Central Adelaide Local Health Network
Central Adelaide Rehabilitation Service

SA Brain Injury Rehabilitation Service

Sub-Acute Model of Care

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Contents

Purpose of Document .......................................................................................................................... 5

1. ABI Rehabilitation .......................................................................................................................... 5
   A. Objectives ................................................................................................................................. 7
   B. Governance .............................................................................................................................. 7
   C. Principles of Care ...................................................................................................................... 7

2. Models of Care ............................................................................................................................... 8
   Subacute Rehabilitation Eligibility Criteria .................................................................................. 10
   Subacute Rehabilitation Referral process ..................................................................................... 10
   Subacute Rehabilitation Intervention ........................................................................................... 10
   Subacute Rehabilitation Discharge Criteria .................................................................................. 11
   A. Workforce ............................................................................................................................... 12

Workforce Requirements .................................................................................................................. 12

B. Support Service requirements ..................................................................................................... 13

Infrastructure and Equipment to support and implement the Model: .............................................. 14

4. Appendix 1- Indicative pathways .................................................................................................. 15

5. Appendix 2- Service Gaps and Risks .......................................................................................... 17
   1. Services required to successfully implement the Model .......................................................... 17
   2. Infrastructure required to support and implement the Model ............................................... 21

BIRU ward and therapy spaces ........................................................................................................... 21
Office space........................................................................................................................................... 22

Early and safe discharge - Transitional Living Units........................................................................... 23

Hydrotherapy Pool.................................................................................................................................. 23

Car Parking............................................................................................................................................... 23

3. Workforce requirements for successful implementation of the model................................. 23

4. Equipment requirements for successful implementation of the model .................................. 24

5. Technology.......................................................................................................................................... 25

6. Other considerations ............................................................................................................................ 25

6. Appendix 3 - References..................................................................................................................... 26
Abbreviations key

ABI- Acquired brain injury
AFRM-The Australasian Faculty of Rehabilitation Medicine
BIRCH- Brain Injury Rehabilitation Community and Home
BIRU-Brain Injury Rehabilitation Unit
CALHN-Central Adelaide Local Health Network
CARS- Central Adelaide Rehabilitation Services
CSP-Clinical Services Profile
DCSI-Department for Communities and Social Inclusion
DRS- Day Rehabilitation Services
GP-General practitioner
HRC- Hampstead Rehabilitation Centre
OPC-Out Patient Clinics
nRAH- New Royal Adelaide Hospital
NTRU – Neurotrauma Rehabilitation Unit at nRAH
RITH- Rehabilitation in the Home
SABIRS- South Australian Brain Injury Rehabilitation Services
TBI-Traumatic Brain Injury
TQEH- The Queen Elizabeth Hospital
Purpose of Document

This document outlines a proposed model of care for Acquired Brain Injury (ABI) specialist subacute rehabilitation beds based in SA, within Central Adelaide Local Health Network. Recommendations are provided regarding the objectives, governance and overarching principles of care, the patient cohort, model of care, and enablers.

1. ABI Rehabilitation

The South Australian Brain Injury Rehabilitation Service (SABIRS) is the state-wide service providing integrated specialist rehabilitation services for South Australia. SABIRS is a part of Central Adelaide Rehabilitation Services (CARS). SABIRS provides specialist rehabilitation services for adults who have sustained neurological impairment due to an acquired brain injury (ABI). SABIRS provides specialist services across the care continuum, including: Rehabilitation Medicine consultancy in the acute setting, acute rehabilitation, sub-acute inpatient rehabilitation, specialist outpatient clinics, centre-based and home-based ambulatory rehabilitation, outreach services (country clinics and telerehabilitation), and collaboration with community services that provide support for people with an ABI (refer to SABIRS Clinical Service Profile).

The Model of Rehabilitation for ABI in South Australia (2012) was developed and endorsed by the Rehabilitation Clinical Network, based on best available evidence and extensive consultation, to be a blueprint for service delivery. The Model of Rehabilitation for ABI supports early commencement of rehabilitation in the acute sector and seamless transitions across sub-acute and ambulatory settings.

Under Transforming Health there is a proposal to reduce acquired brain injury inpatient rehabilitation beds to 16 inpatient beds, and to have 6 acute rehabilitation beds co-located with the Neurosurgical Unit reserved for acute brain injury rehabilitation (Neurotrauma Rehabilitation Unit-NTRU) in the new Royal Adelaide Hospital. It is recommended that Central Adelaide LHN consider and implement the proposed ABI rehabilitation model outlined in this paper.

