

Clinical and organizational quality indicators for the optimal management of stroke in adults: scoping review protocol

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ABSTRACT

Introduction Clinical and organizational indicators have been developed to measure current stroke practices in different organizations. Although there is a broad range of indicators regarding the acute stroke phase, there is no synthesis of these indicators during this phase, and information is missing on how they have been tested, validated and integrated within organizations and clinical practice. The present article describes a scoping review protocol to identify clinical and organizational indicators conducive to the optimal management of acute ischemic stroke in adults. **Method and analysis** Our scoping review will be based on the methodological framework developed by Arskey and O'Malley (2005). Medline, CINHAL, Academic search complete and Cochrane Library databases will be used along with Google Scholar and Google to identify writings that meet the inclusion criteria. All scientific studies and grey literature conducted and published since 2015, in French and English, dealing with clinical and organizational indicators for the management and optimal care of adults with acute ischemic stroke will be retained. Indicators will be classified based on the dimensions of care performance. Next, an advisory committee composed of clinical and scientific experts together with the partner patient will draw up a final list of indicators using the Delphi process. We expect this scoping review to identify the best clinical and organizational indicators for optimal acute stroke management, thus allowing for improved supervision of quality of care. **Ethics and dissemination** No ethical approval is required. Dissemination of the results will be made through scientific publications, poster and oral presentations.

Key words: ischemic stroke, quality indicators, acute phase, organization of care

RESUMÉ

Introduction Des indicateurs cliniques et organisationnels ont été élaborés pour mesurer les pratiques actuelles en matière d'AVC dans différentes organisations. Bien qu'il existe un large éventail d'indicateurs concernant la phase aiguë de l'AVC, il n'y a aucune synthèse de ces indicateurs au cours de cette phase et il y a un manque de connaissance dans la façon dont ceux-ci ont été testés, validés et intégrés au sein des organisations et de la pratique clinique. Dans cet article, nous décrivons un protocole d'examen de la portée afin d'identifier des indicateurs cliniques et organisationnels menant à une gestion optimale de l'AVC ischémique en phase aiguë chez les adultes. **Méthode et analyse** Cet examen de la portée s'appuiera sur le cadre méthodologique de Arskey et O'Malley (2005). Les bases de données Medline, CINAHL, Academic search complete, Cochrane Library ainsi que Google Scholar et Google seront utilisés afin d'identifier les écrits répondant aux critères d'inclusion. Toutes les études scientifiques et la littérature grise menées et publiées depuis 2015, en français et en anglais, traitant des indicateurs cliniques et organisationnels pour une gestion et une prise en charge optimale de la clientèle adulte ayant subi un AVC ischémique en phase aiguë seront retenues. Les indicateurs seront classés en fonction des dimensions de la performance des soins. Ensuite, un comité consultatif composé d'experts cliniques et scientifiques et du patient partenaire établira une liste finale d'indicateurs à l'aide du processus Delphi. Nous anticipons que cet examen de la portée permettra de mettre en évidence les indicateurs cliniques et organisationnels favorables à une gestion optimale de l'AVC en phase aiguë. L'identification de ces indicateurs permettra d'assurer une meilleure surveillance de la qualité de soins. **Éthique et diffusion** Aucune approbation éthique n'est requise. La diffusion des résultats se fera par le biais de publications scientifiques, d'affiches et de présentations orales.

Mots-clés : AVC ischémique, indicateurs de qualité, phase aiguë, organisation des soins

INTRODUCTION

Cardiovascular disease is the primary cause of death in adults across the world. Some 17 million people die from it each year, 6.2 million of them following a stroke (GBD, 2019). In Canada, a stroke is one of the main causes of severe disability (Agence de la santé publique du Canada, 2011) and the third cause of death after cancer and heart disease (Statistique Canada, 2018). What's more, data from the Institut national de santé publique du Québec (INSPQ) suggest that the number of stroke patients will increase in the next decade owing to the accelerated ageing of the population along with improved treatments, care and services shielding patients from the consequences of the disease (Blais & al., 2018).

