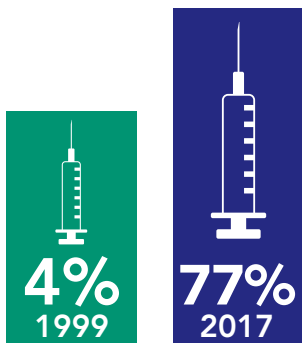


**Stroke Foundation
Audits – a 20 year
retrospective**

Key insights



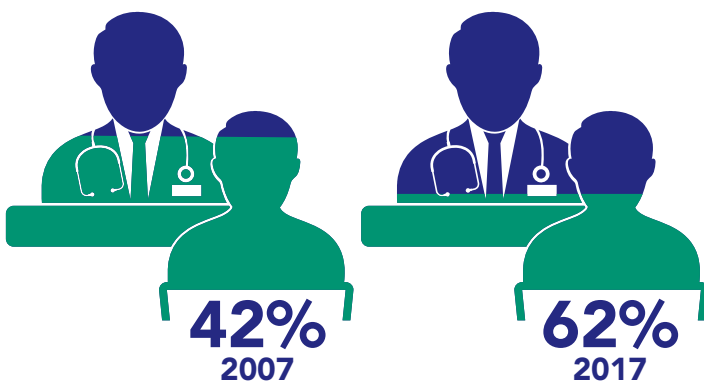
Proportion of hospitals providing **thrombolysis** has increased

However, the proportion of ischaemic stroke patients who receive thrombolysis remains poor at 11%[†] in 2017.



Thrombolysis delivery also needs to accelerate with only 30% of patients receiving treatment within 60 minutes of hospital arrival compared to approximately 60% in the US and UK

The proportion of patients who received advice on **risk factor modification** has increased



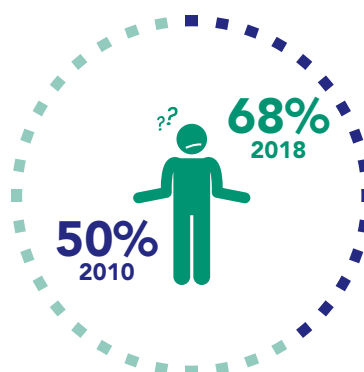
The proportion of patients who received **treatment in a stroke unit** has increased

The proportion of patients who had their mood assessed has increased from 34% in 2012 to 56% in 2018.



however, access to psychology services remains poor, with **37% of hospitals** providing these services in 2017

The proportion of hospitals routinely giving patients a **discharge care plan** has increased



Improving the quality of care provided to Australian patients with acute stroke



between 2007–2017 **would have avoided the loss of over 17,000 healthy years of life.**

[†]This includes patients with premorbid functional impairment, recent stroke surgery, major comorbidities, other contraindications, or imaging showing spontaneous reperfusion, as well as those on warfarin with INR (international normalised ratio) >1.7, or who are rapidly improving.

Introduction

Stroke kills more women than breast cancer, more men than prostate cancer and leaves thousands with ongoing disabilities.¹ The number of strokes in Australia is on the increase.

There is now one stroke every nine minutes and there are an estimated 475,000 stroke survivors living in our communities.² By 2050, it is estimated there will be one stroke every four minutes in Australia and one million stroke survivors living in our communities.²

Stroke is a serious emergency, requiring urgent medical attention. With the right treatment at the right time, many people can recover from stroke. Improving the quality of stroke care provided in Australian hospitals is critical to reducing the burden of stroke on survivors, their families and carers, the community and the healthcare system.

The Stroke Foundation is dedicated to empowering health professionals to deliver best-practice evidence-based stroke treatment and care. The National Stroke Audit is at the core of this work. The Audit commenced in 2007 and changes focus between acute stroke services and inpatient rehabilitation services each alternate year.

The Audit provides a comprehensive snapshot of stroke treatment and care, and a benchmark for clinicians, health administrators and government to build upon. It highlights areas where the system is working well and reports on where improvement or changes may be needed. The Audit is the only report of its kind in Australia, tracking the performance of Australia's stroke care against evidence-based Clinical Guidelines, the *Acute Stroke Services Framework 2015* and *National Rehabilitation Stroke Services Framework 2013*, and the Australian Commission on Safety and Quality in Health Care *Acute Stroke Clinical Care Standard 2015*.

