Guideline 9.2.2 – Stroke

Summary

This guideline has been updated based on updates to the 2020 International Liaison Committee on Resuscitation (ILCOR) evidence review,[1,2] the National Stroke Foundation Clinical Guidelines[3] and the Thoracic Society of Australia and New Zealand Oxygen Guidelines for Acute Oxygen Use in Adults.[4]

Who does this guideline apply to?

This guideline applies to adults and children.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations:

1. If the person is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart [Refer to ANZCOR Guideline 8].
2. If the person becomes unconscious but is breathing to lay the person on their side and ensure airway is clear [Refer to ANZCOR Guideline 3].
3. We recommend using a validated stroke assessment system to assist stroke recognition.[1] [CoSTR 2020, strong recommendation, low certainty evidence]
4. We suggest the use of the Facial drooping, Arm weakness, Speech difficulties and Time to call emergency services (FAST) stroke assessment for individuals with suspected acute stroke when blood glucose measurement is not feasible.[2] [CoSTR 2020, weak recommendation, low certainty of evidence]
5. We suggest that when blood glucose measurement is feasible, the use of a stroke assessment tool that includes blood glucose measurement, such as the Melbourne Ambulance Stroke Screen (MASS) or the Los Angeles Prehospital Stroke Screen (LAPPS).[2] [CoSTR 2020, weak

recommendation, low certainty evidence]

6. Send for an ambulance immediately if stroke is suspected, even if short duration of symptoms or if symptoms have resolved. [Good Practice Statement]
7. Do not routinely administer oxygen to persons with stroke.[2] Administer oxygen only if there are obvious signs of shock or evidence of low oxygen saturation according to Use of Oxygen in Emergencies [Refer to ANZCOR Guideline 9.2.10].
8. Do not give the person anything to eat or drink, as swallowing may be impaired. [Good Practice Statement] If the blood sugar is measured and low, treat according to ANZCOR Guideline 9.2.9.

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
CoSTR	Consensus on Science with Treatment Recommendations (from International Liaison Committee on Resuscitation - ILCOR)
FAST	• **F**acial weakness – ask the person to smile. Is their mouth droopy on one side? • **A**rm weakness – ask the person raise both arms. Can they only raise one arm or is one arm weaker? • **S**peech difficulty – ask the person to repeat a phrase. Is their speech slurred and can they understand what you say? • **T**ime to act fast (Take Action) – if any of these signs are present send for an ambulance immediately
MASS	Melbourne Ambulance Stroke Screen
LAPSS	Los Angeles Prehospital Stroke Screen

1.0 | Introduction

Stroke is a common cause of death and disability.[5] A stroke occurs when the supply of blood to part of the brain is suddenly disrupted. Blood flow can stop through the artery when it gets blocked by a blood clot or when an artery ruptures. Without the oxygen that the blood supplies, surrounding brain cells are quickly damaged and die. A quick response is needed because 'Time is Brain'. If treatment is provided quickly, some of these damaged brain cells can survive. **This is why it is so important to recognise stroke quickly and to send for an ambulance immediately if stroke symptoms are present.**

A person with the symptoms of stroke should be transported by ambulance because paramedics can start the management for stroke and make sure the person is taken to the most

appropriate hospital for specialist stroke management. Paramedics can also notify the receiving hospital, reducing time to the start of treatment.

2.0 | Recognition

- **ANZCOR recommends using a validated stroke assessment system to assist stroke recognition.** [1] [CoSTR 2020, strong recommendation, low certainty evidence] When there is doubt over the diagnosis, the person should be managed as having a stroke until proven otherwise.
- **ANZCOR suggests the use of the FAST stroke assessment for individuals with suspected acute stroke when blood glucose measurement is not possible.** [1] [CoSTR 2020, weak recommendation, low certainty of evidence]

FAST[6] is a simple way for remembering the most common signs of stroke.

- **F**acial weakness – ask the person to smile. Is their mouth droopy on one side?
- **A**rm weakness – ask the person raise both arms. Can they only raise one arm or is one arm weaker?
- **S**peech difficulty – ask the person to repeat a phrase. Is their speech slurred and can they understand what you say?
- **T**ime to act fast (Take Action) – if any of these signs are present send for an ambulance immediately.