Best evidence-based practice for brain injury rehabilitation mandates contextual learning and co-location of the inter-disciplinary team. Therefore most activities should take place on the ward not in an area removed from the ward. BIRU must have its own gym area, therapy kitchen, dining room, client laundry, computer area and therapy/small rooms to enable ward based activities that simulate...
the demands of living in the community. It also must have recreation areas where individuals and groups undertake therapeutic recreational activities that have additional value.

Location of therapy areas within the ward is critical for the interdisciplinary approach which is best practice for working with patients with ABI. Staff from different disciplines collaborate in the delivery of individualised patient rehabilitation programs. Co-location of staff and therapy spaces is critical to achieving patient goals and facilitating timely discharge. Therapy within the ward environment is particularly important for ensuring a 24 hour rehabilitation approach. Supervised therapy facilities located on the ward are also accessible to patients to work more independently as their condition improves.

Ward based therapy facilities are also essential for the following reasons:

1) Patient safety - Many ABI patients are not safe to travel between separated ward and therapy spaces, due to the risk of brain overstimulation leading to agitation and increased occurrence of challenging behaviours.

2) Patient dignity – Timely and respectful nursing management of adult incontinence episodes that are known to occur throughout rehabilitation of ABI patients. This enables prompt resumption of the therapy activity.

3) Complex needs - Timely nursing management of complex needs on the ward minimises therapy interruptions, for example, tracheostomy management, peg feeds, frequent neurological/cardiovascular observations during therapy.

4) Staff safety - Staff working in the same area provides immediate support and response around management of challenging behaviours

5) Staff resources - A high proportion of patients who have independence within the ward would need staff assistance with transport to a separate therapy space. Having therapy and ward co-located allows therapists access to patients throughout the day, saving time, and allowing therapists to monitor and assess patients throughout the day

6) Patient progress towards discharge - Co-location promotes patient independence, as some of the patients can access therapy space themselves.

7) Patient projects – Supervised project work available within the ward environment motivates patients to support each other around projects and goals, promoting social skills development.

Co-location supports greater intensity of therapy, as patients are more accessible, and less time is lost managing the distance between areas. Co-location also supports greater rehabilitation efficiency.
A. Objectives

The objective of specialist ABI subacute inpatient rehabilitation is to:

- Provide the rehabilitation model, staffing and facilities required to provide intensive, specialised interdisciplinary rehabilitation to optimise goal directed functional progress, decrease carer burden, minimise complications and enable people with complex ABI to live safely in the community and to build on their skills and lifestyle with ambulatory/community-based rehabilitation.

- Provide targeted and effective rehabilitation in a 24 hour facility for patients with ABI who require a secure environment for safety in the early phase of rehabilitation.

- Provide dedicated support to families and other carers to learn the care requirements for an individual following complex ABI, to support their successful return to the community.

- Streamline care and develop best practice protocols and pathways across care settings.

- Cohort patients to ensure staff have the appropriate skillsets to manage their complex rehabilitation needs.

- Optimise bed management and the patient journey.

B. Governance

Patients admitted to the ABI Rehabilitation beds would transfer to a rehabilitation code for case-mix and be managed by the Rehabilitation consultant. This case-mix coding enables rehabilitation funding from the point of admission to these beds and a rehabilitation model of care to be provided.

C. Principles of Care

The guiding principles of this model are consistent with the State-wide Rehabilitation Service Plan (2009) and SA Health’s aim to optimise care by providing the right care, at the right time, in the right place; consistency and equity in access; seamless services; partnerships in service delivery; and by offering patient centred care that optimises physical recovery, function and psychosocial wellbeing, maximises independence, vocation & lifestyle opportunities.1

This model operates within a rehabilitation framework. Rehabilitation is “the process of assessment, treatment and management with on-going evaluation by which individuals (and their family/carer)
are supported to achieve their maximum potential for physical, cognitive, social and psychological function, participation in society and quality of living”. ²

Each person’s brain injury and situation are unique. Best practice rehabilitation maintains the expressed wishes and priorities of the patient at its centre.

Rehabilitation is a collaborative process with a team including the patient, their significant others and rehabilitation staff.

Rehabilitation services are planned and delivered to be relevant and meaningful for the patient and their significant others. Early commencement of rehabilitation services supports best outcomes.

Rehabilitation is a dynamic and creative process of skill building and adaptation which is undertaken in a spirit of optimism, respect and flexibility.

