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This is the third in a series of eight guideline chapters that provide evidence-based recommendations for recovery from stroke and TIA in adults.

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Introduction

The Stroke Foundation is a national charity that partners with the community to prevent, treat and beat stroke. We stand alongside stroke survivors and their families, healthcare professionals and researchers. We build community awareness and foster new thinking and innovative treatments. We support survivors on their journey to live the best possible life after stroke.

We are the voice of stroke in Australia and we work to:

- Raise awareness of the risk factors, signs of stroke and promote healthy lifestyles.
- Improve treatment for stroke to save lives and reduce disability.
- Improve life after stroke for survivors.
- Encourage and facilitate stroke research.
- Advocate for initiatives to prevent, treat and beat stroke.
- Raise funds from the community, corporate sector and government to continue our mission.

The Stroke Foundation has been developing stroke guidelines since 2002 and in 2017 released the fourth edition. In order for the Australian Government to ensure up-to-date, best-practice clinical advice is provided and maintained to healthcare professionals, the NHMRC requires clinical guidelines be kept current and relevant by reviewing and updating them at least every five years. As a result, the Stroke Foundation, in partnership with Cochrane Australia, have moved to a model of living guidelines, in which recommendations are continually reviewed and updated in response to new evidence. This approach was piloted in a three year project (July 2018 -June 2021) funded by the Australian Government via the Medical Research Future Fund.

This online version of the *Australian and New Zealand Living Clinical Guidelines for Stroke Management* updates and supersedes the Clinical Guidelines for Stroke Management 2017. The Clinical Guidelines have been updated in accordance with the *2016 NHMRC Standards for Guidelines* and therefore recommendations are based on the best evidence available. The Clinical Guidelines cover the whole continuum of stroke care, across 8 chapters.

Review of the Clinical Guidelines used an internationally recognised guideline development approach, known as GRADE (**G**rading of **R**ecommendations **A**ssessment, **D**evelopment and **E**valuation), and an innovative guideline development and publishing platform, known as MAGICapp (**Ma**king **G**rade the **I**rresistible **C**hoice). GRADE ensures a systematic process is used to develop recommendations that are based on the balance of benefits and harms, patient values, and resource considerations. MAGICapp enables transparent display of this process and access to additional practical information useful for guideline recommendation implementation.

Purpose

The *Clinical Guidelines for Stroke Management* provides a series of best-practice recommendations to assist decision-making in the management of stroke and transient ischaemic attack (TIA) in adults, using the best available evidence. The Clinical Guidelines should not be seen as an inflexible recipe for stroke management; rather, they provide a guide to appropriate practice to be followed subject to clinical judgment and patient preferences.

Scope

The Clinical Guidelines cover the most critical topics for effective management of stroke, relevant to the Australian and New Zealand context, and include aspects of stroke management across the continuum of care including pre-hospital, assessment and diagnosis, acute medical and surgical management, secondary prevention, rehabilitation, discharge planning, community participation, and management of TIA. Some issues are dealt with in more detail, particularly where current management is at variance with best practice, or where the evidence needs translation into practice.

The Clinical Guidelines do not cover:

- Subarachnoid haemorrhage (refer to other available guidelines like the *2023 Guideline for the Management of Patients with Aneurysmal Subarachnoid Hemorrhage: A Guideline from the American Heart Association/American Stroke Association* (Hoh et al 2023 *[454]*);
- Stroke in infants, children and youth, i.e. <18 years old (refer to Victorian Subacute Childhood Stroke Advisory Committee, *Guideline for the subacute management of childhood stroke – 2019*, https://informme.org.au/Guidelines/Childhood-stroke-guidelines); or
- Primary prevention of stroke. (Refer to *Guidelines for assessing and managing cardiovascular disease risk 2023* (Australian Chronic Disease Prevention Alliance *[5]*) - https://informme.org.au/guidelines/guideline-for-assessing-and-managing-cardiovascular-disease-risk, and *Guideline for the diagnosis and management of hypertension in adults 2016* (Heart Foundation *[6]*) - https://www.heartfoundation.org.au/for-professionals/ clinical-information/hypertension).

Target audience
The Clinical Guidelines are intended for use by healthcare professionals, administrators, funders and policy makers who plan, organise and deliver care for people with stroke or TIA during all phases of recovery.

