Stroke Rehabilitation

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Faculty/Presenter Disclosure

- **Faculty:** Sepideh Pooyania

- **Relationships with commercial interests:**
  - **Grants/Research Support:** Unrestricted research grant from Allergan
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  - **Other:** N/A

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Only generic names of the medication and products will be used in this presentation.

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Objective

To Understand the role of rehabilitation in patients following a cerebrovascular accident.

- Evidence Based Research in Stroke Rehabilitation (EBRSR)
- Best Practice Recommendations for stroke Care
- Stroke Engine.

Outlines:

- 1) Importance of stroke rehab
- 2) Essential elements for Stoke Rehab
- 4) Canadian Stroke Strategy Standards
- 5) How to triage for Inpatient vs outpatient Stroke Rehab
- 6) Discuss some of the rehab interventions

- Within our aging population, stroke is an increasingly common and often disabling condition
- It is the leading cause of adult neurologic disability in Canada, with over 300,000 people (1% of the population) living with its effects

- Although significant investments have been made to reduce the incidence of stroke through prevention efforts and to treatments such as thrombolytic therapy, their impact is not expected to be sufficient to reduce the burden of stroke-related disability in the face of changing demographics.

- The greatest opportunity for recovery after a stroke is **a system of well-organized rehabilitation**.

- Achieving optimal outcomes in stroke rehabilitation and recovery at any age starts with early post stroke rehabilitation assessment, and the development of an individualized rehabilitation plan.

- The plans should incorporate patient goals, environmental factors (e.g., social supports, living arrangements), current functional, cognitive and emotional deficits, and potential for recovery.

- The plan clearly describes the types of therapies required based on the results of clinical assessments across all domains of rehabilitation.

- The interdisciplinary stroke rehabilitation unit has been associated with reductions in death and the combined outcomes of death or disability and death or the need for institutionalization

- stroke Unit Trialists' Collaboration, Organised inpatient (stroke unit) care for stroke, *Cochrane Database Syst Rev* (1) (2002)

5 essential elements necessary to achieve optimal stroke rehabilitation care

- (1) Specialized interdisciplinary stroke rehabilitation units.
- (2) Early admission to stroke rehabilitation units.
- (3) Intensive provision of therapies.
- (4) Task-specific therapy.
- (5) Outpatient therapy.
- Teasell et al A Blueprint for Transforming Stroke Rehabilitation Care in Canada: The Case for Change

- Admitting stroke patients earlier to rehabilitation reduces the LOS in acute hospital units and overall hospital LOS and results in improved functional outcome.
- The intensity with which stroke rehabilitation therapies are provided is positively correlated with the rate of recovery poststroke.

- Task specific in which subjects practice context-specific motor tasks and receive some form of feedback has been shown to decrease LOS when compared with neurodevelopmental techniques and results in better functional outcomes.

- Outpatient therapy allows patients with moderately disabling strokes the opportunity to maintain or augment gains achieved during inpatient stroke rehab, while allowing some patients with mild disability to avoid inpatient rehabilitation completely.

- L. Gilbertson, et al Domiciliary occupational therapy for patients with stroke discharged from hospital: randomised controlled trial, *BMJ* **320** (2000), pp. 603–606

- Adequate well-resourced outpatient therapy, which is relatively inexpensive, is essential to ensure rapid and timely discharge from more costly inpatient programs.

Canadian Stroke Strategy Standards:

- All persons admitted to hospital with acute stroke should have an initial assessment by rehab professionals ASAP.
- All people with acute stroke with any residual stroke rehab impairments who are not admitted to hospital should undergo a comprehensive outpatient assessment.

Canadian Stroke Strategy Standards:

- Clinicians should use standardized, valid assessment tools to evaluate the patient's stroke related impairments and functional status.
- Survivors of a severe and moderate stroke should be reassessed at regular intervals for their rehab needs.

What would be your criteria for admission to a stroke rehabilitation unit?

Who should receive stroke rehab?

Anyone who has suffered a stroke:

- Medically stable
- Has functional deficit

And also

- Is able to learn
- Is able and willing to participate
- Identifiable goals.

- Grensham et al ,1995

Inpatient Stroke Rehab:

Rules of 2s:

1) Can remember 2/3 objects.
2) Can follow 2 step commands.
3) 2 hours out of bed.
4) Willing 2 participate.
5) At least 2 practitioners expertise needed (nursing care necessary).
6) Discharge 2 ? (In terms of realistic goal setting and advanced planning).

