

Stroke Rehabilitation

A glimpse

Dr. Fathima Haneena¹, Dr. Nitha J², Dr. Heera Selsa³

Stroke is a global health problem. It is the fourth leading cause of death and the fifth leading cause of disability in India⁽¹⁾. The impact of Stroke is widespread both in developed as well as developing countries. Stroke can lead to death or physical and cognitive impairments and can have significant psychological and social implications⁽²⁾.

Stroke affects not only the survivors but also the carers and family, and their quality of life, physically, mentally, and economically. Even though, the acute management of stroke has tremendous advancements in recent years, still one-third of stroke survivors end up with moderate to severe disability⁽³⁾. Post-stroke impairments limit the ability of stroke survivors to independently perform their activities of daily living and also restrict them from effective participation in family and social roles⁽⁴⁾. Hence, Rehabilitation is essential as a continuum of stroke care.

What is Stroke Rehabilitation?

Stroke Rehabilitation is evidence-based and early admission to stroke rehabilitation units can enhance functional outcomes. World Health Organisation defines Rehabilitation as "a set of interventions designed to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment"⁽⁵⁾.

According to American Heart Association(AHA), Rehabilitation services are provided by a multidisciplinary team, involving

^{1,2,3}Department of Physical Medicine and Rehabilitation, KIMSHEALTH, Trivandrum, Kerala, India

Corresponding Author: Fathima Haneena, Department of Physical Medicine and Rehabilitation, KIMSHEALTH, Trivandrum, Kerala India. Phone: 9048407371, email: phanee-na3@gmail.com

How to cite this article: Haneena F, Nitha, Selsa H. Rehabilitation in Stroke. JAMST. 2023; 1(1): 8-13

Physiotherapists, Occupational therapists, Speech and language pathologists, nursing staff, Psychiatrists, Psychologists, Social workers, Orthotists under the leadership of physicians trained in Physical Medicine and Rehabilitation (Physiatrist)⁽⁶⁾.

Consultation with Rehabilitation Physician (Physiatrist)

AHA/ ASA group had put strong recommendations with evidence level of 1A for early referral and consultation by physicians trained in Physical Medicine and Rehabilitation (PM&R) during acute stroke care ideally within 24 hours of stroke. Rehabilitation physician services provided from the initial visit in acute stroke care unit may need to be extended to the rest of the living years of stroke survivors⁽⁷⁾. In an uncomplicated stroke, acute care led by a neurologist may

be as short as 4 days. Subsequently, patient care responsibility is with Physiatrist, which should be continued through subacute to long term care ⁽⁸⁾.

Rehabilitation Settings

The stroke Rehabilitation components can be categorized into the following settings based on timing, resource allocation, and service provision ⁽⁹⁾.

- o Early Rehabilitation (Acute & Hyperacute phase)
- o Sub-acute Rehabilitation
- o Outpatient Rehabilitation
- o Home based or Community based Rehabilitation
- o Long term and sustained Rehabilitation

Early Rehabilitation

The focus of a physiatrist is on assessment of impairments and management planning to reduce the disability impact. Rehabilitation provided immediately after stroke in an intensive care set up is referred as hyper acute care. Ward based or step-down care based rehabilitation services fall into acute category ⁽¹⁰⁾.

The Physiatry consultation during acute care, ends with recommendation for appropriate level of care transition from acute care. In Indian settings, the transition can be to an inpatient institutional based rehabilitation, outpatient rehabilitation or home/ community based care ⁽¹¹⁾. Early rehabilitation focuses on NHSS review and recovery estimation categorization, assessment of stroke risk factors and secondary stroke and DVT prophylaxis. Evaluation and management of cognitive and perceptual disorders, mental health, communication and dysphagia are also focussed. During this period, care is given for adequate nutrition, skin integrity, bowel and bladder function, self-care and mobility. It is also equally important to ensure caregiver availability, caregiver and patient education and provision of assistive devices, durable medical equipments and orthotic services.

Sub-Acute Rehabilitation

Sub-acute Rehabilitation is the most challenging, intense and customized to individual patients. Inpatient Rehabilitation Facility (IRF) is the mainstay of sub-acute rehabilitation. IRF should provide hospital level care 24/7 under the expertise of rehabilitation physician involving coordinated, multidisciplinary rehabilitation team. IRF is recommended when stroke survivor attains medical stability to tolerate 3 hours of therapy 5 days /week. IRF should be prioritised to stroke survivors in whom with a reasonable length of time, significant improvement is expected ⁽¹²⁾.

