



strokefoundation

# Rehabilitation Stroke Services Framework

2013





## Contents

Introduction.....	3
Scope .....	3
Aims of the framework.....	4
Target audience.....	4
Section 1: Essential principles of stroke rehabilitation services .....	4
Section 2: Essential elements of stroke rehabilitation services.....	5
Section 3: Recommended models of care for rehabilitation stroke services ....	8
Section 4: Community Reintegration .....	12
Section 5: Workforce and resource requirements .....	13
Section 6: Data and quality improvement.....	14
Section 7: Conclusion.....	16
Appendix 1.....	18
Appendix 2.....	20
Appendix 3.....	21
Appendix 4.....	22
Appendix 5.....	23
Appendix 6.....	24
References .....	25



## Introduction

It is estimated that there are 50,000 new and recurrent strokes each year<sup>1</sup> in Australia with 6,000-6,500 admitted for rehabilitation across Australia in 2011.<sup>2,3</sup> Stroke represents the third largest impairment category of all the rehabilitation episodes in the public sector.<sup>2</sup> National audit data shows that only 51% of patients discharged from acute care accessed some type of further rehabilitation.<sup>4</sup>

Rehabilitation is a proactive, person-centred and goal-oriented process that should begin the first day after stroke. Rehabilitation should be timely, equitable and comprehensive and have as the ultimate aim that the person with stroke will maximise their function, ideally return to the community, and achieve the highest possible level of independence — physically, psychologically, socially and financially. Rehabilitation needs to be offered in a culturally appropriate environment giving regard to a person's desires, ethnicity and belief systems. Rehabilitation is concerned not only with physical recovery but also with reintegration of the person into the community and therefore the transition between hospital and community care (including primary care) and supporting services is vitally important. The principles of rehabilitation should be applied in the acute and post-acute settings.<sup>5</sup>

The infrastructure (e.g. access to rehabilitation) and resources (e.g. staffing) available for stroke rehabilitation around Australia are variable.<sup>3</sup> In general the systems of stroke care that currently exist in Australia comprise free-standing and co-located acute and rehabilitation (inpatient, ambulatory and community) services. Integration of the various rehabilitation stroke service models is also important. People with stroke will often exit one service model and re-enter another. Ideally a seamless transition should occur from one service to the next and it is important that systems are in place to enable this.

Rehabilitation services that provide access to specialist stroke expertise reduce the odds of death or dependency compared to general rehabilitation services.<sup>6</sup> Workforce capacity and comprehensive team functioning are critical and National audits have noted a need for patients to have better access to the full range of disciplines, and services to provide continuing staff education.<sup>3</sup>

The Clinical Guidelines for Stroke Management 2010 provide guidance for processes of rehabilitation stroke care, however currently there is no guidance similar to that of the acute stroke services framework to guide rehabilitation services in best practice for core infrastructure, principles and models of stroke care. Various organisations such as the Australasian Faculty of Rehabilitation Medicine (AFRM) and AROC have published standards and outcome data for rehabilitation services, but to date nothing formal has been published discussing ideal structures, processes and models of care for stroke rehabilitation.

The need for standardised systems to deliver best-practice rehabilitation is further highlighted by the recent National Stroke Audit Rehabilitation Services report<sup>3</sup> which recommends that “further work should be undertaken to identify core elements of effective stroke rehabilitation units to facilitate greater access to this model of evidence-based stroke care in Australia”.

This document complements the Acute Stroke Services Framework 2011.<sup>8</sup> The current review process has included:

- a) Review of the National Stroke Management Guidelines (2010) and other literature (01 July 2009 – 26 March 2013)
- b) Review of data from the National Stroke Audit - Rehabilitation Services Report 2012<sup>3</sup>
- c) Review of information from international work
- d) Meeting on April 10, 2013 to review the draft framework and seek consensus
- e) Further consultation on revised draft framework.

## Scope

The National Rehabilitation Stroke Services Framework (“The Framework”) details the essential elements, principles and models of care determined as best-practice evidence-based rehabilitation stroke care for rehabilitation stroke services. It also provides guidance about systems for effective



integration of stroke survivors into the community after they leave hospital. Workforce and resource requirements are discussed as is requirements regarding data collection and quality improvement activities.

The Framework builds on the recommendations of the Clinical Guidelines for Stroke Management and the National Stroke Audits to provide guidance about the best systems to provide rehabilitation stroke services.

Finally, the Framework incorporates fundamental principles of *The National Disability Strategy 2010-2020*.<sup>9</sup> This includes the promotion of personal & community support, and health & well-being of the person with a stroke. Many key areas of action of *The National Disability Strategy 2010-2020* are addressed by the models and principles of the National Rehabilitation Stroke Services Framework (see Appendix 1).

### Aims of the framework

The framework aims to improve the quality of Australian rehabilitation stroke services by outlining recommended structures, networks, settings, workforce and criteria for monitoring.

The intended use of the of the framework is to:

- Outline essential **principles, elements** and **models** of stroke rehabilitation services in order to **assist planning** of rehabilitation stroke services.
- Provide a basis for **measuring** adequacy of current structures and resources for best practice stroke care.
- Enable this information to be used to **advocate** for improved services where gaps are identified.
- Guide decisions about **resource requirements** (e.g. workforce).
- Provide an outline for **monitoring** quality of care delivered by stroke services.

The framework is not developed to be used for accreditation purposes (this may change during future reviews).

### Target audience

This Framework is intended for use by administrators, funders, policy makers and health professionals who plan, organise and deliver care for people with stroke who require rehabilitation services.