Other less common symptoms and signs of stroke include:

- numbness of the face, arm or leg
- difficulty swallowing
- dizziness, loss of balance or an unexplained fall
- loss of vision, sudden blurred or decreased vision in one or both eyes
- headache, usually severe and of abrupt onset or unexplained change in the pattern of headaches
- drowsiness
- confusion
- reduced level of consciousness.
- **ANZCOR suggests, that when blood glucose level measurement is feasible, use a validated stroke assessment tool that includes blood glucose level measurement**[1] such as the Melbourne Ambulance Stroke Screen (MASS)[7] or the Los Angeles Prehospital Stroke Screen (LAPSS).[8] [CoSTR 2020, weak recommendation, low certainty evidence]

Symptoms of stroke may also be caused by other conditions such as epilepsy, migraine or low blood glucose level (BGL). The measurement of a blood glucose level may improve the recognition of stroke from other conditions when used in conjunction with a stroke assessment tool.[1] Importantly, early recognition of a low blood glucose level enables early treatment according to

ANZCOR Guideline 9.2.9 improving the outcome of this condition as well.

3.0 | Management

- If the person is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart [Refer to ANZCOR Guideline 8].
- If the person becomes unconscious but is breathing, lay the person on their side and ensure airway is clear [Refer to ANZCOR Guideline 3].
- Send for an ambulance for any person who has shown signs of stroke, no matter how brief or if symptoms have resolved. [Good Practice Statement].
- ANZCOR suggests against the routine administration of oxygen to persons with stroke.[2, 10, 11] [CoSTR 2020, weak recommendation, low to moderate certainty of evidence] Administer oxygen only if there are obvious signs of shock or evidence of low oxygen saturation according to ANZCOR Guideline 9.2.10.
- Do not give anything to eat or drink, as swallowing may be impaired. [Good Practice Statement].
- If the blood glucose level is measured and low and the person is fully conscious and able to swallow, treat according to ANZCOR Guideline 9.2.9.

References

1. Meyran D, Cassan P, Singletary E, Zideman D on behalf of the International Liaison Committee on Resuscitation (ILCOR) First Aid Task Forces. First Aid Stroke Recognition Consensus on Science with Treatment Recommendations [Internet] Brussels, Belgium: International Liaison Committee on Resuscitation (ILCOR) First Aid Task Force, 2020 January 2 available from: http://ilcor.org
2. Singletary EM, Zideman DA, Bendall JC, et al. 2020 International Consensus on First Aid Science With Treatment Recommendations.*Circulation* 2020; **142**(16_suppl_1): S284-S334.
3. National Stroke Foundation. Clinical Guidelines for Stroke Management (2020). Melbourne, Australia. strokefoundation.com.au (Accessed 29/07/2020).
4. Beasley, R., Chien, J., Douglas, J., Eastlake, L., Farah, C., King, G., Moore, R., Pilcher, J., Richards, M., Smith, S. and Walters, H. (2015), Thoracic Society of Australia and New Zealand oxygen guidelines for acute oxygen use in adults: 'Swimming between the flags'. Respirology, 20: 1182–1191. doi: 10.1111/resp.12620.
5. AIHW, Cause of death Australia, https://www.aihw.gov.au/reports/life-expectancy-death/deaths-in-australia/contents/multiple-causes-of-death. Accessed 18 July 2020
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stroke: community validation of the Melbourne Ambulance Stroke Screen (MASS). Cerebrovascular Diseases 2005;20:28-33.
8. Kidwell CS, Starkman S, Eckstein M, Weems K, Saver JL: Identifying stroke in the field. Prospective validation of the Los Angeles prehospital stroke screen (LAPSS). Stroke 2000; 31: 71–76.
9. Chang WT, Sakamoto T, Lee CC, Singletary EM, Zideman D, Schmölzer G, Bendall J, Berry DC, Borra V, Carlson JN, Cassan P, Charlton NP, Djarv T, Douma M, Epstein J, Hood NA, Markenson D, Meyran D, Orkin A, Swain J, Woodin JA, Morley P: First Aid Supplementary Oxygen in Acute Stroke Consensus on Science with Treatment Recommendations [Internet] Brussels, Belgium: International Liaison Committee on Resuscitation (ILCOR) First Aid Task Force, 1 Jan 2020. Available from http://ilcor.org.
10. Singletary EM, Zideman DA, Bendall JC, et al. 2020 International Consensus on First Aid Science With Treatment Recommendations.*Resuscitation* 2020; **156**: A240-A82
11. National Stroke Foundation. Clinical Guidelines for Stroke Management 2017. Chapter 3 of 8: Acute medical and surgical management. Melbourne. Retrieved 20 November 2020 fromhttps://informme.org.au/en/Guidelines/Clinical-Guidelines-for-Stroke-Management-2017: National Stroke Foundation

