

# Clinical Guidelines for Stroke Management

## Summary – Pharmacy

This summary is a quick reference to the recommendations in the Clinical Guidelines for Stroke Management most relevant to pharmacists.

Pharmacists hold a qualification in the distribution of medications, recognised by national authority[s]. Pharmacists assist the team in the decisions related to the distribution of medications and need to be based on the best available evidence to achieve the most beneficial outcomes for the patient.

While this summary focuses on specific recommendations, stroke care is the most effective when all members of an interdisciplinary team are involved. For the comprehensive set of recommendations that covers the whole continuum of stroke care, please refer to further information on InformMe

<https://informme.org.au/Guidelines/Clinical-Guidelines-for-Stroke-Management>.

The Stroke Foundation in partnership with Cochrane Australia is testing a model of continually reviewing and updating recommendations for the Clinical Guidelines for Stroke Management in response to new evidence on a monthly basis. For changes to recommendations based on new research evidence, please refer to further information on InformMe <https://informme.org.au/Guidelines/Living-guidelines-for-stroke-management>

The Clinical Guidelines uses an internationally recognised guideline development approach called GRADE (Grading of Recommendations Assessment, Development and Evaluation) and an innovative guidelines development and publishing platform known as MAGICapp (MAKING Grade the Irresistible Choice). GRADE ensures a systematic process in developing recommendation, which are based on the balance of benefits and harms, quality of evidence, patient values, and resource considerations. MAGICapp enables transparent display of this process and access to additional practical information for recommendation implementation.

## Recommendations

Each recommendation is given a strength based on GRADE. GRADE methodology includes four factors to guide the development of a recommendation and determine the strength of that recommendation.

- The balance between desirable and undesirable consequences
- Confidence in the estimates of effect (quality of evidence)
- Confidence in values and preferences and their variability (clinical and consumer preferences)
- Resource use (cost and implementation considerations).

The GRADE process uses only two categories for the strength of recommendation, based on how confidence the guideline developers are in that the “desirable effects of an intervention outweigh undesirable effect [...] across the range of patients for whom the recommendation is intended” (GRADE Handbook):

- **Strong recommendations:** where guideline developers are certain that the evidence supports a clear balance towards either desirable or undesirable effects; or
- **Weak recommendations:** where guideline developers are not as certain about the balance between desirable and undesirable effects as the evidence base isn't as robust.

These strong or weak recommendations can either be for or against an intervention. If the recommendation is AGAINST an intervention this means it is recommended NOT to do that intervention.

**Consensus-based recommendations:** statements have been developed based on consensus and expert opinion (guided by any underlying or indirect evidence) for topics where there is either a lack of evidence or insufficient quality of evidence on which to base a recommendation but it was felt that advice should be made.

**Practice points:** for questions outside the search strategy (i.e. where no systematic literature search was conducted), additional considerations are provided.

Recommendations are presented as at December 2020 with a note if it has changed since the 2017 recommendations and are also presented in Chapter order for easier reference to the relevant section of the full Clinical Guidelines.

For the full list of references, please refer to the individual MAGICapp chapters through InformMe <https://informme.org.au/Guidelines/Clinical-Guidelines-for-Stroke-Management>.

## Chapter 2 of 8: Early assessment and diagnosis

### Transient ischaemic attack

#### Strong recommendation

- All patients with suspected transient ischaemic attack (TIA), i.e. focal neurological symptoms due to focal ischaemia that have fully resolved, should have urgent clinical assessment. (Lavalley et al. 2007; Rothwell et al. 2007) (*Refer to the 'Practical Information' section for further useful information*)
- Patients with symptoms that are present or fluctuating at time of initial assessment should be treated as having a stroke and be immediately referred for emergency department and stroke specialist assessment, investigation and reperfusion therapy where appropriate. (Lavalley et al 2007; Rothwell et al. 2007)
- In pre-hospital settings, high risk indicators (e.g. crescendo TIA, current or suspected AF, current use of anticoagulants, carotid stenosis or high ABCD<sup>2</sup> score) can be used to identify patients for urgent specialist assessment. (Lavalley et al. 2007; Rothwell et al. 2007)

#### Strong recommendation

When TIA patients present to primary care, the use of TIA electronic decision support, when available, is recommended to improve diagnostic and triage decisions. (Ranta et al. 2015)

#### Weak recommendation **AGAINST**

In TIA patients, use of the ABCD<sup>2</sup> risk score in isolation to determine the urgency of investigation may delay recognition of atrial fibrillation and symptomatic carotid stenosis in some patients and should be avoided. (Wardlaw et al. 2015)

#### Strong recommendation

All TIA patients with anterior circulation symptoms should undergo early carotid imaging with CT angiography (aortic arch to cerebral vertex), carotid Doppler ultrasound or MR angiography. Carotid imaging should preferably be done during the initial assessment but should not be delayed more than 2 days (see [Imaging](#)).

