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Factors Predicting Discharge Home From Inpatient Rehabilitation After Stroke

Summary

This Analysis in Brief explores factors associated with discharge destination following stroke rehabilitation in participating inpatient rehabilitation facilities across Canada. Findings suggest that a number of factors are associated with the likelihood of being discharged home. Motor function at admission was by far the strongest predictor of discharge home; clients who were admitted with high motor function were more than six times more likely to be discharged home compared to those admitted with low motor function. The second-strongest factor associated with discharge home compared to discharge to a residential care or assisted-living setting was whether a client lived with a spouse or family member prior to the stroke. These clients were four times as likely to go home as clients living alone prior to the stroke. Younger age, unilateral body impairment, proximity of admission to rehab following stroke onset and sex were also all found to be significant factors associated with an increased likelihood of discharge home. In contrast to some previous studies, facility type (specialty versus general) was not significantly associated with likelihood of being discharged home. Results may assist health care managers and planners with service planning and resource allocation based on the ability to predict discharge destination from client characteristics at time of admission.

Introduction

A stroke is a sudden loss of brain function caused by either a blockage of an artery to the brain, usually by a blood clot (ischemic stroke), or bleeding in or around the brain caused by a ruptured blood vessel (hemorrhagic stroke).¹ Approximately 50,000 Canadians have a stroke each year; that is, in Canada, someone has a stroke every 10 minutes.² In addition, stroke is one of the leading causes of death and disability in Canada.³

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Strokes create a substantial burden on the health care system, since between one-third and two-thirds of survivors are left with some degree of permanent disability.^{2, 4} The Heart and Stroke Foundation of Canada estimates that only 10% of people that have a stroke recover completely, and that there are approximately 300,000 Canadians currently living with the effects of stroke.² It also estimates that Canadians spend 3 million days in hospital because of stroke.² In terms of dollars, the Heart and Stroke Foundation estimates the average acute care cost to be approximately \$27,500 per stroke, and the Public Health Agency of Canada estimates that there were \$2.1 billion in indirect costs associated with death and disability from stroke in 2000–2001, in addition to \$664.9 million in direct costs.^{2, 5} As a significant proportion of people who have had a stroke are left with physical and cognitive impairments, they are often admitted to inpatient rehabilitation following their acute care stay.

The ability to predict client outcomes following stroke is of value to practitioners and program managers involved in the acute and rehabilitation care of these clients, as such information enables more effective case planning and management. In addition, system-level planners may use such information to better understand stroke care needs across the continuum of care settings. As well, clients and their families may use such information to inform their own expectations of their inpatient rehabilitation stay. Several studies, from both the acute and rehabilitation phases of stroke treatment, have identified factors that correlate with outcomes of stroke survivors. The factors most consistently observed include the following:

- Age at admission^{6–13}—increased age is typically associated with less favourable outcomes, such as a decreased likelihood of being discharged home.
- Stroke characteristics, such as stroke type (hemorrhagic or ischemic), severity (acute stroke scales) and nature of resulting impairment (unilateral versus bilateral involvement)^{6–9, 14}—more severe strokes, as well as those that involve either the right hemisphere or result in bilateral body involvement, are associated with a decreased likelihood of being discharged home.
- Motor and cognitive function at admission^{9, 11–13, 15–18} and/or discharge^{10, 14, 19–20}—greater motor and/or cognitive functioning at admission and/or discharge is associated with more favourable outcomes, such as increased likelihood of being discharged home.
- Pre-stroke living setting and/or level of family/social support^{9–11, 13, 17–18, 20–22}—typically, people living with a spouse or family member and/or those that have more significant social support are more likely to be discharged home than those who lack these resources.
- System factors, including time from stroke to initiation of rehabilitation¹⁵ and whether stroke care occurred in specialized versus general acute and rehabilitation units^{15, 23–26}—briefer periods between the time of onset of stroke and access to rehabilitation care and treatment provided in specialized stroke units/facilities have been associated with more favourable outcomes.

