

TIA and stroke

a management guide for GPs

The incidence of stroke in Australia is about 46,000 per year. It is the third most common cause of death in this country (about 15,000 per year) and a major cause of disability. All GPs need to be aware of rapid changes occurring in management.

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For stroke, perhaps above all other medical conditions, there is a need for a seamless continuum of care from the acute presentation, through management in hospital or other healthcare facility, to integration back into the community. With the availability of level I evidence to show that the burden of stroke may be reduced by specific strategies for the acute phase as well as effective forms of secondary prevention, management is changing rapidly. This article discusses current approaches to management, and highlights the specific roles that GPs play – these are summarised in the box on page 18. The evidence underlying changes in management approaches is also explained (see the box on page 21).

There are now three specific strategies in acute stroke management that have been proven to improve outcomes (that is, are supported by level I evidence). Specifically:

- administration of intravenous tissue plasminogen activator (tPA [Actilyse]) within three hours of stroke onset may increase the number of patients improving to virtually no

clinical deficit by about 30%^{1,2}

- administration of aspirin within 48 hours of ischaemic stroke onset may reduce death and disability in about nine patients per 1000 treated³
- management in a stroke care unit may reduce mortality and disability by about 20%.⁴

Pre-hospital management

For the stroke patient, time is brain. The GP's initial tasks are to recognise the symptoms and signs of an acute transient ischaemic attack (TIA) or stroke (Table 1), and to facilitate rapid transfer to a healthcare facility where the strategies listed above can be put into place with minimal delay. If there is any doubt about the diagnosis, the patient should be transferred to hospital for further investigation. Differential diagnoses are listed in Table 2.

A number of factors have been identified that may prolong hospital arrival times. These include the following:

- lack of recognition of cause of symptoms

IN SUMMARY

- Stroke is one of the major causes of death and disability in Australia.
- All cases of acute stroke should be referred directly to a hospital with imaging facilities (CT and/or MRI), and preferably a stroke unit that provides thrombolytic therapy.
- Management in a stroke unit can reduce long term outcomes of death and dependency.
- Risk factor identification and management are important.
- Early rehabilitation in a multidisciplinary team environment is ideal.
- Rural GPs are in a unique position to take on multiple roles in stroke management (physician, service co-ordinator, staff and family educator, and support service).

Table 1. Symptoms and signs of TIA and stroke

- Motor symptoms: weakness or clumsiness (unilateral or bilateral)
- Sensory symptoms: altered feeling on one side of the body
- Somatosensory symptoms
- Difficulty swallowing
- Speech or language disturbance: slurred speech, difficulty with reading or understanding
- Vestibular dysfunction
- Visual symptoms: loss of vision in one eye, loss of visual field, diplopia
- Nonfocal symptoms: generalised weakness, incontinence, imbalance, altered state of consciousness

Table 2. Differential diagnoses

- Migraine
- Syncope
- Epilepsy (Todd's palsy)
- Intracranial structural lesions
- Encephalopathy
- Encephalitis
- Multiple sclerosis
- Transient global amnesia
- Peripheral neuropathy or myopathy

- nonambulance transport
- GP contact
- less severe stroke
- ischaemic stroke
- living alone
- being asleep at stroke onset.

The fact that 'GP contact' delays transfer to hospital may seem paradoxical, but it is understandable given that GPs cannot always immediately attend the home to establish the diagnosis. Hence it is crucial that they, having being contacted by a patient or carer by telephone, act to facilitate rapid ambulance (ideally) or other mode of transport to hospital if there is reasonable suspicion that stroke has occurred.

Stroke

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Stroke is a common cause of death and permanent disability in adults. With the results of key trials and meta-analyses that have recently become available, management is undergoing rapid change. Increasing emphasis is being placed on the value of specific treatment strategies in the acute phase and effective forms of secondary prevention.

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Hospital care

After transfer to hospital has been effected, time is still the most important factor. The GP has an important role in a number of the steps involved.

Clinical confirmation of diagnosis

Rapid triage by a nurse trained to recognise the symptoms and signs of stroke is helpful, and expeditious clinical evaluation should establish the diagnosis more clearly. The presentation of the stroke syndromes can often be divided according to the vascular territories using, for example, the Oxford classification of cerebral infarction, which may assist in management. It is

continued

also important to identify risk factors such as hypertension, atrial fibrillation, diabetes, cigarette smoking, hyperlipidaemia, a past history of stroke and previous ischaemic heart disease.

