



National Rehabilitation Stroke Services Framework 2022

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Version history

Version	Date	Author	Reason	Sections
1.0	2013	Stroke Foundation	Initial draft	All
1.01	2018	Stroke Foundation	Reviewed with no changes required	All
2.0	2022	Stroke Foundation	Updated with further content on community rehabilitation, changes to model of care, updates to recommended workforce (aligned with updated AFRM standards) and alignment with living guidelines	All

Introduction

It is estimated that there were 27,428 Australians who experienced stroke for the first time in their lives in 2020, which equates to one stroke every 19 minutes. (Deloitte Access Economics, 2020) Approximately 10,000 people with stroke were admitted for inpatient rehabilitation across Australia in 2020 (Annual AROC Report, 2018) (Stroke Foundation, 2020) with 46% of people with stroke discharged from acute care referred for some type of further rehabilitation. (Stroke Foundation, 2021) Stroke represents the third largest impairment category of all the rehabilitation episodes in the public sector. (Annual AROC Report, 2018) Furthermore, there is estimated to be 445,087 people with stroke across Australia many of whom report unmet needs. (Deloitte Access Economics, 2020)

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 and achieve the highest possible level of independence — physically, psychologically, socially and financially. Rehabilitation needs to be offered in a culturally safe and appropriate environment giving regard to a person's desires, ethnicity and belief systems. Rehabilitation must also focus on 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 hospital and community settings. (Langhorne & Ramachandra, 2020)

The infrastructure (e.g. access to inpatient rehabilitation) and resources (e.g. staffing) available for stroke rehabilitation around Australia are variable. (Stroke Foundation, 2020) 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. Inpatient services that provide specialist care on a stroke or rehabilitation unit reduce the odds of death or dependency compared to general hospital ward care. (Stroke Foundation, 2022) Workforce capacity and comprehensive team functioning are critical and national audits have noted a need for people with stroke to have better access to the full range of disciplines, and services to provide continuing staff education. (Stroke Foundation, 2020)

Significant changes have also occurred in recent years with the shift to telerehabilitation services particularly in response to the coronavirus (COVID-19) pandemic. Integration of the various rehabilitation stroke service models is now increasingly 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. Determining the most appropriate community-based rehabilitation service should consider the individual needs, goals, and preferences of the person recovering from stroke (and their family/carer) but also needs to consider the capacity of different community services to deliver adequate dose of therapy. The assessment of rehabilitation needs should occur for all people with acute stroke however, there is high variability between services. (Stroke Foundation, 2021) (Lynch, Luker, Cadilhac, & Hillier, 2016) (Grimley R. S., et al., 2019) Gaps in access to rehabilitation were more common in people with stroke with mild to moderate functional impairments. (Grimley R. S., et al., 2019) The amount of therapy rehabilitation services provide is highest during care that commences within hospital (acute stroke unit care followed by inpatient rehabilitation) with less therapy offered by various community-based services with the majority of people with stroke not receiving recommended therapy times. (Grimley R. S., et al., 2020) There is a gap in appropriate

community rehabilitation which is concerning given the trend to shorter lengths of stay in hospital rehabilitation services. (Annual AROC Report, 2018) The COVID-19 pandemic has also impacted inpatient rehabilitation services with more services provided in the community or remotely via telehealth increasing the importance of adequate community services. Transition care services are common but there are very few stroke specific early supported discharge services. (Stroke Foundation, 2020) Other post-hospital care models are needed to reduce the long-term burden due to stroke. (Boehme, Toell, Lang, Knoflach, & Kiechl, 2021)

The Clinical Guidelines for Stroke Management provide guidance for processes of rehabilitation stroke care and the Australasian Faculty of Rehabilitation Medicine (AFRM) and Australasian Rehabilitation Outcomes Centre (AROC) have published standards and outcome data for rehabilitation services.

This document complements the Acute Stroke Services Framework 2019 (Stroke Foundation , 2019) (Australia's Disability Strategy 2021-2031, 2021) and provides an update to recommendations for infrastructure, principles and models of stroke rehabilitation.