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While there is considerable evidence suggesting factors associated with improved outcomes, including discharge home after stroke, few studies have been completed using Canadian data; likewise, there are relatively few studies examining factors associated with outcomes specifically of inpatient stroke rehabilitation in Canada.

In Canada, the National Rehabilitation Reporting System (NRS) at the Canadian Institute for Health Information (CIHI) contains information on clients admitted to inpatient rehabilitation at participating facilities in nine Canadian provinces, including clients admitted with a primary reason for rehabilitation of stroke. Stroke clients represented 16% of the total number of admission records submitted to the NRS in 2007–2008. Within the NRS, stroke is defined as clients with resulting deficits associated with any insult to the brain of vascular origin (including thrombosis, embolism, hemorrhage, aneurysm and AV malformation) and data used in the present report correspond specifically to clients for whom the effects of stroke are the main reasons for rehabilitation. The information collected in the NRS enables evaluation of the above-mentioned factors as predictors of client outcomes following stroke rehabilitation in facilities reporting to the NRS.

This Analysis in Brief examines the association of specific factors with discharge home following rehabilitation for stroke in participating Canadian rehabilitation facilities. Given the prevalence of stroke and subsequent disability from stroke, as well as the burden of stroke on the health care system, increased knowledge of the factors that may predict outcomes after rehabilitation, including discharge destination, may assist decision-makers to more effectively and efficiently allocate resources and manage client rehabilitation plans.

About the FIM™ instrument and Total Function Scores

For the purposes of the NRS, functional status at inpatient rehabilitation admission and discharge is measured using the FIM™ instrument.ⁱ The FIM™ instrument is a measure of disability and caregiver burden associated with the level of disability; it is composed of 18 items (13 motor items and 5 cognitive items) that are rated on a scale representing gradations from independent (7) to dependent (1) function. Adding the ratings for these 18 items provides a Total Function Score,ⁱⁱ which has an overall maximum of 126 (18 items x 7). CIHI requires that the FIM™ instrument be completed on admission and discharge for all adult clients who stay four days or longer in an inpatient rehabilitation facility or unit.

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- i. The FIM™ instrument referenced herein is the property of Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities, Inc.
 - ii. Function Scores referenced in this document are based on data collected using the FIM™ instrument.

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About the NRS

The NRS was developed by CIHI in 2001 to support data collection by hospitals for inpatient rehabilitation clients who are mainly age 18 and older. The rehabilitation services are provided in specialized rehabilitation hospitals and in general hospitals in rehabilitation units, programs or designated rehabilitation beds. As of 2008–2009, there were more than 211,000 pairs of admission and discharge records (that is, episodes) in the NRS database, submitted by more than 100 hospitals in nine provinces and covering a range of health conditions, including strokes, orthopedic conditions and amputations.

For additional information on the National Rehabilitation Reporting System and additional NRS publications, please write to rehab@cihi.ca or visit the NRS website at www.cihi.ca/nrs.

Methods and Analysis

A conceptual framework for modelling the likelihood of being discharged home following an inpatient rehabilitation stay for stroke was developed based on factors commonly referenced in the stroke literature. Preliminary analysis was completed on factors within each domain of the framework to assess the association of each with the probability of being discharged home. Table 1 identifies demographic, admission function and stroke-related impairment characteristics, as well as system factors that are suggested to influence the likelihood of being discharged home, and relates these to data available in the NRS database. Note that despite the clear relationship between discharge destination and the function of the client at the moment of discharge, the present analysis assessed Admission Function Scores for their potentially more useful predictive ability, in light of the fact that Admission and Discharge Function Scores are closely correlated.

