NRS

Inpatient Rehabilitation in Canada

2004–2005

Special Topic:
Focus on Function

National Rehabilitation Reporting System

Canadian Institute
for Health Information

Institut canadien
d'information sur la santé

Acknowledgements

The Canadian Institute for Health Information (CIHI) wishes to acknowledge and thank those who contributed to the development of this report.

Sincere appreciation goes to the rehabilitation teams at participating facilities. Their role in the National Rehabilitation Reporting System (NRS) is essential to all of CIHI's rehabilitation reporting activities.

Executive Summary

Inpatient Rehabilitation in Canada, 2004–2005 is the third public report based on data from the National Rehabilitation Reporting System (NRS), developed and maintained by the Canadian Institute for Health Information (CIHI).

The intent of the report is to shed some light on rehabilitation services in participating Canadian hospitals and on the types of clients who receive them, as well as to provide characteristics of various rehabilitation activities and clinical outcomes. The analyses contained within this report are based on data for 30,418 clients who were discharged from 84 participating hospitals in six provinces during 2004–2005 and for who complete admission and discharge assessments were successfully submitted to CIHI. This volume of records represents an increase of 13.5% over the number of records available for the previous annual report, owing primarily to the growth in participation in the NRS in 2004–2005.

In order to access aggregate data used to produce the charts and graphs presented in the report, source tables are available on the CIHI Web site at www.cihi.ca under "Quick Stats". Throughout this report, references to the relevant tables can be found at the end of each paragraph or section.

The first half of the report presents summary statistics on the types of rehabilitation clients seen in the NRS. Socio-demographic, administrative and health characteristic data are presented at a high level in order to provide an overview of the 854,915 inpatient rehabilitation days in the NRS for the 2004–2005 reporting period. These first chapters contain analyses that are similar to analyses presented in the previous iteration of this report, *Inpatient Rehabilitation in Canada, 2003–2004*. This has been done intentionally with the goal of facilitating trending analyses in future NRS reports.

Overall in 2004–2005, most clients (92%) admitted to inpatient rehabilitation in participating NRS facilities were referred from inpatient acute care units, either in the same facility as the rehabilitation unit, or a separate facility. The remaining 8% were referred from a number of sources: a private healthcare practitioner, ambulatory care or residential care facility, as examples. Among clients for whom a date ready for admission to rehabilitation was known, 53% were admitted to inpatient rehabilitation the same day they were deemed clinically ready. Clients referred from acute care tended to wait fewer days, on average, for admission to a rehabilitation bed than clients who were referred from external sources such as a residential care facility or a private medical practitioner.

The average age of clients receiving inpatient rehabilitation services in 2004–2005 was 71, up slightly from the average of 70 in the previous year. The ratio of female to male clients increased with age group, from 40% of the under-45 age group, to 72% of the 85-and-over age group. Overall, the dominant health condition in inpatient rehabilitation was orthopaedics, representing 50% of all episodes submitted to the NRS in 2004–2005. Considered part of the orthopaedic group, clients receiving rehabilitation following a hip or knee replacement comprised 32% of all NRS records submitted for that period. After orthopaedics, clients receiving rehabilitation following a stroke were the second largest group in the NRS, at 16% of all submitted records.

Median length of stay in inpatient rehabilitation in 2004–2005 was 19 days. This value varied according to health condition. Clients receiving rehabilitation for arthritis had the shortest median length of stay at 13 days, while burn clients had the longest median length of stay at 49 days. Following rehabilitation, 83% of clients who had been living in a private dwelling (e.g. house or apartment) prior to admission to rehabilitation were able to return to that type of living setting. Seven percent of clients living in a private dwelling prior to admission were discharged to a residential care facility upon completing rehabilitation. Orthopaedic clients had the highest rate of return to a private dwelling of all client groups at 90%, while stroke clients had the lowest rate at 71%.

The second half of *Inpatient Rehabilitation in Canada, 2004–2005* focuses on clinical outcomes in rehabilitation. This is accomplished by examining the motor and cognitive subscales of the FIM™ instrument, which is the clinical tool used to collect data on the functional abilities of clients admitted to participating NRS facilities for rehabilitation. Separating the motor and cognitive components of the FIM™ instrument provides an additional level of detail into admission and discharge functional levels, as a means of identifying variations in functional status and outcomes for the different types of client groups that are frequently admitted to inpatient rehabilitation.

Improvement in motor function is a key goal for many rehabilitation programs. Motor function at admission and discharge is compared using the FIM™ instrument Motor Function Score. The NRS data for 2004–2005 suggest an inverse relationship between average admission Motor Function Score and median length of stay. Clients with lower motor function on admission tended, on average, to stay longer in the inpatient rehabilitation setting than their counterparts with higher levels of motor function. Change in Motor Function Score while in rehabilitation appeared to be similar across age groups, with the 85-and-over age group making average gains in Motor Function Score comparable to younger age groups. Following completion of the rehabilitation program, clients who were discharged to a private dwelling had, on average, higher discharge Motor Function Scores than clients who were discharged to assisted-living or residential care settings.

Cognitive function in the NRS is measured using the FIM™ instrument Cognitive Function Score. As with motor function, there appeared to be an inverse relationship between average admission Cognitive Function Score and median length of stay for clients in the NRS. However, the correlation was not as strong with the Cognitive Function Score as it was for the Motor Function Score. Unlike motor function, average gains in Cognitive Function Score from admission to discharge appeared to decrease with higher age groups. A large component of this chapter focused on client groups receiving rehabilitation for stroke, brain dysfunction and neurological conditions, as cognitive function in these clients is often a key aspect of the rehabilitation effort. Cognitive abilities on discharge appeared to be related to discharge destination for the stroke, brain dysfunction and neurological groups. Clients from these groups that were discharged to a private dwelling with no follow-up health services had an average Cognitive Function Score of 30.4 out of a maximum possible score of 35. For clients discharged to a private dwelling with a referral for home care services, the average cognitive score was 28.8. Clients discharged to residential care facilities, where the available level of assistance with daily activities is generally much higher, had an average cognitive score of 21.9.

Inpatient rehabilitation services are recognized as playing a vital role in the health care spectrum in Canada. Rehabilitation professionals work to assist their clients in reaching optimal functional levels following illness or injury and, where possible, facilitate their re-integration into the community. *Inpatient Rehabilitation in Canada* provides a sample of some of the NRS data that support the delivery of these services.

Inpatient Rehabilitation in Canada, 2004−2005

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Chapter 1. Introduction and Background

Objectives of the Report

Inpatient Rehabilitation in Canada, 2004–2005 is the third public report based on data from the National Rehabilitation Reporting System (NRS). The Canadian Institute for Health Information (CIHI) developed the NRS to support inpatient rehabilitation service planning activities and policy development. Data are available for inpatient rehabilitation episodes from 2000–2001 onwards.

This year's report provides information on inpatient physical and cognitive rehabilitation services that occurred between April 1, 2004 and March 31, 2005 in participating rehabilitation facilities. The report was developed by CIHI to provide additional information for people involved with or interested in the provision of inpatient rehabilitation services, including clinicians, hospital managers, policy makers and organizations representing rehabilitation clients. In addition to a general overview, *Inpatient Rehabilitation in Canada, 2004–2005* includes chapters focusing on data collected with the FIM™ instrument,[1] the 18-item, 7-level scoring measure used in the NRS to assess the functional independence of individuals. This focus is intended to provide an additional level of detail to the functional outcomes presented in this report.

The overall goal of the report is to enhance knowledge about inpatient rehabilitation services in participating facilities across the country. In doing so, CIHI hopes to facilitate discussion on the current state of hospital-based rehabilitation and on future challenges and opportunities facing the sector.

Specific objectives for the report are:

- To provide background information on the NRS;
- To present aggregate 2004–2005 data from the NRS;
- To provide a more detailed picture of functional outcomes in the NRS than has been done in previous reports; and
- To stimulate discussion on the information needs for the inpatient rehabilitation sector and further enhancement of the NRS.

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1. The FIM™ instrument referenced herein is reproduced with permission of U B Foundation Activities, Inc. and is the property of Uniform Data System for Medical Rehabilitation (UDSMR), a division of U B Foundation Activities, Inc.

Organization of the Report

Inpatient Rehabilitation in Canada, 2004–2005 contains six chapters. The first three chapters are presented in largely the same format as the previous iterations of *Inpatient Rehabilitation in Canada*. This was done intentionally to present information that can be compared to previous NRS annual reports. CIHI acknowledges that there may be few changes in patterns of rehabilitation services in a single year. It is anticipated, however, that data received over the next few years will make trending analyses valuable. Consequently, certain aspects of this report will be repeated annually.

Chapter 1 provides an introduction to the report, including a brief history of the NRS as well as its current status. An overview of the methodology used in the analyses and reporting is provided. This chapter examines the role of the NRS in facilitating information collection, analysis and dissemination. Some contextual information on the facilities participating in the NRS is provided to support an enhanced understanding of the inpatient rehabilitation sector. No facilities that have submitted data to the NRS are identified by name in this report.

Chapter 2 provides an overview of the socio-demographic characteristics of the clients who were discharged from participating facilities following rehabilitation during fiscal year 2004–2005. Summary statistics such as living arrangements, informal support and age/sex distribution are presented in order to provide a snapshot of the rehabilitation population. Administrative information, such as length of stay and referral patterns, is also presented.

Chapter 3 presents data on the Rehabilitation Client Groups (RCG)[2] reported in the NRS. Clients are grouped into RCGs based on the diagnosis or functional impairment that led to the rehabilitation admission. Indicators are presented for the various groups, including days waiting for admission to rehabilitation and reasons for discharge. This chapter also introduces analyses on clinical outcomes assessed during inpatient rehabilitation. Clinicians, managers and policy makers may be interested in this section, which presents some high-level outcomes and the potential factors affecting these outcomes.

Chapters 4 and 5 examine the motor and cognitive subscales of the FIM™ instrument, respectively. Separating the motor and cognitive components of the FIM™ instrument provides an additional level of detail into the functional levels typically seen for various client groups on admission and discharge. Demographic, health characteristic and outcome information is presented alongside data related to motor and cognitive functional levels (as measured by the FIM™ instrument), as a means of identifying variations in functional status and outcomes for the different types of client groups that are frequently admitted to inpatient rehabilitation.

Chapter 6 will briefly summarize and discuss some of the findings from the 2004–2005 report. Potential directions and future NRS analytical activities as well as topics for subsequent annual reports are also highlighted in this chapter.

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

While many readers may be familiar with the concepts used within the report, others may be encountering NRS data for the first time. A glossary of NRS terms (Appendix A) is included at the end of the report. This will assist readers in understanding the terms and definitions commonly used in the NRS.

The Canadian Institute for Health Information (CIHI)

CIHI collects and analyzes information on health and health care in Canada and makes it publicly available. Canada's federal, provincial and territorial governments created CIHI as a not-for-profit, independent organization dedicated to forging a common approach to Canadian health information. CIHI's goal: to provide timely, accurate and comparable information. CIHI's data and reports inform health policies, support the effective delivery of health services and raise awareness among Canadians of the factors that contribute to good health.

For more information, visit the CIHI Web site at www.cihi.ca.

The National Rehabilitation Reporting System

Hospital-based inpatient rehabilitation is an important component of the continuum of health services in Canada. By facilitating the collection of standardized information on rehabilitation clients, the NRS provides an opportunity to enhance the knowledge surrounding inpatient rehabilitation services across the country.

The NRS was developed to support data collection by facilities for adult inpatient rehabilitation clients. These rehabilitation services are provided in specialized rehabilitation facilities, or in general hospitals with rehabilitation units, programs or designated beds.

Inpatient rehabilitation clients receive services provided by health professionals such as nurses, physiotherapists, occupational therapists and physicians specializing in physical medicine and rehabilitation. These professionals assist clients in maximizing their physical and cognitive function through training and education, and prepare them to return to the community following illness or injury. Clients reported in the NRS include only those with a primary health condition that is physical in nature. As such, the term "rehabilitation" in the context of NRS reporting does not include rehabilitation services provided for a mental health condition or for drug or alcohol addiction.

A cornerstone of the NRS is the concept of human function and the focus of rehabilitation in assisting individuals to achieve maximum independence in daily living, be it at home or in an assisted-living facility. The NRS indicators and reports provide a source of information for defining and describing functional outcomes for individuals who have received rehabilitation services. For greater comparability, this information is grouped according to the nature of the illness or injury. These groups form the basis for NRS reporting and are known as Rehabilitation Client Groups (RCG). There are seventeen major RCGs, including conditions such as stroke, limb amputation and brain injury. Appendix B contains a brief description of each Rehabilitation Client Group (RCG).

National Rehabilitation Reporting System: Development and Implementation

CIHI has been promoting health information standards for hospital-based inpatient rehabilitation services since 1995, when the organization initiated a national pilot study to develop and evaluate indicators, a minimum data set, and related case-mix grouping methodology. The CIHI pilot study, involving more than 2,000 adult rehabilitation clients, collected information on the characteristics and effectiveness of rehabilitation services in six provinces.

A national prototype reporting system for inpatient rehabilitation services was implemented in April 2000. The development was a component of the Health Information Roadmap Initiative, a collaborative effort between CIHI, Statistics Canada, Health Canada, provincial/ territorial health departments and many others.

Following the launch of the new NRS, CIHI began producing comparative reports for facilities in February 2001, focusing on key indicators that were developed during the original CIHI pilot study. These comparative reports provide facilities with information to assess client outcomes, to examine access to inpatient rehabilitation and to evaluate programs and services.

By facilitating the collection of standard information, the NRS provides an opportunity to enhance the knowledge surrounding inpatient rehabilitation services across the country. As a result of its voluntary nature, the NRS does not have comprehensive coverage of all inpatient rehabilitation services at this time. Therefore, information derived from the NRS may not reflect the full picture of hospital-based inpatient rehabilitation in Canada.

Scope of Participation in the National Rehabilitation Reporting System

As of May 2005, 87 inpatient rehabilitation facilities in Newfoundland and Labrador, Nova Scotia, New Brunswick, Ontario, Saskatchewan, Alberta and British Columbia have submitted data to the NRS. The information in this report is based on data received from the 84 inpatient rehabilitation facilities in six provinces (Newfoundland and Labrador, Nova Scotia, Ontario, Saskatchewan, Alberta and British Columbia) that submitted NRS data for the April 2004–March 2005 reporting period.

Submission of data to the NRS is voluntary for Canadian facilities with the exception of facilities in Ontario. Effective October 2002, the Ontario Ministry of Health and Long-Term Care mandated submission of NRS data for all facilities with designated adult inpatient rehabilitation beds in the province. No other provincial ministry of health or regional health authority had mandated NRS participation during the 2004–2005 period.

As a result of its primarily voluntary nature, the NRS does not have comprehensive coverage of all inpatient rehabilitation services within Canada. Therefore, the information presented in this report does not necessarily reflect the full picture of hospital-based inpatient rehabilitation in Canada. However, the information from the NRS provides a valuable and growing opportunity to enhance the knowledge surrounding inpatient rehabilitation services across the country and to assist planning and management activities in this sector.

More information on the NRS is available at www.cihi.ca\nrs or by contacting rehab@cihi.ca.

The National Rehabilitation Reporting System Data Set

The NRS data set consists of 75 data elements grouped into the following major categories:

- **Client Identifiers:** These are data elements used to identify individual records. Client names are never collected for the NRS database.

- **Socio-demographics:** Information such as birth date, sex, living arrangements and vocational status are collected to provide valuable information on the types of clients admitted to rehabilitation programs.

- **Administrative:** Data are collected on wait times for admission and discharge, service interruptions, and provider types, in order to better understand accessibility to rehabilitation, factors influencing length of stay, and resource utilization.

- **Health Characteristics:** Diagnoses and related co-morbidities at admission provide information on conditions most often seen in a rehabilitation setting, and conditions that may affect a client's ability to progress in the rehabilitation program.

- **Activities and Participation:** This is the largest section of the data set and contains clinical assessments of motor and cognitive functional abilities of rehabilitation clients. The data are collected using the 18-item FIM™ instrument and six additional cognitive data elements developed at CIHI that provide further information on cognitive abilities of rehabilitation clients. More details on the items assessed with the FIM™ instrument, a standardized assessment tool developed by the Uniform Data System for Medical Rehabilitation (UDS_{MR}), are available in Appendix C.

Facilities collect the data when a client is admitted to, and when they are discharged from, the inpatient rehabilitation program. Facilities can also choose to complete an optional follow-up assessment on their clients between three and six months following discharge from the program. Collection of this follow-up information provides an opportunity to assess sustainability of functional outcomes that were gained during rehabilitation, as well as the level of client re-integration into the community.

The FIM™ Instrument

The FIM™ instrument is a proprietary outcome measure used in the NRS to measure functional independence at admission and discharge. "FIM" stands for "functional independence measure", but the instrument itself is always referred to as the FIM™ instrument. It is composed 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™ instrument is a measure of disability, and looks at the caregiver burden associated with the level of disability. The overall FIM™ instrument score can be broken down into motor and cognitive subscales, to provide further detail on identifying areas of functional loss.

The motor and cognitive FIM™ instrument subscales are further grouped into six domains based on similar areas of function. There are four motor domains and two cognitive domains. These groupings provide an even further level of detail on specific areas of functional ability. The domains have varying numbers of FIM™ instrument items included, so the score ranges for the various domains may not be the same. For example, a domain containing 2 items will have a smaller potential score increase from admission to discharge than

a domain containing 6 items. As a result, comparisons should be made within and not across domains. Refer to Table 1.1 for a list of the six FIM™ instrument domains, the respective items included, and the score ranges for each.

Table 1.1   FIM™ Instrument Domains

Domain	# Items	FIM™ Instrument Items Included	Score Range
Self-Care	6	Eating, Grooming, Bathing, Dressing Upper Body, Dressing Lower Body, Toileting	6–42
Sphincter	2	Bowel Management, Bladder Management	2–14
Transfer	3	Bed/Chair, Toilet, Tub	3–21
Locomotion	2	Walk/Wheelchair, Stairs	2–14
Communication	2	Expression, Comprehension	2–14
Social Cognition	3	Social Interaction, Problem Solving, Memory	3–21
	18	**FIM™ Instrument Score Range**	**18–126**

For the analyses in this report, all FIM™ instrument score averages will be presented to one decimal place.

Methodological Notes

The following information is presented in order to provide readers with an understanding of the general methodology used to calculate the indicators in this report. More detailed notes on specific methodologies are presented throughout the text, when appropriate.

Records Included in This Report

The data included in this report are based primarily on the 30,418 pairs of complete NRS admission and discharge records for 2004–2005. These are complete records with a discharge date between April 1, 2004, and March 31, 2005, inclusive. These records may have admission dates either in 2004–2005 or in earlier fiscal years. Admission records with no corresponding discharge record in the NRS database as of May 17, 2005, the deadline for 2004–2005 data submission, are excluded from the report.

Clients who were discharged within three days of admission are also excluded from the majority of analyses contained in this report. These records, referred to as (Un)planned Discharges, are excluded because a limited amount of information is collected for these clients due to the short length of stay. The FIM™ instrument admission assessment, for example, can take up to three days to complete. As such, FIM™ instrument scores are generally not available for clients staying three days or less in the rehabilitation program. In 2004–2005, there were 1,688 clients admitted and discharged within three days of admission. These records are excluded from all analyses with the exception of length of stay data presented in Chapter 2.

The majority of analyses conducted with data collected using the FIM™ instrument include only clients with complete admission and discharge FIM™ instrument assessments. In cases where the client is transferred unexpectedly and does not return, there may not be an opportunity to complete a discharge FIM™ instrument assessment. Of the 30,418 complete NRS records discussed in this report, 29,319 have complete admission and discharge FIM™ instrument assessments. The remaining 1,099 records only have completed admission FIM™ instrument assessments, and not discharge assessments.

To summarize:

- Figures related only to admission FIM™ instrument scores, are based on the 30,418 records submitted that include complete admission FIM™ instrument scores.

- Figures that include analysis of both admission and discharge scores derived from FIM™ instrument assessments are based on the 29,319 complete pairs of admission and discharge FIM™ instrument assessments submitted.

- The population of reference is included in all figures. Where the population differs from the numbers presented above, additional information is provided on the records included.

Tables and Statistics for This Report

For readers who would like to access the aggregate data used to produce the figures presented in the NRS report, source tables are available on the CIHI Web site at www.cihi.ca\nrs under "Quick Stats". Throughout this report, references to the Quick Stats tables can be found at the end of relevant paragraphs or sections. For a complete list of Quick Stats tables available on the Web site, refer to Appendix D.

Data Suppression

This report adheres to CIHI's policies governing the publication and release of health information, developed to safeguard the privacy and confidentiality of data entrusted to CIHI. In compliance with these guidelines, cell counts between one and four within data tables are combined with other cells where appropriate. Three RCGs with small numbers of records have been aggregated into an "Other RCGs" category. The RCGs that were aggregated in this manner are: Developmental Disabilities, Other Disabling Impairments and Congenital Deformities. The intent of cell suppression and aggregation is to ensure anonymity and avoid disclosure of personal and identifiable information.

Computations

Statistics within this report and in the web-based tables are generally presented to one decimal place. As a result of rounding, percentages may add to between 99% and 101%. The report also presents mean values of certain characteristics at admission, discharge and the mean change between admission and discharge. Again, due to rounding, the difference between the mean admission and discharge values and the mean change presented may range from -1 to +1.

This report uses two statistical measures of central tendency: the median and the (arithmetic) mean. The *median* is the point in a distribution that splits the distribution into two equal parts: half of the values lie below this point and half lie above it. The *mean*, or average, is calculated by summing all the values of the distribution and dividing that sum by the number of values presented. A mean can be affected by extreme values; therefore, for highly skewed distributions, the median is usually used, as it is less affected by such values. Throughout the report, the arithmetic mean is referred to as the "average" and median is referred to as itself.

Box-and-Whisker Plots

Chapters 4 and 5 of this report contain box-and-whisker plots. This type of graph presents information on the distribution of a set of data. It can be helpful to think of a box-and-whisker plot as a diagram that presents five points of interest:

Maximum Observed

Upper Quartile (Q3)

Median (Q2)

Lower Quartile (Q1)
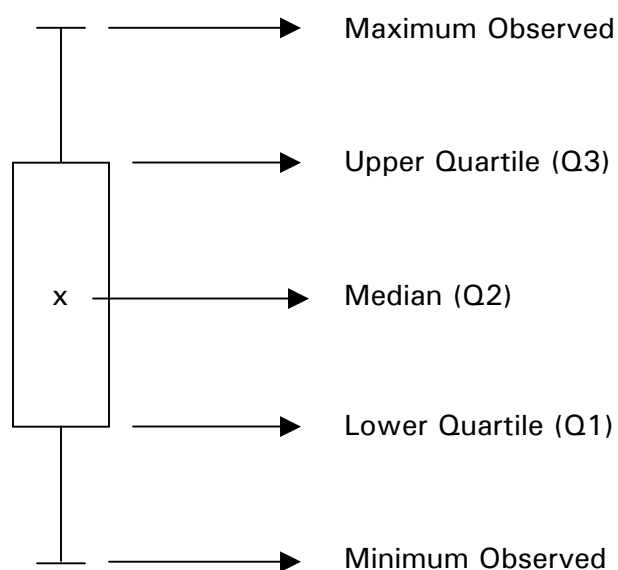
Minimum Observed

The minimum and maximum values correspond to the smallest and largest observed values, respectively. The ends of the whiskers in a box-and-whisker plot represent these values.

The "x" inside the box corresponds to the median value. The median is the middle value of a set of data. If a set of observations is sorted by value, the median corresponds to the value in the middle of that ordered list. The median splits a data set into two halves containing an equal number of observations. In a data set containing 100 ordered observations, the median divides the bottom 50 observations (lower half of the data set) and the top 50 observations (upper half of the dataset).

The lower quartile (Q1) and the upper quartile (Q3) are the median values of the lower and upper halves of the data set, respectively. One quarter of the observations will be at or above the upper quartile (Q3), while one quarter of the observations will be at or below the lower quartile (Q1). In a box-and-whisker plot, the top and bottom edges of the box represent the upper and lower quartiles, respectively.

The range of values between the upper and lower quartiles is known as the *interquartile range*. This range contains the middle 50% of values in the data set. In a box-and-whisker plot, the area inside the box corresponds to the interquartile range.

It can be helpful to think of a box-and-whisker plot as a diagram that splits a data set into 4 ranges, each containing the same number of observations. Each of the whiskers and each of the two halves of the box represent 25% of the observations in the data set. If the data are skewed, certain ranges will be larger than others.

Data Quality and the National Rehabilitation Reporting System

The Canadian Institute for Health Information (CIHI) has incorporated five dimensions of data quality into its corporate *Data Quality Framework*, first implemented during the fiscal year 2000–2001. When used as a conceptual framework, these dimensions facilitate the assessment of data quality in many types of system-level data holdings.

The framework implementation is part of the larger data quality cycle at CIHI in which issues are identified, addressed, documented and reviewed on a regular basis. It also standardizes information on data quality for users and helps to identify priority issues, which in turn are intended to trigger continuous improvements.

The five dimensions of data quality assessed at CIHI are:

1. **Accuracy:** that measures how well information within a database reflects what was supposed to be collected;
2. **Comparability:** that measures the extent to which a database can be properly integrated within broader health information systems;
3. **Timeliness:** that measures whether the data are available for user needs within a reasonable time period;
4. **Usability:** that measures how easily the storage and documentation of data allows users to utilize the data intelligently; and
5. **Relevance:** that measures incorporation of all of the above dimensions to some degree, but focuses specifically on value and adaptability.

CIHI conducts regular data quality assessments on the NRS with respect to coding guidelines, data collection software specifications and other validation procedures in order to identify areas of strength and weakness. The five dimensions stated above are used to drive the ongoing evaluation. Areas needing improvement are flagged for further action. CIHI uses this information both internally for data quality improvement, and externally, to respond to stakeholder inquiries.

Chapter 2. Characteristics of Inpatient Rehabilitation Clients

This chapter provides information on all clients who received inpatient rehabilitation services at facilities participating in the National Rehabilitation Reporting System (NRS) in the April 1, 2004 to March 31,2005, reporting period. All of the information is drawn from data in the NRS database at the Canadian Institute for Health Information (CIHI). As of the 2004–2005 fiscal year submission deadline (May 2005), 84 facilities from Newfoundland and Labrador, Nova Scotia, Ontario, Saskatchewan, Alberta and British Columbia had submitted data to CIHI. Approximately 85% of the data used for this report were submitted by participating NRS facilities in Ontario.

Participating facilities submit data that is collected when rehabilitation clients are admitted to the facility and again just prior to discharge. As mentioned in Chapter 1, the analyses in this report were primarily based on information from the 30,418 clients who were discharged from participating facilities during 2004–2005 and for whom complete admission and discharge assessments were submitted to and accepted by CIHI.

Facility Type

Facilities participating in the NRS are classified as either *General* or *Specialty*. This classification is specific to the NRS and is intended to facilitate comparative reporting; it is not necessarily consistent with facility classification methods used in various provinces or regions. According to the NRS definition, a General rehabilitation facility is a rehabilitation unit or collection of beds designated for rehabilitation purposes that is part of a general hospital offering multiple levels or types of care. A Specialty rehabilitation facility is one that provides more extensive and specialized inpatient rehabilitation services and is commonly a freestanding facility or a specialized unit within a hospital. The rehabilitation team at the facility decides which profile most closely represents their rehabilitation program(s) and categorizes itself as General or Specialty when beginning submissions to the NRS. Table 2.1 shows that 74% of facilities that submitted data to the NRS in 2004–2005 classified themselves as General facilities, and the remaining 26% were classified as Specialty facilities. About two thirds (66%) of all clients were admitted to General rehabilitation facilities in 2004–2005 and a third (34%) were admitted to Specialty rehabilitation facilities.

Table 2.1   Facility Types in the NRS, 2004–2005

	General Facilities		Specialty Facilities		All Facilities	
	#	%	#	%	#	%
Facilities submitting to NRS in 2004–2005	62	73.8	22	26.2	84	100.0
Clients*	20,186	66.4	10,232	33.6	30,418	100.0

*Refers to clients discharged in 2004–2005 with complete admission and discharge assessments.

Source: NRS, CIHI 2004–2005.

Admission Class

Figure 2.1 shows that 86% of clients discharged from inpatient rehabilitation programs during 2004–2005 were classified as *Initial Rehabilitation* clients, which refers to a first inpatient rehabilitation stay for their particular health condition. Ten percent of clients met requirements for a *Short Stay* classification, primarily defined as an admission lasting between 4 and 10 days. Three percent of clients were classified as *Readmissions*, indicating that they received rehabilitation services relating to a condition for which they had previously received inpatient rehabilitation. Less than one percent of clients were transferred directly to a rehabilitation facility from another inpatient rehabilitation unit or program for ongoing treatment of the existing illness or injury, referred to as *Continuing Rehabilitation*.

The remaining admission class in the NRS is referred to as *(Un)planned Discharge*. This refers to clients with an admission stay, planned or unplanned, that lasts three days or less. In 2004–2005, 1,688 records classified as (Un)planned Discharge were submitted to the NRS. Due to the short admission time frame, the data collected on these clients is minimal, and a separate discharge assessment is not completed. The majority of analyses in this report include only those 30,418 clients for who complete admission and discharge assessments were submitted. For this reason, data on the (Un)planned Discharge client group are excluded for most of the analyses in this report, unless specifically indicated.

Figure 2.1 also shows that General facilities had a slightly lower proportion of Initial Rehabilitation clients: 83% compared with 93% in Specialty facilities. Conversely, 99% of clients categorized as Short Stay were admitted to General facilities, accounting for over 15% of all admissions to General facilities in the NRS. Sixty-eight percent of NRS clients classified as Readmission or Continuing Rehabilitation were admitted to Specialty facilities, and together these two admission classes accounted for almost 7% of all admissions to Specialty facilities. *(Quick Stats, Table 1)*
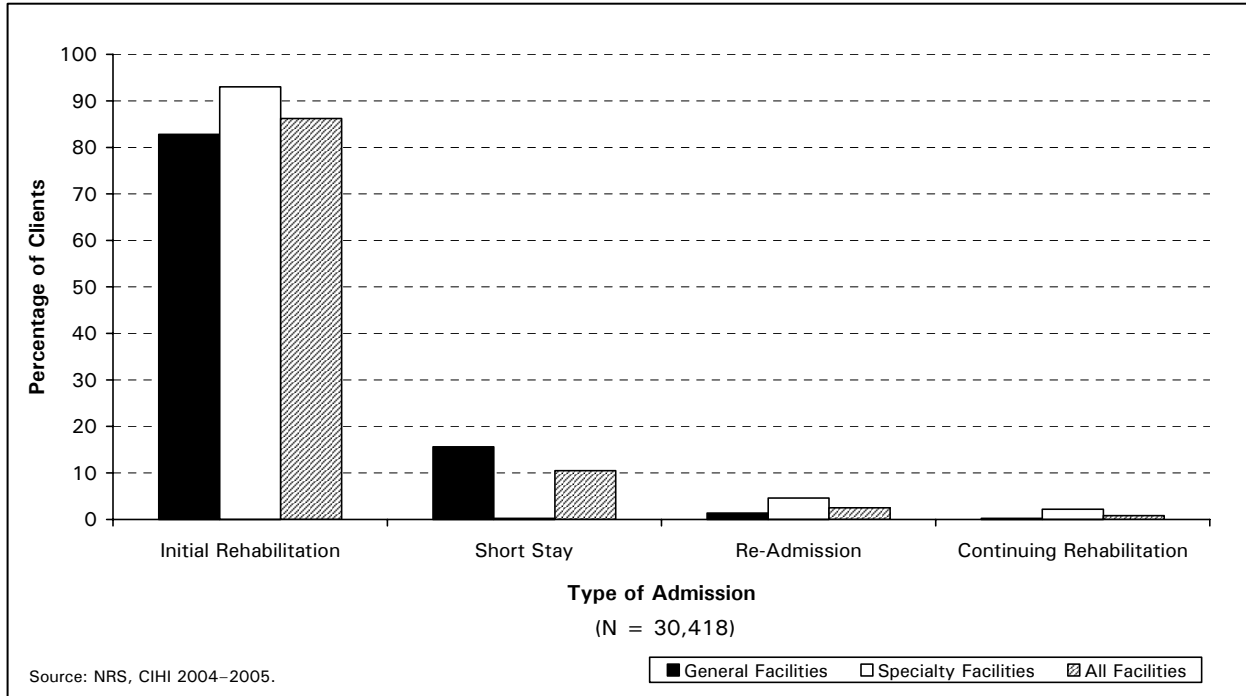
Figure 2.1   Type of Admission to Inpatient Rehabilitation by Facility Type, 2004–2005

As mentioned, clients admitted under the Short Stay category were almost exclusively admitted to General facilities. A review of the predominant Rehabilitation Client Groups (RCG) in the Short Stay admission class showed that the orthopaedic RCG accounted for 83% of short stays in General facilities. Of this group, 44% were knee replacement clients and 25% were hip replacement clients.

Source of Referral to Rehabilitation

The referral source in the NRS is the facility, agency or individual that initiated the referral of the client for admission to rehabilitation. Nine out of every ten clients (92%) admitted to an inpatient rehabilitation unit were referred by an inpatient acute care unit, either in the same facility (46%) or from a different facility (46%). Clients referred by a private healthcare practitioner (such as a family doctor or physiotherapist) accounted for only 2% of admitted rehabilitation clients, while those referred from facility-based ambulatory care services (e.g. dialysis or geriatric day programs) accounted for 1% of all clients. The remaining 5% of clients were referred by a variety of different sources including: rehabilitation units in different facilities; residential care facilities (e.g. nursing homes, long-term or continuing care facilities); a family member; or the client initiated the referral themselves.

As Figure 2.2 shows, there were some differences among the referral sources of clients admitted to General and to Specialty rehabilitation facilities. Sixty-six per cent of NRS clients admitted to General facilities were referred from an inpatient acute unit of the same facility and 29% were referred from an inpatient acute care unit of a different facility. In contrast, only 6% of clients admitted to Specialty facilities were referred from an inpatient acute unit within the same facility while 80% were referred from inpatient acute care at a different facility. This is consistent with the definition of a Specialty facility as commonly being a freestanding building with a focus on rehabilitation services rather than on acute care services, and therefore receiving the majority of their clients from other facilities. *(Quick Stats, Table 2)*
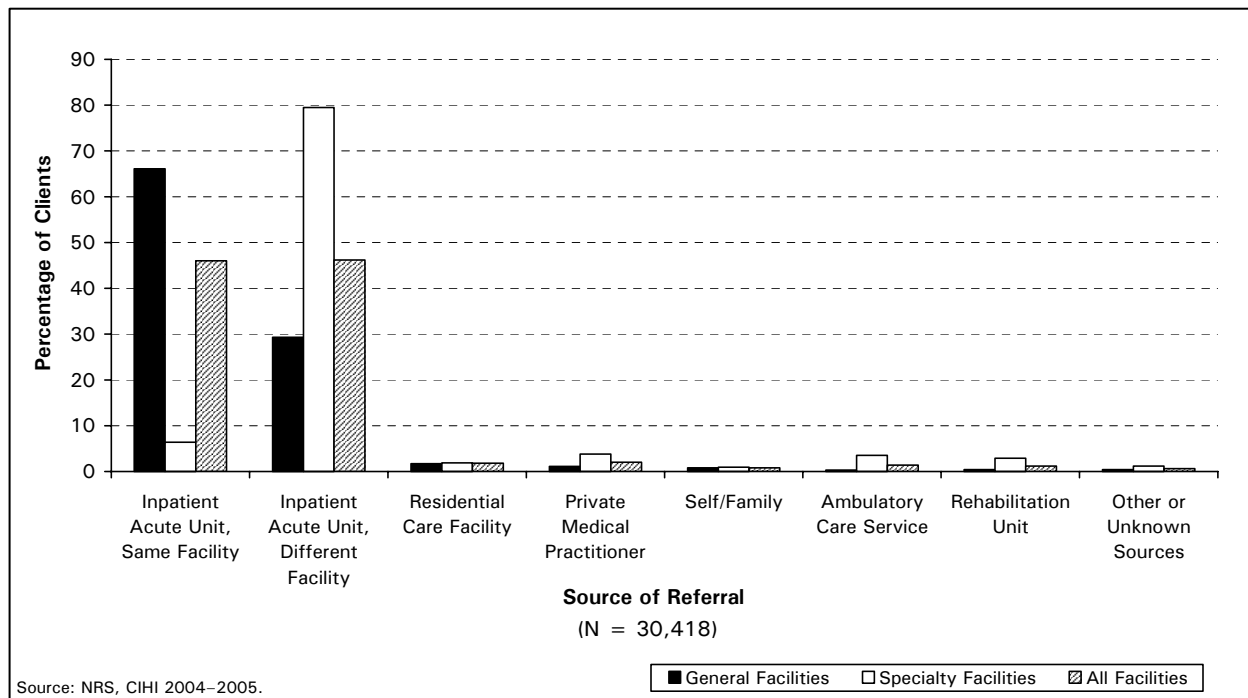
Figure 2.2   Source of Referral to Inpatient Rehabilitation by Facility Type, 2004–2005

The NRS data also show that of the 423 clients that were referred by a facility-based ambulatory clinic, 84% were admitted to Specialty rehabilitation facilities, while 64% of the 244 clients whose referral to inpatient rehabilitation was initiated by themselves or by family members were admitted to General facilities. (*Quick Stats, Table 2*)

Days Waiting for Admission

The *Days Waiting for Admission* indicator in the NRS refers to the number of days from the date a client is deemed ready for inpatient rehabilitation to the date they were actually admitted. The date ready for admission refers to the date that the client was clinically ready to start a rehabilitation program and met the criteria for admission to the rehabilitation facility. It does not refer to the date the client was put on a waiting list if this was done prior to when the client was clinically ready for rehabilitation. The date ready for admission is determined by the rehabilitation program accepting the client or by the referring facility, depending on the admission process at a particular facility.