#### Weak recommendation

Patients with TIA should routinely undergo brain imaging to exclude stroke mimics and intracranial haemorrhage. MRI, when available, is recommended to improve diagnostic accuracy (see [Imaging](#)).

#### Strong recommendation

Patients with suspected TIA should commence secondary prevention therapy urgently (see [Secondary Prevention](#)).

### **Strong recommendation**

- All patients with TIA should be investigated for atrial fibrillation with ECG during initial assessment and referred for possible prolonged cardiac monitoring as required (see [Cardiac Investigations](#)).
- TIA patients with atrial fibrillation should commence anticoagulation therapy early after brain imaging has excluded haemorrhage, unless contraindicated (see [Anticoagulant therapy](#) in [Secondary Prevention](#)).

### **Practice statement**

#### **Consensus-based recommendations**

- All patients and their family/carers should receive information about TIA, screening for diabetes, tailored advice on lifestyle modification strategies (smoking cessation, exercise, diabetes optimisation if relevant – see [Secondary prevention](#)), return to driving (see [Driving](#) in [Community participation and long-term care](#)) and the recognition of signs of stroke and when to seek emergency care.
- All health services should develop and use a local TIA pathway covering primary care, emergency and stroke specialist teams to ensure patients with suspected TIA are managed as rapidly and comprehensively as possible within locally available resources.

## **Assessment of suspected stroke**

### **Strong recommendation**

All suspected stroke patients who have been pre-notified to the stroke or ED team, and who may be candidates for reperfusion therapy, should be met at arrival and assessed by the stroke team or other experienced personnel. (Meretoja et al. 2012; Meretoja et al. 2013)

### **Weak recommendation**

The use of clinical screening tools to identify stroke by ED staff is recommended where an expert stroke team is unable to immediately assess a patient. (Jiang et al. 2014; Whiteley et al. 2011)

### **Info box**

#### **Practice points**

- Initial diagnosis should be reviewed by a clinician experienced in the evaluation of stroke.
- Stroke severity should be assessed and recorded on admission by a trained clinician using a validated tool (e.g. NIHSS).
- A blood glucose reading should be taken to improve specificity (hypoglycaemia can present as a 'stroke mimic').

## Investigations

### Imaging

#### Brain imaging

##### Strong recommendation

All patients with suspected stroke who are candidates for reperfusion therapies should undergo brain imaging immediately. All other suspected stroke patients should have an urgent brain CT or MRI ('urgent' being immediately where facilities are available and preferably within 60 minutes). (Brazzelli et al. 2009)

##### Weak recommendation

In patients with suspected stroke and TIA, MRI is more sensitive and specific than non-contrast CT and is the preferred modality when diagnostic confirmation is required. (Brazzelli et al. 2009)

##### Practice statement

##### Consensus-based recommendations

Either CT or MRI are acceptable acute imaging options but these need to be immediately accessible to avoid delaying reperfusion therapies.

##### Strong recommendation

If using CT to identify hyperdense thrombus, thin slice (< 2 mm) non-contrast CT should be used rather than the standard 5 mm slices to improve diagnostic sensitivity for vessel occlusion. (Mair et al. 2015)

##### Weak recommendation

CT perfusion imaging may be used in addition to routine imaging to improve diagnostic and prognostic accuracy. (Biesbroek et al. 2012)

##### Info box

##### Practice points

- If a patient with stroke develops neurological deterioration, immediate clinical assessment and further brain imaging (CT or MRI) should be considered.
- Routine brain imaging approximately 24 hours after reperfusion therapies have been administered is recommended to identify haemorrhagic transformation and delineate the extent of infarction, both of which are important when making decisions about antithrombotic therapy and DVT prophylaxis.

## Chapter 3 of 8: Acute medical and surgical management

### Reperfusion therapy

#### Thrombolysis

##### Strong recommendation

For patients with potentially disabling ischaemic stroke within 4.5 hours of onset who meet specific eligibility criteria, intravenous thrombolysis should be administered as early as possible after stroke onset (Wardlaw et al. 2014; Emberson et al. 2014)

##### Strong recommendation

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. (Parsons et al 2012; Campbell et al 2018)

##### Weak recommendation

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. (Huang et al 2016)

##### Strong recommendation

When using intravenous alteplase, a dose of 0.9 mg/kg, maximum of 90 mg should be administered. (Wardlaw et al. 2014; Emberson et al. 2014; Anderson et al. 2016)

##### Strong recommendation

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. (Ma et al 2019; Campbell et al 2019)

##### Weak recommendation

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 (Thomalla et al 2019).

## Info Box

### Practice points

Thrombolysis should be undertaken in a setting with appropriate infrastructure, facilities and network support (e.g. via telemedicine) including:

- access to an interdisciplinary acute care team with expert knowledge of stroke management, who are trained in delivery of thrombolysis and monitoring of patients receiving thrombolytic therapy
- a streamlined acute stroke assessment workflow (including ambulance pre-notification, code stroke team response and direct transport from triage to CT scan) to minimise treatment delays, and protocols available to guide medical, nursing and allied health acute phase management
- immediate access to imaging facilities and staff trained to interpret images
- routine data collected in a central register to allow monitoring, benchmarking and improvements of patient outcomes over time for those treated with reperfusion.