Inpatient Rehabilitation Facility (IRF)- is it needed for all stroke survivors?

Not all patients with stroke require IRF services. For stroke survivors, with moderately severe stroke, utilization of IRF facilities does improve functional outcome compared with conventional stroke care, with level 1A evidence. Mild disability will have good outcome, whether we do only exercise physiotherapy or rehabilitation. Post stroke with mild disability functional outcomes are not influenced by site of rehabilitation. Hence depending on the disability and availability of resources OP/ Home based/ Community based Rehabilitation can be chosen. Rehabilitation physician has to overlook all this service provision at regular intervals for optimal functional outcomes ⁽¹²⁾.

Gap in Stroke Rehabilitation service provision and utilization

Rehabilitation being the primary service for recovery in stroke survivors, practice guidelines for this is well established. Still stroke survivors often does not receive the standard of care consistent with these guidelines ⁽¹³⁾. Even though, the awareness of stroke and acute care has improved drastically the awareness regarding rehabilitation is still lacking and this results in underutilization of rehabilitation services in India. Affordability is another major challenge as health insurance coverage is very minimal (14). Stroke survivors may end up with fragmented system of care provided by therapists or by complementary or alternative medicine providers rather than a rehabilitation physician driven comprehensive care ⁽¹⁴⁾.

Neuroplasticity

Ischemic damage to the brain leads to spontaneous neuroplasticity in perilesional tissue, promoting map reorganization and rewiring, aiding post stroke recovery ⁽¹⁵⁾. It is the rationale behind the rehabilitation and task oriented training. Mechanisms underlying the neuroplasticity are neurogenesis, gliogenesis, axonal sprouting, and the re-balancing of excitation and inhibition in cortical networks. A meta-analysis of neurophysiological and neuroimaging studies has reported that neural changes in the sensorimotor cortex of the affected hemisphere accompany the gains in functional paretic upper extremity movements achieved with task-specific training ⁽¹⁶⁾. To create an alternative functional ensemble with the neurons that are still viable in brain after the stroke, recruitment of both spared neurons in the lesioned hemisphere and undamaged neurons in the intact hemisphere may be used to control the execution of movements after stroke. This has been postulated to occur via the unmasking of latent synaptic connections because of the down-regulation of inhibitory mechanisms and synaptogenesis both within the lesioned hemisphere and in the intact hemisphere ⁽¹⁶⁾.

CPASS trial demonstrated that there was superior recovery in ischemic or hemorrhagic stroke survivors, who were admitted in inpatient rehabilitation at 2-3 months compared with therapy given at 12 months, also the same effect was not noted when therapy was initiated at 6 months post-stroke⁽¹⁷⁾. Neuroplasticity is noted to be occurring mostly in the first six months post stroke.

Prevention of complications

In the initial period, aim is to prevent complications like pressure injuries, contractures, malnutrition, dehydration, excessive muscle wasting, urinary tract infections, pneumonia and overdependence on ancillary devices such as urinary catheter, tracheostomy tube and feeding tube. Daily stretching of hemiplegic limbs is recommended to prevent joint contractures. Proper positioning of the hemiplegic shoulder for a maximum of 30 minutes each day is beneficial⁽¹⁸⁾. Adequate resting hand splints and ankle foot orthosis, also standing at a tilt table 30 minutes per day are useful in preventing contractures (19). Early mobilization after stroke is recommended in many clinical guidelines to avoid complications. The AVERT (Avery Early Rehabilitation Trial), a randomized controlled trial of efficacy and safety of very early mobilization within 24 hours of stroke onset, showed that early mobilization was associated with a reduction in the odds of a favourable outcome at 3 months⁽¹²⁾.

