Supporting Information

Supplementary table

This appendix was part of the submitted manuscript and has been peer reviewed. It is posted as supplied by the authors.

Appendix to: English C, Hill K, Cadilhac DA, et al. Living clinical guidelines for stroke: updates, challenges and opportunities. Med J Aust 2022; doi: 10.5694/mja2.51520.
### Summary of all new and updated recommendations

| Problem / clinical issue | Specific recommendations | New or updated | Change in GRADE | Summary of change |
|--------------------------|--------------------------|----------------|-----------------|-------------------|
| Chapter 1 – Pre-hospital care | Regular stroke education may improve patient identification by clinicians. | New | Practice point | Practice point in response to new studies\(^1,2\) |
| Chapter 3 – Acute Medical and Surgical Management | **Thrombolysis**<br>For patients with potentially disabling ischaemic stroke without large vessel occlusion who meet specific clinical and brain imaging eligibility criteria, tenecteplase may be used as an alternative to alteplase within 4.5 hours of onset. | New | Weak recommendation | Alternative antithrombotic drug (tenecteplase) may be used where imaging findings suggest benefit |
|  | For patients with potentially disabling ischaemic stroke who meet perfusion mismatch criteria in addition to standard clinical criteria, intravenous alteplase (dose of 0.9 mg/kg, maximum of 90 mg) should be administered up to 9 hours after the time the patient was last known to be well, or from the midpoint of sleep for patients who wake with stroke symptoms, unless immediate endovascular thrombectomy is planned. | New | **Strong recommendation** | Extends the time window recommended for thrombolysis treatment up to 9 hours after time of stroke where imaging findings suggest benefit |
|  | For patients with potentially disabling ischaemic stroke of unknown onset time who meet MRI FLAIR-diffusion mismatch criteria in addition to standard clinical criteria, intravenous alteplase (dose of 0.9 mg/kg, maximum of 90 mg) may be administered | New | Weak recommendation | New evidence\(^3\) for the safety and benefit of thrombolysis treatment when the time of stroke is unknown and where imaging findings suggest benefit |
|  | For patients with potentially disabling ischaemic stroke due to large vessel occlusion who meet specific eligibility criteria, intravenous tenecteplase (0.25mg/kg, maximum of 25mg) or alteplase (0.9mg/kg, maximum of 90mg) should be administered up to 4.5 hours after the time the patient was last known to be well. | New | **Strong recommendation** | Addition of a new recommended antithrombotic agent (tenecteplase) in patients with large vessel occlusion |
For patients with potentially disabling ischaemic stroke without large vessel occlusion who meet specific clinical and brain imaging eligibility criteria, tenecteplase may be used as an alternative to alteplase within 4.5 hours of onset.

**Neurointervention**

For patients with ischaemic stroke caused by a large vessel occlusion in the internal carotid artery, proximal middle cerebral artery (M1 segment), or with tandem occlusion of both the cervical carotid and intracranial large arteries, endovascular thrombectomy should be undertaken when the procedure can be commenced between 6-24 hours after they were last known to be well if clinical and CT perfusion or MRI features indicate the presence of salvageable brain tissue.

**Acute anti-thrombotic therapy**

Aspirin plus clopidogrel should be commenced within 24 hours and used in the short term (first 3 weeks) in patients with minor ischaemic stroke or high-risk TIA to prevent stroke recurrence.

Aspirin plus ticagrelor commenced within 24 hours may be used in the short term (first 30 days) in patients with minor ischaemic stroke or high-risk TIA to prevent stroke recurrence.

Acute antiplatelet therapy should not be given within 24 hours of thrombolysis administration with the exception of patients who require stent implantation as part of acute stroke therapy.

**Oxygen therapy**

For acute stroke and Transient Ischaemic Attack (TIA) patients who have SpO2 >92% on room air, the routine use of supplemental oxygen is not recommended.

If supplemental oxygen is required (SpO2 <93% on room air) a target oxygen saturation of 94-96% is reasonable, or 88-92% if the patient is at risk of hypercapnic respiratory failure.

**Acute telehealth services**

In hospitals without onsite 24/7 stroke medical specialist availability, telestroke systems should be used to assist in patient assessment and decision making regarding acute thrombolytic therapy and possible transfer for endovascular therapy. This system should include the ability for stroke medical specialists to access remote brain imaging scans and preferably include the use of videoconferencing facilities or, if not possible, ensure the diagnosis and management discussions between local clinicians/family/patient occurs via a telephone consultation.
| Head position | Patients with acute stroke, while in bed and not receiving nasogastric feeding, may be managed in any position during the first 24 hours after hospital admission. | New | Weak recommendation for | Clinical equipoise existed, based on trials investigating the effect of lying flat versus elevated head positions after stroke. Trial outcomes have been equivocal. |
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| **Chapter 4 – Secondary prevention** | | | | |
| **Antiplatelet therapy** | In patients with spontaneous (or primary) intracerebral haemorrhage who were previously prescribed antithrombotic therapy for secondary prevention of cardiovascular and/or cerebrovascular disease, restarting antiplatelet therapy after the acute phase may be considered, although the optimal timing is undetermined (see practical information in the living guidelines). | New | Weak recommendation for | New trial evidence showing no harm from restarting antiplatelet therapy after intracerebral haemorrhage. |
| **Cholesterol lowering therapy** | In patients with ischaemic stroke, cholesterol lowering therapy should target LDL cholesterol < 1.8 mmol/L for secondary prevention of atherosclerotic cardiovascular disease. | New | Strong recommendation for | New trial evidence̊ showing more aggressive lowering of low-density lipoprotein levels reduced recurrent cardiovascular events. |
| **Patent foramen ovale management** | In patients with ischaemic stroke aged <60 in whom a patent foramen ovale is considered the likely cause of stroke after thorough exclusion of other aetiologies, percutaneous closure of the PFO is recommended. | Updated | Strength of recommendation upgraded. | Two new trials, long term follow-up of a previous trial and a new meta-analysis̊ have confirmed the benefits of PFO closure where it is considered the likely cause of stroke. |
| **Management of atrial fibrillation** | For patients with ischaemic stroke due to atrial fibrillation and a genuine contraindication to long-term anticoagulation, percutaneous left atrial appendage occlusion may be a reasonable treatment to reduce recurrent stroke risk. | New | Weak recommendation for | This was previously a practice point, but new evidence from a single trial̊ showed benefit in a select group of people after stroke. |
### Lifestyle modifications