The *National Stroke Audit Program 20-year Report* utilises data from the Acute Services and Rehabilitation Services Audit Reports to demonstrate the evolution of stroke treatment and care in Australia over the last two decades.



“

This report demonstrates the impact Stroke Foundation's National Audit Program has had in reporting and driving quality improvement in our health services, benefiting thousands of Australians. Much has changed over the last two decades with significant advances in stroke care, but there is more to do to ensure equity of access to evidence-based stroke treatment and care.

”

Professor Bruce Campbell,
Stroke Foundation Clinical Council Chair.

Results from organisational and clinical surveys across the years

Acute Services 1999 – 2017

Stroke care has improved in Australia over the past two decades. This report provides evidence of improvements in the hospitals which participated in the audits between 2007 and 2017.

A greater proportion of patients were treated according to best-practice recommendations detailed in the *Clinical Guidelines for Stroke Management*. Care provided also more often reflected the quality statements in the *Acute Stroke Clinical Care Standard*.

Improvements have been made in the delivery of acute stroke treatment and care. However, time-critical treatment and best-practice care is not available to all Australian patients, and there is still much more to be done.

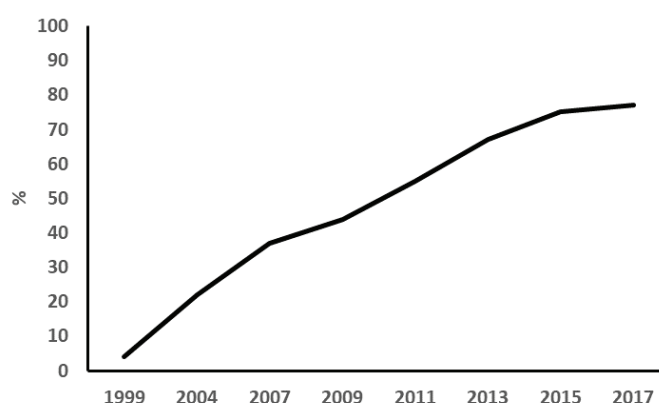
'Time is brain' therapies

Recent advancements in 'time is brain' stroke treatments are saving lives and reducing disability in stroke survivors.

Thrombolysis (clot-dissolving treatment) involves administering a drug within the first 4.5 hours of stroke symptoms occurring, which can break down and disperse a clot that is blocking a blood vessel and preventing blood from reaching the brain.

There was an overall increase in hospitals providing intravenous thrombolysis over the last two decades, from 4% in 1999 to 77% in 2017 (Figure 1). From 2009 to 2017, the number of hospitals which offered this service 24 hours a day, seven days a week (24/7) also increased.

Figure 1 Proportion of public hospitals offering intravenous thrombolysis for acute ischaemic stroke (1999-2017)



From 2007 to 2017, the proportion of ischaemic stroke patients who received thrombolysis increased significantly from 3% to 11%[‡]. However, many Australian stroke patients still do not have access to this time-critical stroke treatment, particularly those living in regional and rural areas. Australia is also lagging behind our international colleagues in the time taken for patients to be treated once in hospital, with only 30% of patients receiving treatment within 60 minutes of hospital arrival compared to approximately 60% in the US and UK.

[‡]This includes patients with pre-morbid functional impairment, recent stroke surgery, major comorbidities, other contraindications, or imaging showing spontaneous reperfusion, as well as those on warfarin with INR (international normalised ratio) >1.7, or who are rapidly improving.



Endovascular thrombectomy (blood clot removal treatment) takes out clots using a tiny retractable mechanical device guided through the arteries to the brain. This game-changing stroke treatment, pioneered by Australian researchers, is most effective when performed as soon as possible after stroke onset. Endovascular thrombectomy can be highly beneficial in some patients within 24 hours of stroke symptom onset.³ This treatment is used for very large clots (which normally result in severe strokes).

In most states and territories, access to this breakthrough treatment is currently limited to major metropolitan hospitals. In several states and territories this procedure is only available during the week and within business hours.

While endovascular thrombectomy is a technically challenging procedure and should only be performed by highly trained specialists, it is vital pathways to this treatment are established for all Australians.

