



## **Supporting Information**

### **Supplementary material**

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

Appendix to: Kleinig TJ, Murphy L, 30/60/90 National Stroke Targets Taskforce. 30/60/90 National stroke targets and stroke unit access for all Australians: it's about time. *Med J Aust* 2024; doi: 10.5694/mja2.52459.

## **Narrative account of 30/60/90 national stroke targets development and endorsement**

The national stroke leaders, who proposed stroke key performance indicator (KPI) targets as a priority for the “Championing Care”-themed combined Smart Strokes/Australian and New Zealand Stroke Organisation 2023 Annual conference, comprised those members of the conference organising committee, who also had key national quality improvement responsibilities. This initial core group comprised A/Prof Ben Clissold (Conference Chair, Stroke Clinical Lead and Chair of the Data Committee for the Cardiovascular Learning Health Network for Safer Care Victoria), Prof Timothy Kleinig (SA/NT Telestroke Network founder, National Telestroke forum chair, SA Stroke Community of Practice Chair, President of the Australian and New Zealand Stroke Organisation (ANZSO) and Australian Stroke Coalition co-chair), Prof Dominique Cadilhac (Scientific Committee Co-Chair, Data Custodian for the Australia Stroke Clinical Registry (AuSCR) and ANZSO Vice-president) and Prof Geoffrey Cloud (Scientific Committee Co-Chair, Head of the Alfred Hospital Comprehensive Stroke Centre, and Chair of the AuSCR Clinical Quality Improvement committee).

The initial priority proposed within this small group in February 2023 was to improve Australia’s poor ‘door-needle’ times. In videoconference meetings and email follow-up, GC initially proposed ‘breaking the 60-minute barrier’ as a theme for a pre-conference workshop, proposing that the national median should be less than this. No timeframe for achieving this was initially set. He proposed a workshop of medical and nursing representatives from comprehensive, primary and regional stroke centres and telehealth networks. DC in March approached the Angels initiative representative Kim Malkin for assistance in supporting and co-designing this workshop.

Following a joint meeting of these members in April, TK suggested a suite of targets under a ‘30/60/90’ banner, centred on reperfusion speed and stroke unit care. This suite of targets was not based on a separate literature review, rather, it was based on the 2019 and 2023-4 draft Australian Commission on Safety and Quality in Healthcare (ACSQHC) Stroke indicators (these indicators, however, are strongly evidence-based). He (and others subsequently) considered and then selected those indicators recordable within the AuSCR, most tightly linked to patient outcome and therefore able to demonstrate a health economic benefit if met (see Table 1). This concept and focus was presented by DC and TK and informally endorsed at the May 10<sup>th</sup> Australian Stroke Coalition meeting (the Australian Stroke Coalition is the most broadly-representative national peak body for stroke, jointly chaired by ANZSO and the Stroke Foundation). TK then undertook the responsibility for discussing the potential targets individually with State Stroke Network leads, Telestroke leads, the Stroke Foundation, the Chair of the AuSCR management Committee and (more opportunistically) other national stroke key opinion leaders, seeking comment and consensus.

The initial proposal from TK was that, by 2030:

- 1) 50% of all thrombolysed patients in Australia will have a door-needle time of 60 minutes or less
- 2) 50% of all patients receiving EVT will have a door-artery time of less than 90 minutes (or <60 minutes for transferred cases)
- 3) 50% of all hospitals admitting stroke patients will have >90% of patients with a primary diagnosis of stroke admitted to a certified Stroke Unit
- 4) 50% of all such all hospitals will have >60% of their admitted stroke patients spending >90% of their admission on the stroke unit

Upon further discussion by TK with the AuSCR, State Stroke Network and Telestroke leads, and then returning to the core group. it was agreed that:

- 1) This first KPI should remain

- 2) This second KPI should be kept at 90 minutes for direct-presenting patients, but lowered to 30 for transferred patients, as the national median transfer patient door to arterial puncture time was already 40 minutes
- 3) This third KPI should change to >90% of stroke patients overall, as this would give a more precisely quantifiable benefit
- 4) This fourth KPI should be dropped, as the health economic benefit of this target was unproven

TK then suggested a further target (decreasing door-in door-out times to <60 minutes), which both core group and individual State leads accepted. GC suggested the metric '75% admitted to a Stroke Unit within 4 hours of presentation', however this was not included due to the difficulties collecting this item (not being currently collectible within AuSCR) and the difficulty proving an associated health economic benefit.