Development
The Guidelines are published in eight separate chapters:
Pre-hospital care
Early assessment and diagnosis
Acute medical and surgical management
Secondary prevention
Rehabilitation
Managing complications
Discharge planning and transfer of care
Community participation and long-term care
The Clinical Guidelines have been developed according to processes prescribed by the National Health and Medical Research Council (NHMRC) under the direction of an interdisciplinary working group. Refer to the document on InformMe that details the Interdisciplinary Working Group Membership and Terms of Reference.

Use
The primary goal of the Clinical Guidelines is to help healthcare professionals improve the quality of the stroke care they provide.

Guidelines differ from clinical or care pathways (also referred to as critical pathways, care paths, integrated care pathways, case management plans, clinical care pathways or care maps). Guidelines are an overview of the current best evidence translated into clinically relevant statements. Care pathways are based on best practice guidelines but provide a local link between the guidelines and their use.

In considering implementation of the Guidelines at a local level, healthcare professionals are encouraged to identify the barriers, enablers and facilitators to evidence-based practice within their own environment and determine the best strategy for local needs. Where change is required, initial and ongoing education is essential and is relevant to all recommendations in the Guidelines.

Aboriginal and Torres Strait Islander People
Refer to the document on InformMe for information regarding Aboriginal and Torres Strait Islander people.

Decision-making
Stroke survivors should be treated in accordance with the principles of shared decision-making contained within the *Acute Stroke Care Clinical Standard*, *Acute Stroke Services Framework 2023* and *Rehabilitation Stroke Services Framework 2022*, which include, among other things, that treatment should be patient-centred. Therefore, stroke survivors should be involved in decisions about their care at all times; but where they do not have capacity, or have limited capacity, family members should be involved in the decision-making.

Consent
The principles of informed consent underpin these Clinical Guidelines and therefore the wording of the recommendations are directed at the healthcare professional; that is, the intervention should/may be used, rather than offered, for the stroke patient. For patients with aphasia and/or cognitive disorders requiring formal consent, easy English or aphasia-friendly written versions of an information sheet and consent form should be offered and clearly explained to patients and their families in order to assist understanding and agreement.

Endorsement
The Clinical Guidelines have been endorsed (based on the 2017 version) by a number of organisations and associations. Refer to the document on InformMe that details the organisations formally endorsing the Clinical Guidelines.

Evidence gaps
Refer to the document on InformMe that details the gaps in evidence identified, noting areas for further research.

Reports
Refer to documents on InformMe - Technical Report, Administrative Report and Dissemination and Implementation Report.

Resources
Refer to documents on InformMe that provide supporting resources to assist with implementation of the Clinical Guidelines.

Publication Approval

Australian Government

National Health and Medical Research Council

The 2017 guideline recommendations were approved by the Chief Executive Officer of the National Health and Medical Research Council (NHMRC) on 25 July 2017 under Section 14A of the National Health and Medical Research Council Act 1992 with a subsequent amendment approved on 22 November 2017. Since moving to a continual (living) guideline model, further updates have been approved:

- 9 July 2018 (updated recommendations for neurointervention)
- 7 November 2019 (updated recommendations for thrombolysis, acute antiplatelet therapy, and patent foramen ovale management)
- 11 February 2021 (updated recommendations for oxygen therapy, cholesterol lowering targets, new acute antiplatelet agent, shoulder pain and weakness)
- 7 July 2021 (updated recommendations for standing, antiplatelet therapy, and activities of living)
- 22 December 2021 (updated recommendations for pre-hospital care, acute telehealth, head position, telehealth for rehabilitation, swelling of extremities, memory, management of atrial fibrillation, lifestyle modifications, and virtual reality for arm function)
- 5 August 2022 (updated recommendations for pre-hospital care [mobile stroke unit], assessment for rehabilitation, aphasia, dysarthria, prevention and treatment for depression, treatment of anxiety, personality and behaviour, pressure injury)
- 6 December 2022 (updated recommendations for aphasia and incontinence)
- 27 July 2023 (updated recommendations for driving, neurointervention, oxygen therapy, and central post-stroke pain)
- 8 December 2023 (updated recommendation for management of atrial fibrillation)
- 2 January 2025 (updated recommendation for self-management)
- 22 April 2025 (updated recommendations for ICH management – surgical interventions, cerebral venous thrombosis, sleep disorders, and carer support)
- 3 September 2025 (updated intravenous thrombolysis, acute blood pressure lowering therapy, and ICH management – medical interventions)
- 24 April 2026 (updated intravenous thrombolysis and head position).

