# Development and implementation of stroke guidelines: the WSO Guidelines Subcommittee takes the first step (Part one of a two-part series on the work of the WSO Stroke Guidelines Subcommittee)

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## Introduction

Despite the high incidence of stroke, the prevalence of millions of stroke survivors world-wide, and the growing body of evidence-based research on stroke management, wide variations in the quality of stroke care delivery persist. Audits of stroke care delivery in multiple jurisdictions have demonstrated variations and gaps in the quality of stroke care, with the result that some stroke patients do not receive medical care consistent with evidence-based standards (1–4). Explanations for deficiencies in care are multifactorial, but may include:

- variations in knowledge about stroke (public and provider awareness and recognition of stroke signs and symptoms)
- regional or institutional resources (such as availability of computed tomography, medical and rehabilitation specialists in stroke care and telemedicine technologies)
- organisational levels of stroke care (use of acute stroke units or stroke protocols and agreements with emergency medical services, participation in a stroke registry), and
- variations in the opinions and knowledge of local health care providers of evidence-based stroke care delivery (5).

Clinical practice guidelines have become a common element of clinical care throughout the world. Such guidelines have the potential to improve the care received by patients by promoting interventions of proven benefit and discouraging ineffective ones (6). Grimshaw examined the impact of guideline dissemination and implementation strategies through a systematic review of 235 studies. He found that it is possible to change healthcare provider behaviour and achieve an approximate 10% improvement in the process of care indicators (7). These findings are clinically significant in the context of stroke care delivery, where improvements in processes of care have been linked to improved patient outcomes (8). The combined development of evidence-based clinical guidelines, which describe 'what' should be done, and validated performance measures, which describe 'how well' it is being done, are powerful tools to drive an international agenda to improve and monitor the quality of stroke care across the continuum.

Given the significant burden of stroke world-wide, the need to develop standardised best practice guidelines for stroke, based on the best available evidence and adaptable to local/regional contexts, has become imperative for all stroke clinicians. In 2007, the World Stroke Organization created a Stroke Guidelines Subcommittee to exemplify its commitment to stroke best practices uptake and implementation. The mandate of this subcommittee is to establish a framework and action plan for collaboration in the development and dissemination of stroke guidelines across the continuum of care and across organisations and jurisdictions. The goals of the Guidelines Subcommittee are to:

- create a mechanism for conducting and/or sharing systematic literature reviews to reduce wasteful duplication across organisations
- identify priority areas for new guideline development based on strong emerging research findings
- develop a common approach to the dissemination of stroke guidelines to maximise uptake
- collaborate on education initiatives related to stroke guideline uptake and implementation in stroke care delivery, and
- collaborate in the evaluation of the impact of stroke guidelines on patient outcomes with the goal of developing international targets and benchmarks for inclusion in stroke guideline documentation.

## International Stroke Guidelines Survey

As a first step in meeting their goals, the WSO Guidelines Subcommittee conducted an electronic survey to identify current stroke guideline development initiatives across the globe. Members of the Guideline Subcommittee developed the survey content and reviewed all the findings.

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## Survey sample

The survey was sent to 1500 registered members of the World Stroke Organization in December 2008, through a common email announcement about the survey. The email included a link to an online survey tool where respondents could reply directly. A link to the survey was also posted on the WSO website. Two reminder emails were sent out subsequently to encourage members to complete the survey. The online survey remained open for six-weeks.

## Survey content

The survey explored whether stroke guidelines had been developed by state/provincial/national groups; the process that was followed for development of the guidelines; whether interprofessional groups of healthcare providers were involved in guideline development; the stages of the stroke continuum of care addressed in the guidelines; and whether a process had been established to monitor the effectiveness of the guidelines in improving stroke care delivery within the appropriate jurisdictions (Fig. 1).

There were two parts to the survey; part one inquired about stroke best practice guideline development within the respondent's country or region, and part two explored current practices for measurement and monitoring of stroke care performance based on best practices.