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 Australia's Disability Strategy 2021-2031 (Australia's Disability Strategy 2021-2031, 2021) This includes the promotion of personal and community support, and health and well-being of the person with a stroke. Many key areas of action of Australia's Disability Strategy 2021-2031 (Australia's Disability Strategy 2021-2031, 2021) 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:

- All people with stroke will benefit from rehabilitation 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. (Australian Stroke Coalition Rehabilitation Working Group, 2012)
- Every person with stroke has the right to choose their goals, activities and priorities.
- Rehabilitation should be client-centred. Health professionals should move towards and enable an equal partnership in care with clients, their families and significant others.
- Rehabilitation should adopt a whole person approach and which includes addressing physical, social and spiritual dimensions.
- 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.
- 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.
- 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. Resources need to be accessible for different groups (e.g. aphasia friendly, different languages).
- Rehabilitation should be provided by a specialised interdisciplinary team of health professionals throughout the care continuum. Access to specialised services (e.g.

aphasia, return to work, driving etc.) should be available at any time along the rehabilitation pathway.

- Rehabilitation should be offered in a culturally safe and appropriate environment. (Australia's Disability Strategy 2021-2031, 2021)
- Rehabilitation should be provided in an optimal amount to promote maximum recovery.

Section 2: Essential elements of inpatient stroke rehabilitation services

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

2.1. Effective links with acute service providers

Inpatient and early community-based 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.

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

Dedicated inpatient services providing rehabilitation for people with stroke have been shown to improve outcomes compared to general hospital services. (Langhorne & Ramachandra, 2020) Core to this benefit is the coordinated care of a team of health professions with skills and experience in stroke rehabilitation and recovery. It is important that staff in dedicated stroke services have ongoing access to regular professional development to maintain and update their skills and knowledge in stroke care. Multi/inter-disciplinary 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.

2.3. Co-located stroke beds within a geographically defined unit

Stroke unit care is the single most important guideline recommendation for improving stroke management. (Stroke Foundation, 2022)

The strongest evidence is for those stroke units that can provide several weeks of rehabilitation on a comprehensive stroke unit or stroke rehabilitation unit. (Langhorne & Ramachandra, 2020)

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. (Langhorne, et al., 2005)

2.4. 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.

(International Centre for Allied Health Evidence, 2010) Data from the National Stroke Audit – Acute services revealed that only 67% of people with stroke in the participating units had a documented assessment for ongoing rehabilitation.

In a literature review (International Centre for Allied Health Evidence, 2010) 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 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

a. 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.#
b. Palliation: Death is imminent, refer to palliative care team.
c. Coma and/or unresponsive, not simply drowsy – determined by criteria for minimally responsive i.e. responds to stimuli meaningfully as able.
d. Declines rehabilitation

Functional deficits may not be apparent prior to return to usual activity after hospital discharge, which may not be evident on initial inpatient assessment. Therefore, assessment of return to pre-morbid function should be confirmed early post discharge and careful discharge planning and appropriate referral to community providers is important.

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. (Hakkennes, Brock, & Hill, 2011) 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.

2.5. Written rehabilitation goal setting processes

Goal setting is a fundamental requirement of the rehabilitation process and should always take place with the stroke survivor and family/carer or significant other. (Playford, Siegert, Levack, & Freeman, 2009)

Goal setting should be:

- Client centred
- Interdisciplinary and inclusive of the person with stroke / carer
- Meaningful
- Specific, Measurable, Achievable, Rewarding, Time-based (SMART)
- Documented

Routine use of evidence-based guidelines to inform evidence-based therapy

Rehabilitation services need to be able to tailor interventions to focus on impairment, activity and participation levels and have systems in place to ensure that care is provided in accordance with the guidelines as this has been demonstrated to improve outcomes. (Hubbard, et al., 2012)

2.6. Best practice and evidence-based intensity of therapy for the goal related activity

Higher intensity therapy improves both patient outcomes and service efficiency. 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.

Rehabilitation services should structure their services to enable practitioners to provide as much physical therapy as possible with a minimum of two hours active practice (or three hours of practice per day at least five days a week. (Stroke Foundation, 2022) Providing sufficient intensity and duration of therapy overall may require therapy to be delivered on weekends.

2.7. Systems for transfer of care, follow-up and re-entry

Consumer surveys (Andrew, et al., 2013) and the Stroke guidelines (Stroke Foundation, 2022) 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.

2.8. 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. National guidelines 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. (Stroke Foundation, 2022) Rehabilitation services should provide services to meet these needs or have established links to other services providing these types of support services.