Stroke unit access and care

Building on time-critical stroke treatment, access to a dedicated stroke unit is proven to make the biggest difference to patient outcomes following stroke.⁴ Stroke unit care is characterised by provision of care in one location by an interdisciplinary team including medical, nursing and allied health professionals with expertise in stroke.

The proportion of hospitals with a stroke unit increased from 26% in 1999 to 79% in 2017. Although the question and response options changed over time, of those hospitals with a dedicated stroke unit, the number likely to directly admit patients to the stroke unit increased over time (1999: 43%, 2017: 79%).

The proportion of patients who had been treated in a stroke unit increased from 53% in 2007 to 70% in 2017.

Access to stroke units was greater in urban compared to rural regions across all audits. Larger increases in urban areas were evident from 2007 to 2017.



“

I was 41 years old when I had my stroke. I believe if it had not been for the expertise of the team at the stroke unit where I was treated, my recovery would have been greatly impaired. Research shows dedicated stroke units save lives and reduce disability, improving the quality of life post stroke for survivors.

”

Brenda Booth, stroke survivor.



Acute stroke team

The acute stroke team – which may include a number of professional disciplines including medical, nursing and allied health clinicians – is a critical component of acute stroke care. The team provides a coordinated approach to optimise patient recovery post stroke, including individual assessment, treatment, discharge planning and follow-up.

Overall, there was greater access to allied health specialties for patients with stroke in 2017 compared to 1999.

Specialist nurses were available in more hospitals in 2017 (69%) than in 2004 (22%).

Discharge processes and the transition from hospital care

Effective discharge planning facilitates the transfer of the stroke survivor to the community by maximising independence, minimising social isolation and ensuring the needs of the patient and carer are addressed.

Almost all hospitals reported meeting with patients and/or family members regarding care in 2017, up from 70% in 2004, with similar changes evident in hospitals that provide information to the patient and family (1999: 47%, 2004: 56%, 2017: 96%). Variability existed in the proportion of hospitals reporting providing patients with a discharge care plan.

More patients and/or families were involved with developing a discharge care plan with the team over time, increasing from 58% in 2007 to 65% in 2017. From 2007 to 2017, an increasing trend was observed for general practitioners being provided with a discharge summary (2007: 79%, 2017: 96%).

Carers are essential in supporting the transition home and the ongoing recovery process for patients with stroke. Practices around supporting carers in the community have improved over the audits, with more receiving carer training (2007: 24%, 2017: 49%) or an assessment of their needs for support (2009: 53%, 2017: 57%) in the 2017 audit.

Services for patients with transient ischaemic attack (TIA)

TIA is recognised as a stroke warning, thus acute service providers must have services for rapid assessment and management of people with suspected TIA to prevent stroke.

In 1999, only 8% of hospitals reported having a TIA/stroke rapid outpatient assessment clinic, whereas in 2017, half of the hospitals either admitted all TIA patients, or had an assessment clinic where these patients could be seen within 48 hours. Although not collected in the early surveys, the proportion of hospitals using defined processes for assessing TIA patients increased from 56% in 2009 to 82% in 2017.

Minimising the risk of another stroke

Four in 10 stroke survivors will go on to have another stroke within a decade, with the risk of recurrent stroke highest in the first year⁵, yet stroke can be prevented. All patients should be assessed for, and educated about, lifestyle risk factor modification in order to prevent further stroke. There was an increase in the proportion of patients who received advice on risk factor modification at discharge over the audits (2007: 42%, 2017: 62%).

Audit results showed almost 40% of stroke survivors and their families were still leaving hospital without vital knowledge to reduce their risk of experiencing another stroke. These gaps have significant and at times devastating implications for patients, their families and carers, and the healthcare system.

The *Clinical Guidelines for Stroke Management*³ recommend the use of blood pressure-lowering, cholesterol-lowering and antiplatelet or anticoagulation pharmacotherapy to prevent recurrent stroke.

Improvements were seen in the prescription of lipid lowering medication for those with ischaemic stroke (2007: 65%, 2017: 85%). The proportion of patients with ischaemic stroke on antithrombotic medications at discharge was 95% or more in all audits, with little change over time for both antithrombotics and antihypertensives.

Darlene's story

When Darlene McLeod collapsed on the kitchen floor, her young daughter thought it was a game. Darlene's husband Don immediately thought stroke.