The NRS makes an allowance for the fact that the date ready for admission to rehabilitation is not always easily ascertained. Where this is the case, facilities may indicate on the admission assessment that the date ready for admission was not known. During 2004–2005, the date ready for admission was not known for one fifth (20%) of clients who were discharged during the fiscal year. Records where the date ready for admission was not known are not included in the analyses for this section. Percentages given in the following paragraphs are based on the 24,373 records where the date ready for admission was known. As part of its ongoing data quality monitoring activities, CIHI has identified this as a potential issue and has initiated further investigation and action to address item non-response associated with this data element.

Figure 2.3 shows that 53% of the clients for whom a date ready for admission was available were admitted to inpatient rehabilitation the same day they were deemed clinically ready and a further 17% waited only one day. Eight per cent of clients waited over a week before they were admitted, and 1% waited over 30 days. *(Quick Stats, Table 3)*

Figure 2.3 also compares the days waiting for admission to inpatient rehabilitation by facility type. As the figure shows, a larger proportion of clients admitted to General facilities appear to have been admitted for rehabilitation on the same day they were deemed ready: 62% of clients admitted to General facilities compared with 36% admitted to Speciality facilities. This appears to be consistent with the finding that the majority of clients admitted to General facilities were referred by the inpatient acute unit of that same facility, whereas Specialty facilities often receive their clients from another facility. The admission process in Specialty facilities may necessitate a more detailed application for rehabilitation and an inter-facility transfer—processes that might contribute to the variation suggested by the NRS data.
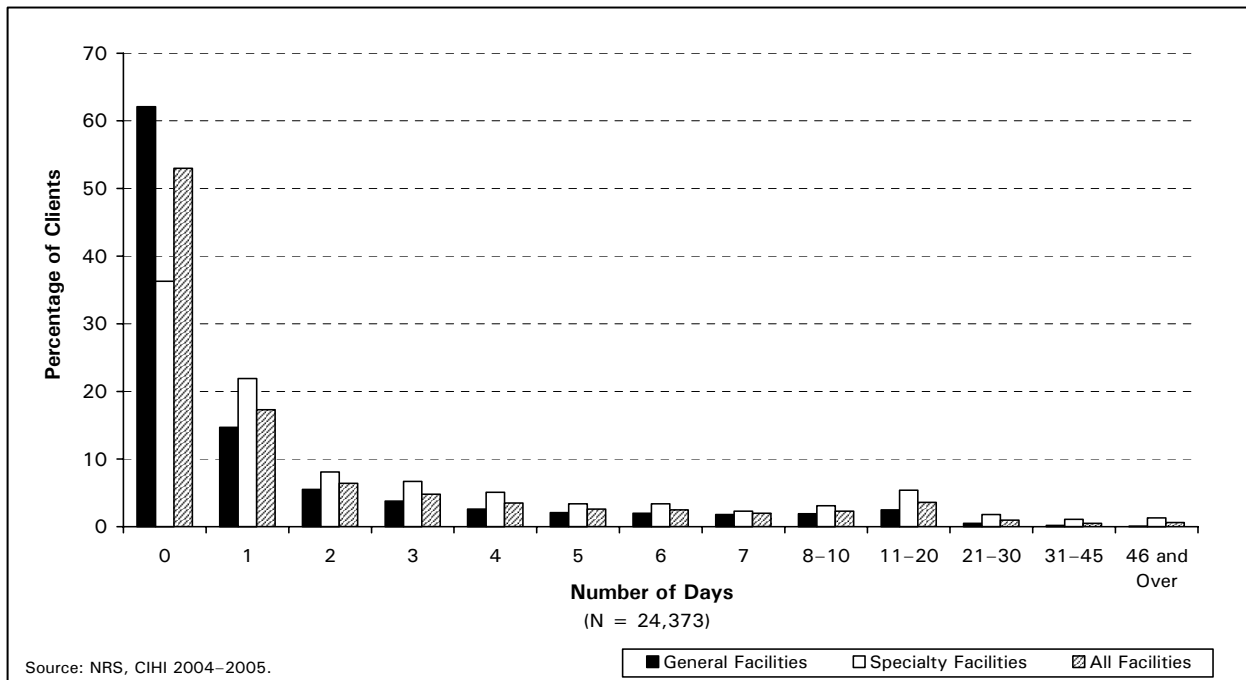
Figure 2.3   Distribution of Days Waiting for Admission to Inpatient Rehabilitation, 2004–2005

The median number of days that clients with a known date ready for admission waited for admission to a rehabilitation facility was zero days (i.e. at least half of the clients were admitted on the same day as they were deemed ready for admission). The median rather than the mean was used in this report to describe the days waiting for admission, as the distribution of values was skewed, with the majority of clients waiting for less than a week for admission to a rehabilitation facility.[1]

Figure 2.4 shows the median number of days clients waited for admission according to the referral source for all facilities. Data in this figure are based on the 24,373 records where the data element *Date Ready for Admission* was populated. The figure shows that clients referred to rehabilitation by an acute inpatient unit in the same facility or by a rehabilitation unit from the same or a different facility all had a median wait of zero days. In other words, at least half of these clients were admitted to the rehabilitation unit from these sources on the same day they were deemed ready for admission.

Source: NRS, CIHI 2004–2005.
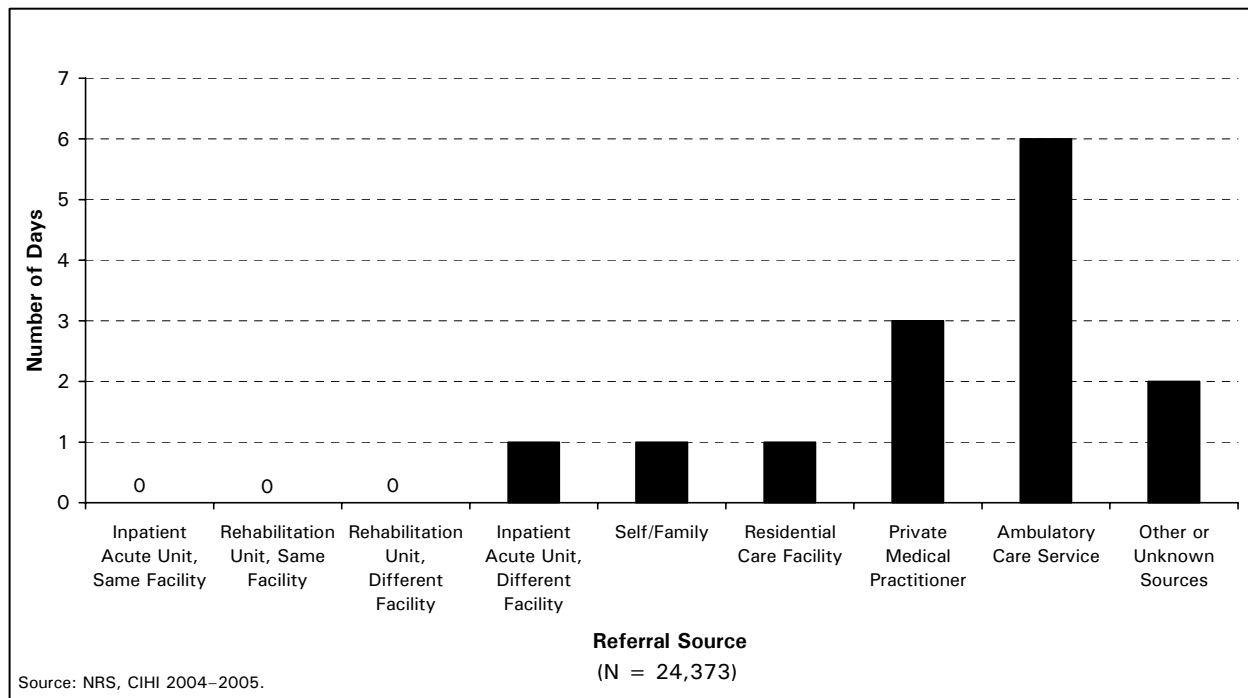
Figure 2.4   Median Days Waiting for Admission to Inpatient Rehabilitation by Source of Referral, 2004–2005

Clients referred from an inpatient acute care unit of a different facility (50% of clients for whom a date ready for admission was known), a residential care facility (1.6% of all clients), or a self-referral (just under 1% of clients) all had a median wait of one day before they were admitted. The remaining referral sources had longer median wait times: private medical practitioner—3 days; and ambulatory care services—6 days. However, these two referral sources together accounted for only 2.5% of all NRS client records for 2004–2005. *(Quick Stats, Table 4)*

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1. Refer to the "Computations" section in Chapter 1 for more details on the calculation of median and mean.

While many clients in the NRS appear to have waited less than a week for admission to rehabilitation, Chapter 3 will show that some client groups waited longer, on average, than others for admission to a rehabilitation bed. Implications for delays in waiting for admission to rehabilitation can have many facets; for example, they may be financial, in cases where the client is occupying a more expensive acute care bed, or psychological, where the client is not coping well in the community and is relying heavily on family support while awaiting admission. While the data suggest that there is some variation in wait times, further investigation is required to shed light on the reasons behind these differences.

Demographic Characteristics

Figure 2.5 shows that the largest age group represented in the NRS in 2004–2005 was the 75 to 84-age bracket, at 34% of all NRS clients. One quarter (24%) of all clients admitted for inpatient rehabilitation in 2004–2005 were aged between 65 and 74 years. This percentage is only slightly lower than the percentage of clients in the entire 18 to 64 age groups combined (28%). The remaining 14% of clients were 85 years of age and over. The average age of inpatient rehabilitation clients in the NRS was 71 years. *(Quick Stats, Table 5)*
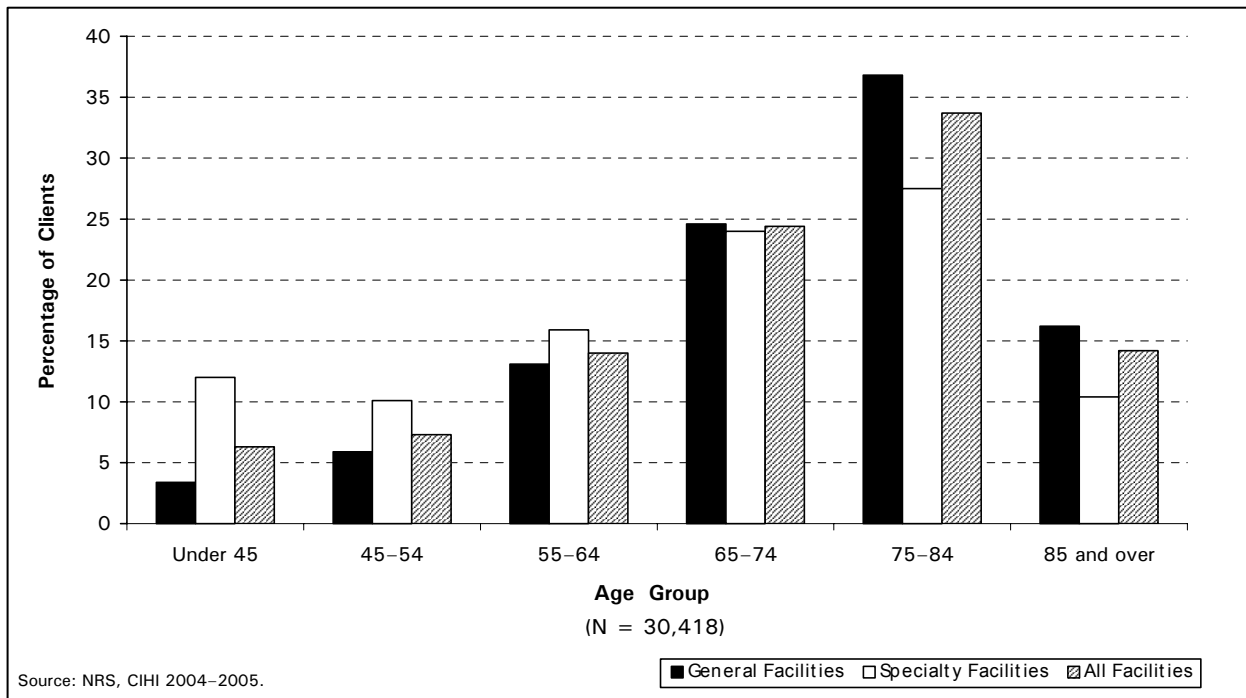
Figure 2.5   Age at Admission to Inpatient Rehabilitation by Facility Type, 2004–2005

The NRS data also suggest that clients who were admitted to General facilities tended to be older than those admitted to Specialty facilities. The average age of clients admitted to General facilities in 2004–2005 was 73 years compared with 66 years for those admitted to Specialty facilities. Over three quarters (78%) of the clients admitted to General rehabilitation facilities were aged 65 years and over compared with 62% admitted to Specialty rehabilitation facilities. Chapter 3 will show that clients in the younger age groups (under the age of 45) are more frequently admitted for rehabilitation of acute

traumatic conditions, such as spinal cord or head injuries, rather than for chronic or non-traumatic conditions. Rehabilitation for these types of acute injuries tends to be offered more frequently in freestanding facilities that have specialized programs oriented towards this clientele, consistent with NRS data suggesting a lower average age of clients admitted to Specialty facilities.

Table 2.2 below compares the Canadian population in 2004 to the age groups in the NRS for 2004–2005. The numbers in the "% of Total" columns suggest what rehabilitation clinicians and managers collecting data for the NRS are generally aware of: that older people are disproportionately represented in the NRS as rehabilitation clients, compared to the general population.

Table 2.2   Canadian Population for 2004 and NRS Inpatient Rehabilitation Clients by Age Group for 2004–2005

Age Group	Canadian Population 2004				Representation in the NRS 2004–2005			
	# (Thousands)	% of Total	Males (%)	Females (%)	Total Episodes (#)	% of Total	Males (%)	Females (%)
Under 45	19,612.8	61.4	50.8	49.2	1,925	6.3	60.3	39.7
45–54	4,805.9	15.0	49.7	50.3	2,226	7.3	51.9	48.1
55–64	3,386.7	10.6	49.3	50.7	4,268	14.0	45.9	54.1
65–74	2,212.9	6.9	47.5	52.5	7,431	24.4	44.1	55.9
75–84	1,460.4	4.6	41.2	58.8	10,245	33.7	37.1	62.9
85+	467.7	1.5	30.5	69.4	4,323	14.2	28.2	71.8

Sources: NRS, CIHI 2004–2005.
         Statistics Canada, 2004.

Figure 2.6 shows that, in general, the ratio of female to male clients admitted to participating NRS facilities increased with age. The youngest age group (those aged under 45 years) had the largest proportion of male clients and smallest proportion of female clients (60% male to 40% female). Males and females accounted for approximately equal proportions of clients in the 45 to 54 age group (52% vs. 48%). The proportion of female clients starts to increase with the 55 to 64 and 65 to 74 age groups. This trend continues through the remaining age groups, up to where the 85 and over age group is 28% male and 72% female. These differences were also reflected in the average age of male and female clients in the NRS: 68 years and 73 years respectively. *(Quick Stats, Table 5)*

The distribution of sexes also varied between General and Specialty facilities (figure not shown). In General facilities, 62% of clients were female and 38% were males, while in Specialty facilities, the proportions of female and male clients were approximately equal at 52% and 48%, respectively.
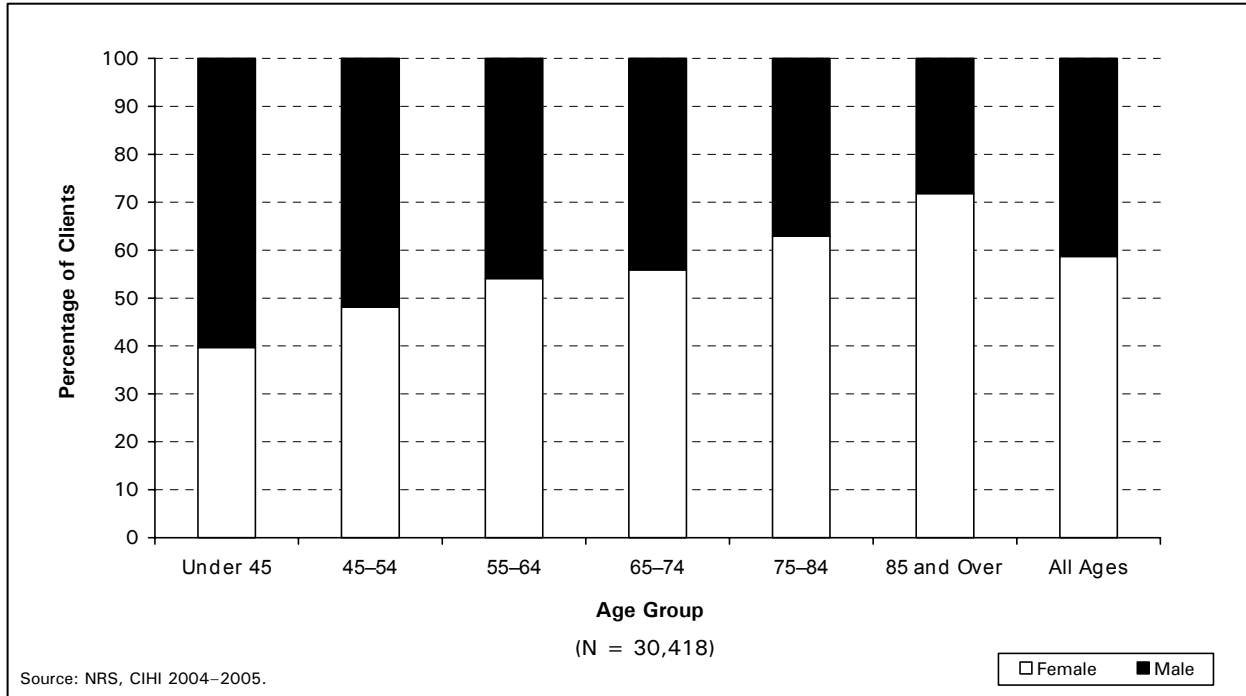
Figure 2.6   Proportion of Male and Female Inpatient Rehabilitation Clients by Age, 2004−2005

General population trends such as longer life expectancy in women may be contributing to a disproportionate number of older female clients in the NRS. Table 2.3 presents other data that may partially account for the proportion of females in the higher age groups in the NRS. The table presents the age/sex distribution of clients undergoing knee and hip replacements from facilities in Canada submitting data to CIHI's Canadian Joint Replacement Registry (CJRR) for 2002−2003. Many hip-and-knee-replacement clients are referred to inpatient rehabilitation following surgery. This is supported, in part, by NRS data showing that clients receiving inpatient rehabilitation following either hip or knee replacements accounted for 32% of all NRS clients for 2004−2005. The data in Table 2.3 suggest that older female clients undergo these procedures more often than their older male counterparts. These data, coupled with the prevalence of hip-and-knee-replacement clients in the NRS, may partially account for the higher number of older female clients in the NRS.

Table 2.3   Age/Sex Distributions of Hip Replacement and Knee Replacement Clients in Canada, 2002–2003

Age Group	Total Hip Replacements					Total Knee Replacements				
	Males		Females		Total	Males		Females		Total
	#	%	#	%	#	#	%	#	%	#
<45	548	53.4	479	46.6	1,027	144	40.7	210	59.3	354
45–54	1,126	51.6	1,056	48.4	2,182	716	38.0	1,169	62.0	1,885
55–64	2,077	48.4	2,214	51.6	4,291	2,379	39.9	3,587	60.1	5,966
65–74	2,981	43.0	3,954	57.0	6,935	4,212	41.7	5,896	58.3	10,108
75–84	1,994	32.4	4,152	67.6	6,146	2,743	37.1	4,658	62.9	7,401
85+	347	25.9	991	74.1	1,338	272	34.6	514	65.4	786
Total	**9,073**	**41.4%**	**12,846**	**58.6%**	**21,919**	**10,466**	**39.5%**	**16,034**	**60.5%**	**26,500**

Source: Hospital Morbidity Database 2002–2003, CIHI.

Pre-Admission Living Setting

In the NRS, living setting refers to the physical environment in which the client is living, such as an apartment or a long-term care facility. At admission, information is collected on the type of living setting the client was residing in just prior to admission to the health care system. On discharge, living setting information is collected based on the planned living setting destination following the rehabilitation program.

Figure 2.7 shows that in 2004–2005, 89% of clients admitted for inpatient rehabilitation lived in a private house or apartment prior to their admission (with or without receiving paid health services). Four percent of clients lived in assisted living accommodations, such as group or retirement homes or supervised living settings, and 2% of clients lived in residential care (for example, long-term care facilities or nursing homes) prior to their admission. Note that the "Other/Unknown" category denotes clients living in other types of accommodations (e.g. boarding house or shelter) or whose living setting was not known at the time of admission. *(Quick Stats, Table 6)*

Source: NRS, CIHI 2004–2005.
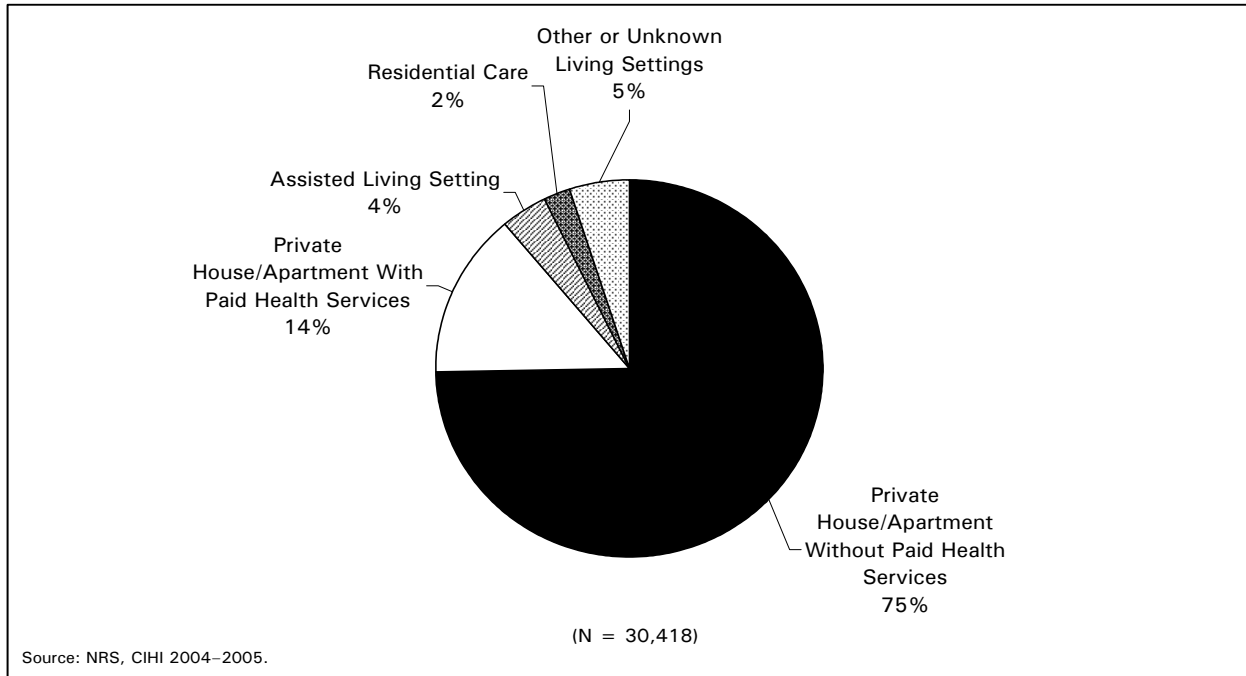
Figure 2.7   Pre-Admission Living Setting, 2004–2005

If a client lives in a private dwelling, information is also collected on whether or not he or she received paid health services prior to admission. Paid health services refer to health care services that are paid for either privately through third party or out-of-pocket, or publicly through provincial healthcare and are received in the client's home. These services can include things like meals on wheels, home care, hospital equipment at home, etc., and may or may not be related to the condition for which the client was admitted. Fourteen percent of clients living in a private house or apartment received some kind of paid health services prior to admission. Among those clients who lived in a private house or apartment prior to their admission, 68% lived with their spouse, family or friend(s), while 31% lived alone.

Informal Support Received Prior to Admission

Many people living at home receive varying degrees of informal support to carry out their daily routines. This is the network of family members, friends and neighbours who assist the client on an unpaid basis with tasks related to their daily living. Often, this assistance allows the client to remain in the community and manage without any formal assistance from organizations or health-related groups. These tasks can range from simply checking in on the client to performing household tasks such as cleaning, cooking and running errands. This network may have responsibilities that require a certain skill level (such as medication supervision) or time factor (e.g. weekly grocery shopping for the client).

The NRS includes data elements to assess whether or not informal needs exist for a client and, if so, whether they are being met entirely, partially or not at all. Note that the qualifiers "entirely", "partially" or "not at all" are determined by the clinical team through interviews with the client and/or family and friends. The information is collected at admission based on care received during the seven days prior to the day of admission to the health care system. It is also collected at discharge based on the expected needs and informal resources available on discharge.

Figure 2.8 shows that in 2004–2005, just over half (51%) of clients indicated they were receiving all of the informal support they required prior to their admission. An additional 11% of clients received only some of the required support. Two percent reported receiving no informal support at all, even though they felt there was a need. Over a third (36%) of clients did not require any informal support, either because the clients were able to care for themselves or because they received all their required support from formal service providers. *(Quick Stats, Table 7)*
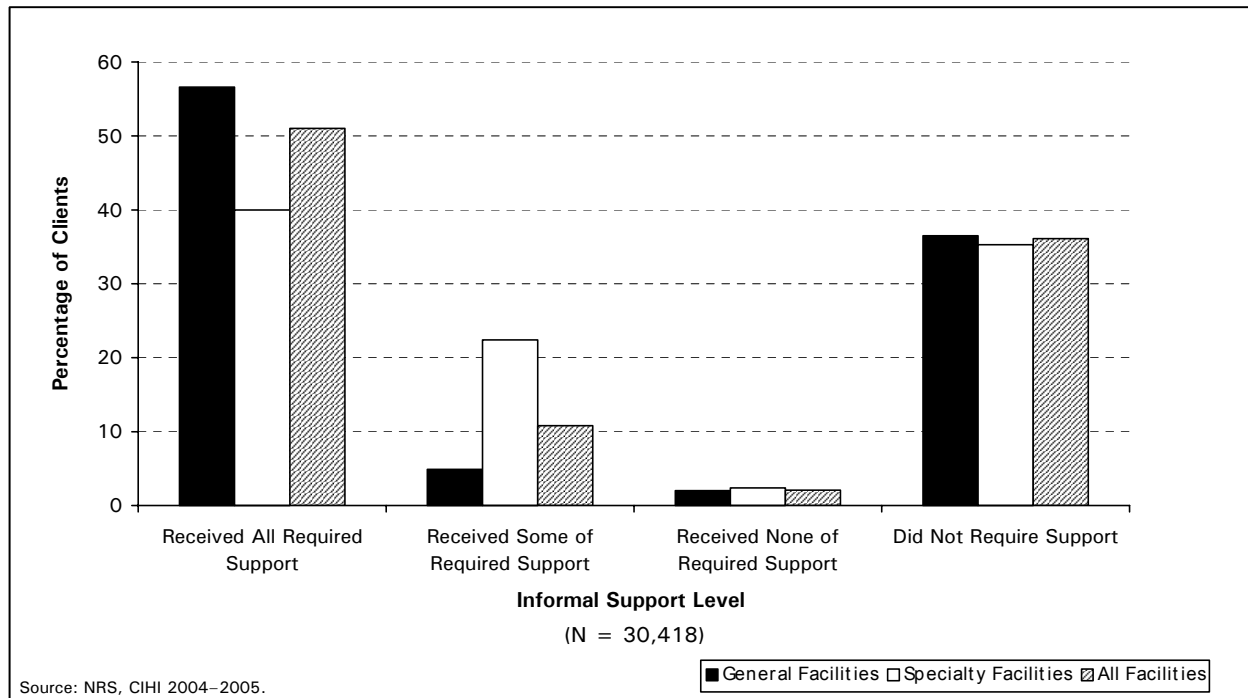
Figure 2.8   Inpatient Rehabilitation Clients Requiring and Receiving Informal Support Prior to Admission by Type of Facility, 2004–2005

Figure 2.8 also shows some variation in the amount of required informal support received according to the type of facility to which the client was admitted. A smaller proportion of clients admitted to Specialty facilities received all of the informal support required prior to admission (40% compared with 57% for those admitted to General facilities), and a larger proportion of clients in Specialty facilities received only some of the help required (22% compared with 5% in General facilities). Future NRS analytical activities may examine in more depth the variation in population characteristics between General and Specialty facilities that may be influencing these data.

This information on informal support is one mechanism to assess the level of unpaid, non-professional support that exists for clients in the community. Although the NRS data provide a glimpse into the requirements for and availability of informal support for this inpatient rehabilitation population, they do not provide information on the types of support required and received, or the reasons why informal needs that may be required are not being met.

Length of Stay

Length of stay (LOS) for the NRS is calculated as the number of days between a client's admission to and discharge from the rehabilitation facility, excluding any service interruptions. Service interruptions are recorded when rehabilitation services are temporarily suspended due to a change in the client's health status. These interruptions are excluded from LOS calculations in order to obtain a more accurate count of the number of days that clients were able to participate in the rehabilitation program. In 2004–2005, just 3% of clients had service interruptions at some point during their rehabilitation stay. As such, service interruptions did not affect the median length of stay for NRS clients, which was 19 days including or excluding service interruptions.

Figure 2.9 shows the distribution of client length of stay in inpatient rehabilitation. As the figure shows, the largest proportion of clients (23%) stayed in inpatient rehabilitation facilities between 8 and 14 days. Twenty percent of clients stayed under 7 days and 15% had a stay of between 15 and 21 days. One third (33%) of all NRS clients stayed in the rehabilitation facility for over four weeks. Note that for this analysis, records classified as (Un)planned Discharge have been included. Care should be used if comparing this figure to the corresponding figure in the previous report, *Inpatient Rehabilitation in Canada, 2003–2004,* where (Un)planned Discharge records were not included. Recall that clients in the (Un)planned Discharge admission class, by definition, have a length of stay of between one and three days. *(Quick Stats, Table 8)*

Source: NRS, CIHI 2004–2005.
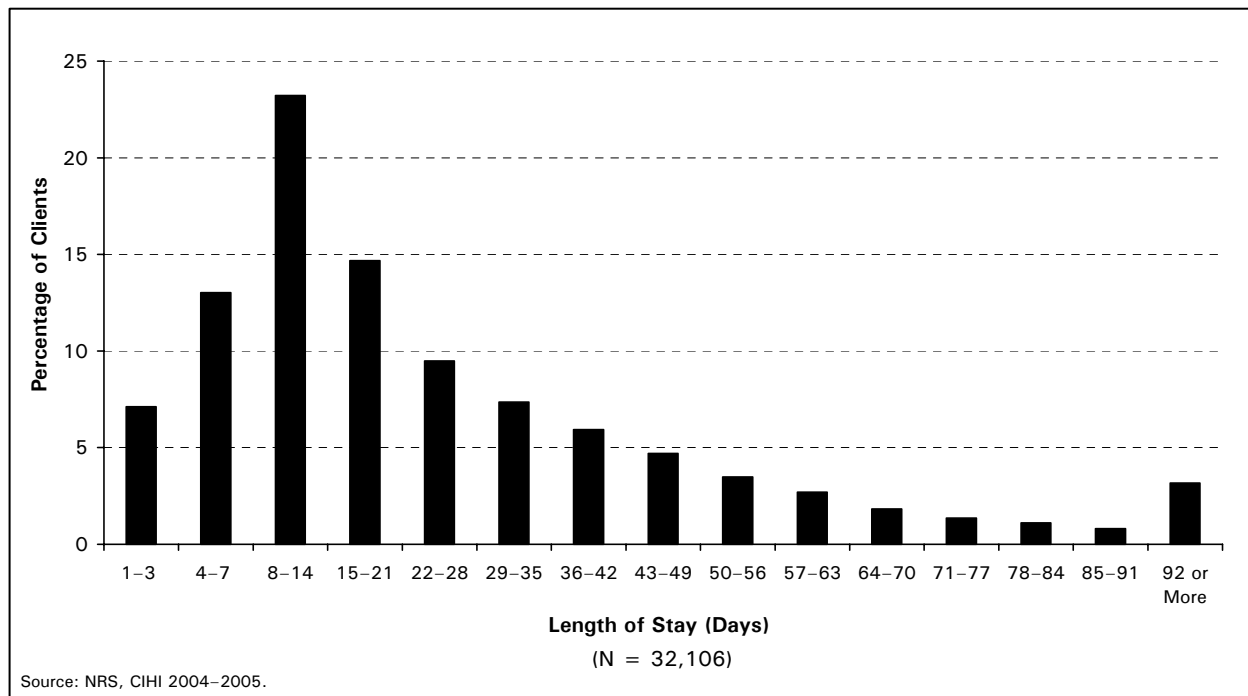
Figure 2.9   Distribution of Length of Stay in Inpatient Rehabilitation, 2004–2005

Excluding those clients classified as (Un)planned Discharge (for whom minimal data is collected), clients classified as Short Stay admissions had the shortest median length of stay (6 days). This is consistent with the definition of this admission class as describing clients with a length of stay between four and ten days. Those classified as Initial Rehabilitation clients had a median stay of 21 days. Clients admitted as Readmissions had a median length of stay of 25 days, and Continuing Rehabilitation clients had the longest median length of stay at 39 days. *(Quick Stats, Table 9)*

The median length of stay for clients admitted to Specialty facilities was longer than that for clients admitted to General facilities (31 days and 14 days, respectively). The median lengths of stay for some admission types also varied according to the facility type. For example, clients classified as Initial Rehabilitation admissions had a median length of stay of 31 days if they were admitted to a Specialty facility, compared to 17 days for those Initial Rehabilitation clients admitted to a General facility. Chapter 3 includes information on variations in length of stay between the different Rehabilitation Client Groups (RCG).

Reasons for Discharge

The NRS contains information on the reason for a client's discharge from a participating rehabilitation facility. These data provide information on whether or not a client's rehabilitation goals (determined collaboratively by the rehabilitation team and the client and documented on admission) were met or not met, and whether the client was discharged into the community or was transferred to another unit or facility. Other reasons for discharge include the withdrawal of the client from rehabilitation services against professional advice or the death of the client.

Note that a return to the community does not imply that the client returned back to their home, if that was their pre-admission living environment. Community living can include living environments such as a retirement community or other type of assisted living, or returning to live with a family member. A transfer to another facility generally implies that the client is still residing in the healthcare system. These living environments can include long-tem care facilities, alternate level-of-care beds, or a transfer back to acute care for further treatment.

