Stroke FOUNDATION

National Stroke Audit

Rehabilitation Services Report 2016

strokefoundation.org.au

About the Stroke Foundation

The Stroke Foundation is a national not-for-profit organisation working across the stroke journey supporting stroke survivors, carers, health professionals, governments and the public to reduce the impact of stroke on the Australian community. We are the voice of stroke in Australia.

Our mission is to stop stroke, save lives and end suffering.

We will achieve this by:

- Raising awareness of the risk factors and signs of stroke and promoting healthy lifestyles.
- Improving treatment for stroke to save lives and reduce disability.
- Improving life after stroke for stroke survivors.
- Encouraging and facilitating stroke research.
- Advocating for improved stroke prevention, treatment and support.
- Raising funds from the community, corporate sector and government to continue our mission.

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Clinical governance and advice was provided by the Stroke Foundation's Clinical Council.

Data analysis was undertaken by the Translational Public Health and Evaluation Division, Stroke and Ageing Research, School of Clinical Sciences at Monash Health, Monash University.

The data was collected on the Australian Stroke Data Tool (AuSDaT), an integrated data management system developed through a collaboration of programs and led by the Stroke Foundation for clinical monitoring of stroke care in Australia.

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Foreword

On behalf of the Stroke Foundation and our Clinical Council I present the National Stroke Audit – Rehabilitation Service Report for 2016. This biennial audit of Australian stroke rehabilitation services has been conducted since 2008 and, together with the Acute Services report produced in alternate years, is the cornerstone of our efforts to drive stroke quality improvement across the Australian hospital system.

The report is distinguished by the quality of its data and large sample of rehabilitation sites involved. This edition was the most comprehensive ever, encompassing rehabilitation services that account for the care of around 90% of all patients who were provided with inpatient stroke rehabilitation during 2015.

Report findings demonstrate inpatient stroke rehabilitation quality has stagnated. Similar to the 2015 Acute Services Report, the data shows pockets of best practice which is encouraging but far too many areas of ongoing concern must be highlighted and addressed.

Stroke is an insidious disease that strikes without warning and is often devastating in its immediate impact. Recovery can be long and slow but with appropriate, timely and accessible care, many stroke survivors can make a meaningful recovery. Australia has some of the best and brightest health professionals working in stroke rehabilitation but a lack of appropriate hospital systems and processes continues to hinder best practice. This is compromising patient safety, leading to unnecessary suffering and adding increasing cost to the health system. Stroke survivors deserve the opportunity to make their best recovery possible. We can and must do better to assist them in achieving their recovery goals.

There are three key messages from the 2016 stroke rehabilitation report.

Firstly, we must improve the systems that guide rehabilitation care Australian stroke patients receive. There is enormous variability in care and narrowing the gap between the best and the worst performing hospitals must be a priority.

Secondly, we must urgently address consistent neglect of patient's emotional and psychological needs. It is well recognised mental and emotional wellbeing can significantly alter outcomes from rehabilitation and ultimately the quality of the lives of patients and their families. Yet Audit results since 2008 show this area has been consistently ignored. Too many patients continue to miss out on assessment for conditions such as anxiety and depression, and patients who have been identified as needing support or treatment are not being provided with psychological assessments or the necessary care.

Finally, we must find a way to better prepare patients for the often long and challenging recovery journey that continues following discharge from hospital. Half of patients were discharged without vital education about stroke and lifestyle advice vital to preventing further strokes. This is despite the now widespread availability of resources such as My Stroke Journey, a stroke patient information pack provided free by the Stroke Foundation to hospitals.

In summary, there is still much more to be done to improve the rehabilitation treatment stroke patients receive in Australia. We know what good care looks like but sadly too few patients are experiencing it.

Pockets of high quality rehabilitation demonstrate it can be done and I commend those teams who have demonstrated consistent improvement in performance since the audit began in 2008. If we can encourage the spread of this success and share the learnings from their improvement journeys then future stroke patients, their families and carers will be the beneficiaries.

Finally, I want to thank the staff at each of the 121 sites who participated in the 2016 audit for their time and for their commitment to improving stroke rehabilitation services in Australia. This is your report and we hope it will help you to continue striving for a world free from disability and suffering caused by stroke.

I commend this report and its recommendations.

Sharon McGowan
Chief Executive Officer

Executive Summary

The National Stroke Audit Rehabilitation Services Report 2016 provides the most comprehensive snapshot to date of inpatient rehabilitation services for stroke in Australia. The Audit highlights areas where the system is working well and reports on improvements or changes that may be needed. Importantly the results are presented according to best practice guidelines in the National Rehabilitation Stroke Services Framework 2013 and the Clinical Guidelines for Stroke Management 2010. In addition the Audit highlights progress that has been made over time with the last audit completed in 2014.

Clinicians, health administrators and governments alike can use the valuable data provided in this report to review services and clinical care to improve the quality of stroke rehabilitation in Australia.

The Audit is comprised of two parts. The first is a survey of resources, processes and infrastructure completed by 121 stroke rehabilitation services and the second is a retrospective audit of 3,514 case notes (from 108 services). Participating rehabilitation services reported admitting 8,110 stroke patients in the previous 12 months accounting for 90% of all inpatient stroke rehabilitation admissions (total of 9,056). The median age of patients was 76 years, 56% of audited cases were male and over three-quarters (79%) were identified as having an ischaemic stroke. These demographics were reflective of previous audits.

Rehabilitation of people with a stroke is a process aimed at enabling them to reach and maintain their optimal physical, sensory, intellectual, psychological and social functional levels. Rehabilitation provides people who have had a stroke with the tools they need to attain independence and self-determination.

The Audit's findings show the vast majority of patients are not being supported to lead their best life after stroke. This is despite significant advancements in the treatment and care guidelines for stroke rehabilitation and efforts of health professionals. There continues to be systematic and process issues leading to care inconsistent with recommended Guidelines. Stroke patients are suffering poorer outcomes as a result.

No services reported meeting the ten essential care elements outlined in the National Rehabilitation Stroke Services Framework 2013. The Framework helps guide service planning, monitoring and improvement of rehabilitation stroke services to support the delivery of best practice care. This includes but is not limited to the use of evidence-based guidelines to inform clinical practice, delivery of patient care within a dedicated stroke or neuro-rehabilitation unit, involving patients in their goal setting and developing written plans, systems for the transfer of care and follow up of patients and support for carers.

There was little demonstrated improvement in compliance when compared to the previous Audit. Almost three-quarters (74%) of participating sites adhered to between four and eight of the Framework elements in 2016. In fact there was a decrease in the number of services achieving nine or more elements of the Framework.

Some of the most concerning data from this component of the Audit included:

› A decline in the use of evidence-based guidelines to inform patient therapies from 69% in 2014 to 56% in 2016. This result raises significant concerns about what clinicians are basing their practices on.

- Thirty-nine percent of services reporting the absence of a specialised interdisciplinary team and limited access to stroke specific education and development.
- Only 12 (10%) of rehabilitation services reported providing care in specific, geographically defined stroke units.
- Over two-thirds of services reporting no processes for the transfer or follow up of patients after discharge. This is despite almost two-thirds of stroke patients referred on for further rehabilitation after inpatient care.

For any service delivering stroke rehabilitation there is an expectation it can meet standards outlined in the Framework or at least improve compliance over time. The results of the Organisational Survey suggest all rehabilitation services need to refocus on how they can achieve and maintain adequate standards for delivering best practice care.

Building on the Organisational Survey results, the Clinical Audit reflects an unacceptable deterioration in the delivery of best-practice care as outlined in the Guidelines.

Patients and their carers are being discharged from in-patient rehabilitation services without the information, supports and even medications they need.

Effective stroke rehabilitation empowers the person with stroke to live their best life after stroke. However, more than one-in-five (22%) patients were being sent home without collaboratively developed plans for their ongoing care and 85% were not provided with information on intimate relationships. It is recognised recovery from stroke extends after discharge. Currently patients and their carers are being left without the resources and information they need to drive their own recovery following rehabilitation and at significant and unnecessary risk of recurrent stroke and further complications.

Audit results revealed almost half of patients were not provided with a mood assessment. In addition, of those assessed, two out of three patients who had been identified as having mood disorders – such as depression or anxiety – were not provided with a further psychological assessment or the necessary care. Mood disorders can significantly alter outcomes from rehabilitation and ultimately the quality of the lives of patients and their families, their social connectedness and their ability to return to work.

Alarmingly only half of patients received education on the cause of their stroke, recovery, hospital management and secondary prevention prior to discharge. Adding to this poor result just over half (51%) of patients were provided with stroke risk factor modification advice. Most concerning is one-in-five patients were discharged without receiving recommended blood pressure or cholesterol lowering medication. Almost half of stroke survivors will experience another stroke within 10 years and commencing medication prior to discharge is critical for long term health and secondary prevention.

Carers play a critical role providing physical, emotional, recreational and financial support after stroke. This Audit shows carers are being forgotten in the transition home, the number of carers provided with relevant training declined to 75% (84% in 2014) and an assessment of carers needs to 65% (from 82% in 2014). This mean carers are being left without the information and supports they need to help their loved one through their stroke recovery and the challenges ahead.

It is important to note there were improvements in some areas and locations. The increased practice of goal setting with patients (79% in 2010 to 89% in 2016) indicates with focused effort, investment and education improvements can be made.

In summary, this data reveals stroke rehabilitation care in Australia has stalled or regressed in key areas to the detriment of patients and health services. 2014 Audit results reported were optimistic and demonstrated that with effort there were some areas of improvement, however, over the past 24 months improvements have stagnated.

With an aging population subsequent increases in stroke incidence and advancements in stroke treatment mean more Australians are surviving stroke than ever before. Demand on the rehabilitation care system has increased.

Opportunities exist for improvements across the country through tailored strategies which can impact the quality of care provided. Effective delivery requires collaboration and prioritisation of stroke across all levels of government and within health services to improve the quality of care in line with best practice and outcomes for stroke patients.

Ongoing work and effort is required to review gaps in care, assess local barriers and enablers, develop and implement improvement plans. In addition the impact of these quality improvement plans and the care provided during inpatient rehabilitation must be monitored.

Efforts must be concentrated where they will have the greatest impact. That is empowering health professionals and providing them with the education, resources and support to improve the quality of care. This includes identifying common gaps in care, forming strategies to address these, sharing knowledge and committing to the roll out of these measures across the system. We must improve how resources are utilised and systems of care delivered to ensure the best possible outcomes for all Australians.

*Please note a review of *Clinical Guidelines for Stroke Management* is currently underway. Updated Guidelines will be released in 2017.

Recommendations

1. Greater adherence to essential elements of care outlined in the Rehabilitation Stroke Services Framework, particularly to ensure all patients with stroke are managed on one dedicated ward (geographically defined rehabilitation).
2. Greater focus on processes to ensure the psychological needs of all patients are assessed and appropriate support is provided during and after inpatient rehabilitation.
3. Further efforts to ensure all patients and their family/carers are involved in their rehabilitation. This critically includes the provision of information (including sexuality post stroke), collaborative goal setting and thorough education on stroke recovery.
4. Ensure secondary prevention advice including risk factor modification, appropriate medications and long-term compliance is provided prior to discharge.
5. Continued efforts to provide comprehensive discharge planning to all patients with stroke including providing a personalised care plan as well as specific training and support for carers.
6. Increased focus on implementation of the recommendations in evidence-based guidelines and reduction in unwarranted clinical variation by developing improved systems of care (clear policy, procedures and practices).

