replacement and hip fracture populations, raising questions about the extent to which patients across the region receive equitable access to evidence based care. For joint replacement patients this is being addressed through the work of the Total Joint Network for joint replacements, however a similar initiative is needed in the area of hip fracture rehabilitation. In order to demonstrate effective, efficient and equitable care for hip fracture patients and their families in the Greater Toronto Area, there must be a more deliberate attempt to quantify and compare actual and expected outcomes and to link expected functional outcomes with length of stay and resource needs. In addition, discharge locations should be linked to patient needs in a clear and appropriate manner by exploring differences between discharge destinations. Where patients are sent home with the expectation that an informal caregiver be involved in the convalescence or reintegration period, appropriate supports should be in place for the caregiver.

- **Action 6.1:** Develop standards for what should be achieved in a hip fracture rehabilitation program. Articulate and measure these in common terms.
- **Action 6.2:** Redevelop the service delivery model for hip fracture patients by convening panels of experts to determine and standardize program components. This will provide a better understanding of the infrastructure required to treat this group.
- **Action 6.3:** Develop definitions to clarify the meaning of rehabilitation or the bundle of services offered under the heading of rehabilitation in each of the different service settings in order to establish role clarity and differentiation of discharge settings.
- **Action 6.4:** Develop resources, which support the informal caregiver by offering information, coping strategies, and support groups.

### **Recommendation 7: Consolidate services to achieve critical mass, optimize outcomes and ensure access for all patients.**

The number of locations at which musculoskeletal programs and services are offered raised questions about how the system is balancing critical mass with considerations of proximity to the patient's home. While excellent care close to home is ideal, studies have shown that quality improves with critical mass.<sup>29</sup> With a larger number of centres offering care, case volume per facility decreases. In addition, some organizations make their inpatient rehabilitation beds available for referrals from across the region, while others restrict use of their rehab beds to their own acute care patients. Where this is not the case, organizations are often dealing with issues of patient flow and maintain closed access in order to alleviate pressures on alternate level of care beds.

- **Action 7.1:** Explore the establishment of centres of excellence, which would consolidate rehabilitation offerings for different populations within musculoskeletal rehabilitation while considering proximity of care issues. The centres of excellence should include the home care component (Community Care Access Centres). Due consideration should be given to managing patient flow.
- **Action 7.2:** Develop a policy of open access whereby patients from within or from outside the organization can get access to all inpatient rehab and outpatient ambulatory care services. Consideration must be given to the impact of such a policy on patient flow.
- **Action 7.3:** Conduct an outpatient and home care focused study on the MSK population group, which includes both utilization and service availability information.

<sup>29</sup> Tracy, J. and Zelmer, J., *CIHI Survey: Volumes and Outcomes for Surgical Services in Canada*. Healthcare Quarterly (2005). V. 8. n.4. (In a systematic review of 331 studies on the relationship between outcomes and volume, it was found that 68% of the studies showed better outcomes with higher volume). It is noted that critical mass vs. proximity considerations for surgery may be different than for rehabilitation.