The patient and caregivers should be involved in the decision to give thrombolysis whenever possible and this discussion of risk and benefit documented in the medical record. However, as a time-critical emergency therapy, thrombolysis should not be delayed if the patient does not have the capacity to consent and there are no legal representatives present. Clinicians should follow local health department policies regarding consent for emergency treatment in patients who are unable to consent for themselves.

## Acute antithrombotic therapy

### **Strong recommendation**

Patients with ischaemic stroke who are not receiving reperfusion therapy should receive antiplatelet therapy as soon as brain imaging has excluded haemorrhage. (Sandercock et al. 2014)

### **Strong recommendation AGAINST**

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. (Zinkstok et al. 2012)

### **Strong recommendation AGAINST**

Routine use of anticoagulation in patients without cardioembolism (e.g. atrial fibrillation) following TIA/stroke is not recommended. (Sandercock et al. 2015; Whiteley et al. 2013)

### **Strong recommendation**

Aspirin plus clopidogrel should be commenced within 24 hours and used in the short term (first three weeks) in patients with minor ischaemic stroke or high-risk TIA to prevent stroke recurrence. (Hao et al. 2018)

#### **Weak recommendation**

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. (Johnston et al 2020)

## Acute blood pressure lowering therapy

#### **Weak recommendation AGAINST**

Intensive blood pressure lowering in the acute phase of care to a target SBP of < 140 mmHg is not recommended for any patient with stroke. (Bath and Krishnan 2014)

#### **Weak recommendation**

In patients with intracerebral haemorrhage, blood pressure may be acutely reduced to a target systolic blood pressure of around 140 mmHg (but not substantially below). (Tsvigoulis et al. 2014; Qureshi et al. 2016)

#### **Weak recommendation**

Pre-existing antihypertensive medication may be withheld until patients are neurologically stable and treatment can be given safely. (Bath and Krishnan 2014)

#### **Practice statement**

#### **Consensus-based recommendations**

- All acute stroke patients should have their blood pressure closely monitored in the first 48 hours after stroke onset.
- Patients with acute ischaemic stroke eligible for treatment with intravenous thrombolysis should have their blood pressure reduced to below 185/110 mmHg before treatment and in the first 24 hours after treatment.
- Patients with acute ischaemic stroke with blood pressure > 220/120 mmHg should have their blood pressure cautiously reduced (e.g. by no more than 20%) over the first 24 hours.

## Surgery for ischaemic stroke

## Management of cerebral oedema

#### **Weak recommendation AGAINST**

Corticosteroids are not recommended for management of stroke patients with brain oedema and raised intracranial pressure. (Sandercock et al. 2011)

#### **Practice statement**

#### **Consensus-based recommendation**



In stroke patients with brain oedema and raised intracranial pressure, osmotherapy and hyperventilation can be trialled while a neurosurgical consultation is undertaken.

## Intracerebral haemorrhage (ICH) management

### Medical interventions

#### Weak recommendation

- For stroke patients with warfarin-related intracerebral haemorrhage, prothrombin complex concentrate should be urgently administered in preference to standard fresh frozen plasma to reverse coagulopathy. (Steiner et al. 2016)
- Intravenous vitamin K (5–10 mg) should be used in addition to prothrombin complex to reverse warfarin but is insufficient as a sole treatment. (Steiner et al. 2016)

#### Weak recommendation

Stroke patients with intracerebral haemorrhage related to direct oral anticoagulants should urgently receive a specific reversal agent where available. (Pollack et al. 2016; Connolly 2016)

#### Strong recommendation **AGAINST**

For stroke patients with intracerebral haemorrhage previously receiving antiplatelet therapy, platelet transfusion should not be administered. (Baharoglu et al. 2016)

#### Weak recommendation

For stroke patients with intracerebral haemorrhage, blood pressure may be acutely reduced to a target systolic blood pressure of around 140 mmHg (but not substantially below) (see [Acute blood pressure lowering therapy](#)).

## Neuroprotection

### Practice statement

#### Consensus-based recommendations

For stroke patients, putative neuroprotective agents, including hypothermic cooling, are not recommended outside the context of research.

### Practice statement

#### Consensus-based recommendations

Patients with acute ischaemic stroke who were receiving statins prior to admission can continue statin treatment.