Brain imaging

CT remains the workhorse of acute stroke management, and has the important advantage over MRI of immediately distinguishing between haemorrhage (increased signal) and infarction (usually little change within the first few hours). Examples are shown in Figures 1a and b. MRI is becoming more readily available – diffusion-weighted MRI has the great advantage of detecting acute ischaemia almost immediately after stroke onset when a CT scan would still be negative. In

fact, one-third of clinically proven TIAs have MRI ischaemic changes that correspond with the clinical presentation. MRI also provides better resolution than CT for imaging the posterior fossa and brainstem.

Acute management with tPA and/or aspirin

Therapy with intravenous tPA may be considered if the length of time from symptom onset is less than three hours, CT scans are essentially normal, blood pressure is less than 185/110 mmHg, the coagulation profile is normal, and there are no other contraindications to thrombolysis. For every 100 patients treated within three hours, 12 patients will have little or no residual clinical deficit (i.e. the number needed to treat to benefit one individual is about eight). tPA was licensed for use in managing stroke in appropriate centres in August 2003.

Oral aspirin (100 mg) should be administered as early as possible, prefer-

ably within 48 hours of stroke onset. Note, however, that tPA and aspirin are never given before brain imaging.

Ultrasound of carotid or vertebralbasilar arteries

Carotid and transcranial Doppler ultrasound may show focal narrowing in the internal carotid artery and the posterior circulation, respectively. Each patient's suitability for surgical intervention (carotid endarterectomy) should be considered before he or she is subjected to the test. Significant symptomatic stenosis in the internal carotid artery is defined as 70% or more.

Management in a stroke care unit

Level I evidence is now available to show that managing acute stroke patients in a stroke care unit reduces the risk of death and dependency at one year by about 20% compared with management in a general ward, and therefore the former

The GP's role in managing patients with stroke

Pre-hospital management

- Recognising the symptoms and signs of acute transient ischaemic attack (TIA) or stroke
- Facilitating rapid transfer to a healthcare facility where acute stroke management strategies can be put into place with minimal delay

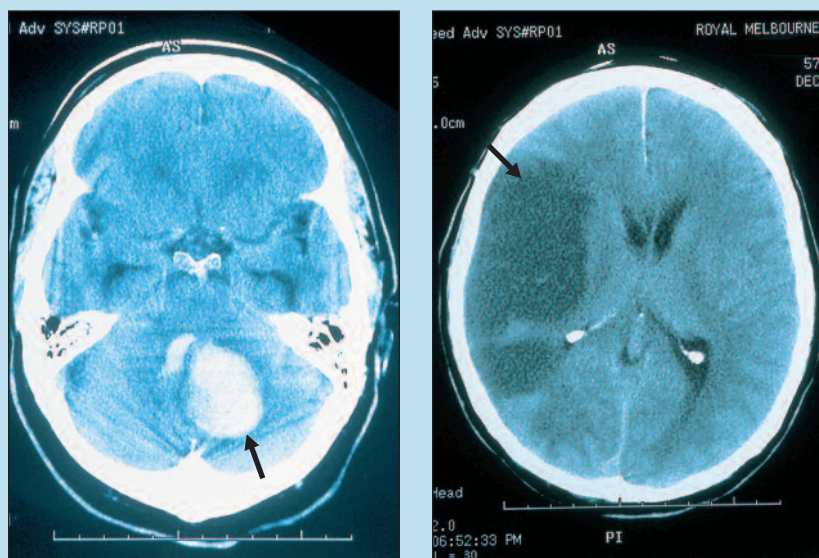
Hospital care

- Assisting with medical management (in some hospitals)
- Providing additional medical and historical information about patients to hospital doctors
- Preparing family and carers for the patient's discharge
- Liaising with 'hospital in the home' or 'rehabilitation in the home' programs
- Care-planning with hospital team for discharge

Community care

- Implementing secondary prevention strategies
- Reintegrating stroke patients into the community

CT imaging in acute stroke management



Figures 1a and b. CT scans are mandatory for all stroke patients and crucial in making decisions about therapy. a (left). An area of haemorrhage appears white (arrow). b (right). Cerebral infarcts (arrow) appear darker than normal brain.

