Asia Pacific Consensus Forum on Stroke Management

Organizing Committees (Program, Advisory, and Local)

**Background and Purpose**—Because of the enormity of the burden of stroke globally, there is a real need to develop strategies to reduce its impact. With this in mind, the World Health Organization (Division of Mental Health and Prevention of Substance Abuse) together with the National Stroke Foundation (Australia) sponsored the Asia Pacific Consensus Forum on Stroke Management in Melbourne, Australia, in October 1997. Representatives from the European Stroke Council, American Heart Association, Canadian Heart Association, Stroke Society of Australasia, and South-East Asian Stroke Association were involved, together with other delegates from Southeast Asia, Asia, North America, Europe, the Middle East, South Africa, and the subcontinent. Contributions from delegates allowed a broad set of principles to be put in place concerning stroke management that may be generalizable globally and with specific emphasis on the Asia Pacific region.

**Summary of Report**—The Melbourne Declaration on Stroke Management of October 29, 1997, consisted of 9 key points made in the areas of primary prevention, acute stroke, secondary prevention, organization of stroke services, economic aspects, issues relating to developing countries, remote and rural areas, evaluation of quality of care, rehabilitation, and public health/education issues.

**Conclusions**—The consensus statement embodied in the Melbourne Declaration provides a framework for countries to establish minimum standards of stroke care and thus make a contribution toward reducing the global burden of stroke. (Stroke. 1998;29:1730-1736.)

**Key Words:** stroke management ■ consensus document ■ guidelines

Stroke is the second most common cause of death globally, although, paradoxically, the problem tends to receive less attention than many other disease processes from healthcare providers. As the world population ages, the burden due to stroke is likely to increase in regions such as Asia, where an increase in risk factors such as smoking and the introduction of western dietary patterns is also occurring. Other groups, such as women, may also need attention because of their longer lifespan and increase in smoking incidence. In order to contain the problem, minimum standards concerning stroke management need to be set to provide a framework within which governments may work. This document addresses many of these issues.

**Scope and Purpose**

This consensus meeting was an initiative of the World Health Organization (WHO, Division of Mental Health and Prevention of Substance Abuse) and the National Stroke Foundation (Australia). Representatives from the European Stroke Council, American Heart Association, Canadian Heart Association, Stroke Society of Australasia, and South-East Asian Stroke Association were also involved. It was thought that since the first WHO-sponsored consensus meeting in Helsinki for the European population new issues had arisen that could be addressed in a second consensus forum. Specific issues related to the Asia Pacific Region also needed to be addressed. To obtain a broad representation, delegates from Southeast Asia, Asia, North America, Europe, the Middle East, South Africa, and the subcontinent were invited to contribute so that a broad set of principles could be put in place concerning stroke management. At the same time, regional variations in available resources for healthcare management in general could be taken into account.

The general aims of the conference were to produce a series of statements with accompanying goals, specific interventions, and future and research priorities in the following areas: (1) primary prevention, (2) acute stroke, (3) secondary prevention, (4) organization of stroke services, (5) economic aspects, (6) developing countries, remote and rural issues, (7) evaluation of quality of care, (8) rehabilitation, and (9) stroke, a public health and education issue.

**Methods**

The delegates were initially addressed by the following speakers at the opening ceremony: Right Honorable Robert Knowles, Minister of Health, Victoria, Australia; Dr John Orley, Program Manager, Program on Mental Health, Division of Mental Health and Prevention of Substance Abuse, World Health Organization, Geneva, Switzerland; and Professor Geoffrey A Donnan, Director of Research, National Stroke Foundation, Melbourne, Australia.
The first part of the program consisted of a series of plenary sessions in which experts in the field gave an overview of the topic that would later be discussed in workshops. A poster session was also conducted in which participants from various countries addressed aspects of stroke management pertinent to their region.

In the second part of the forum, the workshops were conducted by chairpersons and cochairpersons and assisted by rapporteurs. A draft of a consensus statement was presented to the group after which interactive discussion, modification of the statement, and/or complete replacement with a new statement were undertaken.