Table 1 Conceptual Framework of Rehabilitation Outcomes—Summary of Findings for Preliminary Analysis, 2007–2008

| Domain/Characteristic | NRS Data Element Included in Model |
|--|--|
| Demographics | |
| Age | Three groupings: younger than 65, 65–84, 85 and older |
| Sex | Male, female |
| Pre-Admission Living Setting | By design, analysis restricted to cases in which pre-admission living setting was at home |
| Pre-Admission Living Arrangement | Two groups: lived with spouse/partner/family or lived alone |
| Function on Admission | |
| Motor | Admission FIM™ Motor Score—three groupings: 13–38 (low functioning), 39–50 (intermediate functioning), 51–91 (high functioning) |
| Cognitive | Admission FIM™ Cognitive Score—three groupings: 5–20 (low functioning), 21–29 (intermediate functioning), 30–35 (high functioning) |
| Stroke-Related Impairment | |
| Body Involvement | Unilateral, bilateral |
| System Factors | |
| Onset Days (Number of Days Between Stroke and Admission to Inpatient Rehabilitation) | Three groupings: 7 days or less, 8–21 days, 22 days or more |
| Facility Type | General, specialty |

Given the nature of the present analysis, stroke clients were included if information in the NRS was related to the first rehabilitation stay after a stroke, if they were living at home prior to the stroke and if they were admitted to inpatient rehabilitation directly from acute care. These inclusion criteria were considered to ensure a more homogeneous population for analysis. In addition, records were excluded if they were missing key variables required to complete the analysis (for example, FIM™ instrument not completed, specific discharge destination not known). In 2007–2008, there were 5,835 episodes for which stroke was the primary reason for rehabilitation. A total of 3,752 episodes were included in the analysis, whereas 2,083 episodes were excluded for the reasons listed above. For complete details of the clients included and excluded from the analysis, please see tables A and B in the appendix at the end of this report.

A logistic regression model was then fitted, using the characteristics included in the framework, to estimate the odds of being discharged home compared to those of being discharged to a residential or assisted-living facility. Logistic regression analysis enables the determination of which factors were independently associated with discharge home, after all the other factors in the model had been taken into account.

Results

Characteristics of Inpatient Stroke Rehabilitation Clients

Table 2 displays the number of stroke clients included in the present analysis, as well as some demographic descriptors for this sample. As the table shows, 85% of all stroke rehabilitation clients included in the analysis were discharged home. On average, those discharged home were younger, tended more often to be male than female and were more likely to be living with a spouse, partner or family member prior to admission to inpatient rehabilitation. As expected, they were admitted with higher overall function and the time between stroke onset and admission to inpatient rehabilitation was shorter than those who were discharged to long-term care or assisted living.

Table 2 Demographics of Stroke Clients Included in Analysis, 2007–2008

| Indicator | Discharged Home | Discharged to Facility | p-Value (Discharged Home Versus Discharged to Facility) | All |
|---|-----------------|------------------------|---|-----------------|
| N | 3,198 | 554 | — | 3,752 |
| Average Age in Years (SD) | 68.4 (13.77) | 75.7 (11.53) | <0.0001 | 69.5 (13.71) |
| Percent Female | 43.3 | 55.0 | <0.0001 | 45.0 |
| Percent Living With Spouse/Partner/ Family Prior to Admission | 75.9 | 46.4 | <0.0001 | 71.5 |
| Percent Admitted to Specialty Facility | 44.0 | 49.8 | 0.0106 | 44.8 |
| Average Days Between Stroke and Admission to Inpatient Rehabilitation (SD) | 17.8 (16.48) | 24.0 (24.41) | <0.0001 | 18.7 (18.01) |
| Percent With Unilateral Stroke | 91.1 | 92.1 | 0.4729 | 91.3 |
| Average Admission Function Score (SD) | | | | |
| Total | 82.3 (22.48) | 59.4 (21.85) | <0.0001 | 78.9 (23.81) |
| Motor | 55.9 (19.39) | 38.1 (18.64) | <0.0001 | 53.3 (20.29) |
| Cognitive | 26.3 (6.98) | 21.3 (7.68) | <0.0001 | 25.6 (7.31) |

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| Indicator | Discharged Home | Discharged to Facility | p-Value (Discharged Home Versus Discharged to Facility) | All |
|--|------------------|------------------------|---|------------------|
| Average Discharge Function Score (SD) | | | | |
| Total | 106.9 (16.22) | 80.2 (26.16) | <0.0001 | 103.0 (20.36) |
| Motor | 77.6 (13.34) | 56.2 (22.29) | <0.0001 | 74.4 (16.79) |
| Cognitive | 29.3 (5.50) | 24.0 (7.24) | <0.0001 | 28.6 (6.09) |
| Percent Discharged Home | 100.0 | 0.0 | — | 85.2 |

Source

National Rehabilitation Reporting System, 2007–2008, Canadian Institute for Health Information.