At a glance

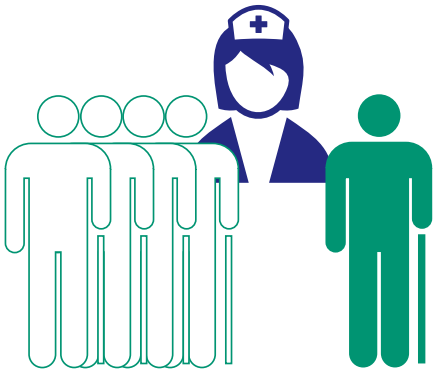
121
Rehabilitation services

9,056
Patient admissions

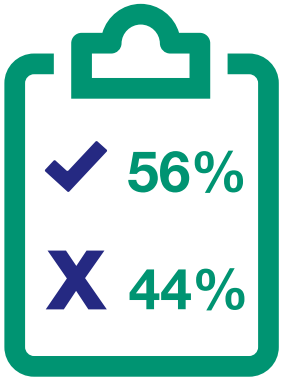
3,514
Patients audited

One-in-10 services offer a dedicated stroke rehabilitation unit

Services meeting all 10 essential elements of care = ZERO



One-in-five
patients are discharged without a care plan



Routine adherence to *Clinical Guidelines for Stroke Management* to inform care

Patients assessed for mental wellbeing

Only one-third
receive comprensive follow up

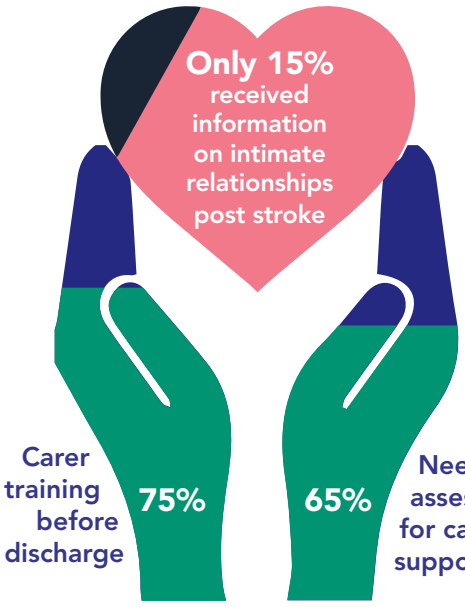


Table A: Summary of national adherence to recommended processes of care

Process of care	Eligible to receive process of care Known N	Number receiving process of care n	Adherence to process of care %
Patient assessment and management			
Patient met team to discuss management*	3,320	2,759	85
Goal setting with the patient*	3,329	2,961	89
Mood assessed during admission	3,514	1,866	53
Secondary prevention			
Patient received education about behaviour change for modifiable risk factors prior to discharge†	3,477	1,790	51
Discharged on antithrombotic if ischaemic stroke+	2,722	2,548	94
Discharged on lipid-lowering medication if ischaemic stroke†	2,756	2,130	77
Discharged on blood pressure-lowering medication+	3,383	2,651	78
Discharge planning and support for life after stroke			
Patient and/or family received information covering stroke, hospital management, secondary prevention and recovery (e.g. *My Stroke Journey* booklet)	3,514	1,769	50
Discharge care plan outlining post-discharge care in the community developed with the input from the team and the patient†	3,232	2,535	78
Received information on sexuality post stroke†	3,477	528	15
Post-discharge contact provided to stroke survivor or family†	3,477	2,270	65
Carer received training^	1,097	820	75
Post-discharge needs discussed with carer^	1,097	711	65

* Set with patient, therefore those without severe cognitive and /or communication difficulties
† Patients discharged alive
+ Eligible patients discharged without contraindications for drug
^ Included carers of stroke survivors discharged to a private residence

121

Rehabilitation services

9,056

Patient admissions

3,514

Patients audited

CHAPTER 1

Introduction

Stroke in Australia

Stroke is one of Australia's biggest killers and a leading cause of disability. There are approximately 50,000 new and recurrent strokes each year.[1] Over one-third of those admitted will transition between acute and rehabilitation services.[2] Hospitals across Australia admit just under 8,000 stroke rehabilitation episodes each year.[3] Stroke directly accounts for about 8% of hospital rehabilitation episodes.[3] The cost burden of stroke is estimated to be around $5 billion per year.[4]

Most people with stroke benefit from rehabilitation although the setting where this should occur will depend on the individual.[5]

Clinical Guidelines and the National Stroke Audit

The *Clinical Guidelines for Stroke Management 2010*[5] present evidence-based recommendations for clinical care and are approved by the National Health and Medical Research Council (NHMRC).[5] These guidelines form the basis of the National Stroke Audit determining what data is collected. This Audit is a Stroke Foundation initiative and is part of its commitment to promoting the delivery of evidence-based care for stroke.

The National Stroke Audit Program

The *National Stroke Audit – Rehabilitation Services* comprises:

› An Organisational Survey of stroke rehabilitation services across Australia. The survey assesses the resources required to deliver evidence-based stroke care such as the availability of stroke units, comprehensive assessment by the interdisciplinary team and team meetings. Survey questions specifically reflect the Stroke Rehabilitation Services Framework.[6]

› A Clinical Audit involving the retrospective review of up to 40 consecutive patients admitted to participating rehabilitation units. The Clinical Audit measures the delivery of evidence-based processes of care such as timely assessment by allied health, goal setting, care planning and discharge planning.

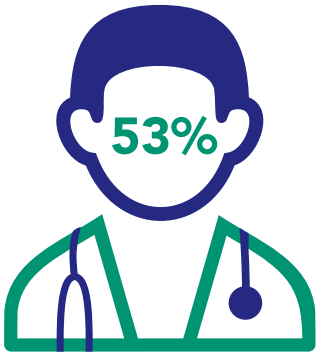
The Organisational Survey and Clinical Audit were developed in tandem and the results are presented collectively. This is because areas of excellence and areas of need identified in the Clinical Audit may be better understood in association with information about the available resources obtained from the Organisational Survey.

The National Stroke Audit – Rehabilitation Services commenced in 2008 and is conducted biennially to provide cross sectional data on clinical performance. Each alternate year the Stroke Foundation undertakes an audit of acute services for patients with stroke.

Structure of the report

This report outlines the adherence to the *Clinical Guidelines for Stroke Management 2010*[5] in services providing inpatient rehabilitation for patients with stroke. It reports resources available within these units and the quality of care provided.

Chapter 4 includes the response to the Organisational Survey. Responses are analysed at a hospital level and do not reflect patient-level practice per se. Chapter 5 provides results of the Clinical Audit which reflects individual patient care and are also grouped by service characteristics.



Patients assessed for mental wellbeing

Only one-third
receive comprensive follow up

47% missing out on assessment of mood

CHAPTER 2

Methods

Development of the questions

The clinical audit questions for the National Stroke Audit – Rehabilitation Services were reviewed in line with the *Clinical Guidelines for Stroke Management 2010*[5] and comments received from previous audit participants. The organisational survey questions were reviewed based on the *Stroke Rehabilitation Services Framework 2013*. All feedback was discussed and potential changes approved by the Stroke Foundation Clinical Council. Aside from minor alterations to question wording (expanded upon in Chapter 6), Clinical Audit questions were essentially unchanged from the previous cycle, though some changes were made to the Organisational Survey to decrease its length and have better alignment with the National Stroke Audit - Acute Services' Organisational Survey.

Recruitment

To be eligible for the National Stroke Audit – Rehabilitation Services, services were required to provide an inpatient rehabilitation service and have admitted at least one patient with stroke for rehabilitation in 2015. Eligible services were identified through previous participation in the National Stroke Audit, correspondence with clinical leads or state-based clinical network managers and via admission data available from the Australasian Rehabilitation Outcomes Centre (AROC) registry. Rehabilitation services were recruited between December 2015 and February 2016 where chief executive officers and key contacts from both public and private services were sent a letter of invitation. Sites were asked to complete and return a form to confirm participation. Sites were also requested to give permission for the Stroke Foundation to share summarised audit data with relevant state-based clinical networks or health departments to promote transparency and facilitate support for quality improvement. Each participating service nominated a site coordinator to receive all correspondence during the audit period. This coordinator was responsible for data completion and quality at their site.

Training

The Australian Stroke Data Tool (AuSDaT) was used for the first time in a National Stroke Audit – Rehabilitation Services cycle. The tool has been designed to reduce the data entry burden and time for data collection. All participants were required to complete standardised training regarding the AuSDaT and a data dictionary was made available, providing a rationale for each question as well as definitions and help notes. The Stroke Foundation project team was available for questions at all times leading up to and during the data collection period.

Data collection

All respondents from participating services completed the Organisational Survey via the AuSDaT between 1 March and 30 April 2016. The full list of questions is presented online in our report supplement at www.informme.org.au/stroke-data

Between 1 March and 31 May 2016 sites choosing to participate in the Clinical Audit component completed a retrospective case note audit of up to 40 consecutive stroke admissions to their service. For the vast majority of these episodes admission and discharge dates had to fall between 1 January and 31 December 2015. Patients with an ICD-10 code of I61.0 – I61.9 (intracerebral haemorrhage), I63.0-I63.9 (cerebral infarction), I64 (stroke not specified as haemorrhagic or infarction) and I62.9 (intracerebral haemorrhage unspecified) were eligible for inclusion. Patients presenting with transient ischaemic attack (TIA) or

subarachnoid haemorrhage were excluded from the audit due to their different pathways of care. The full list of Clinical Audit questions is presented online in our report supplement www.informme.org.au/stroke-data
After permission was granted sites with existing Australasian Rehabilitation Outcomes Centre (AROC) data had their relevant audit cases exported from AROC and securely imported into the AuSDaT using statistical linkage key methods.

Security and confidentiality were maintained by assigning services with a hospital identification code and a password to enter and access their data on the AuSDaT. Clinicians at participating services were required to login to access the AuSDaT and carry out data collection. No patient-identifying data was collected by the Stroke Foundation. However, to facilitate data checking and quality as part of verification processes, services were asked to keep a record of the cases they submitted into AuSDaT.

Each participating rehabilitation service was asked to enter between three to five patients' clinical notes twice using two different auditors. This was to identify whether a case note audited independently by two people provided the same responses to ensure data was being reliably collected. The results of this data quality procedure were not reported here but the information gathered will be used to refine future National Stroke Audit – Rehabilitation Audit cycles.

Data verification

Respondents were able to change their responses up until 31 May 2016 at which point all data was locked. Programmed logic checks of the data was then conducted and used to validate data from the Organisational Survey and the Clinical Audit. Queries were sent back to services where assumptions about true values could not be made. Where data appeared incorrect further changes were permitted. The final, cleaned data was then verified with each of the participating services prior to being analysed.

Data analysis

Staff from the Translational Public Health and Evaluation Division, Monash University independently analysed the anonymised data. Names of services not necessary for analysis were excluded from the data submitted to Monash University. Only the site identification number was provided.

The data was analysed using computer programs including Intercooled STATA 12.0 for Windows (Stata Corp, College Station, TX) and Excel (Microsoft Excel 2007). The data was exported from the web-based DET as an Excel spreadsheet and transferred into STATA.

All organisational and clinical data was aggregated to provide national estimates. Subcategories for analyses included urban/rural status and public/private status. The Northern Territory (NT) and the Australian Capital Territory (ACT) had one site each which participated in the Clinical Audit and, therefore, no state level reporting for these locations has been provided.

For medical history and impairment data only valid responses (i.e. Yes, No) were included in the analysis. 'Not documented' responses to these questions have been reported in a separate column in the results section but were excluded from the denominator. For data relating to processes of care i.e. received advice about

risk factor modification, not documented and unknown responses have been assumed to be negative (i.e. a care process not provided) and was included in the denominator.

Adherence to processes of care was generally calculated on the entire sample. When reporting adherence to care, 'Known N' refers to all eligible patients. In some instances eligibility criteria for processes of care were specified. For example, adherence to the process of care relating to the use of antithrombotics on discharge was calculated only for patients presenting with ischaemic stroke who were discharged. For processes of care where eligibility criteria were specified a note has been made in the rationale or in a table footnote. Derived variables relating to outcomes of care, such as length of stay, were calculated based on admission and discharge dates.

The median (50th percentile) and first and third quartiles (25th percentile and 75th percentile) were reported for skewed (i.e. data not normally distributed) continuous data from questions such as the number of strokes admitted each year.

Differences in proportions between 2014 and 2016 were assessed using a matched analysis of services contributing data to both the 2014 and 2016 Clinical Audits.