The consensus statements were reviewed by a broadly based consensus panel, the membership of which consisted of Professor Geoffrey Donnan (Forum Chairman), Professor Stephen Davis (International Advisory Committee), Dr Brian Chambers (Local Organizing Committee), Professor Jean-Marc Orgogozo (Europe), Dr Tim Ingall (North America), Dr John Orley (WHO), Dr David Dunbar (geriatrics), Ms Louise Ada (allied health), Dr Michael Fett (National Health and Medical Research Council–Australia), Ms Barbara Lester (nursing), Dr Meng Wong (Southeast Asia), Ms Franca Smarelli (nongovernment organizations), and Dr Susanne Wright (consumers).

A final review of the statements was then undertaken at a session involving all delegates. This version was presented and read as the Melbourne Declaration on Stroke Management, October 29, 1997.

The Melbourne Declaration of the Asia Pacific Consensus Forum on Stroke Management

Stroke is a public health problem that contributes significantly to the global burden of disease, and is predicted to become an even greater burden within the next 25 years, given the ageing of the population and the increase in other risk factors.

At the meeting, nine statements were made in response to this global problem. (1) Primary prevention should form the cornerstone of a plan to reduce the incidence of stroke. Both mass campaigns and those focused on high risk groups should be used. (2) The general public and healthcare professionals should be made more aware that stroke is a medical emergency. Education needs to be provided concerning the signs and symptoms of stroke and, wherever possible, specialized stroke units or stroke teams need to be established to provide acute stroke care. (3) Existing knowledge about methods to reduce the recurrence of stroke following a first attack should be applied more broadly in healthcare services and the community. (4) Concerning the organization of stroke services, the views of patients, community groups, and service providers need to be taken into account to ensure a seamless service for patients as they move through the system. (5) The concept of cost effectiveness needs to be embraced when developing management plans for stroke prevention, acute treatment, rehabilitation, and community integration. This should include the identification of specific issues and items that determine the overall direct and indirect costs of stroke. (6) It must be recognized that many countries are unable to provide an ideal stroke service because of lack of resources.

However, in these countries it is still possible to introduce or strengthen efforts that will reduce the incidence of stroke, particularly by public health measures directed at risk factor modification. It is also possible to identify or establish local teams who would be clinically responsible for the delivery of stroke services and provide training and education of other healthcare providers. (7) Countries should establish systems for the collection of appropriate data for measuring trends of incidence, prevalence, morbidity, and mortality from stroke as well as data evaluating the quality of stroke prevention and management at local, regional, and national levels. (8) All stroke patients should have access to adequate rehabilitation services directed toward achieving optimal function, independence, and quality of life for patients through restorative care.

Consensus Statement 1: Primary Prevention

Goal

To formulate and implement community specific programs for reducing the incidence of stroke and vascular dementia.

Specific Interventions

In each community we should: (1) measure trends of incidence, prevalence, morbidity, and mortality of stroke; (2) determine risk factors for stroke; (3) devise specific targets through an understanding of cost-effectiveness, equity, and resource allocation; (4) introduce strategies targeted at the whole population to encourage a healthy lifestyle, including smoking cessation, regular exercise, and reduction of obesity, cholesterol, excessive intake of salt, dietary fat, and alcohol, and other relevant risk factors. These strategies should be integrated within a broad prevention health promotion program targeted at all vascular diseases; (5) identify, treat, and monitor those with hypertension, diabetes, atherosclerotic vascular disease, and cardiac diseases that predispose to stroke (such as atrial fibrillation, myocardial infarction, and rheumatic heart disease); (6) Educate the community about stroke, its presenting symptoms and the risk factors which predispose to stroke; (7) improve compliance with lifestyle recommendations and medical treatments to reduce stroke risk; (8) carotid endarterectomy for asymptomatic carotid stenosis may be of benefit in selected patients but the benefits of surgery do not warrant mass screening programs.