As shown in Figure 2.10, nine out of every 10 clients (91%) were determined to have sufficiently met their service goals at discharge; 81% of all clients met their goals and returned to live in the community (a private house or apartment, boarding house or assisted living setting), while 10% of all clients met their goals but were referred or transferred to other units within the same facility or to other facilities. Eight percent of all clients were reported as not having met their service goals, and were either discharged to the community or transferred to another unit or facility. *(Quick Stats, Table 10)*
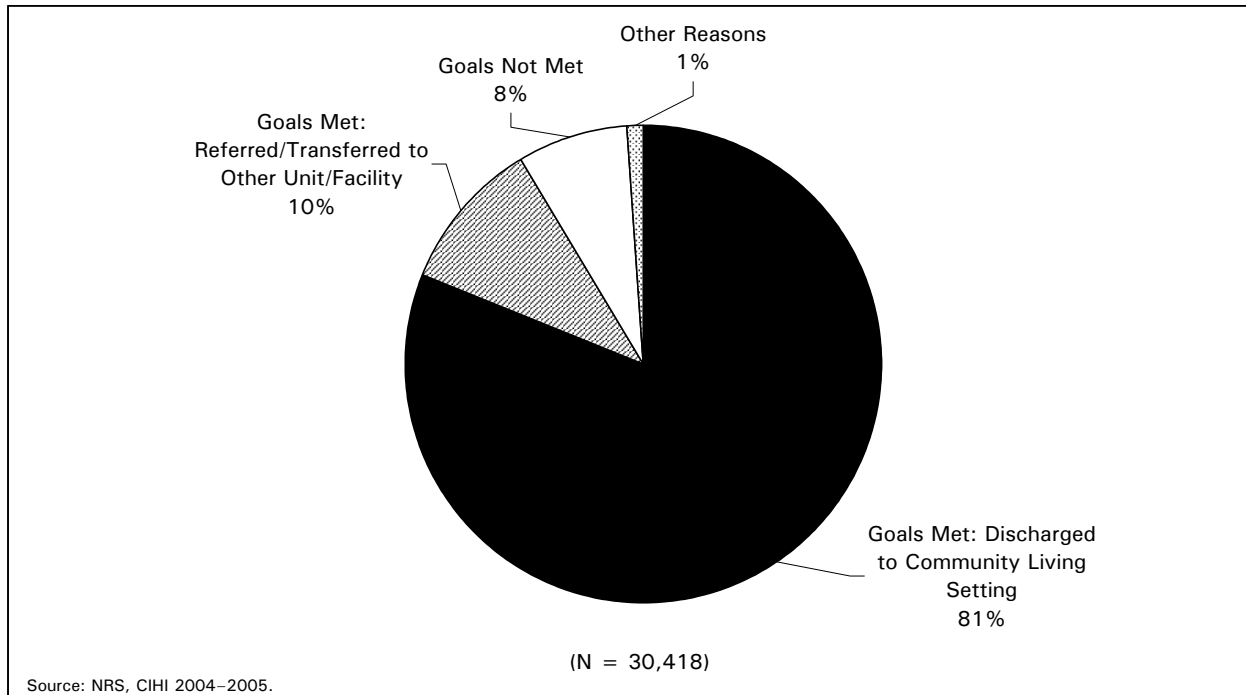
Figure 2.10   Reasons for Discharge From Inpatient Rehabilitation, 2004–2005

Achieving rehabilitation goals does not necessarily imply a return to pre-injury/illness functional status. Goals set by the rehabilitation team and the client are intended to maximize a client's functional independence under existing circumstances. It is the level of independence achieved that often plays a large role in determining the appropriate type of living setting on discharge. For example, at admission, it may be clear that a client with a severe stroke will not be able to recover enough function to return to living alone, but a reasonable rehabilitation goal might include being able to get into or out of bed with the help of just one person. Whether or not the client achieves this goal may help determine which type of living setting can adequately provide for this client's needs. All clients who have sufficiently met their goals through rehabilitation are considered to have had a "successful" course of rehabilitation for the purposes of the NRS, regardless of whether or not the client has returned to their previous level of function.

Services Referred to at Discharge

Whereas the previous section described the various reasons for clients being discharged from a rehabilitation program, this section will examine the types of services or care that these clients were most often referred to upon discharge. These services include home, community, and ambulatory care services for clients discharged into the community, and residential care or inpatient care for those who continue to reside in the health care system following a stay in rehabilitation.

During 2004–2005, over four out of five (84%) NRS clients were referred for services or transferred to other facilities upon discharge from rehabilitation in order to receive additional services pertaining to a health condition. NRS data suggest that the remaining 16% of clients were either not referred or transferred for any services, or the information was not collected for other reasons, such as the client's withdrawal from the rehabilitation program.

Among those clients referred for services after discharge, 33% were referred to home care agencies; 14% were referred to facility-based ambulatory care services; and 11% were referred to a private healthcare practitioner, such as a family doctor or physiotherapist. Five percent of clients were referred for some type of community service on discharge (includes transportation arrangements, public health referrals, etc.). Other clients were transferred for various types of facility-based care. For example, 9% were transferred to a residential care facility, 6% were referred to inpatient acute care units, and 3% were transferred to another inpatient rehabilitation facility. *(Quick Stats, Table 11)*
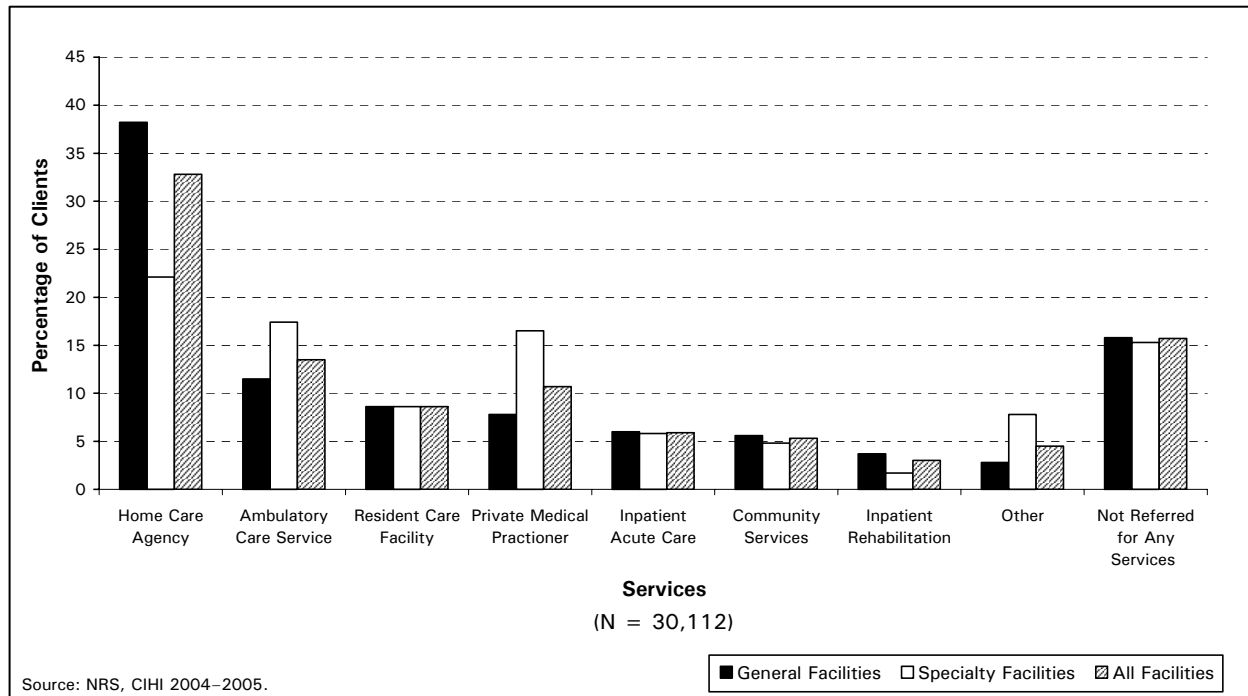
Figure 2.11   Services Referred to After Discharge From Inpatient Rehabilitation, 2004–2005

Figure 2.11 also shows that there was some variation in the services to which clients were referred upon discharge according to the type of facility from which they had been discharged. Clients discharged from General facilities were more likely to be referred to home care agencies than those discharged from Specialty facilities (38% versus 22%). The reverse was true for clients referred to ambulatory care services or private medical practitioners. Among clients discharged from Specialty facilities, one in five (17%) were referred to ambulatory care services and the same percentage to private medical practitioners. In contrast, only 12% discharged from General facilities were referred to ambulatory care service and less than one in 10 (8%) were referred to a private healthcare practitioner. Referrals to residential care were the same for both groups at 10%.

The previous version of this report, *Inpatient Rehabilitation in Canada, 2003–2004*, showed that clients over the age of 75 were much more likely to be referred to home care services while their younger counterparts were more likely to be referred to ambulatory care services or a private practitioner. While the corresponding 2004–2005 data is not shown here, the results are almost identical. These data are consistent with the finding that older clients (referred more often for home care) are more frequently admitted to General facilities, while younger clients (referred more often for ambulatory care and private practice) are more frequently admitted to Specialty facilities.

Post-Discharge Living Setting

Client living setting prior to admission into an inpatient setting was examined earlier in this chapter. This section of the report discusses the various types of living settings to which clients were discharged in 2004–2005 following completion of the rehabilitation program. Additional resources (both human and financial) may often be involved in finding new living environments for clients unable to return to their pre-admission environment. This NRS indicator provides information on the rates at which clients return to the community following rehabilitation or require relocation to a facility that provides care services, such as an assisted living or residential care facility.

Figure 2.12 shows the post-discharge living setting of clients classified according to their pre-admission living setting. The figure shows that most clients returned to their pre-admission living setting following discharge from the rehabilitation facility, suggesting that they were likely at least able to return to a baseline level of function appropriate for that setting. For example, of clients who were living in an assisted living environment prior to their entry into the health care system, 59% returned to that environment after their stay in rehabilitation, while 19% were placed in a residential care setting. Note that for this figure, the number of records is provided for each pre-admission living setting instead of for the overall number of records. This is because each grouping of bars represents clients with the same pre-admission living setting. For this type of analysis, comparisons across pre-admission living setting groups are not meaningful. *(Quick Stats, Table 12)*
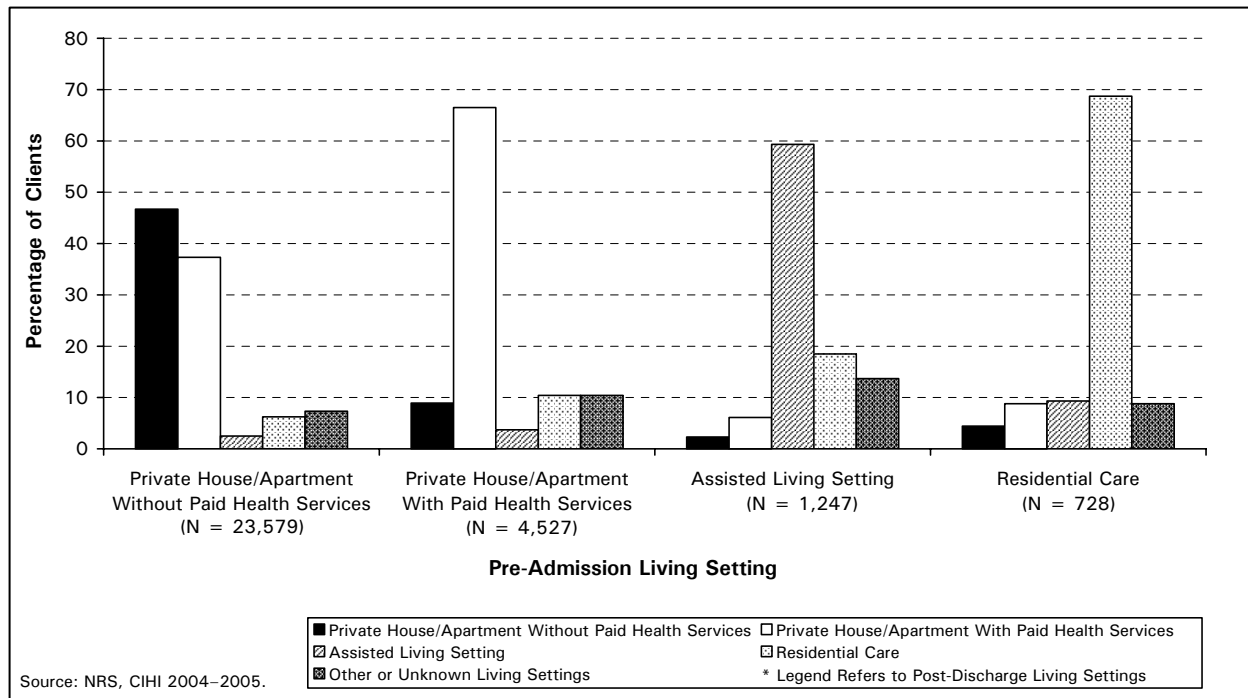
Figure 2.12   Pre-Admission and Post-Discharge Living Setting of Inpatient Rehabilitation Clients, 2004–2005

Clients who had not received paid health services prior to their admission were slightly more likely to return home on discharge, compared to those who had received paid services prior to admission. For example, 84% of clients who lived at home but had not received paid health services prior to admission returned home on discharge from rehabilitation (with or without paid services), while 9% moved into an assisted living environment or to a residential care facility. In comparison, 75% of clients who *had* received paid health services prior to admission returned to a private house or apartment upon discharge, while 14% moved into either an assisted living environment or to a residential care facility.

Summary

Full admission and discharge records for 30,418 clients discharged from inpatient rehabilitation facilities in 2004–2005 were submitted to the NRS. This chapter highlights several characteristics of the clients, facilities and rehabilitation episodes that are reflected in the NRS data. Some noteworthy differences across facility types, demographic characteristics and referral patterns are presented in order to provide a broad summary of the inpatient rehabilitation services in participating facilities across Canada. The data presented this year are, in many ways, very similar to what was presented in *Inpatient Rehabilitation in Canada, 2003–2004*. The strong similarities between data sets from last year and this year suggest that the rehabilitation population captured in the NRS has been relatively stable for that time period. The pattern of repeating analyses for Chapters 2 and 3 will likely continue with future reports, so that trending analysis will eventually be possible.

Key Findings:

- In 2004–2005, the average age of inpatient rehabilitation clients was 71 years. The ratio of female to male clients increased with age.

- Over nine out of every ten clients were referred for inpatient rehabilitation services by acute care facilities.

- Among clients for whom a date ready for admission was known, 53% were admitted to inpatient rehabilitation the same day they were deemed clinically ready to participate in rehabilitation. One percent of clients had to wait over 30 days for admission.

- Sixty-four percent of clients reported requiring some level of informal support to manage their activities of daily living prior to admission for rehabilitation services.

- Most clients living in a particular living setting prior to admission to inpatient rehabilitation were able to return to the same or similar type of living setting on discharge from rehabilitation.

- The majority of clients were referred for some type of service through a facility or agency following their discharge from rehabilitation. One third of clients were referred to home care agencies and 14% were referred to ambulatory care services.

Chapter 3. Rehabilitation Client Groups

Clients are admitted to rehabilitation programs to improve functional levels that may have declined due to injury or illness, or following surgery. Health conditions such as stroke, arthritis and spinal cord injury, for example, that result in the need for rehabilitation can vary significantly in terms of health resource requirements and rehabilitation approach. Grouping clients according to specific conditions and comparing the data within and across these groups provides information towards understanding variation in client outcomes and rehabilitation service provision.

Within the National Rehabilitation Reporting System (NRS), a client is categorized into one of 17 health condition groups, known as Rehabilitation Client Groups (RCG). The RCG selected for a particular client is based on the condition that best describes the primary reason for the client's admission to the inpatient rehabilitation unit or facility—for example, stroke or limb amputation. Some RCGs are further sub-divided in order to facilitate more specific analyses of groups that contain large numbers of rehabilitation clients. The limb amputation RCG, for example, is further subdivided into groups that denote which limb was amputated and at what level the amputation occurred. A full list of RCGs used in the NRS can be found in Appendix B. For the purposes of this report, only the 17 main groups and selected sub-divisions of RCGs are discussed. Where the term "Other RCGs" appears in a figure or table, two or more RCGs have been grouped together due to small numbers of individuals in those groups.

Overall Distribution of Rehabilitation Client Groups

Two RCGs, orthopaedic conditions and stroke, accounted for two thirds (66%) of all inpatient rehabilitation clients discharged from participating NRS facilities in 2004–2005. Figure 3.1 shows that half (50%) of all clients in the NRS received rehabilitation relating to orthopaedic conditions, such as hip fracture, hip replacement or knee replacement, while an additional 16% of clients received rehabilitation services following a stroke.

The remaining RCGs were seen relatively less frequently: medically complex conditions— 7% of all clients; brain dysfunction, limb amputation, and debility—each with 4% of clients. A further 3% of NRS clients received rehabilitation services following spinal cord dysfunction, which includes non-traumatic or traumatic paraplegia and quadriplegia, as well as other traumatic spinal cord injuries. The remaining 12% of clients received inpatient rehabilitation for other conditions such as arthritis, cardiac disease, major multiple trauma, pain syndromes, and pulmonary disease. *(Quick Stats, Table 13)*
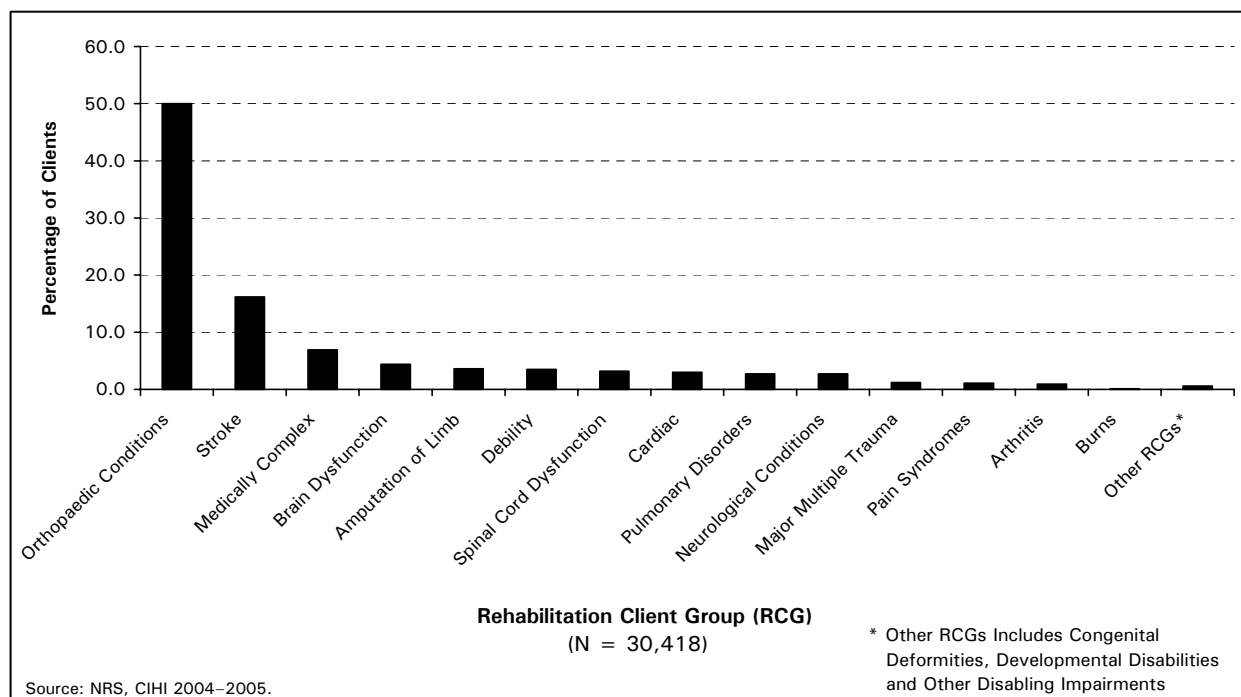
Figure 3.1   Distribution of Inpatient Rehabilitation Clients by Rehabilitation Client Group, 2004–2005

Rehabilitation Client Group by Type of Facility

Although orthopaedic and stroke clients were the largest groups in both General and Specialty rehabilitation facilities during 2004–2005, there were some differences in the distribution of clients across RCGs within the General and Specialty facility types.

General facilities had a relatively higher proportion of admissions for orthopaedic, medically complex and debility clients. For example, 56% of clients admitted to General facilities received services for orthopaedic conditions compared to 38% of clients admitted to Specialty facilities. Conversely, Specialty facilities had a relatively higher proportion of admissions for brain dysfunction, spinal cord dysfunction, limb amputations and major multiple trauma. For example, brain dysfunction admissions accounted for only 2% of all admissions to General facilities, compared to over 9% of all admissions to Specialty facilities. General and Specialty facilities had similar proportions of clients admitted for inpatient rehabilitation following a stroke (15% and 18% respectively). *(Quick Stats, Table 13)*
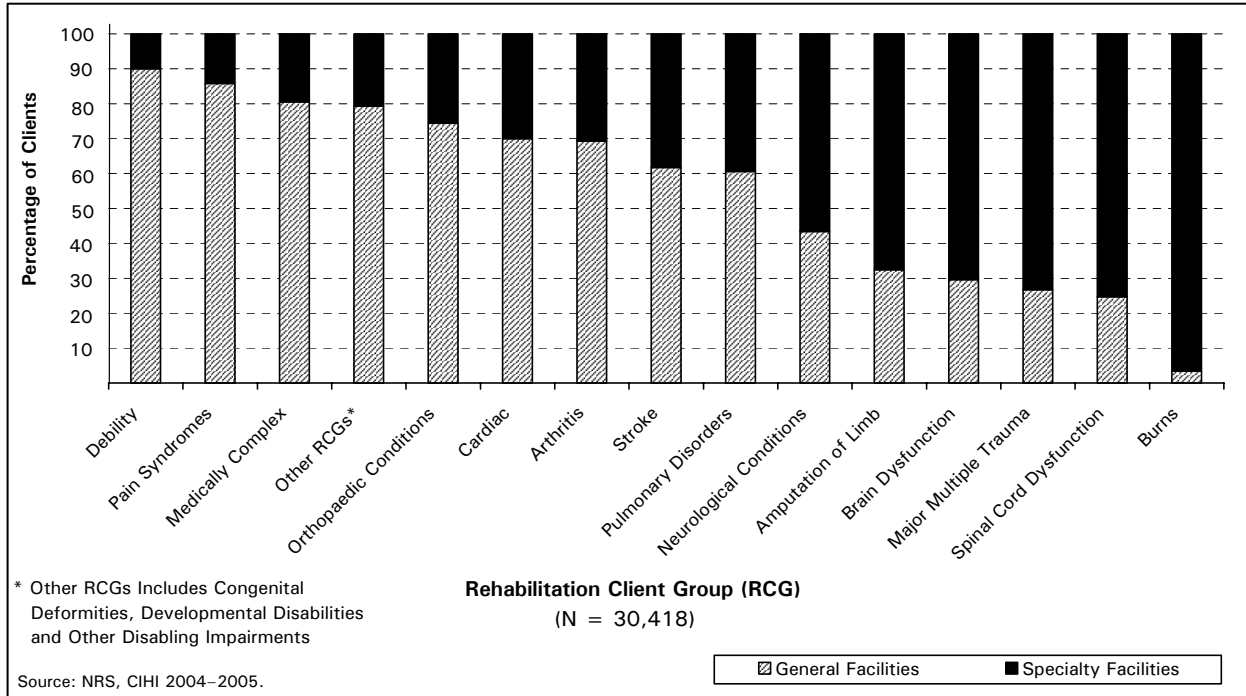
Figure 3.2   Distribution of Rehabilitation Client Groups by Facility Type, 2004–2005

Figure 3.2 is a graphical representation of the proportion of RCG admissions by facility type. The orthopaedic, debility, medically complex and pain syndrome RCG clients were admitted in much larger proportions to General facilities than to Specialty facilities. For example, of all NRS clients in the orthopaedic RCG, 74% were admitted to General facilities while only 26% went to Specialty facilities. These data are consistent with the demographic data from Chapter 2 that showed older NRS clients were admitted more frequently to General facilities. Data in subsequent sections of this chapter will show that older clients were more typically admitted to rehabilitation for conditions relating to the orthopaedic, debility and medically complex RCGs—client groups that are admitted more frequently to General facilities. Brain dysfunction, neurological conditions, limb amputations, spinal cord dysfunction and major multiple trauma RCGs—conditions seen more frequently in younger clientele—accounted for larger proportions of clients admitted to Specialty facilities. For example, three quarters (75%) of all spinal cord dysfunction clients were admitted to Specialty facilities compared to only a quarter (25%) who were admitted to General facilities. *(Quick Stats, Table 14)*

Days Waiting for Admission

As mentioned in the previous chapter, the date that the client was ready for admission to rehabilitation was not known for a fifth (20%) of clients discharged in 2004–2005. These clients were therefore excluded in the following analysis. This should be considered when interpreting the following data on days waiting for admission to inpatient rehabilitation.

Overall, clients in the NRS for whom a date ready for admission was known had a median wait of zero days for admission to inpatient rehabilitation (i.e. half of these clients were admitted the same day they were deemed eligible). As Figure 3.3 shows, orthopaedic, medically complex, cardiac, pulmonary, pain syndrome and arthritis were the RCGs that had the shortest median wait at zero days, while the median wait time for stroke, debility, spinal cord dysfunction, burns, major multiple trauma and neurological conditions clients was one day. Clients with brain dysfunction and limb amputations tended to wait the longest for admission to a rehabilitation facility with a median wait of two days. As discussed in Chapter 2, median is used rather than mean, due to the skewed nature of the values reported for days waiting for admission. *(Quick Stats, Table 15)*
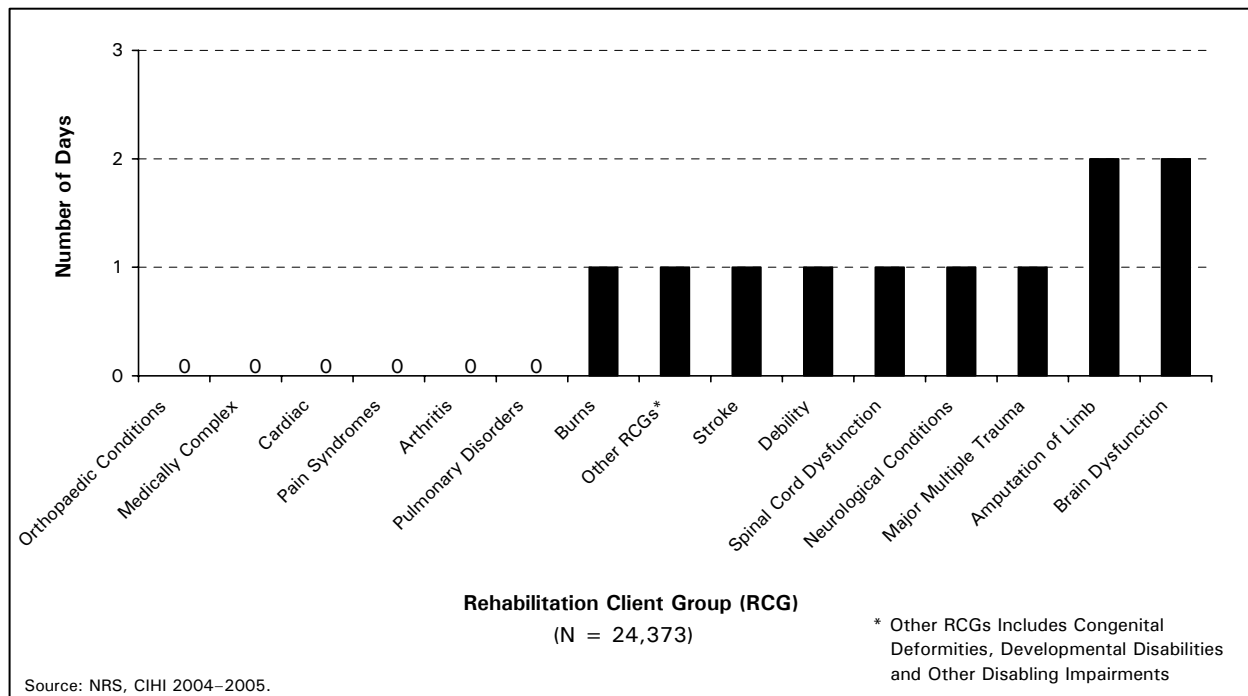
Figure 3.3   Median Days Waiting for Admission to Rehabilitation by Rehabilitation Client Group, 2004–2005

Demographic Characteristics

Chapter 2 described the age and sex distributions of clients who received inpatient rehabilitation from participating NRS facilities in 2004–2005. In this chapter, the age and sex characteristics are presented for each specific RCG. The data indicate that the demographic characteristics can vary widely between client groups.

Figure 3.4 shows that the orthopaedic, pain syndrome and arthritis RCGs had the highest proportion of female clients in 2004–2005, approximately 70% for each of these RCGs. The stroke and neurological conditions RCGs had almost equal proportions of female and male clients. In sharp contrast, the brain dysfunction, spinal cord dysfunction, amputation of limb, major multiple trauma and burn clients were much more likely to be male; the proportions of male clients in these RCGs ranged from 63% to 70%. *(Quick Stats, Table 16)*
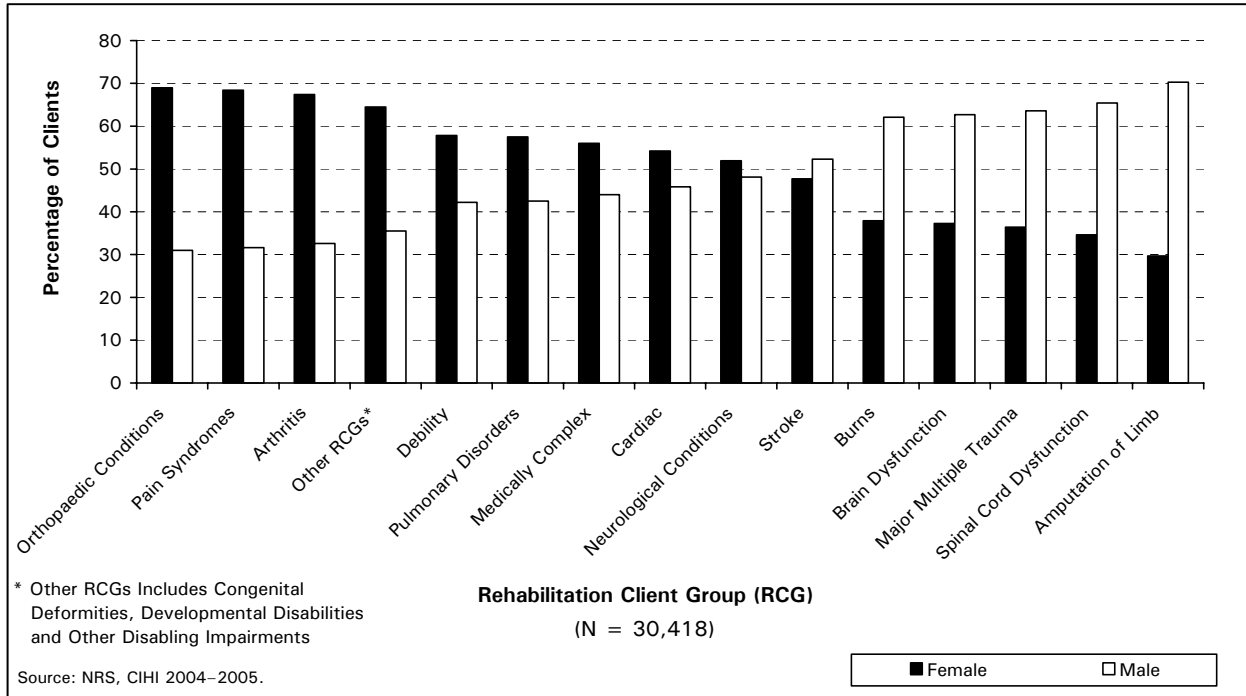
Figure 3.4   Male/Female Distribution of Inpatient Rehabilitation Clients by Rehabilitation Client Group, 2004–2005

Although many RCGs demonstrate a higher proportion of one sex over the other, Figure 3.5 demonstrates some similarities in the age distributions for these client groups. For many RCGs, there appears to be a higher incidence of admissions to rehabilitation with increasing age. The orthopaedic, stroke, medically complex, debility and cardiac RCGs are examples of client groups that show this trend, with the 75 to 84-age group having the largest representation. However, incidences of admissions for these RCGs diminish in the 85 and over age category. Other RCGs, such as brain dysfunction, spinal cord dysfunction, and major multiple trauma, demonstrate a decreasing trend of admissions with increasing age. *(Quick Stats, Table 17)*
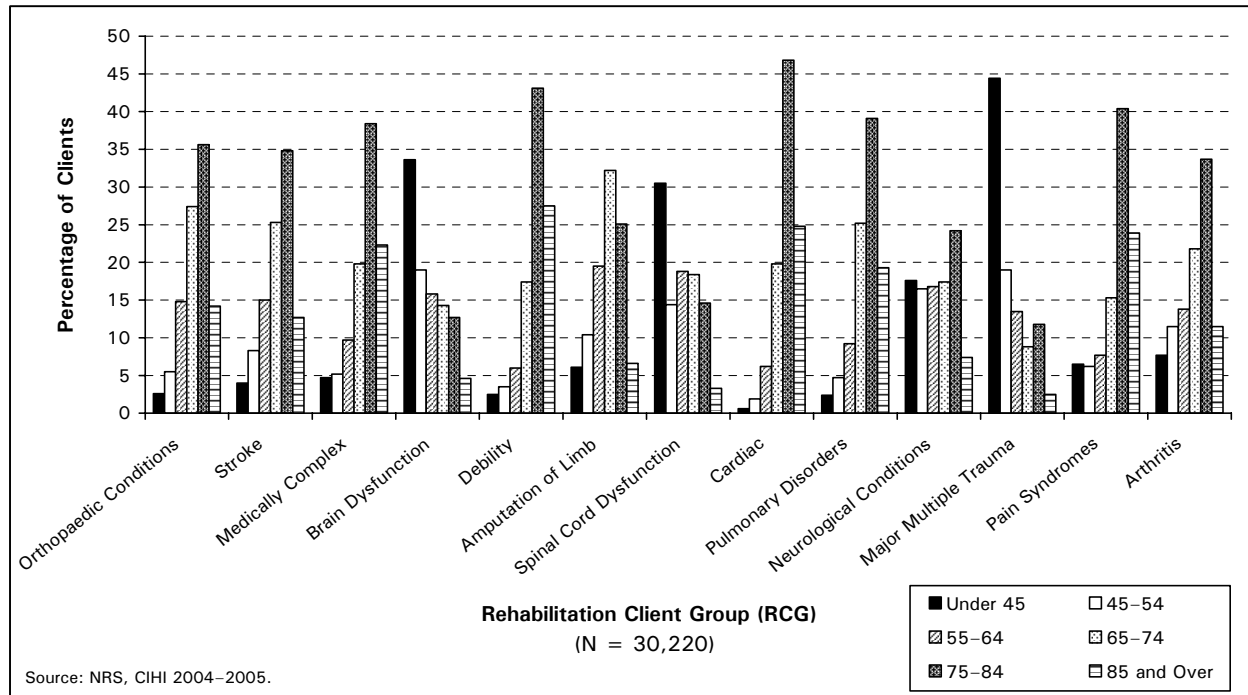
Figure 3.5 **Age at Admission of Inpatient Rehabilitation Clients by Rehabilitation Client Group, 2004–2005**

At the aggregate level, the distribution of clients by age group in the neurological conditions RCG shows much less variation when compared to other RCGs. Further analysis examining the different conditions included in this RCG would likely suggest some variation with age. For example, both multiple sclerosis (MS) and Parkinson's disease are diagnoses that fall under the neurological RCG; however, clients with MS tend to be younger, whereas Parkinson's is seen more frequently in the older population.

Also, for this analysis, the brain dysfunction and spinal cord dysfunction RCGs include clients with both traumatic and non-traumatic aetiologies. When the brain dysfunction and spinal cord dysfunction client groups are further broken down, specific trends are noted with regards to traumatic and non-traumatic as well as male/female distributions. A subsequent paragraph in this chapter looks at the age/sex breakdown of traumatic and non-traumatic brain dysfunction client groups. A similar analysis was performed with the spinal cord dysfunction group in the preceding report in this series, *Inpatient Rehabilitation in Canada, 2003–2004*.