What Are the Factors Associated With Discharge Home?

Following preliminary analysis, the factors described in Table 2 were analyzed to determine which factors were related to whether a client was discharged home after the rehabilitation stay. Upon completing the logistic regression analysis, a number of factors were found to be significantly related to the likelihood of being discharged home, as detailed below and illustrated in Figure 1.

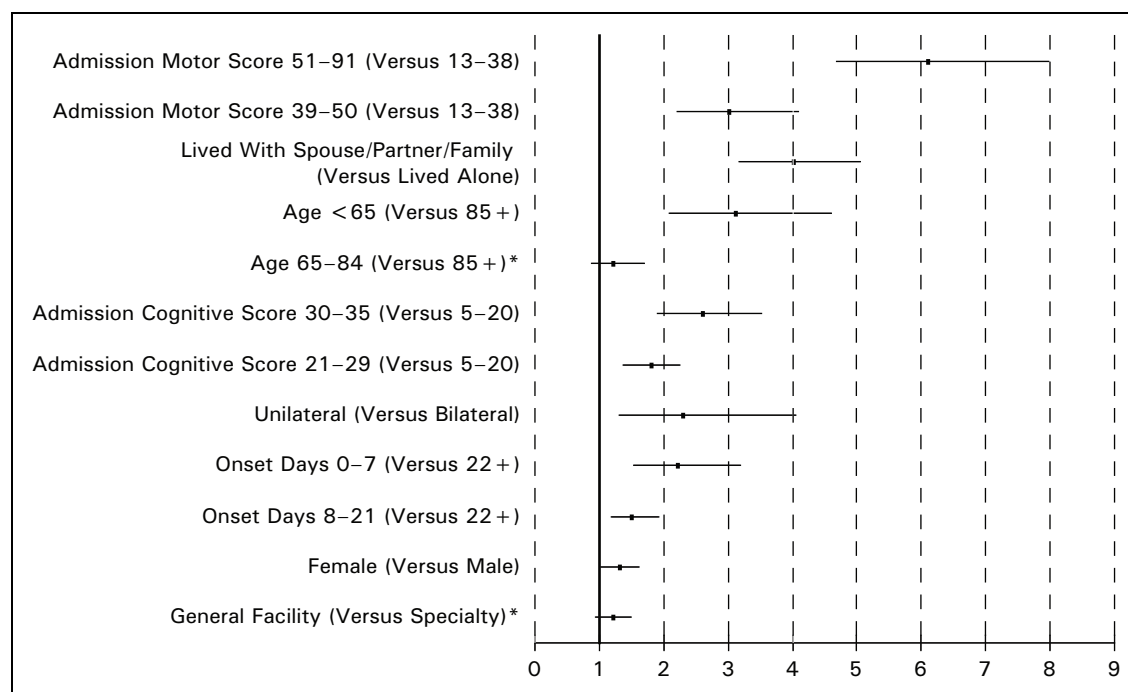
Admission Motor Function Scores

As seen in Figure 1, a high Admission Motor Function Score (51 to 91) was the strongest predictor of discharge home, with a sixfold increase in the likelihood of being discharged home compared to clients with low Admission Motor Function Scores (13 to 38). Similarly, stroke clients with intermediate Admission Motor Function Scores (39 to 50) had a threefold increase in the likelihood of being discharged home compared to clients with low Admission Motor Function Scores. These findings are in keeping with many previous studies^{9, 12–16, 18–21} observing high correlations between function on admission and discharge destination. As might be expected, clients that begin rehabilitation with more independence in motor function, such as transferring, bed mobility, eating, bladder and bowel control, and walking, are more likely to be discharged home than those who are admitted with less independence in the motor activities assessed with the FIM™ instrument.