In instances where multiple responses were received from the same country, it could be difficult to ascertain whether their responses related to the same single guideline document or whether they referred to separate distinct documents. To

Section One: Stroke Guideline Development

1. Your Country: Your State/Province/Region:

2. Has your country/province/state developed stroke best practice guidelines based on currently available research evidence? Yes ☐ No ☐

If yes, please complete the Table at the end of this survey describing the guidelines you currently have implemented. If no, please proceed to Section Two

3. Are these guidelines available for distribution? Yes ☐ No ☐
(Please provide citation in the Table at the end of this document)

What is the name of the group/organization who is responsible for the development of these guidelines?

Do you have a formal process that is followed when developing or updating stroke best practice clinical guidelines? Yes ☐ No ☐

Is a multidisciplinary group of healthcare professionals involved in eth development of these guidelines? Yes ☐ No ☐

Would these country/province/state guidelines be available to be considered for posting on the WSO website as part of a central guideline repository? Yes ☐ No ☐

Who is the primary contact to access these guidelines?
(Please include name and email address or Phone No.)

Section Two: Monitoring and Evaluation of Stroke Care Delivery

Does your country/province/state have systems in place to assess whether evidence-based stroke guidelines and/or care processes are implemented or adhered to? Yes ☐ No ☐

Has your country/province/state identified a set of stroke performance measures or other quality indicators to monitor stroke care delivery? Yes ☐ No ☐

If yes, please upload the list of indicators

Has your province/state/country conducted a stroke audit (coordinated process for collecting data on a population or sample of stroke patients using patient hospital charts within a specified time frame) within the past five years? Yes ☐ No ☐

If yes, date of last stroke patient audit?

How many charts were included in the audit?

What components of the stroke continuum of care were covered by your audit?

☐ Primary Prevention ☐ Prehospital
☐ Emergency care ☐ Acute Inpatient Care
☐ Stroke Rehabilitation ☐ Secondary Stroke Prevention

Does your province/state/country have a stroke registry in place (data system for collecting data on all stroke patients managed within participating centres on an ongoing continuous basis) to monitor stroke care delivery on an ongoing basis? Yes ☐ No ☐

Name of the Registry:

Name of the Primary Administrator of the registry:

Year Registry started: Current number of patients enrolled:

What components of the continuum of care are covered by this stroke registry?

☐ Primary Prevention ☐ Prehospital
☐ Emergency care ☐ Acute Inpatient Care
☐ Stroke Rehabilitation ☐ Secondary Stroke Prevention

**Fig. 1** WSO Guideline Survey.

clarify these uncertainties further inquiries were sent, where possible, to respondents or other representatives from the identified guideline developer groups.

## Results

A total of 358 full or partial responses were received during the survey period. Of these, 226 had answered all the stroke guideline-related questions. The respondents represented 65 of the 84 member countries of the WSO (77%) from across six continents, with the greatest number of responses received from Asia (41%) and Europe (34%).

### Part one: guideline development

Among the responses, 70 distinct guidelines were clearly identified from 39 countries. For some of these guidelines, only partial information was received regarding content areas, development process, update frequency, and expected next update. Table 1 provides a list of countries where stroke guidelines were identified by survey respondents.

Respondents from 17 countries reported their country did not have standardised stroke guidelines available. Follow-up searches in the published literature and online search tools were conducted to see if guidelines in these countries could be found that respondents may not have been aware of. None were found for the following countries: Algeria, Bahrain, Greece, Iran, Kenya, Turkey and the United Arab Emirates.

Of the guidelines identified through this survey, more than half had last been updated before 2006, and 31 groups out of the 70 identified that they were planning updates to their guidelines in 2009 or 2010. The topics covered by each guideline varied, as shown in Fig. 2. Most guidelines included more than one part of the continuum within the same document, most frequently emergency (hyperacute) and acute care, and acute care and secondary prevention. Guidelines for stroke rehabilitation and prehospital care more often stood alone rather than in combination with other topic areas, or were not included at all.

The survey respondents reported a range of methods that were employed to develop the available stroke guidelines. Formal methods involving interprofessional groups were reported for 70% of the guidelines. On further exploration, physicians alone were involved in the majority of the guidelines, developed with the support of research assistants (79%). In other guidelines a broader interprofessional healthcare team approach was indicated, primarily including nurses and physical therapists.