2. Models of Care

The following pathways are all elements of the SABIRS model of care

A. Acute to NeuroTrauma Rehabilitation Unit (NTRU) (nRAH site)

B. Acute and/or NTRU to subacute inpatient rehabilitation

C. Community to subacute inpatient rehabilitation

D. Subacute to Rehabilitation In The Home

E. Subacute to maintenance care setting (Patients on maintenance care)

F. Acute/ Subacute/Community to Ambulatory

G. Acute to Concussion clinic/ABI clinic

This paper focusses on subacute inpatient rehabilitation (B and C)

B. Acute and/or NTRU to subacute inpatient rehabilitation:
The role of the Brain Injury Rehabilitation Unit is primarily to provide comprehensive rehabilitation services for adults of working age and adolescents who are no longer in secondary schooling and have:

**Traumatic brain injury or**

- Acquired brain injury as the result of
  - intracerebral haemorrhage
  - hypoxia
  - metabolic injury
  - infection
  - neurosurgical procedures
  - tumour

Other neurological injury will be considered on an exceptional needs basis. *Generally excludes patients with a progressive/degenerative neurological condition.*

**BIRU provides specialised inpatient rehabilitation to patients with traumatic or acquired ABI who:**

- Require intensive neuro-rehabilitative nursing and interdisciplinary services and can participate in therapy involving two or more disciplines. Tolerates minimum two hours therapy per day
- Have identified goals directed at regaining functional skills, increasing independence, improving quality of life, and reducing carer burden.
- Agree to participate in active rehabilitation (or have consent from their guardian).
- Have physical and cognitive potential to improve.
- Are making reasonable functional progress.
- Are medically stable and can be managed safely in the BIRU rehabilitation environment.
- An elective bed is allocated for patients assessed by SABIRS as needing rehabilitation admission or readmission from community.
- Admission of a patient with tracheostomy will need to be negotiated.
- Require a 24 hour rehabilitation facility.
- Require 24 Hour nursing care.
- Require establishment of a model of care (model of care pathway)

Admission to BIRU is managed by BIRU Allocation team following acute hospital triage /subsequent consultation. Admission is prioritised according to clinical status and available resources.
C. Community to subacute inpatient rehabilitation

A time limited admission from the community will be considered for targeted goal oriented rehabilitation e.g. behaviour support, medication adjustment, spasticity management. Community admissions will also be considered to determine / review model of care.

Subacute Rehabilitation Eligibility Criteria

Patients are not eligible for admission

- If medically unstable
- If no SMART rehabilitation goals identified by patients/families/SABIRS team.
- If ABI is predominantly due to alcohol-related brain damage, with main need for alcohol rehabilitation services rather than specialised ABI services.
- If only waiting for placement.

Subacute Rehabilitation Referral process

Coordinated referral entry system / standardised process for early notification for consult and for inpatient bed referrals. Triage assessment to identify appropriate ABI pathway. Eligibility and readiness for rehabilitation needs to be established. Rehabilitation Consultant triage should happen once a week and liaison nurse/ Registrar triage throughout the week.

Subacute Rehabilitation Intervention

Aim: To provide intensive inter-disciplinary rehabilitation to enhance functional gains following ABI.

Rehabilitation interventions include:

- Specialist multi-disciplinary assessment, individualised short term goal setting and discharge planning based on necessity for safe discharge and preparation for successful community living.
- Daily intervention and onward referral to other services.
- Rehabilitation may include: building patients’ awareness of their capabilities and limitations, learning skills and strategies to promote function, independence and progress, communication and cognitive rehabilitation, training for physical and mobility skills, family training for their provision of care and support, graded preparation for community living including home skills, parenting and community access.
- Carer / family training needs to start early.
- Behaviour support programmes for patients with challenging behaviours. Secure lockable areas within the ward are essential to prevent patients with challenging behaviours from harming others.
- A sensory room that helps patients suffering from overload to unwind and have peaceful moments is also an essential element of their rehabilitation environment

**Subacute Rehabilitation Discharge Criteria**

Discharge / transfer from the subacute brain injury rehabilitation beds is coordinated by the Rehabilitation team, and guided by individual goal attainment and service discharge criteria. The Rehabilitation service will proactively manage and transfer patients to the most appropriate setting, facilitating discharge from the subacute setting as soon as practical and clinically indicated. The interdisciplinary rehabilitation team will utilise team huddles and journey boards to support the discharge planning process.

Rehabilitation goals and individually prescribed equipment (e.g. specialised wheelchairs) will follow the patient during their journey (to avoid duplication), where applicable.

Patient pathways are fluid and vary according to individual needs. Some indicative pathways are illustrated in Appendix 1.