Admission Cognitive Function Scores

As seen in Figure 1, clients with a high Admission Cognitive Function Score (30 to 35) were two-and-a-half times more likely to be discharged home than those with a low Admission Cognitive Function Score (5 to 20). Similarly, stroke clients with intermediate Admission Cognitive Function Scores (21 to 29) were almost two times more likely to be discharged home compared to clients with low Admission Cognitive Function Scores. As with motor functioning, clients that begin rehabilitation at an already relatively high level of cognitive function are more likely to be discharged home than those who are admitted with more impaired cognitive abilities. Of interest, differing cognitive function on admission, as measured by the FIM™ instrument, did not have nearly the same effect as differing admission motor function did on discharge destination, suggesting that, in the population analyzed, motor function may have played a larger role in determining ability to be discharged home than cognitive function. As well, fewer activities are measured in the cognitive domain, which may impact the influence the Cognitive Function Score may have. These factors notwithstanding, higher cognitive function did influence the likelihood of being discharged home.

Figure 1 Odds Ratios and 95% Confidence Intervals of Significant Factors Associated With Stroke Clients Being Discharged Home From Inpatient Rehabilitation, 2007–2008



Notes

* Not significant at $p < 0.05$. Values in brackets indicate the reference category used in each comparison.

Source

National Rehabilitation Reporting System, 2007–2008, Canadian Institute for Health Information.

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Pre-Admission Living Arrangement

The second-strongest predictor of discharge home following inpatient stroke rehabilitation was a client's pre-admission living arrangement. Clients living with a spouse/partner or family member prior to their stroke were four times as likely to be discharged home following stroke rehabilitation than those who had been living alone prior to the stroke (Figure 1). Family members are commonly called upon to assist with activities of daily living (for example, moving about the house, bathing), as well as instrumental activities (for example, preparing meals, managing finances, driving a client to appointments) after a client returns home post-rehabilitation. Therefore, the ability to return home safely is often influenced by the presence of a family member in the home setting.

Client Age

Age at the time of admission was also a significant predictor of being discharged home following stroke rehabilitation. Clients younger than 65 were three times more likely to be discharged home than those age 85 and older. This effect is likely due, in part, to the association between increasing age and other factors, such as the presence of comorbidities, general frailty and a lower probability of the client having a strong community support system to enable a successful transition home. Of note, there was no significant difference between clients age 65 to 84 and those age 85 or older with respect to likelihood of being discharged home.

Stroke Onset to Rehabilitation Admission

The amount of time elapsing between the onset of stroke symptoms and admission to inpatient rehabilitation is also a predictor of discharge destination. Clients admitted within 7 days following their stroke were twice as likely to be discharged home as those admitted 22 days or more post-stroke, independent of level of function at time of admission. Those admitted between 8 and 21 days post-stroke were almost one-and-a-half times more likely to be discharged home than the 22 days or more group. It is possible that clients with longer onset to rehabilitation admission times may have required longer stays in acute care to stabilize their medical condition and achieve the level of function and tolerance needed to be transferred to rehabilitation. This medical complexity may impact some clients' prognosis and influence their probability of being discharged home following rehabilitation.

Stroke-Related Impairment

In this analysis, clients admitted to inpatient rehabilitation with a stroke that affected only one side of the body (unilateral involvement) were more than twice as likely to be discharged home as those who were admitted with bilateral body involvement. These findings are in keeping with previous studies.^{6-9, 17} Bilateral body involvement may be indicative of injury to both sides of the brain due to the stroke, or even perhaps to cases where multiple strokes have occurred in the same acute period. If impairments remain on both sides of the body after rehabilitation, it may be more difficult to compensate for impairments to one arm or leg by depending on the other side. Therefore, as expected, clients presenting with bilateral body involvement are less likely to be discharged home after rehabilitation. It is important to note that in the present analysis, clients with unilateral involvement represent more than 90% of the sample.

