Research to practice: Nursing stroke assessment guidelines link to clinical performance indicators

By M. Patrice Lindsay, Linda Kelloway, and Heather McConnell

Abstract

Stroke is the fourth leading cause of death in Canada and, each year, approximately 50,000 Canadians will suffer a stroke with a range of severities from mild, short duration symptoms to significant long-term disability or death. Of these 50,000 patients, at least 20,000 are hospitalized. Earlier this year, a core set of evidence-based performance indicators were identified by a national consensus panel that may be used to determine the quality of care provided to stroke patients in hospital during the acute phase of illness. Nurses play a critical role in stroke care across the continuum and recently published stroke assessment guidelines for nurses clearly describe key approaches to assessment and/or screening of stroke survivors. Many of the nursing assessments and/or screening actions recommended in the guidelines have direct or indirect associations with the recent performance indicators. This article describes where those relationships exist and the role nurses may play in determining overall performance for acute stroke patient care delivery during the hospitalization phase of the stroke continuum of care.

Introduction

Stroke is the fourth leading cause of death in Canada and each year approximately 50,000 Canadians will suffer a stroke with a range of severities from mild, short duration symptoms to significant long-term disability or death (Heart and Stroke Foundation of Canada, 2003). Of these 50,000 patients, at least 20,000 are hospitalized for acute stroke management and, overall, there are approximately 300,000 people currently living with the effects of stroke in Canada. As management of acute ischemic stroke advances, widespread implementation of optimal stroke care continues to pose enormous challenges for health care systems. Initiatives such as regionalization of stroke care, guideline development, and quality improvement efforts have been established in an attempt to increase system responsiveness and optimize patient outcomes following an acute ischemic stroke (European Stroke Initiative, 2003; Holloway et al., 2001; Petty, 2000; Wilson et al., 2001).

In the spring of 2004, the Canadian Stroke Quality of Care Study acute stroke advisory panel proposed 23 core indicators to measure the quality of stroke care provided in Canada (Lindsay et al., 2005a). These indicators focus on acute care, and represent a significant component along the continuum of care. Subsequent research is currently underway to develop additional indicators along other points on the continuum. The intent is that these indicators be utilized by physicians, nurses, allied health professionals, researchers and policymakers to ensure best practice provided to patients, internal and external accountability, and enable continuous quality improvement.

Coincident to the identification of these performance indicators, the Heart and Stroke Foundation of Ontario (HSFO) and the Registered Nurses Association of Ontario (RNAO) joined together in partnership to develop and evaluate a best-practice guideline focusing on nursing assessment of persons who experience stroke across the continuum of care (Heart and Stroke Foundation of Ontario, 2005). These guidelines provide nurses with evidence-based recommendations regarding the assessment and/or screening of stroke survivors across the continuum of care. Although stroke is an attack on the brain, the sequelae from a stroke may be complex, involve multiple body systems, devastate family support systems and require a multidisciplinary team approach. Nurses are the most significant contributors to patient care in all sectors of the health care system in terms of degree of patient contact (Pringle, & Doran, 2003). Ongoing assessment, monitoring and management of these systems by nurses are necessary to ensure both patient safety and the ability to optimize patient recovery from the potentially devastating and long-term impact of stroke. This is best accomplished through the use of evidence-based practice guidelines of this nature, which have been shown to decrease length of stay, morbidity, mortality and disability (Stroke Unit Trialists’ Collaboration, 2003).

An examination of both the core set of performance indicators and the best-practice guideline recommendations clearly demonstrate the potential role for nursing to influence performance levels for acute stroke care during initial hospitalization. The remainder of this paper will provide an overview and discussion of the relationships that exist between specific performance measures identified in the Canadian Stroke Quality of Care Study (CSQCS) and the Best Practice Guideline for Stroke Assessment developed by the Heart and Stroke Foundation of Ontario and the Registered Nurses Association of Ontario.