In approving the guidelines recommendations the NHMRC considers that they meet the NHMRC standard for clinical practice guidelines.

NHMRC is satisfied that the guideline recommendations are systematically derived, based on identification and synthesis of the best available scientific evidence and are developed for health professionals practising in an Australian health care setting.

This publication reflects the views of the authors and not necessarily the views of the Australian Government.

Disclaimer

These Clinical Guidelines are a general guide to appropriate practice, to be followed subject to the clinician's judgment and the patient's preference in each individual case. The Clinical Guidelines are designed to provide information to assist decision-making and are based on the best evidence available at the time of development.

Funding

The Stroke Foundation gratefully acknowledges the financial assistance provided to establish the Living Stroke Guidelines between 2018-2021 by the Australian Government, Medical Research Future Fund. Following on from this funding was secured by the Australian Living Evidence Collaboration (https://livingevidence.org.au) to assist the continuation of the Living Stroke Guidelines. From 2024 the Stroke Foundation has been funding the Living Stroke Guidelines from public donations. The development of the final recommendations are not influenced by the views or interests of any funding body.

Citation

Stroke Foundation. Australian and New Zealand Living Clinical Guidelines for Stroke Management. Available at https://informme.org.au/en/Guidelines/ Clinical-Guidelines-for-Stroke-Management. Accessed [insert date, month and year and if applicable specific sections or chapters].

Methodology

Development of questions

Questions have been extensively developed and reviewed over the four iterations of the guidelines. In this 'living' phase the Content Steering Group reviews the PICO questions on an annual basis. The clinical questions are listed at the start of each chapter. Individual PICOs (population, intervention/s, comparator, outcomes) are listed in the research evidence section as related to each topic or recommendation.

Literature identification

On a monthly basis, we monitor the literature for relevant, new evidence by screening all randomised controlled trials or systematic reviews related to stroke published in the Pubmed database. One member of the project team initially screens all abstracts and excludes clearly irrelevant studies.
Potentially included studies are allocated to relevant topics covered by the guidelines and a second member of the project team reviews and confirms included studies prior to sending to the relevant working group members. In addition, each month new economic studies and studies related to patient values and preferences are also captured.

Clinical expert review

Where new evidence has been identified by the project team a summary is sent to content experts who review and make a final decision to include or exclude the study and also to assess the potential impact of the new evidence on current recommendations. As a result of this assessment one of
two options will be communicated for each topic:

a. New evidence is unlikely to change current recommendations: review and potentially integrate information in the next review cycle; or

b. New relevant evidence may change current recommendations: rapidly review.

Data extraction, updating evidence summary and GRADE profile

For rapid updates, the project team incorporates the new evidence into the existing body of evidence by:

- Updating the Summary of Findings table including the risk of bias assessment
- Review any additional studies related to Preferences and values of patients on the topic Concurrently members of the economic

working group review newly published economic studies.

The project team then drafts changes to the overall summary (GRADE profile). This profile is then reviewed and modified by clinical content experts and people with relevant lived experience (consumers). Finally changes to the changes to the recommendation, rationale and practical considerations are considered, discussed and agreed.

Draft changes are then circulated to the wider expert working groups (including consumer panel) for internal review. Once signed off by the Steering Group a period of public consultation is undertaken. Feedback is then reviewed and any changes made in response to feedback before finally submitting to the National Health and Medical Research Council (NHMRC) for approval.

Brief summary of GRADE

The Guidelines were developed following the GRADE methodology (Grading of Recommendations, Assessment, Development and Evaluation).

GRADE 'evidence to decision' framework includes a minimum of four factors to guide the development of a recommendation and determine the strength of that recommendation:

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

For full details of how GRADE is used for developing clinical recommendations, refer to the GRADE handbook, available at: http://gdt.guidelinedevelopment.org/app/handbook/handbook.html.

Strength of recommendations

The GRADE process uses only two categories for the strength of recommendations, based on how confident the guideline panel is 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 authors are certain that the evidence supports a clear balance towards either desirable or undesirable effects; or
- Weak (or conditional) recommendations: where the guideline panel is less certain about the balance between desirable and undesirable

effects.