Don's quick thinking meant it wasn't long before Darlene was in hospital getting specialist stroke treatment with thrombolysis.

But the clot wasn't dissolving and the outlook was grim. Two finger-widths of Darlene's brain was dying and another large area was threatened. Don was worried he would lose Darlene.

Fortunately both luck and research were on Darlene's side.

Darlene's neurologist was part of a research team trialling a new treatment called endovascular thrombectomy in combination with thrombolysis. It was Darlene's best chance.

Don had to sign approval to use the new procedure.

"Once the doctor said he would do it if the patient was his wife, I knew we had to go for it," Don said.

The clot was successfully removed and by the end of the day Darlene was sitting up in bed and even able to say hello to her children. Her rapid recovery was described by hospital staff as 'miraculous'.



“

When blood thinners didn't work on Darlene, the doctor told me about the then relatively new clot retrieval procedure. Hesitant I asked if this was your wife what would you do and he said 'I'd sign the paper, without hesitation,' and it saved her life.

”

Don McLeod, husband of stroke survivor Darlene.

Rehabilitation services 2008–2018

Advancements in acute stroke treatment mean more Australians are now surviving stroke. There is an increasing demand for high-quality rehabilitation services to support and empower survivors to recover and live their best possible life after stroke.

This report provides evidence that changes in the quality of stroke care provided to patients has been limited in rehabilitation hospitals participating in the audits between 2008 and 2018.

The organisation of rehabilitation services for patients with stroke has changed in some hospitals around features such as resources, workforce and infrastructure. More hospitals met eight or more elements in the *Rehabilitation Stroke Services Framework* (2014: 14%, 2018: 35%).

Variability in clinical change was seen across the audits, with adherence to many processes remaining relatively unchanged. In the areas that did improve, often gaps in care remained.

Stroke survivors and their families have been denied the opportunity to live well after stroke because they do not have access to the high-quality rehabilitation and supports they need and deserve.

Discharge planning processes

An increase in the proportion of hospitals using protocols to guide discharge planning (2010: 51%, 2018: 62%), and those providing patients with a discharge care plan (2010: 50%, 2018: 68%), was evident over time. However, in 2018, these processes were still not occurring in more than 30% of hospitals.

A greater proportion of hospitals were providing patients with the contact details of someone in the hospital for post discharge questions in recent years (2008: 57%, 2018: 82%), and although variability was evident in hospitals that provided patient education prior to discharge, this was 89% or more in all audits.

Communication with patients

It is important stroke patients are provided with the opportunity to discuss their desired goals for rehabilitation with the multidisciplinary team.

Variation was evident in the proportion of patients and/or families who met with the team to discuss management across the audits. An increase in patient-centred goals being set with the patient and family was observed (2010: 81%, 2018: 94%). Question changes precluded direct comparisons over the audits for the process related to patients and families receiving information on stroke.

Secondary prevention

Although there were changes in questions and response options related to risk factor advice over the audit periods, a steady increase was noted between 2008 and 2018. In 2018, one in three patients did not receive risk factor advice on discharge.

More than 89% of patients with ischaemic stroke received antithrombotics on discharge in all audits. While provision of lipid lowering medications for those with ischaemic stroke improved (2008: 77%, 2018: 85%), no real change in the prescription of antihypertensives was observed.



“

It is quite amazing to think of how far I have come since my stroke. The health professionals who supported me were wonderful and I am so grateful.

My life is busy, but I take care of myself. I am on blood pressure medication to prevent a second stroke and I have made some lifestyle changes.

”

Emily Korir, stroke survivor.

Assessment of impairments

Patients should be assessed by members of the multidisciplinary team to identify any impairments impeding their ability to live well. This may include difficulties speaking and communicating, walking, eating or mood disorders.

Mood disorders frequently occur following stroke. One-third of stroke survivors will experience depression⁶, and between 18 and 25 percent will experience anxiety.⁷ Mood disorders in stroke patients have been associated with reduced participation in rehabilitation, higher rates of mortality and increased disability.⁸

The proportion of patients who had their mood assessed increased from 34% in 2012 to 56% in 2018; however, almost one in two patients are still not receiving this important process of care.