The Achievable Benchmark of Care (ABC™) methodology was used to create benchmarks for a sub-section of indicators based on the performance of the upper 15% of patients in the top-performing hospitals.[7]

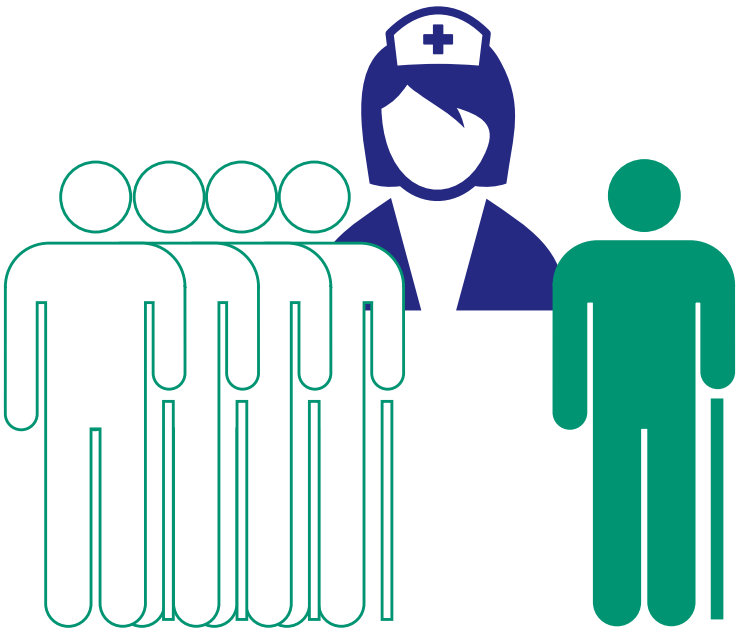
Supplementary data

In addition to this report a supplement containing details of questions from the Organisational Survey and Clinical Audit, as well as a full list of sites that participated is available. This also contains further detail regarding numerators and denominators for all Framework elements and indicators of clinical care and is available at www.informme.org.au/stroke-data

Site specific feedback

Feedback to participants is an essential component of the National Stroke Audit Program considering the evidence that audit and feedback can influence and change clinical practice.[8] Each participating rehabilitation service receives a site-specific report highlighting performance so informed decisions can be made to improve patient care and outcomes.

In addition, for the first time, all sites have access to their own results at www.informme.org.au. They will also be able to benchmark their 2016 performance against similar rehabilitation services across Australian for continuous quality improvement purposes.



One-in-five
are discharged without
a care plan

CHAPTER 3

Participating rehabilitation services

Response rates and characteristics of participating rehabilitation services

Of the 196 rehabilitation services approached, 127 public services were eligible. The number of eligible private services is unknown. However, based on previous participation or through communication with stroke clinical networks, 69 were identified.

The 127 eligible public services were targeted with active recruitment procedures including follow up phone calls and emails. In total 103 public services and 18 private services completed the Organisational Survey and among these, 93 public and 15 private services participated in the Clinical Audit. This represents 73% participation in both components of the National Stroke Audit by eligible public services.

A total of 24 eligible public services elected not to participate. Among these 12 were from New South Wales (NSW), four each were from Victoria (VIC) and WA (Western Australia), two from Queensland (QLD), and one each from Southern Australia (SA) and the Northern Territory (NT).

Table 1: Participating rehabilitation services by location and rurality

	Organisational Survey			Clinical Audit		
	Total	Public	Private	Total	Public	Private
Australia	**121**	**103**	**18**	**108**	**93**	**15**
ACT	2	2	0	1	1	0
NSW	38	34	4	34	30	4
NT	1	1	0	1	1	0
QLD	24	20	4	21	18	3
SA	7	5	2	7	5	2
TAS	4	3	1	4	3	1
VIC	32	28	4	29	26	3
WA	13	10	3	11	9	2
Rurality						
Urban	112	96	16	99	86	13
Rural	9	7	2	9	7	2

The 121 services that completed the Organisational Survey reported a total of 9,056 admissions for patients requiring inpatient stroke rehabilitation in 2015. Sites that reported 29 or less annual stroke rehabilitation admissions (N=22) accounted for 434 (5%) of all reported admissions. Rehabilitation services admitting 80 or more patients with stroke per year (N=41) admitted 5,529 (61% of all patients). The 108 services participating in the Clinical Audit accounted for a total of 8,110 admissions or 90% of the reported caseload for 2015.

Staff reported a total of 3,788 dedicated in-patient rehabilitation beds in the 121 participating services (per hospital median: 24; Q1:16, Q3: 40). South Australia (SA) reported the largest rehabilitation services, while NSW reported the smallest (Table 2). Almost half the sites (48%) reported between 30 and 79 stroke rehabilitation admissions in 2015. The number of patients with stroke admitted to each of these services in 2015 ranged from seven to 290 (median: 62; Q1:36, Q3: 101).

Rehabilitation beds are an important resource. Respondents were asked to report the number of beds on their rehabilitation ward (if applicable) and on the dedicated stroke rehabilitation unit (if present). A stroke rehabilitation unit differs from the other two types of stroke unit, acute and integrated, in that admissions usually occur within a week or so after stroke onset.

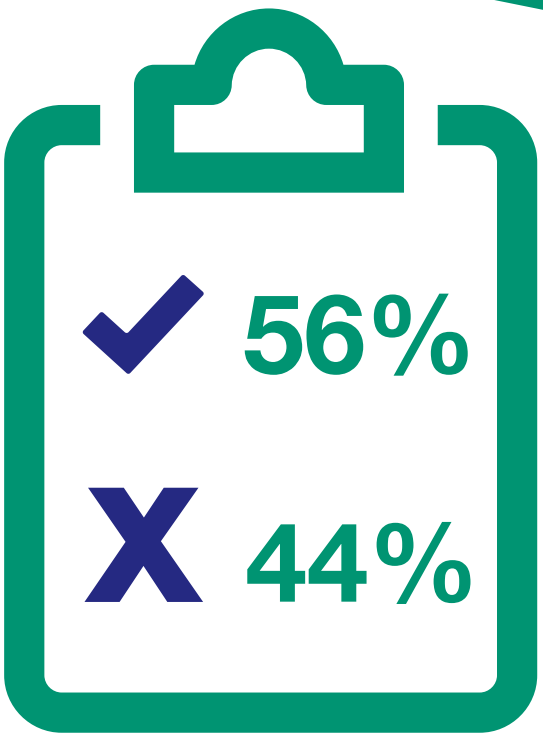
Twelve services (10%) reported having co-located stroke beds within a geographically defined unit. These 12 services admitted a total of 1,226 stroke rehabilitation patients last year (14% of all patients) with 888 admissions directly into their dedicated stroke rehabilitation unit. The size of these units ranged from 4 to 25 beds (median: 10; Q1:4, Q3:16).

Respondents were asked to describe their rehabilitation service, i.e. if a free-standing rehabilitation hospital or a rehabilitation service located with an acute hospital.

The majority of in-patient rehabilitation services were provided in either a standalone rehabilitation hospital (26%) or within a rehabilitation ward in the same building as the acute hospital (56%). On the day of the survey 723 patients with stroke were admitted to all the rehabilitation services. Among these 82 (11%) patients were cared for on a dedicated stroke rehabilitation unit.

Table 2: Participating rehabilitation services by location, rurality and setting, and number of rehabilitation beds and annual stroke admissions

	Number of beds Median (Q1 Q3)	Number of annual admissions Median (Q1 Q3)	Number of annual stroke admissions per site		
			≤29	30–79	≥80
Location					
Australia (N=121)	**24 (16, 40)**	**62 (36, 101)**	**22 (18%)**	**58 (48%)**	**41 (34%)**
ACT (N=2)	32 (28, 36)	128 (74, 181)	0	1	1
NSW (N=38)	20 (17, 35)	51 (28, 71)	10	20	8
QLD (N=24)	22 (16, 35)	69 (48, 107)	2	13	9
SA (N=7)	55 (6, 65)	79 (36, 134)	1	3	3
TAS (N=4)	22 (13, 35)	44 (41, 57)	0	4	0
VIC (N=32)	30 (20, 48)	77 (43, 116)	5	12	15
WA (N=13)	26 (12, 60)	47 (26, 101)	4	4	5
Rurality					
Urban (N=112)	25 (18, 40)	64 (40, 103)	18	54	40
Rural (N=9)	8 (6, 20)	27 (25, 55)	5	3	1
Setting					
Public (N=103)	22 (16, 35)	68 (40, 113)	18	45	40
Private (N=18)	46 (30, 65)	43 (26, 62)	5	12	1



Routine adherence to *Clinical Guidelines for Stroke Management* to inform care

CHAPTER 4

Adherence to the Framework and results of the Organisational Survey

4.1 Individual elements of the Framework

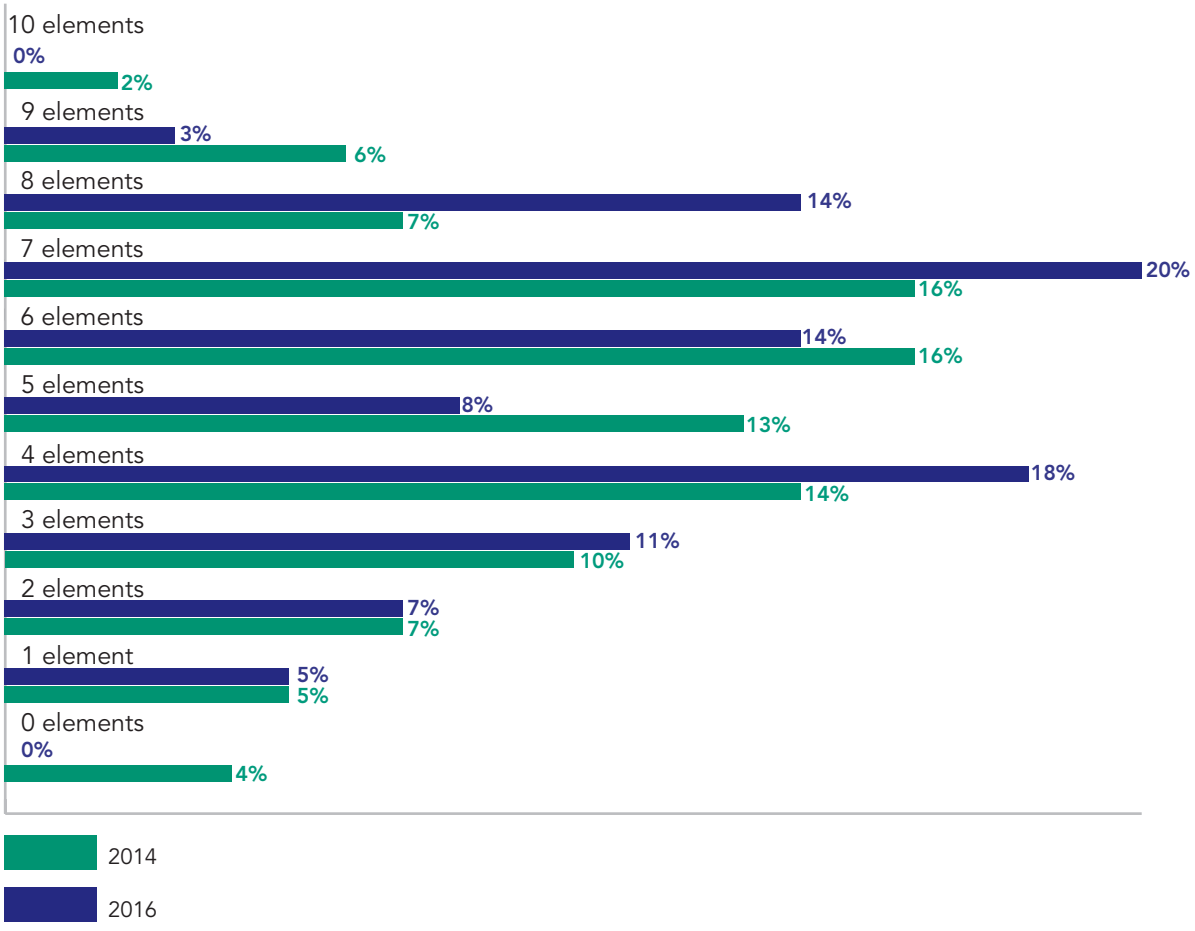
Table 3. Adherence to the individual elements of the Framework by hospital location