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. There are a number of recommendations where we have stated that the intervention may only be used in the context of research. We have done this because these are guidelines for clinical practice, and while the intervention cannot be recommended as standard practice at the current time, we recognise there is good rationale to continue further research.

The implications of a strong or weak recommendation for a particular treatment are summarised in the GRADE handbook as follows: Table 1: Implications of GRADE recommendation categories (for a positive recommendation) for patients, clinicians and policy makers. Source: GRADE Handbook (http://gdt.guidelinedevelopment.org/app/handbook/handbook.html)

	Strong Recommendation	**Weak Recommendation**
For patients	Most individuals in this situation would want the recommended course of action and only a small proportion would not.	The majority of individuals in this situation would want the suggested course of action, but many would not.
For clinicians	Most individuals should receive the recommended course of action. Adherence to this recommendation according to the guideline could be used as a quality criterion or performance indicator. Formal decision aids are not likely to be needed to help individuals make decisions consistent with their values and preferences.	Recognise that different choices will be appropriate for different patients, and that you must help each patient arrive at a management decision consistent with her or his values and preferences. Decision aids may well be useful helping individuals making decisions consistent with their values and preferences. Clinicians should expect to spend more time with patients when working towards a decision.
For policy makers	The recommendation can be adapted as policy in most situations including for the use as performance indicators.	Policy making will require substantial debates and involvement of many stakeholders. Policies are also more likely to vary between regions. Performance indicators would have to focus on the fact that adequate deliberation about the management options has taken place.

For topics where there is either a lack of evidence or insufficient quality of evidence on which to base a recommendation but the guideline panel believed advice should be made, statements were developed based on consensus and expert opinion (guided by any underlying or indirect evidence). These statements are labelled as 'Practice statements' and correspond to 'consensus-based recommendations' outlined in the NHMRC procedures and requirements.

For topics outside the search strategy (i.e. where no systematic literature search was conducted), additional considerations are provided. These are labelled 'Info Box' and correspond to 'practice points' outlined in the NHMRC procedures and requirements.

Explanation of absolute effect estimates used

The standardised evidence profile tables presented in the Clinical Guidelines include "Absolute effect estimates" for dichotomous outcomes. These represent the number of people per 1000 people expected to have the outcome in the control and intervention groups. This estimated risk in people receiving the intervention is based on a relative effect estimate which might be adjusted, e.g. to account for baseline differences between participants or when effect estimates have been pooled from different studies in a systematic review and adjusted to account for the variance of each individual estimate. Therefore, this estimated risk in the intervention group may differ from the raw estimate of the intervention group risk from the corresponding study. The estimated risk reflects the best estimate of the risk in the relevant population, relative to the risk observed among patients receiving the control or comparator intervention.

Wherever possible (i.e. when the relevant study reported enough information to allow the calculation to be done), these estimates were calculated using the following procedure:

Obtain the relative effect estimate (odds ratio or relative risk) and confidence interval from the best available study (systematic review or primary study) providing evidence about the effects of the intervention.

Use the observed number of events in the control group of the same study to calculate a baseline risk per 1000 people (or "assumed control risk").

Calculate an estimate of the corresponding risk per 1000 in people receiving the intervention using the relative effect estimate. This can be done using methods based on the formulas for calculating absolute risk reductions provided in the *Cochrane Handbook for Systematic Reviews of Interventions* (http://handbook.cochrane.org/). Applying the same calculations to the upper and lower bounds of the confidence interval for the relative effect estimate gives a confidence interval for the risk in the intervention group, which is then used to calculate the confidence interval for the difference per 1000 people, reported in the evidence tables.

Cost effectiveness summaries

There are several important points to consider when interpreting the cost-effectiveness information provided in the *Resources and Other Considerations*
sections of the Clinical Guidelines.

Firstly, an intervention can be cost-effective without being cost-saving. This means that although there is an additional cost for the health benefits gained from the intervention, the intervention is still considered worthwhile. The incremental cost-effectiveness ratios (ICER) presented (e.g. cost per quality adjusted life year gained) are an indication of the cost-effectiveness or "value-for-money", with lower ICERs indicating better cost-effectiveness of an intervention.

