

## Clinical stroke guidelines: where to now?

Craig S Anderson

*Updated guidelines recommend improving access to specialised stroke units and thrombolytic therapy, and the rapid assessment of patients with transient ischaemic attacks for stroke risk*

Stroke, with its high incidence and serious consequences, is one of the foremost health challenges for Australia and globally. Although stroke rates appear to be decreasing,<sup>1</sup> population ageing will intensify the impact of this disease and the need for effective prevention and management strategies.<sup>2</sup> Stroke is a complex disease with a range of causes, manifestations, outcomes and treatment approaches, but is too common and costly to be left as the province of a single clinical discipline, neurology. As the therapeutic time window in which to rescue or “protect” the brain from ischaemic damage is extremely short, there is a need for good systems of communication and responsive, expert team care, both in the community and in hospitals, to ensure safe and effective delivery of interventions early after onset and in subsequent phases of acute stroke. Indeed, the single most important therapeutic advance in stroke medicine is arguably the recognition that well coordinated, multidisciplinary care in the form of stroke care units (SCUs) can significantly improve the chances of recovery from stroke. So how can we improve patient access to expert SCU care and therapies that provide the best opportunity for a favourable outcome?

A popular approach to improving the quality of health care delivery is the development of clinical guidelines. A good example is the *Clinical guidelines for acute stroke management*,<sup>3</sup> produced by the National Stroke Foundation in 2007. These guidelines update a document published in 2003 and are available from the Foundation’s website (<http://www.strokefoundation.com.au>). They aim to provide clinicians and patients with all the key information needed to make the best decisions about the benefits and risks of treatment, through the use of systematically developed statements, recommendations and algorithms based on supporting grades of evidence. In addition, the document may provide a degree of medicolegal protection for the treating clinician, and political leverage for developing services both locally and generally. So what can we learn from these stroke guidelines, developed with specific relevance to the local context?

The guidelines followed the rigorous standards of development and production set down by the National Health and Medical Research Council (NHMRC) and cover a wide range of clinically relevant topics in a simple, accessible format. The multidiscip-

linary expert working group that developed the guidelines is to be commended for seeking a wide range of external advice and comment, for incorporating consumer values and preferences in a unique additional grading of the recommendations, and for making sensible judgements for nearly half of the 148 recommendations where high-level randomised evidence was lacking — not surprisingly, mainly in the areas of supportive care and early rehabilitation.

A key recommendation emphasised in the updated guidelines is the need for rapid assessment and management by specialists of patients who present not only with established features of an acute stroke but also with a transient ischaemic attack (TIA). TIA has generally been considered more “benign” than stroke and akin to migraine, because of its brevity and reversibility. However, recent studies show that the risk of recurrent stroke early after a TIA is similar to the risk after mild ischaemic stroke: about 10% in the first week and 20% by 3 months.<sup>4,5</sup> Thereafter, the annual risks of stroke and myocardial infarction are around 5% and 2%–3%, respectively.<sup>6</sup> Given that 30%–40% of patients with ischaemic stroke have had a preceding TIA or minor stroke,<sup>7,8</sup> and that evidence is accumulating of the benefits of early interventions such as antiplatelet therapy, blood pressure-lowering therapy and carotid endarterectomy, TIAs provide an important opportunity for stroke prevention.<sup>8,9</sup>

However, the diagnosis of true stroke-related “focal” TIA is often challenging as it generally relies on patients recalling symptoms from a time when they were possibly impaired. As outlined in the

### ABCD<sup>2</sup> tool for assessment of patients with transient ischaemic attack<sup>10</sup>

- A. Age  $\geq 60$  years = 1 point.
- B. Blood pressure  $\geq 140/90$  mmHg = 1 point.
- C. Clinical features: unilateral weakness = 2 points, speech impairment alone = 1 point.
- D. Duration  $> 60$  minutes = 2 points, 10–59 minutes = 1 point.
- D. Diabetes = 1 point.

Total. 0–3 = low risk of stroke, 4–7 = high risk of stroke.

stroke guidelines, a simple measure — the ABCD<sup>2</sup> tool (a 7-point score calculated from age, blood pressure, clinical features, duration of symptoms, and diabetes status [Box])<sup>10</sup> — can help clinicians, including those in primary care, with patient triage. Those at "high" risk of subsequent stroke have the option of admission to hospital to expedite investigations and management, while those with "low" risk could be followed up quickly in specialist outpatient clinics, where available. Early assessment offers further benefits for patients, through establishing correct diagnoses for TIA-mimics, such as syncope, seizure, anxiety-hyperventilation and vestibular disturbance, allowing specific interventions and avoidance of unnecessary, costly and sometimes risky avenues of management. For all these reasons, and as suggested by Kehdi et al in this issue of the Journal (page 9),<sup>11</sup> early in-hospital management of patients with TIA may improve outcomes. However, there are major implications for resources and service configuration if rapid expert neurological assessment is to be provided to patients who present to emergency departments with TIA as well as those with stroke.