Following this process, a 'National Targets' workshop was planned for the August 22<sup>nd</sup> pre-conference day. In addition to the core planning group, invitees comprised all State and Territory Stroke network (or equivalent) leads, all state telestroke leads, and representatives from the Australasian Stroke Academy, Australian Stroke Alliance, Australasian Stroke Nurses Education Network, 2 international quality improvement experts, Stroke Foundation representatives, the Chair of the AuSCR reperfusion committee, the CEO of the Council of Ambulance Authorities (who could not attend, but endorsed via email) and the chair of the Conjoint Committee for Recognition of Training in INR.

Organisational representatives attending the workshop presented in turn, using a presentation template. They provided their perspective on the targets (including current status, barriers and enablers), were invited to state whether they felt the targets were achievable, whether they would suggest any modification, and finally, whether they endorsed the targets. There was then a forum for open discussion, to allow for any further suggestions. Each representative endorsed the targets without modification, with the exception of the CCINR, which could not endorse the targets, as it did not believe it had the jurisdiction to do so. Formal letters of support were obtained partially before and partially after the workshop. The only modification to the targets post-workshop was following feedback from regional Australia experts (BC and James Evans (NSW Telestroke lead)) who suggested that the 'Door-in Door-out' target be relaxed to 75 minutes for hospitals in inner regional areas. In these locations, where longer distance road transfer was required (but not aeroretrieval) a 60-minute target was viewed unachievable by 2030 due to ambulance logistical barriers.

Lived Experience representatives were not present at this workshop, but they are represented at the Australian Stroke Coalition (2 representatives), where these targets were informally presented in May, and then formally presented and endorsed. Further, the ASC is overseeing the targets. Further, these same ASC Lived Experience representatives had substantial input into the 2019 ACSQHC Standards and Indicators, and the proposed 2023-24 Revised Indicators (to be formalised later this year) which serve as the basis for KPI targets (Table 1).

Table 1: Matrix for assessing the impact of potential national stroke targets

<b>ACSHQC Stroke Standard Indicator</b>	<b>Applicability</b>	<b>Measurability</b>	<b>DALY avoided quantifiability</b>	<b>Treatment variability/improvability</b>
1: Proportion of patients with suspected acute stroke who were assessed by ambulance services using a validated stroke screening tool	+++	+**	?	++
2a: Proportion of patients with a final diagnosis of ischaemic stroke who were provided intravenous thrombolysis	++	++++	+	++
2b: Proportion of eligible patients with a final diagnosis of ischaemic stroke who received endovascular thrombectomy	++	++++	+	+
2c: Proportion of patients with a final diagnosis of ischaemic stroke provided thrombolysis who received the therapy within 60 minutes of presentation to hospital.	++	++++	++++	++++
2d: Time from arrival to hospital to endovascular thrombectomy. <sup>†</sup>	++	++++	++++	++++
2e: Time from arrival to hospital to transfer out for endovascular therapy*	++	++++	+++	++++
3a: Proportion of patients with a final diagnosis of acute stroke who have documented treatment in a stroke unit.	++++	++++	++++	++++
4a: Proportion of patients with a final diagnosis of acute stroke seen by a physiotherapist within 48 hours of presentation to hospital.	+++	++**	?	++
4b: Proportion of patients with a final diagnosis of acute stroke assessed for ongoing rehabilitation using a structured assessment tool prior to separation from acute care.	++	++**	?	++

<b>ACSHQC Stroke Standard Indicator</b>	<b>Applicability</b>	<b>Measurability</b>	<b>DALY avoided quantifiability</b>	<b>Treatment variability/improvability</b>
5a: Proportion of patients with a final diagnosis of acute stroke provided blood pressure-lowering medication on separation from hospital.	+++	++++	+***	++
5b: Proportion of patients with a final diagnosis of ischaemic stroke on cholesterol-lowering medication on separation from hospital.	+++	++++	+***	++
5c: Proportion of patients with a final diagnosis of ischaemic stroke and atrial fibrillation prescribed oral anticoagulants on separation from hospital.	++	++**	+***	+
5d: Proportion of patients with a final diagnosis of ischaemic stroke on antithrombotic medications on separation from hospital.	+++	++++	++***	+
5e: Proportion of patients with a final diagnosis of acute stroke who have documented evidence of advice on risk factor modification prior to separation from hospital.	+++	++**	+***	+
6a: Proportion of patients with a final diagnosis of acute stroke whose carer(s) received a formal needs assessment prior to separation from hospital.	+****	++**	?	+
6b: Proportion of patients with a final diagnosis of acute stroke who require assistance with activities of daily living, and whose carer(s) received relevant training prior to separation from hospital.	+****	++**	?	+
7a: Proportion of stroke patients with a final diagnosis of acute stroke provided with a documented care plan prior to separation from hospital.	+++	++++	+	++