Discharge pathways include:

- Discharge to home / community (includes residential care), with appropriate community services support, in collaboration with the general practitioner (GP) and with access to ongoing SABIRS ambulatory and outpatient services.
- Transfer to a general rehabilitation unit or general hospital including country hospital with access to in-reach support from SABIRS.
- Transfer to a maintenance care facility when inpatient rehabilitation phase has finished and awaiting supported accommodation.
- Transfer to Department for Communities and Social Inclusion (DCSI) services.
- Transfer to an independent living unit.

Models of Care for Subacute to Rehabilitation In The Home, Subacute to maintenance care setting. Acute/ Subacute/Community to Ambulatory and Acute to Concussion clinic/ABI clinic exist or are being developed.
3. Enablers

A. Workforce

Brain Injury Rehabilitation is a complex, specialist area of practice that requires dedicated staff with Rehabilitation expertise and specialised knowledge and skills in brain injury. This model requires a dedicated, specialist interdisciplinary team sufficient for bed base, at optimal intensity of input.

Workforce Requirements

Rehabilitation Services are provided primarily by medical, nursing and allied health staff. Staffing of rehabilitation services needs to be appropriate in terms of both to the quantum of staff (FTE) and mix of skill levels and expertise required to deliver safe and effective clinical care and to deliver best outcomes. This should be across all rehabilitation services. Staffing for inpatients needs to cater for current and planned bed numbers and to enable an optimal level of rehabilitation intensity and frequency required over 5 days minimally but over 6-7 day days in the longer term where this is appropriate and will improve patient outcomes. Staffing also needs to be appropriate for home, centre and community based ambulatory services. AFRM provides guidelines for staffing to bed ratios for inpatients.

Staffing levels in all areas need to incorporate time to allow for teaching, administration, quality improvement and clinical research. There needs to be an acknowledgement of the importance of student supervision in all disciplines and across the continuum of care for future capacity building and the dedicated time that is required to ensure student experience on placement is meaningful and worthwhile and that patient care is maintained.

Mechanisms should be in place for all staff to have appropriate development and supervision opportunities to continue to develop skills in rehabilitation. Medical staff include Rehabilitation Consultants, Registrars and Interns. Staffing levels need to be able to cover triage and assessment and after hours and weekend work. Medical staffing need to be available to service the growing number of patients who require specialist intervention, and to allow for clinics to be offered in other locations in metropolitan Adelaide as well as peri-urban and country locations (face to face and e-health).

Nursing staff involved in rehabilitation may range from generalist nurses to advanced practitioner nurses with specialist skills in rehabilitation. Specialised nursing staff can provide 7 day rehabilitation services including weekend recreation options for inpatients.
Nursing staff will also be involved in outpatient and outreach clinics. Allied Health staff in most rehabilitation settings include physiotherapy, occupational therapy, social work, speech pathology and dietetics. Clinical psychology, neuro psychology, podiatry, exercise physiologists are part of more specialised rehabilitation services (level 5 and 6). Specialised Statewide Services have staff focussed on lifestyle issues such as recreational and vocational officers. Allied Health staffing working in level 5 and 6 units should meet the rehabilitation core competencies as a minimum requirement.

Statewide Services should be providing evidence based services. They also have an important role in providing consultancy, education, advice and support to community and country services and in capacity building community organisations. Staffing needs to address these important roles and provide support to generalist services and country clinicians, when patients transfer to country areas for their ongoing rehabilitation or when being discharged to more generalist services. Support for country patients will be offered via telehealth options, education and training and interdisciplinary staff visits if required.

Additional staffing to support the rehabilitation of patients with an ABI includes dedicated support service officers, dedicated clinical pharmacist, administration staff, food services, and volunteers.

B. Support Service requirements

This Model does not work in isolation, but should be considered within the context of the SABIRS CSP and all its service elements, and other interdependencies.

In line with the single service, multiple site model, and the intent of the state-wide services models of rehabilitation to consider the holistic needs of patients, there will be a range of rehabilitation services across the continuum to be able to provide the right care in the right place at the right time. This includes both CAHLN and SABIRS programs.

The Model of Care outlines the core functioning of the unit, but does not provide the details to ensure the successful planning for the implementation of the model. The proposed Model of Care document outlines a number of discharge pathways so that the Rehabilitation service can manage and transfer patients to the most appropriate setting, however many of these discharge pathways do not currently exist for patients with an ABI. The Model also assumes that additional services are in place. These current gaps in service are described in Appendix 3.