Overview of the CSQCS Acute Stroke Performance Measures: A core set of 23 performance indicators were identified by the Canadian Stroke Quality of Care Study advisory panel, and were rated based on a modified Delphi process described elsewhere (Lindsay et al., 2005a). These indicators address issues directly related to the acute phase of the stroke continuum of care for patients who experience an ischemic stroke. The indicators focus on areas such as tissue plasminogen activase (tPA) administration, specific aspects of care provided to stroke patients, the goal to care for patients on...
organized stroke units, and initiation of secondary prevention therapies in hospital. They are intended to inform efforts for the development of best-practice consensus guidelines in Canada for acute stroke management for individual disciplines and across multiple disciplines, and may facilitate the establishment of benchmarks for quality stroke management that are realistic to achieve in clinical practice (Lindsay, et al., 2005b).

**Overview of the Nursing Best Practice Guideline for Stroke Assessment:** Clinical practice guidelines are systematically developed statements, based on best available evidence, to inform client and practitioner decision-making in specific clinical circumstances, such as the assessment, diagnosis and treatment of a particular clinical condition (i.e., stroke) (Field & Lohr, 1990). The guideline Stroke Assessment Across the Continuum focuses on adults (over age 18) who have experienced a stroke and their family caregivers (Heart and Stroke Foundation of Ontario, 2005). For the purpose of defining the scope of the guideline, the types of stroke included were hemorrhagic (including subarachnoid and intracerebral hemorrhage), ischemic and transient ischemic attacks (TIAs).

In the fall of 2003, the HSFO and RNAO, with funding support from the Ministry of Health and Long Term Care, convened a panel of nurses identified as having stroke expertise across the continuum and who practised in a variety of nursing roles. The panel identified the scope of the guideline through a process that included identifying components of stroke assessment, both general and specific, across the continuum. Central to the scope of the project was consensus on the focus of the guideline being assessment and/or screening of stroke clients. Management and treatment are not addressed within the scope of this document.

The guideline is intended for nurses who are not experts in stroke care, and who work in a variety of practice settings across the continuum of care. Nurses have knowledge of client assessment principles, and the focus of this guideline is to emphasize a holistic, focused stroke assessment (Heart and Stroke Foundation of Ontario, 2005). It is also intended to support and facilitate partnerships and ongoing communication between nursing and other members of the interdisciplinary team, clients and families.

Members of the development panel reviewed and critiqued the results of a comprehensive literature review, examined published stroke assessment/screening tools and drafted initial recommendations. The resulting set of recommendations (practice, education and organization and policy) was distributed to external stakeholders for review. Feedback received from these stakeholders was reviewed by the panel and, through a process of discussion and consensus-building, revisions were made to the document prior to its preparation for publication.

Concurrent to the development of the Stroke Assessment Across the Continuum guideline and the work of the CSQCS, several members of the HSFO/RNAO development panel were invited to participate in a consensus panel for the SCORE (Stroke Canada Optimization of Rehabilitation by Evidence) Project (SCORE, 2005). The aim of the SCORE project is to develop a national network of rehabilitation providers to implement the latest research evidence (Knowledge translation arm) and address strategic stroke rehabilitation research priorities. The objective of the Knowledge Translation arm is to develop evidence-based recommendations in three areas where experts considered the evidence strongest, i.e., arm rehabilitation; leg rehabilitation; and, screening of those at risk of dysphagia, depression, falls, skin breakdown and cognitive impairment. Upon reviewing the recommendations from the work of the SCORE team, it was noted that both documents were similar in their approach to the areas of cognition, falls, depression and dysphagia. Hence, collaboration between the two projects occurred to ensure consistency in practice recommendations within these identified areas. An expert panel that included representative members of the RNAO guideline development group was convened by SCORE to identify validated screening tools that could be used to screen those at risk. The panel resulted in a set of recommendations that were then used by both the RNAO group and the SCORE project team.

