Strategies to improve outcomes after acute stroke

Stroke care units are the key to improving outcomes

OVER THE PAST 25 YEARS there has been a quiet revolution in care of patients with stroke, with the introduction of effective interventions to minimise the impact of stroke after its onset. Although some potential secondary prevention strategies were used sporadically before the mid-1970s, none had been proven to be effective with what we now accept as Level 1 evidence. However, since then, a series of evidence-based strategies have been introduced — antiplatelet agents (initially aspirin in 1978,[1] and most recently clopidogrel[2]), carotid endarterectomy in 1991,[3] warfarin (for patients with atrial fibrillation) in 1993,[4] and perindopril in 2001.[5] In spite of the tenuous epidemiological association between cholesterol levels and ischaemic stroke, statins (eg, simvastatin) may also be effective in secondary prevention.[6]

Interventions for acute stroke have been more problematic. Despite the exciting advances in treatment of ischaemic heart disease, developments in stroke treatment were slow. Stroke care units were introduced in the mid-1970s — the first in Australia at the Austin Hospital, Melbourne, in 1978.[7] However, not until 1993 did it become clear that management in a stroke care unit reduced morbidity and mortality compared with general ward management[8] and, more recently, that patients treated in physically discrete units have better outcomes than those who are dispersed in different locations and rely on mobile stroke teams.[9] Thrombolysis with tissue plasminogen activator (tPA) (given within three hours of stroke onset) was introduced in 1995[10] and with aspirin (given within 48 hours of onset) in 1997.[11] Neuroprotection with agents such as glutamate antagonists, among others, is still being evaluated.

In this issue of the Journal, four articles reflect on the enactment of these advances in Australia.[12-15] Duffy and colleagues (*page 318*) document the secondary prevention strategies administered in Australian hospitals and show their relatively poor uptake into clinical practice despite Level 1 evidence of their effectiveness.[12] This highlights the difficulty of bridging the evidence–practice gap.[16] The other three articles focus on the "sharp end" of stroke intervention — a report of the first Australian experience of thrombolysis with tPA (Szoeke et al; *page 324*),[13] another on the reasons for delay to admission for acute stroke management (geographical location of the patient at stroke onset was the only independent predictor) (Broadley and Thompson; *page 329*),[14] and finally the outcomes of combined acute and rehabilitation care in a stroke unit — probably the ideal model of care (Ang et al; *page 333*).[15]

It is salutary to compare the effects on death and disability of the three proven strategies for stroke intervention — management in a stroke care unit, and aspirin and tPA administration (Box). Using broad assumptions about the current uptake of these strategies by Australian physicians, the absolute benefits of stroke care unit management clearly outweigh those of aspirin and tPA administration. If use of all three strategies was maximised to about 80% for stroke care unit management, 80% for aspirin administration within 48 hours of stroke onset, and 10% for tPA administration within three hours, the difference in potential absolute benefits would be even more marked —the benefits of stroke unit management would be more than double those of either tPA or aspirin. Perhaps even more importantly, when a stroke care unit is established the staff skill base increases, and protocols are put in place, increasing the likelihood of evidence-based practice for both acute intervention and secondary prevention strategies. These benefits highlight the need for the timely introduction of stroke care units in Australia.

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What then is being done? Progress has been lamentably slow. While there have been stroke care units in most tertiary hospitals in Victoria for the past 10–15 years, their introduction in other States has been tardy. However, this is changing. The New South Wales Minister for Health has

Actual and potential benefits (avoidance of death or disability) of acute interventions for stroke in Australia

Intervention	Absolute risk reduction	Number needed to treat	Estimated proportion of stroke patients treated*	Current absolute benefit† (number of cases)	Potential proportion of stroke patients treated	Potential absolute benefit† (number of cases)
Stroke care unit	4%‡	25‡	23%	423	80%	1472
Aspirin§	1.2%§	83§	70%	387	80%	443
Tissue plasminogen activator¶	12.0%¶	8¶	< 1%	< 23	10%	575

* From the National Stroke Foundation survey of stroke care unit access, 1998.[16]
† Number of deaths or cases of disability avoided among 46 000 strokes in Australia per year.
‡ From the Stroke Unit Trialists' Collaboration.[17] § From the International Stroke Trial.[11]
¶ From the National Institute of Neurological Disorders and Stroke recombinant tissue plasminogen activator trial.[10]

taken a bold initiative which would be well emulated in other States and Territories. Based on advice from senior physicians, a plan was established for the current and future health needs of the almost five million people living in Sydney and surrounding areas. An increase in the number and quality of stroke care units was clearly a priority. More than $10 million of recurrent and $2 million of capital funding was allocated to upgrade facilities within the greater metropolitan area, which will lead to the establishment or improvement of 18 stroke care units.

Moves are also afoot nationally. The National Health Priorities Action Committee has formed a Heart, Stroke and Vascular Disease group. One of its first tasks, in collaboration with the National Stroke Foundation, has been to help coordinate the introduction of stroke care units in Australia.

However, improving "front-end" resources is only one issue. Stroke management is a continuum of care from entry into acute stroke care units through to access to rehabilitation and geriatric facilities, community involvement and, for some, nursing home placement. Resources are needed to avoid blockages at any points on this continuum. Too many stroke care units are unable to admit patients for acute intervention because beds are blocked by those awaiting nursing home placement.[18] As with other major health problems, the peculiarly Australian phenomenon of acute health being a state responsibility, while nursing home bed numbers are under federal control, acts as a political and bureaucratic barrier to action. Benefits to stroke patients are being lost while state and federal bodies debate who is responsible for this lack of coordination. It is time for constructive action!

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Competing interests

GAD and SMD are investigators for START (Stroke in Hospitals: an Australian Review of Treatment), coauthors of the article by Duffy et al[12] and members of the National Health Priorities Action Committee. SMD is also a coauthor of the article by Szoeke et al.[13]

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