## Section 1: Essential principles of stroke rehabilitation services

The National Rehabilitation Stroke Services Framework is premised by a number of core principles. These are:

1. All people with stroke will benefit from rehabilitation<sup>10</sup> and therefore it should be made available unless they meet the exception criteria as outlined in the Australian Stroke Coalition (ASC) Assessment for Rehabilitation Pathway and Decision-Making Tool.<sup>10</sup>
2. Every person with stroke has the right to choose their goals, activities and priorities.<sup>11</sup>



3. Rehabilitation should be client-centred. Health professionals should move towards and enable an equal partnership in care with clients, their families and significant others.<sup>11</sup>
4. Rehabilitation should adopt a whole person approach and which includes addressing physical, social and spiritual dimensions.<sup>11</sup>
5. Stroke care should be evidence based. Processes to promote the implementation of evidence and best practice should be in place to support safe and effective care. Evidence-based practice should be supported through professional development, teaching, quality research and quality assurance activities.
6. The model of care for rehabilitation should be driven by client preference and level of need, i.e. level of support/ability to function in the client's own environment.
7. Service providers have a responsibility to ensure that the resources and environment facilitate maximum recovery of a client's motor, sensory, social and cognitive levels.
8. Rehabilitation should be provided by a specialised interdisciplinary team of health professionals throughout the care continuum.<sup>6</sup> Access to specialised services (e.g. aphasia, return to work, driving etc.) should be available at any time along the rehabilitation pathway.
9. Rehabilitation should be offered in a culturally appropriate environment.

## Section 2: Essential elements of stroke rehabilitation services

To optimise outcomes for people with stroke, all models of rehabilitation services should include the following elements:

### 1. Effective links with acute service providers

Rehabilitation services should have established links and referral processes with acute service providers. This should include a standardised referral form and/or process for rehabilitation consultation and services and for referral back to acute service providers if required.

### 2. Specialised interdisciplinary stroke (or neurorehabilitation) team with access to staff education and professional development specific to stroke

There is evidence to support that stroke-trained staff are more effective (as part of a multidisciplinary stroke unit team). It is important that staff in dedicated stroke services have received the appropriate training in stroke care and that they have ongoing access to regular professional development to maintain and update their skills and knowledge in stroke care. Multidisciplinary group education sessions may be an effective way to maintain professional development specific to stroke. They also assist the team to remain focussed on the client's goals, and not just discipline specific goals.

### 3. Co-located stroke beds within a geographically defined unit

Stroke unit care is the single most important guideline recommendation for improving stroke management.<sup>6</sup>

The strongest evidence is for those stroke units that can provide several weeks of rehabilitation on a comprehensive stroke unit or stroke rehabilitation unit.<sup>5</sup>

The stroke units that have been shown to deliver highly effective stroke care share a number of characteristics including:

- location in a geographically discrete unit
- comprehensive assessments



- a coordinated multidisciplinary team
- early mobilisation and avoidance of bed rest
- staff with a special interest in the management of stroke, and access to ongoing professional education and training
- clear communication, with regular team meetings to discuss management (including discharge planning) and other meetings as needed (e.g. family conferences)
- active encouragement of stroke survivors and their carers/families to be involved in the rehabilitation processes.<sup>21</sup>

#### 4. Standardised and early assessment for neurorehabilitation

The rehabilitation literature both nationally and internationally consistently demonstrates that the assessment of people with stroke for rehabilitation is not performed routinely.<sup>12</sup> Data from the National Stroke Audit –Acute services revealed that less than 50% of people with stroke in the participating units are assessed for rehabilitation. In addition, the processes used are highly variable from one site to another; are inconsistent between individuals assessing;<sup>13</sup> are often based on non-clinical factors<sup>14</sup> or are based on clinical factors that do not have a relationship with rehabilitation outcomes or the capacity for functional improvement.<sup>15</sup> Furthermore, assessment processes are poorly documented and therefore are most likely to be ad hoc and potentially inequitable.

In a literature review<sup>12</sup> undertaken for the ASC no clear indicators (clinical or otherwise) were identified that could be used to definitively confirm someone as ineligible or unlikely to benefit from rehabilitation. Given this evidence, the ASC recommended<sup>10</sup> that everyone be assessed for rehabilitation after stroke unless they meet any one of the four exceptions shown in Table 1:

Table 1. Exception criteria for Rehabilitation assessment<sup>10</sup>

1.	Return to pre-morbid function: Person with stroke has made a full recovery in all aspects, such as functional (physical, communication etc.), emotional/psychological and cognitive.
2.	Palliation: Death is imminent, refer to palliative care team.
3.	Coma and/or unresponsive, not simply drowsy – determined by criteria for minimally responsive i.e. responds to stimuli meaningfully as able.
4.	Declines rehabilitation

There is a strong correlation between early admission to stroke rehabilitation and improved functional outcomes demonstrated in both individual studies and based on the results of meta-analysis.<sup>15</sup> It follows that assessment for rehabilitation should occur as early as possible to determine the person with stroke's rehabilitation needs. The issue of when the person with stroke should be assessed for ongoing rehabilitation is unclear but consensus suggests this should occur within the first week.

#### 5. Written rehabilitation goal setting processes

Goal setting is a fundamental requirement of the rehabilitation process<sup>6</sup> and should always take place with the stroke survivor and family/carer or significant other.<sup>17</sup>

Goal setting should be:

- Client centred
- Interdisciplinary and inclusive of the patient / carer
- Meaningful
- Specific, Measureable, Achievable, Rewarding, Time-based (SMART)
- Documented



## **6. Routine use of evidence-based guidelines to inform evidence-based therapy**

Rehabilitation is a holistic process that should begin the first day after stroke with the aim of maximising the participation of the person with stroke in the community. To achieve this, rehabilitation services need to be able to tailor interventions to focus on impairment, activity and participation levels<sup>6</sup> and have systems in place to ensure that care is provided in accordance with the guidelines as this has been demonstrated to improve outcomes.<sup>16</sup> Rehabilitation services should be able to provide or have access to the full range of allied health disciplines required to support stroke survivors in achieving their goals.

## **7. Best practice and evidence-based intensity of therapy for the goal related activity**

Higher intensity therapy improves both patient outcomes and service efficiency.<sup>7</sup> However; current public hospital inpatient rehabilitation services provide 25% or less therapy hours than recommended international standards. Intensity of therapy is usually defined as number of minutes per day of therapy or the number of hours of consecutive therapy.<sup>17</sup>

Rehabilitation services should structure their services to enable practitioners to provide as much physical therapy as possible with a minimum of one hour active practice per day at least five days a week.<sup>6</sup> Providing sufficient intensity and duration of therapy overall may require therapy to be delivered on weekends.

