

Clinical Guidelines for Stroke Management 2017

Summary – Emergency Department

This summary is a quick reference to the recommendations in the *Clinical Guidelines for Stroke Management 2017* most relevant to emergency care.

The Emergency Department (ED) is often the first point of contact for the stroke patient seeking treatment, and decisions made in the ED need to be based on the best available evidence to achieve the most beneficial outcomes for the patient.

While this summary focuses on relevant aspects of care, 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/en/Guidelines/Clinical-Guidelines-for-Stroke-Management-2017>.

Key points

- All patients with suspected stroke or transient ischaemic attack (TIA) should be managed as a time-critical medical emergency and receive urgent assessment.
- Eligible patients should receive thrombolysis or endovascular thrombectomy as soon as possible. Other medical interventions and surgeries should be carefully considered according to patients' conditions.
- Routine aspects of acute care should be monitored to avoid common complications, e.g. temperature, blood pressure, glucose level, and oxygen level.

- Secondary complications as a result of a primary impairment should be screened and managed, such as malnutrition, dehydration, incontinence, and deep venous thrombosis.
- Investigations of underlying causes of stroke should be started early to enable commencement of secondary prevention therapies.
- TIA is a medical emergency. The highest risk of stroke occurring following TIA is within the first 2 days. TIA requires rapid assessment and management to prevent stroke. Diagnostic work-up and implementation of optimal therapy for patients with suspected TIA should be completed within 24 hours. This requires diagnostic confirmation by a stroke specialist, ECG +/- prolonged monitoring and brain imaging (CT or MRI).

The *Clinical Guidelines for Stroke Management 2017* is an update of the previous clinical guidelines published in 2010 and is based on the best evidence available. The new Clinical Guidelines use an internationally recognised guideline development approach called GRADE (Grading of Recommendations Assessment, Development and Evaluation) and an innovative guideline development and publishing platform known as MAGICapp (Making Grade the Irresistible Choice). GRADE ensures a systematic process in developing recommendations, 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 recommendations, based on how confident the guideline developers are in that the “desirable effects of an intervention outweigh undesirable effects [...] 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 for the 2010 and 2017 versions to note changes easily, and are also presented in Chapter order for easier reference to the relevant section of the full Clinical Guidelines.

2010 Clinical Guidelines	2017 Clinical Guidelines
Chapter 2: Stroke recognition and pre-hospital care	Chapter 1: Pre-hospital care
Stroke patients should be assigned a high priority by ambulance services.	<p>Strong recommendation Updated</p> <p>All stroke patients should be managed as a time critical emergency. The dispatch of ambulances to suspected stroke patients who may be eligible for reperfusion therapies requires the highest level of priority.</p>
Health and ambulance services should develop and use pre-notification systems for stroke.	<p>Strong recommendation Updated</p> <ul style="list-style-type: none"> • Ambulance services should preferentially transfer suspected stroke patients to a hospital capable of delivering reperfusion therapies as well as stroke unit care. • Ambulance services should pre-notify the hospital of a suspected stroke case where the patient may be eligible for reperfusion therapies.
Ambulance services should preferentially transfer suspected stroke patients to a hospital with stroke unit care.	
Chapter 3: Early assessment and diagnosis	Chapter 2 of 8: Early assessment and diagnosis
Transient ischaemic attack	Transient ischaemic attack
All patients with suspected TIA should have a full assessment that includes a detailed history and clinical, prognostic (e.g. ABCD2 score) and investigative tests (e.g. blood tests, brain and carotid imaging and ECG) at the initial point of healthcare contact, whether first seen in primary or secondary care.	<p>Strong recommendation Updated</p> <ul style="list-style-type: none"> • 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. • 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. • In pre-hospital settings, high risk indicators (e.g. crescendo TIA, current or suspected AF, current use of anticoagulants, carotid stenosis or high

	<p>ABCD² score) can be used to identify patients for urgent specialist assessment.</p>
	<p>Strong recommendation New</p> <p>When TIA patients present to primary care, the use of TIA electronic decision support, when available, is recommended to improve diagnostic and triage decisions.</p>
	<p>Weak recommendation AGAINST New</p> <p>In TIA patients, use of the ABCD² 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.</p>
<p>Patients identified as high risk (e.g. ABCD2 score >3 and/or any one of AF, carotid territory symptoms or crescendo TIA should undergo:</p> <ul style="list-style-type: none"> • urgent brain imaging (preferably MRI with DWI), 'urgent' being immediately where available, but within 24 hours) • carotid imaging should also be undertaken urgently in patients with anterior circulation symptoms who are candidates for carotid re-vascularisation. In settings with limited access to these investigations, referral within 24 hours should be made to the nearest centre where such tests can be quickly conducted. 	<p>Strong recommendation Updated</p> <p>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.</p>
	<p>Weak recommendation Updated</p> <p>Patients with TIA should routinely undergo brain imaging to exclude stroke mimics and intracranial haemorrhage. MRI, when available, is recommended to improve diagnostic accuracy.</p>

	<p>Strong recommendation New</p> <p>Patients with suspected TIA should commence secondary prevention therapy urgently.</p>
	<p>Strong recommendation New</p> <ul style="list-style-type: none"> • All patients with TIA should be investigated for atrial fibrillation with ECG during initial assessment and referred for possible prolonged cardiac monitoring as required. • TIA patients with atrial fibrillation should commence anticoagulation therapy early after brain imaging has excluded haemorrhage, unless contraindicated.
	<p>Practice statement Consensus-based recommendations New</p> <ul style="list-style-type: none"> • 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), return to driving 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.
Patients classified as low-risk (e.g. ABCD2 score <4 without AF or carotid territory symptoms or who present more than one week after last symptoms should have brain and carotid imaging (where indicated) as soon as possible (i.e. within 48 hours).	-