It is essential that appropriate specialist ABI ambulatory services exist to provide a continuation of care following the inpatient episode, facilitating early discharge and avoiding unnecessary transfers
and re-admissions. This is particularly required in order to support the efficiencies required to support a reduction in the total number of SABIRS rehabilitation inpatient beds across CAHLN.

Working as a single service across multiple sites will require access to timely transport and storage for equipment items, tech staff etc. to move between the acute, sub-acute and storage sites.

Access to other specialties, by referral is required on a needs basis.

Administrative and data collection support is required.

**Infrastructure and Equipment to support and implement the Model:**

- Access to therapy areas on the ward, this includes a large communal gym space, recreation activity room, and individual therapy rooms, sound rated.
- Storage space (on or off ward) for equipment and workshop items that cannot be stored in the therapy space.
- Therapy and ward equipment for rehabilitation.
- Access to larger IT-enabled meeting room(s) suitable for family meetings, and team meetings, co-located on the ward.
- Individual therapy rooms should have networked PC with nearby printer access to support patient clinical sessions with access to information and resources.
- Secure communal dining space for patients.
- Access to telerehabilitation facilities to support transitions to regional services.
- Dedicated interdisciplinary team office spaces for rehabilitation staff (blue space), including private rooms, suitable for teaching, and supervision.
- Access to custom-designed area(s) for progressive mobility training (steps, ramps, grassed area for running etc.).
- Secure, large, and interactive therapy garden area for patients and families.
- Disability parking requirements sufficient to meet the needs of patients with disability as a result of complex acquired brain injury. This includes provision of adequate number of spaces, and covered pick up and drops off locations in very close proximity to ward.
- Additional detail on space requirements to support the Model of Care has been developed (See Appendix 2)
4. Appendix 1- Indicative pathways

TBI Referral

Assessment to check eligibility and readiness for rehab

Medically or surgically unstable

Review by ABI triage team

Able to participate in rehabilitation

Sub-acute ABI inpatient Rehabilitation

Medically and surgically stable; 2 streams-Complex or short stay (~2wks)

nRAH ABI rehabilitation

*Discharge to community +/- ABI ambulatory services**

* A trial in independent living unit may be considered before discharge home
**ABI ambulatory services=RI TH, DRS, BIRCH, OPD clinics**

* A trial in independent living unit may be considered before discharge home
5. Appendix 2- Service Gaps and Risks

The Model of Care document outlines the core functioning of the unit, but does not provide the details to ensure the successful planning for the implementation of the model.

The Model does not work in isolation, but should be considered within the context of the SABIRS Clinical Services Profile and all its service elements, and other interdependencies. The Model assumes the existence of some services that are not currently functioning for patients with an ABI.

To ensure the additional detail is available to facilitate planning and implementation of the Model and to ensure that services that do not currently exist are recognised, comments are made under the following headings:

1. Services required to successfully implement the model
2. Infrastructure required to support and implement the model
3. Workforce requirements for successful implementation of the model
4. Equipment requirements for successful implementation of the model
5. Technology
6. Other considerations

1. Services required to successfully implement the Model

The SABIRS Inpatient Rehabilitation Model of Care has been developed to guide service planning and implementation for the subacute rehabilitation unit.

The guiding principles of this model are consistent with the State-wide Rehabilitation Service Plan (2009) and SA Health’s aim to optimise care by providing the right care, at the right time, in the right place; consistency and equity in access; seamless services; partnerships in service delivery; and by offering patient centred care that optimises physical recovery, function and psychosocial wellbeing, maximises independence, vocation & lifestyle opportunities. (Model of Care – Principles of Care page 6)

The proposed Model of Care document outlines a number of discharge pathways so that the Rehabilitation service can manage and transfer patients to the most appropriate setting, facilitating discharge from the subacute setting as soon as practical and clinically indicated (Model of Care – Discharge pathways page 11). However many of these discharge pathways do not currently exist. The team recommends that there needs to be an explicit statement in the Model of Care document...
stating that many of the discharge pathways currently outlined in the Model document do not currently exist for patients with an ABI.