Analyzing age and sex of clients at the same time within each RCG showed that for some client groups, a substantial segment of clients within the individual RCGs consisted of either male or female clients in one or two age groups. Figure 3.6 looks at the age/sex distribution for the seven most frequently coded RCGs in the NRS in 2004–2005. The figure shows that orthopaedic clients tended to be older women; 43% of orthopaedic clients were females in the 65 to 74 and 75 to 84 age groups, while males of the same age group accounted for only 20% of orthopaedic clients. Similarly, debility clients tended to be women aged over 75 years—accounting for 43% of all clients in that RCG. In contrast, among limb amputation clients, males in the 65 to 74 and 75 to 84 age groups accounted

for 41% of all limb amputation clients in the NRS. Females of the same age groups accounted for only 17% of clients in this RCG. Males under 45 years of age were the most predominant group in both brain dysfunction and spinal cord dysfunction RCGs and accounted for 24% and 23% of these RCGs, respectively.
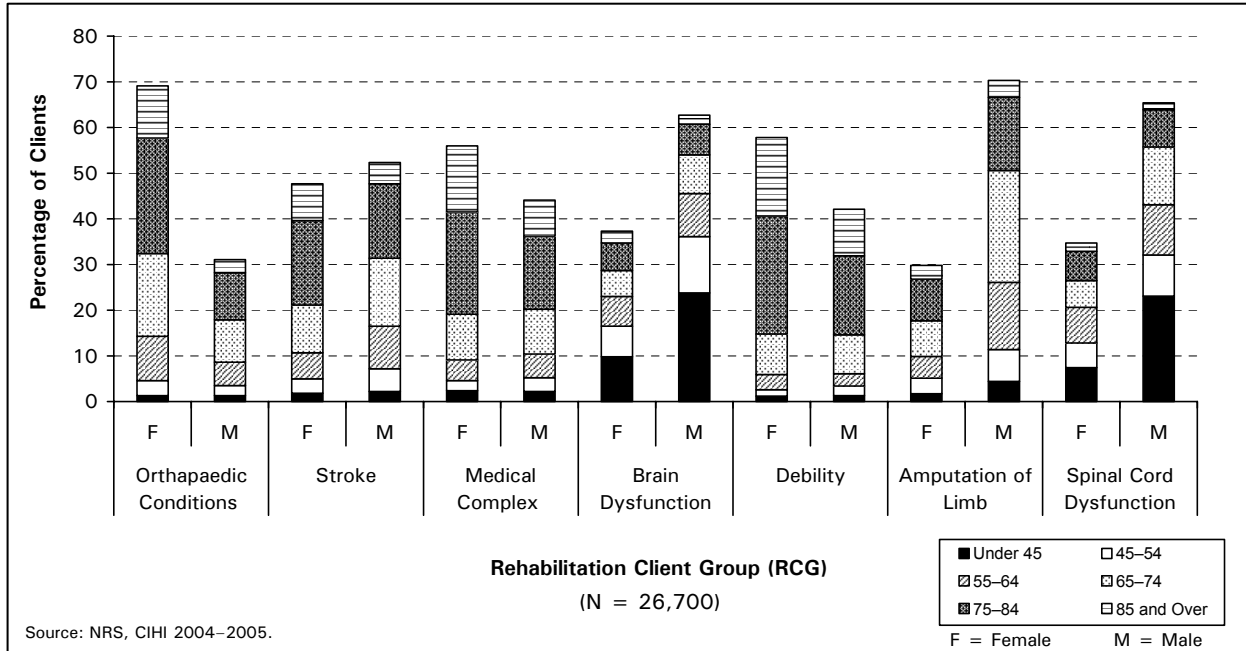
Figure 3.6 **Age and Sex of Inpatient Rehabilitation Clients by Rehabilitation Client Group, 2004–2005**

While the stroke client group shows overall proportions of males and females that are approximately equal, males outnumber females in all younger age groups, up until the 75 to 84 and 85 and over age groups, where there are more female clients than male clients. *(Quick Stats, Table 18)*

A Note About Brain Dysfunction Clients in the National Rehabilitation Reporting System

To date in this report, data for all brain dysfunction clients have been reported under the broad category of the brain dysfunction RCG. Within the NRS database, this RCG is further divided into traumatic and non-traumatic categories, as a means of differentiating the origin of the dysfunction. An examination of the brain dysfunction RCG by traumatic and non-traumatic grouping reveals patterns of inpatient rehabilitation admissions for these groups according to age and sex distribution, as shown in Figure 3.7.
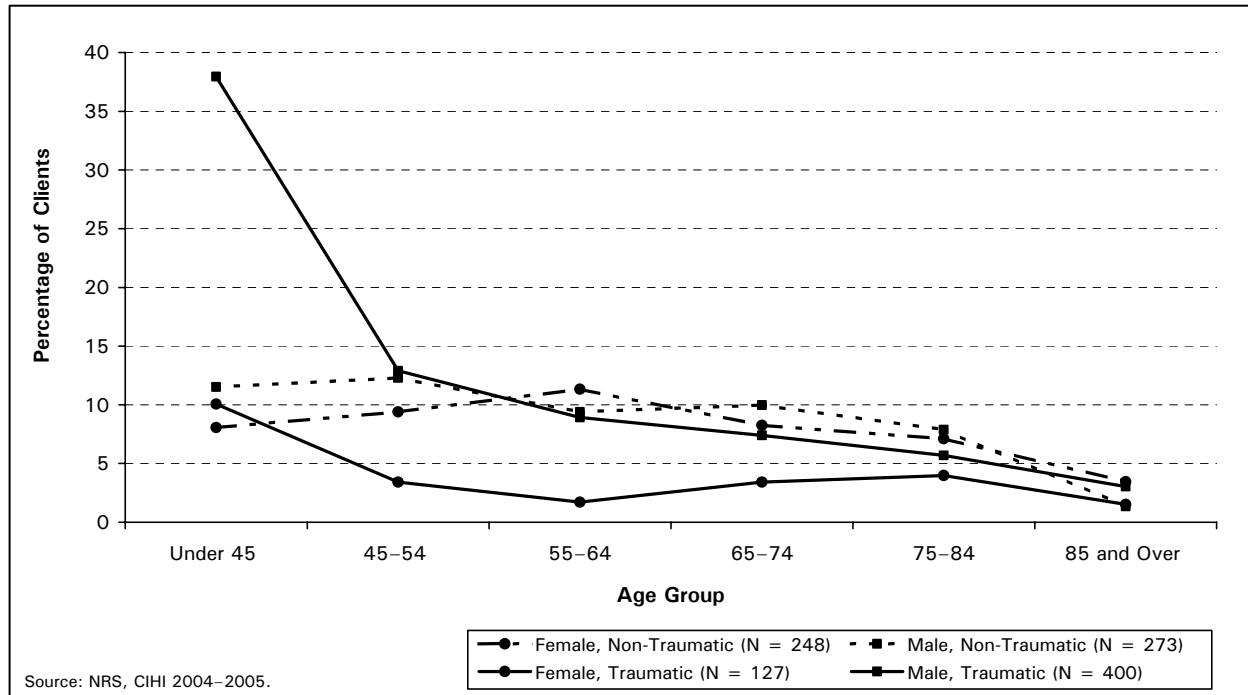
Figure 3.7   Non-Traumatic and Traumatic Brain Dysfunction by Age and Sex, 2004–2005

Figure 3.6 in the previous section showed that young males made up a large component of the overall brain dysfunction RCG. Figure 3.7 reveals that, specifically, males under the age of 45 with traumatic brain dysfunction represent the largest proportion of clients in the overall brain dysfunction RCG, at almost 40%. In the under-45 age group for the traumatic brain dysfunction RCG, males outnumber females by nearly four to one. Female clients in the NRS with traumatic brain dysfunction showed a peak occurrence in the under-45 age group as well. However, while the proportion of male traumatic brain dysfunction clients appears to drop with increasing age, the proportion of female traumatic brain dysfunction actually rose slightly for the 65 to 74 and 75 to 84 age groups.

Unlike the traumatic group, the proportion of non-traumatic brain dysfunction clients (i.e. dysfunction resulting from conditions such as tumours, senile dementia, for example) seems to stay relatively stable across age groups, regardless of sex, although both groups show a decline in rehabilitation admissions over the age of 85. *(Quick Stats, Table 19)*

The analysis by age and sex here is similar to that presented in *Inpatient Rehabilitation in Canada, 2003–2004* on spinal cord dysfunction clients. These distributions in the brain and spinal cord dysfunction RCGs suggest that analysis of these client groups should include differentiation of the traumatic and non-traumatic clients in order to get a more accurate picture of the specific clientele most frequently seen in each group.

Pre-Admission Living Setting

During 2004–2005, almost all inpatient rehabilitation clients (89%) were living in a private house or apartment prior to their admission to the health care system. This proportion ranged from 78% of clients in the neurological conditions RCG to 95% of clients in the major multiple trauma RCG.

In the NRS, if a client lives in a private dwelling, information is also collected on whether or not he or she received paid health services in the home prior to admission. Paid health services refer to health-related services that are paid for either privately through a third party or out-of-pocket, or publicly through provincial healthcare, and are received in the client's home. These services can include meals on wheels, home care, and hospital equipment at home, as examples, and may or may not be related to the condition for which the client was admitted. Figure 3.8 shows that the proportion of clients who lived in a private house or apartment *and* received paid health services varied across the RCGs. This proportion was largest among clients in the debility and amputation of limb RCGs (29% and 35% respectively) and smallest among clients in the major multiple trauma (4%), stroke (8%) and brain dysfunction (8%) RCGs. *(Quick Stats, Table 20)*
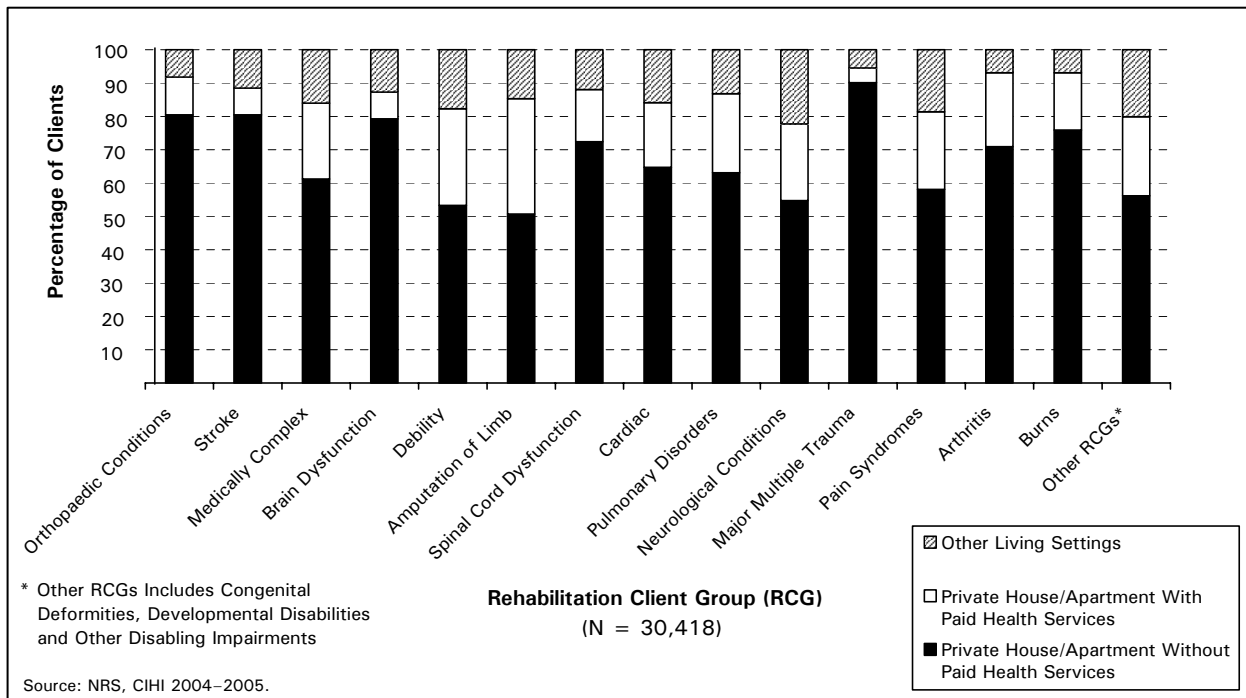
Figure 3.8   Pre-Admission Living Setting of Inpatient Rehabilitation Clients by Rehabilitation Client Group, 2004–2005

Total Function Scores

When clients are admitted to a participating NRS facility, their motor and cognitive functional abilities are assessed within 72 hours of admission using the FIM™ instrument, developed by the Uniform Data System for Medical Rehabilitation (UDS$_{MR}$). A similar assessment is carried out when the client is discharged from the facility. The FIM™ instrument contains 18 elements: 13 of these elements assess components of motor function, such as eating and walking (referred to as the motor subscale), and 5 elements assess cognitive abilities such as communication and social interaction (referred to as the cognitive subscale). A full list of the elements can be found in Appendix C of this report. Each of the 18 FIM™ instrument elements is rated on a scale from 1 to 7, with a higher score indicating that the client has a greater level of independence in performing the task involved with that element. The scores for the 18 elements can be added together to obtain a Total Function Score,[1] which provides a summary measure of the clients' overall functional ability. The Total Function Score ranges from 18 to 126, with a higher score indicating a relatively higher overall level of function and independence. Analysis of admission and discharge Total Function Scores provides some information about the variations in functional abilities of clients in the different RCGs. This chapter makes reference only to the Total Function Score for each RCG. Analyses using the motor and cognitive subscales of the FIM™ instrument will be examined in Chapters 4 and 5, respectively. FIM™ instrument average scores are presented to one decimal place.

Not all inpatient rehabilitation clients are able to have a full functional assessment at discharge due to reasons such as unexpected transfer out of the rehabilitation bed. Among the clients discharged in 2004–2005, 3.6% of clients did not have a full FIM™ instrument assessment on discharge and therefore did not have a submitted discharge Total Function Score. The proportion of clients without a discharge Total Function Score varied across RCGs from 2% of clients in the orthopaedic conditions to 7% of clients in the pulmonary RCG. Figures in this report that include analyses of both admission and discharge scores derived from the FIM™ instrument are based on the 29,319 complete pairs of admission and discharge FIM™ instrument assessments that were submitted in 2004–2005. Figures that include only analyses of admission scores are based on the 30,418 records submitted with complete admission scores.

Total Function Scores at Admission

Figure 3.9 shows the distribution of the admission Total Function Scores for all clients admitted to participating NRS rehabilitation facilities during 2004–2005 and for whom a complete admission Total Function Score was available. The distribution of admission Total Function Scores suggests that relatively fewer clients had very low or very high admission scores. The average (mean) and median admission Total Function Scores was 85.6 and 89.0, respectively. This figure presents the range of functional levels, as measured by the FIM™ instrument that NRS clients exhibit on admission to rehabilitation.

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1. Function Scores referenced in this document are based on data collected using the FIM™ instrument. The FIM™ is the property of Uniform Data System for Medical Rehabilitation (UDS^{MR}), a division of U B Foundation Activities, Inc.
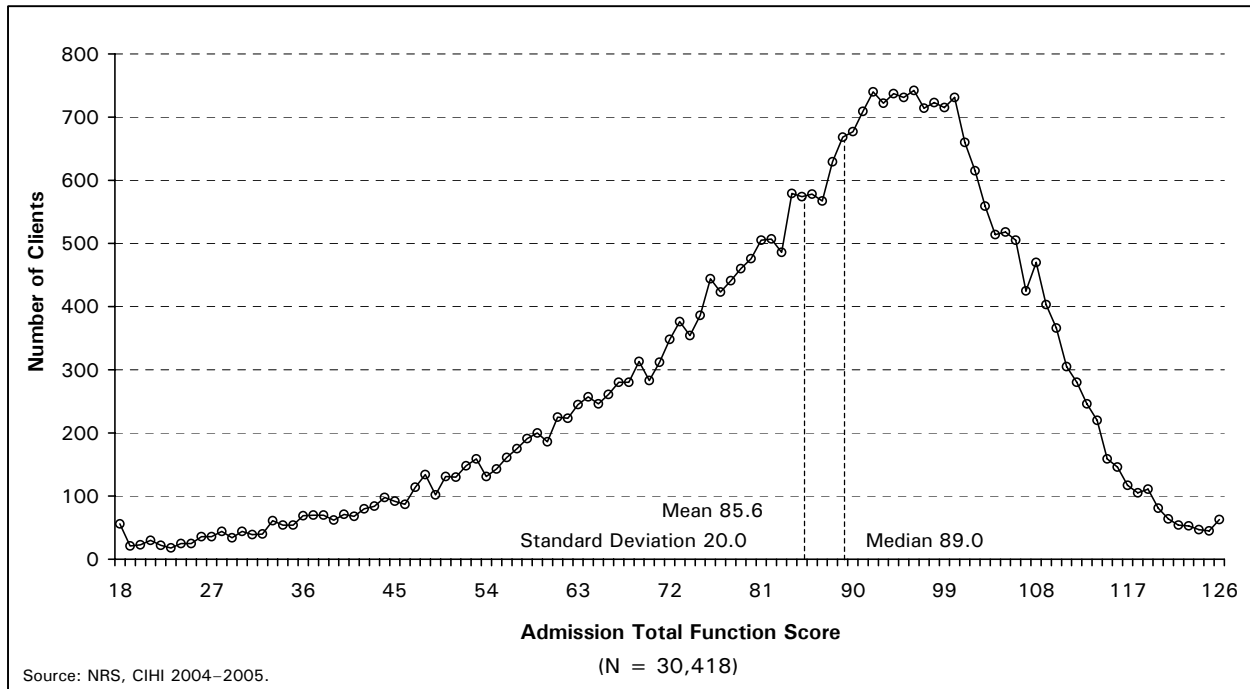
Figure 3.9   Distribution of Admission Total Function Scores of Inpatient Rehabilitation Clients, 2004–2005

Investigation of NRS clients' Total Function Scores on admission and their pre-admission living setting (see previous section) suggests that those who lived in a private house or apartment without paid health services prior to admission appear to have had, on average, higher functional abilities on admission compared to clients who received paid health services at home prior to admission. The average admission Total Function Scores of clients who did not receive paid health services prior to admission was 87.9 compared to 82.7 for clients who had received paid health services. Clients who receive paid health services at home, in turn, had a higher average admission Total Function Score compared to clients who lived in other living settings such as assisted living and residential care facilities prior to admission, where average admission Total Function Scores were 77.3 and 70.6, respectively.

Change in Total Function Scores From Admission to Discharge

Improvement in client function, both physical and cognitive, is a key underlying goal of rehabilitation. Whether or not a client returns to his or her pre-injury/illness level of ability, the objective of the clinical team is to maximize function gain so that the client can live as independently as possible. Comparisons between client groups based on the *change* in Total Function Scores from admission to discharge shed some light on the degree of improvements in motor and cognitive function that can occur during an inpatient rehabilitation stay. A larger increase in Total Function Score from admission to discharge suggests that a greater level of functional improvement (relative to admission) has been achieved. Overall, the average Total Function Score change for all clients during 2004–2005 was 19.2, from an average score of 86.1 at admission to 105.3 at discharge. This section analyzes the average change in Total Function Score from admission to discharge for the various NRS Rehabilitation Client Groups.
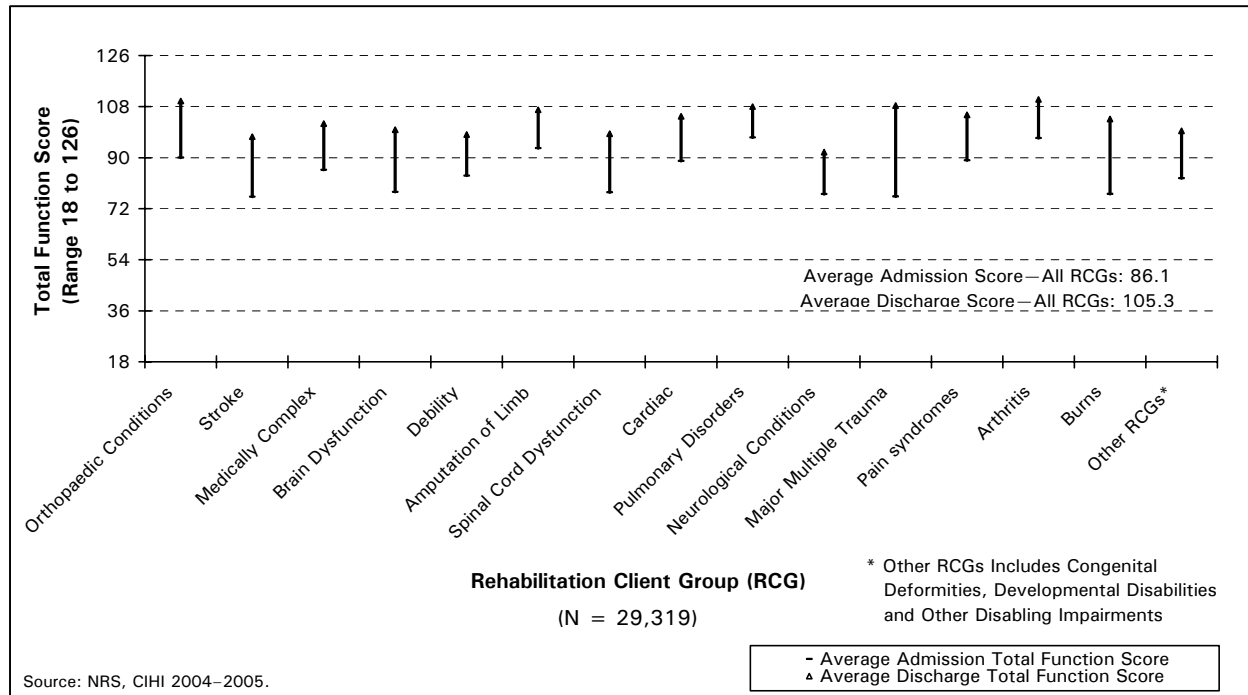
Figure 3.10   Admission and Discharge Total Function Scores by Rehabilitation Client Group, 2004−2005

Figure 3.10 presents the average change between admission and discharge Total Function Scores for each individual RCG, so that comparisons can be made across NRS client groups. The graph shows that some client groups are typically admitted to inpatient rehabilitation with higher average admission Total Function Scores (ex. limb amputation, pulmonary, arthritis) than others (ex. stroke, brain and spinal cord dysfunction, neurological conditions, major multiple trauma and burns). In addition, the figure shows that some client groups show a greater gain in Total Function Score, on average, from admission to discharge. For example, the major multiple trauma client group showed an average score increase of 32.1, and burn clients had an average score increase of 26.4. Other client groups had relatively smaller gains in function, as measured by the FIM™ instrument, during the course of the rehabilitation stay. The pulmonary group, for example, saw an average score increase of 10.9.

When assessing improvements in Total Function Score, it's important to consider the "starting point", or admission Total Function Score. Client groups with higher average function scores on admission have smaller potential gains to be made as measured by the FIM™ instrument. Some groups showed similar changes in Total Function Score but had very different admission scores. The arthritis and neurological client groups had similar score changes of 13.7 and 14.8 respectively, but the arthritis group had an average admission score of 96.9, where the average admission score for the neurological group was lower at 77.2. Conversely, the neurological and burn client groups had identical average admission scores of 77.2, but the burn group showed more improvement from admission to discharge than the neurological group (26.4 versus 14.8, respectively). *(Quick Stats, Table 21)*

Analyzing change in Total Function Score by RCG may provide information to assist in identifying variations in functional improvement in clients with different health conditions. Variations in functional improvement of clients in the different RCGs may be related to factors such as age, pre-injury/illness functional status, and length of rehabilitation stay, among other things. Further research is required to investigate possible links between these factors and the potential for change in Total Function Score for the various client groups.

The admission Total Function Scores of clients who were assessed at both admission and discharge were higher, on average, than those clients who were assessed only at admission (i.e. did not have a discharge Total Function Score). The average admission Total Function Score among clients who were assessed at both admission and discharge was 86.1 compared with 72.4 for those who were assessed only at admission. Further investigation is required to assess potential explanatory factors for this variation. However, it may be possible that clients who were not able to be assessed at discharge due to reasons such as unexpected transfer or death may have had more health problems and may have been less functional on admission than those clients who were able to complete their rehabilitation stay and were able to be assessed at discharge.

Length of Stay

Length of stay in a rehabilitation program can potentially be influenced by many factors: presence of co-morbid conditions, number of beds in a facility, staffing, and the availability of needed post-discharge care resources, to name a few. As such, caution should be used when interpreting values for rehabilitation lengths of stay in general. However, it may be of interest to note some of the differences in lengths of stay across various client groups.

Figure 3.11 shows the median length of stay, excluding service interruptions, for clients in each RCG. The overall median length of stay was 19 days. Clients in the burns and spinal cord dysfunction RCGs had the longest median lengths of stay (49 and 43 days respectively) while clients in the arthritis RCGs had the shortest median length of stay at 13 days. Cardiac and orthopaedic clients also had relatively shorter median lengths of stay at 14 days. Some of these variations may be attributable, in part, to the different levels of care required for these client groups. Spinal cord dysfunction clients frequently require specialized rehabilitation training, often taking longer to make functional gains due to the degree of disability associated with spinal cord injury. Conversely, orthopaedic and cardiac clients are more likely to have undergone a standard, elective procedure such as a joint replacement or a coronary artery bypass graft, and may show good functional improvement in a relatively brief period of time. *(Quick Stats, Table 22)*
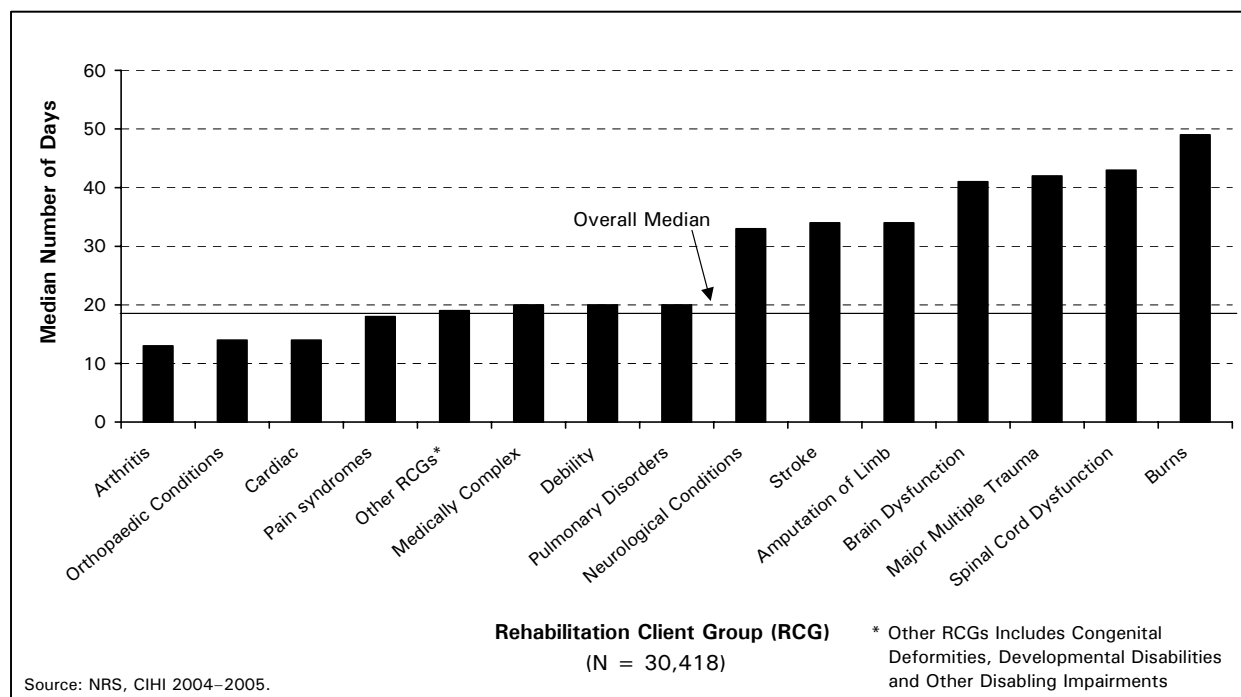
Figure 3.11   Median Length of Stay in Inpatient Rehabilitation Clients by Rehabilitation Client Group, 2004–2005

Length of Stay Efficiency

In the NRS, the Length of Stay Efficiency indicator measures the functional progress made by clients in relation to how long they stayed in rehabilitation. Average length of stay efficiency is calculated by dividing change in Total Function Score by length of stay for each individual client, and then taking the average of the individual values. It demonstrates the change in Total Function Score (as measured using the FIM™ instrument) per day of client rehabilitation. In general, a higher value for length of stay efficiency suggests that client functional status improved to a greater degree in a shorter period of time. As with length of stay, service interruption days are not included in this calculation.

The average length of stay efficiency for all clients discharged from rehabilitation facilities in 2004–2005 was 1.3. In other words, for each day that a client participated in an inpatient rehabilitation program, their Total Function Score increased, on average, slightly more than one point. The average length of stay efficiency ranged from 0.4 for amputation of limb clients to 1.7 for orthopaedic clients. *(Quick Stats, Table 22)*

Care should be exercised when examining length of stay efficiency values. As mentioned earlier, change in Total Function Score and length of stay—both of which are used in the calculation of length of stay efficiency—can be influenced by multiple factors. This indicator is not intended to be used in isolation but rather may be used alongside other information such as resource availability, age distribution and admission Total Function Scores for the various Rehabilitation Client Groups, in order to provide more insight into the reasons for the variations in length of stay efficiency between the RCGs.

Admission Total Function Score and Length of Stay

As discussed earlier in this chapter, many factors can influence a client's length of stay in rehabilitation. Considering that a key goal of rehabilitation is to improve functional levels, it might be reasonable to observe that, keeping all other things constant, a lower level of functional ability on admission might lead, on average, to a longer length of stay in rehabilitation. Conversely, a higher level of functional ability on admission might result in a typically shorter stay. Figure 3.12 depicts average Total Function Scores on admission (solid line) and median length of stay (dashed line) across all RCGs. *(Quick Stats, Table 23)*
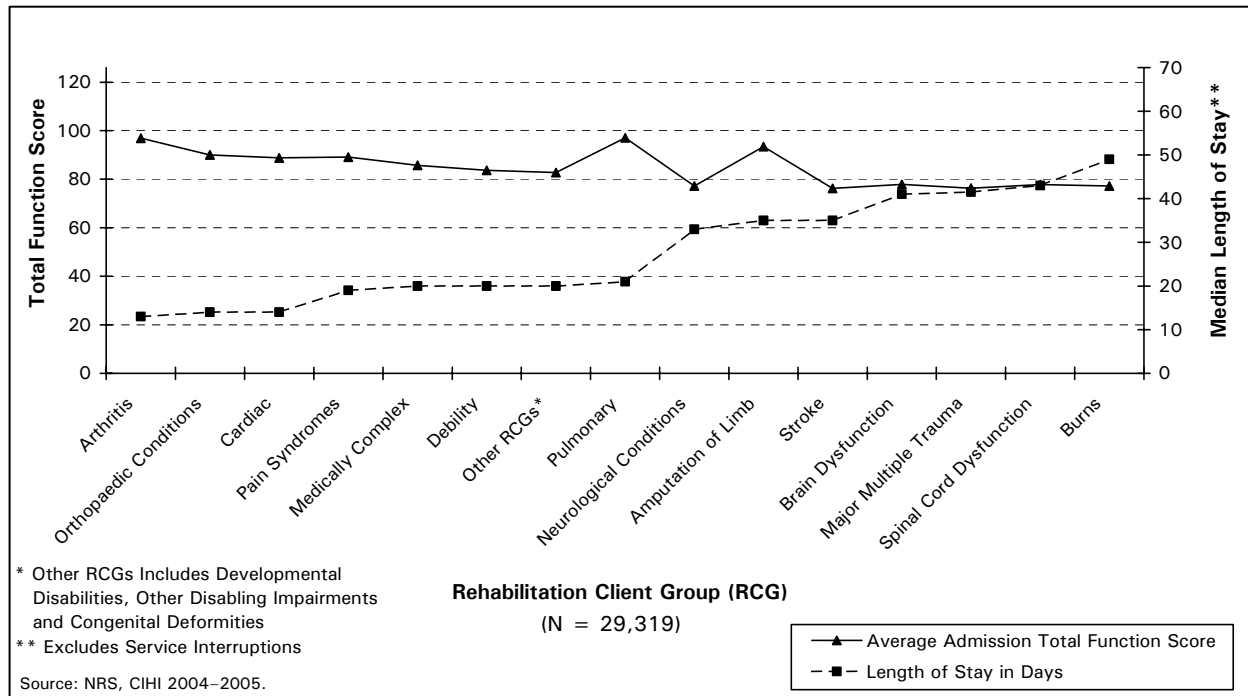
Figure 3.12   Average Admission Total Function Score and Median Length of Stay by Rehabilitation Client Group, 2004–2005

This analysis is not intended to conclusively show that a causal relationship exists between admission Total Function Score and length of stay, but it is interesting to note that across nearly all RCGs, lower admission scores tend to be associated with longer lengths of stay, and higher admission scores tend to be associated with shorter lengths of stay. There is a statistically significant inverse correlation ($r = -0.39$, $p < 0.05$) between admission Total Function Score and length of stay in the NRS. It is important to note that this figure does not control for other factors such as client age, or the presence of co-morbidities (other health conditions that may be present in addition to the main rehabilitation health condition). However, the figure does suggest that admission Total Function Score should likely be a part of any research using NRS data that looks at the relationship between functional levels and inpatient rehabilitation length of stay for inpatient rehabilitation populations.

Clients Reporting Pain

The presence of pain can impede the ability to make progress in rehabilitation. In the NRS, clients are asked at admission and again at discharge to report whether or not they are currently experiencing pain. This pain may or may not be related to the condition that led the client to inpatient rehabilitation. This is one of the two data elements collected in the NRS that is based on *client* reporting, rather than on what the clinician observes. On admission to rehabilitation in 2004–2005, two thirds of clients (67%) reported they had some degree of pain at admission, 28% reported no pain, and the remaining 5% of clients were unable to respond.

Figure 3.13 shows some variation in the proportion of clients who reported pain across the different RCGs. The RCGs with the largest proportion of clients reporting pain at admission were pain syndromes (89%), arthritis (84%), orthopaedic conditions (83%), and major multiple trauma (82%). The RCGs with the lowest proportion of clients reporting pain at admission were stroke (37%), pulmonary disorders (40%), and brain dysfunction (42%). The burn RCG had the highest proportion of clients who were unable to answer (14%). *(Quick Stats, Table 24)*
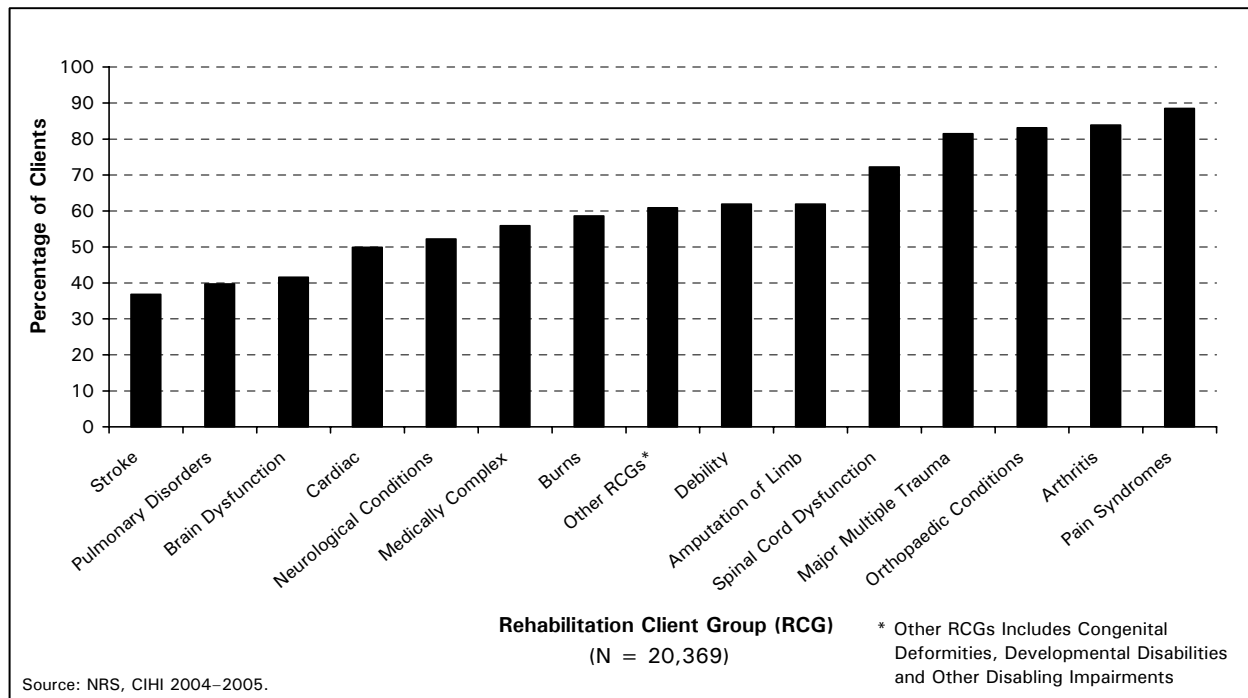
Figure 3.13   Inpatient Rehabilitation Clients Reporting Pain at Admission by Rehabilitation Client Group, 2004–2005

Clients that reported pain were also asked to rate the intensity of the pain (mild, moderate or severe) and the number of activities that were impacted by the pain (none, a few, some or most). Clients were identified as having an improvement in pain levels if they had less pain and/or fewer activity limitations due to pain at discharge than they had at admission, or if they no longer had any pain on discharge.