<p>The following investigations should be undertaken routinely for all patients with suspected TIA: full blood count, electrolytes, erythrocyte sedimentation rate (ESR), renal function, lipid profile, glucose level, and ECG.</p>	<p>-</p>
<p>Rapid assessment in the emergency department</p>	<p>Rapid assessment in the emergency department</p>
<p>Initial diagnosis should be reviewed by a clinician experienced in the evaluation of stroke.</p>	<p>Strong recommendation Updated 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.</p>
<p>Emergency department staff should use a validated stroke screening tool to assist in rapid accurate assessment for all people with stroke.</p>	<p>Weak recommendation Updated 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.</p>
<p>Stroke severity should be assessed and recorded on admission by a trained clinician using a validated tool (e.g. NIHSS or SSS).</p>	<p>Info Box Practice points Updated</p> <ul style="list-style-type: none"> • 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	Imaging - Brain imaging
All patients with suspected stroke should have an urgent brain CT or MRI ('urgent' being immediately where facilities are available but within 24 hours). Patients who are candidates for thrombolysis should undergo brain imaging immediately.	Strong recommendation Updated 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).
	Weak recommendation Updated 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.
	Practice statement Consensus-based recommendation New Either CT or MRI are acceptable acute imaging options but these need to be immediately accessible to avoid delaying reperfusion therapies.
	Strong recommendation New 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.
	Weak recommendation New CT perfusion imaging may be used in addition to routine imaging to improve diagnostic and prognostic accuracy.

<p>A repeat brain CT or MRI and acute medical review should be considered urgently when a patient's condition deteriorates.</p>	<p>Info Box Practice points Updated</p> <ul style="list-style-type: none"> • 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.
<p>Imaging – Vascular imaging</p>	
<p>All patients with carotid territory symptoms who would potentially be candidates for carotid re-vascularisation should have urgent carotid imaging.</p>	<p>Strong recommendation Updated</p> <ul style="list-style-type: none"> • All patients who would potentially be candidates for endovascular thrombectomy should have vascular imaging from aortic arch to cerebral vertex (CTA or MRA) to establish the presence of vascular occlusion as a target for thrombectomy and to assess proximal vascular access. • All other patients with carotid territory symptoms who would potentially be candidates for carotid re-vascularisation should have early vascular imaging to identify stenosis in the ipsilateral carotid artery. CT angiography (if not already performed as part of assessment for reperfusion therapies), Doppler ultrasound or contrast-enhanced MR angiography are all reasonable options depending on local experience and availability.
<p>Further brain, cardiac or carotid imaging should be undertaken in selected patients:</p> <ul style="list-style-type: none"> • where initial assessment has not identified the likely source of the ischaemic event • with a history of more than one TIA • likely to undergo carotid surgery. 	
	<p>Info Box Practice points New</p> <ul style="list-style-type: none"> • In ischaemic stroke and TIA patients, routinely imaging the entire vasculature from aortic arch to cerebral vertex with CTA or MRA is encouraged to improve diagnosis, recognition of stroke aetiology and assessment of prognosis.

	<ul style="list-style-type: none"> The administration of intravenous iodinated contrast for CT angiography/perfusion, when clinically indicated, should not be delayed by concerns regarding renal function. Post-hydration with intravenous 0.9% saline is advisable.
	<p>Info Box Practice point New</p> <p>Vascular imaging should not be performed for syncope or other non-focal neurological presentations.</p>
	<p>Cardiac investigations</p>
	<p>Weak recommendation New</p> <p>Initial ECG monitoring should be undertaken for all patients with stroke. The duration and mode of monitoring should be guided by individual patient factors but would generally be recommended for at least the first 24 hours.</p>
	<p>Strong recommendation New</p> <p>For patients with embolic stroke of uncertain source, longer term ECG monitoring (external or implantable) should be used.</p>
	<p>Weak recommendation Updated</p> <p>Further cardiac investigations should be performed where clarification of stroke aetiology is required after initial investigations. In patients with ischaemic stroke, echocardiography should be considered based on individual patient factors. Transoesophageal echocardiography is more sensitive for suspected valvular, left atrial and aortic arch pathology.</p>

<p>Investigations</p>	
<p>The following investigations should be routinely carried out in all patients with suspected stroke: full blood count, electrocardiogram, electrolytes, renal function, fasting lipids, erythrocyte sedimentation rate and/or C-reactive protein and glucose.</p>	-
<p>Selected patients may require the following additional investigations: catheter angiography, chest X-ray, syphilis serology, vasculitis screen and prothrombotic screen. These tests should be performed as soon as possible after stroke onset. Some of these tests may need to be performed as an emergency procedure in certain patients.</p>	-
<p>Chapter 4: Acute medical and surgical management</p>	<p>Chapter 3 of 8: Acute medical and surgical management</p>
	<p>Stroke unit care</p>
	<p>Strong recommendation All stroke patients should be admitted to hospital and be treated in a stroke unit with an interdisciplinary team.</p>
	<p>Info Box Practice points</p> <ul style="list-style-type: none"> • All stroke patients should be admitted directly to a stroke unit (preferably within three hours of stroke onset). • For patients with suspected stroke presenting to non-stroke unit hospitals, transfer protocols should be developed and used to guide urgent transfers to the nearest stroke unit hospital. • Where transfer is not feasible, smaller isolated hospitals should manage stroke services in a manner that adheres as closely as possible to the criteria for stroke unit care. Where possible, stroke patients should receive care in geographically discrete units.