## **8. Systems for transfer of care, follow-up and re-entry**

Consumer surveys<sup>19, 20</sup> and the Stroke guidelines<sup>6</sup> both support the need for particular services around transitioning between services and for ongoing monitoring of needs after formal service provision has ceased. One outcome of monitoring (follow-up) could be the identification of newly emergent needs which require re-entry into formal service provision or referral to sub-sets of service provision. During transfer of care, it is important to maintain client centred rehabilitation goals. Follow-up should involve a review of goals achieved, and a discharge plan that allows for GP monitoring and assessment to facilitate re-entry into the rehabilitation process as required. Follow-up should also involve monitoring of individualised lifestyle modifications recommended for secondary stroke prevention.

## **9. Support for the person with stroke and carer to maximise community participation and long-term recovery**

Social support has been shown to correlate directly with positive outcomes post stroke.<sup>6</sup> National guidelines<sup>6</sup> recommend that people with stroke and their family/carers be given a care plan, be provided carer training, be provided information about peer support, self-management programs, return to work, driving, leisure and sexuality prior to leaving the hospital setting. Rehabilitation services should provide services to meet these needs or have established links to other services providing these types of support services.

## **10. Systems that support quality improvement**

The stroke rehabilitation evidence base is growing exponentially. All rehabilitation providers need to ensure they have a culture of quality improvement via audit, benchmarking and review to ensure they are providing the best practice care, based on best available evidence, expert consensus and client experience. These quality improvement activities should be regular (at least every two years), use data to identify practice gaps, gain consensus from the multidisciplinary team on the highest priorities, review local factors involved and lead to a clear action plan for improvement.





### **Section 3: Recommended models of care for rehabilitation stroke services**

There are a number of models of care currently used in rehabilitation stroke services (refer Figure 1). These include:

1. Inpatient rehabilitation services
2. Specialised inpatient sub acute (stroke unit) care
3. Early supported discharge services (ESD)
4. Community rehabilitation
  - a. Ambulatory care (day hospital, outpatients)
  - b. Ambulatory care (home-based)
5. Outreach
6. Telemedicine rehabilitation support (inpatient or community settings)

#### **1. Inpatient Rehabilitation**

There are different models of inpatient rehabilitation for stroke. These are:

- a) Mixed rehabilitation unit – rehabilitation provided on a ward managing a general caseload.
- b) Comprehensive stroke unit – combined acute and rehabilitation unit in a discrete ward.
- c) Stroke rehabilitation unit – a discrete rehabilitation unit for stroke patients who are transferred from acute care 1-2 weeks post-stroke.

Inpatient rehabilitation consists of the following characteristics:



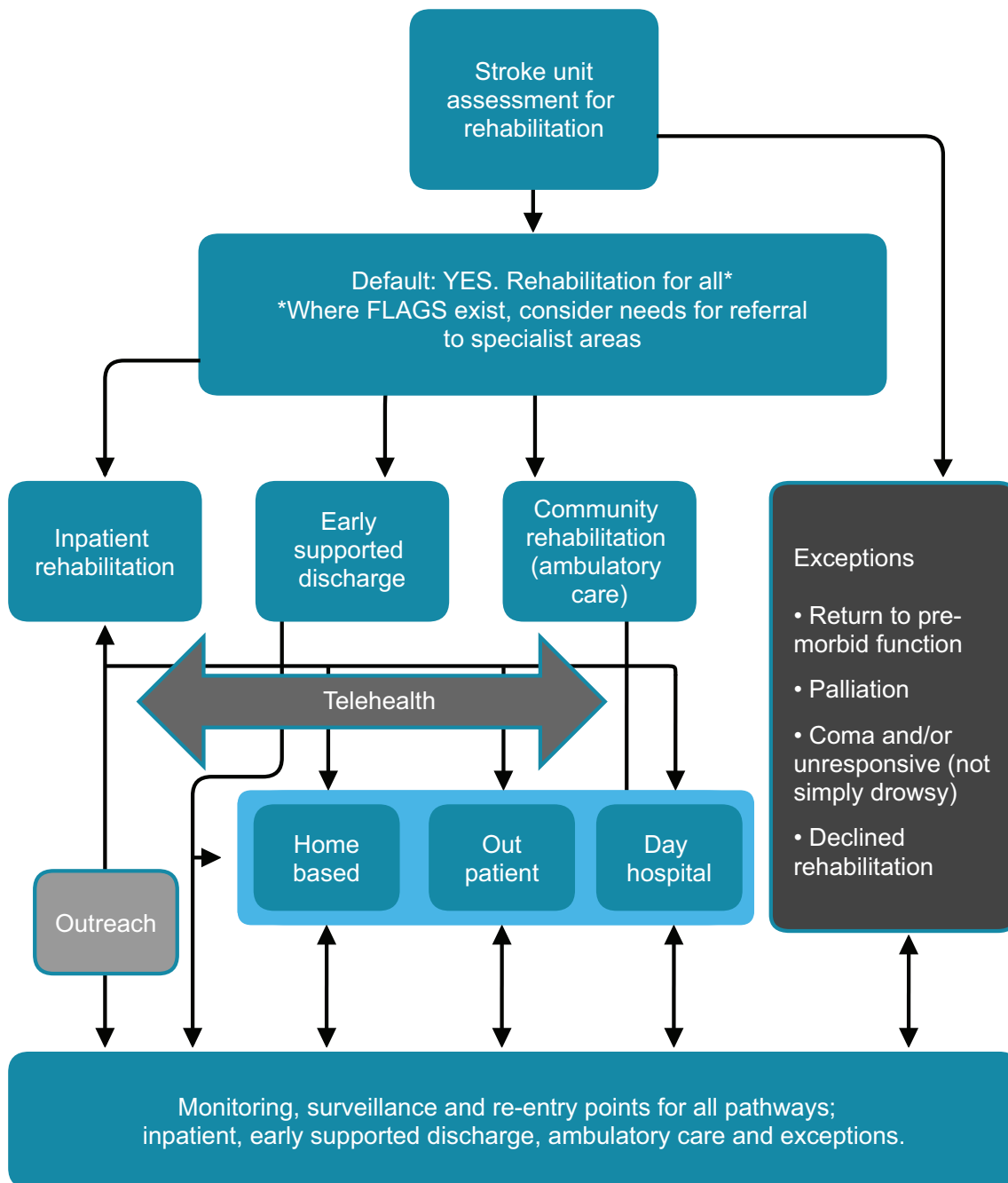


Figure 1. Models of Rehabilitation

- rehabilitation delivered in an inpatient setting (can be a co-located rehabilitation unit located within the acute hospital or standalone, rehabilitation unit located separately to the acute hospital), with the person accommodated overnight in the facility