### Part two: measurement and monitoring

One-third of survey respondents reported that their country/region has ongoing mechanisms in place to monitor adherence to stroke best practices. These mechanisms included; formal performance measurement systems, and identified lists of performance indicators.

Respondents reported 35 distinct stroke registries that continually monitor stroke performance. The majority of these registries focused on emergency department and acute care, with two-thirds also including secondary prevention. Rehabilitation was included in less than half of the reported registries. Distinct stroke audits

**Table 1** Countries reporting stroke guidelines by World Health Organization regions

| World Health Organization region | Countries reporting existence of guidelines |
|---|---|
| Pan-American Health Region | Argentina, Brazil, Canada, Chile, El Salvador, United States of America |
| European Health Region | Belgium, Bulgaria, Bosnia-Herzegovina, Croatia, Czech Republic, Denmark, Finland, France, Germany, Israel, Italy, Montenegro, Netherlands, Norway, Poland, Romania, Russian Federation, Slovak Republic, Spain, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland, Scotland, Ukraine |
| Eastern Mediterranean Health Region | No guidelines reported in survey |
| African Health Region | No guidelines reported in survey |
| Western-Pacific Health Region | Australia, China, Japan, Malaysia, New Zealand, Philippines, Singapore |
| South-East Asia Health Region | Indonesia, Thailand |

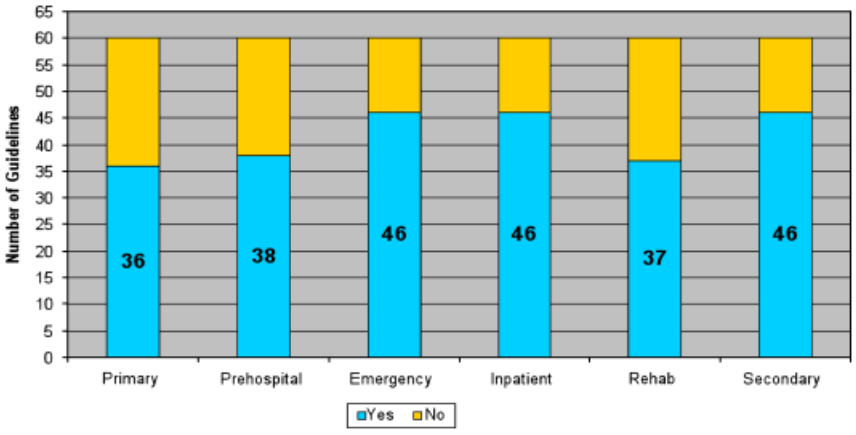


**Fig. 2** Topic areas addressed in existing stroke guidelines identified through WSO guideline survey.

were also explored as part of the survey. Among the results, 54 of the 358 respondents reported their country/region had conducted a stroke audit to examine stroke care delivery. Of these, 91% included acute stroke care and 84% included care in the emergency department as well. Secondary prevention was included in 72% of reported audits, and rehabilitation in 65%. Prehospital care was included in only 37% of reported audits.

## Discussion

The WSO Guideline Subcommittee has taken the first steps to understanding the resources available around the world to support healthcare professionals involved in stroke care to deliver evidence-based practice. The survey provided valuable information and guidance to the WSO Guidelines Subcommittee. It was somewhat surprising but certainly gratifying to note that organisations from across six continents had undertaken comparable processes in developing evidence based stroke practice guidelines. Most of these guidelines however emerged from more developed jurisdictions. On further inquiry, these guidelines have been found to be similar in overall development approach, in key content topics, in the research base used to support these topics, and in the final recommendations.

Nuances specific to the country of origin do appear in the recommendations, which often reflect differences in the structure of healthcare systems, geographic make-up, and resource availability: such as location and access to computed tomography scanners and comprehensive stroke centres, emergency medical service agreements, and the existence of stroke prevention clinics. In Europe, although the European Stroke Organization (ESO) guidelines have been adopted as the official guidelines for several countries, it was interesting that through this survey several European nations referred to additional local or regional guidelines that may or may not be based on the broader ESO guidelines.