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Sex

Sex was also found to influence discharge destination, although to a lesser degree than other factors. Male clients admitted for stroke rehabilitation were 1.3 times more likely to be discharged home than female clients, after all other factors were considered.

Facility Type

In contrast to several previous studies suggesting a difference in discharge outcome based on location of stroke care, the current analysis found no significant difference between specialty and general rehabilitation facility types with respect to discharge destination following stroke. In previous studies, improved outcomes were related to care being provided by specialized stroke teams and in specialized stroke units. Within the NRS, the designation of specialty facility does not necessarily mean that care was provided in a specialized stroke unit. Furthermore, facility designation has not been analyzed to determine if there are differences in the breadth of service providers providing care, the care delivery model (stroke unit or stroke team compared with generalist rehabilitation unit or team) or the intensity of the rehabilitation care received in the two settings.

For a summary of variables analyzed and number of observations, as well as p-values, confidence intervals and odds ratios, see Table C of the appendix.

Conclusion

This analysis of stroke clients demonstrates that certain factors are more strongly associated with the likelihood of clients admitted to inpatient rehabilitation for a stroke being discharged home. Specifically, higher Admission Function Scores, living with a spouse or other family member prior to the stroke, age younger than 65, unilateral body involvement, earlier admission to inpatient rehabilitation post-stroke and being male were all factors associated with increased likelihood of stroke clients being discharged home. In contrast, rehabilitation facility type was not associated with whether clients with stroke would be discharged home after inpatient rehabilitation.

These findings may help inform stroke rehabilitation practice for planning and resource allocation. More specifically, this analysis may be used by clinicians, managers, decision-makers, system planners and policy-makers to:

- Assist in the further development of clinical practice guidelines and care maps for the inpatient stroke rehabilitation population (for example, develop specific care maps for those clients who fall into “likely to be discharged home” group and for those who do not fall into this group).
- Allocate clinical and support resources for stroke inpatient rehabilitation and discharge planning effectively and efficiently (for example, help predict amount of home care/ community rehabilitation needed).

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- Contribute to needs assessments for resource planning along the stroke continuum of care (for example, knowing the percentage of clients who are estimated to not be discharged home may assist in determining the number of beds needed in long-term care).

Given the findings and limitations presented in this analysis, it is recommended that further investigations be performed to generate additional evidence regarding other predictive factors for client outcomes post-stroke, as well as the relationships among the factors. For example, future studies may be considered to link clients who are discharged directly home from acute care following stroke to those stroke clients who are admitted to inpatient rehabilitation, as well as those who are discharged elsewhere directly after acute care, to better understand factors that predict overall recovery from stroke across the continuum of care.

Appendix

Data Source

The analysis presented here is based on data from CIHI's National Rehabilitation Reporting System (NRS) for the fiscal year 2007–2008.

Inclusion/Exclusion Criteria

In order to analyze a more homogeneous group, several records from the total number of 2007–2008 stroke discharges were excluded based on various criteria. Reasons for the exclusions and the number of records affected are displayed in Table A. Of note, just more than 1,000 records were excluded because the discharge destination was categorized as a setting other than home or assisted living/long-term care. The vast majority of these cases were reported as being discharged to "other." Coding practices suggest many of these cases are discharged to another rehabilitation setting or facility-based care other than acute care or assisted living/long-term care. However, the specific discharge destination is not known, and thus the records were excluded. Clients with stroke classified as "other stroke" were also excluded as they could not be grouped into having either unilateral or bilateral body involvement.