To successfully implement the Model of Care including the discharge pathways requires additional services to be in place as follows:

- An increase in funded and rehabilitation actual beds is needed
  BIRU at Hampstead currently has 25 funded beds and 28 actual beds. The additional three beds enable the ward to flex up during busy times and also to cohort patients or to move patients into another bed when issues arise between patients that require segregation, for example through disturbing or noisy behaviour, or need for infection control.
  The decision to cap existing brain injury rehabilitation beds to 25 at Hampstead Rehabilitation Centre has already impacted on the service that can be provided to patients with an ABI. The proposal to further reduce subacute rehabilitation beds to 16 in addition to the 6 acute rehabilitation beds at the new RAH will remove any capacity to flex up by those additional 3 beds (as used to occur at times of peak demand in the acute sector before beds were capped at 25 at HRC) will result in a reduced service availability for patients with complex brain injury. Patients, who need an intensive inpatient stay in a specialist brain injury unit, will not be admitted due to the reduction in beds with the risk of unacceptable waiting times. In addition lack of additional physical beds will reduce the flexibility in how the ward operates in response to varied clinical imperatives.
  The commencement of 6 acute brain injury rehabilitation beds at the new RAH as part of the 12 bed neuro trauma rehabilitation beds will not offset the reduction in SABIRS subacute rehabilitation beds.

- Adequate in home rehabilitation and support services are needed from the date of discharge to facilitate early patient discharge.
  Currently there is no specialised rehabilitation in the home service for people with a complex brain injury, particularly with behavioural issues. Currently access to existing rehabilitation in the home services is denied to most patients with a significant brain injury, through service selection criteria, which are targeted to general rehabilitation patients. A new service staffed by specialist clinicians needs to be established to facilitate in home rehabilitations for people with complex brain injury. The service needs to be available for up to three months to support the patients and families/carers on return home. This is particularly necessary in order to support the efficiencies needed for the proposed reduction in the total number of SABIRS rehabilitation inpatient beds across CAHLN and indeed across
the state. Such a service is also likely to assist in reducing the “revolving door” acute representations of patients.

- Patient requests for carer hours or accommodation supports need to be actioned in a timely manner by the Department of Disability Community and Social Inclusion (DCSI).

  Historically and currently, patients, who require funding for carer hours or accommodation, frequently wait many months before the requests are actioned. This means that patients deemed to have finished their rehabilitation and deemed to be on “maintenance care” are in a bed that is needed for rehabilitation. This creates bed blocking and negatively impacts on other patients being admitted to the ward. This issue needs to be addressed at an interdepartmental level as the processes lie outside SABIRS control. Any decrease in beds will escalate the current problems and will both limit the availability of beds for patients needing inpatient rehabilitation and also impact on the model of care for other patients in the rehabilitation unit.

- “Maintenance care” beds need to be available for patients on maintenance care external to the ward.

  Currently there are limited options for patients with a behavioural disorder, who will no longer benefit from rehabilitation. St Margaret’s which is the current transitional care facility does not take patients with behavioural problems. Transition beds need to be available for younger patients on maintenance care and for patients with an ABI and behavioural issues.

- A facility needs to be developed to provide slow stream neuro rehabilitation

  Until about 5 years ago, patients who would benefit from a low intensity rehabilitation program for an extended period of over twelve months were able to be admitted to the Brain Injury Rehabilitation Unit. Some of these patients gained enormous benefit from rehabilitation to the extent that they could get back to living at home eventually. This is particularly relevant for a cohort of young adults with extremely severe traumatic brain injury. Over the last few years the pressure on beds and emphasis on decreasing length of stay has meant that some of these patients, who would benefit from long term, low intensity programs are either not admitted or only admitted for a short time to develop a model of care for their high level care and management in the community.

  A facility that provides slow stream neuro rehabilitation along the same lines as the subacute service would also allow the severely disabled slow to recover patients with rehabilitation potential to continue to progress, but at a slower rate, to transfer from the subacute facility to that facility. This would enable more patients to access appropriate
levels of rehabilitation along the lines of the model, across the spectrum of brain injury casemix and severity

- A trial in independent living unit is available before discharge home. Many rehabilitation units interstate have access to independent units on site or close to the subacute rehabilitation unit, where patients can trial independent living for up to several months with distant support from the ward. This is particularly useful for patients, who will have minimal support at home, or for patients from country areas where there is no access to brain injury rehabilitation or support services. Patients in the Brain Injury Rehabilitation Unit require 24 hours a day supervision whereas the independent unit allows the patient to test out abilities and function without direct supervision but in proximity to the ward support if required. Without the facility to trial independent living with distant support, discharge for some patients can be slower, as staff are not able to verify that the patient can function independently and safely, which is part of the risk management prior to patient discharge.

- Outpatient clinics are available to support patient discharge
  Patients are routinely reviewed in outpatients following discharge and followed up as necessary. Medical governance requires appropriate supervision of junior staff. Locating outpatient clinics close to the ward areas allows for supervision of junior staff, when senior staff are running clinics. Clinics include medical reviews, neuropsychiatry, spasticity and concussion.

