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**Summary**  
**Organization and Provision of**  
**Rehabilitation Services for Stroke**  
**Patients and Their Families: A Review of**  
**the Evidence**

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# Summary

## Organization and Provision of Rehabilitation Services for Stroke Patients and Their Families: A Review of the Evidence

### Introduction

Stroke is one of the leading causes of disability in adults. Of the rehabilitation admissions to 94 facilities in seven Canadian provinces (not including Québec) recorded in 2006-2007, 47% were for orthopedic problems and 16% were due to a stroke. In Québec, the Ministère de la Santé et des Services sociaux has decided to review the care and services devoted to this illness, in order to improve their access, continuity and quality. As part of this process, INESSS was involved in work by a Comité avisier ministériel sur l'AVC and published a report on the organization of stroke services in 2011.

Rehabilitation is an important part of the stroke service continuum. In addition to INESSS' collaboration with the Comité avisier ministériel, the provincial Ordre des ergothérapeutes, the Ordre professionnel des physiothérapeutes and the Association des établissements de réadaptation en déficience physique du Québec asked INESSS to look more closely at the rehabilitation services available to stroke patients. There were two parts to this request: 1) defining the trajectory to be followed by patients and their families in the different phases of the continuum of stroke rehabilitation services; and 2) describing standards for the process of dispensing services in the different phases to ensure that stroke patients are sent directly and quickly to the place most capable of meeting their rehabilitation needs, given the severity of their impairment and their demographic and socioeconomic characteristics.

### Objectives and methods

The specific issues examined in this report are as follows:

1. The key structural components of rehabilitation services in the different phases of the continuum (acute, postacute, social reintegration).
2. The organization of rehabilitation services (e.g., the target clientele according to type of service, the patient's trajectory in the service network, referral processes for specialized services).
3. The characteristics of the available and recommended tools for assessing neurological deficits and disabilities.
4. The nature of the rehabilitation services required in the different phases of the continuum.
5. The mechanisms for continuously improving the quality of rehabilitation services.

This report is a review of the scientific evidence, clinical practice guidelines, and experience of some health care systems outside of Quebec, in order to synthesize the existing knowledge and draw conclusions for decision-makers involved in planning rehabilitation services in Québec. Since the recommendations examined originate from regions where organization of the health care system and demographics differ from that in Québec, transposition to the Québec context is made with caution. Eight clinical practice guidelines from key countries (Canada, United Kingdom, Australia and the United States) were selected, to which was added work by the Ontario research group Evidence-Based Review of Stroke Rehabilitation (EBRSR), which incorporates several systematic reviews. Original research studies and provincial government publications of interest were also included, such as those concerning the Québec or Canadian context or regarding evaluation tools. The methodological quality of the clinical practice guidelines and the research studies that were included was assessed with validated tools.

In addition, as part of preparatory work for INESSS's previous report on the organization of stroke services carried out in 2010-2011, the recommendations in the literature concerning rehabilitation were

submitted to the aforementioned ministerial advisory committee. These interactions led to the inclusion of contextual information in our summary of the key organizational aspects of rehabilitation services and in our description of the clinical pathway for rehabilitation services during the postacute phase.

## **Overview of the evidence**

The results of our analysis are grouped according to five main themes: general considerations regarding the process of stroke care, rehabilitation in the acute and postacute phase, social reintegration, and ongoing quality improvement mechanisms.

General considerations regarding the process of stroke care

### **The patient trajectory in the service continuum**

During the acute phase of a stroke, symptomatic patients may use ambulance services or arrive at the emergency room of an acute-care hospital by their own means. Some will be admitted to a stroke unit [in Québec, this unit is usually in a Centre hospitalier de soins généraux et spécialisés (CHSGS)] for appropriate medical care and initial “early” rehabilitation sessions. Once medical status is stabilized, after about 7 to 10 days, patients are normally discharged and return home or are referred to either a specialized rehabilitation facility or an alternate living and long-term care environment. In Québec, most stroke patients return home after their acute-care hospital stay (60%); 17% are referred to a facility that provides rehabilitation services, and 12% go to a long-term care facility.

During the postacute phase, stroke patients admitted to a rehabilitation facility receive specialized rehabilitation services until they are able to safely return home or are referred to an alternate living environment if their functional recovery is insufficient. According to recent Canadian data, 71% of stroke patients return home upon discharge from a rehabilitation facility.

After returning home, stroke patients may receive, on an outpatient basis or at home, specialized rehabilitation services in order to continue their functional recovery. In addition, they may receive day hospital services and home support services offered, in Québec, by a Centre de santé et de services sociaux (CSSS) and community organizations.