During 2004–2005, among clients who reported experiencing pain at the time of admission and who were able to rate their level of pain at discharge, over two thirds (69%) reported an improvement in pain levels and/or fewer activity limitations due to pain by the end of their stay in rehabilitation. Figure 3.14 displays the proportion of clients reporting improvement in pain by RCG. The proportion of clients reporting improvement in their level of pain ranged from a low of 40% among burn clients to a high of 72% among orthopaedic clients. For most client groups, between 60 and 63% of clients reported an improvement in pain levels on discharge. *(Quick Stats, Table 25)*
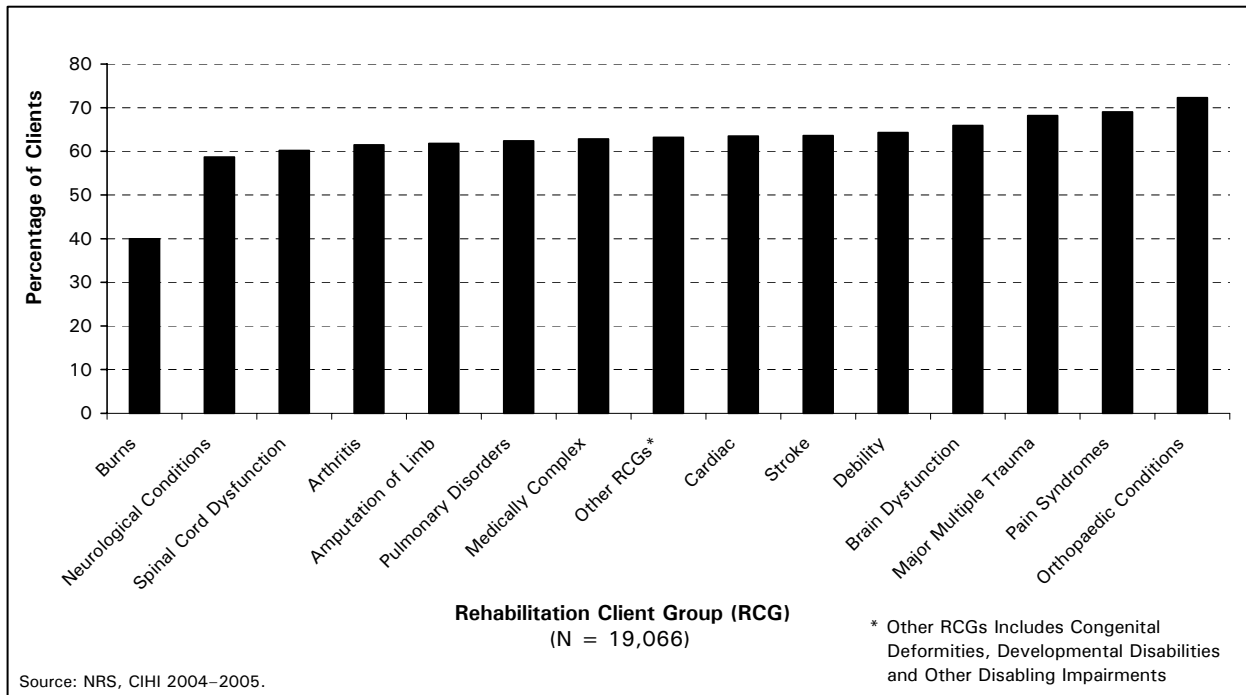
Figure 3.14 Inpatient Rehabilitation Clients Reporting an Improvement in Pain at Discharge by Rehabilitation Client Group, 2004–2005

Reasons for Discharge

Upon discharge from rehabilitation, clients are identified as to whether or not their rehabilitation goals were met or not and, for those that met their goals, if they were discharged into the community or transferred to another facility or unit. Other reasons for discharge can include the client withdrawing from the program, or the death of the client. Note that a return to the community does not necessarily imply that the client returned back to their home, if that was their pre-admission living environment. Community living can include living environments such as a retirement community or other type of assisted living, or returning to live with a family member. A transfer to another facility generally implies that the client is still in the healthcare system. These living environments can include long-term care facilities, alternate level-of-care beds, or a transfer back to acute care for further treatment. Recall that Chapter 2 highlighted that, in 2004–2005, 81% of all NRS clients met their rehabilitation goals as determined at admission and returned to live in the community. Ten percent met their goals but were transferred to another facility or unit. Another 8% were reported as not having met their service goals upon discharge, regardless of discharge destination. In this section, similar information is presented by individual RCG.
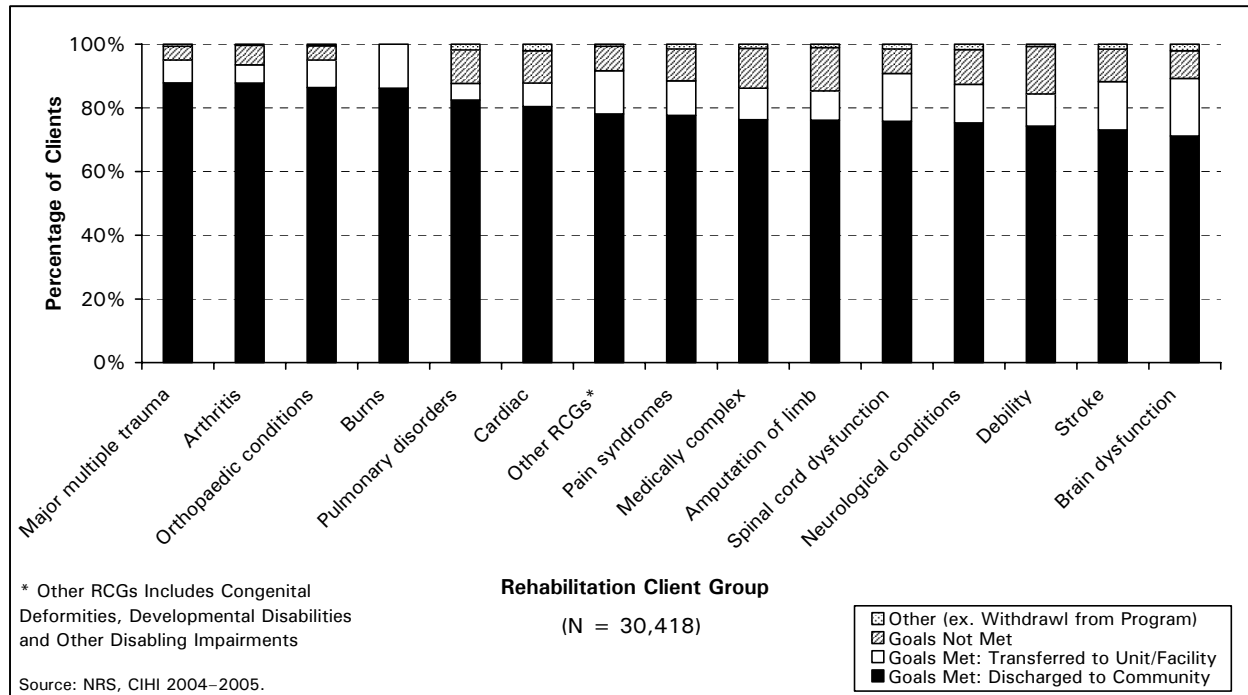
Figure 3.15   Reasons for Discharge From Inpatient Rehabilitation by Rehabilitation Client Group, 2004–2005

Figure 3.15 shows that reasons for discharge varied by RCG. Although most clients within each RCG met their service goals and returned to living in the community, the proportion doing so ranged from an average low of 71% for brain dysfunction clients to a high of 88% for clients admitted with arthritis or major multiple trauma. Other RCGs with relatively lower proportions of clients achieving goals and being discharged to the community were the stroke (73%) and debility (74%) client groups. Other RCGs with high proportions of clients meeting their goals and returning to the community were orthopaedic conditions and burns (both 86%).

Brain dysfunction, spinal cord dysfunction and stroke client groups had relatively higher proportions of clients who met their service goals but were referred or transferred to another unit or facility at the time of discharge (between 15% and 18%). The client group with the highest reported proportion of not achieving service goals was the debility client group at 15%. *(Quick Stats, Table 26)*

Pre-Admission and Post-Discharge Living Setting

The NRS data indicate that during 2004–2005, 83% of all clients who were living in a private house or apartment prior to their admission to an inpatient or facility setting returned to this environment following discharge. However, this proportion varied across the RCGs. Ninety percent of orthopaedic and arthritis clients returned to their private house or apartment upon discharge, while the stroke and debility RCGs had lower rates of clients returning home on discharge (71% and 73% respectively).
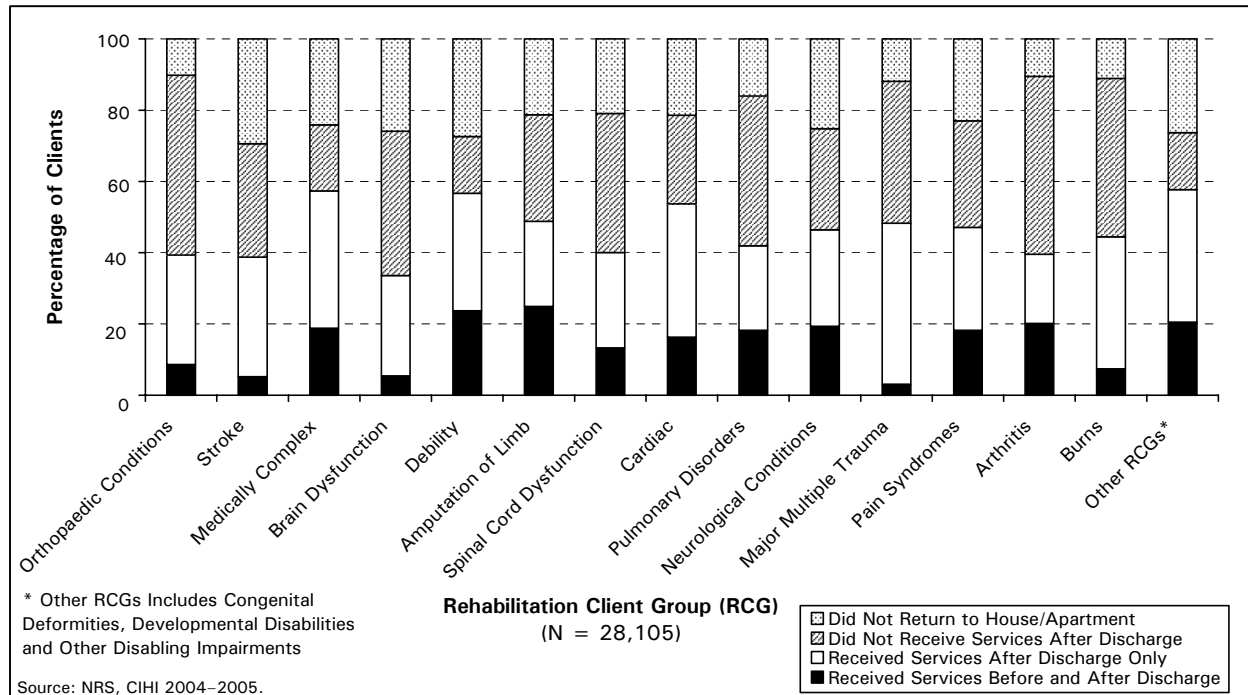
Figure 3.16   Receipt of Paid Health Services in the Home After Discharge for Clients Who Were Living at Home Prior to Admission by Rehabilitation Client Group, 2004–2005

Figure 3.16 looks at data from NRS clients who were living at home prior to admission. The top section of the RCG bars shows the proportion of clients in each RCG that were unable to return home following discharge. Nearly a third (29%) of stroke clients who were living at home prior to admission were unable to return home immediately after being discharged from rehabilitation. Over a quarter of all debility, brain dysfunction and neurological clients were also unable to return home following their rehabilitation stay. Conversely, only 10% of clients in the orthopaedic and arthritis groups were unable to return home. The average discharge Total Function Score for clients not returning home was 84.9.

Of those clients that did return home following rehabilitation, some required paid health services on discharge and some did not. The figure shows these proportions also varied across client groups. In the orthopaedic and arthritis groups, 50% of clients in both groups returned home without requiring paid health services, either because the client was able to perform these services themselves, or the needs were met on an unpaid basis. The average discharge Total Function Score for clients returning home but not requiring paid services was 114.1.

Clients requiring paid health services upon returning home were broken down into two groups: those who received paid health services at home only at discharge, and those who received paid health services at home both prior to admission *and* after discharge. Relatively few major multiple trauma, burn, stroke and brain dysfunction clients were receiving paid health services prior to admission, but proportions of these groups requiring paid services on discharge ranged from 28% to 45%. RCGs that had higher proportions of clients requiring paid services both before admission *and* after discharge included the debility and limb amputation client groups. The average discharge Total Function Scores for clients requiring paid services only after discharge was 107.6, while the average discharge score for clients requiring paid services both before admission and after discharge was 102.3. *(Quick Stats, Table 27)*

Summary

Separating rehabilitation clients into groups according to the principle diagnosis/condition that led to the inpatient rehabilitation stay assists in making the aggregate NRS data more meaningful, particularly for clinicians that predominately see only certain groups of clients. Chapter 3 describes similar information as presented in Chapter 2 but presents it by individual Rehabilitation Client Group. Consequently, certain variations and patterns appear that may help to highlight the different needs and challenges faced by clients in the various groups.

Key Findings:

- Orthopaedic and stroke clients continued to make up the largest component of inpatient rehabilitation records submitted to the NRS. In 2004–2005, these clients accounted for two thirds of all inpatient rehabilitation clients discharged from participating facilities.

- Orthopaedic clients tended to be older females, while traumatic brain dysfunction, spinal cord dysfunction and major multiple trauma clients tended to be younger males.

- Three quarters of orthopaedic clients were admitted to General facilities, while the same proportion of spinal cord dysfunction clients were admitted to Specialty facilities.

- There is an inverse relationship between admission Total Function Score and median length of stay.

- Median length of stay varied considerably across RCGs, from a low of 13 days for arthritis clients, to a high of 49 days for burn clients.

- On average, clients in all RCGs saw improvements in function during rehabilitation. Average gain in Total Function Score per day of rehabilitation ranged from 0.4 for limb amputation clients to 1.7 for orthopaedic clients.

- Most clients within each RCG met their service goals and returned to live in the community following rehabilitation, ranging from 71% of brain dysfunction clients to 88% of clients in the major multiple trauma and arthritis RCGs.

- The stroke RCG accounted for one fifth of all records in the NRS during 2003–2004, and was among RCGs with the lowest proportion of clients returning to their private home or apartment on discharge.

Chapter 4. The FIM^{TM} Instrument: Motor Subscale

Chapter 3 of this report introduced the FIM^{TM} instrument and the concept of the Total Function Score—the sum of all 18 FIM^{TM} instrument scores. Total Function Score can be broken down into separate Motor and Cognitive Function Scores,[1] as a measure of the client's level of function in each of these areas. The Motor Function Score reflects the sum of the scores from the 13 motor items of the FIM^{TM} instrument—the motor subscale— and ranges from 13 to 91. This chapter contains a series of analyses specifically examining the motor subscale of the FIM^{TM} instrument. The Cognitive Function Score is the sum of the five cognitive elements of the FIM^{TM} instrument—the cognitive subscale—and will be discussed in more detail in Chapter 5. Separating the motor and cognitive components of the Total Function Score into these subscales allows a more detailed assessment of functional level specific to motor or cognitive skills. Two clients can have the same Total Function Score but clinically present very differently depending on differences in Motor and Cognitive Function Scores.

Motor Function Score

This chapter begins with an examination of average Motor Function Scores for client episodes in the National Rehabilitation Reporting System (NRS) for 2004–2005. The motor subscale of the FIM^{TM} instrument is used to assess a client's level of independence in performing activity-based tasks such as eating, dressing, bathing and walking. Motor Function Scores for the FIM^{TM} instrument motor subscale range from a minimum of 13 (client scores "1" on all 13 motor items) to a maximum of 91 (client scores "7" on all 13 motor items).

Figure 4.1 presents the average change in Motor Function Score from admission to discharge across the various Rehabilitation Client Groups (RCG) in the NRS. This is the average gain in motor function during the rehabilitation stay, as measured by the FIM^{TM} instrument. Where Figure 3.10 in Chapter 3 presented the change in Total Function Score from admission to discharge, Figure 4.1 looks specifically at the motor subscale of the FIM^{TM} instrument. Table 4.1 includes admission and discharge Motor Function Scores for each RCG, as well as the change in score for each group. RCGs are presented in descending order of number of records from each client group in the NRS for 2004–2005.

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1. Function Scores referenced in this document are based on data collected using the FIM^{TM} instrument. 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.
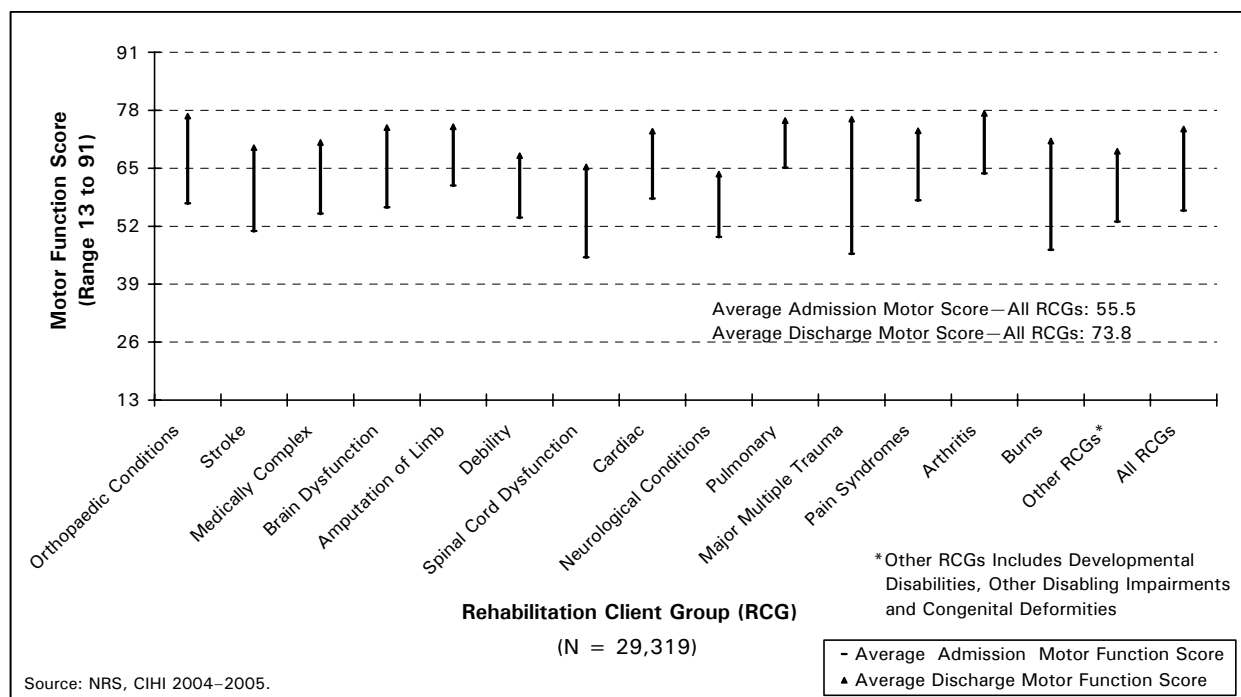
Figure 4.1   Motor Function Score Change From Admission to Discharge Across Rehabilitation Client Group, 2004–2005

Table 4.1   Values for Motor Function Score Change From Admission to Discharge Across Rehabilitation Client Group, 2004–2005

RCG	No. of Clients	Average Admission Motor Function Score	Average Discharge Motor Function Score	Change in Motor Function Score
Orthopaedic Conditions	14,871	57.1 *(12.5)*	76.7 *(10.8)*	19.6
Stroke	4,717	50.9 *(20.3)*	69.6 *(19.8)*	18.7
Medically Complex	1,951	54.8 *(16.5)*	70.8 *(17.1)*	16.0
Brain Dysfunction	1,309	56.2 *(23.2)*	74.1 *(20.2)*	17.9
Amputation of Limb	1,011	61.1 *(15.7)*	74.3 *(13.6)*	13.2
Debility	1,007	53.9 *(16.4)*	67.8 *(16.4)*	13.9
Spinal Cord Dysfunction	952	45.0 *(20.0)*	65.3 *(22.4)*	20.3
Cardiac	839	58.2 *(13.7)*	73.3 *(14.6)*	15.1
Neurological Conditions	788	49.6 *(19.6)*	63.7 *(22.5)*	14.1
Pulmonary	760	65.1 *(17.8)*	75.7 *(15.7)*	10.6
Major Multiple Trauma	354	45.8 *(18.3)*	76.0 *(14.5)*	30.2
Pain Syndromes	319	57.8 *(15.8)*	73.4 *(13.6)*	15.6
Arthritis	252	63.8 *(18.6)*	77.3 *(14.1)*	13.5
Burns	29	46.7 *(19.3)*	71.1 *(16.8)*	24.4
Other RCGs*	160	53.0 *(16.4)*	68.8 *(17.4)*	15.8
All RCGs	29,319	55.5 *(16.4)*	73.8 *(15.5)*	18.3

*Other includes congenital deformities, developmental disabilities and other disabling impairments.

Values in parentheses ( ) represent the range of values one standard deviation above and below the mean.

Source: NRS, CIHI 2004–2005.

The data presented in Figure 4.1 and Table 4.1 suggest that, although there was a positive change in score for all client groups, average admission and discharge Motor Function Scores varied across RCGs. Average admission motor scores ranged from a low of 45.0 in the spinal cord dysfunction group, to a high of 65.1 in the pulmonary group. The FIM^{TM} instrument Motor Function Score can range from 13 to 91, but Table 4.1 suggests that average levels of motor function seen on admission to inpatient rehabilitation fell within a much narrower range. Clients with admission Motor Function Scores that were much lower or higher than this range were less frequently seen in the NRS. The range of discharge Motor Function Scores was even narrower, from an average of 63.7 in the neurological conditions group, to 77.3 for arthritis clients. Discharge Motor Function Scores will be examined in more detail in subsequent pages. *(Quick Stats, Table 28)*

The change in motor function also varied across RCGs. Clients in the major multiple trauma and burn groups had the highest average gains in Motor Function Score, at 30.2 and 24.4, respectively. Clients in the pulmonary and limb amputation groups made the smallest average gains in Motor Function Score at 10.6 and 13.2 respectively, but these clients were admitted to rehabilitation with some of the highest admission scores.

Admission Motor Function Score and Length of Stay

Improvement in motor function is a primary goal of inpatient rehabilitation. Figure 4.1 suggests that, of the client groups in the NRS, some tended to show more gains in motor function (as measured by the FIM^{TM} instrument) than others. In addition, these groups were admitted to and discharged from inpatient rehabilitation with varying motor function levels.

Figure 4.2 presents average admission Motor Function Scores and median lengths of stay for the various client groups in the NRS. As with previous analyses involving length of stay, median values are used for LOS rather than average values to reduce the impact of a small number of very high values for this indicator.
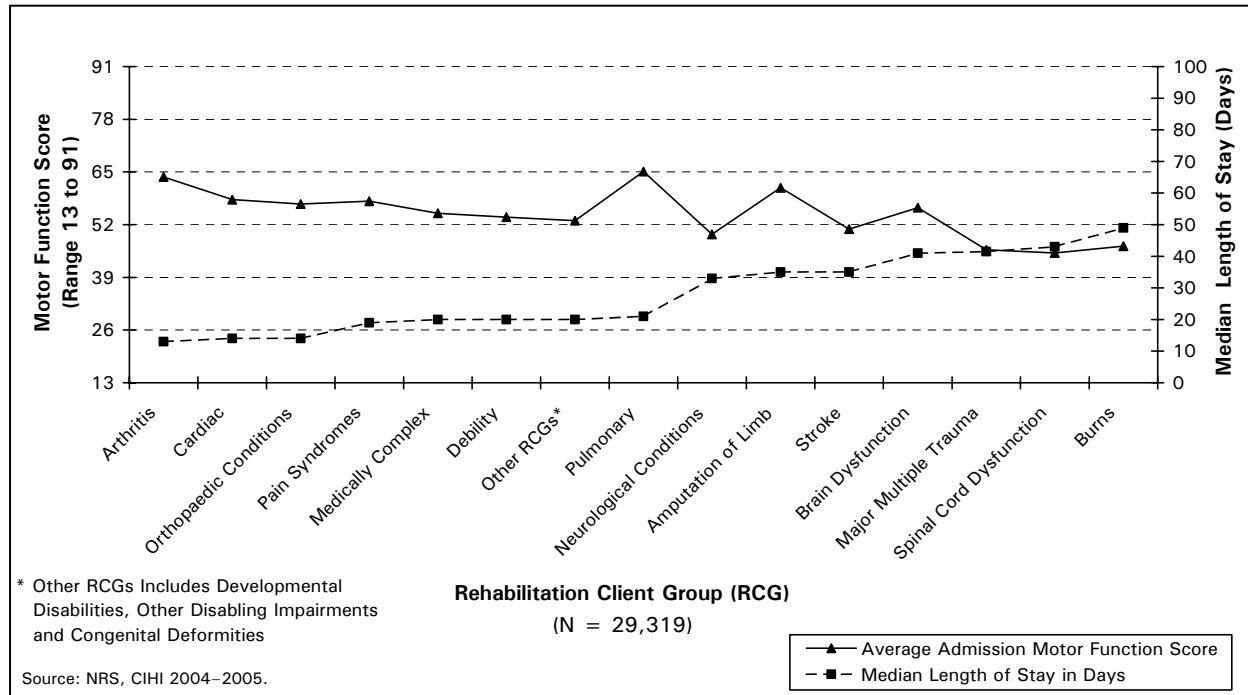
Figure 4.2   Average Admission Motor Function Score and Median Length of Stay by Rehabilitation Client Group, 2004–2005

As with Figure 3.12, Figure 4.2 alone does not provide enough information to quantify a causal relationship between admission Motor Function Score and length of stay in rehabilitation. However, for many of the RCGs, a higher average admission motor score seemed to coincide with a shorter median length of stay. There was a statistically significant inverse correlation (r = -0.35, p<0.05) between admission Motor Function Score and length of stay across all RCGs. RCGs like the arthritis, cardiac and orthopaedic groups that had higher average admission Motor Function Scores appear to have had shorter lengths of stay. Conversely, RCGs such as major multiple trauma, spinal cord dysfunction and burns had lower average admission Motor Function Scores, and are shown as having had comparatively longer median length of stay. Note that this figure looks only at the parameters of Motor Function Score and length of stay. Other factors such as client age, Cognitive Function Score and the presence of co-morbidities are not included in this analysis. *(Quick Stats, Table 29)*

Change in Motor Function Score by Age Group

Figure 4.3 shows the average improvement in Motor Function Score in the NRS, by age group, for 2004–2005. The average Motor Function Score change from admission to discharge across all age groups was similar, ranging between 17.9 and 19.2. The 44 and under age group showed the highest average gains in Motor Function Score at 19.2. This age group was most often admitted under the brain dysfunction, spinal cord dysfunction and major multiple trauma RCGs.
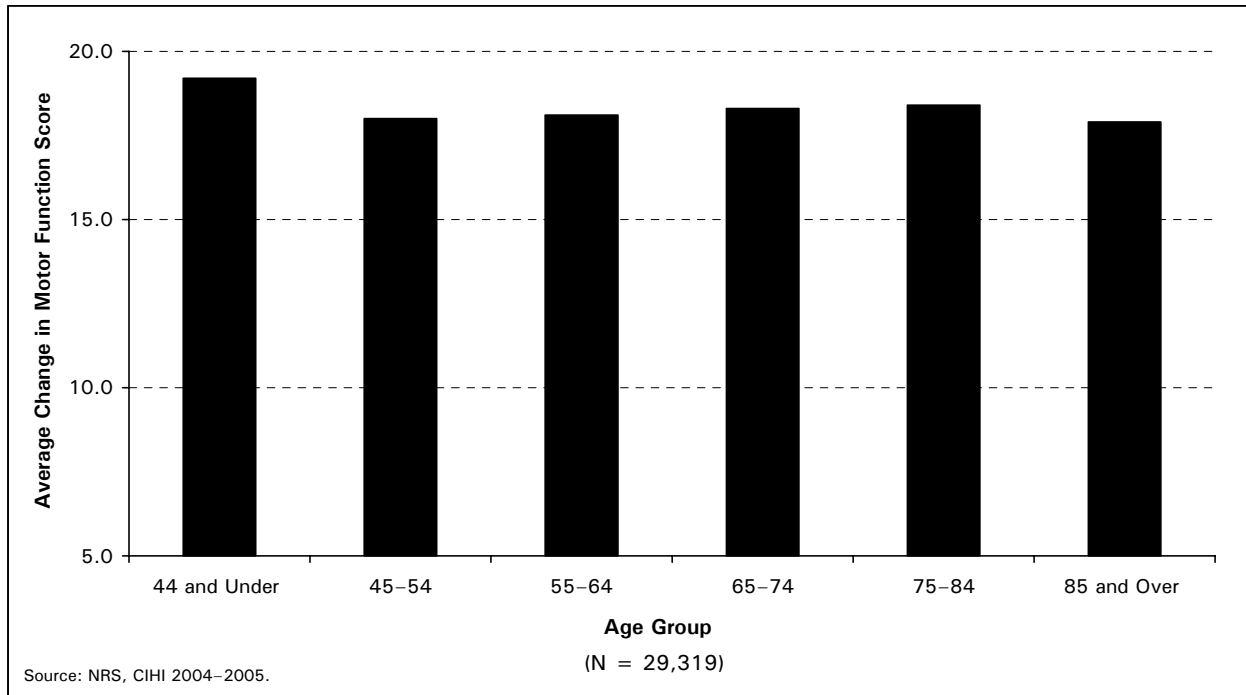
Figure 4.3   Average Change in Motor Function Score by Age Group, 2004–2005

The 45 to 54-age group was also prevalent in the brain dysfunction, spinal cord dysfunction and major multiple trauma RCGs, in addition to the neurological RCG. The 74 to 85 and the 85 and over age group was predominately seen in RCGs such as orthopaedic, stroke, medically complex, debility and cardiac in 2004–2005. *(Quick Stats, Table 30)*

Although Figure 4.3 includes only gains in motor function, and does not take admission scores (i.e. the "starting point") into account, it demonstrates that average improvement in motor function during a rehabilitation stay, as measured by gains in FIM™ instrument Motor Function Score, was similar across age groups.

Discharge Motor Function Score

Part of discharge planning in rehabilitation includes identifying the living setting to which the client will return upon leaving the rehabilitation environment. Level of motor function on discharge often plays a key role in determining the type of discharge setting that will best meet a client's needs.

The box-and-whisker plot in Figure 4.4 presents the distribution of discharge Motor Function Scores across various types of discharge destinations identified in the NRS data set. There are separate plots for each discharge destination listed on the horizontal axis, and the number of clients included in each plot (i.e. the number of clients discharged to that destination) is also presented. For a review on the interpretation of box-and-whisker plots, refer to the Methodology section in Chapter 1.

The "x" inside each box represents the median Motor Function Score value for clients discharged to the corresponding destination on the horizontal axis. Half of the total Motor Function Score values for clients going to that particular discharge destination fall at or below this value, and half fall at or above this value. The interquartile range (the box) reflects the 50% of clients with discharge Motor Function Scores in the middle of the distribution.

The bottom quartile (the whisker line below the box) indicates the Motor Function Score range for the bottom 25% of clients discharged to that particular living setting, and the top quartile (the whisker line above the box) shows the Motor Function Score range for the top 25% of clients going to that living setting. The minimum and maximum observed values indicated by the symbols at the ends of the whiskers in each plot are 13 and 91, respectively. In this case, these values happen to correspond to the minimum and maximum values for the motor subscale of the FIM™ instrument. This indicates that at least one client with a Motor Function Score of 13 was discharged to each type of discharge destination, and at least one client with a Motor Function Score of 91 was also discharged to each type of destination.
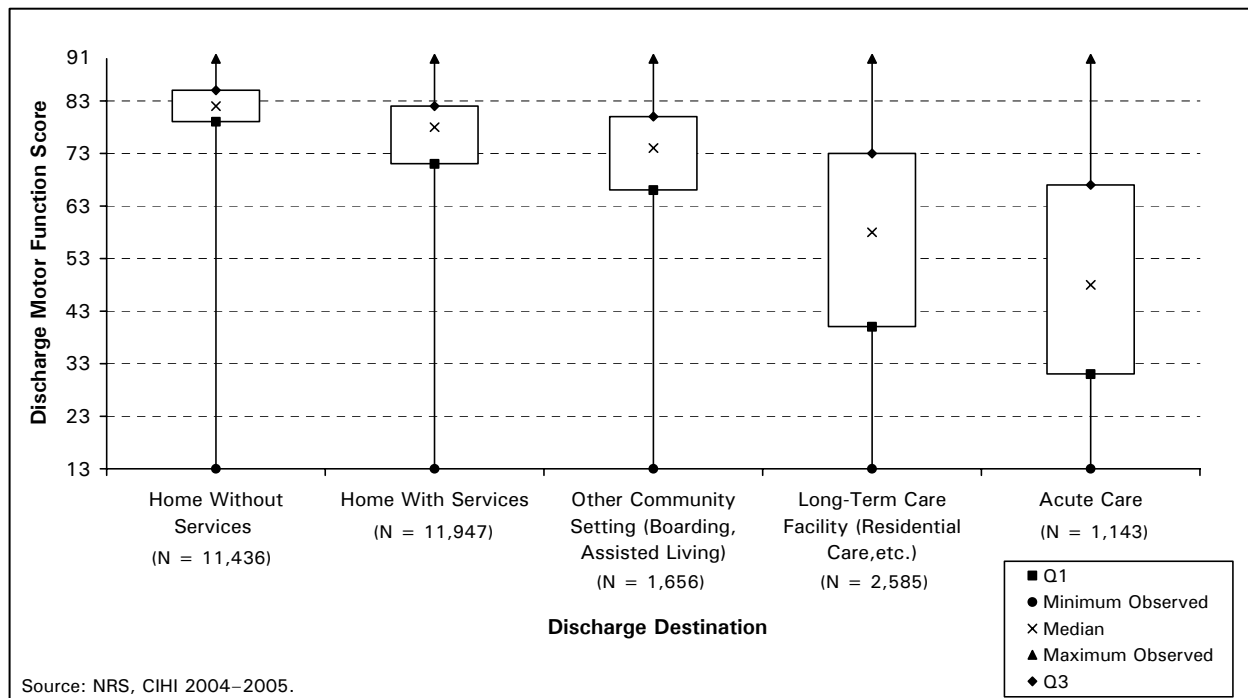
Figure 4.4   Discharge Motor Function Score and Discharge Destination, 2004–2005

The figure provides some useful information about the distribution of discharge Motor Function Scores according to where NRS clients are going after they leave the rehabilitation setting. Across the horizontal axis, the discharge destination options range from living in a private dwelling without paid services, to living in residential care, or being transferred back to acute care. From left to right on this axis, the level of supervision and/or assistance with daily tasks available to the client generally increases. The median Motor Function Score for each discharge destination decreased along the horizontal axis, suggesting that lower discharge Motor Function Scores tended to be associated with living environments

where increased assistance was available (i.e. that were less independent). Conversely, higher discharge Motor Function Scores tended to be associated with relatively more independent living environments. In addition, the interquartile range increased from left to right, implying that more variation in discharge Motor Function Scores was seen in clients discharged to long-term care or acute care, than was seen for clients being discharged home without any paid services.

For clients discharged home without any paid services, the median discharge Motor Function Score of 82.0 for this group was highest median score of all the discharge destinations presented. In addition, the top quartile and interquartile range were small compared to other discharge destinations, meaning a smaller range in variability in discharge Motor Function Score. These two areas of the plot represent the range of discharge Motor Function Scores of 75% of the clients that were discharged home without services. Specifically, 75% of clients discharged home without any paid services had Motor Function Scores of between 79 and 91 on discharge.

For those clients discharged to a residential care facility, the median discharge Motor Function Score was 58.0. In other words, many clients discharged to long-term care facilities appeared to exhibit much less independence in completing motor tasks. The interquartile range was also larger compared to the one for clients that were discharged home without services, indicating a wider variation of discharge Motor Function Scores for the middle 50% of the distribution. Compared to clients being discharged home without services, 75% of clients being discharged to long-term care had Motor Function Scores of between 13 and 73 on discharge. *(Quick Stats, Table 31)*

Frequency Distribution of Admission and Discharge Motor Function Scores for the Orthopaedic and Stroke Rehabilitation Client Groups

Previous analyses in this report have presented overall average admission and discharge FIM^{TM} instrument Function Scores across the various Rehabilitation Client Groups. Figures 4.5 and 4.6 present the distribution frequency of admission and discharge Motor Function Scores for clients in the orthopaedic and stroke RCGs—the two client groups with the largest number of NRS records for 2004–2005. These figures shed some light on the range and frequency of admission and discharge motor scores in inpatient rehabilitation for these two client groups.

Note: Values with record counts of 1 to 4 were suppressed in accordance with CIHI privacy policy guidelines.

Source: NRS, CIHI 2004–2005.

