FOCUS GROUP UPDATE ON STROKE REHABILITATION

INPATIENT REHABILITATION

DISCLAIMER

This update was developed to be a guide for best clinical practice, based on the best available evidence at the time of development. Specific attempts were made to use local data and publications to ensure local relevance. The update was adapted mainly from the Australian Clinical Guidelines, Canadian Stroke Best Practices and NICE Stroke Rehabilitation for adults 2023 (1, 2. 3). Other sources were reviewed when necessary. The update will also be updated from time to time. Adherence to this update is at the discretion of the healthcare provider and does not necessarily lead to the best clinical outcome in individual patient care. Every healthcare provider is responsible for the management of his/her unique patient based on the clinical presentation and management options available locally.

1. https://informme.org.au/guidelines/living-clinical-guidelines-for-stroke-management
2. https://www.strokebestpractices.ca/recommendations
3. NICE Stroke rehabilitation in adults: Clinical Guideline, [NG236] 2023. www.nice.org.uk/guidance/ng236.

INPATIENT REHABILITATION

STROKE REHABILITATION PHASES

Stroke rehabilitation is a continuous process that starts at the time the patient first presents with impairments and may need to be provided throughout the rest of his or her living years (Teasell et al., 2018). Based on current evidence, we recommend the following settings as components of the stroke rehabilitation continuum (Figure 1 and 2):

a) Early rehabilitation (hyperacute phase and acute phase).
b) Subacute rehabilitation.
c) Outpatient rehabilitation.
d) Home-based rehabilitation.
e) Community-based rehabilitation.
f) Long-term and sustained rehabilitation

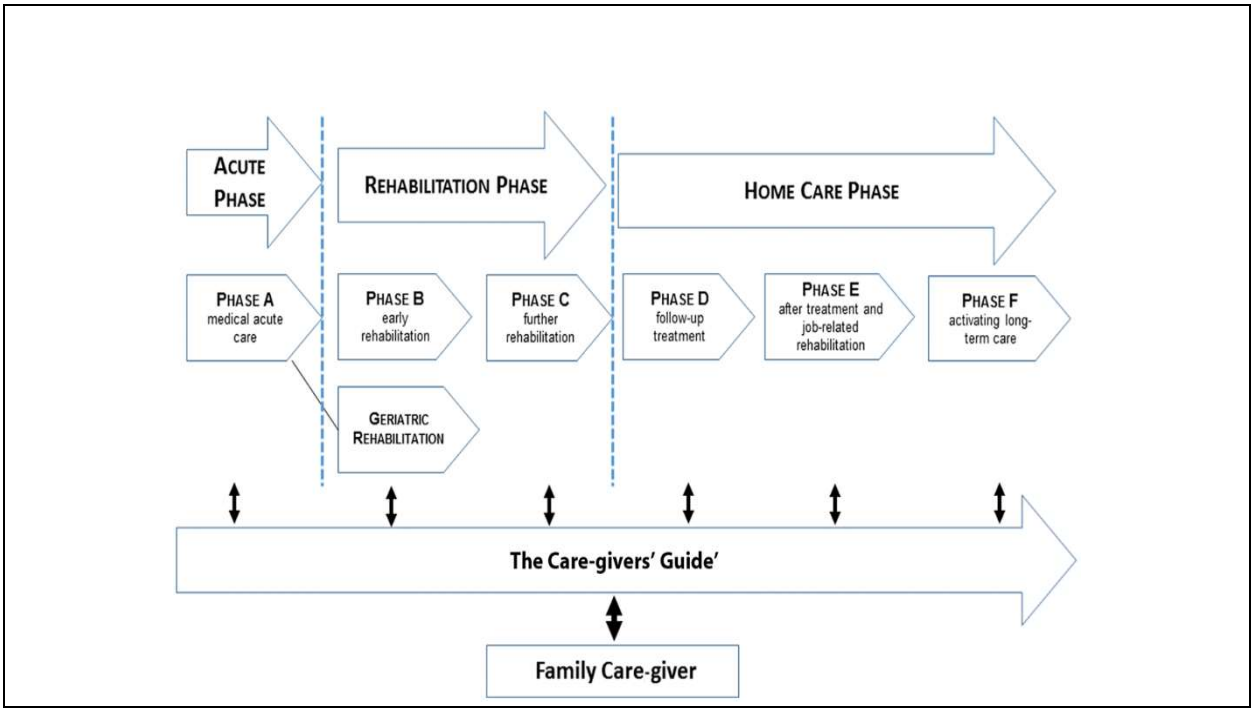

Figure 1: Recommended stroke rehabilitation support system and the timing of support by the Care-givers' Guide. Source: Adapted from Bundesarbeitsgemeinschaft (2014). Kreiger et.al (2020)