- Ambulatory services following discharge
  It is essential that appropriate specialist ABI ambulatory services exist to provide a continuation of care following the inpatient episode, facilitating early discharge and avoiding unnecessary transfers and re-admissions. Following discharge patients frequently receive short term impairment based services from a day rehabilitation centre. These services are very time limited (often 6-8 weeks). The ambulatory service of SABIRS (BIRCH- Brain Injury Rehabilitation Community and Home) provides medium term rehabilitation around life skills and roles (return to work, study, driving, parenting roles) for people with an ABI. Currently there is frequently a gap in services available for people, who have been discharged from day rehabilitation services, but who still need an impairment based program and are not yet ready for a BIRCH program. This current gap in service provision needs to be addressed.
2. Infrastructure required to support and implement the Model

Key aspects of infrastructure that is essential to support and implement the proposed Model are:

BIRU ward and therapy spaces

- Appropriate number of single bedrooms, set up for brain injury rehabilitation eg signage to assist way finding for confused clients. At least 3 bedrooms need to be soundproofed to contain and limit the adverse effects of extremely loud or disinhibited patients upon other patients, visitors and therapy sessions.
- Doorways to bedrooms, bathrooms and therapy spaces need to be wide enough so that beds and wheelchairs have adequate clearance space to pass through, to safely accommodate staff assisting agitated clients, and others in the vicinity.
- Suitable bathrooms for brain injury rehabilitation, including at least one allowing bathing on a bariatric trolley with up to 4 staff assisting.
- A lockable separate dining room that can be secured if required and a separate lounge area visible from the nurses’ station.
- Sufficient numbers of quiet therapy rooms for individual therapy activities, and larger private rooms for group therapy are required. At least one therapy space requires access to the internet and a computer.
- Therapy rooms need to have windows in the wall/door to allow for viewing/staff safety.
- The therapy kitchen needs to be close to the dining room, with space for multiple clients including those in wheelchairs, and have gas and electric stoves to allow supervised practice of activities of daily living with appliances that match what is available in their homes.
- Recreation room with space and facilities for the range of leisure activities required, including a wet area, and soundproofing so music is not intrusive on ward and therapy activities can be loud.
- The range of therapy facilities are required for brain injury rehabilitation including work shed, sports/basketball gym, grassed space for gait and running practice and sport-type activities.
- Custom-designed mobility garden is required including varied terrain, steps, ramps, balance beams and vehicle for car transfers.
- Large and small quiet outdoor spaces are required for inpatient rehabilitation, including for therapy activities, for agitated clients to de-escalate, for counselling, for clients to have family time, for relaxation and for privacy. Having these “respite” spaces assists clients learning to cope with and adjust to significant in their life and life roles imposed by the brain
injury and so enhances the effectiveness of rehabilitation. Clients who are agitated and detained to the ward for clinical reasons need secure objective space that allows for varied outdoor activities, to limit behavioural escalation.

- The Large Therapy Room space needs to allow for multiple activities at once involving multiple staff, clients and family members, and space for the full range of rehabilitation equipment required. This needs to allow for concurrent activities such as circuit class, student training, carers’ training, independent client exercise programmes, and heavily disabled clients needing lots of equipment to support their training. A small adjacent staff office space is needed to allow for supervision of cognitively impaired clients.
- Part of the Large Therapy Room needs to be able to be closed off for loud/agitated clients to work in relative privacy and safety.
- Assessment spaces such as 20 metre track for walking/running and 14 step staircase are required for standardised measures.
- Regular access to onsite Biomechanics Laboratory for objective clinical assessment and research is required.
- A wheelchair workshop adjacent to the ward with storage for all necessary wheelchairs and components is required.
- Plaster room with suitable space and facilities for casting and splinting is required. This needs to include an elevating platform to raise a client in a wheelchair for staff to cast ankles at safe working height.
- Storage space for equipment that is used daily is required on/near the ward. This needs to be adequate space so that equipment can be accessed quickly and safely.
- Easy access to telerehabilitation facilities to support transitions and clinical handover to regional services.
- All spaces need to support working as an interdisciplinary team.

Office space

- It is essential that office and blue spaces support the interdisciplinary approach to rehabilitation. The interdisciplinary team uses the one common staff office area to facilitate teamwork.
- A combination of shared and private office space is required.
- It is essential to have an adequate number of private office/consulting spaces. Private office/consulting spaces are needed for social workers and psychologists for phone
consultations and family interviews. Private office spaces are also needed on a daily basis for supervision sessions, for confidential discussions.