Responsibilities

The responsibility for primary prevention of stroke is shared. The parties include the following:

- Governments—to legislate (eg, anti-tobacco advertising), develop, and fund intervention programs;
- Professional & nongovernment organizations—to develop targets in conjunction with government, advise and provide educational resources to government and the community, and educate healthcare providers;
Consensus Statement 2: Acute Stroke

Goals
The following guidelines can be adopted according to the extent of resources in each region.

1. To make the public and healthcare providers more aware that stroke is a medical emergency and provide education of the signs and symptoms of stroke.
2. To provide access (including emergency transport) for all patients with acute stroke to an acute care hospital and, wherever possible, to specialized stroke units or stroke teams.
3. To introduce emerging acute stroke therapies using evidence-based principles.
4. To establish the early diagnosis of cerebral infarction or intracerebral hemorrhage, wherever possible this should be by CT or other neuroimaging techniques.
5. To reduce the early mortality of acute stroke while improving the proportion with minimal disability.

Specific Interventions
1. There is definite evidence that management in a specialized stroke unit environment improves mortality and outcome in a cost-effective way.
2. Evidence-based principles should be the basis for introduction of new acute therapies; disproven treatments should not be used.
3. There is emerging evidence that thrombolysis may be an effective form of therapy for ischemic stroke if administered within 3 hours of stroke onset.
4. Modest elevation of blood pressure should not be treated in the acute phase of ischemic stroke.
5. Aspirin given within 48 hours of acute ischemic stroke slightly improves outcomes.
6. Early mobilization, early rehabilitation, attendance to potential swallowing problems, and compressive stockings for paralyzed legs are some factors likely to be of importance for good outcome.
7. Current evidence indicates that low- or intermediate-dose heparin given subcutaneously does not improve stroke outcome, but may be indicated for deep vein thrombosis prophylaxis. Low-molecular-weight heparins are currently under investigation.

Research Priorities
1. Development and testing in clinical settings of new therapeutic principles that may also be effective during longer time windows after the onset of acute ischemic stroke;
2. Develop a better understanding of the pathophysiology of stroke progression and early recurrence;
3. Develop new therapeutic strategies to improve the outcome of intracerebral hemorrhage;
4. To identify factors (including hospital arrival time and emergency room delay) that would increase the proportion of patients who would be eligible for acute therapies;
5. Develop brain imaging techniques to facilitate early diagnosis of stroke.

Consensus Statement 3: Secondary Prevention

Goals
1. To reduce the incidence, disability, dependency and mortality from recurrent stroke;
2. To better define risk factors for recurrent stroke;
3. To introduce known means of reducing stroke recurrence more broadly in the community eg, antiplatelet therapy.

Specific Interventions
1. Modification of adverse lifestyle and major risk factors such as hypertension, diabetes, lipids, smoking, and alcohol abuse is desirable after stroke.
2. Antiplatelet agents, such as aspirin, reduce the relative risk of stroke or death by approximately 20% per year after transient ischemic attack (TIA) or minor ischemic stroke. This translates into an absolute benefit of 12 strokes (in 12 patients) prevented per 1000 patients treated for 1 year, at a cost of approximately 1 intracerebral hemorrhage. Ticlopidine and clopidogrel are slightly more effective than aspirin. The precise role of other antiplatelet strategies such as dipyridamole and combination therapies remains under surveillance.
3. In patients with TIA or minor stroke and nonvalvular atrial fibrillation, warfarin reduces the relative risk of recurrent stroke by about 70% and should be used in selected patients. In treating 1000 such patients, approximately 80 strokes will be prevented at a cost of 20 major hemorrhages per year. The use of anticoagulation is associated with significant hazard and requires rigorous patient selection and quality assurance. The therapeutic International Normalized Ratio should be 2.0 to 3.0, based on the evidence from both secondary and primary stroke prevention trials in patients with atrial fibrillation.
4. In developing countries, rheumatic heart disease is also a major cause of stroke. In these regions anticoagulant monitoring is a major problem and should be made more accessible.
5. In appropriate patients with symptoms attributable to ipsilateral carotid stenosis of 70% or more using North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria (equivalent to 80% European Carotid Surgery Trial [ECST] criteria) carotid endarterectomy reduces the relative risk of subsequent risk of stroke or death by about 70% within 2 years. The benefits of surgery increase with greater degree of stenosis and number of risk factors. Carotid endarterectomy is associated with significant risk and the combined angiographic and perioperative stroke and death rate should be less than 6%. Therefore, surgical expertise should be developed in selected centers. Extracranial carotid disease is much less common in Asian populations.
Research Priorities
1. Identification of risk factors or predictors of stroke recurrence.
2. Trials of modification of risk factors for stroke recurrence such as hypertension and elevated blood lipids.
3. Development and testing of new antiplatelet agents to reduce the incidence of stroke recurrence.
4. Development and evaluation in controlled clinical trials of new techniques such as angioplasty/stenting.
5. Aspirin safety should be further assessed in Asian populations.
6. Alternative, safer, and cost-effective treatments for cardiogenic embolism, particularly rheumatic heart disease, should be explored.
7. Monitoring and research in controlled clinical trials of the use of new and alternative medical strategies, including vitamins, acupuncture, and traditional medicines should be conducted.
8. Further research is needed into different types of cerebrovascular disease and their prevalence in different geographical regions.