	Location							
Elements of the Framework	**Australia N=121 n (%)**	ACT N=2 n (%)	NSW N=38 n (%)	QLD N=24 n (%)	SA N=7 n (%)	TAS N=4 n (%)	VIC N=32 n (%)	WA N=13 n (%)
Effective links with acute stroke service providers	**80 (66%)**	2 (100%)	27 (71%)	17 (71%)	7 (100%)	1 (25%)	19 (59%)	6 (46%)
Specialised interdisciplinary stroke (or neuro-rehabilitation) team with access to staff education and professional development specific to stroke	**74 (61%)**	2 (100%)	22 (58%)	14 (58%)	5 (71%)	2 50%)	20 (63%)	8 (62%)
Co-located stroke beds within a geographically defined unit	**12 (10%)**	1 (50%)	2 (5%)	3 (13%)	1 (14%)	0 (0%)	2 (6%)	3 (23%)
Standardised and early assessment for neuro-rehabilitation	**69 (57%)**	2 (100%)	21 (55%)	15 (63%)	5 (71%)	0 (0%)	20 (63%)	5 (38%)
Written rehabilitation goal setting processes with patients	**89 (74%)**	2 (100%)	26 (68%)	20 (83%)	3 (43%)	3 (75%)	26 (81%)	8 (62%)
Routine use of evidence-based guidelines to inform evidence-based therapy for clinicians	**68 (56%)**	1 (50%)	22 (58%)	15 (63%)	4 (57%)	1 (25%)	19 (59%)	6 (46%)
Best practice and evidence-based intensity of therapy for goal related activity with patients	**62 (51%)**	1 (50%)	19 (50%)	17 (71%)	6 (86%)	1 (25%)	13 (41%)	5 (38%)
Systems for transfer of care, follow up and re-entry for patients	**35 (29%)**	1 (50%)	9 (24%)	4 (17%)	5 (71%)	0 (0%)	14 (44%)	2 (15%)
Support for the person with stroke and carer (e.g. carer training, provision of information/education, provision of care plan) to maximise community participation and long-term recovery	**61 (50%)**	1 (50%)	19 (50%)	13 (54%)	3 (43%)	4 (100%)	16 (50%)	5 (38%)
Systems that support quality improvement, i.e. regular (at least every two years) review of local audit data by the stroke team to prioritise and drive stroke care improvement	**91 (75%)**	2 100%)	25 (66%)	19 (79%)	6 (86%)	1 (25%)	27 (84%)	11 (85%)

4.2 Overall adherence to the Framework

Among rehabilitation services completing the Organisational Survey none were found to have all ten elements of the Framework. There were four services who met nine of the Framework elements, the largest proportion of services (24 services) met seven elements and the median number of elements met was 6 (Q1:4, Q3: 7). The median number of elements met increased slightly with the volume of stroke patients admitted, moving from five for small volumes to six for the larger volume services. Further detail of the findings from the Organisational Survey is provided below.

Figure 1. National adherence to the Rehabilitation Framework



4.3 Stroke rehabilitation team

4.3.1 Composition of stroke rehabilitation team

An important component of rehabilitation is a specialised interdisciplinary team of health professionals who provide a coordinated program and include individual assessment, treatment, regular reviews, discharge planning and follow up. The rehabilitation team may include many disciplines combining and coordinating the use of medical, nursing and allied health skills along with social, educational and vocational services.

Respondents were asked to describe the composition of their rehabilitation team including the specialisation of the medical leader.

Results

For 83% (101) rehabilitation services the medical leadership for stroke was formally recognised. There was little variation across states or annual admission-groupings with responsibility for management mostly falling to rehabilitation physicians (69%) or, in some cases, geriatricians (19%). As expected specialist rehabilitation physicians were less prominent outside of urban locations (22%).

Allied health staff were well represented in the make-up of specialised interdisciplinary teams across Australia with 100% of rehabilitation services reporting access to physiotherapists, occupational therapists, speech pathologists and dietitians. However, clinical psychologists (49%) and neuropsychologists (43%) were actively involved in the management of stroke patients at less than half of participating services. While even fewer provided access to recreational therapists (14 services, 12%) and diversional therapists (18 services, 15%).

4.3.2 Team communication

Regular communication among the interdisciplinary team is vital to address the various issues that may arise in a timely manner. Case conferences and team meetings facilitate coordinated communication. Respondents were asked to report the frequency of case conference meetings.

Results

Regular team meetings (case conferences) occurred in 120 (99%) rehabilitation services. Of these 88 (73%) reported meeting once per week and 32 (27%) reported meeting more frequently.

Overall 94 (78%) rehabilitation services reported having a dedicated person liaising between acute and rehabilitation services.

4.3.3 Professional development

Embedding a culture of evidence-based practice can be facilitated by providing targeted education and collaborative involvement in data collection and quality improvement. Access to regular stroke-specific education is a core component of organised stroke care. Respondents were asked to report on staff access to continuing education related to stroke management.

Results

A total of 79 (65%) rehabilitation services reported access to a program of continuing education for staff relating to stroke management. There was variability across states ranging from 50% to 100% and it appears staff in larger services were more likely to have opportunities for professional development.

Table 4: Staff development

	Annual admissions (2015)			
	Australia N=121 n (%)	**≤29 N=22 n (%)**	**30-79 N=58 n (%)**	**≥80 N=41 n (%)**
Rehabilitation services with access to a program of continuing education for staff relating to stroke management	79 (65%)	12 (55%)	35 (60%)	32 (78%)

4.4 Assessment for rehabilitation

Access to rehabilitation and the case mix of rehabilitation inpatients is dependent on the assessment for suitability and acceptance for rehabilitation. Consideration for further rehabilitation needs is undertaken in the acute setting but may involve rehabilitation team members. Respondents were asked to describe how patients were assessed for admission to the rehabilitation service.

Results

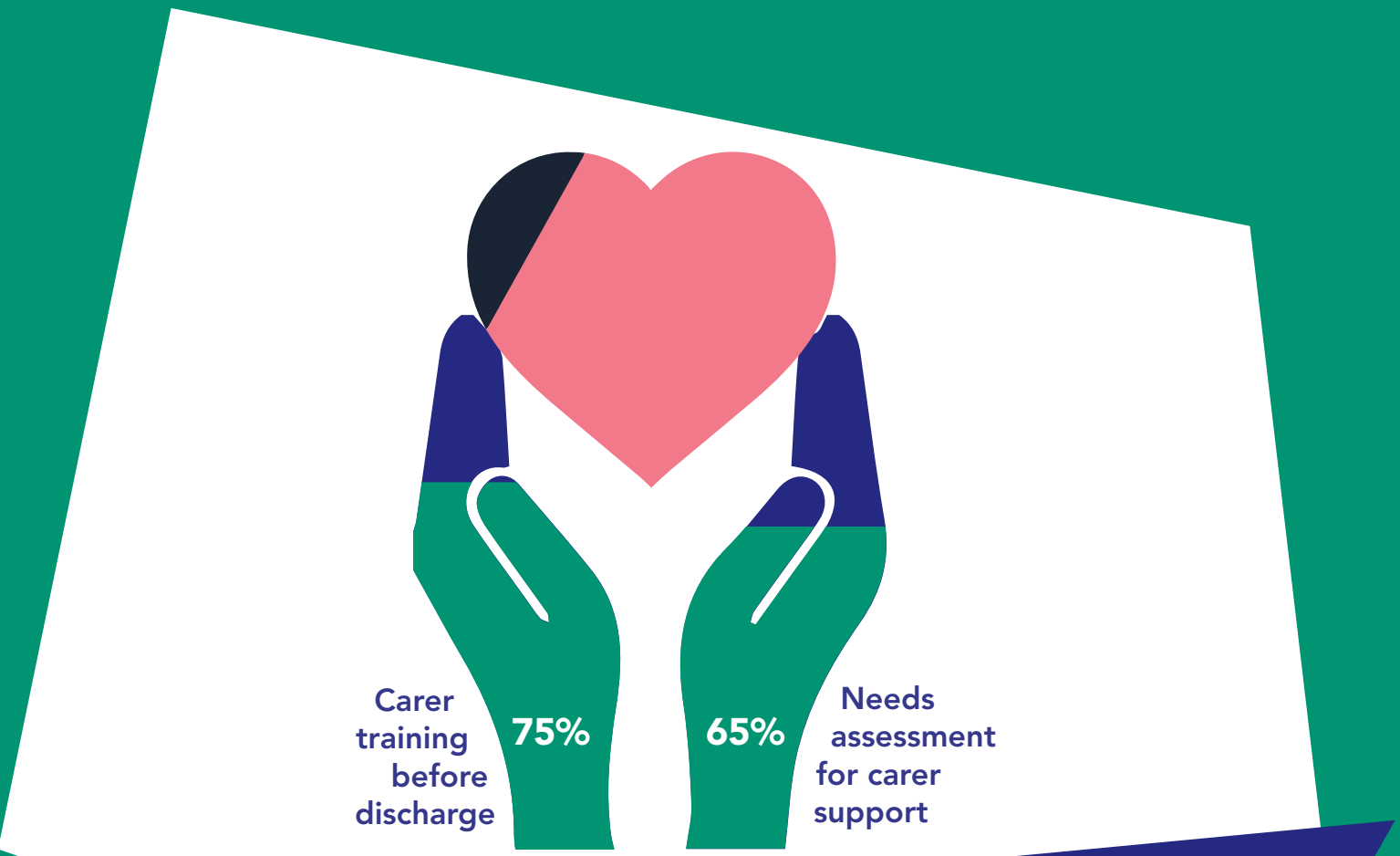
The decision on suitability and acceptance for rehabilitation was most often made by the specialist rehabilitation physicians (76%). However, respondents also indicated suitability was commonly assessed by the acute physician (65%) or in conjunction with the whole acute interdisciplinary team (64%). Overall 103 (85%) services reported using a standardised process to assess patient suitability for a rehabilitation admission. Of those sites with a standardised process this usually (69%) occurred within the first week of a patient's acute admission.

4.5 Intensity of therapy

The amount and intensity of rehabilitation provided to survivors of stroke greatly affects their outcomes. The *Clinical Guidelines for Stroke Management 2010*[5] recommend patients be provided with as much therapy as possible with a minimum of an hour active practice for physical therapy and as much therapy for dysphagia or communication difficulties as can be tolerated. Group therapy is suggested as one strategy to increase the amount of practice.

Results

At the majority of services (93%) patients with motor impairments usually undertook at least one hour of active physical therapy (physiotherapy and/or occupational therapy) per day at least five times per week. This figure remained over 90% across almost all states (with just one state reporting this to be 85%) and annual admission-groupings. The majority of services (94%) also reported providing therapy in a group setting. Again there was little variation across differing states or annual admission-groupings with each reporting a high level of adherence.



Only 15% received information on intimate relationships post stroke

CHAPTER 5

Performance against Indicators and results of the Clinical Audit

5.1 Characteristics of patients from Clinical Audit

A total of 3,514 (excluding 350 reliability cases) patient case notes were audited. The vast majority (94%) of these patients were managed in urban rehabilitation services.

Table 5: Patient demographics

Demographic	Australia (N=3,514) n (%)
Male	1,962 (56%)
Median age, years (Q1 Q3)	76 (66, 84)
Patients identifying as Aboriginal and/or Torres Strait Islander background*	73 (2%)
Non-English speaking background with requirement for interpreter	204 (6%)
Ischaemic stroke	2,788 (79%)
Intracerebral haemorrhage	656 (19%)
Undetermined stroke type	70 (2%)
Independence within 72 hours of admission to rehabilitation (mRS 0-2)†	391 (11%)

Q1 Q3: 25th percentile, 75th percentile
* % excluded not stated/inadequately described
mRS: modified Rankin Scale
† <1% missing data

5.2 Location of inpatient rehabilitation

The majority of the audited cases were managed in general rehabilitation wards. Less than one-sixth (14%) of the cases audited were treated in either a dedicated stroke rehabilitation unit or neuro-rehabilitation unit with a similar proportion managed in combined acute/rehabilitation units.

Table 6: The ward patients were treated on during in-patient rehabilitation

Location	Australia (N=3,514) n (%)
Dedicated stroke rehabilitation unit	204 (6%)
Neuro-rehabilitation unit	269 (8%)
Combined acute/rehabilitation unit	481 (14%)
General rehabilitation ward	2,560 (73%)

5.3 Patient assessment

Respondents were asked to provide the dates of assessment by members of the interdisciplinary team on each audited case. Eligibility for an assessment by allied health was determined from the medical record. Reporting of assessments by dietitians and psychologists took into account the presence of nutrition complications and mood impairment respectively.

Results

The majority of patients were assessed by most members of the interdisciplinary team at some point during their admission (Table 7). Some patients were not seen by certain allied health disciplines because the particular therapist was not employed by the service and, therefore, was not available to contribute to care. This was most common for patients with mood impairment where clinical psychology was often unavailable. In this case 31% of patients with a mood impairment were not seen by psychology as there was no one employed to provide this service.