### **Evaluation tools**

Various evaluation tools are used to determine the severity of neurological deficit or disabilities in stroke patients, with the goal of improving referral within the service continuum during all phases of the illness. Facilities offering services to stroke patients should use a common set of evaluation tools, the choice of which is based on psychometric qualities and practical considerations. The use of the NIHSS (National Institutes of Health Stroke Scale) or the CNS (Canadian Neurological Scale) to measure degree of neurological impairment and the FIM (Functional Independence Measure) to measure disabilities are advantageous, despite limitations specific to each scale. Consideration might also be given to using the SMAF (Système de mesure de l'autonomie fonctionnelle), which is widely used in geriatric medicine.

### **Classifying stroke by severity**

The classification of stroke severity is closely linked to the evaluation tool used. A score less than 5 on the NIHSS scale, greater than 8.5 on the CNS scale and/or greater than 80 on the total FIM scale would indicate a mild stroke; a score between 5 and 13 on the NIHSS scale, less than 9 on the CNS scale and/or a score between 40 and 80 on the FIM would indicate moderate impairment; and a score greater than 13, less than 9 and/or less than 40, respectively, on these scales would indicate severe impairment.

### **Choosing the timing and intensity of rehabilitation**

The clinical practice guidelines recommend that stroke patients be quickly admitted to a complete stroke unit or a stroke rehabilitation unit, and that they start rehabilitation as soon as possible once medically stable. The Canadian Stroke Strategy recommends at least 3 hours of direct and specific therapy per day

for at least 5 days a week, with the maximum intensity depending on the patient's needs and individual tolerance. It should be noted that in Canadian provinces outside Québec, intensive postacute therapy is often provided in a hospital, whereas in Québec, such services are provided in rehabilitation facilities.

The treatment team should encourage patients to practice the skills learned in rehabilitation sessions in their daily activities. Thus, patients can perform therapeutic activities outside of scheduled rehabilitation hours under the supervision of a nurse or a caregiver.

### **Caregiver involvement**

All of the literature examined stresses the importance of informal caregivers in the rehabilitation of stroke patients. It is recommended that informal caregivers actively participate in the care process, in the development and management of the care plan, and in the planning of the patient's discharge. Information, training and support for caregivers can reduce the burden of care and improve their quality of life. The information should address, among other issues, the course of the illness, its causes and treatments, stroke sequelae, and recovery at home following a stroke. The training should be tailored to the patient's needs, with emphasis on self-efficacy, and include personal care techniques, communication strategies and physical handling techniques.

### **Other aspects**

The choice of clinical modalities and rehabilitation techniques should be evidence-based and in accordance with available practice guidelines. The data examined were not conclusive with regard to the benefits of using care pathways. The electronic health record is likely to facilitate access to clinical information and sharing of this information between health professionals. Lastly, telerehabilitation would permit increased access to expertise, especially in outlying regions.

#### Rehabilitation in the acute phase

The acute phase is the period immediately following the onset of stroke symptoms. There is a consensus in the literature consulted that a person who has suffered a stroke should be initially treated in a stroke unit at an acute-care hospital. A stroke unit is a physically-separated, well-defined care unit staffed by professionals with stroke and rehabilitation expertise, has a coordinated multidisciplinary team, offers training and information programs to staff, patients and informal caregivers, and uses agreed-upon, evidence-based protocols. The early rehabilitation services provided in these units consist mainly of the following:

- initial evaluation of physical, cognitive and communication deficits, which is done as soon as possible after admission, ideally within the first 24 to 48 hours;
- determining the patient's rehabilitation needs, including psychosocial and communication components;
- positioning the patient in order to prevent complications (such as shoulder pain);
- early mobilization, within 24 hours of admission, which may help reduce the future use of rehabilitation services; and
- screening for dysphagia using a bedside clinical evaluation or an instrumental method and, if dysphagia is suspected, thorough evaluation by a speech-language pathologist or an appropriately-trained specialist.

#### Rehabilitation in the postacute phase

The clinical practice guidelines recommend that all stroke patients requiring specialized rehabilitation services on an inpatient basis be admitted to a stroke rehabilitation facility, regardless of the severity of the stroke. The guidelines recommend a minimum of 60 rehabilitation beds per million population, with stroke rehabilitation units containing at least 10 to 20 beds.

The patient should be transferred from the acute-care hospital (stroke unit) to the rehabilitation facility as soon as his/her medical status permits. Patients with severe impairment might benefit from a “slow-recovery” approach, while those with mild impairment can be followed on an outpatient basis or at home. Functional status, age and exercise tolerance may all play a role in determining where the patient will be referred after the acute phase, as proposed in an algorithm developed by a group in Ontario.