Secondly, whether or not the intervention is cost-effective is a judgment call; and should reflect a society's willingness-to-pay to have the intervention for the potential outcomes achieved. An ICER that is approximately or equivalent to US$50,000 has been commonly used by researchers in the past as a threshold for judging an intervention as being cost-effective (http://www.nejm.org/doi/full/10.1056/NEJMp1405158#t=article). However, no scientific basis for this threshold exists and actual willingness-to-pay may differ. For example, in a survey of 1000 Australian respondents conducted in 2007, the willingness-to-pay for an additional quality adjusted life year in Australia was estimated to be $64,000 (https://www.ncbi.nlm.nih.gov/pubmed/ 19382128).

Thirdly, there is no absolute threshold for determining whether an intervention should be funded based on the ICER (https://www.ncbi.nlm.nih.gov/ pmc/articles/PMC5153921/). ICERs are only one of the major factors considered in priority setting (the process to decide which interventions should be funded within a given resource constraint). Other considerations include affordability, budget impact, fairness, feasibility and other factors that are important in the local context (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5153921/).

Lastly, in areas where there are no data from economic evaluations that support the recommendations or practice statements, it remains unclear whether the additional costs of providing the intervention above usual care for the additional potential benefits obtained is justified. However, this should not detract from implementing the Clinical Guideline recommendations.

Use of language related to timing of interventions
***Immediate*:** without delay, or within minutes, not hours (life critical action required).
***Urgent*:** minutes to several hours (immediate action but not life critical).
Very early: within hours and up to 24 hours.
Early: within 48 hours.

For all Clinical Guideline recommendations we make the assumption that healthcare professionals will be appropriately qualified and skilled to carry out the intervention.

Clinical questions

3.1 Does care on a stroke unit improve outcomes for people with stroke?

3.2 Do strategies to assist palliation and death improve outcomes for people with stroke and their family?

3.3 Does the administration of thrombolysis improve outcomes after acute ischemic stroke?

3.4 Does the use of neurointerventional treatments improve outcomes in people with stroke?

3.5 What is the optimal time to screen for dysphagia?

3.6 Does comprehensive swallow assessment improve outcomes for people who have failed a swallow screen?

3.7 Which interventions improve outcomes in stroke patients with dysphagia?

3.8 Does the use of antithrombotic therapy within first 48 hours improve outcomes in acute stroke?

3.9 Does the use of acute blood pressure lowering therapy improve outcomes for people with stroke?

3.10 Does the use of surgical interventions improve the outcomes for people with acute ischemic stroke?

3.11 What non-surgical interventions improve outcomes in acute stroke patients with cerebral oedema / raised intracranial pressure?

3.12 Does the administration of medical interventions improve outcomes after acute intracerebral haemorrhagic stroke?

3.13 Do surgical interventions improve outcomes after acute intracerebral haemorrhagic stroke?

3.14 Does oxygen therapy improve outcomes in stroke patients who are not hypoxic?

3.15 Does glycaemic therapy improve outcomes in stroke patients with hyperglycaemia?

3.16 Does the use of neuroprotective agents improve outcomes for people with acute stroke?

3.17 What interventions improve outcomes in stroke survivors with pyrexia?

3.18 Does the use of telehealth improve outcomes for patients with acute (or suspected) stroke?

Acute medical and surgical management - overview

This chapter covers medical and surgical management in the acute phase of care. Importantly though, several other critical components of very early assessment (including screening) and management should be routinely provided in addition to those discussed in this chapter. These include nutrition and hydration, incontinence, deep venous thrombosis or pulmonary embolism and early mobilisation.

A patient's rehabilitation needs and goals should be assessed by staff trained in rehabilitation within 24–48 hours of admission to the stroke unit using the Assessment for Rehabilitation Tool, and a tailored rehabilitation program commenced. (*See relevant sections in Rehabilitation for guidance on the timing of specific interventions).*

Medical interventions

Potential medical interventions aim to reduce haematoma growth, which is strongly associated with worse patient outcomes. Reversal of coagulopathy and control of blood pressure are the main strategies currently available.