**Methodology for comparison**

The HSFO/RNAO stroke assessment guideline was reviewed during its development by the CSQCS investigators as an opportunity to link the core areas of performance for acute stroke care addressed in the indicators directly with the stroke assessment guidelines. At the completion of the development phase of both initiatives, members of both research and development teams met and reviewed the guideline recommendations and indicators in depth. For each practice recommendation, the corresponding quality of care indicators were identified, and a determination was made as to whether there was a direct or indirect relationship. Direct relationships implied that following the stroke assessment recommendations consistently would have a direct impact on the performance described by the indicator. Indirect association implied that there was agreement that an association existed between the indicator and the recommendation, however, many other factors also exist concurrently that would affect the level of performance and a direct relationship could not be drawn. In Table One, on page 24, the key practice recommendations of the best practice guideline Stroke Assessment Across the Continuum are listed along with the acute stroke performance indicators that were determined to have a direct or indirect relationship to the guideline. Guideline recommendations and quality indicators that could not be linked are not included in the Table and are discussed below.

**Discussion**

This review set out to examine the relationship between two types of “guidelines”. The first describes some key elements of care that are considered markers of quality care delivery in acute care settings, and the second is a set of best-practice recommendations describing stroke assessment processes within the scope of nursing practice across the continuum of care. Both the guideline and the performance indicators were developed through expert panel processes and based on best available evidence. In the absence of strong evidence from the existing scientific knowledge base, both initiatives relied on the clinical expertise of their panel members to determine which recommendations were valid and relevant.
## Table One:
### Associations between Stroke Assessment Best Practice Guidelines and Canadian Stroke Quality of Care Acute Stroke Care Indicators

<table>
<thead>
<tr>
<th>HSFO/RNAO Stroke Assessment Guideline Recommendation</th>
<th>Related CSQCS Performance Measure</th>
</tr>
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<tbody>
<tr>
<td>Screen clients for risk factors related to stroke in order to facilitate appropriate secondary prevention.</td>
<td>Patients with acute ischemic stroke should have their smoking status assessed while in hospital and documented on patient chart.</td>
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<tr>
<td>Patients with an acute ischemic stroke and non-valvular atrial fibrillation should be discharged on appropriate anticoagulants unless contraindicated.</td>
<td></td>
</tr>
<tr>
<td>Patients discharged following an ischemic stroke event should be assessed for and prescribed a lipid-lowering agent if appropriate.</td>
<td></td>
</tr>
<tr>
<td>Patients discharged following an ischemic stroke event should be assessed for and prescribed a blood-pressure lowering agent if appropriate.</td>
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<tr>
<td>Recognize the new onset of the signs and symptoms of stroke as a medical emergency to expedite access to time dependent stroke therapy, as “Time is Brain”.</td>
<td>All acute stroke patients should be evaluated for thrombolytic agent eligibility.</td>
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<tr>
<td>Conduct a neurological assessment on admission, and when there is a change in client status. This neurological assessment should include at minimum: • Level of consciousness; • Orientation; • Motor (strength, pronator drift, balance and coordination); • Pupils; • Speech/Language; • Vital signs (TPR, BP, SpO₂); and • Blood glucose.</td>
<td>NINDS inclusion/exclusion criteria should be applied for patient selection for thrombolysis.</td>
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<tr>
<td>Patients potentially eligible for tPA should have CT brain scan completed within 25 minutes of ED arrival.</td>
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<tr>
<td>Blood glucose checked on arrival and regularly for first 24 hours.</td>
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<tr>
<td>Elevated pre-prandial blood glucose should be treated with glucose lowering agents.</td>
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<tr>
<td>All patients presenting with acute stroke symptoms should have an electrocardiogram in the ED.</td>
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<tr>
<td>Fever should be treated with antipyretics to reduce temperature to &lt; 38° C.</td>
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<tr>
<td>Assess the client’s risk for pressure ulcer development.</td>
<td>Patients with an acute ischemic stroke should be mobilized and out of bed within 24 hours of stroke symptom onset unless contraindicated.</td>
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<tr>
<td>Assess stroke clients for the following stroke complications: painful hemiparetic shoulder, spasticity/contractures, and deep vein thrombosis.</td>
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<tr>
<td>Maintain all stroke clients NPO (including oral medications) until a swallowing screen is administered and interpreted.</td>
<td></td>
</tr>
<tr>
<td>Administer and interpret a swallowing screen within 24 hours of the stroke client becoming awake and alert.</td>
<td>A protocol or screen for dysphagia assessment should be initiated on all acute ischemic stroke patients before being given food or drink and results documented in patient chart.</td>
</tr>
<tr>
<td>Assess stroke clients’ ability to perform the activities of daily living (ADL).</td>
<td>Patients with an acute ischemic stroke should be mobilized and out of bed within 24 hours of stroke symptom onset unless contraindicated.</td>
</tr>
<tr>
<td>Assess clients for urinary incontinence and retention.</td>
<td>Indwelling urethral catheter should be avoided in patients with acute ischemic stroke.</td>
</tr>
<tr>
<td>Assess/screen caregiver burden.</td>
<td>Patients with acute ischemic stroke and their caregivers should receive stroke education prior to discharge from hospital and have this education documented on the chart.</td>
</tr>
<tr>
<td>Assess the stroke client and their caregivers’ learning needs, abilities, learning preferences and readiness to learn.</td>
<td>Patients with acute ischemic stroke and their caregivers should receive stroke education prior to discharge from hospital and have this education documented on the chart.</td>
</tr>
</tbody>
</table>