Table 7: Multidisciplinary team assessment

	Eligible for assessment N	Received assessment n (%)
Physiotherapy	3,511	3,475 (99%)
Occupational therapy	3,504	3,482 (99%)
Speech pathology	3,022	2,799 (93%)
Social work	3,178	2,712 (85%)
Dietetics	1,105*	1,034 (94%)
Psychology	756†	280 (37%)

*Known N includes patients with nutrition complications identified on admission
†Known N includes patients with mood impairment identified on admission

5.4 Management of impairments

Auditors were asked to record the impairments documented on admission and the management of these for selected topics. Management options were based on common therapies recommended in the *Clinical Guidelines for Stroke Management 2010*.[5]

Results

The impairments found on admission varied. Most (87%) patients had difficulties with activities of daily living (ADLs), 75% were unable to walk and 69% experienced an arm deficit. The use of therapies or management strategies varied.

In total 2,931 (83%) patients were assessed for urinary incontinence within 72 hours of their admission to rehabilitation with this proportion unchanged from 2014. In 2014 941 (37% of those assessed) patients had urinary incontinence present during their inpatient admission. Comparable data was not collected in this year's National Stroke Audit although it was reported 674 (24%) of patients had identified urge incontinence and 396 (14%) had identified urinary retention.

In 2014 62% of patients who had an identified impairment received a urinary incontinence management plan. In 2016 1,228 patients had the provision of such a plan documented (35% of the entire cohort regardless of impairment).

Table 8: Management of impairments

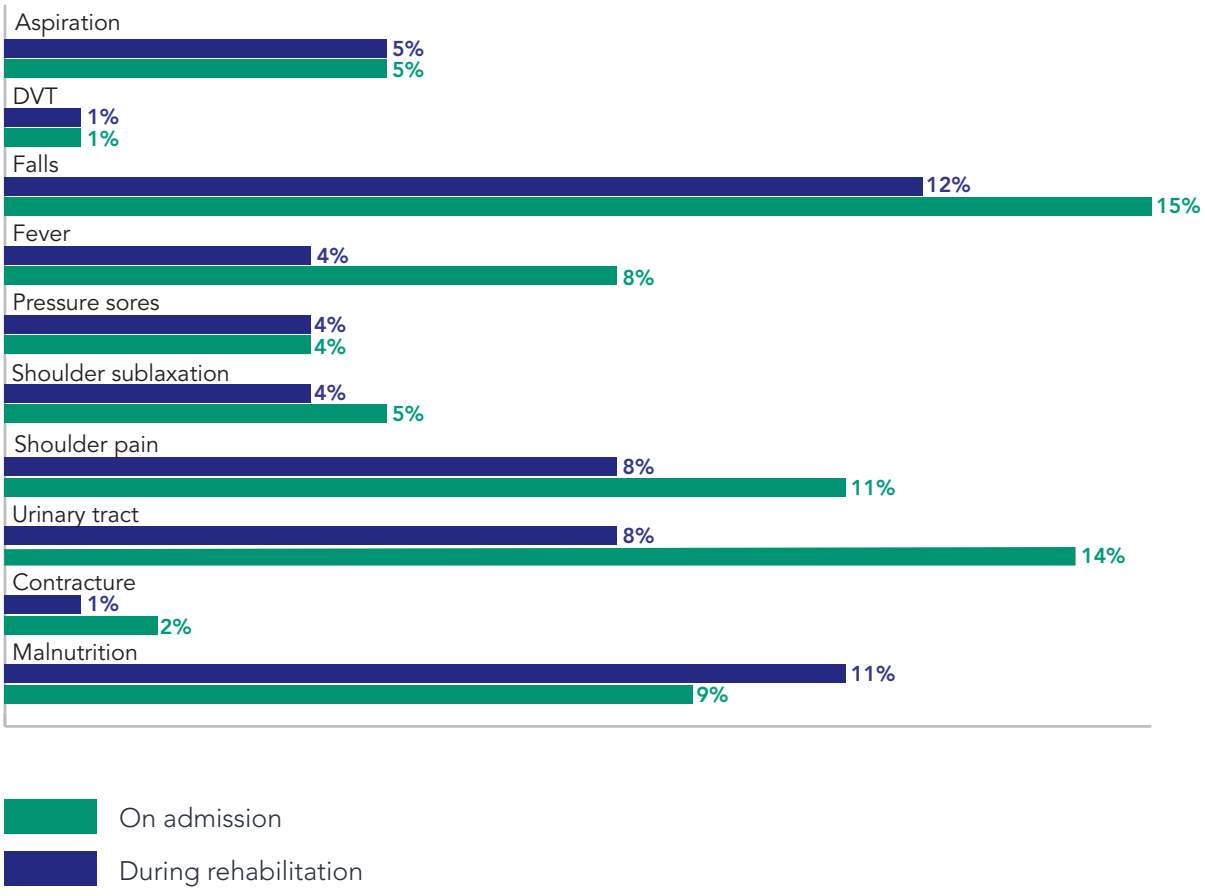
	Assessment documented N*	'Not documented' response n (%)	Impairment present n (%)*	Type of therapy/ management	Therapy provided n (%)+
Difficulty walking independently	3,511	3 (<1%)	2,617 (75%)	Tailored, repetitive practice of walking	2,380 (91%)
				Cueing of cadence	910 (35%)
				Mechanically assisted gait	359 (14%)
				Joint position biofeedback	382 (15%)
				Other therapy	1,630 (62%)
Difficulties with ADLs	3,499	15 (<1%)	3,049 (87%)	Task specific practice	2,770 (91%)
				Trained use of appropriate aids	1,889 (62%)
				Other	1,451 (48%)
Aphasia	3,396	118 (3%)	1,017 (30%)	Alternative means of communication	617 (61%)
				Phonological and semantic interventions	707 (70%)
				Constraint-induced language therapy	88 (9%)
				Supported conversation techniques	776 (76%)
				Delivery of therapy programs via computer	132 (13%)
				Group therapy	261 (26%)
				Other therapy	491 (48%)
Neglect/ inattention	3,185	329 (9%)	945 (30%)	Visual scanning with sensory stimulation	639 (68%)
				Prism adaption	17 (2%)
				Eye patching	22 (2%)
				Simple cues	807 (85%)
				Mental imagery training	158 (17%)
				Other therapy	412 (44%)
Nutrition complication	3,331	183 (5%)	1,141 (34%)	Ongoing monitoring by dietician	1,058 (93%)
				Nutritional supplementation	878 (77%)
				Alternative feeding	226 (20%)
Mood impairment	1,805†	61 (3%)	855 (47%)	Antidepressants	523 (61%)
				Psychological (e.g. cognitive-behavioural) interventions	334 (39%)
				Other therapy	320 (37%)
Upper limb difficulty	3,427	87 (2%)	2,362 (69%)	Constraint-induced movement therapy (in selected people)	210 (9%)
				Repetitive task-specific training	1,960 (83%)
				Mechanically assisted training	307 (13%)
				Other therapy	1,558 (66%)

*Known N includes all patients with assessment recorded (excludes not documented responses)
† Known N includes only those who had their mood assessed
+N (denominator) is all patients with impairment present

5.5 Complications during inpatient admission

Figure 2 depicts the proportion of patients with complications present on admission for inpatient rehabilitation and the proportion of those who developed complications during the rehabilitation admission. Notably 528 (15%) of the audited patients had a fall and 475 (14%) developed a urinary tract infection during their rehabilitation admission.

Figure 2. Complications on admission and during rehabilitation



5.6 Communication with patients

Communication with the patient is an integral component of stroke rehabilitation. It is important the patient is provided with the opportunity to discuss their desired goals for rehabilitation with the multidisciplinary team (MDT). Goal setting performed with the team will ensure the goals will be relevant to the patient and will also permit the team to evaluate their progress throughout the admission.[5]

Respondents were asked to describe how goal setting was performed and to record the usual practice of goal setting as described in the patient's medical record. Respondents were also asked to report the numbers of patients meeting with the team to discuss their management and undertake goal setting.

Results

Almost all services (88%) had a formal process in place for developing and documenting goals with patients. The processes used for establishing goals are outlined below. The most common practice for goal setting was an interview with the patient by individual disciplines followed by a review at the MDT meeting (59%).

In total 2,759 (83%) patients, without severe cognitive and/or communication difficulties, had the opportunity to meet and discuss their management with the MDT. For 194 (26%) patients with severe cognitive and/or communication difficulties, family members met with the team in lieu of the patient, to discuss their management. Almost 16% of patients had no documented evidence of discussing their management with the team.

Overall 2,961 (89%) patients without cognitive or severe communication difficulties were central to the process of setting their goals with input from MDT. For 185 (33%) patients with severe cognitive or communication difficulties the patient's goals were set by their family/carer with input from the MDT. One in 10 patients (without severe cognitive or communication difficulties) did not have the opportunity to discuss goal setting with the MDT.

Table 9: Patient involvement in goal setting processes and methods that goals are usually established (combined Clinical Audit and Organisational Survey data)

Clinical Audit	Australia n (%)
Patients met with team to discuss management*	2,759 (83%)
Goals set with input from patients*	2,961 (89%)
Organisational Survey	**Australia (N=121) n (%)**
Patient goals usually established	
Patient interviewed by each discipline only	10 (8%)
Goals discussed and reviewed at team meeting after patient meets with each discipline separately	72 (59%)
Patient and full multidisciplinary team set goals together	25 (21%)
Ad hoc (no consistent processes used)	6 (5%)

*Patients without cognitive/communication difficulties

5.7 Secondary prevention

There are clear recommendations in the *Clinical Guidelines for Stroke Management 2010*[5] for the use of blood pressure–lowering, cholesterol-lowering and antiplatelet or anticoagulation pharmacotherapy to prevent further vascular events.[5] All patients should be assessed for and educated on lifestyle risk factor modification.[5]

Results

The table below summarises the secondary prevention measures provided on discharge. At discharge 94% of patients with an ischaemic stroke were prescribed antithrombotics; 78% were prescribed anti-hypertensives and just over half (51%) received advice about risk factor modification. Of those patients not prescribed antithrombotics on discharge, 34 (1%) were contraindicated. Of those not prescribed antihypertensives, 94 (3%) were contraindicated for the treatment.

Table 10: Secondary prevention measures on discharge

Secondary prevention measure	Australia n (%)
On antithrombotics on discharge*† (N=2,722)	2,548 (94%)
On antihypertensives on discharge† (N=3,383)	2,651 (78%)
Received advice about risk factor modification on discharge† (N=3,477)	1,790 (51%)
On lipid-lowering treatment at discharge*† (N=2,756)	2,130 (77%)

*Ischaemic strokes only

†Patients discharged alive, and with no contraindication

5.8 Preparation for discharge

A range of physical, psychosocial, social and financial consequences can create challenges for the stroke survivor's adjustment to life in the community following discharge. 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. Carers often report difficulties coping in the community due to inadequate training and lack of support.[9,10]

Results

Of the 121 rehabilitation services that completed the Organisational Survey, 96% stated patient education was routinely provided at their hospital. Just over half (54%) of the services surveyed reported they provided a discharge care plan though the Clinical Audit revealed almost four-in-five (78%) patients received a care plan prior to discharge. Just over half of the services surveyed reported having protocols guiding discharge planning (52%) while three-quarters offered a contact person for post-discharge programs (75%).

Tailored information regarding stroke rehabilitation and recovery was provided to only 1,769 (50%) of stroke survivors. This is much lower than reported in the Organisational Survey. Adherence to the other discharge planning processes are outlined below.

Table 11: Use of discharge-planning processes

Discharge planning process	Australia n (%)
Discharge care plan provided (N=3,232)*	2,535 (78%)
GP sent discharge summary (N=3,298)*	3,115 (94%)
Contact provided for post-discharge programs (N=3,477) *†	2,270 (65%)

*Known N is limited to eligible patients alive at discharge
†Contact provided to patient or family

5.9 Life after stroke for patient and family

The *Clinical Guidelines for Stroke Management 2010*[5] covers a range of topics including return to driving, return to work, leisure activities, sexuality and accessing support.[5]

The information provided to stroke survivors and carers regarding preparation for life in the community varied. Two-in-five patients were provided with information about self-management programs but only 15% received information on sexuality. Overall 75% of carers were provided training, however, only 44% were offered information about peer support.