Further Reading

- ANZCOR Guideline 2 Managing an Emergency
- ANZCOR Guideline 3 Recognition and First Aid Management of the Unconscious Victim
- ANZCOR Guideline 4 Airway
- ANZCOR Guideline 5 Breathing
- ANZCOR Guideline 8 Cardiopulmonary Resuscitation
- ANZCOR Guideline 9.2.9 First Aid Management of a Diabetic Emergency
- ANZCOR Guideline 9.2.10 The Use of Oxygen in Emergencies

About this Guideline

Search date/s	September and October 2019

Question/PICO 1:	*Population:* Adults with suspected acute stroke *Intervention:* Use of a rapid stroke scoring system or scale (or test) (as FAST, LAPSS, CPSS, OPSS, KPSS, MASS or others) *Comparison:* Basic first aid assessment without the use of a scale *Outcomes:* • Change time to treatment (e.g. symptom onset to hospital/emergency department arrival or hospital admission (9-Critical) • Recognition of stroke: (5-Important) high number considered beneficial for observational study; high sensitivity and high specificity considered beneficial for diagnosis study • Discharge with favourable neurologic status (increase considered beneficial) (5-Important) • Survival with favourable neurologic outcome (increase considered beneficial) (5-Important) • Increased public/layperson recognition of stroke signs (5-Important)
Question/PICO 2:	**Population**: Adults with suspected acute stroke **Intervention**: Use of supplementary oxygen **Comparators**: No use of supplementary oxygen **Outcomes**: Clinical outcomes such as survival, neurological outcomes (e.g. NIHSS, Scandinavian stroke scale, modified Rankin scale score, etc.), and neurological recovery in the acute phase were ranked as critical outcomes. Quality of life (e.g. Barthel index, EuroQol, Nottingham ADL score, etc.) and hospital length of stay were ranked as important outcomes. Adverse effects and complications (pneumonia, pulmonary edema, necessity of non-invasive positive pressure ventilation, intubation with mechanical ventilation, etc.) were listed as important outcomes. Imaging outcomes such as magnetic resonance imaging (MRI) indicators (diffusion-weighted imaging, lesion volume, diffusion/perfusion mismatch, magnetic resonance spectroscopic indicators, etc.) and reperfusion rate were ranked as important outcomes. Laboratory outcomes such as oxygen saturation (highest, lowest, incidence or duration of oxygen saturation < 90% or 95%, etc.) were listed as good-to-know outcomes. **Study Designs**: Randomized controlled trials (RCTs) and non-randomized studies (non-randomized controlled trials, interrupted time series, controlled before-and-after studies, cohort studies) are eligible for inclusion. Unpublished studies (e.g., conference abstracts, trial protocols) were excluded. **Timeframe**: All years and all languages were included; unpublished studies (e.g., conference abstracts, trial protocols) were excluded. Literature search updated to Oct 16, 2019.
Method:	Systematic Reviews (ILCOR First Aid Task Force, CoSTR)
Primary reviewers:	Natalie Hood, Finlay Macneil
Other consultation	Kevin Nation, Janet Bray
Worksheet	See https://www.ilcor.org/
Approved:	April 2021

Guideline superseded:	ANZCOR Guideline 9.2.2 - August 2016

Referencing this guideline

When citing the ANZCOR Guidelines we recommend:

ANZCOR, 2026, Guideline 9.2.2 – Stroke , accessed 29 September 2026, https://www.anzcor.org/home/first-aid/guideline-9-2-2-stroke