Table A Records Excluded From Stroke Analysis, 2007–2008

| Reasons for Exclusion From Analysis | Number of Records Affected |
|--|----------------------------|
| Not admitted to inpatient rehabilitation as an initial admission for stroke | 312 |
| Not admitted directly from acute care | 359 |
| Stroke symptom onset to inpatient rehabilitation admission date exceeds 365 days | 50 |
| Pre-admission living setting was other than home | 374 |
| Discharge setting was other than home or assisted living or residential care | 1,010 |
| Stroke was classified as "Other Stroke" | 313 |
| Incomplete function scores on the admission and/or discharge assessment | 397 |
| Records removed due to a prior inpatient rehabilitation stay for stroke | 352 |
| Insufficient data to determine a prior inpatient rehabilitation stay for stroke | 22 |
| Total number of records excluded | 2,083 |

Source

National Rehabilitation Reporting System, 2007–2008, Canadian Institute for Health Information.

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As these exclusion criteria are not mutually exclusive, many records were excluded for more than one reason. By limiting the analysis by these factors, 36% of all stroke client episodes discharged in 2007–2008 were excluded from the analysis.

A comparison between records included and excluded can be found in Table B. Note that there were differences between the two groups in many of the factors assessed in the analysis. Some of these differences may be explained by the reasons for excluding records. In particular, records were excluded if key variables required for the analysis (such as discharge destination) were not completed. These variables are not required in cases where clients do not achieve their service goals and are transferred to another facility.

Table B Analysis of Records Included and Excluded From Analysis

| Indicator | Included | Excluded | Excluded N |
|--|---------------|---------------|------------|
| Total N | 3,752 | 2,083 | 2,083 |
| Average Age in Years (SD) | 69.5 (13.71) | 71.4 (14.03) | 2,083 |
| Percent Female | 45.0 | 45.5 | 2,083 |
| Percent Living With Spouse/Partner/Family Prior to Admission | 71.5 | 59.2 | 2,083 |
| Percent Admitted to Specialty Facility | 44.8 | 38.0 | 2,083 |
| Average Number of Days Between Stroke and Admission to Inpatient Rehabilitation (SD) | 18.7 (18.01) | 51.9 (215.27) | 2,069 |
| Percent With Unilateral Stroke | 91.3 | 78.2 | 2,083 |
| Average Admission FIM™ Score (SD) | | | |
| Total | 78.9 (23.81) | 70.2 (25.00) | 2,004 |
| Motor | 53.3 (20.29) | 46.1 (20.95) | 2,004 |
| Cognitive | 25.6 (7.31) | 24.1 (7.81) | 2,004 |
| Average Discharge FIM™ Score (SD) | | | |
| Total | 103.0 (20.36) | 89.6 (26.70) | 1,686 |
| Motor | 74.4 (16.79) | 62.9 (22.43) | 1,692 |
| Cognitive | 28.6 (6.09) | 26.6 (7.09) | 1,703 |
| Percent Discharged Home | 85.2 | 50.2 | 1,447 |

Note

Number of cases excluded from different indicators may vary due to the nature of the NRS data set. In certain scenarios, such as reason for discharge or type of rehabilitation admission, some data elements may be optional and not collected by the NRS.

Source

National Rehabilitation Reporting System, 2007–2008, Canadian Institute for Health Information.

Analysis

Table C provides the complete results of the logistic regression analysis.

Table C Results of Logistic Regression Model for Being Discharged Home Following Inpatient Rehabilitation for Stroke, 2007–2008