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approach should now be mandatory. There has been a general recommendation that stroke care units be established Australia-wide,⁵ and the initiative is being taken up by a number of States and Territories. At present, however, only 23% of Australians have access to stroke care unit facilities.

Minimum investigation set

In order to define the type of stroke and associated comorbidities, a minimum set of investigations is recommended.

This comprises:

- brain CT
- chest x-ray
- full blood examination

- erythrocyte sedimentation rate
- random blood sugar
- urea, creatinine, and electrolytes
- ECG.

Transoesophageal echocardiography is an additional investigation that may be used to detect aortic arch atheroma as an embolic source if no obvious cardiac

Newer strategies for reducing the burden of stroke: a look at the evidence

Acute management

There is now level I evidence for three acute management strategies in reducing the burden of stroke: tissue plasminogen activator (tPA), aspirin and care in a stroke care unit. This is summarised in Table A.

Table A. Benefits (avoidance of death or disability) of acute interventions

Strategy	Absolute risk reduction	Number needed to treat	Number of patients who currently benefit per year	Number of patients who could potentially benefit per year*
Tissue plasminogen activator (tPA) ¹	12.0%	8	<23	575
Aspirin ³	1.2%	83	387	443
Stroke care unit ⁴	4%	25	423	1472

* Based on tPA, aspirin and stroke care unit being used to treat 10%, 80% and 80% of 46,000 stroke patients, respectively.

The evidence relies on a number of pivotal trials and meta-analyses that have been conducted over the last 10 years. Of these strategies, the number of patients needed to treat to obtain benefit for one individual is most favourable for tPA. It should be noted that although tPA does increase the risk of symptomatic intracranial haemorrhage (about 7% of patients), it does not appear to increase mortality.^{1,2} tPA is now licensed in Australia for management of stroke in appropriate centres.

Aspirin is less effective than tPA, but it is cheaper and safer. There is no evidence that intravenous or subcutaneous heparin is of benefit,³ although it is still used occasionally for early secondary prevention in patients in atrial fibrillation. Management of patients in a stroke care unit is effective and safe, and should not be particularly expensive. Even in smaller hospitals, a stroke care unit can be established and operated by reorganising existing resources.

Secondary prevention

Level I evidence now exists for at least four early strategies for secondary prevention in improving long term outcomes after TIA or stroke: use of antiplatelet agents, blood pressure lowering, warfarin and carotid endarterectomy. This is summarised in Table B.

Table B. Benefits of secondary prevention strategies

Strategy	Relative risk reduction	Absolute risk reduction	Number needed to treat
Antiplatelet agent (aspirin) ⁶	23	1.2	83
Blood pressure lowering ⁹	28	2.2	45
Warfarin ¹¹	67	8.0	53
Carotid endarterectomy ¹²	44	3.8	36

More detailed discussion of the use of secondary prevention strategies, including use of different types of antiplatelet agents, begins on page 22.

or large artery sources have been identified. In patients with atrial fibrillation or recent acute myocardial infarction, this investigation is not usually indicated unless more information about cardiac function is required.

Management of medical complications

Each complication should be managed on its merits. These include:

- infections (e.g. pneumonia, urinary tract infections)
- deep venous thrombosis or pulmonary embolism
- cardiac failure, fluid imbalance
- hypertension
- hyperglycaemia
- cardiac arrhythmias
- pressure sores
- urinary and bowel problems
- seizures.

Significant hypertension is not an uncommon finding in the acute stroke setting, and generally there is no need for intervention in ischaemic stroke unless the systolic pressure is above 220 mmHg or the diastolic pressure is above 120 mmHg. Fortunately, elevated blood pressure at admission usually settles within hours, or within a few days at most.

Pressure stockings are essential for preventing deep venous thrombosis; subcutaneous heparin is often used in patients who cannot be mobilised. Speech assessment is important for patients with speech impairment, and appropriate dietary advice is essential for those with swallowing difficulties.

Early rehabilitation

Although there is rapidly accumulating evidence that rehabilitation improves clinical outcomes, it is uncertain how early this should occur. Nevertheless, it is generally considered that rehabilitation should usually be commenced as soon as practicable, and this is the practice in most stroke care units.

Early secondary prevention

A person who has experienced a TIA has a risk of stroke that is up to nine times higher than that for a person of the same age and sex. There is now level I evidence that at least four early strategies for secondary prevention may improve long term outcomes after TIA or stroke. Some of these may be initiated in hospital, but most often they are commenced by the GP when the patient has returned to the community. These strategies are discussed in the section 'Secondary prevention' below.