Planning the discharge should be started as soon as possible after admission. Furthermore, early-supported discharge should be offered to patients with mild or moderate impairment as soon as they can safely return to their living environment, provided that their safety can be ensured and that they have access to complete, multidisciplinary outpatient or home rehabilitation services and help from caregivers or support services. Teams offering these services should meet the same criteria as organized, inpatient stroke treatment teams.

Various service entities have compiled lists of admission and end-of-intervention criteria. Their common underlying principle concerning who is eligible for rehabilitation as an inpatient can be summarized as follows: a patient with i) disabilities preventing his/her immediate return home; ii) a stable medical status; and iii) a potential for rehabilitation. Furthermore, there is a consensus that interventions on an inpatient basis should end as soon as the individual can safely return to his/her living environment. Rehabilitation services should continue to be provided as long as required by the patient on an outpatient basis or at home.

### Social reintegration

The guidelines consulted recommend that after being discharged from an acute-care hospital or a rehabilitation facility, stroke patients should continue to have access to rehabilitation services appropriate to their needs on an outpatient basis or at home. Driving, leisure-time activities, sexuality, return to work, family responsibilities and social relations are key components of social participation and should be addressed by rehabilitation professionals as they pursue the objectives set out in the previous phases, with emphasis on social integration.

Regular ongoing follow up for patients living at home after a stroke facilitates evaluating recovery, preventing deterioration in the person’s condition, optimizing functional and psychosocial status, and improving quality of life. In addition, support for the community at large is necessary to improve the social reintegration of a person who has had a stroke.

### Mechanisms for continuously improving services

Quality assurance consists of a set of activities and programs that include assessing quality of services, identifying problems, designing activities aimed at correcting deficiencies, and following up to ensure the effectiveness of the process. The recommended quality assurance strategies include the following:

- the development and promotion of high-quality guidelines to assist clinicians with applying evidence in rehabilitation practice;
- patient registries that systematically gather information on the care process, services received and outcomes in order to identify aspects requiring improvement and to be able to take action accordingly;
- audits for comparing the clinical and organizational quality of each facility with performance at the provincial or national level;
- institutional accreditation such as the joint accreditation program for health care institutions in Québec by Accreditation Canada and the Conseil québécois d’agrément;
- research activities to increase the availability of evidence in the area of rehabilitation and stroke.

## Conclusion

This evidence review and this examination of the different publications yields a number of observations.

### **General considerations :**

- The various institutions and their components should be appropriately linked and mechanisms should be put in place to facilitate transition between the different phases of care, effective communication between facilities, maintenance of therapeutic objectives determined in individualized intervention plans, and use of a common set of evaluation tools;
- Of the available evaluation tools, the NIHSS and CNS scales and the FIM are likely the most appropriate for classifying a stroke according to its severity. The SMAF, which is commonly used in Québec with the elderly, could be used to evaluate disabilities;
- As for the intensity of rehabilitation interventions, one should opt for the highest possible level based on the patient's needs and individual tolerance;
- Caregiver involvement is essential, especially when planning patient discharge;
- Professional practice should be evidence based;
- The electronic health record and telerehabilitation are useful for improving access to and the quality of care.

### **During the acute phase of a stroke, guidelines recommend:**

- providing coordinated care in a stroke unit to all stroke patients as early as possible once medically stable. This includes evaluating and treating dysphagia and early-supported discharge for patients with mild to moderate impairment, if appropriate.

### **During the postacute phase of a stroke, guidelines recommend:**

- transferring the patient from the stroke unit to a rehabilitation facility as soon as his/her medical status permits;
- having a "slow-recovery" approach available to meet the needs of patients with severe impairment;
- providing follow up on an outpatient basis or at home for those with mild impairment;
- providing rehabilitation services on an inpatient basis to patients with disabilities preventing an immediate return home, but a stable medical status and potential for rehabilitation. The interventions should end in the inpatient setting as soon as the patient can safely return to his/her living environment, and continue on an outpatient basis or at home as long as required;
- providing services via an interdisciplinary team, with a coordinator within the institution and a key health professional or liaison person who will follow the patient's treatment course in order to facilitate linkage between facilities.

### **Regarding social reintegration, guidelines recommend:**

- ensuring that the necessary resources are available in the community;
- addressing the key components of social participation : driving, leisure-time activities, sexuality, return to work, family responsibilities and social relations.

The recommended quality assurance strategies include high-quality evidence-based guidelines, patient registries, audits and institutional accreditation. These strategies for continuously improving the quality of rehabilitation services for stroke patients should be implemented at the institutional, regional and provincial level.

INESSS also proposes a trajectory of patients throughout the rehabilitation service continuum and a list of characteristics expected of rehabilitation facilities.