## Glycaemic therapy

#### Strong recommendation

All stroke patients should have their blood glucose level monitored for the first 72 hours following admission, and appropriate glycaemic therapy instituted to treat hyperglycaemia (glucose levels greater than 10 mmol/L), regardless of their diabetic status. (Middleton et al. 2011)

**Strong recommendation AGAINST**

For stroke patients, an intensive approach to the maintenance of tight glycaemic control (between 4.0–7.5 mmol/L) is not recommended. (Bellolio et al. 2014; Ntaios et al. 2014; Johnston et al. 2019)

## Pyrexia management

**Strong recommendation**

All stroke patients should have their temperature monitored at least four times a day for 72 hours. (Middleton et al. 2011)

**Weak recommendation**

Stroke patients with fever  $\geq 37.5$  °C may be treated with paracetamol as an antipyretic therapy. (Chen et al. 2018; Middleton et al. 2011)

## Chapter 4 of 8: Secondary prevention

### Adherence to pharmacotherapy

#### Weak recommendation

Interventions to promote adherence with medication regimens may be provided to all patients with stroke. Such regimens may include combinations of the following:

- reminders, self-monitoring, reinforcement, counselling, motivational interviewing, family therapy, telephone follow-up, supportive care and dose administration aids (Lawrence et al 2015; Mahtani et al 2011; Nieuwlaat et al 2014; Haynes et al 2008)
- development of self-management skills and modification of dysfunctional beliefs about medication (O'Carroll et al 2014; Kronish et al 2014)
- information and education in hospital and in the community (Lawrence et al 2015; Mahtani et al 2011; Nieuwlaat et al 2014).

### Blood pressure lowering therapy

#### Acute blood pressure management

##### Practice statement

##### Consensus-based recommendations

- All patients with acute stroke should have their blood pressure closely monitored in the first 48 hours after stroke onset.
- Patients with acute ischaemic stroke eligible for treatment with intravenous thrombolysis should have their blood pressure reduced to below 185/110 mmHg before treatment and in the first 24 hours after treatment.
- Patients with acute ischaemic stroke with blood pressure >220/120/mmHg should have their blood pressure cautiously reduced (e.g. by no more than 20%) over the first 24 hours.

#### Weak recommendation **AGAINST**

Intensive blood pressure lowering in the acute phase of care to a target SBP of <140mmHg is not recommended for any patient with stroke. (Bath and Krishnan 2014)

#### Weak recommendation

In patients with intracerebral haemorrhage blood pressure may be acutely reduced to a target systolic blood pressure of around 140mmHg (but not substantially below). (Tsvigoulis et al 2014; Qureshi et al 2016)

#### Weak recommendation

Pre-existing antihypertensive agents may be withheld until patients are neurologically stable and treatment can be given safely. (Bath and Krishnan 2014)

## Long term blood pressure management

### Strong recommendation

- All patients with stroke or TIA, with a clinic blood pressure of >140/90mmHg should have long term blood pressure lowering therapy initiated or intensified. (Zonneveld et al 2018; Ettehad et al 2016)
- Blood pressure lowering therapy should be initiated or intensified before discharge for those with stroke or TIA, or soon after TIA if the patient is not admitted. (Zonneveld et al 2018; Ettehad et al 2016)
- Any of the following drug classes are acceptable as blood pressure lowering therapy; angiotensin-converting-enzyme inhibitor, angiotensin II receptor antagonists, calcium channel blocker, thiazide diuretics. Beta-blockers should not be used as first-line agents unless the patient has ischaemic heart disease. (Zonneveld et al 2018; Mukete et al 2015)

### Weak recommendation

- In patients with a systolic blood pressure of 120-140mmHg who are not on treatment, initiation of antihypertensive treatment is reasonable, with best evidence for dual (ACEI/diuretic) therapy. (Ettehad et al 2016; Kitagawa et al 2019; Katsanos et al 2017)
- The ideal long term blood pressure target is not well established. A target of <130mmHg systolic may achieve greater benefit than a target of 140mmHg systolic, especially in patients with stroke due to small vessel disease, provided there are no adverse effects from excessive blood pressure lowering. (Kitagawa et al 2019; Ettehad et al 2016)

## Management of atrial fibrillation

### Strong recommendation

- For patients with ischaemic stroke or TIA, with atrial fibrillation (both paroxysmal and permanent), oral anticoagulation is recommended for long-term secondary prevention. (Saxena et al 2004; Saxena 2004; Ruff et al 2014)
- Direct oral anticoagulants (DOACs) should be initiated in preference to warfarin for patients with non-valvular atrial fibrillation and adequate renal function. (Ruff et al 2014)
- For patients with valvular atrial fibrillation or inadequate renal function, warfarin (target INR 2.5, range 2.0-3.0) should be used. Patients with mechanical heart valves or other indications for anticoagulation should be prescribed warfarin. (Tawfik et al 2016)

### Practice statement

#### Consensus-based recommendation

For patients with ischaemic stroke, the decision to begin anticoagulant therapy can be delayed for up to two weeks but should be made prior to discharge.

### Info box

#### Practice points

- Concurrent antiplatelet therapy should not be used for patients who are anticoagulated for atrial fibrillation unless there is clear indication (e.g. recent coronary stent). Addition of antiplatelet for stable coronary artery disease in the absence of stents should not be used.
- For patients with TIA, anticoagulant therapy should begin once CT or MRI has excluded intracranial haemorrhage as the cause of the current event.
- 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.