Consensus Statement 4: Organization of Stroke Services

Goals
1. Organizational strategies should be developed in each country to optimize stroke care. These strategies should take into account local, national, and global needs, as well as the availability of resources.
2. Strategies should be developed to promote education at both community and professional levels to address stroke prevention, acute stroke treatment, rehabilitation, and community services.
3. Strategies should be developed to focus resource allocation on the following:
   - Controlling risk factors (improving stroke prevention);
   - Developing acute stroke care facilities;
   - Developing rehabilitation services;
   - Ensuring access to all stroke services including emergency transport and appropriate communication technologies; and
   - Ensuring access to healthcare workers most skilled in stroke care.
4. The views of patients, family, and caregiver have access to all aspects of community stroke services available through the appointment of a linkage coordinator.
5. The smooth coordination of services both locally and nationally needs to occur among the different aspects of health care and delivery of services.

Specific Interventions
1. Organizational strategies should be developed at all levels including the local level (urban, rural, and remote), taking into consideration resource availability, cultural diversity, and geographical constraints.
2. To ensure comprehensive stroke care services the following should be included:
   - 2.1 Stroke prevention;
   - 2.2. Acute stroke services and where possible stroke units;
   - 2.3. Rehabilitation; and
   - 2.4. Community services.
3. The development of centers of excellence of stroke care (ideally stroke units) that provide a model for the delivery of “best practice” stroke care both nationally and locally.

Research Priorities
1. To develop information databases, which assess and evaluate:
   - 1.1. The needs of the community,
   - 1.2. Accessibility to stroke care,
   - 1.3. Effectiveness of acute stroke care,
   - 1.4. Rehabilitation,
   - 1.5. Adequacy of education programs.
2. Monitor the effectiveness of the strategies to optimize stroke-related health care.

Consensus Statement 5: Economic Aspects

Goals
1. For each country to have an assessment of the economic impact of stroke and to have a worldwide view to reducing the burden of stroke.
2. To identify specific issues and items that determine the overall (direct and indirect) costs of stroke.
3. To introduce the concept of cost effectiveness in stroke management plans (primary prevention, acute management, rehabilitation, and secondary prevention) appropriate to individual countries.
4. To introduce standard methodology for evaluating costs and benefits.
5. To encourage a move from simple needs description to needs prioritization (based on potential to benefit) and integration of needs assessment with economic appraisal.
6. To educate clinicians, health planners, and the public about economic issues related to stroke.