Table 12: Preparation of stroke survivor for life in the community

Discharge planning process	Australia n (%)
Received information on sexuality* (N=3,477)	528 (15%)
Provided information about self-management programs if no cognitive issues* (N=3,477)	1,410 (41%)
Offered information about peer support* (N=3,477)	1,226 (35%)
Offered assistance to return to work if wanted to return to work† (N=342)	194 (57%)
Offered some assistance to return to driving if wanted to return to driving† (N=792)	696 (88%)

*Known N is limited to patients alive at discharge
†For those patients discharged to private residence

Table 13: Preparation of carer for life in the community

	Australia n (%)
Number of reported carers*	1,473
Carers provided training† (N=1,097)	820 (75%)
Carers identified and discussed post-discharge needs† (N=1,097)	711 (65%)
Carers offered information about peer support† (N=1,097)	488 (44%)

*Total cohort
† Known N is limited to carers of stroke survivors that were discharged to private residence

5.10 Patient outcomes

Outcome measures allow health professionals to evaluate the effectiveness of their rehabilitation therapies. Respondents were asked to document the outcome measures used at their hospital and provide the patient outcomes of the audited cases in relation to discharge destination, length of stay and functional ability at the time of inpatient discharge.

5.10.1 Mortality, length of stay and functional outcomes

Of the 3,514 patients audited, 37 (1%) people died while in hospital. The median length of stay for those people who died was 21 days (Q1:10, Q3: 29).

The median length of stay for the 3,477 patients discharged from hospital was 21 days (Q1:12, Q3: 37). The median Functional Independence Measure (FIM) score on discharge was 105 (Q1:80, Q3:116).

The FIM efficiency for all patients was 0.75 per day. FIM efficiency is defined as the mean change in FIM score from the beginning to the end of rehabilitation divided by the mean length of stay. The higher the value the greater the level of functional improvement per day. This is similar to FIM efficiency reported by AROC (0.8 per day, AROC data are case-mix adjusted by AN-SNAP class).[3]

Table 14: Distribution of FIM scores on admission and discharge

	Location		Rurality				Setting			
	Australia		Urban		Rural		Public		Private	
FIM range	Admission %	Discharge %	Adm %	Disch %	Adm %	Disch %	Adm %	Disch %	Adm %	Disch %
18–60	35	16	35	16	28	16	36	16	25	12
61–78	20	9	20	10	19	7	21	10	19	8
79–99	27	19	27	19	31	15	26	19	31	18
100–126	18	56	18	55	22	62	17	55	25	62
Median (Q1 Q3) change FIM	696 (88%)		20 (8,33)		17 (7,29)		20 (8,33)		18 (9,27)	

*Known N is limited to patients alive at discharge
†For those patients discharged to private residence

5.10.2 Discharge destination

The discharge destinations of the audited patient cases are outlined below. Of the 2,372 stroke survivors discharged home 1,330 (56%) had formal supports on discharge. For 1,338 (59%) patients the level of support on discharge to home was different from prior to the stroke having occurred.

Table 15: Discharge destination

Discharge destination	Australia (N=3,477) n (%)
An(other) acute hospital	287 (8%)
Residential aged care service*	422 (12%)
Statistical discharge†	84 (2%)
Left against medical advice/discharged at own risk	35 (1%)
Discharged to usual residence (with or without support)	2,268 (65%)
Further inpatient rehabilitation	66 (2%)
Transitional care service	211 (6%)
Other	104 (3%)

* Includes high and low level supported accommodation
† Statistical discharge means the patient was re-coded and was no longer participating in rehabilitation at the site.

5.11 Access to community rehabilitation

Rehabilitation often needs to continue after discharge from an in-patient setting and can be undertaken in various settings depending on availability.[5] A Cochrane systematic review provided evidence that community rehabilitation in the first year has a small but worthwhile effect although there is limited evidence investigating long-term therapy more than one year after stroke.[11,12] Community-based allied health practitioners monitor the need for and encourage actual participation in community and exercise activities.[5]

Based on 121 responses to the Organisational Survey all participating services had access to at least one form of rehabilitation service in the community.

The table below outlines information on patients who were referred for community rehabilitation regardless of their discharge destination. Of the 3,514 patients audited 2,216 (63%) were referred for further rehabilitation in the community.

Table 16: Patients referred for community rehabilitation

	Australia (N=3,514) n (%)
Referred for further rehabilitation	2,216 (63%)
Not known if referral made for further rehabilitation	47 (1%)
Inpatient rehabilitation*	356 (16%)
Outpatient rehabilitation*	711 (32%)
Home-based community rehabilitation*	640 (29%)
Day hospital-based community rehabilitation*	225 (10%)
Early Supported Discharged service*	86 (4%)
Other*	197 (9%)

*If referred for further rehabilitation

5.12 Comparing performance against clinical indicators

The following table presents adherence to select clinical recommendations with results split by hospital location (i.e. state) and annual stroke rehabilitation admissions (2015).

The national benchmarks included below are based on a modified version of the Achievable Benchmark of Care (ABC™) methodology (refer to methods section).

Table 17: Adherence to key indicators by hospital location and stroke admission volume

	Location							Annual admissions (2015)			National benchmark **
	AUST n (%)	NSW n (%)	QLD n (%)	SA n (%)	TAS n (%)	VIC n (%)	WA n (%)	≤29 n (%)	30-79 n (%)	≥80 n (%)	
Patient-centered care											
% Goals set with input from the team and patient* (N=3,329)	**2,961 (89%)**	819 (87%)	658 (93%)	190 (85%)	159 (100%)	798 (90%)	268 (81%)	312 (95%)	1,556 (88%)	1,093 (89%)	**98%**
% Patient's mood assessed during admission (N=3,514)	**1,866 (53%)**	473 (47%)	410 (56%)	171 (74%)	120 (75%)	525 (56%)	154 (43%)	169 (50%)	892 (48%)	805 (61%)	**91%**
Discharge planning											
% Evidence that care plan was developed with the team and patient (or family alone if patient has severe or cognitive impairments) † (N=3,232)	**2,535 (78%)**	738 (77%)	511 (77%)	201 (91%)	135 (96%)	613 (73%)	271 (81%)	252 (82%)	1,354 (79%)	929 (77%)	**84%**
% Patient and/or family received information covering stroke, hospital management, secondary prevention and recovery (e.g. My Stroke Journey booklet) (N=3,514)	**1,769 (50%)**	481 (48%)	405 (55%)	115 (50%)	119 (74%)	434 (46%)	191 (53%)	191 (57%)	930 (50%)	648 (49%)	**90%**
Carers provided training+ (N=1,097)	**820 (75%)**	275 (75%)	169 (82%)	37 (73%)	38 (88%)	232 (74%)	64 (65%)	81 (81%)	400 (68%)	339 (83%)	**95%**
Secondary prevention											
Received advice about risk factor modification on discharge† (N=3,477)	**1,790 (51%)**	477 (48%)	415 (57%)	155 (68%)	112 (70%)	412 (44%)	201 (58%)	159 (47%)	918 (50%)	713 (55%)	**90%**
On antihypertensives on discharge^ (N=3,383)	**2,651 (78%)**	736 (75%)	563 (80%)	195 (88%)	122 (79%)	716 (77%)	262 (80%)	251 (76%)	1,383 (77%)	1,017 (81%)	**91%**

* Set with patient, therefore those without severe cognitive and /or communication difficulties
† Patients discharged alive
+ Included carers of stroke survivors discharged to a private residence
^ Eligible patients only, without contraindications for drug
** The national benchmarks are based on a modified version of the Achievable Benchmark of Care (ABC™) methodology (for further information, please refer to Chapter 2: Methods)

The following table presents adherence to selected recommendations with results categorised by where the patient in question was treated.

Table 18: Adherence to key indicators for dedicated stroke rehabilitation and general rehabilitation services

	Dedicated stroke rehabilitation unit (N=204) n (%)	Neuro-rehabilitation unit (N=269) n (%)	Combined acute/ rehabilitation unit (N=481) n (%)	General/mixed rehabilitation ward (N=2560) n (%)
Patient-centered care				
% Goals set with input from the team and patient*	192 (96%)	240 (97%)	404 (90%)	2,125 (87%)
% Patient's mood assessed during admission	134 (66%)	184 (68%)	221 (46%)	1,327 (52%)
Discharge planning				
% Evidence that care plan was developed with the team and patient (or family alone if patient has severe or cognitive impairments) †	139 (72%)	170 (69%)	302 (68%)	1,924 (82%)
% Patient and/or family received information covering stroke, hospital management, secondary prevention and recovery (e.g. My Stroke Journey booklet)	118 (58%)	126 (47%)	237 (49%)	1,288 (50%)
Carers received relevant training +	39 (81%)	93 (91%)	85 (75%)	603 (72%)
Secondary prevention				
Patient received education about behaviour change for modifiable risk factors prior to discharge †	123 (61%)	145 (55%)	286 (61%)	1,236 (49%)
Discharged on blood pressure–lowering medication and not contraindicated ^	175 (90%)	194 (77%)	360 (78%)	1,922 (78%)

* Set with patient, therefore those without severe cognitive and /or communication difficulties
† Patients discharged alive
+ Included carers of stroke survivors discharged to a private residence
^ Eligible patients only, without contraindications for drug

5.13 Changes over time

Examining changes in adherence to select recommendations over time provides a way to assess whether priorities identified in 2008 and *2010 Clinical Guidelines*[5] are being translated into practice. Teams providing care to patients with stroke should ensure appropriate discharge planning occurs for all of them.

The table below presents a matched analysis of services contributing data in both the 2014 and 2016 National Stroke Audit as a robust assessment of recent progress in adherence to select recommendations. While the audit questions relating to the recommendations may have varied over time, and this may account for some variance, the intentions were similar.

Table 19: Progress against key indicators over time (selected services)

	Matched hospital analysis* n (%)	
Recommendation	**2014 (84 hospitals 2,604 cases)**	**2016 (84 hospitals 2,757 cases)**
Patient-centered care		
% Goals set with input from the team and patient†	2,130 (86%)	2,348 (90%)
% Patient's mood assessed during admission	1,009 (39%)	1,472 (53%)
Discharge planning		
% Evidence that care plan was developed with the team and patient (or family alone if patient has severe or cognitive impairments) +^	1,923 (83%)	2,002 (79%)
% Patient and/or family received information covering stroke, hospital management, secondary prevention and recovery (e.g. My Stroke Journey booklet)^	1,876 (72%)	1,460 (53%)
% Carer received relevant training#^	751 (83%)	638 (75%)
Secondary prevention		
% Patient received education about behaviour change for modifiable risk factors prior to discharge+^	1,012 (41%)	1,428 (52%)
% Discharged on blood pressure–lowering medication and not contraindicated+	2,035 (82%)	2,127 (80%)

*Matched Analysies – includes data from hospitals contributing clinical data from both 2014 and 2016

For patients without severe cognitive/communication difficulties

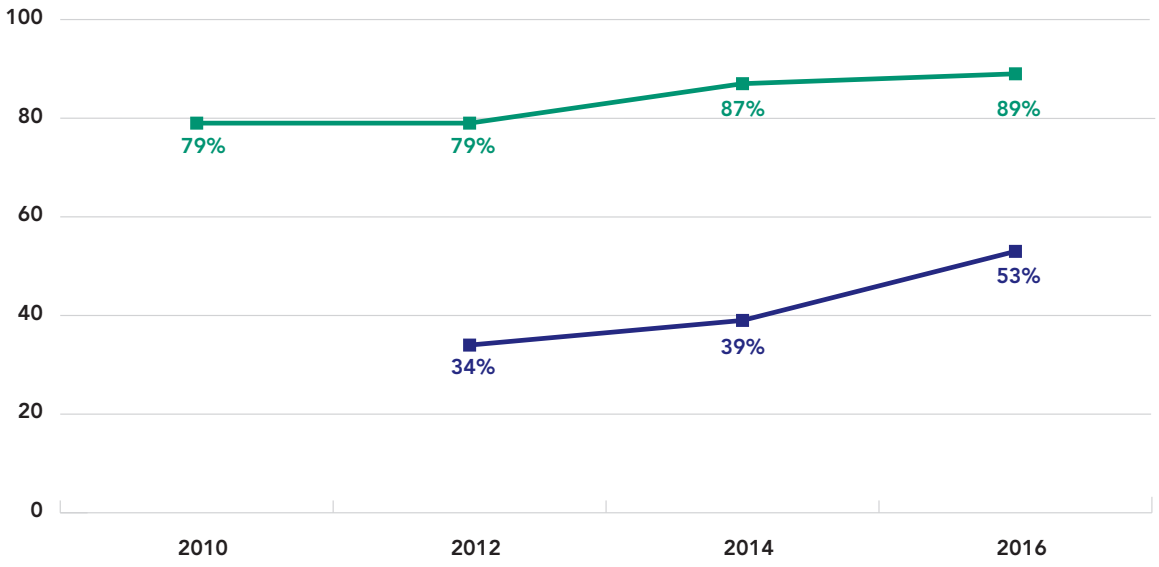
+ For those alive at discharge

#Eligible patients included those who were discharged to a private residence

^ Questions have been reworded and response options have changed over time (i.e inclusion not documented or unknown). Therefore, care must be taken when comparing % across time periods as data is not directly comparable

The following graphs depict changes in national adherence to select recommendations in each audit year since 2010. Data collected in this year's Clinical Audit can be compared to the achievable benchmarks of care for 2016 which are included below. It is important to note, due to changes to the National Stroke Audit dataset in this year's cycle some of these indicators may not be directly comparable. However, the evidence of gaps in care across Australia remain and we will be able to more confidently track changes in adherence in future audits.