	<p>Strong recommendation New</p> <p>All acute stroke services should implement standardised protocols to manage fever, glucose and swallowing difficulties in stroke patients.</p>
	<p>Palliative care</p>
	<p>Strong recommendation</p> <p>Stroke patients and their families/carers should have access to specialist palliative care teams as needed and receive care consistent with the principles and philosophies of palliative care.</p>
	<p>Practice statement Consensus-based recommendations</p> <ul style="list-style-type: none"> • For patients with severe stroke who are deteriorating, a considered assessment of prognosis or imminent death should be made. • A pathway for stroke palliative care can be used to support stroke patients and their families/carers and improve care for people dying after stroke.
	<p>Reperfusion therapy</p>
Thrombolysis	Thrombolysis
Intravenous rt-PA in acute ischaemic stroke should only be undertaken in patients satisfying specific inclusion and exclusion criteria.	<p>Strong recommendation Updated</p> <ul style="list-style-type: none"> • For patients with potentially disabling ischaemic stroke who meet specific eligibility criteria, intravenous alteplase (dose of 0.9 mg/kg, maximum of 90 mg) should be administered. • Thrombolysis should commence as early as possible (within the first few hours) after stroke onset but may be used up to 4.5 hours after onset.
Intravenous rt-PA should be given as early as possible in carefully selected patients with acute ischaemic stroke as the effect size of thrombolysis is time-dependent. Where possible, therapy should commence in the first few hours but may be used up to 4.5 hours after stroke onset.	

<p>Intravenous rt-PA should only be given under the authority of a physician trained and experienced in acute stroke management.</p>	<p>Info Box Practice points Updated</p> <p>Thrombolysis should be undertaken in a setting with appropriate infrastructure, facilities and network support (e.g. via telemedicine) including:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
<p>Thrombolysis should only be undertaken in a hospital setting with appropriate infrastructure, facilities and network support including:</p> <ul style="list-style-type: none"> • access to an multidisciplinary acute care team with expert knowledge of stroke management • who are trained in delivery and monitoring of patients receiving thrombolytic therapy • pathways and protocols available to guide medical, nursing and allied health acute phase • management, in particular acute blood pressure management • immediate access to imaging facilities and staff trained to interpret images. 	
<p>A minimum set of de-identified data from all patients treated with thrombolysis should be recorded in a central register to allow monitoring, review, comparison and benchmarking of key outcomes measures over time.</p>	
<p>The commencement of aspirin for patients who have received thrombolysis should be delayed for 24 hours (usually after a follow-up scan has excluded significant bleeding).</p>	

Neurointervention	Neurointervention
	<p>Strong recommendation New</p> <p>For patients with ischaemic stroke caused by a large vessel occlusion in the internal carotid artery, proximal cerebral artery (M1 segment), or with tandem occlusion of both the cervical carotid and intracranial arteries, endovascular thrombectomy should be undertaken when the procedure can be commenced within six hours of stroke onset.</p>
	<p>Strong recommendation New</p> <p>Eligible stroke patients should receive intravenous thrombolysis while concurrently arranging endovascular thrombectomy, with neither treatment delaying the other.</p>
	<p>Strong recommendation New</p> <p>In selected stroke patients with occlusion of the basilar artery, endovascular thrombectomy should be undertaken.</p>
	<p>Practice statement Consensus-based recommendations New</p> <p>For stroke patients, endovascular thrombectomy may be considered in the following situations based on individual patient and advanced imaging factors:</p> <ul style="list-style-type: none"> • commencement of procedure beyond 6 hours (but within 24 hours) from stroke onset • occlusion in more distal middle cerebral artery branches (M2 segment). <p>Endovascular thrombectomy should be performed by an experienced neurointerventionist with recognised training in the procedure.</p>
<p>Intra-arterial (IA) thrombolysis within six hours can be used in carefully selected patients.</p>	<p>-</p>

Each large tertiary centre should consider establishing facilities and systems for IA thrombolysis.	-
There is insufficient evidence to recommend the use of mechanical clot removal in routine clinical practice. Consideration should be given to enrolling patients in a suitable clinical trial evaluating this intervention.	-
Dysphagia	Dysphagia
Patients should be screened for swallowing deficits before being given food, drink or oral medications.	Practice statement Consensus-based recommendation New People with acute stroke should have their swallowing screened within four hours of arrival at hospital and before being given any oral food, fluid or medication.
Swallowing should be screened for as soon as possible but at least within 24 hours of admission.	
Personnel specifically trained in swallowing screening using a validated tool should undertake screening.	Weak recommendation Updated People with acute stroke should have their swallowing screened, using a validated screening tool, by a trained healthcare professional.
Patients who fail the swallowing screening should be referred to a speech pathologist for a comprehensive assessment. This may include instrumental examination e.g. VMBS &/or FEES. Special consideration should be given to assessing and managing appropriate hydration. These assessments can also be used for monitoring during rehabilitation.	Weak recommendation Updated All stroke patients who have failed swallow screening or who deteriorate should have a comprehensive assessment of swallowing performed by a speech pathologist.
Compensatory strategies such as positioning, therapeutic manoeuvres or modification of food and fluids to facilitate safe swallowing should be provided for people with dysphagia based on specific impairments identified during comprehensive swallow assessment.	Strong recommendation Updated For stroke survivors with swallowing difficulties, behavioural approaches such as swallowing exercises, environmental modifications, safe swallowing advice, and appropriate dietary modifications should be used early.

<p>Dysphagic patients on modified diets should have their intake and tolerance to diet monitored. The need for continued modified diet should be regularly reviewed.</p>	<p>Practice statement Consensus-based recommendations Updated</p> <ul style="list-style-type: none"> • Until a safe swallowing method is established for oral intake, patients with dysphagia should have their nutrition and hydration assessed and managed with early consideration of alternative non-oral routes. • Patients with dysphagia on texture-modified diets and/or fluids should have their intake and tolerance to the modified diet monitored regularly due to the increased risk of malnutrition and dehydration. • Patients with dysphagia should be offered regular therapy that includes skill and strength training in direct therapy (with food/fluids) and indirect motor therapy which capitalises on the principles of neural plasticity to improve swallowing skills. • Patients with persistent weight loss, dehydration and/or recurrent chest infections should be urgently reviewed.
<p>Patients with persistent weight loss and recurrent chest infections should be urgently reviewed.</p>	<ul style="list-style-type: none"> • All staff and carers involved in feeding patients should receive appropriate training in feeding and swallowing techniques.
<p>All staff and carers involved in feeding patients should receive appropriate training in feeding and swallowing techniques.</p>	<ul style="list-style-type: none"> • All staff should be appropriately trained in the maintenance of oral hygiene, including daily brushing of teeth and/or dentures and care of gums.
<p>The gag reflex is not a valid screen for dysphagia and should NOT be used as a screening tool.</p>	<p>-</p>
<p>Antithrombotic therapy</p>	<p>Antithrombotic therapy</p>
<p>Aspirin orally or via a nasogastric tube or suppository (for those with dysphagia) should be given as soon as possible after the onset of stroke symptoms (i.e. within 48 hours) if CT/MRI scans exclude haemorrhage. The first dose should be at least 150 to 300 mg. Dosage thereafter can be reduced (e.g. 100 mg daily).</p>	<p>Strong recommendation Updated</p> <p>Patients with ischaemic stroke who are not receiving reperfusion therapy should receive antiplatelet therapy as soon as brain imaging has excluded haemorrhage.</p>