- episode starts with a multidisciplinary assessment of client impairments, activity and participation needs
- access to a core specialist multidisciplinary care team (medical, nursing and allied health) and access to other specialised services i.e. Orthoptist, neuropsychologist as required in an inpatient setting
- intensive multidisciplinary inpatient program for patients who require and can tolerate an intense rehabilitation program or who require the structured environment for safety reasons
- provision of one-on-one therapy, group therapy and client self management / family involvement in the therapy program
- program of care designed around client centred participation level goals which are, short and long term
- program is time limited

## **2. Specialised inpatient sub acute (stroke unit) care**

Specialised inpatient sub acute (stroke unit) care is care that is characterised by the following:

- Location in a geographically discrete area
- Comprehensive assessments
- A coordinated specialised Rehabilitation multidisciplinary team
- Early mobilisation and avoidance of bed-rest
- Daily therapy timetable
- Treatment plan tailored to current function informed by the client and family's goals (e.g. alternating 30 minute session with 30 minute rest break)
- Energy conservation plan
- Staff with a special interest in the management of stroke, and access to ongoing professional development and training
- Clear communication with regular team meetings to discuss management (including discharge planning and progress on client centred goals) and other meetings as needed (e.g. Family conferences)
- Active encouragement of person with stroke and their carers/families to be involved in the rehabilitation process<sup>23</sup>

## **3. Early Supported Discharge (ESD)**

Early Supported Discharge (ESD) services are defined as early discharge from the acute setting with ongoing rehabilitation provided in the home. ESD services are designed to provide a seamless transfer from hospital to home and enable patients to be rehabilitated in their home environment.<sup>5</sup> Appropriately resourced ESD services provided for a selected group of stroke patients can reduce long term dependency and admission to institutional care as well as reducing the length of hospital stay.<sup>2,3</sup>

ESD services consist of the following characteristics:<sup>24</sup>

- a) Stroke specific and multidisciplinary team (see Appendix 1 for recommended team composition);
- b) Offer coordinated and planned discharge from hospital and continued rehabilitation when patients are settled at home (see Appendix 2 for recommended model of team work);
- c) Target a subset of the stroke population i.e. those of mild to moderate stroke severity (see Appendix 3 for recommended intervention eligibility criteria).



- d) Have strong links between the acute service and the ESD team, with both hospital staff and ESD team members identifying people.
- e) Measure effectiveness using standardized assessments to monitor stroke severity, dependency, activities of daily living and satisfaction as well as the impact of the ESD service on length of stay and readmission rates.

#### **4. Community rehabilitation**

##### **Ambulatory care – day hospital**

Ambulatory care – Day hospital are characterised by:

- Intensive multidisciplinary outpatient program for patients that require two or more therapy appointments
- One-on-one therapy and/or group therapy session
- Episode starts with a multidisciplinary assessment
- Program of care designed around participation level goals, short and long term
- Program is time limited

##### **Ambulatory care – outpatients**

Ambulatory care – outpatients consist of the following characteristics:

- One-on-one or group therapy – discipline specific therapy
- Access to a multidisciplinary team as required
- Can also be individualised and task specific

##### **Ambulatory care – home based**

Ambulatory care – Home based is:

- Provision of rehabilitation therapy within the home (RITH) (usual place of residence) environment
- Individualised and task specific therapy

#### **5. Outreach**

Outreach services consist of the following characteristics:

- Hub and Spoke model between regional and tertiary hospitals or regional and smaller neighbouring rural hospitals
- The outreach model may be a Consultative Model (where the hub site provides advice and support to neighbouring hospitals as required) or a Collaborative Model (where the hub site and neighbouring hospitals work together to provide rehabilitation program for patients). Both models may run simultaneously or separately).
- Outreach coordinator and rehabilitation team collaborate with neighbouring hospital to facilitate ongoing rehabilitation and goal attainment.
- Ongoing education from the hub site to spoke hospital staff (via various mechanisms including telephone, or onsite at either hospital).
- Collaborative rehabilitation care approach between the hub hospital and the neighbouring hospitals



- Involvement of the GP as a key coordination link for the client who is undertaking a rehabilitation program where there is limited access to Rehabilitation and Aged Care physicians.

## **6. Telemedicine rehabilitation support (inpatient or community settings)**

Telemedicine is broadly defined as the use of telecommunications technologies to provide medical information and services.<sup>25</sup> Telerehabilitation is the ability to provide distance support, evaluation and intervention via telecommunication.<sup>26</sup> The use of telemedicine for allied health assessments has been reported to be feasible and valid in several trials and is also feasible and useful for providing therapy.<sup>27, 28, 29</sup>

Telemedicine can be used in all of the above care settings, however would be most useful where there are no in-house specialists.

### **Other models of care currently in use in Australia**

At present there is no robust evidence for the following model of care and it is not generally used where there are existing acute stroke units, however this model is used throughout and NSW and the evidence and cost data is evolving. This model is similar to mobile stroke teams which have been found to be inferior to stroke unit care and similar to care provided on a general medical ward<sup>30</sup> with the main difference being care provided by specialist rehabilitation team as potential interim care prior to transfer to rehabilitation.

### **Inreach to acute**

Inreach to acute services consist of the following characteristics:

- Early rehabilitation intervention by a specialised multidisciplinary team (MDT) in the acute care setting
- Early intervention – potential to maintain and improve function
- Specialised multidisciplinary team
- Comprehensive assessment
- Shared care model between acute and rehab medical specialist
- Can treat acute illness and provide rehabilitation services in parallel (NSW Rehab Design)

## **Section 4: Community Reintegration**

The early post-discharge period is consistently reported by stroke survivors and their families/carers to be a difficult time.<sup>6</sup> Successful reintegration into the community following a stroke requires the consideration of physical, psychological, financial and social aspects of the stroke survivor and their family/carer.