Figure 4.5   Frequency Count for Admission and Discharge Motor Function Scores: Orthopaedic Clients, 2004–2005

Figure 4.5 shows that the distribution of admission Motor Function Scores for the orthopaedic RCG was normal, slightly skewed towards higher average admission scores. As mentioned earlier in the chapter, the average admission motor score for the orthopaedic group was 57.1, with a standard deviation of 12.5. The distribution of discharge Motor Function Scores for the orthopaedic client group shows a large shift towards a higher score range, indicating that the majority of clients in the orthopaedic group left inpatient rehabilitation with high Motor Function Scores. The average discharge motor score for the orthopaedic group was 76.7. In Chapter 3, it was noted that 86% of orthopaedic clients were recorded as having met their goals and were discharged back to the community.
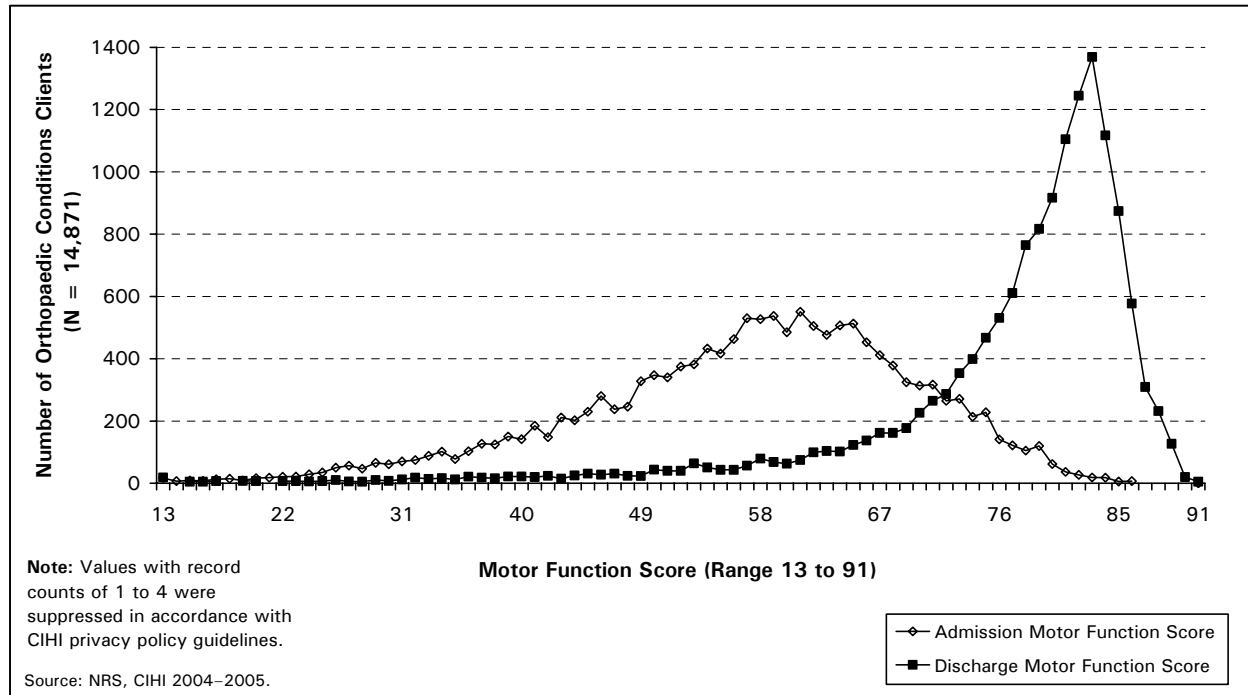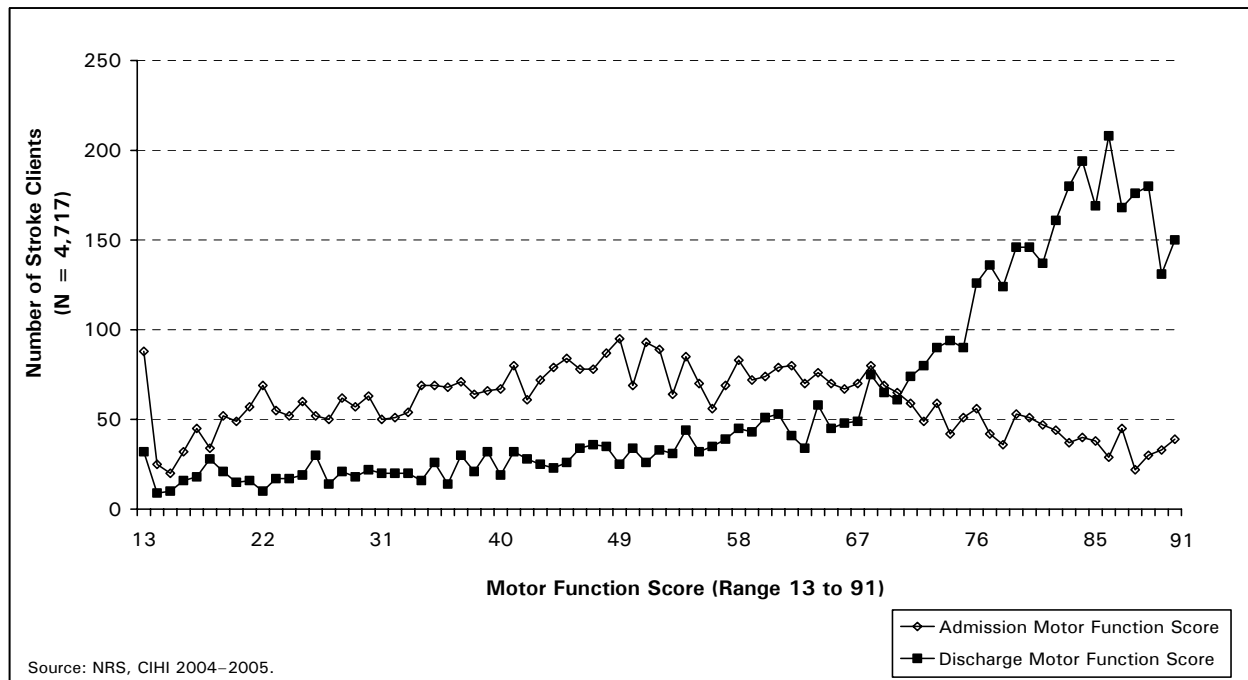
Figure 4.6   Frequency Count for Admission and Discharge Motor Function Scores: Stroke Clients, 2004–2005

Figure 4.6 presents the distribution of scores for the stroke client group. Caution should be used when comparing Figures 4.5 and 4.6 due to different scales used for the vertical axes. The admission Motor Function Scores for the stroke group shows a fair amount of variation. In other words, comparatively similar numbers of stroke clients were admitted at all levels of motor function. This suggests that a wide variety of motor function is seen on admission for stroke clients in the NRS. In 2004–2005, the average admission Motor Function Score for the stroke group was 50.9, with a standard deviation of 20.3. The distribution of discharge Motor Function Scores for stroke clients also shows a shift towards higher motor scores, with an average discharge Motor Function Score of 69.6. In the stroke group, 73% of clients met their goals and were discharged back into the community in 2004–2005. Note that these two figures present motor scores only, and cognitive function is not taken into consideration.

Motor Function Scores for the Orthopaedic, Stroke and Brain Dysfunction Rehabilitation Client Sub-Groups

Figure 4.7 presents the change in Motor Function Score from admission to discharge for sub-groups in three specific RCGs. Although other RCGs contain sub-groups, the orthopaedic, stroke and brain dysfunction groups are the three largest RCGs (in terms of number of client records) that can be broken down into smaller groups. For the orthopaedic group, the data are presented for knee replacements, hip replacements, hip fractures, other orthopaedic conditions (e.g. vertebral surgery, fractures other than hip, etc.) and hip/knee replacements. The stroke group is presented according to left-body (i.e. right brain), right-body (i.e. left-brain) and "Other" (e.g. bilateral) stroke. The brain dysfunction group is grouped according to traumatic and non-traumatic etiology. The number of clients in each group is listed next to the group.
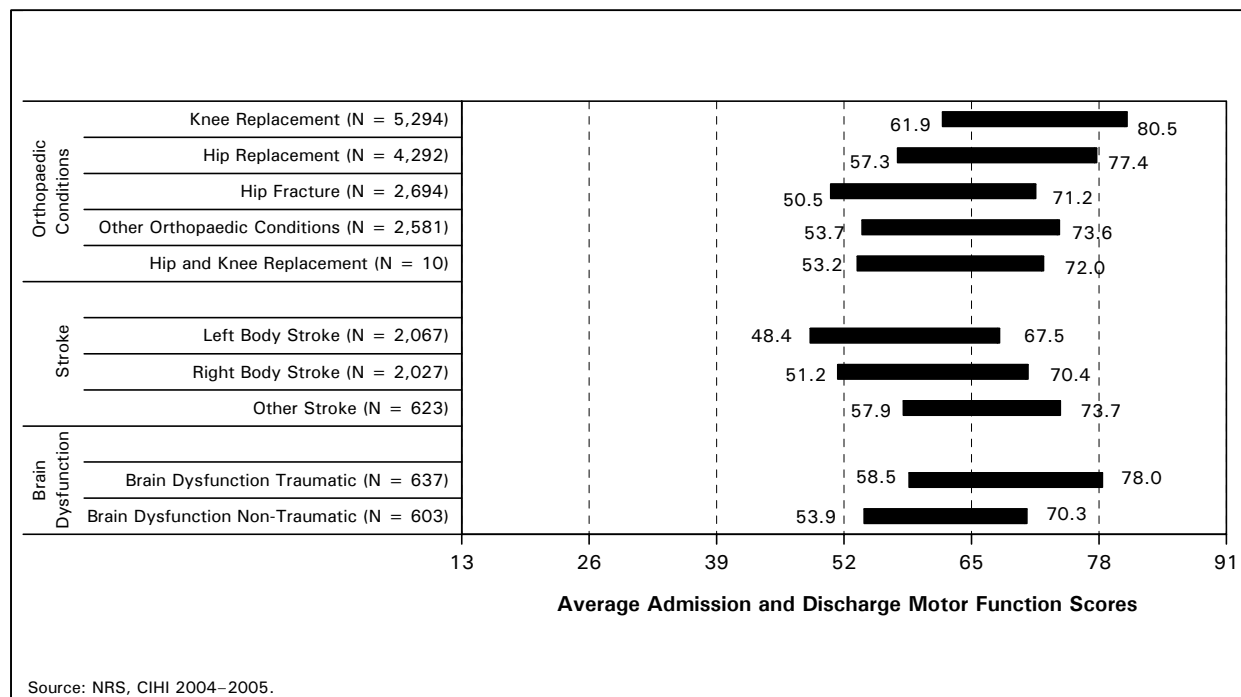
Figure 4.7   Admission and Discharge Motor Function Scores for Orthopaedic, Stroke and Brain Dysfunction Rehabilitation Client Group, 2004–2005

The figure demonstrates some variability in admission and discharge scores across these RCGs, despite similar gains in motor function. For the orthopaedic group, clients in the various sub-groups all had similar average Motor Function Score gains from admission to discharge, ranging from 18.6 to 20.7. However, the admission scores show that the hip fracture group had an average admission motor score of 50.5, as compared to the knee replacement group that had an average admission score of 61.9. On discharge, hip fracture clients had an average motor score of 71.2, whereas their counterparts in the knee replacement group were achieving an average discharge motor score of 80.5. *(Quick Stats, Table 32)*

Within the stroke RCG, the data suggest that both left-body and right-body stroke groups made almost identical increases in Motor Function Score during their rehabilitation stay, at 19.1 and 19.2, respectively. However, the left-body stroke group had average admission and discharge Motor Function Scores of 48.4 and 67.5, respectively, whereas the right-body group were admitted and discharged with slightly higher average scores at 51.2 and 70.4, respectively. Motor Function Scores for these two stroke client groups will be discussed in greater detail later in this chapter.

Finally, the brain dysfunction group also showed differences within the traumatic and non-traumatic groups in admission and discharge Motor Function Scores as well as overall gains in motor function. The traumatic brain dysfunction group had a higher average admission Motor Function Score than the non-traumatic group (58.5 vs. 53.9) and showed a higher average gain in Motor Function Score (19.5 vs. 16.4) during the rehabilitation stay.

FIM^{TM} Instrument Motor Domains

Within the FIM^{TM} instrument motor subscale, the 13 motor items are further grouped into four "domains", representing similar areas of motor function. The motor domains provide a further level of detail into the motor functioning of rehabilitation clients. The motor domains of the FIM^{TM} instrument are presented in Table 4.2:

Table 4.2   FIM^{TM} Instrument Motor Domains

Domain	# Items	FIM^{TM} Instrument Items Included	Score Range
Self-Care	6	Eating, Grooming, Bathing, Dressing Upper Body, Dressing Lower Body, Toileting	6–42
Sphincter	2	Bowel Management, Bladder Management	2–14
Transfer	3	Bed/Chair Transfer, Toilet Transfer, Tub Transfer	3–21
Locomotion	2	Walk/Wheelchair, Stairs	2–14
		Motor Function Score Range	**13–91**

These domains are used to further assess areas within the motor subscale of the FIM^{TM} instrument where there may be functional deficits. As with Total Function Score (sum of all FIM^{TM} instrument item scores), two clients with the same motor score may present differently, for example, if one has difficulties primarily with bowel and bladder control and the other mainly has difficulty walking and climbing stairs.

Note: Not all domains contain the same number of FIM^{TM} instrument items, so caution must be used when referring to some of the figures in this chapter. The score ranges for each domain are included in all figures, but scores between domains should not be compared (i.e. comparing a Transfer score with a Self-Care score).

Gains in Function Score by Motor Domain

Figures 4.8 through 4.11 present data on average admission and discharge scores for the Self-Care, Sphincter, Transfer and Locomotion motor domains, respectively, according to Rehabilitation Client Group. Each domain is presented in a different figure to allow comparisons across RCGs within a single domain. With this type of breakdown, it is possible to look at specific motor areas within each RCG where there is a greater change in function from admission to discharge. Recall that each domain is based on a specific number of FIM^{TM} instrument items and assesses a specific area of function, so caution should be used if comparing between domains. The score range for each domain is presented in each figure to assist with interpretation of the information. RCGs are presented in descending order of number of records in the NRS for 2004–2005. The individual domain scores are not included in the figures, but are available on the "Quick Stats" section of the CIHI Web site.

Figure 4.8   Change in Self-Care Domain Scores From Admission to Discharge Across Rehabilitation Client Group, 2004–2005

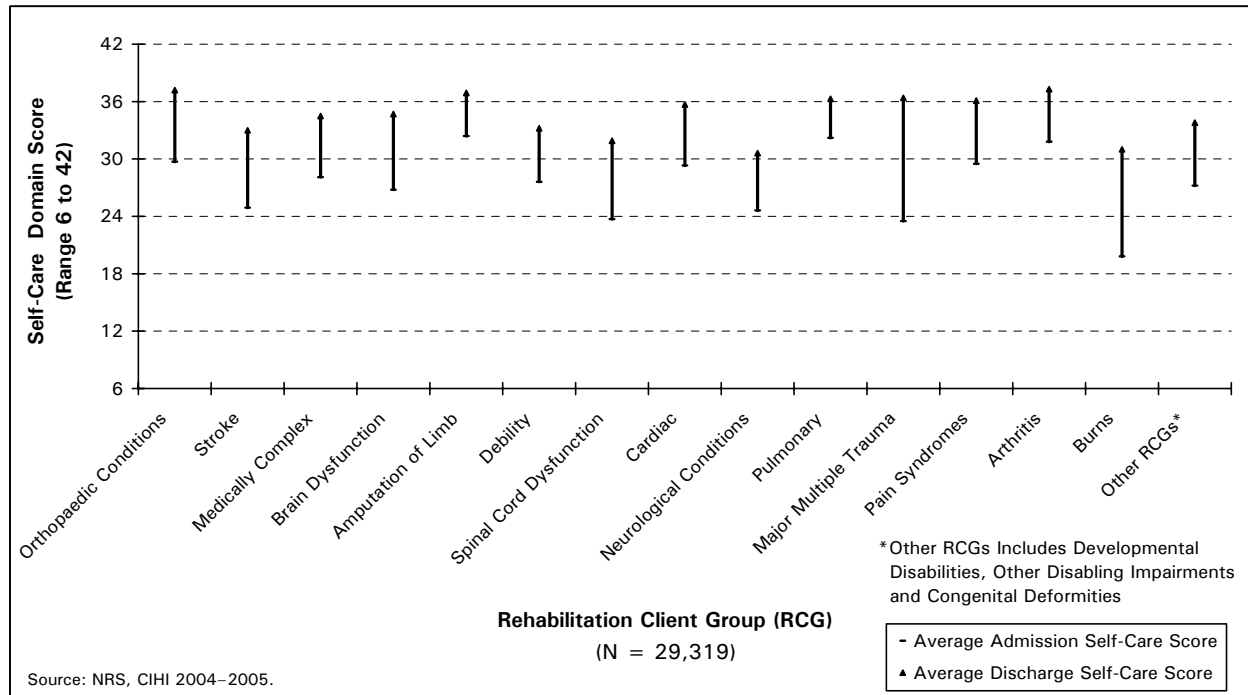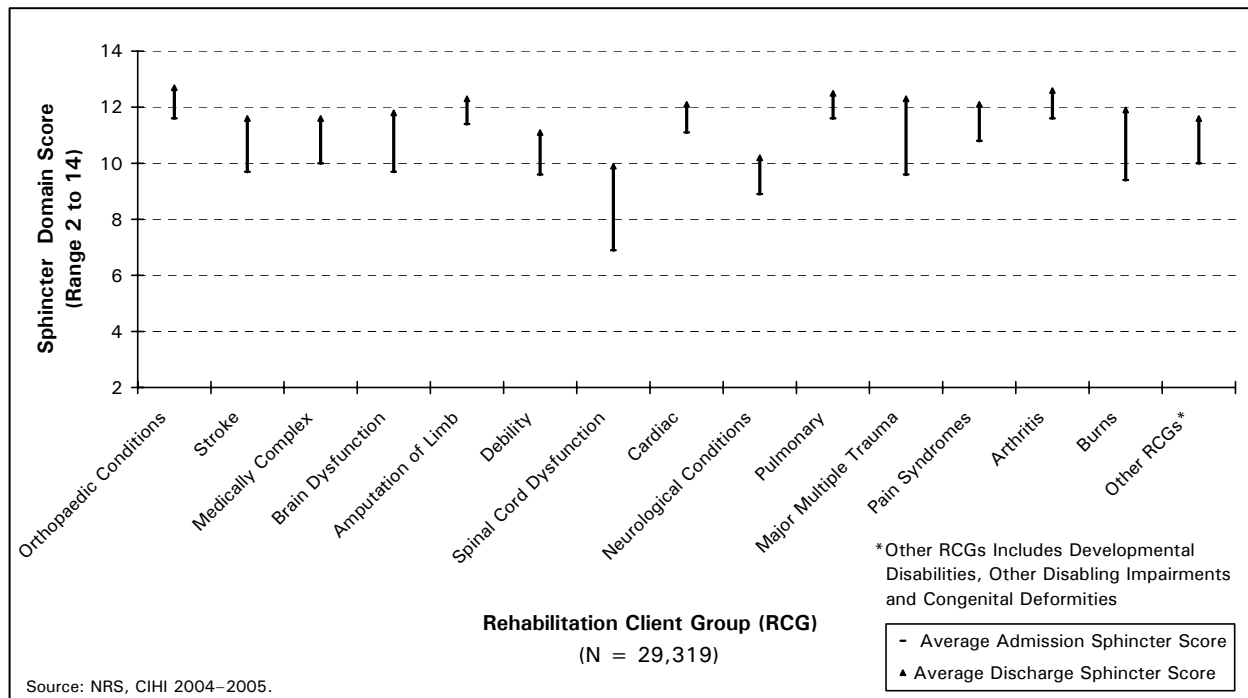**Figure 4.9   Change in Sphincter Domain Scores From Admission to Discharge Across Rehabilitation Client Group, 2004–2005**
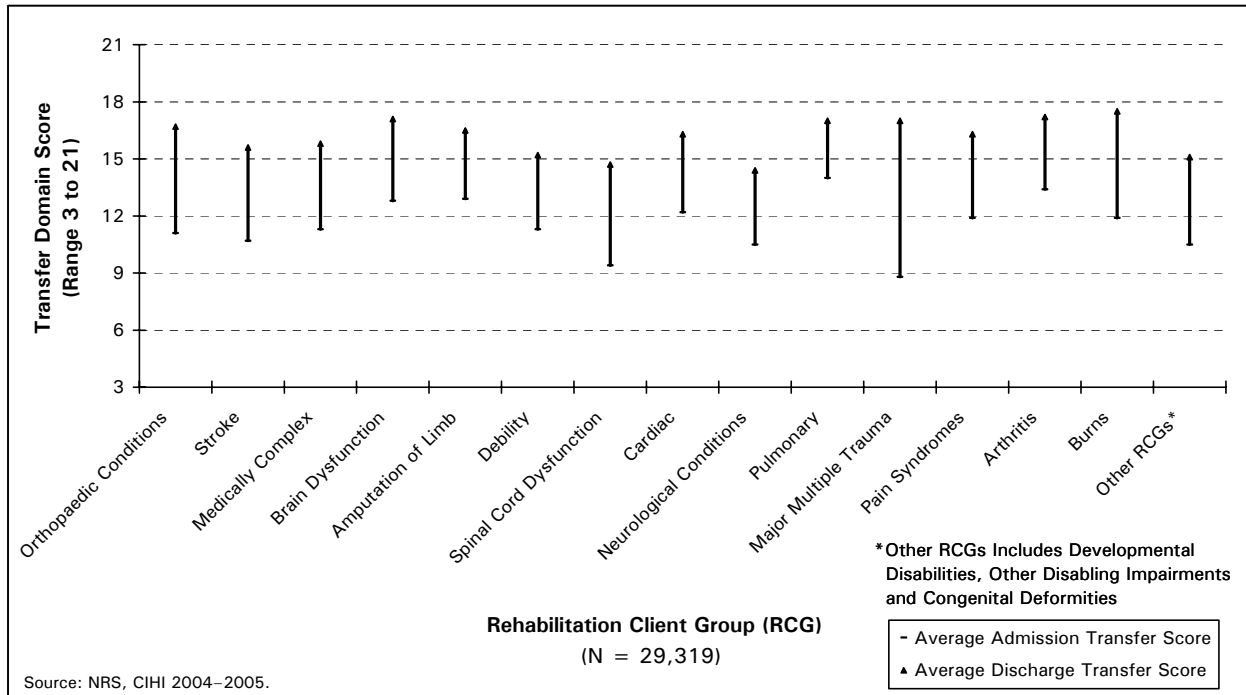
Figure 4.10   Change in Transfer Domain Scores From Admission to Discharge Across Rehabilitation Client Group, 2004–2005
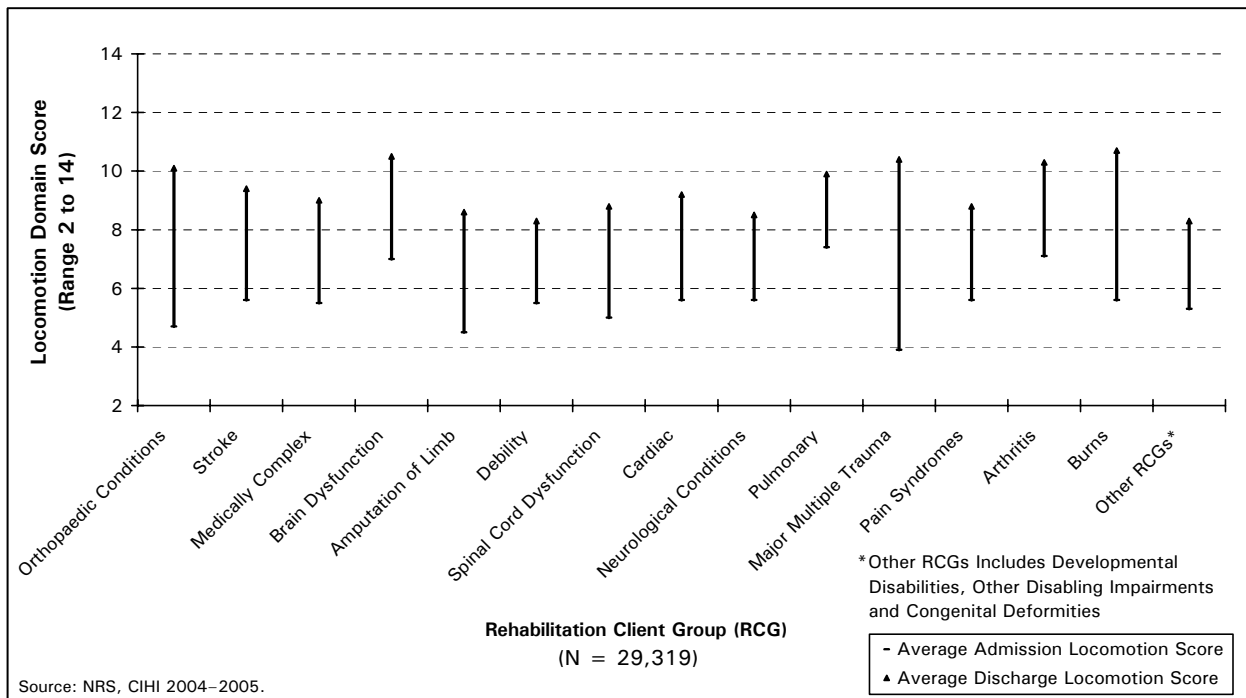

Figure 4.11   Change in Locomotion Domain Scores From Admission to Discharge Across Rehabilitation Client Group, 2004–2005

The information presented in these figures describes changes in Motor Function Scores from admission to discharge across different types of NRS client groups. The data suggest that specific domains of motor function can sometimes account for relatively greater changes in overall Motor Function Score across the various client groups. For example, consider the values for the orthopaedic and stroke RCGs across the various motor domains. Both the orthopaedic and the stroke RCGs had similar overall Motor Function Score changes of 19.6 and 18.7, respectively (Figure 4.1). Within the Self-Care domain, the orthopaedic and stroke client groups had average score increases of 8.1 and 7.5, respectively. However, the stroke group had a lower average admission Self-Care score, at 24.9, as compared to the orthopaedic group, at 29.7. Within the Sphincter domain, there were differences in average admission scores and overall score gains between the two groups. The orthopaedic group had an average admission Sphincter score of 11.6, compared to 9.7 for the stroke group. On discharge, the orthopaedic group had an average Sphincter score of 12.7, while the stroke group had an average discharge score of 11.6. The orthopaedic group showed average score gains in the Transfer and Locomotion domains at 5.6 and 5.4, respectively, where the stroke group saw score changes of 4.9 and 3.8, respectively for these motor domains. *(Quick Stats, Table 33)*

The spinal cord dysfunction RCG had an average Motor Function Score change of 20.3 from admission to discharge. This was the third highest overall motor score change of all the RCGs. However, the spinal cord dysfunction group had the highest average change in the Sphincter domain of all client groups, at 3.0.

The limb amputation and arthritis groups had similar average admission and discharge Motor Function Scores (and hence, similar changes in score), but the limb amputation group showed a greater gain in the Locomotion domain score than the arthritis group (4.1 vs. 3.2). Conversely, the arthritis group showed more gains in the Self-Care domain score (5.5 vs. 4.5). One possible reason for this difference in motor domain improvement might be that rehabilitation programs for amputation clients may be more likely to have gait-training as a primary goal following the loss of a lower limb, whereas clients in rehabilitation for conditions related to arthritis may have goals that are mainly oriented towards learning how to adapt activities such as eating and bathing in order to better cope with their condition. In addition, clients in the limb amputation group had lower average locomotion scores on admission (4.5 versus 7.1 for the arthritis group), suggesting greater potential for score improvement in that domain.

These are a few examples of the variation in functional levels suggested by the NRS data when the Motor Function Score is examined in greater detail. Information such as this may be helpful in planning programs and directing specific rehabilitation resources to targeted client groups. Domain scores can also play a role in evaluating the outcome of a particular intervention targeted at a specific client group. For example, if assessing the impact of an incontinence program introduced on a stroke unit, average Sphincter domain scores may assist in quantitatively measuring the success of the program.

Score Changes in Motor Domains for Stroke Clients

Figure 4.7 suggests that, based on over 4,000 stroke clients for whom data was submitted to the NRS in 2004–2005, right-body (i.e. left brain involvement) stroke clients appeared to have slightly higher average Motor Function Scores on admission and discharge than clients in the left-body (i.e. right brain involvement) stroke group, despite both groups having nearly identical overall gains in Motor Function Score as measured by the FIM^{TM} instrument. Figure 4.12 shows the breakdown in score improvement according to specific motor domain. Although the right-body and left-body stroke groups had similar Motor Function Score gains of 19.1 and 19.2, respectively, the right-body stroke group appears to have had slightly higher average admission and discharge scores for the Self-Care, Transfer and Locomotion domains. The score differences in these three domains were statistically significant at $p < 0.05$. Only in the Sphincter domain do the two stroke groups have average admission and discharge motor score differences that are not statistically significant. However, while there may be a statistically significant difference in domain scores for these groups, this does not imply a clinically significant difference in level of function. *(Quick Stats, Table 34)*

Source: NRS, CIHI 2004–2005.
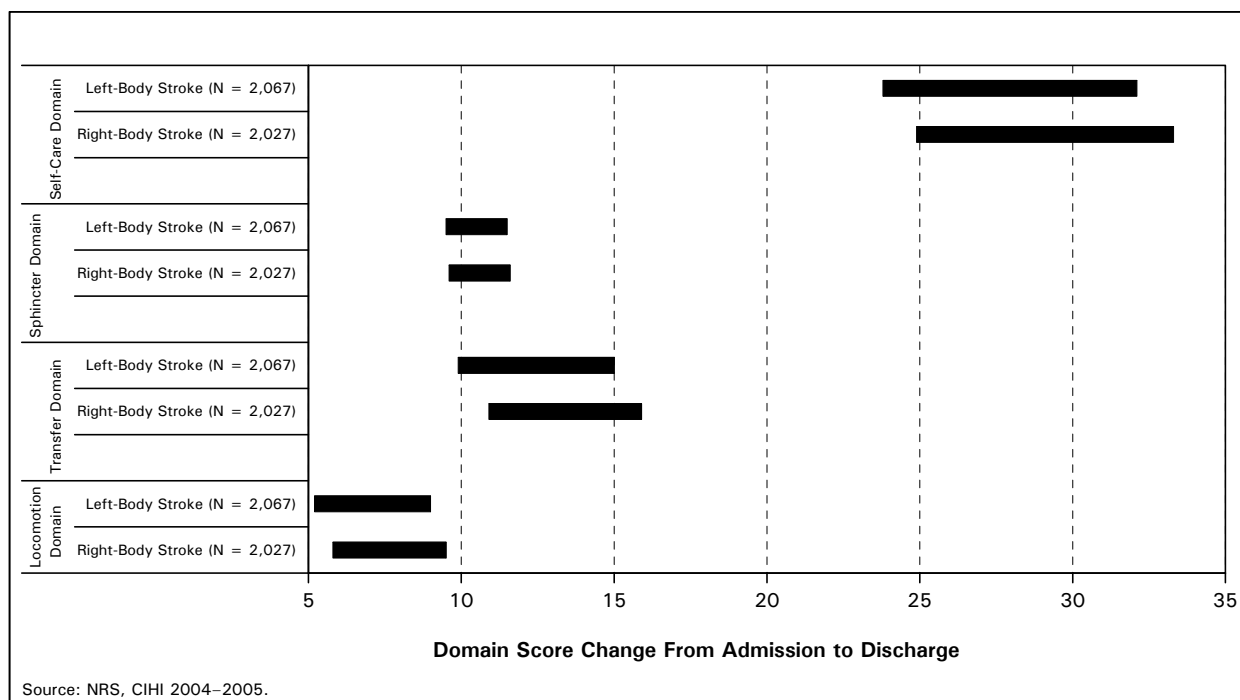
Figure 4.12   Average Admission and Discharge Motor Domain Scores for Left and Right-Body Stroke Clients, 2004–2005

Motor Domain Scores and Discharge Destination

Figure 4.4 examined at discharge Motor Function Score and discharge destination upon leaving the inpatient rehabilitation setting. The data support what clinicians are generally aware of: that a client's level of motor function can influence determination of the living environment that is appropriate at discharge. Figure 4.13 looks at the average motor domain scores at discharge according to the type of environment to which clients were discharged. Each domain is shown separately, and comparisons should only be made within and not between domains. The data show that the average scores for each motor domain decrease as the discharge destination generally involves a greater level of service, from home without services, to home with services, to assisted community living, to residential care and acute care.
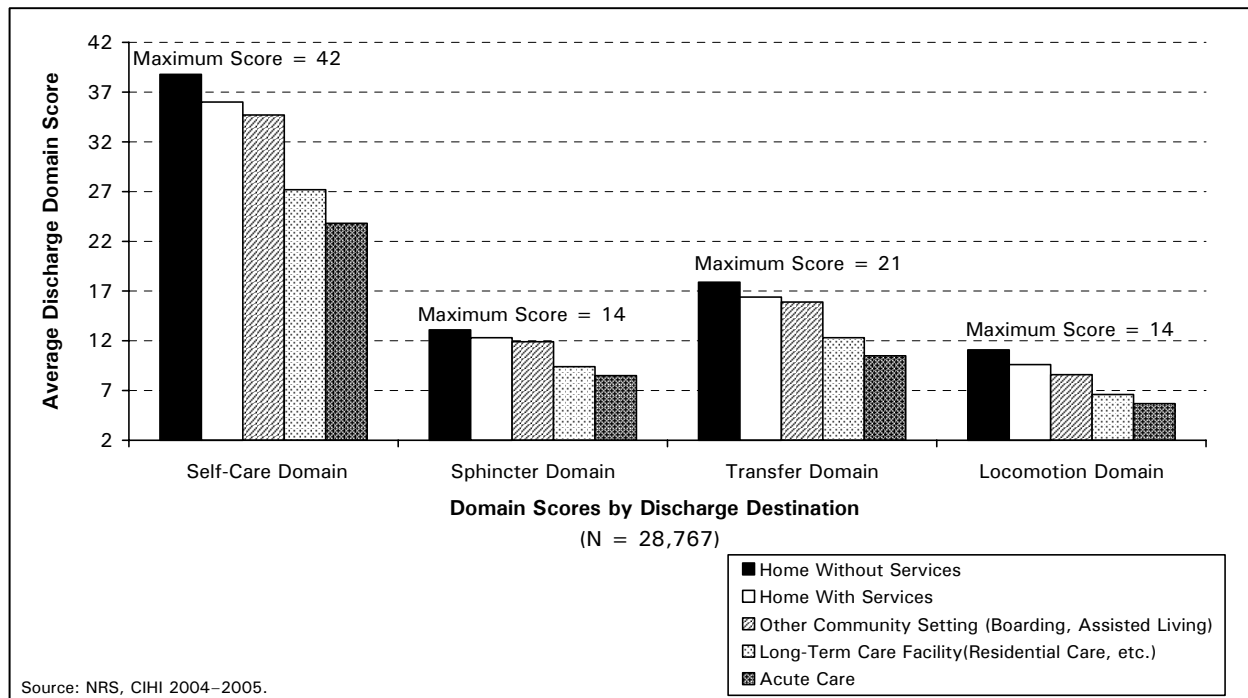
Figure 4.13   Average Discharge Motor Domain Scores and Discharge Destination, 2004–2005

As discussed earlier in the chapter, the level of assistance/supervision available to clients often varies between these living environments. Another key distinction between the discharge settings presented in this analysis is that the first three (home with or without services and other community) are community-based living environments, and the last two (residential care and acute care) are facility-based, implying that the client remains in an institutionalized setting. Considering the discharge motor domain scores across these destinations, average discharge scores for the community-based discharge settings appear to be higher than the discharge scores for the facility-based settings.

Figure 4.13 suggests that clients being discharged home without any paid services are, on average, scoring close to the maximum score for each motor domain, indicating a high level of motor function as measured by the FIM^TM instrument. In the Self-Care domain (containing six FIM^TM instrument items), the maximum score that is possible to attain is 42—where the client scores "7" on all items. For clients being discharged home without services, the *average* Self-Care score was 38.8. In the Sphincter and Locomotion domains, where the maximum score for each is 14 (each is based on two FIM^TM instrument items), clients discharged home without services scored an average of 13.1 and 11.1, respectively. For the Transfer domain, the maximum score is 21, and the average score for clients discharged home without services was 17.9. Conversely, clients that were discharged to long-term care facilities or to acute care scored much lower on average across all motor domains. Clients discharged to long-term care scored an average of 27.2 in the Self-Care domain, 9.4 in the Sphincter domain, 6.6 in the Locomotion domain, and 12.3 in the Transfer domain. *(Quick Stats, Table 35)*

Summary

Improvement in motor function is a key component of most inpatient rehabilitation programs. Clients with higher levels of motor function often have more relative independence with activities of daily living and require less supervision or assistance than clients with lower levels. This chapter has provided insight into the available NRS data on the motor subscale of the FIM^TM instrument, and the relationship between motor scores and different rehabilitation client groups, age groups and discharge destinations. Further assessment of the FIM^TM instrument motor subscale by individual motor domain provides information about the various areas of function that make up the overall Motor Function Score. Among other things, clinicians can use this information to help target specific areas of reduced motor function that need to be addressed in order to maximize rehabilitation resources for optimal outcomes.

Key Findings:

- There appears to be an inverse relationship between admission Motor Function Score and median length of stay.
- Clients aged 85 and over showed an average gain in Motor Function Score following a course of inpatient rehabilitation that was comparable to clients in younger age groups.
- NRS clients with right-body strokes appeared to have slightly higher average levels of function on admission and discharge than their peers with left-body strokes, but these levels are not necessarily clinically significant.
- Seventy-five percent of clients discharged home without any paid services had Motor Function Scores of 79 or higher on leaving the rehabilitation setting.
- Clients that were discharged home without services had average motor scores that were close to the maximum score for all FIM^TM instrument motor domains.

Chapter 5. The FIM^{TM} Instrument: Cognitive Subscale

While Chapter 4 described the motor subscale of the FIM^{TM} instrument and provided analyses as a means of measuring the client's level of function in this area, this chapter focuses on analyses specifically derived from the cognitive subscale. As discussed in Chapter 3, the Total Function Score, which includes all 18 motor and cognitive elements, ranges from 18 to 126. The Cognitive Function Score is the sum of the five cognitive elements of the FIM^{TM} instrument, and ranges from 5 to 35. The goal of this chapter is to shed some light on the specific needs of clients affected by reduced cognitive function and provide insight into the outcomes of these clients following inpatient rehabilitation.