Figure 3. National progress against key indicators of care – patient-centred care (2010-2016)

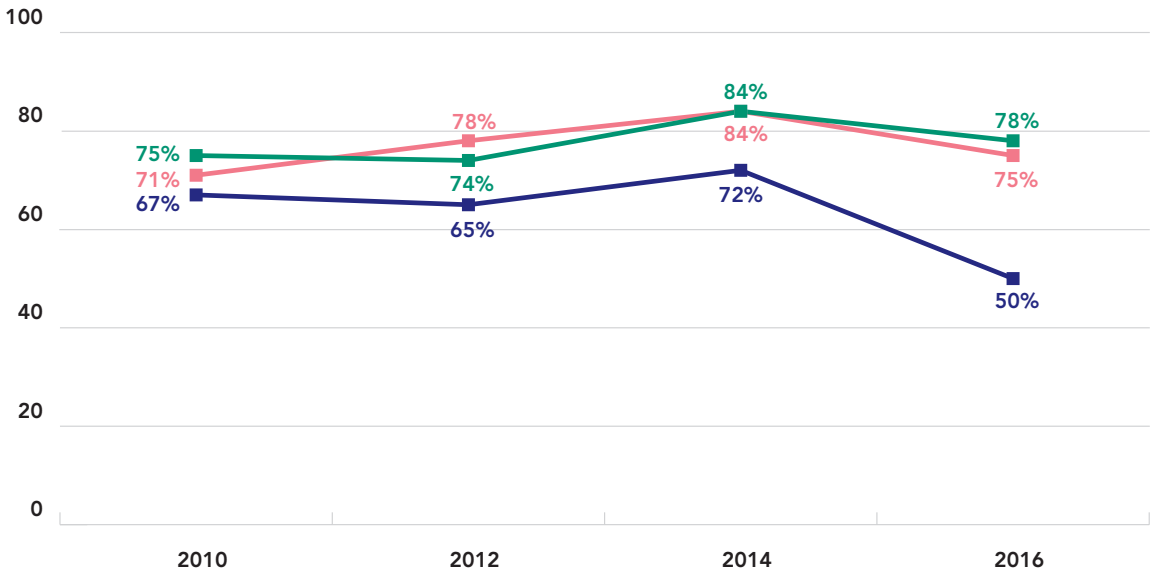


Goals set with input from the team and patient

Patient's mood assessed during admission

Achieveable benchmark (2016)
Goal setting 84%
Mood assessment 90%

Figure 4. National progress against key indicators of care - discharge planning (2010-2016)



Evidence that care plan was developed with the team and patient (or family alone if patient has severe or cognitive impairments)

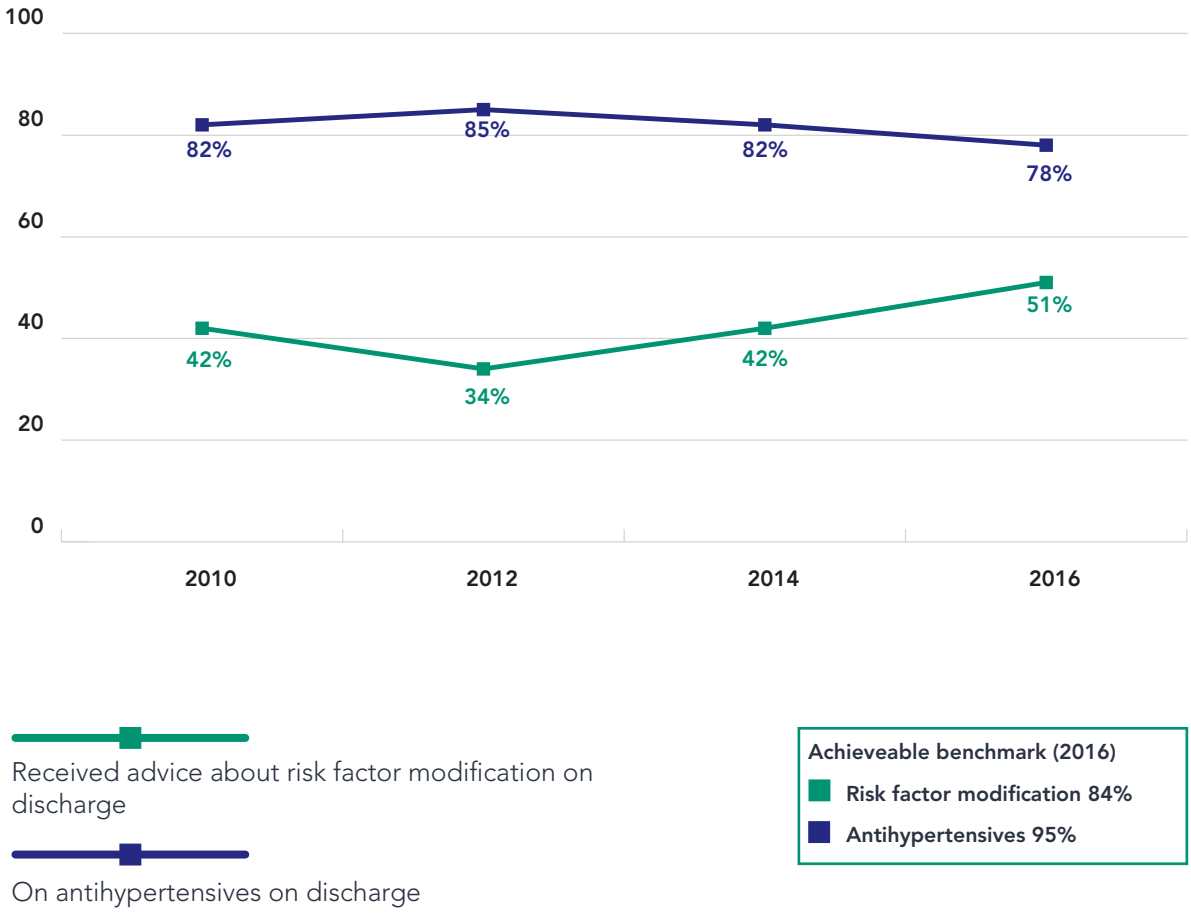
Patient and/or family received information covering stroke, hospital management, secondary prevention and recovery (e.g. My Stroke Journey booklet)^

Carer received relevant training

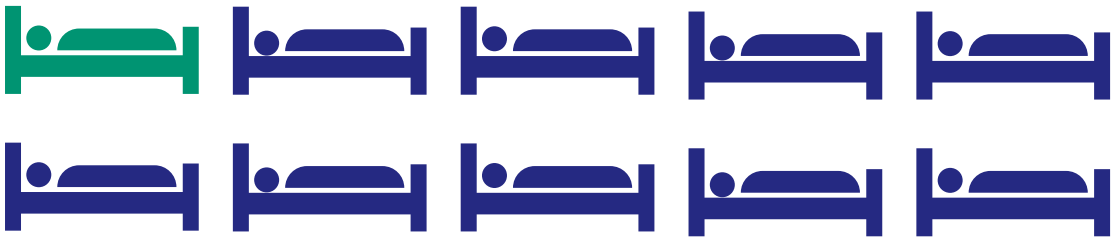
Achieveable benchmark (2016)

- **Discharge care plan 84%**
- **Patient information: 90%**
- **Carer training: 95%**

Figure 5. National progress against key indicators of care - secondary prevention (2010-2016)



One-in-10 services offer a dedicated stroke rehabilitation unit



Services meeting all 10 essential elements of care = ZERO

CHAPTER 6

Discussions and recommendations

The National Stroke Audit Rehabilitation Services Report 2016 provides the largest snapshot to date of current inpatient rehabilitation services for stroke in Australia. Importantly, the results are presented according to the *National Rehabilitation Stroke Services Framework 2013* and progress since the last National Stroke Audit is able to be described. To complement this data, a comprehensive description of clinical care that is aligned with the recommendations stated in the *Clinical Guidelines for Stroke Management 2010*[5] is provided.

Rehabilitation services are encouraged to assess their stroke services' performance by comparing themselves to national, state and annual admission-specific averages presented. We hope that the information provided in this report may help to guide areas for quality improvement activity and improve patient outcomes.

6.1 Discussion

Essential elements of rehabilitation services

The *National Rehabilitation Stroke Services Framework* provides the ability to map the essential elements of high-quality stroke rehabilitation. All stroke rehabilitation services should be able to demonstrate significant levels of compliance with the elements outlined.

Compared with the 2014 National Stroke Audit there has been a 9% increase in the number of stroke rehabilitation services participating in the Organisational Survey. It is pleasing to note more services are willing to participate in such quality improvement processes reflecting a desire to meet required standards. For any service that identifies as a stroke rehabilitation unit there must be an expectation it can meet most of the standards outlined in the Framework and improve compliance over the medium term at the very least. This year's Organisational Survey shows progress in compliance with the elements has been broadly static.

Almost three-quarters (74%) of participating sites adhered to between four and eight of the Framework elements in 2016, a similar figure was reported in 2014 (66%). However, there has been a decrease in the number of services achieving more than eight elements of the Framework.

Furthermore the Organisational Survey highlighted considerable variation across Australia in adherence to several elements of the Framework. For example, the proportion of services reporting that written rehabilitation goals are developed with involvement from their patients ranged from 83% in QLD and 81% in VIC to just 43% in SA. In TAS (25%) and WA (46%) far too few services reported the presence of effective links with acute stroke service providers but results were more promising in NSW (71%), QLD (71%) and in particular SA (100%). Similarly SA led the way in providing best practice and evidence-based intensity of therapy for goal related activity with patients (86%) but VIC (41%), WA (38%) and TAS (25%) lag behind. SA (71%) also boasts the highest proportion of sites reporting systems in place for transfer of care, follow up and re-entry for patients. The results are less promising for QLD (17%), WA (15%) or TAS (0%).

There are clear pockets of excellence in some areas; the proportion of services in TAS providing routine support for carers rose from 25% in 2014 to 100% in 2016. Equally both VIC and WA showed improvement in implanting systems to drive quality improvement with 84% and 85% of sites adhering to this element respectively (both had reported just 50% in 2014). However, the variation in adherence to crucial elements of care between services and

states is unacceptable for patients requiring stroke rehabilitation. The Organisational Survey highlights despite improvements in certain elements, there remains a lack of processes to ensure care is given consistently across Australia.

Ideally a patient-centred unit would have well-established systems in place for the transfer of care, follow up and re-entry into hospital for stroke rehabilitation patients as required. As in the last audit cycle compliance with this integral Framework element is low with more than two-thirds of services reporting to the absence of such processes even though almost two-thirds of patients with stroke were referred for further rehabilitation after inpatient care. Patients often report feeling abandoned after a stroke and further efforts to provide more flexible models of care including routine review and re-entry to inpatient rehabilitation are needed.

The results of the Organisational Survey suggest that all rehabilitation services need to refocus on how they can achieve and maintain adequate standards for delivering best practice care to patients with stroke and their carers.

Professional development and use of evidence-based guidelines

The Framework highlights the need for specialised interdisciplinary stroke teams to access staff education and stroke-specific professional development to maintain and update their skills and knowledge. Unfortunately, 39% of rehabilitation services reported the absence of a specialised interdisciplinary team, and only limited access to ongoing education and professional development.

Use of evidence-based guidelines to inform patient therapies should be routine in clinical practice. However, compliance with this Framework element has dropped from 69% in 2014 to 56% in 2016. The fact that just over half of stroke rehabilitation services in Australia are using evidence-based guidelines to inform evidence-based therapy raises significant concerns and must be focused on as a crucial area for improvement. The current update to the Clinical Guidelines for Stroke Management is due for release in mid-2017 to provide a current summary of new and existing evidence across the stroke pathway.