### **Transition between hospital and community**

The safe transition between hospital and the community is a complex process and requires early planning, assessment of the stroke survivor's needs and effective communication with the stroke survivor, their family/carer and those services in the community providing support and follow-up care.<sup>6</sup>

The minimum activities required prior to discharge include:



1. Pre-discharge needs assessment by the MDT. The assessment should address clinical, functional, physical, social, informational and spiritual needs.
2. Communication and early referral to general practitioner, primary healthcare team, providers of community rehabilitation and community services such as the Aged Care Assessment Team (ACAT).
3. Organisation of all medications, equipment and support services.
4. Organisation of specialist treatment and assessments such as return to driving.
5. Carer training where appropriate.
6. A post-discharge care plan such as My Stroke Care Plan<sup>24</sup> (available at [http://strokefoundation.com.au/site/media/NSF\\_MyStrokeCarePlan\\_web2.pdf](http://strokefoundation.com.au/site/media/NSF_MyStrokeCarePlan_web2.pdf) completed by the stroke survivor and their family/carer in collaboration with the rehabilitation team (the stroke survivor keeps original with potential for a copy provided to their GP along with any discharge summary).
7. Provision of information about local stroke support groups and self-management programs.

Tools such as My Stroke Journey<sup>31</sup> are useful to document relevant information and support services for the stroke survivor.

Hospitals should have the following systems in place to support the discharge process and provide appropriate follow-up care:

- Locally developed or existing protocols for discharge planning
- Established links with primary health care providers through Medicare Locals
- Established links with appropriate community services
- Established links with stroke support services including local stroke support groups, telephone or online support (e.g. StrokeLine, StrokeConnect program) and self-management programs
- Systems for follow up and re-entry post-discharge.

Established links between primary health, community health and rehabilitation services are required to enable potential review by specialist rehabilitation services and periodic intensive rehabilitation when client (or stroke survivor) significant changes are identified on regular review.

## Section 5: Workforce and resource requirements

Skilled interprofessional stroke teams are an essential component to best practice stroke care. There should be a full range of team members (medical, nursing, allied health and support staff) with an appropriate skill base and training to provide comprehensive, evidenced-based programs of care to address the impairments, activity limitations and participation restrictions present in the patients admitted to the rehabilitation service.

There should be sufficient team member hours<sup>32</sup> available to allow each patient to receive an individualised nursing and allied health (e.g. physiotherapy, occupational therapy, social work, speech therapy, psychology, dietetics, others) program of adequate intensity to meet their needs, delivered in a way that optimises the effectiveness and efficiency of the rehabilitation program.

Estimating workforce based on numbers of staff per patient has limitations as there are many factors to consider (staff expertise, organisation of services e.g. group therapy sessions etc). AFRM standards<sup>32</sup> provide consensus-based recommendations for staffing levels (refer Appendix 4 and 5). While this is a useful starting point, this framework recommends services determine their



workforce requirements based on the provision of evidence-based therapy (rather than simple staff numbers). As the Stroke guidelines<sup>6</sup> note, it is more important that the right therapy is provided rather than dictating which team member should provide that care. This is particularly important in rural and remote areas which simply do not have access to all the recommended staff. The use of telerehabilitation as an emerging service model linking specialist staff to other centres can assist to overcome shortfalls in less resourced centres; however the resource commitment at the major centre should also be factored into workforce numbers.

The majority of patients in a rehabilitation service will require input from pharmacists. The pharmacist should be an integral part of the rehabilitation team. Nominated staff from other disciplines such as diversional therapy, music therapy, leisure therapy / recreation therapy, rehabilitation counselling, sexuality and relationship therapy, orthoptist and rehabilitation engineering should be available when required. The services of a neuropsychologist and clinical psychologists should be employed in all units where patients with complex behavioural issues are treated and where adjustment to a disability may be an issue.<sup>32</sup>

Regular access to interpreters for optimal comprehension of rehabilitation, goals and overall process is required. Culturally appropriate goals and acknowledgement of cultural norms for stroke survivors should be in place. Where appropriate, indigenous liaison officers should be considered.<sup>32</sup>

Determination of workforce requirements clearly needs to also consider the importance of teaching requirements for students and junior staff as well as staff involvement in data and quality improvement activities.

## Section 6: Data and quality improvement

Capacity to evaluate the quality of health care delivery is essential for informing clinical practice and improving patient outcomes. It is important and crucial to assess, monitor and evaluate key performance indicators and outcome measures in order to demonstrate effectiveness and efficiencies of stroke rehabilitation services. The principles for collecting data and implementing quality improvement activities in rehabilitation include:

1. Data collection should align with the Australian Stroke Coalition national framework for data and quality<sup>33</sup>
2. Data collection should be linked to recommendations in the guidelines and measure adherence to evidence-based care.
3. Data collection should be routine and ongoing
4. Data collection should be linked to benchmarking and become part of an evidence-based quality improvement cycle
5. Every rehabilitation service should have the ability to collect data for research purposes

Data elements recommended for all stroke rehabilitation services include:

- Indicators used to adjust for case mix, for example:
  - o stroke severity / subtype;
  - o functional limitations (cognitive plus age);
  - o demographics;
  - o carer availability;



- discharge destination of person with stroke
- Processes of care measures.
- Functional change – use tool specific to setting e.g. Modified Rankin / FIM
- Stroke survivor participation in the community
- Quality of life e.g. AQoL
- Patient satisfaction
- Access to community support

There currently exist a number of national and state-based audit programs across Australia. The National Stroke Foundation monitors and measures the delivery of best practice stroke care as outlined in the Clinical Guidelines for Stroke Management 2010<sup>6</sup> through the National Stroke Audit program. The program is a biennial audit of stroke services in Australia that alternates annually between acute and rehabilitation services. The National Rehabilitation Stroke Audit provides evidence of the critical function of rehabilitation in stroke recovery. The audit aims to highlight areas where the system for stroke rehabilitation is working well and to report on improvements or changes that may be needed. It is the only audit of its kind in Australia. Data from the audit is used in the *StrokeLink* program to identify gaps and inform process of systematic quality improvement activities.