At the time of ischemic stroke, the treatment priority is to restore blood brain flow as rapidly as possible to limit deficits and facilitate early rehabilitation with the support of caregivers. The benefits of revascularization treatments are well documented in the scientific literature (Goyal & al., 2016; Menon & al., 2016; Vidale & Agostoni, 2017). Thrombectomy, or endovascular treatment (EVT), has been another acknowledged and preferred practice for removing clots from large blood vessels since 2015 (Goyal & al., 2016; Menon & al., 2016; Vidale & Agostoni, 2017); it is, however, performed only in accredited tertiary centers. Several studies have therefore been conducted in the last decade on access to these treatments and the care of stroke victims during the hyperacute phase (Eswaradass & al., 2017; Institut national d'excellence en santé et en services sociaux [INESSS], 2016, 2019). Now, although the guidelines maintain that the acute phase, which includes early rehabilitation, is also of paramount importance during the post-stroke care trajectory to enable progress in improving cognitive, language and functional capacities (Boulanger & al., 2018; Teasell & al., 2019), care during this phase may be compromised, and the literature highlights a regional and contextual disparity in terms of the services offered (Aguiar de Sousa & al., 2019; INESSS, 2016).

When an individual suffers a stroke, they follow a particular care and service trajectory based on geographic region, type of admitting hospital and available resources. This may sometimes conflict with the Canadian and international guidelines, which propose an optimal care trajectory for the population as a whole. The situation is of particular concern in Canada. An estimated 16 % of stroke patients will start rehabilitation immediately following acute care discharge, and 19 % will start the following month (Coeur et AVC, 2017). These challenges can, notably, influence clinical issues and guidelines at the end of the care trajectory for stroke patients and their caregivers during community reintegration and maintenance. Moreover, a study conducted in collaboration with the Canadian Institute of Health Information shows that targets established in the acute-care plan are not always met in older people or those with functional impairment following a stroke (Dessureault & al., 2015). These observations underscore the impacts of said persons' reintegration into the community. Although the study's authors emphasize the inadequate use of available resources, they also explain how difficult it is, even for experienced clinicians, to predict this population's potential needs for rehabilitation (Dessureault & al., 2015). It is essential, therefore, to properly understand the kind of care required following cerebral revascularization and to intervene quickly during the acute phase. The aim is to identify interdisciplinary needs, both clinical and functional, in terms of early rehabilitation and assistance in day-to-day activities.

Additionally, the present Covid-19 pandemic has resulted in exceptional changes and measures regarding the management and organization of care for stroke victims and their families and caregivers. By all accounts, the clinical and organizational consequences of the pandemic may affect the decisions of managers, the role of clinical staff and the involvement of families and caregivers at the time of a stroke (Montaner & al., 2020; Rudilosso & al., 2020; Smith & al., 2020). Those in particular who suffer a stroke during the pandemic are generally sent home earlier, but the interdisciplinary rehabilitation services provided in hospital during the acute

phase are not continued after discharge, unfortunately, in the majority of cases (Smith & al., 2020).

To support hospital managers and clinicians and optimize practices, especially during the acute phase, the authors of guidelines, studies and grey literature writings outline recommendations aimed at enriching the offer of care and services. Recommendations are also updated regularly to keep pace with the science and enable the development of a personalized action plan to be implemented in each organization based on its mission. In short, they stress the development of interdisciplinary approaches to improve stroke patient care by tailoring it to the individual patient and including partner caregivers in the care and decision-making process (Boulanger & al., 2018; Ministère de la santé et des services sociaux [MSSS], 2017; Powers & al., 2018; Smith & al., 2020; Teasell & al., 2019). These authors also propose numerous quality indicators, both clinical (in line with interventions) and organizational (oriented to the care and service continuum), in order to measure the results of an action plan and make the necessary adjustments (Boulanger & al., 2018; MSSS, 2017; Powers & al., 2018; Teasell & al., 2019). A quality indicator is any reliable and valid measure of a state of health, a practice or a healthcare organization (MSSS, 2012). When developed, quality indicators must meet certain specific, rigorous criteria to ensure their implementation and follow-up in clinical practice, e.g., clinical relevance for improving access and quality of care, validity, reliability, feasibility, conviviality and comparability to a standard of practice.