Interventions addressing secondary stroke risk factors may be used for all people with stroke and TIA. Such interventions should include multiple components including individual (support and counselling) and organisational approaches (regular reviews by relevant health care professionals) and include exercise training as a component.

New
Weak recommendation for

Previously the Guidelines have referred to general Australian guidelines for management of lifestyle risk factors, including physical activity and diet. There is now sufficient evidence, albeit from small trials, about the efficacy of non-pharmacological secondary prevention services to reduce stroke risk factors.

All patients with stroke or TIA should be supported to follow a Mediterranean or similar style diet (high intake of plant-based foods such as fruit, vegetables, whole grain cereals, legumes and nuts, moderate intake of low-fat dairy products, and low intake of processed and red meat and sugary foods, as well as olive oil as the main added dietary fat) to reduce the risk of recurrent stroke.

Update
Consensus based recommendation (from previous practice point)

A recent review \(^{10}\) found moderate strength evidence for the efficacy of Mediterranean-style diets to reduce recurrent stroke risk factors.

### Chapter 5 - Rehabilitation

#### Weakness

For stroke survivors with reduced strength in their arms or legs, progressive resistance training should be provided to improve strength.

Updated
Strong recommendation for

Based on new systematic review, \(^{11}\) there is now sufficient evidence to specify the type of strength training that is most efficacious.

For stroke survivors with arm weakness, repetitive practice using assistive technology, constraint induced movement therapy (CIMT), and robotics may be used to improve arm strength.

New
Weak recommendation for

Based on new systematic review, \(^{12}\) additional specific intervention types may improve strength. Divided into recommendations for arm strengthening and leg strengthening.

For stroke survivors with leg weakness, task specific training, repetitive practice using cycling, or electrical stimulation may be used to improve leg strength.

#### Standing

For stroke survivors who have difficulty with standing, activities that challenge balance should be provided.

Updated
No change in recommendation strength

Recommendation simplified and greater specificity on the types of activities needed.
For stroke survivors who have difficulty with standing, one or more of the following interventions may be used in addition to practising tasks that challenge balance:

- Virtual reality training, which may include treadmill training, motion capture or force sensing devices (e.g. Wii Balance Boards)
- Visual or auditory feedback e.g. force platform biofeedback
- Electromechanically assisted gait or standing training

**Arm activity**

Virtual reality and interactive games may be used to improve upper limb function.

**Activities of Daily Living**

Acupuncture is not routinely recommended to improve activities of daily living.

Selective serotonin reuptake inhibitors should not be used to reduce disability.

**Telerehabilitation**

Telehealth services may be used as an alternative approach to delivering rehabilitation, especially for patients who cannot access specialist rehabilitation in the community. It may also be used as an adjunct to in-person therapy. Delivering of specific interventions via telehealth should only be considered for those that have demonstrated benefits.

**Memory**

For stroke survivors with memory deficits, cognitive rehabilitation may be used to improve memory function in the short term. Memory rehabilitation strategies may include internal (mental) strategies (e.g. association, mental rehearsal, rhymes) and external compensatory aids (e.g. notebooks, diaries, calendars, alarms, audio recordings, photos, mobile phones).
| **Chapter 6 – Managing complications** |
|----------------------------------------|
| **Shoulder pain** | For stroke survivors with shoulder pain, electrical stimulation may be used to manage pain. | Updated  
Recommendation changed direction.  
Now weak recommendation for | An updated systematic review including new trial evidence suggests electrical stimulation may reduce shoulder pain. |
|  | For stroke survivors with shoulder pain, acupuncture in addition to comprehensive rehabilitation may be used to reduce pain. | New  
Weak recommendation | Updated systematic review suggesting acupuncture may reduce pain. |
| **Contracture** | For stroke survivors at risk of developing contracture who are receiving comprehensive, active therapy the routine use of splints or stretch of the arm or leg muscles is not recommended. | Updated  
No change in recommendation strength | Minor change to wording and updated systematic review |
| **Fatigue** | Stroke survivors and their families/carers should be provided with information, and education and strategies to assist in managing about fatigue.  
While there is insufficient evidence to guide practice, possible interventions could include cognitive behavioural therapy (focusing on fatigue and sleep with advice on regular exercise), exercise and improving sleep hygiene. | Updated  
No change in recommendation strength | Minor wording changes and a mention of cognitive behavioural therapy as a possible intervention. |
| **Swelling of the extremities** | For stroke survivors with severe weakness who are at risk of developing swelling of the extremities, management may include the following:  
- passive mobilisation;  
- elevation of the limb when resting. | Updated  
No change in recommendation strength | Recommendation updated based on new evidence. Passive mobilisation added, electrical stimulation and dynamic pressure garments removed. |
|  | For stroke survivors who developed swelling of the hands or feet, management may include the following:  
- passive mobilisation;  
- elevation of the limb when resting. | Recommendation updated based on new evidence. Passive mobilisation added, electrical stimulation and dynamic pressure garments removed. |
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