AROC is a joint initiative of the Australian rehabilitation sector (providers, funders, regulators and consumers). Rehabilitation units who are members of AROC submit a prescribed data set, the AROC dataset, against each and every episode of rehabilitation they provide. AROC receives the data, collates and analyses it, and provides twice yearly benchmarking reports to submitting services, payers, and other interested stakeholders.<sup>34</sup>

In conjunction with the sector, AROC has also facilitated the development of outcomes of treatment of Stroke. Below are the current AROC targets (as at August 2011). Interestingly, as at 2012 there was a significant variation in achievement of these targets between the services providing inpatient stroke rehabilitation care. It is envisaged that ongoing monitoring and publication of achievement of these targets will lead to a reduction in this variation.

Target No.	STROKE TARGET		AN-SNAP class					
			S2 – 204	S2 – 205	S2 – 206	S2 – 207	S2 – 208	S2 – 209
1.	Time Between Onset and Rehabilitation	50% of Stroke episodes to be admitted to Rehabilitation within a specified number of days	9 days	9 days	10 days	14 days	13 days	16 days
		75% of all Stroke episodes to be admitted to rehabilitation within 19 days						
2.	Length of Stay	50% of all stroke episodes to achieve a length of stay of...	14 days or less	21 days or less	20 days or less	26 days or less	29 days or less	38 days or less
		50% of all stroke						





3.	FIM Change	episodes to achieve an average FIM change score of ...	14 FIM points or more	18 FIM points or more	25 FIM points or more	29 FIM points or more	28 FIM points or more	39 FIM points or more
4.	Discharge Destination	Percentage of all stroke episodes to be discharged to accommodation that allows for the same or greater independence ...	82%	77%	80%	75%	61%	78%

Targets are scheduled for revision in 2013.<sup>35, 36</sup>

- As a minimum all hospitals should participate in routinely collecting and monitoring of rehabilitation outcomes (via AROC) and the biennial national stroke rehabilitation audit (via NSF) for processes of care as well as participate in ongoing quality improvement programs such as the *StrokeLink* program. Consideration should be made for integrating the indicator sub-set into routine national data collection systems to allow regular reporting for rehabilitation stroke care.

## Section 7: Conclusion

All efforts should be made to improve patient access to evidence-based rehabilitation stroke care in Australia. Early assessment for rehabilitation is a critical enabler for this to occur. Capacity to evaluate the quality of rehabilitation stroke services is essential for improvement of health care delivery and patient outcomes. The proposed framework should be used by policy makers, administrators and the clinician to identify gaps in recommended evidence based service provision for stroke or the planning for new services.

To ensure a high quality rehabilitation service that provides the optimal outcomes for stroke survivors, it is recommended that:

- All rehabilitation stroke services adopt the core rehabilitation principles and elements described in this document for their care setting.
- All rehabilitation stroke services require close and effective links with (networked) acute service providers.
- All rehabilitation stroke services establish robust communication and referral links between their care setting and community service providers.
- All hospitals that deliver rehabilitation services for stroke be involved in one or more ways to collect data that monitors aspects of the care provided (e.g. AROC; National Rehabilitation Audit; AUSCR). The core set of clinical indicators should also be used routinely (at least every second year) to monitor important processes of care involved in rehabilitation stroke services and drive service improvement.
- This framework be used in conjunction with the Acute Stroke Services Framework 2011 and the Clinical Guidelines for Stroke Management (2010) to increase access to evidence based stroke care throughout Australia.



## **Acknowledgements**

The National Stroke Foundation is extremely grateful to the following members of the National Advisory Committee who were responsible for the development of this Framework:

### **National Advisory Committee**

A/Prof Michael Pollack (Chair)  
Ms Rebecca Naylor  
A/Prof Susan Hillier  
Dr Steven Faux  
Dr Andrew Granger  
Ms Frances Simmonds  
Dr Sally Eames  
Ms Sandra Lever  
Ms Fiona McKinnon  
Mr Kelvin Hill  
Ms Leah Wright

Additional people who provided significant input and who have helped shape this document include:

Ms Naomi Kubina  
Ms Helen Ebzery  
Prof Linda Worrall  
Mr Ian Meade  
Ms Cindy Dilworth  
Dr Andrea Laborde  
Ms Juliette Mahero  
Dr Geoff Boddice  
Prof LeeAnne Carey  
Dr David Skalicky



## Appendix 1

### Mapping Areas of Action of the National Disability Strategy 2010-2020 to the National Rehabilitation Stroke Services Framework (NRSSF)

#### Personal and Community Support

- 4.1 Continue reform begun under the National Disability Agreement.
  - *The NRSSF provides guidance and direction for rehabilitation service providers to undertake reform and provide best practice rehabilitation.*
- 4.2 Consider new approaches to long-term disability care and support, including responses to the Productivity Commission Inquiry, which is due to provide its final report to Government on 31 July 2011.
  - *The NRSSF uses current evidence to provide appropriate approaches to long-term care and support.*
- 4.3 Adopt sustainable funding models and service approaches that give information, choice and control to people with disability and that are flexible, innovative and effective.
  - *Essential elements of the NRSSF provide for service approaches that allow people with disability flexibility, innovation and effectiveness in their care (refer Section 2, page 3).*
- 4.4 Support the development of assistive technologies and more access to aids and equipment for people with disability.
  - *The NRSSF supports the use of telemedicine to enable people with disability to access care (refer Section 3 page 10).*
- 4.5 Continue development of innovative and flexible support models for people with high and complex needs, including supported accommodation and community and family living approaches.
  - *The NRSSF contains innovative and flexible models including early supported discharge, rehabilitation in the home, ambulatory care, outreach and telemedicine services (refer Section 3, pages 6-10).*
- 4.6 Improve access to timely, comprehensive and effective early intervention for people with disability.
  - *The NRSSF advocates for standardised and assessment for rehabilitation and provision of therapy from the first day after stroke to maximise the participation of the person with stroke in the community (refer Section 2, pages 3-4).*
- 4.7 Collaborate with providers of universal personal and community support services to improve access for people with disability.
  - *The NRSSF advocates for multidisciplinary and interagency support for support of people with stroke and their carers in the community (refer Section 4, page 11).*
- 4.8 Promote and sustain community support networks which provide information and support to families and carers.
  - *The NRSSF advocates for multidisciplinary and interagency support for support of people with stroke and their carers in the community (refer Section 4, page 11).*