Cognitive impairment

Cognitive impairments affects almost one third of the stroke survivors at 3 and 12 months after stroke (20). Assessment tools commonly used in our department are Montreal Cognitive Assessment (MoCA) and Addenbrook's Cognitive Examination (ACE III). Multiple domains of cognition like delayed memory, attention, visuospatial and executive function are assessed. Treatments are focussed in restorative strategies to reestablish cognitive activity with the aids of computers, books, games, virtual reality gaming technology. Also, use of compensatory strategies, like diary, reminders, paging systems, electronic voice organisers etc. Pharmacotherapy for cognitive enhancement includes Citicoline, SSRIs, Memantine, Donepezil and Rivastigmine^(21,22).

Depression

Depression has been reported in 33% of stroke survivors, which has negative effects on functional recovery and also effective participation in rehabilitation. Post stroke depression is treatable with antidepressants like Selective Serotonin Reuptake Inhibitors and Tricyclic antidepressants along with physical exercise⁽¹²⁾. Post stroke depression needs to be differentiated from post stroke apathy, pseudobulbar affect, Catastrophic reaction, demoralization and adjustment disorder⁽²³⁾.

Perceptual disorders

All stroke survivors with suspected perceptual impairments (visuo-spatial impairment, agnosias, body schema disorders, neglect and apraxias) should be assessed⁽²⁴⁾. Perception may be impaired in about 70% of stroke survivors leading to distress, increased dependence and poor quality of life⁽²⁵⁾.

Interventions are most often found to be given directly by hospital care providers as well as those using technology-based devices and specialist equipments like robot-assisted gait training, virtual reality, aquatic based exercises, mirror therapy etc.⁽²⁶⁾.

Hemiplegic shoulder pain

Shoulder pain after stroke is common and multifactorial. It can be due to motor weakness, resulting in shoulder subluxation, spasticity, shoulder tissue injury, abnormal joint mechanics, complex regional pain syndrome (CRPS) and central nociceptive hypersensitivity⁽¹²⁾. Proper positioning of hemiplegic shoulder with shoulder slings, lap trays in wheelchair, maintenance of shoulder range of motion, motor retraining, surface electrical stimulations- NMES and TENS, Acupuncture are interventions to prevent and treat pain in hemiplegic shoulder. Care to be taken to avoid aggressive range of motion and overhead pulley exercises. Corticosteroid injections into glenohumeral joint and subacromial space, botulinum injections to shoulder musculature, Suprascapular nerve block, stellate ganglion block are interventions to treat and reduce shoulder pain⁽²⁷⁻²⁹⁾. CRPS and central stroke pain can be managed by pharmacotherapy comprising of antidepressants and anticonvulsants.

Motor cortex stimulations with surgically implanted dural electrodes have shown pain reductions for up to 2 years after implantation in central pain, but is associated with several complications⁽³⁰⁾.

Mobility

Recovery or restoration of motor power and ambulation is one of the primary goal after stroke. Literature shows that mechanically assisted walking with body weight support was found to be more effective than overground walking training⁽³¹⁾. Lokomat, Gait trainer GT-1, G-gaiter and Autoambulator are few Robotic and electromechanics assisted training devices. They provide intensive, repeatable, task specific training⁽¹⁵⁾. Electromyographic feedback and Virtual reality provide the stroke survivor with feedback of their muscle activity and also to do specific task practice in a computer generated visual environment^(32,33). Dextroamphetamine, Levodopa, Methylphenidate, Fluoxetine are medications noted to be potential contributors to motor recovery^(12,34).

In view of gait impairments in stroke survivors, there is high risk for falls. Hence, they will require ambulatory aids like canes, hemiwalkers, wheelchair. Also, orthosis like Ankle Foot Orthosis (AFOs) aids in ambulation. Wheel chair propulsion techniques, transfer training and advanced gait training are given according to the present functional ability of the person.

Communication and Swallowing impairments

Stroke frequently results in communication impairment, which affect negatively in participation in life activities. Common communication disorders are aphasia, dysarthria, cognitive- communication disorders and apraxia of speech. After assessment, the goal is to facilitate recovery of communication and also to train in compensatory strategies for better communication. There were no recommendations for pharmacotherapy for routine use, but medications like Memantine, Donepezil and Galantamine shows promising results ⁽¹²⁾.