*The following summary of recommendations has been modified from the original for the purposes of comparison. For a complete listing of guideline recommendations and performance indicators, please refer to the source documents.*
The relationship between these two types of guidelines could be understood through conceptual frameworks such as Donabedian’s Structure-Process-Outcome, which is often referenced in the health care quality literature and is recommended by the RNAO to structure the monitoring and evaluation of guideline implementation (Donabedian, 1988; Registered Nurses Association of Ontario, 2002). This framework proposes that linkages can be established between clinical process-of-care elements and specific quality outcomes of that care (Brown, et al., 2004; Irvine, et al., 1998). The achievement of a positive health outcome is multifaceted, and is the product of interactions with structural and process factors encountered during the episode of illness (Graff, et al., 2002; Lanska, & Hartz, 1998; Tu, et al., 2001). In this case, the structures related to the care delivery model adopted for acute stroke and the processes of care are in-part articulated in the HSFO/RNAO Stroke Assessment guideline. The CSQCS acute stroke indicators focus mainly on processes of care that have enabled the linkages to be made to the guideline, and these indicators have been considered reasonable proxy measures for outcomes by the panel (McGlynn, 2003). Proxy measures are often used in place of outcomes due to the difficulty in measuring and obtaining outcome data as a result of time lags, inability to follow patients once they leave hospital, resource costs for data collection, data quality issues, and the multiple complex factors that may have an impact on patient outcomes for an acute clinical condition such as stroke.

When the Stroke Assessment guideline was reviewed from the perspective of the stroke performance indicators, several direct relationships were identified and additional important observations were discovered. One of the most striking connections between the two initiatives was the focus on clinical documentation. During the CSQCS panel discussions, the need for clear, accurate and complete documentation was raised frequently. Several indicators that were considered important for stroke management were omitted from the final selection of indicators as a result of the panel concluding that documentation could not improve sufficiently to enable the indicator to be measured reliably over time. For other indicators that were included in the final core set of performance measures, such as patient education and risk factor identification, documentation is also of major importance to the feasibility of the indicator. The comments and concerns raised by the CSQCS expert panel were shared with the HSFO/RNAO Stroke Assessment guideline development panel, and, as a result, the need for documentation of all components of the assessment was made more explicit throughout the nursing guideline document as well as becoming an independent recommendation itself.