- **Applicability** refers to the proportion of stroke patients covered by the standard.

- **Measurability** refers both to whether an Indicator is currently measured in AuSCR, and also whether the data is considered readily measurable and reliable.
- **DALY avoided quantifiability** denotes the degree to which a Disability Adjusted Life Year (DALY) benefit to meeting a target can be reliably assigned.
- **Treatment variability/ improvability** refers to whether there is a probable or proven gap between current practice and practically achievable (or internationally-demonstrable) best practice.

\* Proposed (as opposed to current) Australian Commission on Safety and Quality in Health Care (ACSQHC) Stroke Standard Indicator (proposed in a 2023 joint Australian Stroke Clinical Registry (AuSCR), Stroke Foundation and Australia and New Zealand Stroke Organisation submission (available on request)). Neither all proposed new indicators (nor proposed edits) are shown.

+ In the Indicator proposal splitting of door to arterial puncture time for 'direct-presenter' versus 'transferred' patients is suggested. For both groups there are substantial gaps in both groups compared with Best Practice.

\*\* Not currently measured in AuSCR

\*\*\* Although a measurable gap exists, the DALY benefits of treatment initiation (or risk factor advice) in hospital is uncertain (as opposed to the benefits of long-term adherence to treatment and/or advice)

\*\*\*\* The majority of patients discharged with stroke-related deficits which requires extra carer support are discharged to rehabilitation, not home, and are hence excluded from this indicator

### List of 30/60/90 national stroke targets endorsing organisations

- Australian Stroke Coalition
- Australian and New Zealand Stroke Organisation
- Stroke Foundation
- Australian Stroke Clinical Registry
- Angels Initiative
- Acute Stroke Nurses Education Network
- Australian Stroke Alliance
- Australasian Stroke Academy
- Australian and New Zealand Association of Neurologists
- Australian and New Zealand Society of Neuroradiology
- The Council of Ambulance Authorities
- Australasian College for Emergency Medicine
- Safer Care Victoria
- Agency for Clinical Innovation (NSW Health)
- SA Health
- Queensland Health

### 30/60/90 National Stroke Targets Taskforce members

Organisation	Name(s)
<b>ACT Health</b>	Bart Piechowski-Jozwiak
<b>Acute Stroke Nurses Education Network</b>	Tanya Frost*
<b>Agency for Clinical Innovation (NSW)</b>	James Evans Danielle Wheelwright Ken Butcher**
<b>Angels Initiative</b>	Kim Malkin
<b>Australian and New Zealand Association of Neurologists</b>	Michael Waters (ENI subcommittee)
<b>Australian and New Zealand Stroke Organisation</b>	Timothy Kleinig

<b>Organisation</b>	<b>Name(s)</b>
<b>Australian Stroke Alliance</b>	Anna Balabanski
<b>Australian Stroke Clinical Registry</b>	Geoffrey Cloud Dominique Cadilhac
<b>Council of Ambulance Authorities</b>	David Waters
<b>NT Health</b>	Anna Holwell
<b>Queensland Health</b>	Andrew Wong Aylissa Canning*** Claire Muller**
<b>Safer Care Victoria</b>	Ben Clissold Chris Bladin**
<b>SA Health</b>	Jackson Harvey Michelle Hutchinson Craig Kurunawai**
<b>Stroke Foundation</b>	Lisa Murphy
<b>Tasmania Health</b>	Helen Castley Janell Cole
<b>WA Health</b>	Gill Edmonds Andrew Wesseldine** Thomas Chemmanam

\*Tanya Frost also represents Safer Care Victoria as nursing lead.

\*\* These doctors are State Telestroke leads.

\*\*\* Aylissa Canning is a Telestroke Nurse lead