2.9. 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:

Inpatient rehabilitation services

- a) Mixed rehabilitation care
- b) Specialised inpatient sub-acute care (comprehensive stroke unit or stroke/neurological rehabilitation unit)
- c) In-reach into acute care
- d) Outreach

Ambulatory rehabilitation (undertaken outside of an overnight inpatient admission)

- a. Day hospital, outpatients
- b. Home-based (Rehabilitation-in-the-home) including early supported stroke discharge services (ESD)

Telemedicine rehabilitation support (inpatient or community settings)

3.1. 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 people with stroke who are transferred from acute care 1-2 weeks post-stroke.

Inpatient rehabilitation consists of the following characteristics:

- rehabilitation delivered in an inpatient setting (can be a co-located rehabilitation unit located within the acute hospital or stand alone, 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 people with stroke 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.

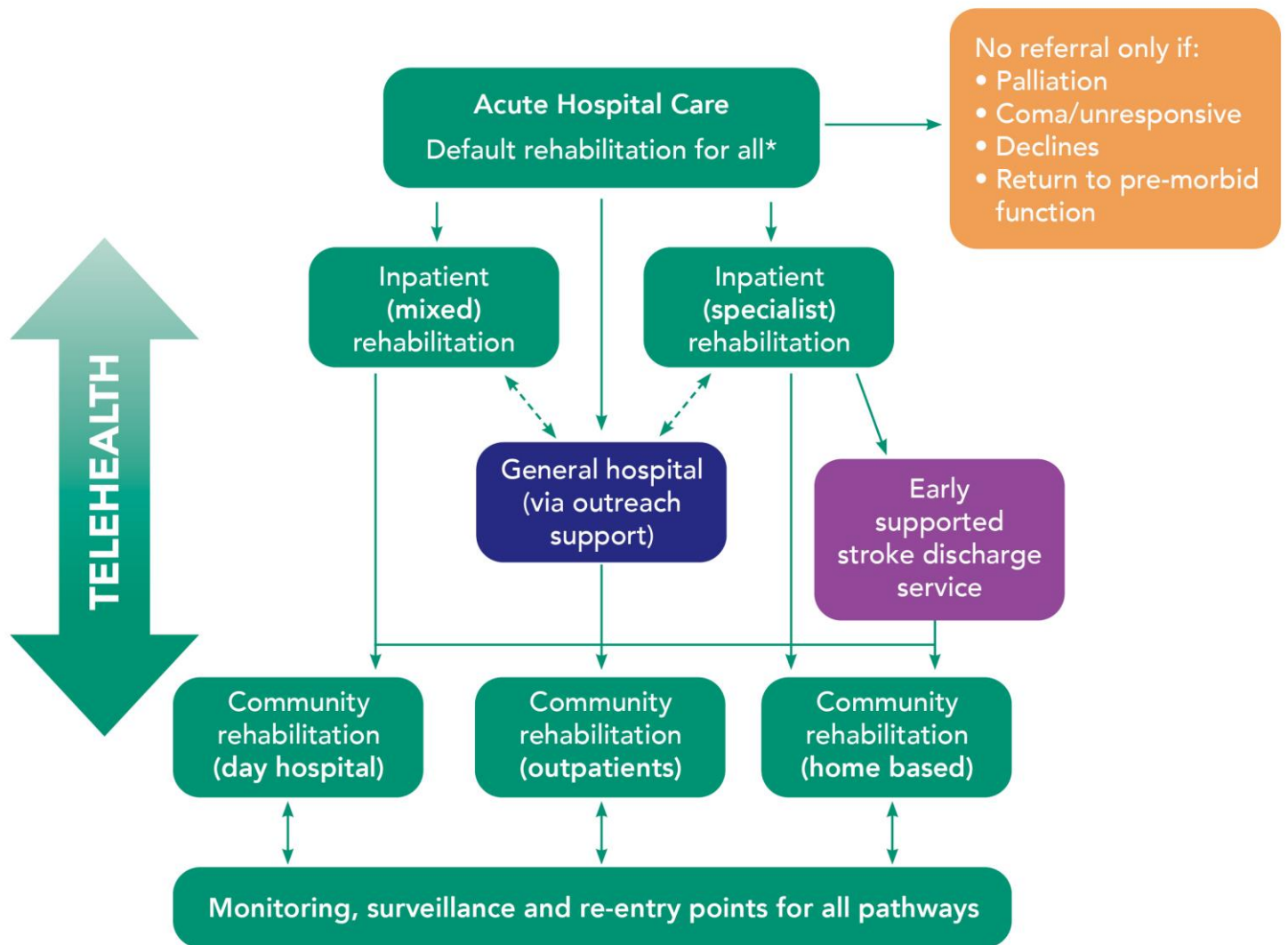


Figure 1. Models of Rehabilitation

Stroke rehabilitation may occur on a comprehensive stroke unit that manages acute stroke care and provides up to several weeks of rehabilitation on the one ward. **Stroke (or neurological) specific rehabilitation** services may also be used. Such services are characterised by the additional factors:

- Location in a geographically discrete area
- Early mobilisation and avoidance of bed rest
- Daily therapy timetable
- Staff with a special interest in the management of stroke, and access to ongoing professional development and training related to stroke rehabilitation
- Active encouragement of person with stroke and their carers/families to be involved in the rehabilitation process. (Langhorne & Pollock, What are the components of effective stroke unit care?, 2002)

Inpatient rehabilitation may involve an in-reach to acute model. Such 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 (Agency for Clinical Innovation (Rehabilitation Network), 2019)

In-reach services are 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 (Langhorne & Ramachandra, 2020) with the main difference being care provided by specialist rehabilitation team as potential interim care prior to transfer to rehabilitation.

Outreach

Outreach services are hospital-based models where care and advice is delivered and supported across more than one service, often linking specialist rehabilitation teams or personnel with general or regional/rural hospitals services.

- '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 people with stroke). Both models may run simultaneously or separately.
- Often involve ongoing education from the hub site to spoke hospital staff (via various mechanisms including telephone, telehealth or onsite).
- May involve the general practitioner (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.

3.2. Ambulatory (community based) rehabilitation

Day hospital

Characterised by:

- Intensive multi/inter-disciplinary outpatient program for people with stroke that require two or more therapy appointments
- One-on-one therapy and/or group therapy session
- Episode starts with a multi/inter-disciplinary assessment
- Program of care designed around participation level goals, short and long term
- Program is time limited (per referral episode)

Outpatients

Characterised by:

- One-on-one or group therapy – discipline specific therapy provided in an outpatient setting
- Access to a multi or inter-disciplinary team as required
- Can also be individualised and task specific

Home based

Characterised by:

- Provision of rehabilitation therapy within the home (RITH) (usual place of residence) environment
- Individualised and task specific therapy
- Also include transition care services to facilitate transition from hospital back into the community. While it is similar to stroke Early Supported Discharge (see below) they are not stroke specific and provide much lower intensity of care.

Early Supported Discharge (ESD)

Stroke Early Supported Discharge (ESD) service is a form of RITH and are defined as early discharge from the acute hospital setting with ongoing rehabilitation provided in the home. ESD is a hospital substitution model and unlike RITH has a multidisciplinary team including nurses working together to provide similar intensity of inpatient rehabilitation. ESD services are designed to provide a seamless transfer from hospital to home and enable people with stroke to be rehabilitated in their home environment. (Langhorne & Baylan, Early supported discharge services for people with acute stroke., 2017) Appropriately resourced ESD services provided for a selected group of people with stroke can reduce long term dependency and admission to institutional care as well as reducing the length of hospital stay.

ESD services consist of the following characteristics: (Fisher, et al., 2011)

- a) Stroke specific and multidisciplinary team (see Appendix 2 for recommended team composition);
- b) Offer coordinated and planned discharge from hospital and continued rehabilitation when people with stroke 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 2 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. (see Appendix 2 for measures)

The establishment of stroke ESD services linked to comprehensive inpatient stroke services is recommended. (Stroke Foundation, 2022)

3.3. Telehealth rehabilitation support (inpatient or community settings)

Telehealth is an important emerging mode of delivering stroke rehabilitation. Many interventions have tested telehealth compared to face-to-face delivery and found equivalent outcomes. (Laver, et al., 2020)

Telehealth services may be used as an alternative approach to delivering rehabilitation, especially for people with stroke who cannot access specialist rehabilitation in the community. It may also be used as an adjunct to in-person therapy. Delivering of specific interventions via telehealth should only be considered for those that have demonstrated benefits. (Stroke Foundation, 2022) Person with stroke and carer/family preference should also be considered when offering telehealth rehabilitation services.