The incidence of intracranial haemorrhage (ICH) in the first year of warfarin therapy has been reported to be 1.9% (Hylek et al. 2007 *[204]*). Despite the availability of reversal agents for warfarin, the risk of disability and death is higher than other causes of intracerebral haemorrhage. The incidence of intracerebral haemorrhage with direct oral anticoagulants (DOACs) is significantly lower than with warfarin. Mortality was similar to warfarin- related bleeds in the era prior to specific reversal agents for DOACs. It remains to be seen whether these reversal agents are able to reduce morbidity associated with DOAC-related intracerebral haemorrhage.

Management of blood pressure is particularly important in ICH as an elevated blood pressure is common in ICH patients and may increase haematoma expansion. See Acute Blood Pressure lowering therapy section.

A care bundle approach for ICH may be a good way to ensure different aspects of care are coordinated. (Parry-Jones et al 2019*[483]*, (Ma et al. 2023*[400]*).

Strong recommendation against

Updated

DRAFT RECOMMENDATION FOR PUBLIC CONSULTATION - MAY 2026

Do not administer platelet transfusion in stroke patients who were receiving antiplatelet therapy prior to intracerebral haemorrhage. This recommendation is only relevant to those who are receiving non-surgical management. (Baharoglu et al 2016 *[203]*)

Minor changes to clarify this recommendation is only relevant to those who are receiving medical interventions only and are not planned for surgical management.

Evidence to decision

Benefits and harms — Important harms

There were increased rates of death and disability (162 more patients with mRS 4–6 per 1000 patients treated), with consistent evidence of harm in both dichotomised modified Rankin Scale and shift analysis (Baharoglu et al. 2016 *[203]*).

Certainty of the evidence — Moderate

One randomised controlled trial of low risk of bias with certainty downgraded due to small patient numbers.

Values and preferences — No substantial variability expected

Patients would not want to receive a therapy shown to increase death and disability.

Resources and other considerations — Factor not considered

Rationale

One randomised controlled trial (PATCH) examined the effectiveness of platelet transfusion on the outcome of patients with intracerebral haemorrhage (ICH) previously taking antiplatelet therapy (Baharoglu et al. 2016 *[203]*). Patients presenting within 6 hours of ICH were randomised to routine care or platelet transfusion within 90 minutes of neuroimaging. The trial excluded patients with infratentorial or large intraventricular haematomas, and those scheduled for surgical evacuation within 24 hours of admission. The odds of death and dependency at three months were higher in the platelet transfusion group, and the risk of haematoma expansion was not decreased. A review incorporating the PATCH trial and six retrospective studies confirm higher risk of death or dependency at three months and found slightly higher risk of haematoma expansion (Lin et al. 2024 *[515]*). No difference in serious adverse events between platelet infusion and standard care were found.

Practical info

This recommendation applies to patients planned for medical management only, as underpinning studies excluded patients scheduled for immediate surgical intervention. In the PATCH trial, patients were excluded if surgery was scheduled within 24 hours of admission. Recent surgical intervention **trial protocols have noted patients randomised to surgery may be considered for platelet transfusion for blood loss**, although this should be assessed on a case-by-case basis by the treating physician (Beck et al 2024 *[445]*; Pradilla et al 2024 *[446]*).

PICO (13.1.5)
Population: Adults with intracerebral haemorrhage taking antiplatelet before
Intervention: Platelet transfusion
Comparator: Standard care

Summary

Baharoglu et al (2016) {203} conducted a multicentre open-label randomised trial (PATCH, n=190) of platelet transfusion after acute intracerebral haemorrhage in people taking antiplatelet therapy. The intervention group received platelet transfusion within 6 hours of intracerebral haemorrhage while the control group received standard care. While the trial was open label, outcome assessors were blind to treatment allocation and allocation concealment was clearly reported. The primary analysis showed significantly increased odds of a shift towards death or dependence at 3 months (modified Rankin scale scores) following platelet transfusion (adjusted common OR 2.05, 95% CI 1.18 to 3.56). Patients receiving platelet transfusion also had significantly increased odds of a poor outcome at 3 months (mRS score 4-6, OR 2.04, 95% CI 1.12 to 3.74), with a nonsignificant decrease in survival and increase in serious adverse events.

A review by Lin et al (2024){451}, pooling the results of Baharoglu et al (2016) and 6 retrospective studies (n=577), found platelet infusion therapy did not improve poor functional outcome (mRS 3-6) at 90 days (OR 0.49, 95% CI 0.27 to 0.89) and did not significantly reduce the risk of mortality (OR 0.79, 95% CI 0.40 to 1.55) or hematoma expansion (OR 1.15, 95% CI 0.65 to 2.01) in ICH patients with prior antiplatelet therapy. No significant differences were found in serious adverse events between platelet infusion and standard care.