As with previous chapters, all FIM^{TM} instrument score averages will be presented to one decimal place.

Cognitive Function Score

This chapter begins by examining the Cognitive Function Scores for client episodes in the National Rehabilitation Reporting System (NRS) for 2004–2005. The cognitive items of the FIM^{TM} instrument are used to assess a client's level of independence in performing tasks related to social cognition and communication activities.

Figure 5.1 and Table 5.1 present the average change in Cognitive Function Score from admission to discharge across the various Rehabilitation Client Groups (RCG). The scores are arranged by the number of records in each RCG, in descending order. A similar figure (Figure 3.10) in Chapter 3 presented the change in Total Function Score. Figure 5.1 focuses specifically on the cognitive subscale of the FIM^{TM} instrument.
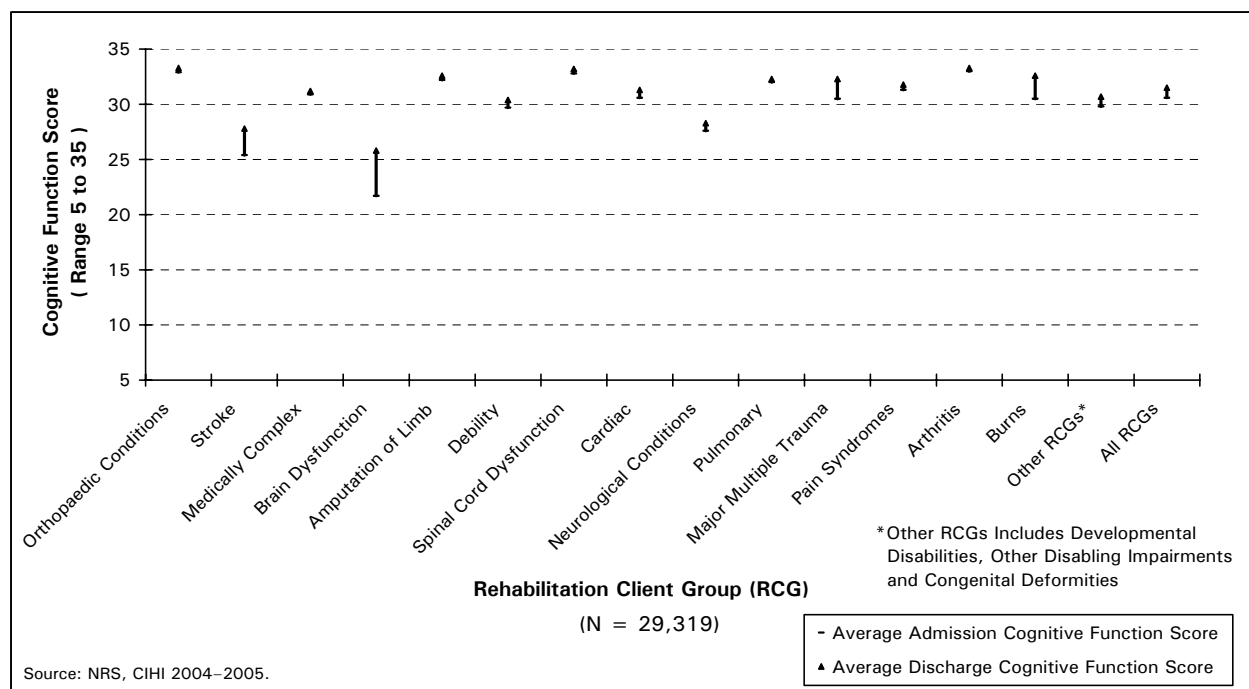
Figure 5.1   Cognitive Function Score Change From Admission to Discharge Across Rehabilitation Client Groups, 2004–2005

Table 5.1   Values for Cognitive Function Score Change From Admission to Discharge Across Rehabilitation Client Groups, 2004–2005

RCG	No. of Clients	Average Admission Cognitive Function Score	Average Discharge Cognitive Function Score	Change in Cognitive Function Score
Orthopaedic Conditions	14,871	32.9 *(4.0)*	33.3 *(3.6)*	0.4
Stroke	4,717	25.4 *(7.7)*	27.8 *(6.8)*	2.4
Medically Complex	1,951	30.9 *(5.8)*	31.2 *(5.8)*	0.3
Brain Dysfunction	1,309	21.7 *(8.0)*	25.8 *(7.1)*	4.1
Amputation of Limb	1,011	32.2 *(4.4)*	32.6 *(4.2)*	0.4
Debility	1,007	29.7 *(5.6)*	30.4 *(5.4)*	0.7
Spinal Cord Dysfunction	952	32.8 *(4.1)*	33.2 *(3.8)*	0.4
Cardiac	839	30.6 *(5.4)*	31.3 *(4.9)*	0.7
Neurological Conditions	788	27.6 *(8.5)*	28.3 *(8.5)*	0.7
Pulmonary	760	32.0 *(4.5)*	32.3 *(4.2)*	0.3
Major Multiple Trauma	354	30.5 *(6.7)*	32.3 *(4.4)*	1.8
Pain Syndromes	319	31.3 *(5.0)*	31.8 *(4.4)*	0.5
Arthritis	252	33.0 *(4.2)*	33.3 *(3.8)*	0.3
Burns	29	30.5 *(5.4)*	32.3 *(4.6)*	2.1
Other RCGs*	160	29.8 *(6.1)*	30.7 *(5.1)*	0.9
All RCGs	29,319	30.6 *(6.4)*	31.5 *(5.5)*	0.9

*Other includes congenital deformities, developmental disabilities and other disabling impairments.
Values in parentheses ( ) represent the range of values one standard deviation above and below the mean.

Source: NRS, CIHI 2004–2005.

Some interesting findings regarding average admission and discharge Cognitive Function Scores are noted by the data presented in Figure 5.1 and Table 5.1. Average admission Cognitive Function Scores range from a low of 21.7 in the brain dysfunction group, to a high of 32.9 in the orthopaedic group, with 30.6 being the average admission Cognitive Function Score for all RCGs. The brain dysfunction, stroke and neurological conditions client groups have the lowest average admission Cognitive Function Scores at 21.7, 25.4 and 27.6 respectively. However, there are also several client groups that had very high admission Cognitive Function Scores (e.g. orthopaedic conditions, amputation of the limb, spinal cord dysfunction). Many of the client in these groups would have entered rehabilitation with few, if any limitations in their cognitive abilities.

Discharge scores range from an average of 25.8 in the brain dysfunction group to 33.3 in the arthritis and orthopaedic conditions client groups. Discharge cognitive scores will be examined in more detail later in this chapter. *(Quick Stats, Table 36)*

The range of improvement in cognitive function also demonstrated differences between client groups. The likelihood of having cognitive impairment following a stroke or head injury, for example, is more prevalent. Therefore, it is not surprising to find that there were lower average admission cognitive scores and larger relative changes in cognitive function scores between admission and discharge for the stroke and brain dysfunction client groups. Clients in these groups had the highest average score gains, at 2.4 and 4.1, respectively. Clients in all other client groups made smaller relative average gains in cognitive function ranging between 0.3 and 2.1.

Admission Cognitive Function Score and Length of Stay

For certain client groups, improvement in cognitive function is a very important part of their stay in inpatient rehabilitation. This next section examines admission cognitive scores and lengths of stay for rehabilitation clients.

Analyses for Figure 5.2 are similar to those used for Figure 3.12 and Figure 4.2.
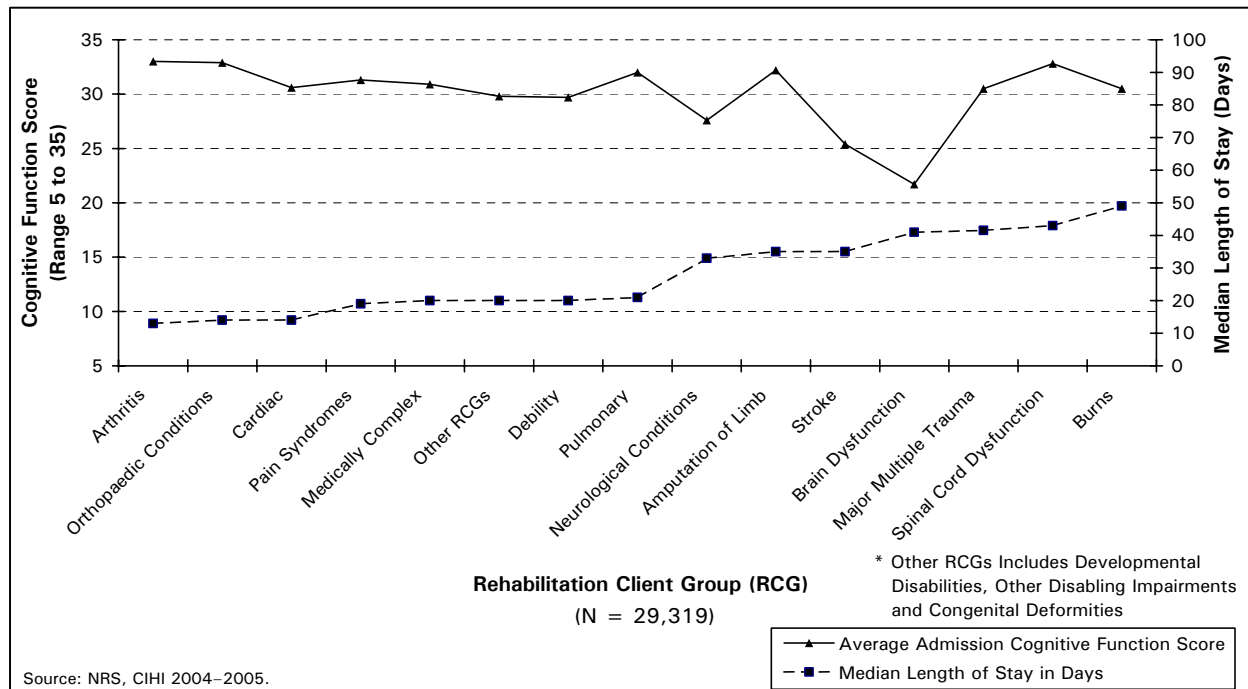
Figure 5.2   Average Admission Cognitive Function Score and Median Length of Stay by Rehabilitation Client Group, 2004–2005

Figure 5.2 demonstrates a similar trend as the ones in Figures 3.12 and 4.2; there appears to be an inverse correlation (r = -0.30, p<0.05) between admission Cognitive Function Score and median length of stay. In other words, a higher average admission Cognitive Function Score frequently coincides with a lower median length of stay, and vice versa. RCGs such as orthopaedic conditions, pulmonary and arthritis, which have higher average admission Cognitive Function Scores, tend to have shorter lengths of stay. Conversely, when considering the stroke and brain dysfunction groups, lower average admission Cognitive Function Scores are observed, as are longer median lengths of stay. *(Quick Stats, Table 37)*

Since changes in the cognitive function score are larger and more prevalent for the client groups that had the lowest admission cognitive function scores, the remainder of this chapter will focus only on the stroke, brain dysfunction and neurological conditions client groups.

Change in Cognitive Function Score With Age

Gain in cognitive function is likely influenced by many factors, one of which may be age. Figure 5.3 examines the average change in Cognitive Function Score for stroke, brain dysfunction and neurological conditions clients in the NRS by age group for 2004–2005. The average Cognitive Function Score change appears to decrease progressively with older age groups. For those between the ages of 15 and 44 years, the average gain in cognitive function was 4.0. For those clients that are 85 years and older, the average gain in cognitive function was 1.5. Recall from Chapter 3 that clients in younger age groups are most often admitted under the brain dysfunction RCG and that the older age groups of 75 years and older tended to be in the stroke and neurological conditions RCGs. *(Quick Stats, Table 38)*
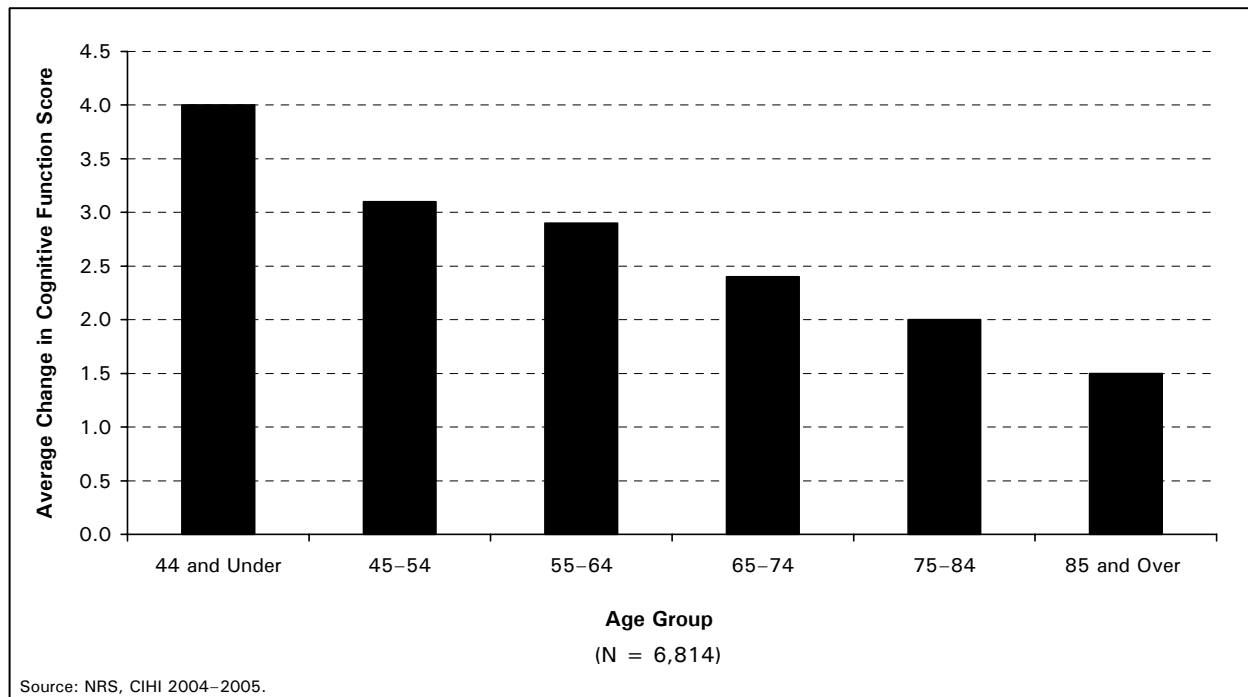
Figure 5.3   Average Change in Cognitive Function Score Across Age Groups for Stroke, Brain Dysfunction and Neurological Conditions Rehabilitation Client Groups, 2004–2005

Discharge Cognitive Function Score

Part of discharge planning in rehabilitation includes identifying the living setting to which the client will return upon leaving the rehabilitation environment. Level of cognitive function often plays a key role in determining the type of setting that will best meet a client's needs. The box and whisker plot in Figure 5.4 presents the distribution of discharge Cognitive Function Scores across various types of discharge destinations identified in the NRS.

Figure 5.4 displays a summary of data on discharge Cognitive Function Scores and discharge destinations for stroke, brain dysfunction and neurological conditions clients. There are separate plots for each discharge destination listed on the horizontal axis, and the number of clients included in each plot (i.e. the number of clients discharged to that destination) is also presented. The minimum and maximum observed values indicated by the symbols at the ends of the whiskers in most plots are 5 and 35. These values also correspond to the minimum and maximum values for the cognitive component of the FIM[TM] instrument. Please refer to the section on Discharge Motor Function Score in Chapter 4, for a detailed description of how to interpret this figure, keeping in mind that the Cognitive Function Score was used in replacement of the Motor Function Score for Chapter 5.

Figure 5.4   Discharge Cognitive Function Score and Discharge Destination for Stroke, Brain Dysfunction and Neurological Conditions Rehabilitation Client Groups, 2004–2005

The figure provides information about the distribution of discharge cognitive scores according to discharge destination for NRS clients. This figure demonstrates that the median Cognitive Function Score for each discharge destination decreases from left to right along the horizontal axis. In addition, the middle 50% of the score distribution (the size of the box) increases from left to right, indicating that the variation in discharge Cognitive Function Scores among the middle 50% of clients was larger for those discharged to acute care than those discharged home without services.

Clients discharged home, with and without any paid services, had median discharge Cognitive Function Scores of 30 and 31 respectively. These groups had the highest median scores of all the other discharge destinations presented. In addition, the figure also demonstrates that 75% of clients discharged home with or without paid services had Cognitive Function Scores of 26 or higher.

For those clients discharged to a long-term care or acute care facility, the median discharge Cognitive Function Score was 23, and 75% of those clients had Cognitive Function Scores of 15 or higher. In other words, many clients discharged to long-term care and acute care facilities appeared to exhibit much less independence in cognitive functional tasks, as measured by the FIM™ instrument than their counterparts who were discharged home. *(Quick Stats, Table 39)*

Cognitive Scores for the Stroke, Brain Dysfunction and Neurological Conditions Rehabilitation Client Sub-Groups

Figure 5.5 examines the change in Cognitive Function Score from admission to discharge for three specific RCG sub-groups: stroke, brain dysfunction and neurological conditions. The stroke group is presented according to left-body (i.e. right-brain), right-body (i.e. left-brain) and "Other" (e.g. bilateral) stroke. The brain dysfunction group is presented according to traumatic and non-traumatic etiology. For the neurological conditions group, the data are presented according to Multiple Sclerosis, Parkinsonism and "Other" neurological conditions. The number of clients in each group is listed next to the group.

Source: NRS, CIHI 2004–2005.

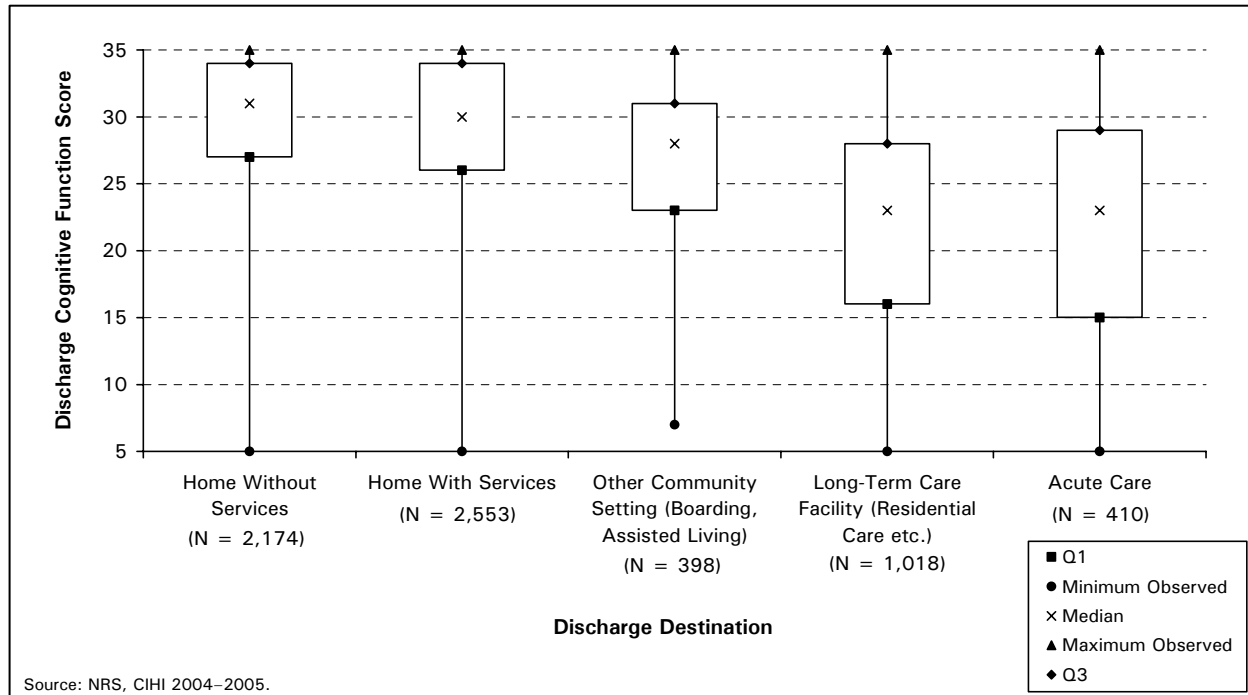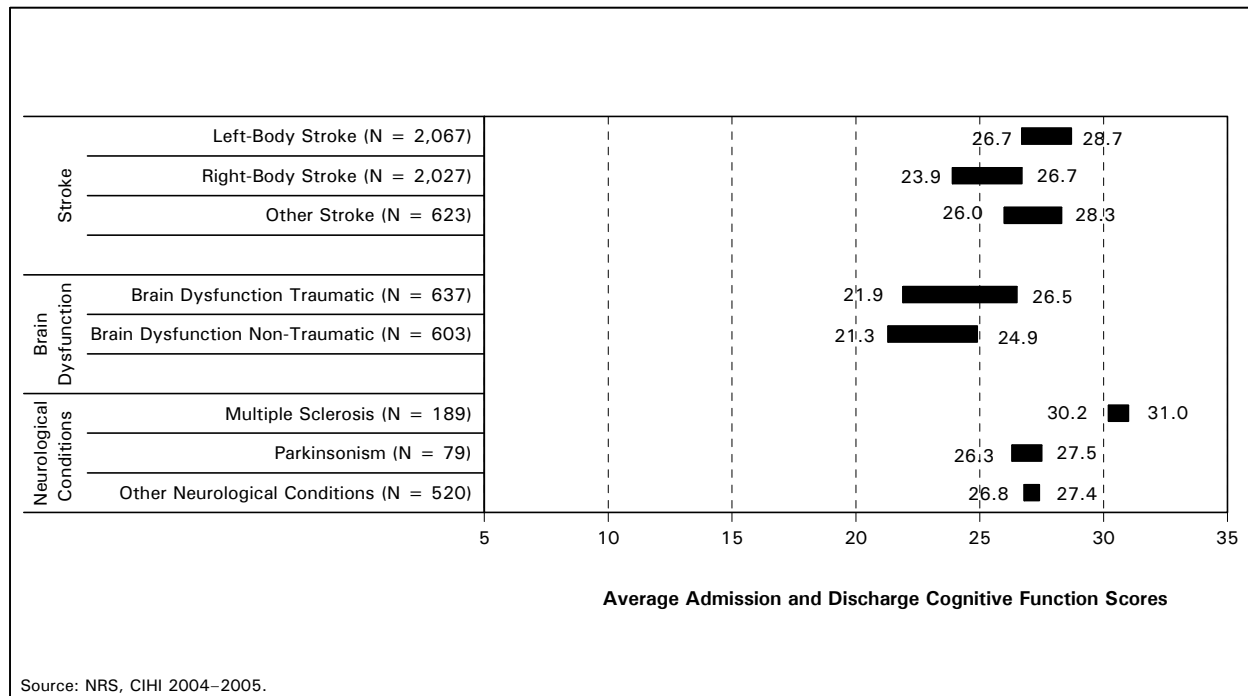**Figure 5.5   Admission and Discharge Cognitive Function Scores for Stroke, Brain Dysfunction and Neurological Conditions Rehabilitation Client Groups, 2004–2005**

Figure 5.5 demonstrates variability in admission and discharge Cognitive Function Scores across the three RCGs. Within the stroke RCG, the data suggest that both left-body and right-body stroke groups experienced different average gains in cognitive function during their rehabilitation stay, at 2.0 and 2.8, respectively. On average, the left-body stroke group scored better on admission and discharge Cognitive Function Scores than their right-body stroke counterparts (26.7 and 23.9 on admission versus 28.7 and 26.7 on discharge, respectively). Cognitive Function Scores for these two stroke client groups will be discussed in greater detail later in this chapter.

In the brain dysfunction group, differences were found in admission and discharge Cognitive Function Scores as well as the overall gain in cognitive function between the traumatic and non-traumatic groups. The traumatic brain dysfunction group had a higher average admission Cognitive Function Score than the non-traumatic group (21.9 vs. 21.3) and demonstrated a higher average gain in Cognitive Function Score (4.6 vs. 3.6) during the rehabilitation stay.

Compared to brain dysfunction and stroke clients, those in the neurological conditions group had smaller average gains in cognitive function, ranging from 0.6 to 1.2 across the sub-groups. At the same time, clients in the neurological conditions group typically had higher admission and discharge Cognitive Function Scores as compared to the brain dysfunction and stroke clients. The admission scores reveal that the Multiple Sclerosis group started with an average admission Cognitive Function Score of 30.2, as compared to clients with Parkinsonism that had an average of 26.3. *(Quick Stats, Table 40)*

FIM™ Instrument Cognitive Domains

Within the cognitive subscale of FIM™ instrument, the five items can be further grouped into two domains, representing similar areas of function. Just as the Total Function Score of the FIM™ instrument can be broken into motor and cognitive scores, the domains provide a further level of detail into the overall cognitive score. The cognitive domains of the FIM™ instrument are presented in Table 5.2.

Table 5.2   FIM™ Instrument Cognitive Domains

Domain	# Items	FIM™ Instrument Items Included	Score Range
Communication	2	Comprehension and expression	2–14
Social Cognition	3	Social interaction, problem solving and memory	3–21
		Cognitive Function Score Range	**5–35**

These domains are used to assess areas within the cognitive component of the FIM™ instrument where there may be functional deficits. As with Total Function Score (sum of all FIM™ instrument item scores), two clients with the same cognitive score may present differently if one has difficulties primarily with comprehension and expression and the other mainly has difficulty with problem solving and remembering.

Note: Not all domains have the same number of items, so caution must be used when referring to some of the figures in the following sections. The score range for each domain is included in all figures, but comparing scores between domains should be avoided (i.e. comparing a Communication with a Social Cognition score).

Score Changes in Cognitive Domains for Stroke Clients

Figure 5.5 in the previous section suggested that, based on over 4,000 stroke clients for whom data was submitted to the NRS in 2004–2005, left-body (i.e. right-brain involvement) stroke clients appeared to have higher average Cognitive Function Scores on admission and discharge than clients in the right-body (i.e. left-brain involvement) stroke group; however, the right-body stroke group made larger gains in cognitive function.

Figure 5.6 demonstrates the breakdown in Cognitive Function Score by specific cognitive domains. The data suggest that, on average, right-body stroke clients score considerably lower than left-body stroke clients in terms of communication. In fact, the average discharge Communication score for right-body stroke clients was lower than the average admission Communication score for left-body stroke clients (10.6 vs. 11.4). The score differences in both domains were shown to be statistically significant at $p < 0.05$. However, as with the motor scores, these differences may not be clinically significant. *(Quick Stats, Table 41)*
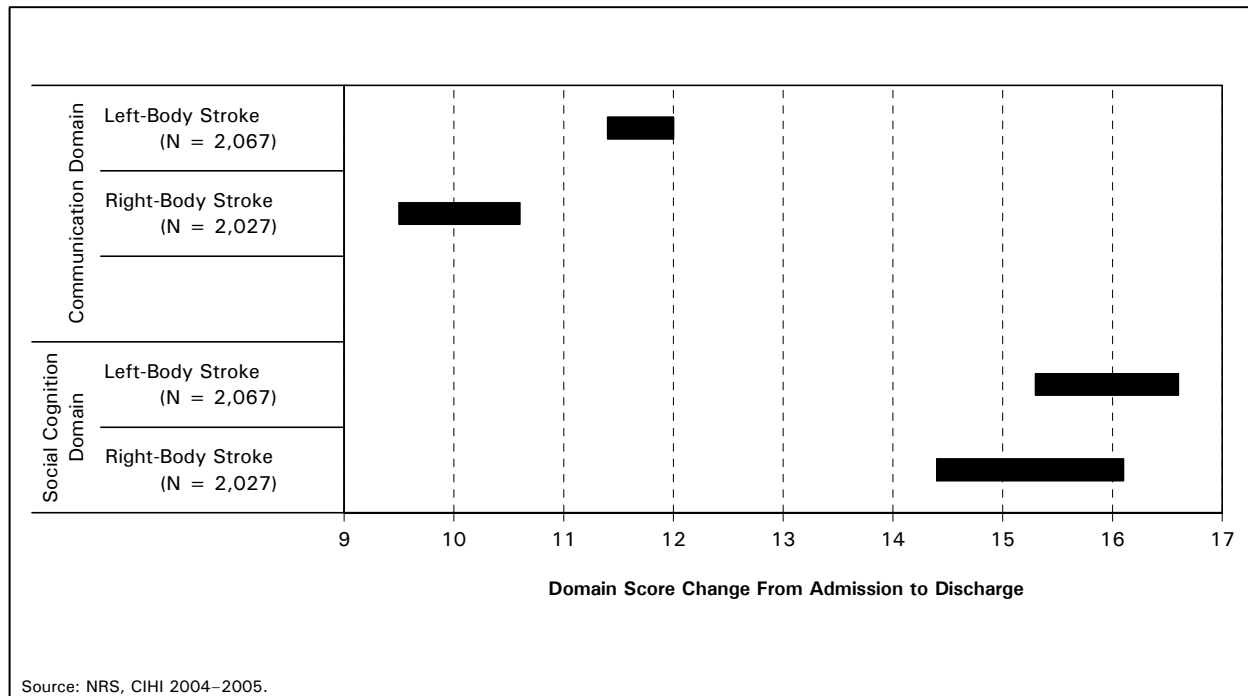
Figure 5.6   Average Admission and Discharge Communication and Social Cognition Scores for Stroke Clients, 2004–2005

Cognitive Domain Scores and Discharge Destination

Figure 5.4 examined discharge Cognitive Function Scores and discharge destinations upon leaving the inpatient rehabilitation setting. Similar analysis first conducted in Chapter 4 support what clinicians are often aware of: that a client's level of motor and cognitive function appears to influence the type of the living environment that is determined to be appropriate on discharge. Figure 5.7 examines the average cognitive domain scores on discharge according to the type of environment to which clients were discharged. Each domain is shown separately, and comparisons should only be made within and not between domains. The data demonstrate that the average scores for each cognitive domain decreases as the discharge destination goes from home without services, to home with services, to assisted community living, to long-term care and to acute care.

Figure 5.7   Average Discharge Cognitive Domain Scores and Discharge Destination for Stroke, Brain Dysfunction and Neurological Conditions Rehabilitation Client Groups, 2004–2005

The first three discharge destinations (home with or without services and other community settings) presented in this analysis are community-based, while the l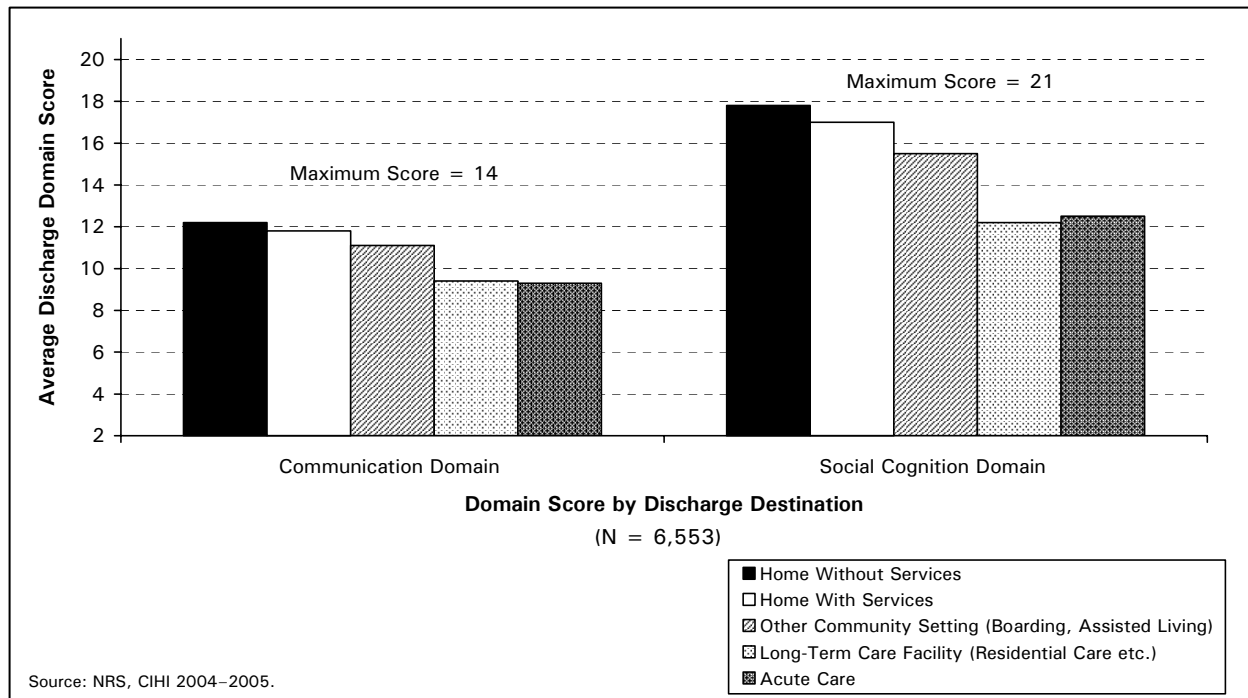ast two (long-term care and acute care) are facility-based, implying that the client remains in an institutionalized setting. Considering the discharge cognitive domain scores across these destination groupings, average discharge scores for the community-based discharge settings were higher than the discharge scores for the facility-based settings. This same marked difference was found in the analyses done for the motor domains in Chapter 4, noted in Figure 4.13.

Within the individual cognitive domains, there are some additional interesting findings. In the Communication domain (containing two FIM™ instrument items), the maximum score that is possible to attain is 14—where the client scores "7" on both items. The figure demonstrates that clients discharged home with and without services scored, on average, close to the maximum score for each cognitive domain. For clients discharged home with and without services, the average Communication score was 11.8 and 12.2 respectively. In the Social Cognition domain, where the maximum score is 21 (based on three FIM™ instrument items), clients discharged home with and without services scored an average of 17.0 and 17.8, respectively.

Conversely, clients discharged to a long-term and acute care facilities scored lower, on average, across both cognitive domains. These clients scored an average of 9.4 and 9.3, respectively in the Communication domain and 12.2 and 12.5, respectively in the Social Cognition domain. *(Quick Stats, Table 42)*

Cognitive Function and Services Referred to at Discharge

While the previous section described the cognitive function scores associated with discharge destinations, this section will examine discharge Cognitive Function Scores and the types of services or care that these clients were most often referred to upon discharge. These services include ambulatory care, home care and community services for those discharged into the community, and residential or acute care for those who remain in the health care system following a stay in rehabilitation. Similar to figures in the previous sections of Chapter 5, this analysis was done with the stroke, brain dysfunction and neurological conditions client groups.

In 2004–2005, approximately 90% of stroke, brain dysfunction and neurological conditions clients were referred or transferred to facilities or other agencies after discharge from rehabilitation in order to receive additional services pertaining to their rehabilitation condition. Nine percent of these clients were not referred to any services. Figure 5.8 demonstrates that clients not referred to any service had a higher average discharge Cognitive Function Score (30.4) than those clients referred to services. The average discharge Cognitive Function Score decreased progressively with the intensity of referred services. For example, clients referred to home care and community services upon discharge had average Cognitive Function Scores of 28.8 and 28.6, respectively, whereas clients referred to facility-based care had average Cognitive Function Scores ranging from 21.8 to 25.6. *(Quick Stats, Table 43)*
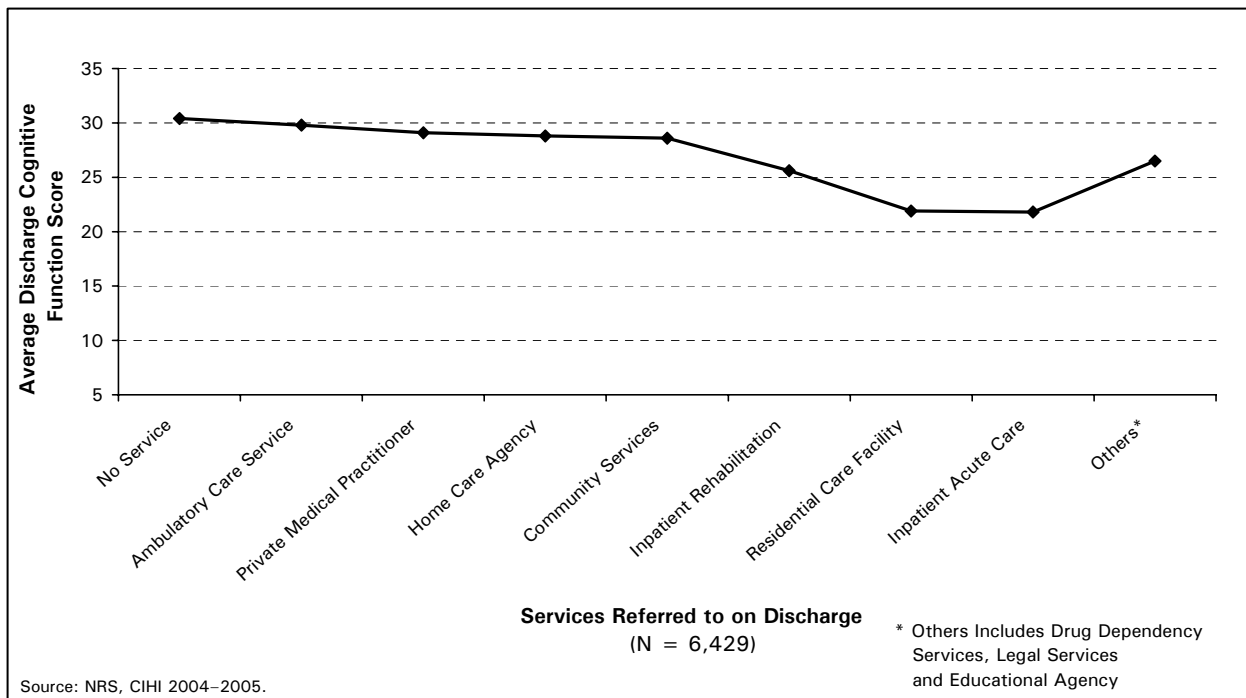

Figure 5.8   Average Discharge Cognitive Function Scores and Services Referred to at Discharge for Stroke, Brain Dysfunction and Neurological Conditions Rehabilitation Client Groups, 2004–2005

Change in Cognitive Function Score From Discharge to Follow-Up

This section of the chapter will provide a glimpse of the sustainability or maintenance of cognitive functional gains that stroke and brain dysfunction clients achieved during the rehabilitation stay, based on the changes in Cognitive Function Score from discharge to follow-up. As such, only those stroke and brain dysfunction clients that had a follow-up assessment will be discussed here.