	<p>Strong recommendation AGAINST Updated</p> <p>Acute antiplatelet therapy should not be given within 24 hours of alteplase administration.</p>
The routine use of early anticoagulation in unselected patients following ischaemic stroke/TIA is NOT recommended.	<p>Strong recommendation AGAINST</p> <p>Routine use of anticoagulation in patients without cardioembolism (e.g. atrial fibrillation) following TIA/stroke is not recommended.</p>
	<p>Weak recommendation New</p> <p>Aspirin plus clopidogrel may be used in the short term (first three weeks) in high-risk patients with minor ischaemic stroke or TIA to prevent stroke recurrence.</p>
Acute phase blood pressure lowering therapy	Acute blood pressure lowering therapy
	<p>Weak recommendation AGAINST New</p> <p>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.</p>
In acute primary intracerebral haemorrhage where severe hypertension is observed on several occasions within the first 24 to 48 hours of stroke onset, antihypertensive therapy (that could include intravenous treatment) can be used to maintain a blood pressure below 180 mmHg systolic (mean arterial pressure of 130 mmHg).	<p>Weak recommendation Updated</p> <p>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).</p>
Pre-existing antihypertensive therapy can be continued (orally or via nasogastric tube) provided there is no symptomatic hypotension or other reason to withhold treatment.	<p>Weak recommendation Updated</p> <p>Pre-existing antihypertensive medication may be withheld until patients are neurologically stable and treatment can be given safely.</p>

<p>In ischaemic stroke, if blood pressure is more than 220/120 mmHg, antihypertensive therapy can be started or increased, but blood pressure should be cautiously reduced (e.g. by no more than 10–20%) and the patient monitored for signs of neurological deterioration.</p>	<p>Practice statement Consensus-based recommendations Updated</p> <ul style="list-style-type: none"> • 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.
<p>Surgery for ischaemic stroke and management of cerebral oedema</p>	<p>Surgery for ischaemic stroke and management of cerebral oedema</p>
<p>Selected patients (18–60 years, where surgery can occur within 48 hours of symptom onset) and with large middle cerebral artery infarction should be urgently referred to a neurosurgeon for consideration of decompressive hemicraniectomy.</p>	<p>Strong recommendation</p> <p>Selected patients aged 60 years and under with malignant middle cerebral artery territory infarction should undergo urgent neurosurgical assessment for consideration of decompressive hemicraniectomy. When undertaken, hemicraniectomy should ideally be performed within 48 hours of stroke onset.</p>
	<p>Weak recommendation New</p> <p>Decompressive hemicraniectomy may be considered in highly selected stroke patients over the age of 60 years, after careful consideration of the pre-morbid functional status and patient preferences.</p>
<p>Corticosteroids are NOT recommended for management of patients with brain oedema and raised intracranial pressure.</p>	<p>Weak recommendation AGAINST</p> <p>Corticosteroids are not recommended for management of stroke patients with brain oedema and raised intracranial pressure.</p>

<p>Osmotherapy and hyperventilation can be trialled while a neurosurgical consultation is undertaken, or in patients whose condition is deteriorating due to raised intracranial pressure.</p>	<p>Practice statement Consensus-based recommendation Updated In stroke patients with brain oedema and raised intracranial pressure, osmotherapy and hyperventilation can be trialled while a neurosurgical consultation is undertaken.</p>
	<p>Practice statement Consensus-based recommendation New For selected patients with large cerebellar infarction threatening brainstem and 4th ventricular compression, decompressive surgery should be offered.</p>
<p>Intracerebral haemorrhage management</p>	<p>Intracerebral haemorrhage (ICH) management</p>
	<p>Medical interventions</p>
<p>The use of haemostatic drug treatment with rFVIIa is currently considered experimental and is NOT recommended for use outside a clinical trial.</p>	<p>Weak recommendation Updated</p> <ul style="list-style-type: none"> • 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. • Intravenous vitamin K (5–10 mg) should be used in addition to prothrombin complex to reverse warfarin but is insufficient as a sole treatment.
<p>In patients with ICH who were receiving anticoagulation therapy prior to the stroke and who have elevated INR, therapy to reverse anticoagulation should be initiated rapidly e.g. using a combination of prothrombin complex concentrate and vitamin K.</p>	
	<p>Weak recommendation New Stroke patients with intracerebral haemorrhage related to direct oral anticoagulants should urgently receive a specific reversal agent where available.</p>
	<p>Strong recommendation AGAINST New For stroke patients with intracerebral haemorrhage previously receiving antiplatelet therapy, platelet transfusion should not be administered.</p>