| Variable | Odds | Wald 95% Confidence Intervals | p-Value | N | Percent Discharged Home |
|--|------|-------------------------------|---------|-------|-------------------------|
| Function on Admission | | | | | |
| Motor Score 13–38 | 1.0 | — | — | 971 | 67.6 |
| Motor Score 39–50 | 3.0 | 2.21–4.09 | <0.0001 | 647 | 84.1 |
| Motor Score 51–91 | 6.1 | 4.69–7.98 | <0.0001 | 2,134 | 93.6 |
| Cognitive Score 5–20 | 1.0 | — | — | 921 | 72.4 |
| Cognitive Score 21–29 | 1.8 | 1.37–2.26 | <0.0001 | 1,456 | 86.1 |
| Cognitive Score 30–35 | 2.6 | 1.90–3.51 | <0.0001 | 1,375 | 92.9 |
| Pre-Admission Living Arrangement | | | | | |
| Did Not Live With Spouse/Partner/Family | 1.0 | — | — | 1,069 | 72.2 |
| Lived With Spouse/Partner/Family | 4.0 | 3.18–5.06 | <0.0001 | 2,683 | 90.4 |
| Age Group | | | | | |
| 85+ | 1.0 | — | — | 379 | 71.5 |
| 65–84 | 1.2 | 0.88–1.69 | 0.2290 | 2,119 | 83.2 |
| <65 | 3.1 | 2.08–4.60 | <0.0001 | 1,254 | 92.7 |
| Body Involvement | | | | | |
| Bilateral | 1.0 | — | — | 327 | 86.5 |
| Unilateral | 2.3 | 1.30–4.02 | 0.0039 | 3,425 | 85.1 |
| Days Between Stroke and Admission | | | | | |
| 22 or More | 1.0 | — | — | 1,022 | 79.0 |
| 8–21 | 1.5 | 1.18–1.93 | 0.0010 | 1,951 | 86.5 |
| 0–7 | 2.2 | 1.53–3.20 | <0.0001 | 779 | 90.4 |
| Sex | | | | | |
| Female | 1.0 | — | — | 1,689 | 81.9 |
| Male | 1.3 | 1.03–1.61 | 0.0236 | 2,063 | 87.9 |

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| Variable | Odds | Wald 95% Confidence Intervals | p-Value | N | Percent Discharged Home |
|----------------------|------|-------------------------------|---------|-------|-------------------------|
| Facility Type | | | | | |
| Specialty | 1.0 | — | — | 1,682 | 83.6 |
| General | 1.2 | 0.95–1.50 | 0.1354 | 2,070 | 86.6 |

Notes

The dependent variable modelled was whether or not the stroke client was discharged home versus discharged to an assisted-living setting or residential care. The logistic regression models explained 28.8% of the variability.

Source

National Rehabilitation Reporting System, 2007–2008, Canadian Institute for Health Information.

Data Limitations

There are some data limitations that should be noted when interpreting the results of this analysis. One limitation is the fact that the extent of a client’s stroke impairment is characterized in the NRS database in relation to laterality of impairment as well as resultant functional impairment. This categorization, however, does not capture more specific factors influencing impairment, such as type and location of stroke, whether the stroke was the result of a bleed or a clot and other such distinctions. As such, the analysis only relates to correlations associated with the factors analyzed.

Another possible data limitation is based on the self-selection of facility type—that is, facilities participating in the NRS self-designate themselves as either a general or specialty facility. 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. It must be noted that these definitions are specific to the NRS. In addition, the facility type designation does not necessarily reflect the breadth or depth of rehabilitation services available, or the degree of specialization in stroke care or organization of that care that is often reported in the literature as a predictor of outcome. This limitation may influence the ability of NRS-defined facility type to predict a client being discharged home.

The present analysis was limited to stroke clients that entered inpatient rehabilitation directly from acute care. Though there are comparatively few stroke rehabilitation clients not entering from acute care, the present results necessarily only reflect a subset of the overall stroke inpatient rehabilitation population.

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Outside of Ontario, submission of data to the NRS is primarily voluntary for Canadian facilities. As a result, the NRS does not have comprehensive coverage of all inpatient rehabilitation services in Canada. Thus, the information presented in this Analysis in Brief does not necessarily reflect the full picture of outcomes post-hospital-based inpatient rehabilitation post-stroke. Of note, annual analysis of information available from sources at each provincial and territorial ministry of health suggests that the NRS currently receives data from approximately 75% of all facilities that provinces would deem appropriate for reporting to the NRS. As pan-Canadian implementation of the NRS continues, the reporting system will be an increasingly comprehensive data source to support further analysis across the country.

About CIHI

The Canadian Institute for Health Information (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.

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