These findings suggest platelet transfusion should not be used following acute intracerebral haemorrhage that does not require surgical intervention.

Outcome Timeframe	**Study results and measurements**	**Absolute effect estimates**		**Certainty of the evidence** (Quality of evidence)	**Summary**
		Standard care	Platelet transfusion		
Death or dependence (mRS 4–6)[1] 90 days	Relative risk: 1.29 (CI 95% 1.04 - 1.61) Based on data from 190 participants in 1 studies Follow up 90 days	**559** per 1000	**721** per 1000 Difference: **162 more per 1000** (CI 95% 22 more - 341 more)	**Moderate** Due to serious imprecision[2]	Platelet transfusion probably increases death or dependence.
All-cause mortality 90 days	Relative risk: 1.42 (CI 95% 0.98 - 2.16) Based on data from 190 participants in 1 studies Follow up 90 days	**226** per 1000	**321** per 1000 Difference: **95 more per 1000** (CI 95% 5 fewer - 262 more)	**Moderate** Due to serious imprecision[3]	Platelet transfusion may have little or no difference on mortality
Hematoma expansion 24 hours	Relative risk: 1.32 (CI 95% 0.91 - 1.92) Based on data from 190 participants in 1 studies Follow up 24 hours	**370** per 1000	**488** per 1000 Difference: **118 more per 1000** (CI 95% 33 fewer - 340 more)	**Moderate** Due to serious risk of bias[4]	Platelet transfusion probably results in little or no difference in haemorrhage growth at 24 hours

1. undefined
2. **Imprecision: serious.** Low number of patients, Only data from one study;
3. **Imprecision: serious.** Only data from one study, Low number of patients;
4. **Risk of Bias: serious.** High risk of bias for included retrospective studies.;

References

[203] Baharoglu MI, Cordonnier C, Salman RA-S, de Gans K, Koopman MM, Brand A, Majoie CB, Beenen LF, Marquering HA, Vermeulen M, Nederkoorn PJ, de Haan RJ, Roos YB : Platelet transfusion versus standard care after acute stroke due to spontaneous cerebral haemorrhage associated with antiplatelet therapy (PATCH): a randomised, open-label, phase 3 trial. Lancet (London, England) 2016.
[451] Lin Y, Liu Y, Liu L, Zhang L, Lin Y, Yu J, et al. Platelet transfusion for spontaneous intracerebral hemorrhage with prior antiplatelet: A systematic review and meta-analysis. Medicine 2023;102(46):e36072.

Strong recommendation against

In review

For stroke patients with intracerebral haemorrhage previously receiving antiplatelet therapy, platelet transfusion should not be administered. (Baharoglu et al 2016 *[203]*)

Recommendation to be superseded by above updated recommendation when approved.

Evidence to decision

Benefits and harms — Important harms

There were increased rates of death and disability (162 more patients with mRS 4–6 per 1000 patients treated), with consistent evidence of harm in both dichotomised modified Rankin Scale and shift analysis (Baharoglu et al. 2016 *[203]*).

Certainty of the evidence — Moderate

One large randomised controlled trial of low risk of bias with certainty downgraded due to small patient numbers from one trial.

Values and preferences — No substantial variability expected

Patients would not want to receive a therapy shown to increase death and disability.

Resources and other considerations — Factor not considered

Rationale

One large randomised controlled trial examined the effectiveness of platelet transfusion on the outcome of patients with intracerebral haemorrhage (ICH) previously taking antiplatelet therapy (Baharoglu et al. 2016 *[203]*). Patients presenting within 6 hours of ICH were randomised to routine care or platelet transfusion within 90 minutes of neuroimaging. The odds of death and dependency at three months were higher in the platelet transfusion group, and the risk of haematoma expansion was not decreased.