	<p>Weak recommendation Updated</p> <p>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).</p>
	<p>Surgical interventions</p>
<p>Patients with supratentorial ICH should be referred for neurosurgical review if they have hydrocephalus.</p>	<p>Weak recommendation AGAINST Updated</p> <p>For stroke patients with supratentorial intracerebral haemorrhage (lobar, basal ganglia and/or thalamic locations), routine surgical evacuation is not recommended outside the context of research.</p>
	<p>Weak recommendation AGAINST New</p> <p>For stroke patients with intraventricular haemorrhage, the use of intraventricular thrombolysis via external ventricular drain catheter is not recommended outside the context of research.</p>
<p>Surgery for supratentorial haemorrhage can be considered in carefully selected patients. If undertaken, surgery should be performed within 72 hours. The strongest evidence for benefit with surgery is for patients aged <85, a Glasgow Coma Score of 5–15 having altered consciousness or severe neurological deficit and presenting within 24 hours.</p>	<p>Practice statement Consensus-based recommendations Updated</p> <ul style="list-style-type: none"> • For selected patients with large (> 3 cm) cerebellar haemorrhage, decompressive surgery should be offered. For other infratentorial haemorrhages (< 3 cm cerebellar, brainstem) the value of surgical intervention is unclear. • Ventricular drainage as treatment for hydrocephalus is reasonable, especially in patients with decreased level of consciousness. • In previously independent patients with large supratentorial haemorrhage and deteriorating conscious state, haematoma evacuation may be a life-saving measure but consideration of the likely level of long term disability is required.
<p>Surgical evacuation may be undertaken for cerebellar hemisphere haematomas >3 cm diameter in selected patients.</p>	

Physiological monitoring	
Patients should have their neurological status (e.g. Glasgow Coma Scale), vital signs (including pulse, blood pressure, temperature, oxygen saturation, and glucose levels) and respiratory pattern monitored and documented regularly during the acute phase, the frequency of such observations being determined by the patient's status.	-
Oxygen therapy	Oxygen therapy
The routine use of supplemental oxygen is NOT recommended in acute stroke patients who are not hypoxic.	Weak recommendation AGAINST For acute stroke patients who are not hypoxic, the routine use of supplemental oxygen is not recommended.
	Weak recommendation AGAINST New For acute ischaemic stroke patients, hyperbaric oxygen therapy is not recommended.
Patients who are hypoxic (i.e. <95% oxygen saturation) should be given supplemental oxygen.	Practice statement Consensus-based recommendation Stroke patients who are hypoxic (i.e. < 95% oxygen saturation) should be given supplemental oxygen.
Neuroprotection	Neuroprotection
Putative neuroprotectors (including hypothermic cooling) should only be used in a randomised controlled trial.	Practice statement Consensus-based recommendation For stroke patients, putative neuroprotective agents, including hypothermic cooling, are not recommended outside the context of research.
Patients with acute ischaemic stroke who were receiving statins prior to admission can continue statin treatment.	Practice statement Consensus-based recommendation

	Patients with acute ischaemic stroke who were receiving statins prior to admission can continue statin treatment.
Glycaemic control	Glycaemic therapy
On admission, all patients should have their blood glucose level monitored and appropriate glycaemic therapy instituted to ensure euglycaemia, especially if the patient is diabetic.	Strong recommendation Updated 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.
An early intensive approach to the maintenance of euglycaemia is currently NOT recommended.	Strong recommendation AGAINST Updated For stroke patients, an intensive approach to the maintenance of tight glycaemic control (between 4.0–7.5 mmol/L) is not recommended.
Pyrexia	Pyrexia management
	Strong recommendation New All stroke patients should have their temperature monitored at least four times a day for 72 hours.
Antipyretic therapy, comprising regular paracetamol and/or physical cooling measures, should be used routinely where fever occurs.	Weak recommendation Updated Stroke patients with fever ≥ 37.5 °C may be treated with paracetamol as an antipyretic therapy.

Chapter 5: Secondary prevention	Chapter 4 of 8: Secondary prevention
Lifestyle modification	Lifestyle modification
<p>Every stroke patient should be assessed and informed of their risk factors for a further stroke and possible strategies to modify identified risk factors. The risk factors and interventions include:</p> <ul style="list-style-type: none"> • stopping smoking: nicotine replacement therapy, bupropion or nortriptyline therapy, nicotine • receptor partial agonist therapy and/or behavioural therapy • improving diet: a diet low in fat (especially saturated fat) and sodium but high in fruit and vegetables • increasing regular exercise • avoiding excessive alcohol (i.e. no more than two standard drinks per day). 	<p>Info Box Practice point Updated</p> <p>All people with stroke or TIA (except those receiving palliative care) should be assessed and informed of their risk factors for recurrent stroke and strategies to modify identified risk factors. This should occur as soon as possible and prior to discharge from hospital.</p>
<p>Interventions should be individualised and delivered using behavioural techniques such as educational or motivational counselling.</p>	
	Smoking
	<p>Info Box Practice point New</p> <p>People with stroke or TIA who smoke should be advised to stop and assisted to quit in line with existing guidelines, such as Supporting smoking cessation: a guide for health professionals.</p>
	Diet
	<p>Info Box Practice points New</p> <ul style="list-style-type: none"> • People with stroke or TIA should be advised to manage their dietary requirements in accordance with the Australian Dietary Guidelines.

	<ul style="list-style-type: none"> All stroke survivors should be referred to an Accredited Practising Dietitian who can provide individualised dietary advice.
	Physical activity
	<p>Info Box Practice point New</p> <p>People with stroke or TIA should be advised and supported to undertake appropriate, regular physical activity as outlined in one of the following existing guidelines:</p> <ul style="list-style-type: none"> Australia’s Physical Activity & Sedentary Behaviour Guidelines for Adults (18-64 years) OR Physical Activity Recommendations for Older Australians (65 years and older).
	Obesity
	<p>Info Box Practice point New</p> <p>People with stroke or TIA who are overweight or obese should be offered advice and support to aid weight loss as outlined in the Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults, Adolescents and Children in Australia.</p>
	Alcohol
	<p>Info Box Practice point New</p> <p>People with stroke or TIA should be advised to avoid excessive alcohol consumption (>2 standard drinks per day) in line with the Australian Guidelines to Reduce Health Risks from Drinking Alcohol.</p>