NRS follow-up assessments are typically conducted by participating facilities through telephone interviews or during follow-up visits to the facility, anywhere from 80 to 180 days after discharge from rehabilitation. The assessment is conducted directly with the clients or through a proxy, if necessary. Information on hospitalizations since discharge, level of perceived reintegration to the community, living arrangements, and living setting is gathered and functional assessment is once again conducted using the FIM™ instrument.

Completing follow-up assessments often requires additional time and resources from a facility. Facilities can choose to collect follow-up data on some, all or none of their clients. As such, the follow-up analyses presented here are not necessarily representative of all stroke and brain dysfunction clients in the NRS.

In 2004–2005, 335 follow-up records were collected for stroke and brain dysfunction clients (about 6% of all NRS episodes for stroke and brain dysfunction clients). Figure 5.9 summarizes the change in cognitive domain scores from admission to follow-up for stroke and brain dysfunction clients. The figure demonstrates that clients who received rehabilitation services associated with a stroke or brain dysfunction episode continued to demonstrate gains in cognitive function following discharge from inpatient rehabilitation. On follow-up, brain dysfunction clients were found to have shown an increase of 2.3 in the Social Cognition domain, and 1.3 in the Communication domain. Score increases in these domains for stroke clients on follow-up were 1.5 and 0.6, respectively. For some cognitive domains, the change in average score change from discharge to follow-up was similar to the change in score from admission to discharge. Recall from the previous section that brain dysfunction clients had larger average gains in cognitive function than the stroke group during their stay in inpatient rehabilitation. *(Quick Stats, Table 44)*
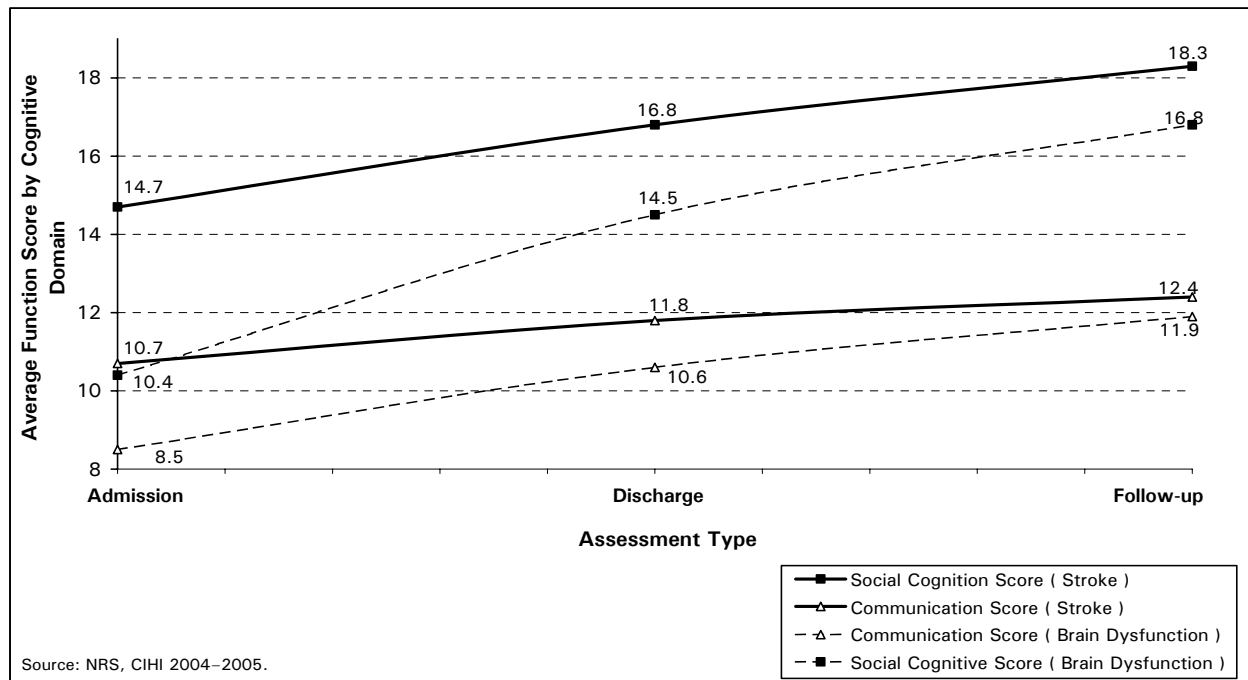
Figure 5.9   Change in Cognitive Domain Scores Between Admission, Discharge and Follow-Up for Stroke and Brain Dysfunction Rehabilitation Client Groups, 2004–2005

Summary

Improvement in cognitive function is a major component of inpatient rehabilitation programs for select client groups, namely stroke, brain dysfunction and neurological conditions. Clients with higher levels of cognitive function have more relative independence with activities of daily living and require less supervision or assistance. This chapter highlighted data on the cognitive component of the FIM™ instrument, and how Cognitive Function Scores relate to different rehabilitation client groups, age groups, discharge destinations and sustainability of outcomes. Further assessing the FIM™ instrument Cognitive Function Score by the individual domains provides information about the various areas of function that make up the overall Cognitive Function Score.

Key Findings:

* There appears to be an inverse relationship between admission Cognitive Function Score and median length of stay for the stroke, brain dysfunction and neurological conditions client groups.

* The average Cognitive Function Score change between admission and discharge appears to decrease progressively with older age groups.

* NRS clients with left-body strokes (i.e. right-brain involvement) appeared to have higher average levels of cognitive function on admission and discharge than those with right-body strokes, but these differences are not necessarily clinically significant.

* Clients who received rehabilitation services related to a stroke or brain dysfunction continued to demonstrate gains in cognitive function following discharge from inpatient rehabilitation.

Chapter 6. Conclusion and Future Directions

Inpatient Rehabilitation in Canada, 2004–2005 is the third public report based on data from the National Rehabilitation Reporting System (NRS), developed and maintained by the Canadian Institute for Health Information (CIHI).

The report provides information on hospital-based physical and cognitive rehabilitation services that occurred between April 2004 and March 2005 in participating rehabilitation units or freestanding rehabilitation facilities in Canada. It specifically highlights NRS data based on the FIM™ instrument and its motor and cognitive subscales. The FIM™ instrument is used in the NRS as part of the assessment of client functional levels at admission and discharge. The second half of this report focuses on FIM™ instrument scores across the various Rehabilitation Client Groups (RCG) in the NRS, as a means of identifying variations in motor and cognitive functional status and outcomes for the different types of client groups that are frequently admitted to inpatient rehabilitation.

The goal of this third report is to shed some light on the scope and outcomes of inpatient rehabilitation services across the country, both for the general rehabilitation population and, more specifically, for the individual client groups identified in the NRS. This report is based on data from 84 participating facilities across Canada that reported to the NRS from April 2004 to March 2005, and provides a snapshot of rehabilitation activity from which further exploration can continue. By facilitating the standard collection of data regarding inpatient rehabilitation services and the people who receive them, the NRS provides an opportunity for discussion and further analysis in the field of rehabilitation.

For participating rehabilitation facilities, this report provides a summary of information that is contained in the CIHI comparative reports relating to activity between April 2004 and March 2005. The comparative reports, which are produced four times a year, provide hospital-specific and peer group information to facilitate planning and management decisions. This annual report also provides a more detailed look at outcomes across client groups in various areas of function, as measured by the FIM™ instrument—something of particular interest to the clinicians involved in the care of these clients.

For provincial and territorial health departments and regional health authorities across the country, this report provides a bird's eye view of participating facilities' characteristics and selected outcomes. Although inpatient rehabilitation is only one component of the continuum of the physical rehabilitation sector, the report may provide another mechanism for considering future policy, funding or planning directions.

Inpatient Rehabilitation in Canada, 2004–2005 is one of the only publications that describes characteristics of hospital-based rehabilitation services and clients in Canada. This allows people who have participated in rehabilitation programs themselves, or who know of family or friends who have, to gain a better understanding on how rehabilitation services information can support decisions and insight in this area of health care.

Measuring Function and Outcomes in Rehabilitation

A cornerstone of the NRS is the concept of human function, evidenced by the fact that much of the information collected in the NRS relates to functional performance of tasks related to daily living. As a reporting system, the NRS focuses on the role of rehabilitation in assisting individuals to achieve maximum independence in daily living and maintain that independence following discharge from the rehabilitation setting. Successful rehabilitation programs and effective service delivery require more than just a thorough understanding of medical diagnoses and their consequences; clinical and outcome-related data across the continuum of care is vital. The assessment of function at admission and discharge (and optionally at follow-up), as measured with the FIM™ instrument, provides clinicians with a quantitative measure of areas of functional limitation and changes in a client's functional independence following a rehabilitation stay. For individual clients, this can mean interventions tailored to their specific needs and goals. For rehabilitation managers and coordinators, aggregate data on client outcomes provide part of the information required for resource planning and implementing successful service delivery programs. In the NRS, data related to functional levels are primarily collected using the 18-item FIM™ instrument, which is a standardized assessment tool developed in the United States by the Uniform Data System for Medical Rehabilitation (UDS$_{MR}$) and is recognized both nationally and internationally.

In *Inpatient Rehabilitation in Canada, 2004–2005*, motor and cognitive data collected with the FIM™ instrument are presented across the range of Rehabilitation Client Groups in the NRS. The information on variations in average function scores and outcomes may assist clinicians in planning rehabilitation interventions and programs for specific client groups that address areas of functional limitations. The FIM™ instrument data, together with other socio-demographic, administrative and health characteristic data provide some insight into the activity limitations experienced by clients and the extent to which rehabilitation programs assist in overcoming these limitations. In addition, the analyses presented in Chapters 4 and 5 are a first step towards looking at the nature and extent of relationships between client functional levels and rehabilitation outcomes such as length of stay and discharge destination.

As familiarity with the NRS in hospitals and other organizations across the country grows, CIHI continues to explore new analytical themes and methods to present more specific information on functional status for the range of client groups seen in this reporting system. Where sufficient volumes of records exist in the NRS, further questions about functional status and related outcomes can be explored, either in subsequent annual reports or through participating facilities making use of NRS data for further research in the rehabilitation community. Such topics may include:

- How can NRS data be used to incorporate "best practices" in various rehabilitation settings?
- What trends or variation in functional status and clinical outcomes across several years are evident in the NRS data?
- How do the interventions provided in rehabilitation programs impact on functional status and other outcome measures in the NRS?

Towards Comprehensive Reporting

As a result of its partly voluntary nature, the NRS does not have complete coverage of all inpatient rehabilitation services in Canada. Therefore, the information presented in this report is limited in the extent to which the characteristics, indicators and outcomes can be assumed to be representative of all inpatient rehabilitation services.

In the future, as more hospitals implement the NRS to support their management and quality improvement activities, and as more provinces, territories and regions begin to use NRS data for planning and policy roles, the snapshot of rehabilitation services may become clearer. A vision for the NRS is to have comprehensive reporting for all inpatient physical rehabilitation services across Canada. This objective would certainly add to the findings released through the various NRS reporting activities.

By enhancing the information contained in the NRS through consultation with various hospital and government partners and through further development, future reports may address additional topics of interest to rehabilitation stakeholders. Incorporating additional sources of information, such as published research and recognized data sources could permit numerous other questions to be explored, including:

- How do outcomes vary across different groups of clients who receive services in different types of programs, such as "slow stream" rehabilitation, or geriatric rehabilitation?
- Do limitations in the information contained in the NRS provide additional direction for the collection of other data elements relating to socio-demographic characteristics, functional status and related clinical outcomes?
- How can NRS information be combined with information from other sources, such as financial and health human resources information, to shed more light on the inpatient rehabilitation sector?
- How do inpatient rehabilitation services relate to other parts of the continuum of settings in which rehabilitation occurs, such as acute care, home care and continuing care?

Conclusion

As a reporting system, the NRS will continue to provide an opportunity for hospitals, policy-makers and other stakeholders to measure activity, to monitor outcomes and to respond to evolving demands and opportunities in Canada's health care system.

As one component of the rehabilitation reporting activities at CIHI, subsequent annual versions of *Inpatient Rehabilitation in Canada* will investigate areas of relevance and importance for hospital-based physical rehabilitation by providing analysis based on input and feedback from across the country.

For more information, contact rehab@cihi.ca or visit the Web site of the National Rehabilitation Reporting System www.cihi.ca/nrs.

Appendix A—NRS Glossary

Terms related to the National Rehabilitation Reporting System are taken from the Rehabilitation Minimum Data Set Manual, which is maintained and distributed by the Canadian Institute for Health Information. Refer to this manual for context-specific information relating to these terms.

The 18-item FIM™ instrument assessment, and the Rehabilitation Client Groups referenced herein are the property of Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities, Inc.

A

Activities of Daily Living (ADL)—Basic daily activities such as eating, grooming, bathing, transferring and dressing.

Adaptive Devices—Items used during the performance of everyday activities that improve function and compensate for physical, sensory or cognitive limitations.

Admission FIM™ instrument Assessment—The baseline functional assessment that is done using the FIM™ instrument at the time of admission to the rehabilitation program. The FIM™ instrument should be administered within 72 hours of admission.

Average—For the purposes of the NRS, defined as the value obtained by adding all of the individual values (e.g. FIM™ instrument scores, days waiting for admission) in a group and dividing that sum by the number of values in the group. Describes the arithmetic mean of a set of values.

B

Bathing (FIM™ instrument)—Includes bathing (washing, rinsing and drying) the body from the neck down (excluding the neck and back); may be either a tub, shower or sponge/bed bath.

Bladder Management (FIM™ instrument)—Includes intentional control of the urinary bladder and, if necessary, use of equipment or agents for bladder control. The functional goal of bladder management is to open the urinary sphincter only when that is needed and to keep it closed the rest of the time. This may require devices, drugs or assistance in some individuals.

Bowel Management (FIM™ instrument)—Includes intentional control of bowel movements and, if necessary, use of equipment or agents for bowel control. The functional goal of bowel management is to open the anal sphincter only when that is needed and to keep it closed the rest of the time.

C

Cognitive Function Score (FIM™ instrument)—The sum of the scores for the 5 cognitive elements on the FIM™ instrument. A higher Cognitive Function Score suggests a higher level of independent functioning in cognitive activities. See *Cognitive Subscale* below. Can be calculated on admission and on discharge.

Cognitive Subscale (FIM™ instrument)—The five items of the FIM™ instrument related to cognitive function: Comprehension, Expression, Social Interaction, Problem Solving and Memory.

Communication Domain (FIM™ instrument)—Includes the FIM™ instrument cognitive items that assess communication skills: Comprehension, Expression.

Complete Independence—Referred to when performing the FIM™ instrument assessment. Refers to a situation where all of the tasks making up a particular activity on the FIM™ instrument are performed safely and without a helper. The activity is performed without modification, assistive devices, or aids, and within a reasonable amount of time. Results in a score of "7" on the FIM™ instrument for that activity.

Comprehension (FIM™ instrument)—Includes understanding of either auditory and/or visual communication (e.g., writing, sign language, gestures). Communication can involve simple and/or complex messages, with the scores reflected accordingly.

Continuing Rehabilitation—One of the available options for coding Admission Class in the NRS. This is part of a rehabilitation inpatient stay that began in another rehabilitation unit or facility. The client was admitted directly from a rehabilitation program in another unit or facility—with the *same* RCG (see *Rehabilitation Client Group*). Includes transfers to a rehabilitation unit within the same facility.

D

Date of Onset—The calendar date of onset of the main rehabilitation condition coded under Rehabilitation Client Group (see *Rehabilitation Client Group*) that precipitated the admission into rehabilitation. For acute conditions, the date of onset is the date of injury or surgery. For chronic condition (e.g. COPD), the date of onset is the date of the most recent exacerbation or functional loss that resulted in the admission to the inpatient rehabilitation unit.

Date Ready for Admission—The date on which the client meets criteria for admission to the rehabilitation facility and is considered ready to start a rehabilitation program. It does not refer to the date the client is put on a waiting list if this is done prior to when the client is clinically ready for rehabilitation.

Date Ready for Discharge—The calendar date that the client is considered ready for discharge from the rehabilitation program. On this date the client meets criteria for discharge according to the rehabilitation team and has met all or most of the rehabilitation goals set for them.

Days Waiting for Admission—One of the NRS indicators relating to accessibility. Defined as the number of days between the Date Ready for Admission and the Date of Admission to rehabilitation.

Discharge FIM™ instrument Assessment—The assessment of the client's functional ability using the FIM™ instrument at discharge. The FIM™ instrument should be administered within 72 hours before discharge from the rehabilitation program.

Dressing—Lower Body (FIM™ instrument)—Includes dressing and undressing below the waist, as well as applying and removing a prosthesis or orthosis when applicable. Includes all items of clothing that are typically worn. The client must use clothing that is appropriate to wear in public. Assessment starts in front of the closet or dresser drawers and includes reaching for items of clothing.

Dressing—Upper Body (FIM™ instrument)—Includes dressing and undressing above the waist, as well as applying and removing a prosthesis or orthosis when applicable. Includes all items of clothing that are typically worn. The client must use clothing that is appropriate to wear in public. Assessment starts in front of the closet or dresser drawers and includes reaching for items of clothing.

E

Eating (FIM™ instrument)—Includes using suitable utensils to scoop and bring food to the mouth, as well as chewing and swallowing, once the meal is presented in the customary manner on a table or tray. Includes all intake of nutrition over a 24-hour period, including tube feeding.

Episode—For the purposes of the NRS, an episode consists of a complete Admission and a Discharge record, and encompasses the entire stay in inpatient rehabilitation. The analyses in the NRS reports are primarily based on rehabilitation episodes. *Exception:* Clients recorded as having an Unplanned Discharge are still considered to have had a rehabilitation episode in the NRS (see *Unplanned Discharge*).

Expression (FIM™ instrument)—Includes clear vocal and/or non-vocal expression of language. This item includes either intelligible speech or clear expression of language using writing or a communication device. Expression of intent can involve simple and/or complex ideas, with scores reflected accordingly.

F

Facility—Refers to the site where the rehabilitation beds are grouped and represents the level at which hospitals submit data for the NRS. Often, "facility" is synonymous with "hospital". For hospitals with more than one site or location, there may be more than one NRS facility within a hospital corporation.

Follow-up FIM™ instrument Assessment—The assessment of the client's functional ability using the FIM™ instrument that is collected between 80 and 180 days after discharge from the rehabilitation program.

Functional Independence Measure (FIM™ instrument)—The functional assessment instrument included in the Uniform Data Set for Medical Rehabilitation (UDS$_{MR}$). It is composed 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. The FIM™ instrument is a measure of disability, and looks at the caregiver burden associated with the level of disability.

G

General Rehabilitation Facility—A facility that provides inpatient rehabilitation services in designated units, programs or beds within a general hospital that has multiple levels of care (i.e. rehabilitation, acute care, chronic care, emergency). Rehabilitation clients receive multi-dimensional (physical, cognitive, psycho-social) diagnostic, assessment, treatment and service planning interventions.

Grooming (FIM™ instrument)—Includes a minimum of 4 activities: (1) oral care; (2) hair grooming (combing or brushing hair); (3) washing the hands; (4) washing the face, and may include a fifth activity, either shaving the face or applying make-up, where applicable. Washing includes rinsing and drying.

H

I

Informal Support—Describes the *unpaid* assistance provided to the client from any individual including family, friends or neighbours. Informal support *excludes* formal paid services or formal referred service providers such as volunteers.

Initial Rehabilitation—One of the available options for coding Admission Class in the NRS. Describes a client's first admission to an inpatient rehabilitation facility for a particular rehabilitation condition (see *Rehabilitation Client Group*).

Impact of Pain—A self-report item describing the impact of pain on a client's daily activities. This is one of two self-report data elements collected for the NRS.

J

K

L

Length of Stay (LOS)—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. Any days on which the client could not participate in the rehabilitation program due to a health reason are excluded from the calculation (see *Service Interruption*).

Length of Stay Efficiency—The change in Total Function Score (see *Total Function Score*) per day of client participation in the rehabilitation program. Calculated as change in Total Function Score from admission to discharge divided by length of stay (see *Length of Stay*).

Locomotion Domain (FIM™ instrument)—Includes the FIM™ instrument motor items that assess locomotion: Walk/Wheelchair and Stairs.

Locomotion: Stairs (FIM™ instrument) - includes going up and down 12–14 stairs (one flight) indoors.

Locomotion: Walk/Wheelchair (FIM™ instrument) - Includes walking, once in a standing position, or if using a wheelchair, moving forward once in a seated position and on a level surface.

M

Maximal Assistance—Referred to when performing the FIM™ instrument assessment. Measure of level of assistance required by a client in carrying out physical or cognitive activities as measured in the FIM™ instrument. The subject expends between 25% and 49% of the effort to perform an activity assessed by the FIM™ instrument (with the remainder being performed by the caregiver) resulting in a score of "2" for that activity.

Median—The middle value in a group when the values are arranged in an increasing order. If there is an even number of values, the median is the average of the middle two values. Results in an upper and lower half for the set of values. For example, in the series 2, 5, 7, 9, 12; "7" is the median. Not the same as Average (see *Average*).

Memory (FIM™ instrument)—Memory in this context includes the ability to store and retrieve information, particularly verbal and visual. The functional evidence of memory includes: (1) recognizing people frequently encountered, (2) remembering daily routines and (3) executing requests without being reminded.

Minimal Contact Assistance—Referred to when performing the FIM™ instrument assessment. Measure of level of assistance required by a client in carrying out physical or cognitive activities as measured in the FIM™ instrument. The subject requires no more help than is provided by a light touch, and expends 75% or more of the effort to perform an activity assessed by the FIM™ instrument, resulting in a score of "4" for that activity.

Mode—Referred to when performing the FIM™ instrument assessment. For the purposes of the NRS, mode refers to the specific method used to carry out a particular activity. The three elements of the FIM™ instrument that require specifying a mode are: Locomotion—mode can be Walk or Wheelchair or Both; Comprehension—mode can be Auditory or Visual or Both; and Expression—mode can be Vocal or Non-Vocal or Both.

Moderate Assistance—Referred to when performing the FIM™ instrument assessment. Measure of level of assistance required by a client in carrying out physical or cognitive activities as measured in the FIM™ instrument. The subject requires more help than touching, or expends half (50%) or more (but less than 75%) of the effort to perform an activity assessed by the FIM™ instrument (with the remainder being performed by the caregiver), resulting in a score of "3" for that activity.

Modified Independence—Referred to when performing the FIM™ instrument assessment. Measure of level of assistance required by a client in carrying out physical or cognitive activities as measured in the FIM™ instrument. In the performance of an activity assessed by the FIM™ instrument, the activity requires an assistive device; OR the activity takes more than reasonable time; OR there are safety (risk) considerations. This level is scored a "6".

Most Responsible Health Condition—The primary etiological diagnosis that describes the most significant condition leading to the client's rehabilitation stay. Where multiple conditions exist, it is the one health condition that is most related to the Rehabilitation Client Group and the condition that most of the resources are directed towards (see *Rehabilitation Client Group*).

Motor Function Score (FIM™ instrument)—The sum of the scores for the 13 motor elements on the FIM™ instrument. A higher Motor Function Score suggests a higher level of independent functioning in motor activities (see *Motor Subscale)*. This can be calculated on admission and on discharge (where applicable).

Motor Subscale (FIM™ instrument)—The 13 motor items of the FIM™ instrument: Eating; Grooming; Bathing; Dressing—Upper Body; Dressing—Lower Body; Toileting; Bladder Management; Bowel Management; Transfers: Bed, Chair, Wheelchair; Transfers: Toilet; Transfers: Tub or Shower; Locomotion: Walk, Wheelchair; and Locomotion: Stairs.

N

National Rehabilitation Reporting System (NRS)—A primarily voluntary national health information system for adult inpatient rehabilitation services. The province of Ontario has mandated its use for all designated rehabilitation beds in that province. The NRS contains client data collected from participating adult inpatient rehabilitation facilities and programs across Canada. The NRS data elements contain information related to socio-demographic information, administrative data, health characteristics, activities and participation and therapeutic interventions. These elements are used to estimate a variety of indicators including wait times and client outcomes.

O

P

Pre-Hospital Living Setting—Physical environment the client was living in prior to his/her admission to hospital for rehabilitation. For example, a private home, or a residential care facility.

Provider Type(s)—Refers to the professional service provider(s) involved in delivering rehabilitation services to the client (see *Rehabilitation Intervention*).

Post-Hospital Living Setting—Physical environment the client will be living in following discharge from the rehabilitation program.

Private Practitioner—An independent professional to whom the client may be referred at time of discharge for related services following the rehabilitation episode; for example, a physician or a physiotherapist in a private clinic.

Problem Solving (FIM™ instrument)—Includes skills related to solving problems of daily living and generally involves five steps: (1) recognizing that a problem is present; (2) making appropriate decisions; (3) initiating steps and readjusting to changing circumstances; (4) carrying out a sequence of events and; (5) evaluating the solution.

Q

R

Readmission—One of the available options for coding Admission Class in the NRS. The code used for a client admitted to an inpatient rehabilitation facility or unit where the current admission is related to a prior admission for the *same* rehabilitation condition (see *Rehabilitation Client Group*). For example, a client who received rehabilitation for a leg amputation returns to the facility a month later with a wound on the residual limb. There is no time limit for length of time since the previous admission.

Record—For the purposes of the NRS, a record consists of the complete information collected on Admission (Admission Record), Discharge (Discharge Record) or Follow-up (Follow-up Record). A completed Admission and Discharge record for a client constitutes a rehabilitation episode in the NRS (see *Episode*).

Rehabilitation Client Group (RCG)—The condition that best describes the primary reason for the client's admission to the rehabilitation program. The rehabilitation team determines the RCG at the time of admission.

Rehabilitation Goals—The functional objectives set by the client in partnership with the rehabilitation team. These are determined shortly after admission to the rehabilitation facility and generally form the basis for activities that will be included in the rehabilitation program.

Rehabilitation Interventions—A set of activities that are provided to a client aimed at improving/maintaining the client's health status and minimizing the impact of impairments and disabilities on the client's quality of life.

S

Self-Care Domain (FIM™ instrument)—Includes the FIM™ instrument motor items that assess basic activities necessary for daily personal care*:* Eating, Grooming, Bathing, Dressing Upper Body, Dressing Lower Body and Toileting.

Service Interruption—Occurs when a client is unable to participate in the rehabilitation program due to a health condition that may or may not result in a transfer out of the rehabilitation bed or unit. Service Interruptions are generally coded only when the client misses more than one day of active rehabilitation and the condition is felt to impact on the client's progress in rehabilitation. This does not include weekend passes to visit family at home or temporary bed closures.

Set Up—Referred to when performing the FIM™ instrument assessment. Assistance with related preparation prior the subject performing an activity, or removal and disposal of equipment/materials after the subject performs an activity. Clients requiring set up to complete a FIM™ instrument item cannot score higher than a "5" for that item.

Short Stay—One of the available options for coding Admission Class in the NRS. Refers to an inpatient rehabilitation stay lasting between 4 and 10 days. The client is admitted for a brief intervention (e.g. prosthetic adjustment), OR the rehabilitation stay lasts only between 4 and 10 days because of medical complications OR the client was discharged against medical advice. Can be coded on Admission if the length of stay is expected to fall within 4–10 days, or re-coded on Discharge to reflect unexpected change in Admission status.

Social Cognition Domain (FIM™ instrument)—Includes the FIM™ instrument cognitive items that assess social and cognitive skills: Social Interaction, Problem Solving and Memory.

Social Interaction (FIM™ instrument)—Includes skills related to participating and co-operating with others in therapeutic and social situations. It represents how one deals with one's own needs together with the needs of others. Participation includes socializing with others or becoming involved in group activities. Co-operation includes working or collaborating with others and following cueing, coaxing and/or directions.

Specialty Rehabilitation Facility—A facility that provides comprehensive inpatient rehabilitation services or specialized rehabilitation programs. This is often a freestanding hospital, but can be a specialized unit within a larger acute or chronic-care facility. In addition to interventions provided in a General Rehabilitation Facility, clients in a Specialty Facility also have access to more comprehensive services such as surgical specialists, orthotics, prosthetics, etc.

Sphincter Domain (FIM™ instrument)—Includes the FIM™ instrument motor items that assess sphincter control: Bladder Management, Bowel Management.

Supervision—Referred to when performing the FIM™ instrument assessment. Measure of level of assistance required by the clients in their physical or cognitive activities. The caregiver must monitor, or provide cueing/coaxing to a subject during the performance of an activity for safety reasons. Supervision may be standby (close) or distant, but there is NO physical contact with the client. Clients requiring supervision or coaxing to complete a FIM™ instrument item cannot score higher than a "5" for that item.

T

Toileting (FIM™ instrument)—Includes three main tasks: (1) adjusting clothing before using toilet, commode or bedpan; (2) maintaining perineal hygiene; and (3) adjusting clothing after using toilet, commode or bedpan.

Total Assistance—Referred to when performing the FIM™ instrument assessment. Measure of level of assistance required by the clients in their physical or cognitive activities. The subject expends less than 25% of the effort to perform an activity assessed by the FIM™ instrument, resulting in a score of "1".

Total Function Score (FIM™ instrument)—The sum of the scores for all 18 elements on the FIM™ instrument; ranging from 18 to 126. A higher Total Function Score suggests a higher level of independent functioning in activities of daily living and communication.

Transfer Domain (FIM™ instrument)—Includes the FIM™ instrument motor items that assess ability to transfer from one surface to another: Bed to Chair/Wheelchair Transfer, Toilet Transfer and Tub/Shower Transfer.

Transfers: Bed, Chair/Wheelchair (FIM™ instrument)—Includes all aspects of transferring to and from a bed, chair, and wheelchair (if client uses a wheelchair), or coming to or from a standing position (if walking is the typical mode of locomotion). Client moves from a supine to a standing position on the bed and vice versa.

Transfers: Toilet (FIM™ instrument)—Includes getting on and off a toilet.

Transfers: Tub or Shower (FIM™ instrument)—Includes getting into and out of a tub or shower stall. Includes positioning, standing, pivot, sitting or sliding transfer, and for tub transfers, also includes lifting legs over threshold of tub.

U

Unplanned Discharge—One of the available options for coding Admission Class in the NRS. Refers to an inpatient rehabilitation stay lasting three days or less, including the day of admission. Includes planned and unplanned discharges. In these cases, the Admission FIM™ instrument is typically not completed, but can be included in the NRS record if complete.

V

Visual Cue—Any visible gesture, posture and/or facial expression that is used to aid in the performance of a task.

WXYZ

Appendix B—Rehabilitation Client Groups (RCG)

The RCGs and selected definitions as referenced in this report are provided below in descending order of volume (i.e. number of records) in the National Rehabilitation Reporting System (NRS). This is not an exhaustive list of RCG definitions available for coding in the NRS.

Definition of Rehabilitation Client Group (RCG)—The health condition that best describes the primary reason for admission to the rehabilitation program. The appropriate Rehabilitation Client Group is determined at the time of admission by the rehabilitation team and can be modified at discharge if necessary.

Orthopaedic Conditions—Includes cases in which the major disorder is post-fracture of bone, post-arthroplasty (joint replacement) or other pathology relating to bone (excludes conditions related to arthritis). Sub-groups of the orthopaedic RCG highlighted in this report include hip fracture, hip replacement and knee replacement, as well as "other" (any orthopaedic condition which does not fall into the first three groups).

Stroke—Includes cases with the diagnosis of cerebral ischemia due to vascular thrombosis, embolism, or haemorrhage. Cerebral impairment related to non-vascular causes such as trauma, inflammation, tumour, or degenerative changes are excluded. Sub-groups of the stroke RCG highlighted in this reports are left-sided stroke (right-brain), right-sided stroke (left-brain), and "other" stroke (e.g. bilateral).

Brain Dysfunction—The non-traumatic brain dysfunction RCG includes cases with such aetiologies as neoplasm, metastases, encephalitis, inflammation, anoxia, metabolic toxicity, or degenerative processes. The traumatic brain dysfunction RCG includes cases with motor or cognitive disorders secondary to trauma.

Amputation of Limb—Includes cases in which the major deficit is absence of a limb. Cases for which limb amputation is the major deficit are included even if the need for treatment is principally related to wound care or a stump infection.

Spinal Cord Dysfunction—Includes cases with various forms of quadriplegia/paresis and paraplegia/paresis. The non-traumatic spinal cord dysfunction sub-group includes cases secondary to non-traumatic cause, including post-operative change. The traumatic spinal cord dysfunction sub-group includes cases secondary to traumatic cause. Cases for which spinal cord dysfunction is the major deficit are included even if the need for treatment is principally related to the urinary tract or skin ulceration.

Medically Complex—Includes cases with multiple medical and functional problems and complications prolonging the recuperation period. Medically complex cases require medical management of a principal condition and monitoring of co-morbidities and potential complications. Rehabilitation treatments are *secondary* to the management of the medical conditions. The Medically Complex RCG groups clients by the program/treatment focus rather than the aetiology.

Debility—Includes cases where clients are generally de-conditioned and there may not be a specific aetiology associated with the decline in function. Includes only clients who are debilitated for reasons other than cardiac or pulmonary conditions.

Cardiac Disorders—Includes cases in which the major disorder is poor activity tolerance secondary to cardiac insufficiency or general deconditioning due to a cardiac disorder.

Neurological Conditions—Includes cases with a variety of neurological, muscular dysfunctions and aetiologies such as multiple sclerosis, Guillain-Barré Syndrome and Parkinsonism.

Pulmonary Disorders—Includes cases in which the major disorder is poor activity tolerance secondary to pulmonary insufficiency. Underlying aetiologies include chronic obstructive lung disease, chronic bronchitis, etc.

Arthritis—Includes cases in which the major disorder is arthritis of all aetiologies. The arthritis RCG is used for clients entering the rehabilitation program without an immediately preceding orthopaedic arthroplastic procedure.

Major Multiple Trauma—Includes cases with more complex management due to involvement of multiple systems or sites following trauma.

Pain Syndromes—Includes cases in which the major disorder is pain, usually chronic and benign, of various aetiologies.

Burns—Includes cases in which the major disorder is thermal injury to major areas of the skin and or underlying tissue.

Congenital Deformities*
Developmental Disabilities*
Other Disabling Impairments*

*Due to small numbers of records in the NRS, these three RCGs are grouped together and referred to as "Other RCGs" within this report where indicated.

Appendix C—FIM^TM Instrument Subscales and Domains

A definition of each FIM^TM Instrument item, as well as the subscales and domains, can be found in the NRS Glossary (Appendix A).

Subscale	Domain	FIM^TM Instrument Items	Score Range
Motor	**Self Care**	Eating	6 to 42
		Grooming	
		Bathing	
		Dressing—Upper Body	
		Dressing—Lower Body	
		Toileting	
	Sphincter Control	Bladder Management	2 to 14
		Bowel Management	
	Transfers	Bed, Chair, Wheelchair	3 to 21
		Toilet	
		Tub or Shower	
	Locomotion	Walk/Wheelchair	2 to 14
		Stairs	
		Motor Function Score Range	**13 to 91**
Cognitive	**Communication**	Comprehension	2 to 14
		Expression	
	Social Cognition	Social Interaction	3 to 21
		Problem Solving	
		Memory	
		Cognitive Function Score Range	**5 to 35**

Appendix D—List of Tables

The source tables for this report are available on the CIHI Web site at www.cihi.ca under "Quick Stats". These tables can be found under "Inpatient Rehabilitation" when searching by '"Topic" or under "National Rehabilitation Reporting System (NRS)" when searching by "Source".

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