Section 4: Community Reintegration and long-term recovery

The early post-discharge period is consistently reported by stroke survivors and their families/carers to be a difficult time. (Stroke Foundation, 2022) Furthermore, recurrent cardiovascular disease, complications, ongoing neurological deficits, and often limited medical and psychosocial care all contribute to long-term disability and lower quality of life. (Boehme, Toell, Lang, Knoflach, & Kiechl, 2021) Long term unmet needs remain high for both stroke survivors (Guo, et al., 2021) (Lin, et al., 2021) and carers. (Denham, et al., 2022) (Zawawi, Aziz, Fisher, Ahmad, & Walker, 2020) The common unmet needs of community-dwelling people with stroke include physical, psychosocial and informational needs with high prevalence 6 months to 2 years after stroke. (Lin, et al., 2021) (Guo, et al., 2021) This time period is often after formal rehabilitation services have concluded and there is limited, or no formal reassessment and re-entry opportunities. Common unmet needs for carers include information and service accessibility, and emotional and psychological wellbeing. (Denham, et al., 2022)

There has been a greater focus in the last decade on follow-up services to support not only risk factor management but management of physical and psychological complications. However, there remains a gap in system-wide models of follow up for stroke.

Transition between hospital and community

The safe transition between hospital and the community is a complex process and requires early planning, assessment of the survivor of stroke needs and effective communication with the survivor of stroke, their family/carer and those services in the community providing support and follow-up care. (Stroke Foundation, 2022) 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.

Research on the barriers and enablers to the hospital to community transition identified three main findings: (Chen, Dongxia Xiao, Chamberlain, & Newman, 2021)

- a. Involving people with stroke/caregivers in true partnership empowers discharge planning, helps to navigate health and social care systems and activate self-management capabilities.
- b. Poor discharge planning and post-discharge support contribute to unmet care needs and inability to cope with poststroke changes.

- c. People with stroke/caregivers expect integrated transitional care services that promote shared decision-making and encourages long-term self-management.

Comprehensive planning for discharge from hospital is therefore critical. 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 (i.e. where the person with stroke has moderate to severe effects of stroke and requires the input of a carer to assist in day to day activity).
6. A post-discharge care plan that outlines goals, follow up appointments, secondary prevention advice, and other relevant information. Such information is embedded within the 'My Stroke Journey' booklet (see <https://strokefoundation.org.au/What-we-do/For%20survivors%20and%20carers/My-Stroke-Journey>) . Information should be completed by the person with stroke and their family/carer in collaboration with the rehabilitation team.
7. Provision of information about local stroke support groups and self -management programs.
8. Provision of other relevant information. A number of 'fact sheets' are available nationally (<https://strokefoundation.org.au/What-we-do/For-survivors-and-carers/stroke-resources-and-fact-sheets>).

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, EnableMe, StrokeConnect program) and self-management programs
- Systems for follow up and re-entry post-discharge are discussed and documented.

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 survivor of stroke) significant changes are identified on regular review.

Long term recovery

While the highest opportunity for recovery occurs within the first few months of stroke, there is clear evidence that benefits of rehabilitation can continue to be achieved over time. Overall language ability improved for people enrolled in studies over three months after stroke although the improvements were less than for people enrolled in the first 1-3 months. (REhabilitation and recovery of peopLE with Aphasia after stroke (RELEASE) Collaborators, 2021) Similarly, increasing the amount of physical therapy improves the likelihood of a treatment effect irrespective of time since stroke. (Lohse, Lang, & Boyd, 2014) Ongoing regular physical activity regardless of mobility is also recommended and those with difficulties in personal or extended activities of daily living also benefit from therapy in the

community. (Stroke Foundation, 2022) (Legg, Lewis, Schofield-Robinson, Drummond, & Langhorne, 2017) Conversely people may deteriorate when rehabilitation ceases.

There has been a greater focus in the last decade on follow-up services to support not only risk factor management but management of physical and psychological complications. However, there remains a gap in system-wide models of follow up for stroke. Established links between primary health, community health and rehabilitation services are urgently required to enable potential review by specialist rehabilitation services and periodic intensive rehabilitation when a person affected by stroke is found to have significant changes on regular review. Links are most important in regional and rural locations without specialist stroke rehabilitation options. The use of telehealth and virtual reality therapy are expanding and is an important option that can enable specialist rehabilitation staff provide support to people wherever they live.

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 people with stroke admitted to the rehabilitation service.