## Health and Well-being

- 6.1 Increase the representation of people with disability on universal health advisory bodies.
  - *The development of the NRSSF included people with stroke and carers on the Advisory Committee, face to face meeting and throughout the consultation.*
- 6.2 At the review points of the National Healthcare Agreement, other national health agreements and health-related National Partnership agreements, parties agree to consider including strategies consistent with the Strategy and performance indicators to ensure they address the health needs of people with disability in all age groups.
  - *The NRSSF recommends that rehabilitation services collect data for important aspects of structures and processes of care (Section 6).*
- 6.3 Ensure a strong interface between disability services, Local Hospital Networks and Medicare Locals with strong links to local communities and health professionals.
  - *The NRSSF advocates for strong links between Rehabilitation services and Medicare locals (refer Section 4).*
- 6.4 Strengthen health care planning, training and the capacity of universal health care providers to diagnose and treat the health and co-morbid conditions of people with disability.
  - *Essential elements of the NRSSF provide for staff education and professional development specific to stroke to be available within rehabilitation services (refer Section 2, page 5). Workforce requirements are also detailed (refer Section 5, page 12).*
- 6.5 Strengthen the continuity, coordination and range of primary, multidisciplinary and sub-acute care available to meet the health needs of people with disability.
  - *The NRSSF outlines essential principles, elements and models of care to provide a range of appropriate care for people with stroke*
- 6.6 Address issues specific to people with disability as part of the national expansion of key public health strategies such as dental programs, nutrition and physical activity programs, mental health, drug and alcohol and sexual and reproductive health programs, so that they explicitly meet the needs of people with disability.
  - *The NRSSF addresses the issues specific to people with stroke.*
- 6.7 Ensure informal and supported decision makers are part of preventative, diagnostic and treatment programs where necessary and appropriate, always ensuring the rights of the individual are respected and protected.
  - *The NRSSF strongly advocates that family and carers are involved in goal-setting and provided education with the person with stroke (Section 2, page 5 & Section 4, 12).*
- 6.8 Further develop the evidence base for the social and environmental determinants of health and ensure it informs the development and implementation of programs and policies.
  - *The NRSSF advocates for Rehabilitation services to provide a culture of quality improvement (refer Section 2, page 6). It is also recommended that Rehabilitation services be involved in data collection, audit and quality improvement activities (refer Section 6, page 13 and Section 7, page 15).*



## Appendix 2

### Team Composition for Implementation of Early Supported Discharge Services<sup>18</sup>

1. Members of the early supported discharge team should have specialist knowledge in stroke care
2. An early supported discharge team should be multidisciplinary
3. A typical early supported discharge team should comprise: <ul style="list-style-type: none"><li>- Physiotherapist</li><li>- Occupational therapist</li><li>- Nurse</li><li>- Speech Pathologist</li><li>- Physician</li><li>- Social worker</li><li>- Administrative Support Person</li></ul>
4. A representative guide for the composition of an early supported discharge team (for a 100-patient-per-year caseload) is: <ul style="list-style-type: none"><li>1.0 Physiotherapist</li><li>1.0 Occupational Therapist</li><li>0.4 Speech Pathologist</li><li>0–0.5 Social Worker</li><li>0–1.2 Nurse</li><li>0.1 Physician</li></ul>



## Appendix 3

### Model of Team Work for Implementation of Early Supported Discharge Services<sup>18</sup>

1.	Each patient should be assigned a key worker (specific staff member responsible)
2.	An early supported discharge team should be organised by a team coordinator
3.	An early supported discharge team should plan and coordinate both discharge from hospital and provide rehabilitation and support in the community
4.	An early supported discharge team should meet on a weekly basis
5.	An early supported discharge team should be based in the hospital
6.	An early supported discharge team should plan and coordinate discharge from hospital and then pass on responsibility of rehabilitation and support in the community-to-community-based teams
7.	An early supported discharge team should be based in the community
8.	An early supported discharge team's main role is to ensure early discharge from hospital to home



## Appendix 4

### Intervention strategy for Implementation of Early Supported Discharge Services<sup>18</sup>

1. Eligibility decisions for early supported discharge should be based on whether the patient is able to live safely back at home
2. Eligibility decisions for early supported discharge should be based, in part on practicality (whether the patient is living within the local area)
3. Hospital staff should identify patients for early supported discharge
4. Early supported discharge team staff should identify patients for early supported discharge
5. Eligibility decisions for early supported discharge should be based in part on the patient's level of disability (eg, Barthel score)
6. Specific eligibility criteria for early supported discharge should be followed
7. Eligibility decisions for early supported discharge should be based on the patient's medical stability
8. The length of intervention offered by an early supported discharge team should be based on the existence and type of other community-based stroke services operating in the area
9. Most patients eligible for early supported discharge would have a Barthel score of between 10/20 and 17/20
10. Patients eligible for early supported discharge would be able to transfer safely from bed to chair (ie, can transfer safely with one with an able carer, or independently if living alone)





## Appendix 5 (AFRM standards 2011)

**Table 2. Medical staff to patient ratios for each 10 inpatients**

Rehabilitation physician	Registrar	RMO
0.625	0.5	0.5

**Table 3. Nursing staff to patient ratios for each 10 inpatients**

Nurse Unit Manager	Rehabilitation Clinical Nurse Consultant	Rehabilitation Nurse Educator	Nursing staff
1.0	0.5	0.5	11.75 – 14.75

**Table 4. Allied health staff to patient ratios for each 10 inpatients**

Due to specialised nature of the caseload, staff mix is recommended to include senior and/or stroke-specific allied health professional staff.