Most previous studies focused on measuring indicators in terms of access to treatments and services in the hyperacute phase including pre-hospital care, with an emphasis on chronodependency. At present, there is a substantial number of quality indicators across the continuum of care. Regarding the acute phase, however, the current state of knowledge does not allow for a synthesis of all such indicators identified in the guidelines, scientific studies and grey literature writings. Furthermore, no study has yet been conducted to identify and

understand the similarities in indicators developed and measured in practice, the possible disparities linked to the internal context (staff characteristics, patient characteristics, available internal resources, etc.) and the external context (geographic area, type of centre, available external resources, hospital policies, etc.), and the variants (elements targeted by each scientific authority, frequency of monitoring indicators, etc.). Additionally, when a set of indicators is developed around a practice, they may be classified based on concepts regarding the quality to achieve for a more general picture of a situation (MSSS, 2015). To our knowledge, there is yet no synthesis of the classification of post-acute stroke indicators and no classification of the dimensions of healthcare performance (access to services, quality of care, access to services, and optimization of resources) that includes the concepts of accessibility, equitable access, efficacy, safety, patient and family reactivity, continuity of care, efficiency and viability (MSSS, 2012).

In light of these observations and despite a broad range of indicators for the acute phase, the way in which these indicators have been validated and integrated into organizations and clinical practice remains ambiguous (Jolley, 2017). To improve the clinical issues of post-stroke patients, therefore, it is important to properly understand the quality indicators relevant to this specific phase while considering regional particularities in terms of health care and services and their organization.

The purpose of this scoping review is to identify the clinical and organizational indicators conducive to an optimal management of the critical ischemic stroke phase. Our research objectives are to identify clinical and organizational quality indicators based on proven results and to evaluate the quality of the writings that support the indicators identified.

METHOD

The scoping review will be performed in keeping with the methodological framework developed by Arskey and O'Malley (2005) and refined by Levac, Colquhoun and O'Brien (2010). The framework is rooted in a structured methodology that allows us to map the data, do an exploratory synthesis of the literature based on iterative data collection and conduct a rigorous and interdisciplinary analysis of the identified writings with integral emphasis on the observations surrounding the issue under study (Arksey & O'Malley, 2005; Levac & al., 2010). It proposes six interdependent steps as follows: 1) identification of research question, 2) identification of relevant studies using key words in different databases, 3) study selection, 4) data extraction, 5) data synthesis and finally, 6) consultation with stakeholders (Arksey & O'Malley, 2005; Levac & al., 2010).

1) Identification of research question

A research question in line with the goal and objectives of the present scoping review is as follows: What evidence-based clinical and organizational quality indicators allow us to identify the actions to be taken clinically (interventions) and organizationally (care and service continuum) to promote optimal acute stroke management?

2) Identification of relevant studies using keywords in different data bases

All empirical and theoretical writings regarding clinical and organizational quality indicators for the optimal management and care of adults with acute ischemic stroke will be included in this scoping review. Four databases (Medline, CINHAL, Academic search complete (EBSCO) and Cochrane Library) and two search engines (Google Scholar and Google) will be consulted to identify relevant studies. A library technician will assist in the search based on a list of keywords predetermined using PICO (population, intervention, comparison, outcomes). The PICO mnemonic highlights keywords related to the research question and facilitates the documentary research strategy, which enables the identification of quantitative, qualitative and grey literature

writings as presented in supplementary file (O'Connor & al., 2011). A search for relevant studies will also be conducted in the reference list of the different articles identified. All such articles will be saved on the Endnote X9.2 software.

3) Study selection

Articles from the provincial, national and international grey literature such as reports from the INESSS, Canadian and international stroke care guidelines, and documents from the Heart and Stroke Foundation of Canada will be included. Additionally, all studies published and conducted since 2015 (randomized clinical trials, systematic reviews, case studies, quasi-experimental and experimental studies, mixed-method studies, qualitative studies, audits or reports assessing the quality of stroke management) will be inventoried to obtain a more accurate picture of the current context of care and the development of recognized ischemic stroke treatments since the middle of the previous decade. Only articles in French and English will be selected. Inclusion criteria are based on studies focused on stroke quality indicators for adult ischemic stroke victims who require acute care involving early inpatient rehabilitation (post-revascularization, subacute or hospitalization phase). Studies can include all types of clinical or professional interventions on the stroke care continuum as well as the development, implementation, assessment, and comparison of quality indicators. In addition, they must have been conducted in a country with a health system comparable to that of Canada. Exclusion criteria refer to studies conducted with hemorrhagic stroke patients or children. Studies that do not discuss quality indicators or that are conducted during pre-revascularization or rehabilitation phase or post-rehabilitation phase including discharge home, long-term care, community-based rehabilitation and palliative care will be excluded.