<p>Adherence to pharmacotherapy</p>	<p>Adherence to pharmacotherapy</p>
<p>Interventions to promote adherence with medication regimes are often complex and should include combinations of the following:</p> <ul style="list-style-type: none"> • reminders, self-monitoring, reinforcement, counselling, family therapy, telephone follow-up, supportive care and dose administration aids • information and education in hospital and in the community. 	<p>Weak recommendation Updated</p> <p>Interventions to promote adherence with medication regimes may be provided to all stroke survivors. Such regimes may include combinations of the following:</p> <ul style="list-style-type: none"> - reminders, self-monitoring, reinforcement, counselling, motivational interviewing, family therapy, telephone follow-up, supportive care and dose administration aids - development of self-management skills and modification of dysfunctional beliefs about medication.
<p>Blood pressure lowering</p>	<p>Blood pressure lowering therapy</p>
<p>All stroke and TIA patients, whether normotensive or hypertensive, should receive blood pressure lowering therapy, unless contraindicated by symptomatic hypotension.</p>	<p>Acute blood pressure management</p> <p>Practice statement Consensus-based recommendations New</p> <ul style="list-style-type: none"> • 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.
	<p>Weak recommendation AGAINST New</p> <p>Intensive blood pressure lowering in the acute phase of care to a target SBP of <140mmHg is not recommended for any patient with stroke.</p>

	<p>Weak recommendation Updated</p> <p>In patients with intracerebral haemorrhage blood pressure may be acutely reduced to a target systolic blood pressure of around 140mmHg (but not substantially below).</p>
	<p>Weak recommendation Updated</p> <p>Pre-existing antihypertensive agents may be withheld until patients are neurologically stable and treatment can be given safely.</p>
	<p>Long term blood pressure management</p>
<p>New blood pressure lowering therapy should commence before discharge for those with stroke or TIA, or soon after TIA if the patient is not admitted.</p>	<p>Strong recommendation Updated</p> <ul style="list-style-type: none"> • All stroke and TIA patients, with a clinic blood pressure of >140/90mmHg should have long term blood pressure lowering therapy initiated or intensified. • 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. • 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.
	<p>Weak recommendation Updated</p> <ul style="list-style-type: none"> • 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. • 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.
Antiplatelet therapy	Antiplatelet therapy
Long-term antiplatelet therapy should be prescribed to all people with ischaemic stroke or TIA who are not prescribed anticoagulation therapy.	Strong recommendation Updated Long-term antiplatelet therapy (low-dose aspirin, clopidogrel or combined low-dose aspirin and modified release dipyridamole) should be prescribed to all people with ischaemic stroke or TIA who are not prescribed anticoagulation therapy, taking into consideration patient co-morbidities.
Low-dose aspirin and modified release dipyridamole or clopidogrel alone should be prescribed to all people with ischaemic stroke or TIA, taking into consideration patient co-morbidities.	
	Strong recommendation New 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.
	Weak recommendation New For high risk patients with minor ischaemic stroke or TIA, aspirin plus clopidogrel may be used in the short term (first three weeks) to prevent stroke recurrence.
The combination of aspirin plus clopidogrel is NOT recommended for the secondary prevention of cerebrovascular disease in people who do not have acute coronary disease or recent coronary stent.	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.

	<p>Strong recommendation AGAINST New</p> <p>Antiplatelet agents should not be used for stroke prevention in patients with atrial fibrillation.</p>
Aspirin alone can be used, particularly in people who do not tolerate aspirin plus dipyridamole or clopidogrel.	-
Anticoagulation therapy	Anticoagulant therapy
Anticoagulation therapy for secondary prevention for people with ischaemic stroke or TIA from presumed arterial origin should NOT be routinely used.	<p>Strong recommendation Updated</p> <ul style="list-style-type: none"> • For ischaemic stroke or TIA patients with atrial fibrillation (both paroxysmal and permanent), oral anticoagulation is recommended for long-term secondary prevention. • Direct oral anticoagulants (DOACs) should be initiated in preference to warfarin for patients with non-valvular atrial fibrillation and adequate renal function. • 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.
Anticoagulation therapy for long-term secondary prevention should be used in people with ischaemic stroke or TIA who have atrial fibrillation or cardioembolic stroke.	
In stroke patients, the decision to begin anticoagulation therapy can be delayed for up to two weeks but should be made prior to discharge.	<p>Practice statement Consensus-based recommendation</p> <p>For ischaemic stroke patients, the decision to begin anticoagulant therapy can be delayed for up to two weeks but should be made prior to discharge.</p>
In patients with TIA, anticoagulation therapy should begin once CT or MRI has excluded intracranial haemorrhage as the cause of the current event.	<p>Info Box Practice points New</p> <ul style="list-style-type: none"> • 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.

	<ul style="list-style-type: none"> • 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.
Cholesterol lowering	Cholesterol lowering therapy
Therapy with a statin should be used for all patients with ischaemic stroke or TIA.	Strong recommendation Updated 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.
Statins should NOT be used routinely for haemorrhagic stroke.	Weak recommendation AGAINST Statins should not be used routinely for intracerebral haemorrhage.
	Weak recommendation AGAINST New Fibrates should not be used routinely for the secondary prevention of stroke.
Carotid surgery	Carotid surgery
Carotid endarterectomy should be undertaken in patients with non-disabling carotid artery territory ischaemic stroke or TIA with ipsilateral carotid stenosis measured at 70–99% (NASCET criteria) only if it can be performed by a specialist surgeon with low rates (<6%) of peri-operative mortality/morbidity.	Strong recommendation Updated <ul style="list-style-type: none"> • Carotid endarterectomy is recommended for patients with recent (<3 months) non-disabling carotid artery territory ischaemic stroke or TIA with ipsilateral carotid stenosis measured at 70-99% (NASCET criteria) if it can be performed by a specialist team with audited practice and a low rate (<6%) of perioperative stroke and death.