Specific Interventions
1. To develop an increased knowledge of the frequency and types of stroke together with costs of stroke in developing countries (both monetary and resource based)
2. To recognize the need for increased study of cost effectiveness of stroke management strategies including the evaluation of new therapies
3. To establish priorities for the allocation of resources within stroke management programs and between different disease processes to optimize cost effectiveness and equity of resource allocation

Future Priorities
1. Assess the potential health gains and cost implications of implementing best practice in stroke management
2. Set up a system for economic assessment (including clinical trials and long-term follow-up studies) of new medical interventions in the field of stroke and implement regular economic assessment of existing interventions
3. Incorporate economic evidence in the development of best practice guidelines
4. To determine the economic impact of alterations in stroke incidence, prevalence, handicap, and mortality and priority setting of stroke management in health service planning

**Consensus Statement 6: Developing Countries, Remote and Rural Issues**

**Issues**
1. Two thirds of the world population lives in developing countries.
   Eighty percent of these populations live in rural areas.
2. Stroke is a major health problem in developing countries. In the next 30 years the burden of stroke will grow most in developing countries rather than in developed countries.
3. Government and health planners in developing countries underestimate the importance of stroke.
4. In rural areas and developing countries access to stroke services is limited because of reasons such as geography, lack of resources, and cultural practices.
5. It is recognized that there are special considerations regarding risk factor management in developing countries, eg, antiplatelet and anticoagulant therapy may be more hazardous. In addition, the profile of risk factors not only includes recognized risk factors in developed countries but also risk factors that are more common in developing countries, eg, rheumatic heart disease and puerperal stroke.

**Goals**
1. To increase awareness of stroke among health planners and government in developing countries
2. Establish priorities in terms of resource allocation for stroke services—these should include stroke prevention as the most important priority, in particular detection and management of hypertension, prevention of smoking, and other lifestyle issues such as diet
3. To develop effective training programs for professional caregivers
4. To develop effective public awareness and education programs for stroke prevention, rehabilitation, and treatment
5. To collect accurate data on stroke
6. To develop ways of transferring rehabilitation knowledge and skills to family members and other community workers as endorsed by the WHO “Community Disability Services” initiative

**Specific Interventions**
1. Identify local individuals or teams within a defined community who are responsible for the implementation and delivery of stroke services, eg, rural and community health workers or stroke teams
2. Identify or establish key national institutions or organizations that promote training and education of health professionals and disseminate information
3. Establish a minimum data set to document and monitor key indicators of stroke at national, regional, and local levels
4. Countries should demonstrate implementation of these strategies by the year 2010.

**Consensus Statement 7: Evaluation of Quality of Care**

**Goals**
1. Countries should establish monitoring systems for routine collection of appropriate basic data needed to evaluate the quality of stroke prevention and management at local, regional, and national levels.

**General Principles**
1. For evaluation to be meaningful, the stroke services structure (ie, staffing, buildings and organization), process (ie, the way services are conducted), and outcome (ie, the effects of services) need to be assessed.
2. Quality of care is concerned with the following:
   - efficacy (does an intervention work?)
   - efficiency (does an intervention save resources?)
   - appropriateness (are the right people being treated?)
   - accessibility (is the service available?)
   - acceptability (do people want it?)
   - equity (are people fairly treated?)
   - humanity (are people treated decently?)

3. Comparisons between services should not be made unless variations in patient characteristics that may effect outcomes (eg, age, stroke severity, socioeconomic, environment, culture, health, and social sector resources) are taken into account. Ultimately, such comparisons may prove impossible to be made reliably.
4. Priorities for evaluation must be set relevant to national, regional, and local needs.
5. Special consideration should be given to views of patients, their caregivers and the general public in defining the scope of evaluation.
6. Evaluation for the purposes of monitoring public health and standards of care should include indicators for the following:
   - prevention,
   - diagnosis/assessment,
   - acute care,
   - rehabilitation,
   - community care,
   - residential care,
   - primary care,
   - informal care, and
   - voluntary sector care.
7. The cost of data collection should be commensurate with the value of obtaining the information.
8. The accuracy of existing mortality and hospital statistics should be improved.
9. Evaluation of stroke services will require more detailed, accurate, and timely information from primary care providers, hospitals, and other service providers.

**Research Priorities**
1. Establishing the key indicators of process and outcome
2. Definition of what to measure, how to measure, and when to measure
Consensus Statement 8: Rehabilitation

Goals
1. All stroke patients should have access to rehabilitation aimed at achieving optimal function, independence, and quality of life through restorative care, including locally and culturally available resources.