Discharge planning

Of the patients with stroke who enter hospital, about 20% will die during their stay and the remainder will be discharged: directly home (33%), to rehabilitation centres (33%) or to nursing homes (only about 10%). For the two-thirds who go either home or to rehabilitation, early planning is essential. Increasingly, patients are being discharged early with the support of 'hospital in the home' programs, in which ongoing medical management of stroke comorbidities is undertaken. The use of 'rehabilitation in the home' programs is an increasingly common trend.

Community care

The GP, who may have been involved during the early phases of stroke onset and hospital care, assumes an even more important role in caring for a patient after discharge from hospital. The main management issues for GPs include use of secondary prevention strategies, and it is useful to have a checklist to ensure that all appropriate steps are taken. They are also involved in reintegrating the patient into the community.

Secondary prevention

There are at least four secondary stroke prevention strategies that need to be implemented where appropriate (see the box on page 21). These are:

- antiplatelet agents

– aspirin⁶

– clopidogrel (Iscover, Plavix)⁷

– aspirin with dipyridamole (Asasantin SR)⁸

- blood pressure lowering agents
 - using perindopril (Coversyl) alone or with indapamide⁹ (a combined preparation [Coversyl Plus] is available)
 - for patients with a previous history of stroke there is some evidence that ramipril (Ramace, Tritace) may be effective¹⁰
- warfarin (Coumadin, Marevan), in patients in atrial fibrillation¹¹
- carotid endarterectomy, in symptomatic patients with carotid stenosis of 70% or more.¹²

Compared with the use of aspirin alone, clopidogrel and combined aspirin/dipyridamole have been shown to further reduce the relative risk of cerebrovascular events by about 9% and 15%, respectively. Their major use is in the setting of further cerebrovascular events despite the use of aspirin or in the patient who cannot tolerate aspirin due to its side effects. For patients with nonvalvular atrial fibrillation who are under 75 years of age, one should aim for an INR of 2.5 (range, 2.0 to 3.0); for older patients, an INR of 2.0 may be more appropriate. Heparin is still occasionally used as a prelude to warfarin, but evidence for this is lacking.³

Lipid lowering using simvastatin (Lipex, Zocor) is a possible fifth strategy to consider. There is some evidence that simvastatin may be of benefit, although this needs to be confirmed in trials specifically designed for patients with TIA or stroke.¹³

Risk factor modification measures are also important. These include cessation of cigarette smoking and avoidance of heavy alcohol consumption. In addition, blood glucose in patients with diabetes should be strictly controlled (although there is no level I evidence to support this recommendation).

Special issues for rural GPs

- Access to CT and duplex ultrasound. Can this be arranged urgently? If not, the patient should be transferred.
- More complete medical management. In many instances the GP may be the sole medical manager, hence a knowledge of level I evidence for acute care (tPA, aspirin, stroke unit management) as well as secondary prevention strategies (antiplatelet agents, warfarin, lipid lowering, blood pressure lowering or referral for carotid endarterectomy) is essential. If not, the patient should be referred or transferred.
- Facilitating the continuum of care from acute presentation through to rehabilitation and community adjustment. Rural GPs are probably even more involved in this than urban GPs.
- Family and emotional support, which are crucial in the recovery process. Depression is not uncommon among stroke patients.

Re-integration

Adjustments to the patient's environment may be required because he or she may need to be reintroduced to work or home activities gradually. Increased stress on carers is likely, sometimes with attendant illnesses. In some instances, respite care may need to be arranged.

Role of the rural GP

The rural GP is faced with additional challenges for managing patients with stroke or TIA – these are described in the box on this page. Therefore, awareness of the evidence base for management strategies is most important – particularly if they undertake more complete medical management. Since access to specialist services is more limited in rural areas, GPs usually assume greater responsibility, thus making it even more important that they are aware of the need to refer to rural

based specialists when appropriate (e.g. for carotid endarterectomy).

Final comments

The management of stroke is changing quite rapidly with the introduction of the evidence based strategies discussed in this article. The role of the GP remains central. MT

Acknowledgement

Figures 1a and b courtesy of Professor Stephen M. Davis. Reproduced from *Mod Med Aust* 1999; 42(1): 36-44.

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