<p>Carotid endarterectomy can be undertaken in highly selected ischaemic stroke or TIA patients (considering age, gender and co-morbidities) with symptomatic carotid stenosis of 50–69% (NASCET criteria) or asymptomatic carotid stenosis >60% (NASCET criteria) only if it can be performed by a specialist surgeon with very low rates (<3%) of peri-operative mortality/morbidity.</p>	<ul style="list-style-type: none"> • Carotid endarterectomy can be considered in selected patients with recent (<3 months) non-disabling ischaemic stroke or TIA patients with symptomatic carotid stenosis of 50–69% (NASCET criteria) if it can be performed by a specialist team with audited practice and a very low rate (<3%) of perioperative stroke and death. • Carotid endarterectomy should be performed as soon as possible (ideally within two weeks) after the ischaemic stroke or TIA. • All patients with carotid stenosis should be treated with intensive vascular secondary prevention therapy.
<p>Eligible stable patients should undergo carotid endarterectomy as soon as possible after the stroke event (ideally within two weeks).</p>	
	<p>Weak recommendation Updated</p> <ul style="list-style-type: none"> • Carotid endarterectomy should be performed in preference to carotid stenting due to a lower perioperative stroke risk. However, in selected patients with unfavourable anatomy, symptomatic re-stenosis after endarterectomy or previous radiotherapy, stenting may be reasonable. • In patients aged <70 years old, carotid stenting with an experienced proceduralist may be reasonable.
<p>Carotid endarterectomy is NOT recommended for those with symptomatic stenosis <50% (NASCET criteria) or asymptomatic stenosis < 60% (NASCET criteria).</p>	<p>Weak recommendation AGAINST Updated</p> <p>In patients with asymptomatic carotid stenosis, carotid endarterectomy or stenting should not be performed.</p>
<p>Carotid stenting should NOT routinely be undertaken for patients with carotid stenosis.</p>	
	<p>Strong recommendation AGAINST New</p> <p>In patients with symptomatic carotid occlusion, extracranial/ intracranial bypass is not recommended.</p>

Carotid endarterectomy should only be performed by a specialist surgeon in centres where outcomes of carotid surgery are routinely audited.	-
	Cervical artery dissection
	<p>Strong recommendation New</p> <p>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.</p>
	Cerebral venous sinus thrombosis
	<p>Strong recommendation New</p> <p>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.</p>
	<p>Practice statement Consensus-based recommendations Updated</p> <ul style="list-style-type: none"> • 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 CVST patients 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.

	<ul style="list-style-type: none"> In patients with the clinical features of idiopathic intracranial hypertension, imaging of the cerebral venous system is recommended to exclude CVST.
Diabetes management	Diabetes management
Patients with glucose intolerance or diabetes should be managed in line with national guidelines for diabetes.	Info Box Practice point Patients with glucose intolerance or diabetes should be managed in line with Diabetes Australia Best Practice Guidelines .
Patent foramen ovale	Patent foramen ovale management
All patients with ischaemic stroke or TIA, and a PFO should receive antiplatelet therapy as first choice.	Strong recommendation Updated Patients with ischaemic stroke or TIA and PFO should receive optimal medical therapy including antiplatelet therapy or anticoagulation if indicated.
Anticoagulation therapy can also be considered taking into account other risk factors and the increased risk of harm.	
There is insufficient evidence to recommend PFO closure.	Weak recommendation AGAINST Updated Routine endovascular closure of patent foramen ovale is not recommended. Endovascular closure may be reasonable in highly selected young ischaemic stroke patients after thorough exclusion of other stroke aetiologies.
Chapter 7: Managing complications	Chapter 6 of 8: Managing complications
Nutrition and hydration	Nutrition and hydration - Early hydration
All stroke patients should have their hydration status assessed, monitored and managed.	Strong recommendation Updated <ul style="list-style-type: none"> All stroke patients should have their hydration status assessed, monitored, and managed throughout their hospital admission.

<p>Appropriate fluid supplementation should be used to treat or prevent dehydration.</p>	<ul style="list-style-type: none"> • Where fluid support is required, crystalloid solution should be used in preference to colloid solutions as the first option to treat or prevent dehydration.
	<p>Nutrition and hydration - Early feeding</p>
<p>All patients with stroke should be screened for malnutrition.</p>	<p>Strong recommendation Updated All stroke patients should be screened for malnutrition at admission and on an ongoing basis (at least weekly) while in hospital.</p>
<p>Nutritional supplementation should be offered to people whose nutritional status is poor or deteriorating.</p>	<p>Strong recommendation For stroke patients whose nutrition status is poor or deteriorating, nutrition supplementation should be offered.</p>
<p>Nasogastric tube feeding is the preferred method during the first month post-stroke for people who do not recover a functional swallow.</p>	<p>Weak recommendation Updated</p> <ul style="list-style-type: none"> • For stroke patients who do not recover a functional swallow, nasogastric tube feeding is the preferred method of feeding in the short term. • For stroke patients, there is no preference with regard to continuous pump (meaning using a pump for greater than or equal to 16hrs out of 24hrs for less than or equal to 80ml/hr) feeding versus intermittent bolus feeding (meaning 250-400mls/hr for 4-5times/day) therefore practical issues, cost and patient preferences should guide practice.
	<p>Weak recommendation AGAINST New For stroke patients who are adequately nourished, routine oral nutrition supplements are not recommended.</p>

<p>Food intake should be monitored for all people with acute stroke.</p>	<p>Info Box Practice points Updated</p> <ul style="list-style-type: none"> • For patients with acute stroke food and fluid intake should be monitored. • Stroke patients who are at risk of malnutrition, including those with dysphagia, should be referred to an Accredited Practising Dietitian for assessment and ongoing management.
<p>Patients who are at risk of malnutrition, including those with dysphagia, should be referred to a dietitian for assessment and ongoing management.</p>	
<p>Screening and assessment of nutritional status should include the use of validated nutritional assessment tools or measures.</p>	<p>-</p>
<p>Poor oral hygiene</p>	<p>Oral hygiene</p>
<p>All patients, particularly those with swallowing difficulties, should have assistance and/or education to maintain good oral and dental (including dentures) hygiene.</p>	<p>Strong recommendation</p> <p>All stroke patients, particularly those with swallowing difficulties, should have assistance and/or education to maintain good oral and dental (including dentures) hygiene.</p>
<p>Staff or carers responsible for the care of patients disabled by stroke (in hospital, in residential care and in home care settings) can be trained in assessment and management of oral hygiene.</p>	<p>Strong recommendation</p> <p>Staff and carers of stroke patients (in hospital, in residential care and home settings) should be trained in assessment and management of oral hygiene.</p>
	<p>Weak recommendation New</p> <p>For stroke patients, chlorhexidine in combination with oral hygiene instruction, and/or assisted brushing may be used to decrease dental plaque and gingiva bleeding. Caution should be taken, however, for patients with dysphagia.</p>