The second important observation related to the first performance indicator suggesting that care of acute stroke patients should be managed in a dedicated acute stroke unit by a multidisciplinary team that includes physicians, nurses and allied health professions with specific training in stroke management for maximum benefit to patients (Adams, et al., 2003; Bisaillon, et al., 2004; Permanente, 2002). The performance indicator panel recognized that resource constraints may prevent such a dedicated model of care and, therefore, also included a hierarchy of coordinated care with general guidelines in place for managing acute stroke patients throughout the hospital at one end of the continuum and dedicated stroke units at the other. The HSFO/RNAO Stroke Assessment guideline is intended to help nurses, regardless of the model of care that is operational, facilitate a comprehensive stroke assessment. The use of evidence-based assessment and/or screening tools provides a standardized language for communication between clinicians, and an opportunity for evaluation of patient outcomes. The HSFO/RNAO Stroke Assessment guideline provides a discussion on the use of these tools in order to ensure that nurses, regardless of their level of stroke expertise, are able to apply the recommendations to their practice. Nurses’ clinical decision-making consists of a series of decisions that include observation, gathering of patient information, evaluation of patient information and actions to achieve desired outcomes (Cranley & Doran, 2004).

The third significant overall observation when considering the relationship between the performance measures and the guideline is that acute stroke patients require complex care that involves many health care professions. Both the guideline recommendations and the performance measures in these examples reflect the scope of nursing practice in coordinating the care of complex patients, and facilitating activities by other members of the multidisciplinary team. The direct impact nursing may have on overall performance for stroke patients in some instances is clear. For example, performance measures related to risk factor identification (such as smoking history), mobilization of patients following stroke, dysphagia screening, need for catheterization, and patient/caregiver education are clearly related to nursing practice, and directly related to the recommendations in the Stroke Assessment guideline.

On the other hand, several of the acute stroke performance measures stem from a medical/physician perspective – decision-making and treatment related to acute thrombolysis, treatment of elevated glucose and fever, initiation of secondary prevention pharmacotherapy. In these examples, the role for nursing would be considered indirect based on the actual wording of the performance measures. That being said, nurses are well-positioned to facilitate rapid assessment of patients when they first present to hospital through the emergency department triage system, and to communicate with physicians and other team members during the decision-making process. Once decisions regarding thrombolysis, acute management, and secondary prevention therapies are made, nurses play a key role in ongoing assessment and/or screening and implementation of the chosen intervention strategies. However, the challenge remains the ability to demonstrate the impact of nursing’s role, due to the lack of availability of information about nursing care recorded on administrative databases. Databases that record care-related activities for patients in specific hospitals, regions, or systems provide an important resource with respect to both the number of patients served and the nature of care provided. However, these databases are often lacking in nursing-relevant information (Pringle & Doran, 2003).

When the results of the analysis of performance is available through actual measurement of the indicators, it is important to be cognizant whether the role of the nurse was direct or indirect. Within a quality improvement model, performance results have the potential to establish a climate of reflective
practice and provides opportunities for practice improvement (College of Nurses, 2004). Nurses must be able to clearly identify their role in the process and be proactive in initiatives to understand the root cause of both desirable and undesirable levels of performance, both organizational and practice, thereby enabling them to act as leaders in the improvement cycle.

Once the review of the performance measures and best-practice recommendations was complete, there were some indicators and recommendations that could not be linked. The best practice recommendations that could not be linked to the acute stroke performance measures included: nursing assessment and recognition in a decline in neurological status; fall risk; pain assessment; nutrition and hydration status; fecal incontinence; depression; sexuality; cognitive impairment; and direct measurement of caregiver burden. The goal of the nursing best-practice guidelines was to provide nurses with evidence-based recommendations regarding the assessment and/or screening of stroke patients across the continuum of care. Therefore, these guidelines held a broader scope for inclusion than the CSQCS performance measures. In addressing the wider continuum of care, the nursing guideline development panel also held consultations and reviews with other researchers involved in stroke management, specifically in the area of rehabilitation. Some of the recommendations that could not be matched to the acute care indicators do emerge in projects such as SCORE, which focuses on rehabilitation.