Study selection will proceed in three stages. In stage one, duplicates will be removed using the Endnote X9.2 software. In stage two, a total of 10 % of the articles retained will be revised independently and randomly by a second expert in the research team to ensure the selection criteria are sufficiently accurate to identify the writings most relevant and most consistent with

the research question and objective. This process will be conducted using the Covidence software, a platform allowing for a literature review involving more than one reviewer.

Disagreement will be resolved through consensus. If an abstract does not provide enough information to include or exclude an article, the entire article will be read. If necessary, a third person with expertise regarding strokes and clinical and organizational quality indicators will offer an opinion to enable a consensus on whether or not to select a particular study. In stage three, all the articles identified will be analyzed based on the selection grid, and only those that satisfy the selection criteria will be retained. The final study selection will be presented using a flow diagram.

4) Data extraction

First, two reviewers will extract data independently from 10 % of the articles that meet selection criteria. The data extracted will include year of publication, city, publication status (scientific literature or grey literature), name and discipline of authors, research design, objective of study, population/sample (age, comorbidities, risk factors, etc.), clinical and organizational quality indicators identified, description and definition of said indicators, indicators' association with health outcomes (allowing for improved practices), implementation context of indicators (country, geographical area, type of center, etc.) and corresponding recommendations. A complete revision of the studies retained will be conducted and subjected to a methodological quality analysis using assessment tools specific to each research design: STROBE (*Strengthening the Reporting of Observational Studies in Epidemiology*) for observational and descriptive studies, AMSTAR (*Assessing the Methodological Quality of Systematic Reviews*) for systematic reviews and meta-analyses, and CONSORT (*Consolidated Standards of Reporting Trials*) for randomized studies. The quality of the grey literature will be assessed using the AACODS checklist (authority, accuracy, coverage, objectivity, date and significance). Next, the indicators identified in the acute phase will be completely mapped based on all retained studies.

5) Data synthesis

In addition, the classification of mapped indicators conducted in step 4 will be done based on the healthcare performance dimensions of the MSSS (2012). These dimensions and their definitions are presented in Table 1.

Accessibility of services	Accessibility	Balance between services sought and services offered. It may involve the relationship between quantity of services sought and quantity of services rendered, or the time it takes to obtain care and services
	Equity of access	Fair and equal access to services for subgroups in the population
Quality of care	Effectiveness	Relation between health and well-being objectives pursued and those reached
	Safety	Degree to which healthcare interventions and environments are free from threats to health and well-being
	Reactivity	Users' appreciation for the way they have been treated
	Continuity	Patients' experience regarding the flow of services received across the service continuum
Optimization of resources	Efficiency	Relationship between quantities of services offered and quantities of resources used
	Viability	Sustainability nature of the health and social services system

In order to properly measure concepts regarding the dimensions of healthcare performance, indicators will be attributed to a single category. Those measuring delays before receiving a service will fall under "accessibility" and those regarding access relative to geographical context

and the concept of fair and equal access under “equity of access.” Indicators referring to hospital use rates or the proportion of patients to be hospitalized in a care unit will be grouped under “efficiency.” Those that assess the protocols established to monitor patients or training offered or any other element implemented to ensure the good practice of long-term care will be grouped under “viability.” Indicators assessing health outcomes, or the achievement of a care or service objective will fall under “effectiveness” and those measuring the coordination and integration of care under “continuity.” Finally, indicators measuring patients’ reaction or satisfaction or considering their needs for personalized care will be grouped under “reactivity.”

6) Consultation with stakeholders

After step 5 is completed, the emerging indicators will be submitted to an advisory committee composed of two doctors from two different hospitals (a neurologist from a university center and an internist from a general hospital), a manager in charge of the post-stroke care and service trajectory, a neurovascular nursing counselor, a partner patient, three nurse-clinicians with stroke care expertise and four clinical staff members of the interdisciplinary team (occupational therapist, physiotherapist, nutritionist and speech therapist) working with stroke patients.