Occupational therapist	Physiotherapist	Allied health assistant	Speech pathologist	Clinical psychologist	Neuro psychologist	Podiatry	Dietitian	Social Work	Exercise physiologist
1.5	1.5	0.5	1.5	0.2	0.6	0.2	0.5	1.0	0.5



## Appendix 6

**Table 5. Ambulatory Rehabilitation Services (neurology) - Staff for each 10 patients**

Nurses	Physiotherapist	Occupational Therapist	Speech Pathologist	Social Worker	Clinical Psychologist	Neuro Psychologist	Rehab Physician	Prosthetis / Orthotist
0.7	0.9	1	0.75	0.4	0.5	0.5	0.2	0.2



## References

1. Deloitte Access Economics 2013. The economic impact of stroke in Australia. Melbourne, Australia.
2. Simmonds F et al. The AROC Annual Report: the state of rehabilitation in Australia 2011. Centre for Health Service Development, The University of Wollongong; 2012; 78.
3. National Stroke Foundation. National Stroke Audit – Rehabilitation Services Report 2012. Melbourne, Australia.
4. National Stroke Foundation. National Stroke Audit – Acute Services Clinical Audit Report 2011. Melbourne, Australia.
5. Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. Cochrane Database Syst Rev. 2007, Issue 4. CD000197.
6. National Stroke Foundation. Clinical Guidelines for Stroke Management 2010. Melbourne, Australia.
7. Australian Rehabilitation Alliance 2011. The Need for a National Rehabilitation Strategy - Working towards a clear and united Rehabilitation Strategy for Australia. Position Statement Australian Rehabilitation Alliance, 10 August 2011.
8. National Stroke Foundation. Acute Stroke Services Framework 2011. Melbourne, Australia.
9. National Disability Strategies 2010-2020 (2011). Council of the Australian Governments, Department of Families, Housing, Community Services and Indigenous Affairs.
10. Australian Stroke Coalition Rehabilitation Working Group. Assessment for Rehabilitation: Pathway and Decision-Making Tool 2012. Melbourne, Australia
11. ARNA Position Statement - Undergraduate Nursing Curricula. Australasian Rehabilitation Nurses Association Inc (ARNA). Accessed April 2013 at <http://www.arna.com.au/pdfs/Undergrad%20Curricula.pdf>
12. International Centre for Allied Health Evidence. Final Report – Systematic literature search – Stroke Rehabilitation. Accessed on 30/05/2013 at <http://australianstrokecoalition.com.au/site/media/ASC-Rehabilitation-literature-review-Final-report-December-20101.pdf>
13. Kennedy GM, Brock KA, Lunt AW, Black SJ. Factors Influencing Selection for Rehabilitation after Stroke: A Questionnaire Using Case Scenarios to Investigate Physician Perspectives and Level of Agreement. Arch Phys Med Rehabil, 2012 Aug; 93(8):1457-9.
14. Ilett PA, BrockKA, Graven CJ, Cotton SM. Selecting patients for rehabilitation after acute stroke: are there variations in practice? Arch Phys Med Rehabil 2010; 91: 788–93.
15. Hakkennes SJ, Brock K, Hill KD. Selection for inpatient rehabilitation after acute stroke: a systematic review of the literature. Arch Phys Med Rehabil 2011; 92: 2057–70.
16. Hubbard I, Harris D, Kilkenney M, Faux S, Pollack M, Cadilhac D. Adherence to clinical guidelines improves patient outcomes in Australian audit of Stroke Rehabilitation practice. 2012 Archives of Physical Medicine and Rehabilitation
17. Playford ED, Siegert R, Levack W, Freeman J. Areas of consensus and controversy about goal setting in rehabilitation: a conference report. Clin Rehabil. 009;23(4):334–44.
18. National Stroke Foundation. Walk in our shoes. Stroke survivors and carers report on support after stroke. Melbourne: National Stroke Foundation; 2007.
19. Andrew N, Kilkenney M, Naylor R, Purvis T, Lalor E & Cadilhac DA. Long-term unmet health needs in Australian stroke survivors. IJS. Vol 8 (Suppl. 2), August 2013, 1-34.



20. Morris R & Morris PM. Participants' experiences of hospital-based peer support groups for stroke patients and carers. *Disability and Rehabilitation*. 2012; Feb;34(4): 347-354.
21. Langhorne P, Pollock A. What are the components of effective stroke unit care? *Age Ageing*. 2002;31(5):365–71.
22. Langhorne P, Dey P, Woodman M, Kalra L, Wood-Dauphinee S, Patel N, et al. Is stroke unit care portable? A systematic review of the clinical trials. *Age Ageing*. 2005; 34(4): 324-330.
23. Fisher RJ, Gaynor C, Kerr M, Langhorne P, Anderson C, Bautz-Holter E, Indredavik B, Mayo NE, Power M, Rodgers H, Rønning OM, Widén Holmqvist L, Wolfe CD, Walker MF. A consensus on stroke: early supported discharge. *Stroke*. 2011 May;42(5):1392-7.
24. Perednia DA, Allen A. Telemedicine technology and clinical applications. *JAMA*. 1995 Feb 8;273(6):483-8.
25. Lai JC, Woo J, Hui E, Chan WM. Telerhabilitation: a new model for community-based stroke rehabilitation. *J Telemed Telecare*. 2004;10:199–205.
26. Schwamm LH, Holloway RG, Amarenco P, Audebert HJ, Bakas T, Chumbler NR, et al. A review of the evidence for the use of telemedicine within stroke systems of care: a scientific statement from the American Heart Association/American Stroke Association. *Stroke*. 2009;40(7):2616–34.
27. Audebert HJ, Schwamm L. Telestroke: scientific results. *Cerebrovasc Dis*. 2009;27 (Suppl 4):15–20.
28. Piron L, Turolla A, Agostini M, Zucconi C, Cortese F, Zampolini M, et al. Exercises for paretic upper limb after stroke: A combined virtual-reality and telemedicine approach. *J Rehabil Med*. 2009;41(12):1016–20.
29. National Stroke Foundation. *My Stroke Journey* 2013. Melbourne, Australia.
30. Australasian Faculty of Rehabilitation Medicine. *Adult Rehabilitation Medicine Services in Public and Private Hospitals - Standards* 2005. Sydney, Australia.
31. Australian Stroke Coalition. *National Stroke Data and Quality Framework*. 2012. Accessed 27 April 2013 <http://australianstrokecoalition.com.au/site/media/National-Stroke-Data-and-Quality-Discussion-paper-ASC-final-draft.pdf>.
32. <http://ahsri.uow.edu.au/aroc/whatisaroc/index.html>
33. <http://ahsri.uow.edu.au/aroc/generaldefinitions/index.html> (24 January 2011)
34. <http://ahsri.uow.edu.au/content/groups/public/@web/@chsd/@aroc/documents/doc/uow129160.pdf> (August 2011)