A key observation from this survey and the follow-up correspondence received by the WSO Guidelines Subcommittee is the growing interest among developing countries to create and implement evidence-based stroke best practices. Healthcare professionals from these countries have sought guidance from the committee and its members on processes to develop or adapt existing guidelines for their use. In response to this need, the WSO Guidelines Subcommittee members have developed a handbook for all healthcare professionals, particularly those in developing countries, which provides step-by-step guidance on adapting existing stroke guidelines to fit with their stated needs and circumstances. The Clinical Practice Guideline Development Handbook for Stroke Care was released by the World Stroke Organization in September 2009 (9).

The goal and intended purpose of the 'Handbook' is to reduce the work associated with developing guidelines by adapting existing guidelines that have been created by other stroke guideline groups using strong methodological rigour. The process of adaptation, defined as 'the systematic approach for considering the use and/or modifying guideline(s) produced in one cultural and organisational setting for application in a different context', has been outlined by groups such as the ADAPTE group (10). The ADAPTE framework has been selected by the WSO as the conceptual framework for this handbook, which provides a clear and concise summary of the steps involved in guideline adaptation. This process can be useful to healthcare groups, and it requires a systematic process to be followed to ensure any stroke guidelines implemented are valid, relevant and will lead to improvements in stroke care.

The WSO Guideline Subcommittee next steps are:

- to gain a further understanding of the guideline efforts of stroke groups
- look for opportunities to align these efforts and increase collaboration in the development of systematic reviews and guidelines among members
- provide guidance to developing countries seeking assistance with establishing and implementing stroke guidelines, and
- further understand the impact all these guideline initiatives have on patient care and outcomes.

To address the latter objective, further exploration of systems in place to measure and monitor stroke care delivery are being undertaken and will be reported in part two of this series. These efforts will hopefully lead to a better understanding of the impact of stroke guidelines and the ability to set benchmarks for a range of settings and healthcare environments where stroke care is provided.

It is evident that there is a strong desire among organisations from around the world to align and collaborate in their efforts to develop clinical practice guidelines for stroke care. The World Stroke Organization and its members are eager to help and are well positioned to support these efforts through a better understanding of the needs of stroke care providers and networks to connect guideline developers and encourage collaboration.

## References


1 Royal College of Physicians. National Sentinel Audit of Stroke. Available at http://www.rcplondon.ac.uk/clinical-standards/ceeu/Completed-work/Pages/Stroke-audit.aspx (accessed 20 August 2010).
2 Kapral M, Hall R, Silver F, Richards J, Robertson A, Fang J. Registry of the Canadian STroke Network: Report on the 2004/05 Ontario Stroke Audit. Toronto: Institute for Clinical Evaluative Sciences, 2009 Available at http://www.ices.on.ca/webpage.cfm?site_id=1&org_id=31&morg_id=0&gsec_id=0&item_id=548 (accessed 20 August 2010).
3 Fonarow GC, Reeves MJ, Smith EE *et al.* on behalf of the GWTG-Stroke Steering Committee and Investigators. Characteristics, performance measures, and in-hospital outcomes of the first one million stroke and transient ischemic attack admissions in get with the guidelines-stroke. *Circulation: Cardiovasc Qual Outc* 2010; **3:**291–302.
4 National Stroke Foundation. National Stroke Audit Clinical Report. Available at http://www.strokefoundation.com.au/images/stories/healthprofessionals/national%20stroke%20audit%20clinical%20report%20acute%20services.pdf (accessed 20 August 2010).
5 Grimshaw JM, Thomas RE, MacLennan G *et al.* Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technol Assessment* 2004; **8:**17–42.
6 Woolf SH, Grol R, Hutchison A, Eccles M, Grimshaw J. Clinical practice guidelines. The potential benefits, limitations, and harms of clinical guidelines. *BMJ* 1999; **318:**527–30.
7 Grimshaw JM, Eccles MP. Is evidence based implementation of evidence based care possible? *MJA* 2004; **180:**S50–1.
8 Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. *Cochrane Database Syst Rev* 2007:CD000197.
9 World Stroke Organization. Available at http://www.world-stroke.org/PDF/guidelines.pdf (accessed 20 August 2010).
10 ADAPTE Group. Available at http://www.adapte.org (accessed 20 August 2010).