## Antiplatelet therapy

### Strong recommendation

Long-term antiplatelet therapy (low-dose aspirin, clopidogrel or combined low-dose aspirin and modified release dipyridamole) should be prescribed to all patients with ischaemic stroke or TIA who are not prescribed anticoagulation therapy, taking into consideration patient co-morbidities. (Rothwell et al 2016; Niu et al 2016; Greving et al 2019)

### Strong recommendation

All ischaemic stroke and TIA patients should have antiplatelet therapy commenced as soon as possible once brain imaging has excluded haemorrhage unless thrombolysis has been administered, in which case antiplatelet therapy can commence after 24-hour brain imaging has excluded major haemorrhagic transformation. (see [Antithrombotic therapy](#) in [Acute medical and surgical management](#))

### Strong recommendation

Aspirin plus clopidogrel should be commenced within 24 hours and used in the short term (first three weeks) in patients with minor ischaemic stroke or high-risk TIA to prevent stroke recurrence. (Hao et al. 2018) (see [Antithrombotic therapy](#) in [Acute medical and surgical management](#))

### Strong recommendation **AGAINST**

The combination of aspirin plus clopidogrel should not be used for the long-term secondary prevention of cerebrovascular disease in people who do not have acute coronary disease or recent coronary stent. (Zhang et al 2015; Greving et al 2019)

### Strong recommendation **AGAINST**

Antiplatelet agents should not be used for stroke prevention in patients with atrial fibrillation. (Connolly et al 2011)

### Weak recommendation **Draft**

In patients with spontaneous (or primary) intracerebral haemorrhage who were previously prescribed antiplatelet therapy for secondary prevention of cardiovascular and/or cerebrovascular disease, restarting antiplatelet therapy after the acute phase is reasonable.

## Cholesterol lowering therapy

### Strong recommendation

All patients with ischaemic stroke or TIA with possible atherosclerotic contribution and reasonable life expectancy should be prescribed a high-potency statin, regardless of baseline lipid levels. (Manktelow et al 2009; Tramacer et al 2019)

### Strong recommendation

In patients with ischaemic stroke, cholesterol lowering therapy should target LDL cholesterol < 1.8 mmol/L for secondary prevention of atherosclerotic cardiovascular disease. (Amarenco et al 2020)

### Weak recommendation **AGAINST**

Statins should not be used routinely for intracerebral haemorrhage. (Manktelow et al 2009; Amarenco et al 2006)

### Weak recommendation **AGAINST**

Fibrates should not be used routinely for the secondary prevention of stroke. (Zhou et al 2013; Wang et al 2015)

## Cervical artery dissection

### Strong recommendation

Patients with acute ischaemic stroke due to cervical arterial dissection should be treated with antithrombotic therapy. There is no clear benefit of anticoagulation over antiplatelet therapy. (CADISS 2015)

## Cerebral venous sinus thrombosis

### Strong recommendation

Patients with cerebral venous sinus thrombosis (CVST) without contraindications to anticoagulation should be treated with either body weight-adjusted subcutaneous low molecular weight heparin or dose-adjusted intravenous heparin, followed by warfarin, regardless of the presence of intracerebral haemorrhage. (Coutinho et al 2011; Misra et al 2012; Afshari et al 2015)

### Practice statement

#### Consensus-based recommendations

- In patients with CVST, the optimal duration of oral anticoagulation after the acute phase is unclear and may be taken in consultation with a haematologist.
- In patients with CVST with an underlying thrombophilic disorder, or who have had a recurrent CVST, indefinite anticoagulation should be considered.
- In patients with CVST, there is insufficient evidence to support the use of either systemic or local thrombolysis.

- In patients with CVST and impending cerebral herniation, craniectomy can be used as a life-saving intervention.
- In patients with the clinical features of idiopathic intracranial hypertension, imaging of the cerebral venous system is recommended to exclude CVST.

## Diabetes management

### Info box

#### **Practice point**

Patients with glucose intolerance or diabetes should be managed in line with [Diabetes Australia Best Practice Guidelines](#).

## Patent foramen ovale management

### **Strong recommendation**

Patients with ischaemic stroke or TIA and PFO should receive optimal medical therapy including antiplatelet therapy or anticoagulation if indicated. (Romoli et al 2020; Sagris et al 2019)

### **Strong recommendation**

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 (Turc et al 2018, Saver et al 2018).

## Hormone replacement therapy

### **Practice statement**

#### **Consensus-based recommendation**

In patients with stroke or TIA, continuation or initiation of hormone replacement therapy is not recommended, but will depend on discussion with the patient and an individualised assessment of risk and benefit. (Boardman et al 2015; Yang et al 2013; Marjoribanks et al 2012; Nudy et al 2019)

## Oral contraception

### **Weak recommendation**

For women of child-bearing age who have had a stroke, non-hormonal methods of contraception should be considered. If systemic hormonal contraception is required, a non-oestrogen containing medication is preferred. (Roach et al 2015; Plu-Bureau 2013; Peragallo et al 2013; Li et al 2019)

### **Practice statement**

#### **Consensus-based recommendations**



For women of child bearing age with a history of stroke or TIA, the decision to initiate or continue oral contraception should be discussed with the patient and based on an overall assessment of individual risk and benefit.