Incontinence	Incontinence
Urinary incontinence	Urinary incontinence
All stroke survivors with suspected urinary continence difficulties should be assessed by trained personnel using a structured functional assessment.	Weak recommendation <ul style="list-style-type: none"> • All stroke survivors with suspected urinary continence difficulties should be assessed by trained personnel using a structured functional assessment. • For stroke survivors, a portable bladder ultrasound scan should be used to assist in diagnosis and management of urinary incontinence.
A portable bladder ultrasound scan should be used to assist in diagnosis and management of urinary incontinence.	
Stroke survivors with confirmed continence difficulties should have a continence management plan formulated, documented, implemented and monitored.	Weak recommendation <ul style="list-style-type: none"> • Stroke patients in hospital with confirmed continence difficulties, should have a structured continence management plan formulated, documented, implemented and monitored. • 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. • If incontinence persists the stroke survivor should be re-assessed and referred for specialist review.
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.	
If incontinence persists the stroke survivor should be re-assessed and referred for specialist review.	
For people with urge incontinence: <ul style="list-style-type: none"> • anticholinergic drugs can be trialled 	Weak recommendation <p>For stroke survivors with urge incontinence:</p> <ul style="list-style-type: none"> • anticholinergic drugs can be tried;

<ul style="list-style-type: none"> • a prompted or scheduled voiding regime program/ bladder retraining should be trialled • if continence is unachievable, containment aids can assist with social continence. 	<ul style="list-style-type: none"> • a prompted or scheduled voiding regime program/ bladder retraining can be trialled; • if continence is unachievable, containment aids can assist with social continence.
<p>For people with urinary retention:</p> <ul style="list-style-type: none"> • 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 in-dwelling catheterisation, they and their family/carer will require education about management, where to access supplies and who to contact in case of problems. 	<p>Practice statement Consensus-based recommendations Updated</p> <p>For stroke patients with urinary retention:</p> <ul style="list-style-type: none"> • 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.
<p>For people with functional incontinence, a whole-team approach is recommended.</p>	<p>Practice statement Consensus-based recommendation</p> <p>For stroke survivors with functional incontinence, a whole-team approach is recommended.</p>
<p>The use of indwelling catheters should be avoided as an initial management strategy except in acute urinary retention.</p>	<p>Practice statement Consensus-based recommendation</p> <p>For stroke survivors, the use of indwelling catheters should be avoided as an initial management strategy except in acute urinary retention.</p>

Faecal incontinence	Faecal incontinence
<p>All stroke survivors with suspected faecal continence difficulties should be assessed by trained personnel using a structured functional assessment.</p>	<p>Weak recommendation</p> <ul style="list-style-type: none"> • All stroke survivors with suspected faecal continence difficulties should be assessed by trained personnel using a structured functional assessment. • 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.
<p>For those 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.</p>	
<p>Bowel habit retraining using type and timing of diet and exploiting the gastro-colic reflex should be used for people who have bowel dysfunction.</p>	<p>Weak recommendation</p> <p>For stroke survivors with bowel dysfunction, bowel habit retraining using type and timing of diet and exploiting the gastro-colic reflex should be used.</p>
<p>Education and careful discharge planning and preparation are required for any patient discharged with bowel incontinence.</p>	<p>Practice statement <u>Consensus-based recommendations</u> Updated</p> <p>For stroke survivors with bowel dysfunction:</p> <ul style="list-style-type: none"> • 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.
<p>If continence is unachievable, containment aids can assist with social continence.</p>	

Deep venous thrombosis or pulmonary embolism	Deep venous thrombosis or pulmonary embolism
<p>Low molecular weight heparin or heparin in prophylactic doses can be used with caution for selected patients with acute ischaemic stroke at high risk of DVT/PE. If low molecular weight heparin is contraindicated or not available, unfractionated heparin should be used.</p>	<p>Weak recommendation Updated</p> <p>For acute ischaemic stroke patients who are immobile, low molecular weight heparin in prophylactic doses may be used in the absence of contraindications.</p>
	<p>Weak recommendation New</p> <p>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).</p>
<p>Thigh-length antithrombotic stockings are NOT recommended for the prevention of DVT/PE post-stroke.</p>	<p>Strong recommendation AGAINST Updated</p> <p>Antithrombotic stockings are not recommended for the prevention of DVT or PE post stroke.</p>
<p>Early mobilisation and adequate hydration should be encouraged in all acute stroke patients to help prevent DVT and PE.</p>	<p>Info Box Practice points Updated</p> <ul style="list-style-type: none"> • 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.
<p>Antithrombotic therapy is NOT recommended for the prevention of DVT/PE in haemorrhagic stroke patients.</p>	

Antiplatelet therapy should be used for people with ischaemic stroke to help prevent DVT/PE.	-
Pressure care	Not included in the scope of these Clinical Guidelines.
Falls	Falls
Falls risk assessment should be undertaken using a valid tool on admission to hospital. A management plan should be initiated for all those identified as at risk of falls.	Practice statement Consensus-based recommendations Updated <ul style="list-style-type: none"> • 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.
Multifactorial interventions in the community, including an individually prescribed exercise program, should be provided for people who are at risk of falling.	Weak recommendation Updated 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.

For access to the full Clinical Guidelines and further information refer to InformMe <https://informme.org.au/en/Guidelines/Clinical-Guidelines-for-Stroke-Management-2017>.