Importantly, the stroke guidelines also included cost-effectiveness analyses of the currently available, clinically proven interventions for prevention and treatment of stroke. Most noteworthy was the finding that substantial economic and health-related benefits could be derived from improved patient access to high-quality stroke services through a modest additional investment of resources. Given that a substantial proportion of the Australian population lives in rural or remote areas, where there are no SCUs or other specialty services, the guidelines recommend the creation of networks linking smaller regional and rural centres to larger centres with SCUs. Furthermore, as the availability of SCUs varies widely even in urban settings, the guidelines recommend that ambulances preferentially transfer patients with suspected stroke to hospitals with SCUs. This recommendation is controversial. Recent audits<sup>12</sup> and experience indicate that not all SCUs are resourced appropriately to allow safe and effective use of the thrombolytic agent, recombinant tissue plasminogen activator (rtPA), in carefully selected patients who present within the first few hours after the onset of ischaemic stroke. Given that rtPA is proven to be cost-effective, a reorganisation of services to allow ambulances to route patients directly to "active rtPA SCUs" could allow many more people to benefit from this treatment.

How can the recommendations in the stroke guidelines be implemented in the real, service-challenged world, where modifying the behaviour of clinicians and providers is difficult, and clinical settings are often not conducive to change? The transfer of evidence into clinical practice has, to date, been unpredictable and often slow and haphazard for many reasons, including poor knowledge, limited therapeutic expertise, lack of time and, in particular, economic restraints. The use of guidelines can better align clinical management with evidence-based practice, but this is difficult when expertise and services are non-existent or inappropriately resourced.

There is limited empirical evidence to support any specific strategy for change over another, but current data suggest that change is possible through comprehensive approaches that target different levels and settings in the health care system.<sup>13</sup> The stroke management guidelines are a positive step. Implementa-

tion strategies, including the development of policy at the highest, central level, are now needed. A key step would be for the federal government to mandate the recommendation of the National Service Improvement Framework that all people with acute stroke receive SCU or appropriate alternative care around the country.<sup>14</sup> Implementation of such policies would provide the best opportunity to improve the outcomes for patients with stroke and the growing population at risk of this devastating illness.

**Competing interests:** I have accepted research grants, honoraria and speaker fees from Boehringer Ingelheim and I am employed by the George Institute and the NHMRC to conduct research on stroke.

### Author details

Craig S Anderson, FRACP, PhD, Director,<sup>1</sup> and Professor of Stroke Medicine and Clinical Neuroscience<sup>2</sup>

<sup>1</sup> Neurological and Mental Health Division, The George Institute for International Health, Sydney, NSW.

<sup>2</sup> Royal Prince Alfred Hospital and University of Sydney, Sydney, NSW.

**Correspondence:** [canderson@george.org.au](mailto:canderson@george.org.au)

### References

- Islam MS, Anderson CS, Hankey G, et al. Trends in the incidence and outcome of stroke in Perth, Western Australia, 1989 to 2001: the Perth Community Stroke Study. *Stroke* 2008; 39: 776-782.
- Tobias M, Cheung J, Carter K, et al. Stroke surveillance: population-based estimates and projections for New Zealand. *Aust N Z J Public Health* 2007; 31: 520-525.
- National Stroke Foundation. Clinical guidelines for acute stroke management 2007. 2nd ed. Canberra: Australian Government, National Health and Medical Research Council, 2007. <http://www.strokefoundation.com.au/news/welcome/clinical-guidelines-for-acute-stroke-management> (accessed Jun 2008)
- Johnston SC, Gress DR, Browner WS, Sidney S. Short-term prognosis after emergency department diagnosis of TIA. *JAMA* 2000; 284: 2901-2906.
- Coull AJ, Lovett JK, Rothwell PM. Population based study of early risk of stroke after transient ischaemic attack and minor stroke: implications for public education and organisation of services. *BMJ* 2004; 328: 326-328.
- Van Wijk I, Kappelle LJ, van Gijn J, et al. Long-term survival and vascular event risk after transient ischaemic attack or minor ischaemic stroke: a cohort study. *Lancet* 2005; 365: 2098-2104.
- Rothwell PM, Warlow CO. Timing of TIAs preceding stroke: time window for prevention is very short. *Neurology* 2005; 64: 817-820.
- Rothwell PM, Giles MF, Chandraratna A, et al. Effect of urgent treatment of transient ischaemic attack and minor stroke on early recurrent stroke (EXPRESS study): a prospective population-based sequential comparison. *Lancet* 2007; 370: 1432-1442.
- Lavallée PC, Mesenue E, Abboud H, et al. A transient ischaemic attack clinic with round-the-clock access (SOS-TIA): feasibility and effects. *Lancet Neurol* 2007; 6: 953-960.
- Johnston SC, Rothwell PM, Nguyen-Huynh MN, et al. Validation and refinement of scores to predict very early stroke risk after transient ischaemic attack. *Lancet* 2007; 367: 283-292.
- Kehdi EE, Cordato DJ, Thomas PR, et al. Outcomes of patients with transient ischaemic attack after hospital admission or discharge from the emergency department. *Med J Aust* 2008; 189: 9-12.
- Bray JE, Coughlan K, Bladin C. Thrombolytic therapy for acute ischaemic stroke: a successful implementation in an Australian tertiary hospital. *Intern Med J* 2006; 36: 483-488.
- Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. *Lancet* 2003; 362: 1225-1230.
- National Health Priority Action Council. National Service Improvement Framework for Heart, Stroke and Vascular Disease. Canberra: Australian Government Department of Health and Ageing, 2006.