Dysphagia is common after stroke. Among the survivors, half of them aspirate and one third develop pneumonia. Clinical bedside swallowing evaluation provide valuable information regarding swallowing mechanism. Video fluoroscopy, Fiberoptic endoscopic evaluation of swallowing or Fiberoptic endoscopic swallowing evaluation with sensory testing are instrumental evaluations for swallowing. There is no consensus in literature for any preferred instrumental study. Dysphagia is managed by swallowing exercises, environmental modifications like upright positioning for feeding, swallow manoeuvres and dietary modifications ⁽³⁵⁾. During this time, nasogastric tube feeding is reasonable for 2 – 3 weeks, following which Percutaneous endoscopic gastrostomy is preferred for adequate nutrition ⁽³⁵⁾.

Activities of daily living

Activities of daily living (ADLs) are essential and routine tasks like grooming, brushing, dressing, toileting, transferring, ambulating, eating, cooking, house- keeping, shopping, using telephone etc. that most young, healthy individuals can perform without assistance⁽³⁶⁾. The inability to do ADLs will lead to interdependence or depending on assistive devices, ultimately affecting the quality of life. The FIM (Functional Independence Measure) score was developed for measurement of disability based on ADLs. Scores at the extremes of this scale correlate with discharge disposition, either to facilities for lower scores or to home for higher scores ⁽³⁷⁾. Occupational therapists often conduct the rehab interventions targeting on each lacking area through repetitive functional task practice or task-oriented therapy.

Community reintegration

Community reintegration is an important part of each stroke rehabilitation program which involves reintegration into work places and leisure activities. A successful community reintegration is hugely impacted by the motor and cognitive functional status of the person as well as by the premorbid education, literacy and functional ability. People who have cognitive dysfunction should receive cognitive rehabilitation individualized to their deficits so that we can explore a wider area of interest while reintegration. Stroke survivors, families, and informal caregivers should be provided with information, education, training, emotional support, and community services specific to the transition they are undergoing ⁽³⁸⁾.

Many central government and state government schemes are available under the RPWD act for the well-being of survivors and their families. Disability percentage or disability certificates which can be availed from designated Health care sectors can be used for concessions in schools, public transports, workplace etc. Home and workplace may require ergonomical modifications and adaptations which are done after prior identification of risk factors.

Conclusion

The literature identifies four major concerns for families and carers which include proper information, skills training, emotional support, and regular respite ⁽³⁾. In Indian setting, rehabilitation centres providing a goal oriented, time bound program that would aim at functional improvement are limited. Unfortunately, in our country, rehabilitation is often equated to physiotherapy alone. Rehabilitation needs to be initiated from the acute care area, continued through reintegration into the community for improving the quality of life of stroke survivors along with their families.

The consequences of having impairments in bodily functions, execution of activities and involvement in life situations are disability and handicap. Its prevention in terms of risk reduction, lifestyle modification, proper screening, diagnosing and treatment, adequate follow up and referrals are required to sustain a community with a low burden of disabled population. Hence, Community based rehabilitation (CBR) in training the family as well as community for medical, financial, educational assistance, providing assistive devices and social support are also needed.

References

1. Jones SP, Baqai K, Clegg A, Georgiou R, Harris C, Holland EJ, et al. Stroke in India: A systematic review of the incidence, prevalence, and case fatality. *Int J Stroke*. 2022 Feb;17(2):132–40.