## Chapter 5 of 8: Rehabilitation

### Goal setting

- Health professionals should initiate the process of setting goals, and involve stroke survivors and their families and carers throughout the process. Goals for recovery should be client-centred, clearly communicated and documented so that both the stroke survivor (and their families/carers) and other members of the rehabilitation team are aware of goals set. (Sugavanam et al. 2013; Taylor et al. 2012)
- Goals should be set in collaboration with the stroke survivor and their family/carer (unless they choose not to participate) and should be well-defined, specific and challenging. They should be reviewed and updated regularly. (Sugavanam et al. 2013; Taylor et al. 2012)

### Participation restrictions

#### Activities of daily living

##### Strong recommendation

- Community-dwelling stroke survivors who have difficulties performing daily activities should be assessed by a trained clinician. (Legg et al. 2017)
- Community-dwelling stroke survivors with confirmed difficulties in personal or extended activities of daily living should have specific therapy from a trained clinician (e.g. task-specific practice and training in the use of appropriate aids) to address these issues. (Legg et al. 2017)

##### Weak recommendation **AGAINST**

For older stroke survivors living in a nursing home, routine occupational therapy is not recommended to improve activities of daily living function. (Sackley et al. 2015)

##### Weak recommendation **AGAINST** Draft update

Acupuncture is not routinely recommended to improve activities of daily living. (Yang et al. 2016)

##### Strong recommendation **AGAINST**

Administration of amphetamines to improve activities of daily living is not recommended. (Martinsson et al. 2007)

##### Weak recommendation **AGAINST** Draft update

Selective serotonin reuptake inhibitors should not be used to reduce disability. (Legg et al. 2019; AFFINITY collaborators; EFFECTS collaborators)

##### Weak recommendation **AGAINST**

Brain stimulation (transcranial direct stimulation or repetitive transcranial magnetic stimulation) should not be used in routine practice to improve ADL and only used as part of a research framework. (Elsner et al. 2020; Hao et al. 2013)

**Weak recommendation**

For stroke survivors, virtual reality technology may be used to improve ADL outcomes in addition to usual therapy. (Laver et al. 2017)

## Chapter 6 of 8: Managing complications

### Spasticity

**Weak recommendation**

For stroke survivors with **upper** limb spasticity, Botulinum Toxin A in addition to rehabilitation therapy may be used to reduce spasticity, but is unlikely to improve activity or motor function. (Foley et al 2013; Gracies et al 2014)

**Weak recommendation**

For stroke survivors with **lower** limb spasticity, Botulinum Toxin A in addition to rehabilitation therapy may be used to reduce spasticity but is unlikely to improve motor function or walking. (Wu et al 2016; McIntyre et al 2012; Olvey et al 2010)

**Weak recommendation AGAINST**

For stroke survivors with spasticity, acupuncture should not be used for treatment of spasticity in routine practice other than as part of a research study. (Lim et al 2015)

**Weak recommendation**

For stroke survivors with spasticity, adjunct therapies to Botulinum Toxin A, such as electrical stimulation, casting and taping, may be used. (Stein et al 2015; Mills et al 2016; Santamato et al 2015)

**Weak recommendation AGAINST**

For stroke survivors, the routine use of stretch to reduce spasticity is not recommended. (Harvey et al 2017)

### Pain

#### Shoulder pain

**Weak recommendation**

For stroke survivors with shoulder pain, shoulder strapping may be used to reduce pain. (Appel et al 2014)

**Weak recommendation**

For stroke survivors with shoulder pain, electrical stimulation may be used to manage pain. (Qiu et al 2019)

**Weak recommendation**

For stroke survivors with shoulder pain, shoulder injections (either sub acromial steroid injections for patients with rotator cuff syndrome, or methylprednisolone and bupivacaine for suprascapular nerve block) may be used to reduce pain. (Adey-Wakeling et al. 2013; Rah et al. 2012)

**Weak recommendation**

For stroke survivors with shoulder pain and upper limb spasticity, Botulinum Toxin A may be used to reduce pain. (Singh et al 2010)

**Weak recommendation**

For stroke survivors with shoulder pain, acupuncture in addition to comprehensive rehabilitation may be used to reduce pain. (Liu et al 2019)

**Practice statement**

**Consensus-based recommendations**

For stroke survivors with severe weakness who are at risk of developing shoulder pain, management may include:

- shoulder strapping;
- education of staff, carers and stroke survivors about preventing trauma;
- active motor training to improve function.

**Info box**

**Practice point**

For stroke survivors who develop shoulder pain, management should be based on evidence-based interventions for acute musculoskeletal pain.

## Fatigue

**Practice statement**

**Consensus-based recommendations** **Draft update**

- Therapy for stroke survivors with fatigue should be organised for periods of the day when they are most alert.
- Stroke survivors and their families/carers should be provided with information, education and strategies to assist in managing fatigue.
- Potential modifying factors for fatigue should be considered including avoiding sedating drugs and alcohol, screening for sleep-related breathing disorders and depression.
- 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.