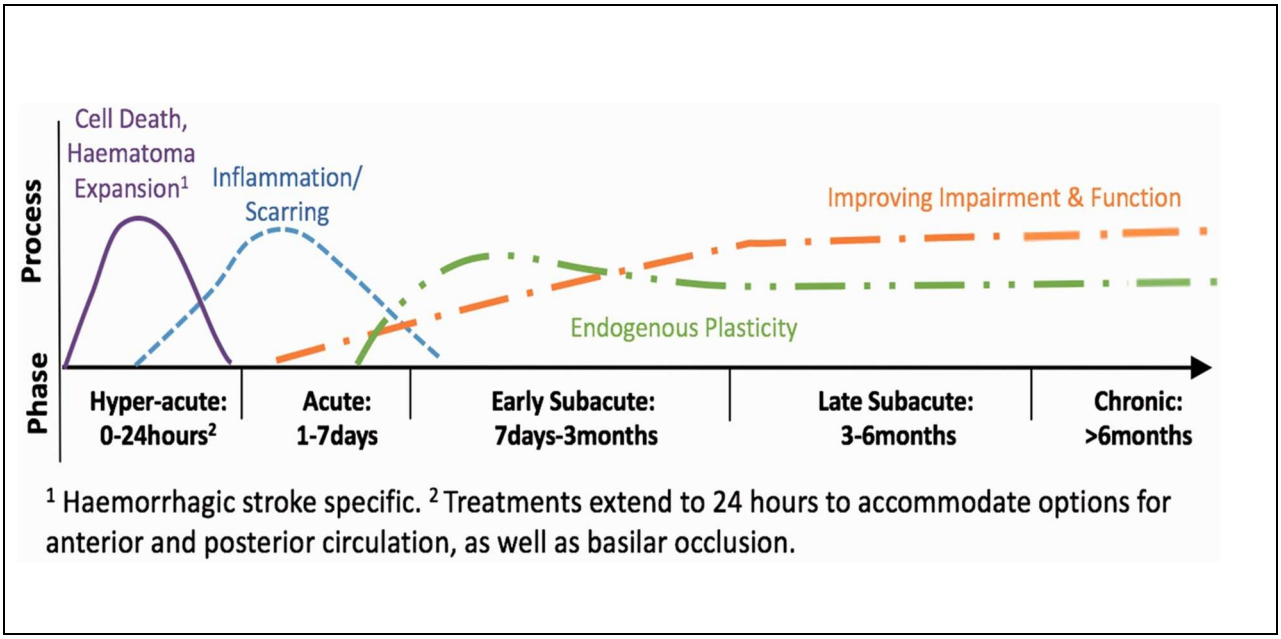

Figure 2: Framework proposed by Bernhardt and colleagues (2017) that summarizes definitions of critical time line after stroke based on the current knowledge on stroke recovery (2)

INPATIENT REHABILITATION POST STROKE

1. HYPERACUTE / ACUTE STROKE REHABILITATION

1.1 All patients with acute stroke should be assessed to determine the severity of stroke and early rehabilitation needs.

1.2 All patients admitted to hospital with acute stroke should have an initial assessment, conducted by rehabilitation professionals, as soon as possible after admission [Evidence Level A].

- The core rehabilitation professional team should include Rehabilitation Physician, or other physicians with expertise/core training in stroke rehabilitation, occupational therapists, physiotherapists, speech-language pathologists, nurses, social workers and dietitians [Evidence Level A].
- All professional members of the rehabilitation team should have specialized training in stroke care and recovery [Evidence Level A].

1.3 In this setting, the main goal of rehabilitation should be to prevent early complications and assess safety and feasibility of early mobilization (Coleman et al. 2017). The key domains of care are:

1.3.1 Complete assessment of patient with focus on the following:

- Impact of stroke with particular focus on presenting impairments and their severity (impairment mapping).
- Co-morbidities and their premorbid impact on function.
- Pre-existing musculoskeletal conditions and/or deformities.
- Pre-existing disability(ies).
- Family setup and support.
- Work and social status.

1.3.2 Protection of the airway and swallow assessment and management.

- Early swallow screening by a trained professional, who is adequately trained in dysphagia management or by another professional (nurse or doctor), is recommended (Palli et al. 2017)
- The patient should not be fed orally or given oral medications unless cleared by swallow screening (Duncan et al. 2005).
- Enteral feeding should be initiated early in patients with dysphagia to avoid malnourishment. This should be considered as soon as it is clinically established that the patient is not able to swallow, as the delay in introducing the enteral feeding should not exceed 3 days (Yamada 2015; Ojo and Brooke 2016).