There should be sufficient team member hours available to allow each person with stroke 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 person with stroke has limitations as there are many factors to consider (staff expertise, organisation of services e.g. group therapy sessions etc). AFRM standards³² provide consensus-based recommendations for staffing levels for inpatient and ambulatory rehabilitation (refer Appendix 3 and 4). 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).

The majority of people with strokes 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 person with strokes with complex behavioural issues are treated and where adjustment to a disability may be an issue.

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, Cultural Support Services should be considered.

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 research and data and quality improvement activities.

Consideration should be given to the structure of the team: multi-disciplinary denotes little interaction between disciplines and highlights specialisation of roles at the expense of some duplication; inter-disciplinary allows purposeful role-overlap and requires more coordination; trans-disciplinary offers role sharing and reduces repetition and potential confusion for the person with stroke. Qualitatively people with stroke want clarity and reduced repetition (e.g. of assessment) and to be part of the team that has shared goals.

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 ASC national framework for data and quality
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
 - o discharge destination of person with stroke
- Processes of care measures
- Functional change – use tool specific to setting e.g. Modified Rankin / FIM or Australian Modified Lawton's IADL Scale (for ambulatory care settings)
- Stroke survivor participation in the community
- Quality of life e.g. AQoL or EQ5D
- Patient satisfaction
- Access to community support.

There currently exist a number of national and state-based audit programs across Australia. The Stroke Foundation monitors and measures the delivery of best practice stroke care, as outlined in the Clinical Guidelines for Stroke Management which are now 'living' guidelines regularly updated to reflect the best available evidence, 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 to inform quality improvement activities.

AROC is a joint initiative of the Australian rehabilitation sector (providers, funders, regulators and consumers). AROC includes both inpatient and ambulatory datasets. Inpatient 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. (University of Wollongong, Accessed 28 February 2022)

As a minimum all hospitals should participate in routinely collecting and monitoring of rehabilitation outcomes (via AROC) and the biennial national stroke rehabilitation audit for processes of care as well as participate in ongoing quality improvement programs. 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 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. Importantly this Framework aligns with other national documents such as the AFRM standards (2019 and 2014) and Australia's Disability Strategy 2021-2031. Overlap and alignment with relevant state-based frameworks should also be considered in each jurisdiction (e.g. the NSW ACI Rehabilitation Network: Principles to Support Rehabilitation Care, 2019).

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

- All inpatient 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 inpatient 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). 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.
- Ambulatory care services should routinely monitor patient outcomes (e.g. AROC ambulatory care dataset)
- Expansion and standardisation of community-based rehabilitation models of care should occur. Multidisciplinary transition services should apply principles relevant to Early Supported Discharge services and be able to provide similar access to full multidisciplinary team and intensity of therapy.
- Stroke specific ESD services should be established where comprehensive acute stroke services and larger primary stroke services exist.
- This framework be used in conjunction with other national and state-based documents and the Clinical Guidelines for Stroke Management to increase outcomes for those recovering from a stroke in Australia.

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Appendix 1 National Rehabilitation Stroke Services Framework (NRSSF)

Mapping Areas of Action of Australia's Disability Strategy 2021-2031 to the National Rehabilitation Stroke Services Framework (NRSSF)

Personal and Community Support

Policy Priority 1: People with disability are able to access supports that meet their needs

- The NRSSF recommends clear assessment of rehabilitation needs and co-developed goals (Essential element 4 and 5).
- The NRSSF recommends systems for follow-up and appropriate provision of support to maximise community participation and long-term recovery (Essential element 8)

Policy Priority 2: The National Disability Insurance Scheme (NDIS) provides eligible people with permanent and significant disability with access to reasonable and necessary disability supports

- The NRSSF supports the role of the NDIS in providing people with stroke with disability support (Section 4)

Policy Priority 3: The role of informal support is acknowledged and supported

- The NRSSF strongly acknowledges the need to support not only the person with stroke but the carer in the recovery after stroke (Essential element 9).