Members of the advisory committee will be recruited by the main researcher. The partner patient will be recruited in keeping with the skills essential to this consultation: critical thinking, good judgment and the ability to express their position. They will also be expected to demonstrate a proper understanding of their role in the committee. A patient partnership is included in the committee of experts to allow for a judicious choice regarding the relevance of the indicators to be measured while considering the impact on patients’ life when gaps in monitoring certain indicators occur.

The role of these twelve interdisciplinary collaborators in the advisory committee will be to offer enlightened opinions based on their expertise, respective points of view and personal clinical or organizational experience. The advisory committee will be invited to take part in an indicator

selection process using the Delphi method. The choice of indicators will rely on rigorous selection criteria to ensure the clinical implementation of criteria such as relevance, validity, reliability, feasibility, conviviality and comparability to a standard of practice. Their definitions are given in Table 2 (MSSS, 2012). These indicators will be compared with recognized national and international acute stroke guidelines for the sake of consistency.

Table 2. Quality criteria for selection of indicators	
Quality criteria	Definition
Validity	Existence of a relation between a particular indicator and the object of measurement
Relevance	Relation to object of measurement is sufficiently important
Reliability	Indicator is based on quality data
Feasibility	Data are accessible and measurable in a timely manner (if not, possibility to collect data based on cost and required workload is evaluated)
Conviviality	Relation between indicator and object of measurement is easy to understand
Comparability	Good fit between the indicators compared and the data used to measure an indicator (comparability with a standard of practice)

The first step of the Delphi method will involve an online questionnaire to be completed by the advisory committee. A scale based on level of agreement (*1: Disagree completely, 2: Disagree, 3: Neither agree nor disagree, 4: Agree, 5: Agree completely*) will be used for three of the quality criteria presented in Table 2 regarding the selection of indicators: relevance, validity and feasibility; these are considered essential priorities when measuring indicators during practice

(MSSS, 2012). Once this is done, indicators with a result equal to or higher than 4 will be retained and those with a result equal to or less than 3 will be eliminated. The advisory committee will then be asked to complete a second online questionnaire using the same principle to determine whether to retain or eliminate indicators where no consensus was reached. Criteria such as reliability, conviviality and comparability will consequently be added. At this stage, indicators with results averaging above 3 will be retained. Finally, the third step will consist of an on-site meeting with the advisory committee to evaluate the quality indicators retained and to ensure a consensus on both the choice of indicators and their target (time, duration, frequency, etc.).

The questionnaires and interview guide used at the meeting will include the objective, an explanation of the collaborators' role and the list of indicators; they will be validated beforehand by the reviewer who participated in steps 3 and 4. Additionally, the results of this scoping review will be discussed at the meeting to decide how information should be transferred to healthcare environments and disseminated to the various stakeholders.

ETHICAL CONSIDERATIONS AND PUBLICATION

Research ethics approval is not required because the role of the advisory committee is to shed light on the choice of indicators without participating in the study. The final list of indicators will be used to conduct a subsequent study focusing on the achievement of clinical and organizational quality indicators in Quebec hospitals with different accreditations.

A scoping review is the preferred method for highlighting current and general knowledge regarding the clinical and organizational quality indicators essential for the optimal management of acute stroke patients and their caregivers. The approach also makes it possible to map the state of evidence-based knowledge, perform a critical analysis of the literature concerning the issue under study and develop a picture of the state of knowledge while meeting defined

research objectives (Lockwood & Tricco, 2020). Indeed, this scoping review will advance knowledge regarding the indicators relevant for measuring the quality of acute stroke care, notably their synthesis and classification based on dimensions of performance. It will also serve to supply needed information about how indicators have been tested, validated and integrated in international organizations and clinical practice. Although this state of knowledge will raise questions about certain care trajectories, our scoping review will support a subsequent step, which is the on-site evaluation of degree of success in achieving measurable, validated indicators impacting stroke management. This approach will highlight the successes and gaps in clinical and organizational stroke care. What's more, regional differences can also be underscored based on type of establishment, allowing for recommendations that consider regional context and available resources. The results of this scoping review will be outlined in a scientific article, a poster presentation and during conference lectures as well as at the local and regional level of different organizations with stakeholders dispensing care and services to stroke victims and their families.

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