Rehabilitation comprises assessment, goal planning, intervention, and evaluation. This should be delivered in the setting most appropriate to the individual.

2. Financial, clinical, and community resources for rehabilitation must be provided in proportion to the level of stroke disability in a community.

Specific Interventions
1. All stroke patients must be assessed as early as feasible to establish the initial rehabilitation goals.

   • 1.1. Optimally, an interdisciplinary team will provide assessment, with each member trained in stroke rehabilitation. The members of the team should include people specialized in assessment and management of all potential disabilities such as those arising from impaired motor and sensory function, cognition, communication, and emotional state.

   • 1.2. Local resources and expectations will require that the team be locally relevant.

2. Initial rehabilitation goals should be patient oriented and involve the person, family, other caregivers, and rehabilitation team members.

   • 2.1. Rehabilitation goals will identify the interventions necessary to enable the individual to achieve maximal potential.

   • 2.2. Rehabilitation goals must recognize the individual’s cultural and social expectations.

3. Effective rehabilitation interventions require collaboration between all persons involved in the individual’s care.

   • 3.1. All resources relevant to achieving the rehabilitation goals should be utilized. Resources include not only current rehabilitation therapies but also traditional and locally available therapies, the person’s family, other caregivers, community services, and support providers. Wherever possible, evidence-based therapies should be used.

   • 3.2. Interventions appropriate to the individual’s need and capacities should be provided in any care setting. Continuity of treatment should be provided when an individual is transferred between care settings.

4. Ongoing evaluation is essential to ensure that the changing recovery and care needs of stroke patients are monitored and met.

   • 4.1. The rehabilitation service, the person, their primary care provider, family, or other caregivers can initiate a reassessment of needs.

Research Priorities
1. Evidence-based rehabilitation practice requires that a range of scientifically valid studies be performed to evaluate potential rehabilitation strategies, including clinical and pharmacological treatments.

2. Understanding of the interrelationship between pathology and the mechanisms of change in impairment, disability, and handicap is essential to the development of effective rehabilitation strategies.

Consensus Statement 9: Stroke: A Public Health and Education Issue

Goals
1. To have a vertically integrated approach to the burden of stroke involving government at international, national and local levels—programs put in place should have achievable goals and practical strategies, involve all stakeholders, and emphasize the importance of research.

2. To implement preventative programs such as the “Brain Attack” campaign—the aim is to involve the community, professional bodies, non-government organizations, and governments to increase public and professional awareness, to bring about lifestyle changes, and to ensure appropriate medical and rehabilitation management.

3. To increase awareness and knowledge among the community and healthcare providers of the preventable nature of stroke

4. To highlight the modifiable risk factors of stroke

5. To educate the public and healthcare workers about the warning symptoms for stroke and the need for a rapid response

6. To recognize the public health issues that arise in the post-stroke phase

Specific Interventions
To focus the “Brain Attack” prevention program on the following areas:

1. The mass approach to primary prevention—this should include public education about lifestyle factors for all people.

2. The high risk approach to primary prevention by educating those with existing risk factors for stroke.

3. The education of the public and healthcare providers concerning the warning symptoms of stroke and that these are medical emergencies.

4. The emphasis on the importance of the continuum of care approach of stroke management from the acute event through to long-term community support. Secondary prevention of stroke must form an important element of this.

5. To develop global, regional, and national guidelines for rehabilitation.

6. To underpin the campaign with a strong and comprehensive research base.

Appendix Committees and Key Participants

International Program Committee
G. Donnan (Chairman), Australia; H. Adams, USA; S. Ahmad, Indonesia; N. Anderson, New Zealand; A. Aquino, Philippines; N. Bharucha, India; S. Davis, Australia; D. Gunawan, Indonesia; R. Kay, Hong Kong; L. Lisheng, People’s Republic of China; W Ng, Malaysia; J. Norris, Canada; J. Orley, WHO, Switzerland; N. Ramani, Singapore; F. Smarelli, Australia; T. Stewart-Wynne, Australia; M. Wong, Singapore; T. Yamaguchi, Japan.
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Workshop Chairs
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