- Meeting/tutorial spaces close to the ward are required to allow for case conferences, staff education, student training, business meetings. A networked PC with data projection and nearby printer access is required in meeting rooms to support patient clinical sessions with access to network, e health records, information and resources.

Early and safe discharge - Transitional Living Units

- Having a number of transitional living units for use between the rehab wards, to facilitate earlier safe discharge, is required.

Hydrotherapy Pool

- Suitable hydrotherapy pool for rehabilitation is required including proximity to the wards, suitable disabled access, graded depth, appropriate water temperature, and adequate changing facilities for staff and other users within the building.

Car Parking

- An appropriate number of disabled access carparks are required close to the wards and therapy areas, for inpatients and outpatients. Easy access to car parking is required for families to facilitate their involvement in rehabilitation and carer training. Suitable car parking for staff, students and other visitors is required including adequate spaces for Access cabs to allow extra time for loading and unloading wheelchair dependent patients. The usual ratio of disability car parks is not relevant for this client group who will have much higher need for disability parking.

3. Workforce requirements for successful implementation of the model

One of the objectives of providing specialist ABI Rehabilitation is to provide the rehabilitation model, staffing and facilities required to provide intensive, specialised interdisciplinary rehabilitation to optimise functional progress, decrease carer burden, minimise complications and put people with complex ABI in a position to build on their skills and lifestyle with ambulatory/community-based rehabilitation.(Model of Care document- page 6).
This model requires the following

- A dedicated, specialist inter disciplinary team sufficient for bed base, at optimal intensity and frequency of participation input, including input over 7 days where this will improve patient outcomes.
- Medical, nursing and allied health staff with skilled assistants.
- AFRM provides guidelines for staffing to bed ratios for inpatients.
- Staffing levels need to allow time for teaching, research and safety/quality improvement activities
- Student supervision is important and needs to be considered in both staffing and infrastructure planning
- Staff need to provide consultancy, education, advice and support to community and country services and assist in capacity building community organisations. Staffing needs to be sufficient to support these important roles.

The model also assumes partnerships with external providers, both with generalist rehabilitation and community services and with private practitioners. To ensure that these partners have the necessary skills, SA BIRS staff needs to be involved in upskilling other workers both about individual patients and about principles of working with patients with a complex brain injury including neuro behavioural disorders.

This consultancy role is not currently undertaken to a large extent and planning around staffing and staff development would be needed for this to occur, service wide.

4. Equipment requirements for successful implementation of the model

Successful implementation of the model of care for Acquired Brain Injury (ABI) Rehabilitation beds at The Queen Elizabeth Hospital (TQEH) requires a large range of appropriate “hi tech” and “low tech” equipment, including robotics, to be readily available on the ward and adequate storage facilities for the equipment on or next to the ward area.

- Access to area(s) for practising mobility (steps, ramps, grassed area for running etc.).
- Good quality wheelchairs with a regular replacement schedule
- Individually prescribed equipment (e.g. specialised seating and powered wheelchairs appropriate to the functional need) will follow the patient during their journey (to avoid duplication), where applicable.
- Equipment will be provided to facilitate discharge in a timely manner (not routinely able to be done currently)
Lack of some suitable equipment and timely replacement is currently an issue that affects service provision and effective discharge planning.

5. Technology

Consistent and up to date technology will be needed across all SA BIRS services to facilitate movement from one part of the service to another (eg EPAS across all sites from the time of going live at any site).

This will include

- Electronic medical records and reviewing and updating EPAS templates that were developed several years ago.
- Technology within the rehabilitation unit will be needed to facilitate patient care e.g. Wi-Fi, tablets and hand held devices.
- Adequate numbers of computers and computer access points in both ward areas and blue spaces
- Access to tele rehabilitation facilities to support transitions to regional services.

6. Other considerations

- Working as a single service across multiple sites will require access to timely transport and storage for equipment items, staff etc. to move between the acute, sub-acute and storage sites.
- With multiple sites, there is a risk of reduced therapy time unless the time required for travel between sites is built into the staffing model.
- Families have a very important role in the rehabilitation of patients with an acquired brain injury. Facilities need to be available to support their involvement in a range of ways. These include involvement in therapy sessions, in individual practice and in providing social and emotional support and practicing life skills. Facilities also need to be available for families to have spaces where they can retreat and relax if necessary.
6. Appendix 3 - References


2 Rehabilitation for patients in the acute care pathway following severe disabling illness or injury: BSRM core standards for specialist rehabilitation (2014) (p3). British Society of Rehabilitation Medicine.