Policy Priority 4: People with disability are supported to access assistive technology

- The NRSSF discusses the need, especially during the transition phase between hospital and community care, where needs of the person with stroke must include equipment which would include assistive technology (Section 4)

Health and Well-being

Policy Priority 1: All health service providers have the capabilities to meet the needs of people with disability

- The NRSSF recommends clear assessment of rehabilitation needs and co-developed goals (Essential element 4 and 5).
- The NRSSF recommends systems for follow-up and appropriate provision of support to maximise community participation and long-term recovery (Essential element 8)
- The NRSSF discusses the important of adequate staffing to ensure patient needs are met and the education and ongoing professional training relevant to stroke (Essential element 2 and Section 5)

Policy Priority 2: Prevention and early intervention health services are timely, comprehensive, appropriate and effective to support better overall health and wellbeing

- The NRSSF recommends clear links between acute and post-acute services to provide seamless and comprehensive care (Essential element 1)
- The NRSSF recommends clear assessment of rehabilitation needs and co-developed goals (Essential element 4 and 5).
- The NRSSF recommends delivery of evidence-based care in line with guidelines with adequate intensity to reach patient goals (Essential element 6 and 7).

Policy Priority 3: Mental health supports and services are appropriate, effective and accessible for people with disability

- The NRSSF strongly acknowledges the need to support not only the person with stroke but the carer in the recovery after stroke which includes social and psychological support (Essential element 9).
- The NRSSF recommends systems be available that meets the complex needs of people with stroke and their carer including follow-up and re-entry pathways (Essential element 8).

Policy Priority 4: Disaster preparedness, risk management plans and public emergency responses are inclusive of people with disability, and support their physical and mental health, and wellbeing

Appendix 2 Early Supported Discharge Services

Team Composition for Implementation of Early Supported Discharge Services (Fisher, et al., 2011)

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"> - Physiotherapist - Occupational therapist - Nurse - Speech Pathologist - Physician - Social worker - Administrative Support Person Additional team members such as dietetics, allied health assistant, clinical psychology and dedicated team leader support should also be considered.
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"> 1.0 Physiotherapist 1.0 Occupational Therapist 0.4 Speech Pathologist 0–0.5 Social Worker 0–1.2 Nurse 0.1 Physician

Model of Team Work for Implementation of Early Supported Discharge Services
(Fisher, et al., 2011)

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 at least on a weekly basis (a daily huddle may also be useful to determine priorities)
5. An early supported discharge team should be based in the hospital

Intervention strategy for Implementation of Early Supported Discharge Services
(Fisher, et al., 2011)

1. Specific process should be followed by either hospital staff or ESD staff to identify potential patients for early supported discharge
2. Specific eligibility criteria for early supported discharge should be followed. Criteria would include if the patient is medically stable, level of disability and ability to safely live at home, ability to transfer safely from bed to chair independently or with a carer), or practical reasons (whether the patient is living within the local area)
3. 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
4. Most patients eligible for early supported discharge would have a Barthel score of between 10/20 and 17/20

Measuring success of Early Supported Discharge Services (Fisher, et al., 2011)

1. Hospital length of stay
2. Readmission rates
3. Patient dependence/stroke severity (e.g. modified Rankin or Barthel score)
4. Patient ADL ability (e.g. Australian Modified Lawton's IADL Scale)
5. Patient and carer satisfaction
6. Patient reported health status / quality of life measure
7. Mood evaluation
8. Costs of the service

Appendix 3 AFRM Inpatient Adult Rehabilitation Medicine Services Standards 2019

1. Governance

A specialist rehabilitation medicine service will be under the direction of a rehabilitation medicine physician (Fellow of the AFRM) and provides comprehensive, person-centred interdisciplinary care. This care is evidenced by the establishment of achievable treatment goals, the periodic assessment and documentation of the functional status of patients, the occurrence of regular case discussion amongst treating practitioners, and attention to the optimal management of concurrent medical problems and psychosocial issues. The primary objective of care is to help patients achieve their optimal level of functioning and participation in society.

2. Staffing

Staffing includes a range of team members (medical, nursing, allied health and support staff) with an appropriate skill base and training to provide comprehensive, contemporary programs of care to address the impairments, activity limitations and participation restrictions present in the patients admitted to the rehabilitation medicine service. There are sufficient team member hours available to allow each patient to receive an individualised nursing and allied health program of adequate intensity to meet their needs, delivered in a way that optimises the effectiveness and efficiency of the rehabilitation program.

3. Facilities and equipment

The facilities and equipment are both adequate and appropriate for the rehabilitation needs of patients and are also able to provide a safe learning environment for retraining in lost skills.

4. Policies and procedures

There is documentation of policies and procedures to ensure safe, appropriate, accountable, effective and measurable improvement in the patients involved in rehabilitation programs.