2. Crocker TF, Brown L, Lam N, Wray F, Knapp P, Forster A. Information provision for stroke survivors and their carers. *Cochrane Stroke Group, editor. Cochrane Database Syst Rev [Internet]. 2021 Nov 23 [cited 2023 Aug 16];2023(5). Available from: <http://doi.wiley.com/10.1002/14651858.CD001919.pub4>*
3. Wolfe CDA. The impact of stroke. *Br Med Bull.* 2000 Jan 1;56(2):275–86.
4. Kamalakannan S, Gudlavalleti Venkata M, Prost A, Natarajan S, Pant H, Chitalurri N, et al. Rehabilitation Needs of Stroke Survivors After Discharge From Hospital in India. *Arch Phys Med Rehabil.* 2016 Sep;97(9):1526-1532.e9.
5. Bindawas SM, Vennu VS. Stroke rehabilitation: A call to action in Saudi Arabia. *Neurosciences.* 2016 Oct;21(4):297–305.
6. Miller EL, Murray L, Richards L, Zorowitz RD, Bakas T, Clark P, et al. Comprehensive Overview of Nursing and Interdisciplinary Rehabilitation Care of the Stroke Patient: A Scientific Statement From the American Heart Association. *Stroke.* 2010 Oct;41(10):2402–48.
7. Teasell RW, Foley NC, Bhogal SK, Speechley MR. An evidence-based review of stroke rehabilitation. *Top Stroke Rehabil.* 2003;10(1):29–58.
8. Guidelines for the Early Management of Adults With Ischemic Stroke | Stroke [Internet]. [cited 2023 Aug 22]. Available from: <https://www.ahajournals.org/doi/full/10.1161/strokeaha.107.181486>
9. Wasti SA, Surya N, Stephan KM, Owolabi M. Healthcare Settings for Rehabilitation After Stroke. In: Platz T, editor. *Clinical Pathways in Stroke Rehabilitation: Evidence-based Clinical Practice Recommendations [Internet]. Cham (CH): Springer; 2021 [cited 2023 Aug 22]. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK585579/>*
10. Winstein CJ, Stein J, Arena R, Bates B, Cherney LR, Cramer SC, et al. Guidelines for Adult Stroke Rehabilitation and Recovery: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke [Internet]. 2016 Jun [cited 2023 Aug 22];47(6). Available from: <https://www.ahajournals.org/doi/10.1161/STR.0000000000000098>*
11. Burris JE. Stroke Rehabilitation: Current American Stroke Association Guidelines, Care, and Implications for Practice. *Mo Med.* 2017;114(1):40–3.
12. Winstein CJ, Stein J, Arena R, Bates B, Cherney LR, Cramer SC, et al. Guidelines for Adult Stroke Rehabilitation and Recovery: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke [Internet]. 2016 Jun [cited 2023 Aug 16];47(6). Available from: <https://www.ahajournals.org/doi/10.1161/STR.0000000000000098>*
13. Philp I, Brainin M, Walker MF, Ward AB, Gillard P, Shields AL, et al. Development of a Poststroke Checklist to Standardize Follow-up Care for Stroke Survivors. *J Stroke Cerebrovasc Dis.* 2013 Oct;22(7):e173–80.
14. Pandian JD, Toor G, Arora R, Kaur P, Dheeraj KV, Bhullar RS, et al. Complementary and alternative medicine treatments among stroke patients in India. *Top Stroke Rehabil.* 2012;19(5):384–94.
15. Alia C, Spalletti C, Lai S, Panarese A, Lamola G, Bertolucci F, et al. Neuroplastic Changes Following Brain Ischemia and their Contribution to Stroke Recovery: Novel Approaches in Neurorehabilitation. *Front Cell Neurosci.* 2017 Mar 16;11:76.
16. Richards LG, Stewart KC, Woodbury ML, Senesac C, Cauraugh JH. Movement-Dependent Stroke Recovery: A Systematic Review and Meta-Analysis of TMS and fMRI Evidence. *Neuropsychologia.* 2008 Jan 15;46(1):3–11.
17. Critical Period After Stroke Study (CPASS): A phase II clinical trial testing an optimal time for motor recovery after stroke in humans [Internet]. [cited 2023 Aug 18]. Available from: <https://www.pnas.org/doi/10.1073/pnas.2026676118>
18. de Jong LD, Nieuwboer A, Aufdemkampe G. Contracture preventive positioning of the hemiplegic arm in subacute stroke patients: a pilot randomized controlled trial. *Clin Rehabil.* 2006 Aug;20(8):656–67.
19. Robinson W, Smith R, Aung O, Ada L. No difference between wearing a night splint and standing on a tilt table in preventing ankle contracture early after stroke: a randomised trial. *Aust J Physiother.* 2008;54(1):33–8.
20. Andrew McClure J, Salter K, Foley N, Mahon H, Teasell R. Adherence to Canadian Best Practice Recommendations for Stroke Care: Vascular Cognitive Impairment Screening and Assessment Practices in an Ontario Inpatient Stroke Rehabilitation Facility. *Top Stroke Rehabil.* 2012 Mar;19(2):141–8.
21. Chang WH, Park YH, Ohn SH, Park C hyun, Lee PKW, Kim YH. Neural correlates of donepezil-induced cognitive improvement in patients with right hemisphere stroke: a pilot study. *Neuropsychol Rehabil.* 2011 Aug;21(4):502–14.
22. Narasimhalu K, Effendy S, Sim CH, Lee JM, Chen I, Hia SB, et al. A randomized controlled trial of rivastigmine in patients with cognitive impairment no dementia because of cerebrovascular disease. *Acta Neurol*