- Evidence indicate that early insertion of per-endoscopic gastrostomy (PEG) tube should be avoided (George et al. 2017).
- In patients requiring enteral feeding, nasogastric tube feeding is recommended for as long as 3 weeks, beyond which insertion of PEG may be considered (George et al. 2017). Please note that nasogastric tube feeding can be associated with regurgitation and aspiration if the patient lies down immediately after a meal. Practice pearl: If nasogastric tube feeding is prolonged, early PEG tube insertion should be considered.
- In practice insertion on PEG also depends on
    - Availability of the staff / professionals to insert the PEG
    - The patient (preference and medical status)
    - Family and environmental support

1.3.3 Prevention of Secondary Complications.

An important role of rehabilitation team in early rehabilitation is prevention of complications. This has now been highlighted as key responsibility of rehabilitation teams in hyperacute and acute rehabilitation settings (Winstein et al. 2016). The rehabilitation team must take steps to prevent, rapidly detect and treat:

a) Malnutrition and dehydration.
b) Pressure injury.
c) Aspiration-related chest infections.
d) Over dependence on ancillary devices such as urinary catheter, tracheostomy tube and feeding tube.
e) Contractures.
f) Excessive muscle asting.
g) Hemiplegic shoulder pain subluxation
h) Agitation and restlessness.
i) Mood disorder/depression
j) Bladder disorders, examples are urinary tract infection, incontinence, acute urinary retention
k) Bowel disorders - constipation, impaction, diarrhea

1.3.4 Starting intensive out-of-bed activities within 24 hours of stroke onset is not recommended. (Rethnam et al. 2020 , Langhorne et al. 2018 , Bernhardt et al. 2015)

1.3.5 All stroke patients should commence mobilization (out-of-bed activity) within 48 hours of stroke onset unless otherwise contraindicated (e.g. receiving end-of-life care). (Bernhardt et al. 2015 ; Lynch et al. 2014)

1.3.6 For patients with mild and moderate stroke, frequent, short sessions of out-of-bed activity should be provided within 24 hours, but the optimal duration is unclear. (Bernhardt et al. 2015)

2. SUBACUTE STROKE REHABILITATION

(Adapted from Wasti et.al 2021, Healthcare Settings for Rehabilitation After Stroke, Clinical Pathway Stroke Rehabilitation, Evidence-Based Practice Recommendation)

Subacute stroke rehabilitation is the next level of care for stroke patients. In the subacute stage of stroke, interventions should be intensive, challenging, task specific and tailored towards the individual needs of the patients. Evidence has shown that that relatively greater functional improvements are made by patients rehabilitated in specialized stroke units when compared to general medical units in the long term (level 1a).

2.1 General Inclusion Criteria for Stroke Rehabilitation

2.1.1 Whilst transfer criteria to subacute rehabilitation facility differs from place to place and depends on the services available at the subacute rehabilitation facility, general criteria for transfer from acute to subacute level of rehabilitation may be applied:

a) All investigations required for determining the nature and cause of stroke have been completed.

b) All required interventions for secondary preventions have been optimized.

c) Medical stability has been achieved with satisfactory control of blood pressure and diabetes mellitus.

d) Patient continues to need close physician supervision.

e) Patient continues to need specialized nursing care.

f) Patient is cognitively able to engage meaningfully in therapies and demonstrate carry-over.

g) Patient is able to tolerate higher intensity of therapies.

h) Patient requires more than one therapy input daily.

i) Patient and family have been suitably counselled to accept a lesser level of medical surveillance and higher intensity of rehabilitation.

j) Inpatient rehabilitation goals expectations are discussed with patients and carer.

k) Patient and family have agreed to the transfer and fully understand its need.

2.1.2 Four exclusion criteria for subacute rehabilitation are listed below based on consensus opinion.

a) Person with stroke has returned to pre-morbid function, i.e. made a full recovery in all aspects including physical, emotional, psychological and cognitive function.

b) Palliation: death is imminent; person with stroke should be referred to the palliative care team.

c) Coma/non-responsive (not drowsy).

d) Patients' refusal to rehabilitation

2.2 Subacute Rehabilitation Facility

The subacute rehabilitation facility for stroke patients should have an integrated multidisciplinary set up for provision of this level of rehabilitation. The patient should be offered intensive therapies. We recommend that for optimal functioning a facility should at least meet the following standards:

1.2.1 The physical space and environment should be optimal and conducive to adequately accommodate the number of patients a given facility is likely to serve.