Currently, Australia's rehabilitation services are designed to focus on the physical disabilities that occur following stroke. Families are suffering because stroke survivors are being denied the specialist mental health treatment and care they need to maximise their recovery.

Life after stroke for the patient and family

The *Clinical Guidelines for Stroke Management*³ provide recommendations on what information should be provided to stroke survivors and carers regarding preparation for life in the community. A wide variety of topics are covered, including return to driving, return to work, leisure activities, accessing support and sexuality.

Across the audits, a greater proportion of patients were provided with information on sexuality or the opportunity to discuss issues related to sexuality (2008: 13%, 2018: 22%). However, this remains an area for improvement, with only one in five patients having access to this information in 2018. Due to different response options over audits, direct comparisons from 2008 to 2018 for other processes related to life after stroke or support for carers, were not possible.



“

During my rehab, I was very focused on my physical recovery, and I didn't really think about the effect stroke had on my mental health. Looking back, I now realise how important dealing with mental health issues is following stroke, particularly how this can impact on your ability to get the most out of recovery.

”

Dan Englund, stroke survivor.

“

The three things I wanted to be able to do after leaving hospital were: walk, climb stairs and drive a car. The doctors said ‘you’re being a bit ambitious but we’ll see how we go’. Fortunately by the time I left hospital I could do all three of those things. My key message to someone who has suffered a stroke is to keep at it.

I can’t stress enough the importance of carers ensuring that stroke survivors don’t miss out on important physio and occupational therapy sessions due to exhaustion.

It is in the early days when you make the most recovery. So, even if you’re tired, when it’s time for your physio sessions, go!

”

Kevin English (right), stroke survivor, with wife Karen.



Economic impact of improving stroke care standards

The number of additional patients who would receive treatment* because of improvements in the standard of acute stroke care from the averages observed in 2007 to the averages observed in 2017, were estimated in this report.

Without this additional treatment, it was estimated more than 17,000 healthy years of life would be lost in 2017. **After considering the savings to the health system due to better health, the cost of achieving this health benefit was estimated to be an additional \$2.5 million, which equates to paying \$144 to avoid the loss of each healthy year of life.**

This would be considered good value for money, since in Australia we would generally be willing to pay up to \$50,000 for each year of healthy life gained as a result of this additional treatment.

The estimated benefits to the health of the Australian community from improving the quality of care provided to patients with acute stroke could be achieved at a relatively low cost.

This evidence supports further investment in initiatives to drive quality improvement.

*Stroke unit care, intravenous thrombolysis and secondary prevention medications provided at discharge.

Final word

In Australia, much has been achieved in stroke treatment and care over the last two decades; however, there is still a lot more to be done.

There have been significant improvements in access to time-critical stroke treatments, but not all access is equal. Ongoing inequalities in acute stroke care and services are costing lives and leaving thousands of patients with unnecessary disability. Australians living in regional and rural areas are among those most impacted.

Advancements in acute stroke treatments have meant more Australians are surviving stroke than ever before; however, improvements to the quality of stroke rehabilitation care in Australian hospitals have been limited. Current health systems are designed to focus on a stroke survivor's physical recovery, and mental health continues to be ignored despite it being recognised by experts as a crucial element of stroke recovery.

Now we must consider what more needs to be done to ensure consistent access to time-critical stroke treatments and enhance the recovery of stroke survivors.

Potential quality improvement programs and initiatives which could address a number of the issues identified in this analysis have been included in the recently completed National Strategic Action Plan for Heart and Stroke. The Action Plan outlines immediately achievable actions Australian Governments at all levels can implement to reduce the impact of stroke on survivors, their families and carers, the community and the healthcare system.

Continuing data collection programs to monitor the quality of stroke care will identify areas that can be improved upon, and the data collected can also be utilised to assess the effects of quality improvement programs.

The estimated advantages to the health of the Australian community from improving the quality of stroke care provided in Australian hospitals were substantial, with relatively low additional costs to achieve the health benefits. Further improvements in the quality of stroke care appear to be achievable, and efforts to facilitate these improvements are likely to be cost-effective and must be a focus in the future.

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This summary is based on an independent report produced by a team of researchers at Monash University who were commissioned by the Stroke Foundation.



About Stroke Foundation

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. We support survivors on their journey to live the best possible life after stroke.

More information

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