- Scand. 2010 Apr;121(4):217–24.
23. Medeiros GC, Roy D, Kontos N, Beach SR. Post-stroke depression: A 2020 updated review. *Gen Hosp Psychiatry*. 2020 Sep;66:70–80.
 24. Canadian Stroke Best Practices [Internet]. [cited 2023 Aug 22]. 8. Rehabilitation of Visual and Perceptual Deficits. Available from: <https://www.strokebestpractices.ca/en/recommendations/stroke-rehabilitation/rehabilitation-of-visual-perceptual-deficits/>
 25. Hazelton C, Thomson K, Todhunter-Brown A, Campbell P, Chung CS, Dorris L, et al. Interventions for perceptual disorders following stroke. *Cochrane Database Syst Rev*. 2022 Nov 3;2022(11):CD007039.
 26. Hazelton C, McGill K, Campbell P, Todhunter-Brown A, Thomson K, Nicolson DJ, et al. Perceptual Disorders After Stroke: A Scoping Review of Interventions. *Stroke*. 2022 May;53(5):1772–87.
 27. Yelnik AP, Colle FM, Bonan IV, Vicaut E. Treatment of shoulder pain in spastic hemiplegia by reducing spasticity of the subscapular muscle: a randomised, double blind, placebo controlled study of botulinum toxin A. *J Neurol Neurosurg Amp Psychiatry*. 2007 Aug 1;78(8):845–8.
 28. Rah UW, Yoon SH, Moon DJ, Kwack KS, Hong JY, Lim YC, et al. Subacromial Corticosteroid Injection on Poststroke Hemiplegic Shoulder Pain: A Randomized, Triple-Blind, Placebo-Controlled Trial. *Arch Phys Med Rehabil*. 2012 Jun;93(6):949–56.
 29. Adey-Wakeling Z, Crotty M, Shanahan EM. Suprascapular Nerve Block for Shoulder Pain in the First Year After Stroke: A Randomized Controlled Trial. *Stroke*. 2013 Nov;44(11):3136–41.
 30. Tsubokawa T, Katayama Y, Yamamoto T, Hirayama T, Koyama S. Chronic motor cortex stimulation in patients with thalamic pain. *J Neurosurg*. 1993 Mar;78(3):393–401.
 31. Ada L, Dean CM, Vargas J, Ennis S. Mechanically assisted walking with body weight support results in more independent walking than assisted overground walking in non-ambulatory patients early after stroke: a systematic review. *J Physiother*. 2010;56(3):153–61.
 32. Woodford H, Price C. EMG biofeedback for the recovery of motor function after stroke. *Cochrane Database Syst Rev*. 2007 Apr 18;2007(2):CD004585.
 33. Laver KE, George S, Thomas S, Deutsch JE, Crotty M. Virtual reality for stroke rehabilitation. *Cochrane Database Syst Rev*. 2015 Feb 12;2015(2):CD008349.
 34. Dam M, Tonin P, De Boni A, Pizzolato G, Casson S, Ermani M, et al. Effects of fluoxetine and maprotiline on functional recovery in poststroke hemiplegic patients undergoing rehabilitation therapy. *Stroke*. 1996 Jul;27(7):1211–4.
 35. Geeganage C, Beavan J, Ellender S, Bath PMW. Interventions for dysphagia and nutritional support in acute and subacute stroke. *Cochrane Database Syst Rev*. 2012 Oct 17;10:CD000323.
 36. Edemekong PF, Bomgaars DL, Sukumaran S, Schoo C. Activities of Daily Living. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 [cited 2023 Aug 17]. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK470404/>
 37. Bottemiller KL, Bieber PL, Basford JR, Harris M. FIM score, FIM efficiency, and discharge disposition following inpatient stroke rehabilitation. *Rehabil Nurs Off J Assoc Rehabil Nurses*. 2006;31(1):22–5.
 38. Mp L. Community Reintegration And Long Term Recovery. ■