## Incontinence

### Urinary incontinence

#### Weak recommendation

- All stroke survivors with suspected urinary continence difficulties should be assessed by trained personnel using a structured functional assessment. (Martin et al 2006)
- For stroke survivors, a portable bladder ultrasound scan should be used to assist in diagnosis and management of urinary incontinence. (Martin et al 2006)

#### Weak recommendation

- Stroke patients in hospital with confirmed continence difficulties, should have a structured continence management plan formulated, documented, implemented and monitored. (Thomas et al 2008)
- A community continence management plan should be developed with the stroke survivor and family/carer prior to discharge, and should include information on accessing continence resources and appropriate review in the community. (Thomas et al 2008)
- If incontinence persists the stroke survivor should be re-assessed and referred for specialist review. (Thomas et al 2008)

#### Weak recommendation

For stroke survivors with urge incontinence:

- anticholinergic drugs can be tried (Nabi et al 2006);
- a prompted or scheduled voiding regime program/ bladder retraining can be trialled (Thomas et al 2015; Thomas et al 2008);
- if continence is unachievable, containment aids can assist with social continence.

#### Practice statement

#### Consensus-based recommendations

For stroke patients with urinary retention:

- The routine use of indwelling catheters is not recommended. However if urinary retention is severe, intermittent catheterisation should be used to assist bladder emptying during hospitalisation. If retention continues, intermittent catheterisation is preferable to indwelling catheterisation.
- If using intermittent catheterisation, a closed sterile catheterisation technique should be used in hospital.
- Where management of chronic retention requires catheterisation, consideration should be given to the choice of appropriate route, urethral or suprapubic.

- If a stroke survivor is discharged with either intermittent or indwelling catheterisation, they and their family/carer will require education about management, where to access supplies and who to contact in case of problems.

#### **Practice statement**

#### **Consensus-based recommendation**

For stroke survivors with functional incontinence, a whole-team approach is recommended.

#### **Practice statement**

#### **Consensus-based recommendation**

For stroke survivors, the use of indwelling catheters should be avoided as an initial management strategy except in acute urinary retention.

## **Faecal incontinence**

#### **Weak recommendation**

- All stroke survivors with suspected faecal continence difficulties should be assessed by trained personnel using a structured functional assessment. (Harari et al 2004)
- For stroke survivors with constipation or faecal incontinence, a full assessment (including a rectal examination) should be carried out and appropriate management of constipation, faecal overflow or bowel incontinence established and targeted education provided. (Harari et al 2004)

#### **Weak recommendation**

For stroke survivors with bowel dysfunction, bowel habit retraining using type and timing of diet and exploiting the gastro-colic reflex should be used. (Venn et al 1992; Munchiando et al 1993)

#### **Practice statement**

#### **Consensus-based recommendations**

For stroke survivors with bowel dysfunction:

- Education and careful discharge planning should be provided.
- Use of short-term laxatives may be trialled.
- Increase frequency of mobilisation (walking and out of bed activity) to reduce constipation.
- Use of the bathroom rather than use of bed pans should be encouraged.
- Use of containment aids to assist with social continence where continence is unachievable.

## **Mood disturbance**

### **Treatment for Emotionalism**

#### **Weak recommendation**

For stroke survivors with emotionalism, antidepressant medication such as selective serotonin reuptake inhibitors (SSRIs) or tricyclic antidepressants may be used. (Allida et al 2019)

## Prevention of depression

### Weak recommendation **AGAINST**

For stroke survivors, routine use of antidepressants to prevent post-stroke depression is not recommended. (Allida et al 2020)

### Weak recommendation

For stroke survivors, psychological strategies (e.g. problem solving, motivational interviewing) may be used to prevent depression. (Allida et al 2020)

## Treatment for depression

### Strong recommendation

For stroke survivors with depression or depressive symptoms, antidepressants, which includes SSRIs should be considered. There is no clear evidence that particular antidepressants produce greater effects than others and will vary according to the benefit and risk profile of the individual. (Mead et al 2012; Hackett et al 2008)

### Weak recommendation

For stroke survivors with depression or depressive symptoms, structured exercise programs, particularly those of high intensity, may be used. (Eng et al 2014)

### Weak recommendation

For stroke survivors with depression or depressive symptoms, acupuncture may be used. (Zhang et al 2010)

### Weak recommendation **AGAINST**

For stroke survivors with depression, non-invasive brain stimulation (transcranial direct stimulation or repetitive transcranial magnetic stimulation) should not be used in routine practice and only used as part of a research framework. (Tian et al 2011)

## Deep venous thrombosis or pulmonary embolism

### Weak recommendation

For acute ischaemic stroke patients who are immobile, low molecular weight heparin in prophylactic doses may be used in the absence of contraindications. (Sandercock et al 2015; Sherman et al 2007)