PICO (13.1.5)
Population: Adults with intracerebral haemorrhage taking antiplatelet before
Intervention: Platelet transfusion
Comparator: Standard care

Summary

Baharoglu et al (2016) {203} conducted a multicentre open-label randomised trial (PATCH, n=190) of platelet transfusion after acute intracerebral haemorrhage in people taking antiplatelet therapy. The intervention group received platelet transfusion within 6 hours of intracerebral haemorrhage while the control group received standard care. While the trial was open label, outcome assessors were blind to treatment allocation and allocation concealment was clearly reported. The primary analysis showed significantly increased odds of a shift towards death or dependence at 3 months (modified Rankin scale scores) following platelet transfusion (adjusted common OR 2.05, 95% CI 1.18 to 3.56). Patients receiving platelet transfusion also had significantly increased odds of a poor outcome at 3 months (mRS score 4-6, OR 2.04, 95% CI 1.12 to 3.74), with a nonsignificant decrease in survival and increase in serious adverse events.

These findings suggest platelet transfusion should not be used following acute intracerebral.

Outcome Timeframe	**Study results and measurements**	**Absolute effect estimates** Standard care	Platelet transfusion	**Certainty of the evidence** (Quality of evidence)	**Summary**
Death or dependence (mRS 4–6)[1] 90 days	Relative risk: 1.29 (CI 95% 1.04 - 1.61) Based on data from 190 participants in 1 studies Follow up 90 days	**559** per 1000	**721** per 1000	**Moderate** Due to serious imprecision[2]	Platelet transfusion probably increases death or dependence.
		Difference: **162 more per 1000** (CI 95% 22 more - 341 more)			

All-cause mortality 90 days	Relative risk: 1.42 (CI 95% 0.98 - 2.16) Based on data from 190 participants in 1 studies Follow up 90 days	**226** per 1000 **321** per 1000 Difference: **95 more per 1000** (CI 95% 5 fewer - 262 more)	**Moderate** Due to serious imprecision[3]	Platelet transfusion may have little or no difference on mortality
Hematoma expansion 24 hours	Relative risk: 1.32 (CI 95% 0.91 - 1.92) Based on data from 190 participants in 1 studies Follow up 24 hours	**370** per 1000 **488** per 1000 Difference: **118 more per 1000** (CI 95% 33 fewer - 340 more)	**Moderate** Due to serious risk of bias[4]	Platelet transfusion probably results in little or no difference in haemorrhage growth at 24 hours

1. undefined
2. **Imprecision: serious.** Low number of patients, Only data from one study;
3. **Imprecision: serious.** Only data from one study, Low number of patients;
4. **Risk of Bias: serious.** High risk of bias for included retrospective studies.;

References

[203] Baharoglu MI, Cordonnier C, Salman RA-S, de Gans K, Koopman MM, Brand A, Majoie CB, Beenen LF, Marquering HA, Vermeulen M, Nederkoorn PJ, de Haan RJ, Roos YB : Platelet transfusion versus standard care after acute stroke due to spontaneous cerebral haemorrhage associated with antiplatelet therapy (PATCH): a randomised, open-label, phase 3 trial. Lancet (London, England) 2016.

Search string
(Stroke Rehabilitation[MeSH] OR Cerebrovascular Disorders[MeSH] OR Endarterectomy, Carotid[MeSH] OR Thrombectomy[MeSH] OR Deglutition Disorders[MeSH] OR Deglutition[MeSH] OR Muscle Spasticity[MeSH] OR Aphasia[MeSH] OR Apraxias[MeSH] OR Dysarthria[MeSH] OR stroke[TI] OR strokes[TI] OR poststroke[TI] OR post-stroke[TI] OR "transient ischemic"[TI] OR "transient ischaemic"[TI] OR "carotid endarterectomy"[TI:~5] OR thrombectomy[TI] OR swallowing[TI] OR deglutition[TI] OR dysphagia[TI] OR spasticity[TI] OR aphasia*[TI] OR apraxia*[TI] OR dyspraxia*[TI] OR dysarthria*[TI])

ICH management – medical interventions inclusion and exclusion criteria

Population
Include:
All adults with ICH
Exclude:
Children/paediatric/neonatal/pregnancy
Animal studies

Intervention
Include:
Medical interventions
Exclude:

Comparator
Include:
No intervention
Exclude:

Outcome
Include:
Death
Institutionlisation rate
Disability (mRS)
Exclude:

Study characteristics
Include:
Major new randomised trial
Individual patient data (IPD) analysis
New data for specific populations
Exclude:
Observational studies
Non-randomised study (if existing studies are randomised)
SR with only studies previously included