The goal of the CSQCS was to identify a minimum core set of indicators that focused specifically on acute stroke management, and would potentially have predictive value for overall quality of care. Therefore, several of these assessment areas were outside the scope of the performance measurement study or were considered by the expert panel to be less sensitive reflections of the overall quality of acute stroke management. Given this perspective, the performance measures included in the CSQCS and not reflected in the nursing practice guideline included timely thrombolytic medication administration within best-practice protocols, early initiation of anti-thrombotic medication, and diagnostic testing within prescribed timelines. Current studies are underway to measure these acute care indicators and examine variations in care across institutions and geographic regions. It is likely that some of the other areas of acute management highlighted in the nursing assessment guidelines will be considered during root cause analysis to help understand and explain potential variations.

The next steps in this work are to complete an evaluation of the dissemination and uptake of the Stroke Assessment Best Practice guideline. Care that is based on evidence as a principle of practice, as synthesized in a guideline, can be effective in changing the process and outcome of care (Thomas, et al., 1999). This evaluation will focus on an active dissemination strategy throughout the Ontario Stroke System and beyond, focusing on awareness and utilization of the guideline recommendations. Concurrently, a study is being undertaken to apply the acute stroke performance measures to current practice and determining the degree of variations in care. The results of both evaluation initiatives will again be reviewed in tandem and information gathered from each will be used for triangulation to inform the findings of each study. Further work will then focus on improving guideline implementation, quality of care, and refinement of both the indicators and the guideline. Conceivably, the approach taken in this work can be used as a model and applied to other parts of the continuum for stroke care as more evidence-based performance indicators become available (Cranley & Doran, 2004).

Summary

Outcomes assessment in nursing practice is key, as measuring outcomes provides evidence for accountability and improvement in the system of stroke care. The increased demands for accountability by all health care professionals and the growing expectations that current practice be based on the best available knowledge and evidence is critical to caring for stroke patients. Comprehensive documentation is required of all health care professionals to enable accurate and comprehensive monitoring of these performance indicators, and the impact of the guideline recommendations on patient outcomes and stroke system performance. This paper strives to combine the best evidence for nursing assessment in the acute stroke patient with the best evidence for evaluation of quality of stroke care. Several links between practice and performance measurement were identified that will strengthen nursing’s evaluation of their role in acute stroke assessment and better define the roles of health professionals and lines of accountability in acute stroke management.

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References

Guidelines for funding requests for neuroscience nursing research

1. Research funds will be allocated yearly based on the number of requests;
2. Fundable projects will focus directly on neuroscience patient care issues;
3. Projects will focus on issues within the scope of nursing practice in Canada;
4. The primary investigator must be a nurse and an active member of CANN in the preceding year;
5. A written letter of request plus the proposal shall be sent to the chairperson of the research committee;
6. The research proposal shall include the following:
   - Title of project
   - Names and qualifications of the principal and co-investigators
   - Purpose of the project
   - Methodology (including sample, procedures and data analysis plan)
   - Evidence of consent by the ethics committee of the institution/agency from which the research subjects will be selected
   - Budget and timeframe
   - Amount of money requested from CANN;
7. The research committee will review proposals and notify the board of directors on decisions about funding awards;
8. Those who receive funding shall provide progress reports to the research committee upon request;
9. Dates for competitions for research funds will be published in AXON;
10. Researchers will be required to publish their results in AXON and at the annual meeting.
11. Researchers must submit a report of their research to the research committee.

Application deadline: Sept. 1, 2005
Maximum Amount: $2,000.00

Submit to: Marlene Reimer, Chair, CANN Research Committee, c/o Faculty of Nursing, University of Calgary, 2500 University Drive NW, Calgary, AB T2N 1N4, Telephone: (403) 220-5839 Fax: (403) 284-4803; E-mail: mareimer@ucalgary.ca