### Weak recommendation

For acute stroke patients who are immobile, the use of intermittent pneumatic compression may be used, either as an alternative to low molecular weight heparin or in those with a

contraindication to pharmacological DVT prophylaxis (including patients with intracerebral haemorrhage or within 24 hours of thrombolysis). (Dennis et al 2013)

### **Strong recommendation AGAINST**

Antithrombotic stockings are not recommended for the prevention of DVT or PE post stroke. (Naccarato et al 2010)

#### **Info box**

#### **Practice points**

- For stroke patients, pharmacological prophylaxis should not be used in the first 24 hours after thrombolysis until brain imaging has excluded significant haemorrhagic transformation.
- For acute stroke patients, early mobilisation and adequate hydration should be encouraged to help prevent DVT and PE.
- For stroke patients receiving intermittent pneumatic compression, skin integrity should be assessed daily.
- For patients with intracerebral haemorrhage, pharmacological prophylaxis may be considered after 48-72 hours and once haematoma growth has stabilised, although evidence is limited.

## **Falls**

#### **Practice statement**

#### **Consensus-based recommendations**

- For stroke patients, a falls risk assessment, including fear of falling, should be undertaken on admission to hospital. A management plan should be initiated for all patients identified as at risk of falls.
- For stroke survivors at high risk of falls, a comprehensive home assessment for the purposes of reducing falling hazards should be carried out by a qualified health professional. Appropriate home modifications (as determined by a health professional) for example installation of grab rails and ramps may further reduce falls risk.

#### **Weak recommendation**

For stroke survivors who are at risk of falling, multifactorial interventions in the community, including an individually prescribed exercise program and advice on safety, should be provided. (Denissen et al 2019; Gillespie et al 2012)

## Chapter 7 of 8: Discharge planning and transfer of care

### Information and education

#### Strong recommendation

- All stroke survivors and their families/carers should be offered information tailored to meet their individual needs using relevant language and communication formats. (Forster et al 2012)
- Information should be provided at different stages in the recovery process. (Forster et al 2012)
- An approach of active engagement with stroke survivors and their families/carers should be used allowing for the provision of material, opportunities for follow-up, clarification, and reinforcement. (Forster et al 2012)

#### Info box

#### Practice points

- Stroke survivors and their families/carers should be educated in the FAST stroke recognition message to maximise early presentation to hospital in case of recurrent stroke.
- The need for education, information and behaviour change to address long-term secondary stroke prevention should be emphasized (refer to [Secondary Prevention](#)).

### Discharge care plans

#### Strong recommendation

Comprehensive discharge care plans that address the specific needs of the stroke survivor should be developed in conjunction with the stroke survivor and carer prior to discharge. (Johnston et al 2010; Goncalves-Bradley et al 2016)

#### Info box

#### Practice point

Discharge planning should commence as soon as possible after the stroke patient has been admitted to hospital.

#### Practice statement

#### Consensus-based recommendation

A discharge planner may be used to coordinate a comprehensive discharge program for stroke survivors.

#### Practice statement

#### Consensus-based recommendations



To ensure a safe discharge process occurs, hospital services should ensure the following steps are completed prior to discharge:

- Stroke survivors and families/carers have the opportunity to identify and discuss their post-discharge needs (physical, emotional, social, recreational, financial and community support) with relevant members of the multidisciplinary team.
- General practitioners, primary healthcare teams and community services are informed before or at the time of discharge.
- All medications, equipment and support services necessary for a safe discharge are organised.
- Any necessary continuing specialist treatment required has been organised.
- A documented post-discharge care plan is developed in collaboration with the stroke survivor and family and a copy provided to them. This discharge planning process may involve relevant community services, self-management strategies (i.e. information on medications and compliance advice, goals and therapy to continue at home), stroke support services, any further rehabilitation or outpatient appointments, and an appropriate contact number for any post-discharge queries

A locally developed protocol or standardised tool may assist in implementation of a safe and comprehensive discharge process. This tool should be aphasia and cognition friendly.

## Patient and carer needs

### Practice statement

#### Consensus-based recommendation

Hospital services should ensure that stroke survivors and their families/carers have the opportunity to identify and discuss their post-discharge needs (including physical, emotional, social, recreational, financial and community support) with relevant members of the interdisciplinary team.

## Home assessments

### Practice statement

#### Consensus-based recommendation

Prior to hospital discharge, all stroke survivors should be assessed to determine the need for a home visit, which may be carried out to ensure safety and provision of appropriate aids, support and community services.

## Carer training

#### **Weak recommendation**

Relevant members of the interdisciplinary team should provide specific and tailored training for carers/family before the stroke survivor is discharged home. This training should include, as

necessary, personal care techniques, communication strategies, physical handling techniques, information about ongoing prevention and other specific stroke-related problems, safe swallowing and appropriate dietary modifications, and management of behaviours and psychosocial issues. (Forster et al 2013)

For access to the full Clinical Guidelines and further information refer to InformMe  
<https://informme.org.au/Guidelines/Clinical-Guidelines-for-Stroke-Management>.