Specialised stroke rehabilitation units

With the majority of services failing to achieve compliance with more than six elements of the Framework, certain elements must be prioritised as essential, giving services a clear focus for quality improvement. Only 12 (10%) stroke rehabilitation services provided care in a specific geographically defined unit within the service for stroke care. The aim to improve this number should be a priority for Australia. Inability to deliver co-located stroke beds suggests either a lack of dedication by hospital administrators to deliver evidence-based care or inadequate information provided to these administrators by those clinicians responsible to do so

Of the 723 patients with stroke who were admitted to all participating rehabilitation services on the day of the Organisational Survey, just over one-in-ten (11%) were cared for on a dedicated stroke rehabilitation unit. All rehabilitation services should, as a minimum, manage patients with stroke on the one ward as this encourages staff specialisation and expertise. Large centres who have multiple wards in particular must coordinate to ensure all patients are located on the one ward.

In an initial analysis (see Table 18), when compared with those treated on a general or mixed rehabilitation unit, patients admitted to a dedicated stroke rehabilitation unit appeared to receive a standard of care more in line with the evidence-based recommendations outlined in the Guidelines. Dedicated stroke rehabilitation units

outperformed general or mixed rehabilitation units in six out of seven key indicators of care. However, the results were less clear when comparing dedicated stroke rehabilitation units to neuro-rehabilitation units with those patients treated in the latter more likely to be involved in goal-setting and receive a mood assessment while carers were more likely to receive relevant training.

Further work is required to understand if services which are reporting to provide specialist stroke rehabilitation care on or within one ward have better adherence to the recommended processes of care as measured in the Clinical Audit. In the Stroke Unit Trialists' Collaboration review there is a subgroup analysis specific to stroke dedicated units which reported benefit regarding reduced mortality but no difference in the combined outcome of death and disability. However this is based on three trials that are over 30 years old and may not reflect current differences between dedicated stroke rehabilitation units and general rehabilitation units.

Goal setting

Collaborative development and working toward patient centred goals remains a cornerstone of good rehabilitation practice. Goal setting involving the patient remains a strength of most rehabilitation services with almost 90% of all patients having their goals documented. Rehabilitation teams also continue to involve the patient and family in such management discussions (83%) although, as with goal setting, there is still room for improvement.

Patient mood

Mood is frequently affected following a stroke. Depression after stroke is the most common mood disturbance with a meta-analysis of 51 observational studies finding just under one-third of patients experience depression. Our findings highlight only 53% of patients with stroke were assessed for a mood impairment during their inpatient rehabilitation admission (although this is an improvement compared to 2014's audit where only 39% of patients were assessed).

There is significant room for improvement in this area especially considering almost one-in-two patients had identified mood impairments when assessed (47%). Once again there is considerable variation across states with SA (74%) and TAS (75%) leading the way. Services which admitted larger number of stroke rehabilitation patients (≥80 in 2015) appear to be assessing for mood impairments more frequently (61%) which may be due to increased access to the relevant allied health staff. There should and can be more focus on mood assessment within stroke rehabilitation services and poor performance remains a consistent pattern. Equally important is the need for subsequent management once an impairment has been identified. The Clinical Audit highlighted just over one-in-ten patients with an identified impairment (11%) received no relevant therapy such as antidepressants or cognitive behavioural intervention.

Only 37% of patients with an identified mood impairment were assessed by a psychologist. It is likely this low figure is linked to staffing levels at stroke rehabilitation services, with less than half (49%) reporting a clinical psychologist is actively involved in the rehabilitation management of patients with stroke and even fewer (43%) reporting the presence of a neuropsychologist.

Complications on admission and during inpatient stay

Auditors were asked to record complications present on a patient's admission and those that developed during their inpatient stay. Continuing a familiar pattern across previous audit cycles there was a high-level of preventable complications such as falls (10% on admission; 14% during admission) and urinary tract infections (8% on admission; 14% during admission). Despite being highlighted previously, the proportion of patients experiencing these complications has not changed and both areas warrant greater focus and improvement.

There was an observed increase in the frequency of complications both on admission and during inpatient rehabilitation across a range of impairments. Most notable was the prevalence of malnutrition which has risen from 9% on admission in 2014 to 11% in 2016 and 4% during admission in 2014 to 9% in 2016.

Patient information, education and discharge planning

Stroke survivors and their families report the transition home after stroke is a crucial time in their recovery and comprehensive planning to facilitate their return to the community is critical. 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. Routine care planning for patients with stroke is a key recommendation in the *Clinical Guidelines for Stroke Management 2010*[5] but it is disappointing to report only 78% of patients are received collaboratively developed care plans prior to discharge. However, SA (91%) and TAS (96%) were found to have excellent state-wide rates. Given the complexity of stroke needs upon discharge, care plans (or patient-held recovery plans) are an essential tool for transition to home and community and should be undertaken for all patients.

All stroke survivors, their families and their carers should be provided with tailored information to facilitate reintegration into the community as well as their physical recovery. To support the stroke survivor's adjustment after discharge there should also be opportunities for clarification or reinforcement of the information provided. In this year's audit only half (50%) of patients were found to have received education prior to discharge. This result is unacceptably low, certainly when there are readily-available stroke-specific resources such as the My Stroke Journey booklet, developed by the Stroke Foundation, is freely available for use by health services to simplify and promote standardised education.

The provision of such information – which should cover stroke, hospital management, the importance of adherence to secondary prevention medication and recovery – has dropped dramatically since 2014 (72%). However, changes in the wording of this question (referred to in Table 19) must be considered when comparing performance over time; a "not documented" option was incorporated for the first time this year and 1,278 (36%) 'not documented' responses were stated. Clearly, documentation needs to improve and the availability and value of generic information such as the My Stroke Journey booklet must be highlighted, encouraged and promoted. These gaps in information have significant implications for both the individual and the health system from the next audit cycle onwards changes in adherence will be more confidently tracked.

Similarly, it is recommended patients with stroke are provided with written information addressing issues relating to intimate relationships reported here as sexuality. Only 15% of patients were offered any information on sexuality after stroke and this figure remains unchanged (17% in 2012, 18% in 2014). Provision of such information remains unacceptably low across all states and annual

admission-groupings. Even fewer patients were offered the opportunity to discuss issues relating to sexuality with appropriate health professionals (12%). There is an ongoing need to tackle this problem as compliance has not shifted since the inception of the National Stroke Audit. This consistent gap in education can be traced to barriers at therapist and patient level; the topic presents a challenge of implementation because of issues in attitudes, knowledge and relevant skills. Education and resources regarding sexuality and relationships after stroke are needed.

The provision of a post-discharge contact for patients with stroke dropped from 67% in 2014 to 65% in 2016 and remains far too low. Further improvements can still be made in this area to combat the range of psychosocial consequences stroke survivors commonly encounter upon their return home from hospital.

Secondary prevention

Given the potential high risk of recurrent stroke and the proven effects of secondary prevention in reducing stroke risk, every patient with stroke should be assessed for risk factors and informed of strategies available to modify these. This year, only just over half (51%) of the patients received lifestyle advice as part of risk factor modification, although this was an improvement over previous audits (42% in 2014). Again, SA (68%) and TAS (70%) were the highest performing states. The provision of comprehensive medical therapy was consistently lower than in previous years with over 20% of patients not receiving the recommended blood pressure or cholesterol-lowering medication. This figure excludes those whose patients are contraindicated and it must be recognised that certain secondary prevention medications will not always be clinically relevant for all patients. Adherence is greater within the acute setting and there is little excuse for why provision of this routine therapy has dropped.

Supporting carers

Carers play a critical role in providing physical, emotional, recreational and financial support after stroke. Disappointingly the provision of both relevant training for carers (75%) and assessments to ascertain the needs of carers (65%) dropped in this audit compared to previous years (84% and 82% respectively in 2014).

6.2 Limitations of the data

The National Stroke Audit Rehabilitation Services provides an excellent cross-sectional overview of stroke rehabilitation services in Australia. However, the data must be interpreted with caution for several reasons. Participation in the National Stroke Audit is voluntary and the data are self-reported and may be subject to reporting bias or misinterpretation of the question (response bias). Secondly, documentation issues should be considered; recording of data for the Clinical Audit assumes if a process was not documented then it was not performed, which may not always be the case. This is highlighted when data from the Organisational Survey and Clinical Audit provide conflicting information. However, as documentation of care is a medico-legal responsibility and proof that care was delivered, care could not be assumed in the absence of documentation. Better documentation will provide the ability to gather more robust data for monitoring stroke care and should be factored into quality improvement activities. Furthermore, the accuracy of the responses may be dependent on the respondent's knowledge of their hospital's stroke services.

The National Stroke Audit is undertaken once every two years and the patient cohort sample size was relatively small in several of the participating services. Application of exclusion criteria and missing data further reduced the sample size for some indicator level analyses. Audit and feedback is a key

driver of clinical behaviour change and having representative data will strengthen its effect.[8] Larger samples and/or more frequent monitoring of the key indicators would provide an improved picture of the quality of stroke rehabilitation in Australian hospitals. This must be balanced with the time required to collect and report on it. The launch of the AuSDaT provides a mechanism for more frequent audits. Using the AuSDaT and taking a modular approach to data collection (allowing snapshots of key indicators rather than the full Audit) would facilitate this.

6.3 Strengths of the data

Potential reporting biases were minimised by a thorough process of standardised training and ongoing support throughout the audit process. A comprehensive data dictionary was provided as an aid for both the Organisational Survey and Clinical Audit to increase inter-rater reliability. Each site also conducted a reliability check in which data from three to five cases was entered by two auditors. Programmed logic checks were built into the AuSDaT to verify data at the point of entry and all participants received their data for verification. In addition, the audit project team was able to monitor data entry to follow up on missing data where these were critical to analysis. To minimise interpretation bias data was analysed by an independent organisation.

With 3,514 episodes audited the total patient cohort for this year's National Stroke Audit was the largest ever submitted for a stroke rehabilitation cycle and covers over one-third of all admitted stroke rehabilitation episodes in Australia (8,896 in 2015).[3] Similarly, more stroke rehabilitation services (121 in total) participated in at least one of the National Stroke Audit components than in any previous rehabilitation cycle. This sizeable sample ensures this year's data and our recommendations are as robust and meaningful as possible.

6.4 Conclusions and recommendations

The National Stroke Audit Rehabilitation Services Report 2016 provides a comprehensive snapshot of the current strengths of our hospital system for inpatient stroke rehabilitation as well as highlighting areas that require further development and focus. While it is encouraging to see improvement in a number of areas, on the whole, the results of this year's audit reveal progress in adherence to the recommended Framework elements and key indicators of clinical care has either stalled or regressed.

Administrators (including budget holders) and clinicians alike are responsible for the delivery of stroke care to the community. Effective delivery requires collaboration, an understanding of the available evidence and a recognition of the priority that must be afforded to stroke care in Australia; there can be no argument about this priority. Ongoing work and effort is required to review gaps in care, assess local barriers and enablers, develop and implement improvement plans and monitor the impact on the quality of care provided during inpatient rehabilitation.

The significant proportion of the Australian population impacted by stroke, the cost of poor outcomes and the benefits that can be achieved by the delivery of appropriate interventions highlight the value of regular monitoring of care and ongoing efforts to improve quality. It is clear more effort needs to be applied by all if we are going to adequately serve the needs of our communities.

Action is required at two levels; gaps in care must be identified and addressed at a local level and, where common gaps exist, work should be carried out in consultation with relevant state clinical networks and health departments to support wider improvement.

Recommendations

1. Greater adherence to essential elements of care outlined in the Rehabilitation Stroke Services Framework, particularly to ensure all patients with stroke are managed on one dedicated ward (geographically defined rehabilitation).
2. Greater focus on processes to ensure the psychological needs of all patients are assessed and appropriate support is provided during and after inpatient rehabilitation.
3. Further efforts to ensure all patients and their family/ carers are involved in their rehabilitation. This critically includes the provision of information (including sexuality post stroke), collaborative goal setting and thorough education on stroke recovery.
4. Ensure secondary prevention advice including risk factor modification, appropriate medications and long-term compliance is provided prior to discharge.
5. Continued efforts to provide comprehensive discharge planning to all patients with stroke including providing a personalised care plan as well as specific training and support for carers.
6. Increased focus on implementation of the recommendations in evidence-based guidelines and reduction in unwarranted clinical variation by developing improved systems of care (clear policy, procedures and practices).

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