5. Quality improvement and risk management activities

The service has a quality improvement and risk management framework with appropriate single discipline and multidisciplinary activities and projects addressing consumer engagement, access, appropriateness, effectiveness, safety and efficiency. The service submits data to the Australasian Rehabilitation Outcomes Centre (AROC) and regularly reviews its performance against benchmarks established by AROC. The service participates in an accreditation process as provided by an external hospital accreditation organisation recognised in Australia or New Zealand.

6. Education and Teaching

The service is actively engaged in continuing education, teaching and continuing professional development.

7. Research

The service promotes the importance of and is actively engaged in research activity.

Recommended staff to patient ratios for each 10 stroke/neurology inpatients

Staff member	Ratio per 10 inpatients
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Rehabilitation physician	0.8
Registrar	0.5
Resident medical officer	0.5
Nursing (including a supernumerary full time nurse unit manager)	11.75-14.75
Clinical nurse Consultant (rehabilitation)	0.5
Nurse educator (rehabilitation)	0.5
Occupational therapy	1.5
Physiotherapy	1.5
Allied health assistant	0.5
Speech Pathology	1.5
Clinical psychology	0.5
Neuropsychology	0.5
Social work	1.0
Dietitian	0.5

Notes:

- Based on five day a week service (six or seven day services will require additional staffing)
- Additional levels should be considered to cover for leave
- Staffing includes clinical care and additional time should be considered to factor in teaching and research activity
- Different services may determine nursing numbers due to local methods to meet specific needs
- Casemix should be considered
- Pharmacist input is also recommended

Appendix 4 AFRM Rehabilitation Medicine Services Standards Ambulatory Care 2014

1. GOVERNANCE

A specialist rehabilitation medicine service under the direction of a rehabilitation physician (Fellow of the AFRM or equivalent) provides comprehensive, person-centred multidisciplinary care. This care is evidenced by the establishment of achievable treatment goals, the periodic assessment and documentation of the functional status of patients, the occurrence of regular case discussion amongst treating practitioners, and attention to the optimal management of concurrent medical problems and psychosocial issues. The primary objective of care is to help patients achieve their optimal level of functioning and participation in society

2. STAFFING

There is a full range of team members (medical, nursing, allied health and support staff) with an appropriate skill base and training to provide comprehensive, contemporary programs of care to address the impairments, activity limitations and participation restrictions present in the patients attending the ambulatory rehabilitation service. There are sufficient team member hours available to allow each patient to receive an individualised nursing and allied health program of adequate intensity to meet their needs, delivered in a way that optimises the effectiveness and efficiency of the rehabilitation program.

3. FACILITIES AND EQUIPMENT

The facilities and equipment are safe, adequate and appropriate for the rehabilitation needs of patients. Facilities should support families and care givers to remain in attendance and be involved in the patient's rehabilitation program. Rehabilitation is also provided in patients' homes and the community. If the rehabilitation is provided in patients' homes, then the safety of the attending clinicians must be considered.

4. POLICIES AND PROCEDURES

There is documentation of policies and procedures to ensure safe, appropriate, accountable, effective and measurable improvement in the patients involved in rehabilitation programs following illness or injury.

5. QUALITY IMPROVEMENT AND RISK MANAGEMENT ACTIVITIES

The service has a quality improvement and risk management framework with appropriate single discipline and multidisciplinary activities and projects addressing consumer involvement, access, appropriateness, effectiveness, safety and efficiency. The service will submit data to the Australasian Rehabilitation Outcomes Centre (AROC) and will regularly review its performance against benchmarks established by AROC.

6. EDUCATION AND RESEARCH

The service is actively engaged in continuing education and teaching and actively promotes the importance of research.

Table 5. Ambulatory Rehabilitation Services (neurology)

Staff member	Relative time associated
Rehabilitation physician	Medium
Nursing	Low
Occupational therapy	High

Physiotherapy	High
Allied health assistant	Medium
Speech Pathology	High
Clinical and or neuro psychology	High
Social work	High
Dietitian	Low







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How to get more involved

-  **Give time** – become a volunteer.
-  **Raise funds** – donate or hold a fundraising event.
-  **Speak up** – join our advocacy team.
-  **Leave a lasting legacy** – include a gift in your Will.
-  **Know your numbers** – check your health regularly.
-  **Stay informed** – keep up-to-date and share our message.

Contact us

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