1.2.2 The multidisciplinary team should include the following categories of staff:

a) Physician(s) with expertise in neurorehabilitation / stroke care

b) Rehabilitation-trained nurses.

c) Neurological physical therapists.

d) Neurological occupational therapists.

e) Neurological speech and language therapist with expertise in dysphagia management and communication rehabilitation.

f) Dietician(s).

g) Social worker(s)/case manager(s).

h) When available, the provision of neuropsychological and orthoptic services is recommended.

1.2.3 The facility should have:

a) links with or access to orthotic, neurological, urological, psychiatry, ophthalmology and general medical services.

b) all essential therapy equipment and aids.

c) dedicated therapy areas, e.g. for physiotherapy, occupational therapy and speech and language therapy.

d) Social networking spaces and provision for community re-integration (shopping, leisure trips, etc.) are desirable.

1.2.4 The ideal staff to patient ratios have not been optimally evaluated and differ in various settings. We recommend that the following ratios be considered for planning such facilities (MSQH, 6th ed. 2021):

a) Physician (with expertise in neurorehabilitation) to patient ratio should not exceed 1 to 16 inpatients.

b) Nurse to patient ratio: No more than 4 patients to one nurse.

c) Physiotherapist to patient ratio: No more than 8 patients to one Physiotherapist

d) Occupational therapist to patient ratio: No more than 8 patients to one Occupational Therapist.

e) Speech-Language Therapist to patient ratio: No more than 20 patients to one Speech-Language Therapist.

f) Neuropsychologist to patient ratio: No more 40 patients to one Neuropsychologist.

1.3 Subacute Rehabilitation Programs

1.3.1 After admission, the patient should be provided with structured care. The facility should have standardized policies for all sessions and domains of care. These include:

a) Functional mobility training including transfer training, truncal balance training, gait training and higher balance training. For those with severe physical impairment, therapeutic ambulation training with proper equipment and where necessary training for full or semi-independence from wheelchair mobility could be conducted.

b) Management of cognitive-communication impairment and cognitive rehabilitation.

c) Management of perceptual deficits.

d) Management of dysphagia with the aim of retraining for oral feeding where this is possible to do safely.

e) Participation in activities of daily living.

f) Upper limb retraining including task specific repetition practices with or without adaptive equipment.

g) Neuropathic pain management.

h) Spasticity management.

i) Management of mood disorder.

j) Management of bladder and bowel dysfunction.

k) Prevention of secondary complications of stroke and to optimize all modifiable risk factors.

l) Caregiver training closer to discharge.

m) Patient and family education on secondary stroke prevention and reintegration to the community.

n) Adjustment and “beginning to live with disability” training.

o) Readiness for discharge to home or modified living.

1.3.2 The following are some guiding parameters in this context:

a) Patient(s) should undergo full multidisciplinary team (MDT) assessment within 24–72 h of admission.

b) The MDT should develop a goal-directed care plan with specific timelines.

c) The patient and family should be fully briefed about the care plan which would be adjusted after taking into consideration their suggestions and concerns. \

d) The progress of the patient should be reviewed by the MDT at least every week and goals and care plan are modified to adjust for change.

e) Discharge planning should start early, preferably within 1 week of admission.

f) Periodic patient and family meetings should be held to brief them about the progress.

g) When deemed necessary, discharge planning meetings can be arranged prior to discharge.

1.3.3 Patient should be offered for stroke rehabilitation according to their needs. The rehabilitation should be conducted for at least three hours a day, on a minimum of five days of the week, and includes a range of multidisciplinary therapist, including physiotherapy, occupational therapy, and speech-language therapy (NICE 2024).

1.4 **Health Facilities Providing Inpatient Acute / Subacute Rehabilitation**

1.4.1 Acute / Hyperacute Stroke Rehabilitation:

a) All major state government hospitals

b) Public University hospitals

c) Private rehabilitation hospitals with rehabilitation physicians and multidisciplinary (MDT) rehabilitation teams

1.4.2 Subacute Stroke Rehabilitation

a) All Major State Government Hospital

b) Universities Hospitals

c) Private Rehabilitation Hospital with Rehabilitation Physician and MDT Rehabilitation Team

d) Public Rehabilitation Hospitals (example is Hospital Rehabilitation Cheras)

e) Rehabilitation Centers (example is Social Security Organization (SOCSO) Rehabilitation Centre)

f) Government District Hospital with *Program Kontinuum Rehabilitasi Stroke* (PKRS) (Refer to: https://hq.moh.gov.my/nursing/e-book-modul-program-kontinum-rehabilitasi-strok-pkrs-kkm/)

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