Where (what environment) is most appropriate and cost effective

- Mild Stroke (**FIM > 80)** at 5-7 days >> Outpatient setting
- Moderate (**FIM 75-55)** to severe (**FIM <55)** strokes >> stroke specific rehab units.
- Patients with severe stroke may be better managed on long-term, less intensive stroke rehab units.
- Younger patients will benefit from inpatient rehab even with high FIM.

Therapy of Hemiplegia

- Early Phase:

  In early stages the hemiplegic limbs are often flaccid and paralyzed. Poor positioning can cause shouledr subluxation or pressure nerve palsies.

Positioning and passive range of motion of the limbs are needed.

Different methods for motor recovery is used.

- Neurodevelopmental techniques advocated by Bobath, uses special reflex- inhibiting postures and movements .
- If spasticity develops, slow steady stretching will be performed.

Development of motor control

- Rehab methods to regain motor control: Stretching and strengthening.
- Sensory feedback to facilitate muscle activation.
- Different facilitation techniques.
- FES, EMG biofeedback
- Virtual reality, robotics.

CIMT

- There is strong evidence of benefit of CIMT and modified CIMT in comparison to traditional therapies post stroke.
- Benefits appear to be confined to stroke patients with some active wrist and hand movements, particularly those with sensory loss and neglect.

Shoulder pain

- There is an association between hemiplegic shoulder pain and poorer functional outcomes, which may simply reflect an association with more severe strokes.

Balance and gait training

- There is strong evidence that strength training increases walking distance post stroke. There is moderate evidence that progressive strength training can improve ADL function.

- There is strong evidence that task- specific gait training improves gait post stroke.

- There is strong evidence that functional electrical stimulation and gait retraining results in improvements in hemiplegic gait.

- There is strong evidence that EMG biofeedback training improves gait and standing post stroke.

- There is strong evidence that balance training post stroke improves outcome.

AFO

- There is limited evidence that ankle foot orthoses alone improve various parameters of gait in hemiplegic strokes.
- There is moderate evidence that ankle foot orthoses combined with posterior tibial nerve deinnervation improves gait outcomes in hemiplegic strokes.

Spasticity

is one of the Conditions Associated with Stroke Survival[4]

Spasticity can lead to...

- Increased pain and discomfort
- Reduced benefits of physiotherapy
- Reduced independence in self-care (eating, walking, sitting, bathing, grooming or dressing)
- Decreased quality of life

Ward A, Begg *et al.* Guidelines: Spasticity Following Stroke. Supplement reprinted from *Guidelines* 2004 October;24:95-98.

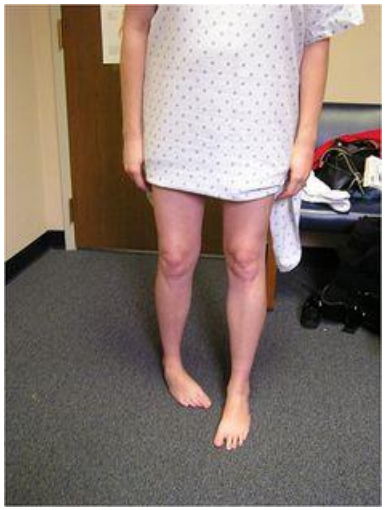
Flexed elbow

Bent wrist

Pronated forearm

Clenched fist

Thumb in palm



Indications for treating spasticity

- Improve voluntary function
- Improve ADL's and reduce burden of care
- Comfort. Proper positioning in wheelchair, better orthotic fit
- Reduce pain from spasticity
- Body image
- Prevention of contractures, or skin breakdown.

- In post stroke spasticity, general pharmacological treatments are limited by adverse events and lack of evidence of functional benefit.

- Yelnik , Pharmacology and upper limb post stroke spasticity .
  Annales de readaptationa et de medicine physique 47(2004)

- Chemodenervation using Botulinum toxin can be used to increase range of motion and decrease pain in patients with focal and /or symptomatically distressing spasticity.

- Evidence Based Research for Stroke Rehabilitation website.

Spasticity in UE

- There is strong evidence that treatment with Botulinum toxin significantly decreases spasticity in the upper extremity in stroke survivors and that this is associated with decreased spasticity, increased range of motion, with subsequent improvements in upper extremity function.

- A mata-analysis which included the results from 8 studies reported a moderate increase in gait speed associated with Botulinum toxin type-A.

Foley et al, 2010. Does the treatment of equinus deformity following stroke with botulinum toxin

Increase gait velocity? A systemic review and meta-analysis. Euro J Neurol 2010. 17: 1419-1427

- In a randomized controlled trial, chronic post stroke patients with focal spasticity were randomized to receive ultrasound, transcutaneous electric stimulation, or Botulinum toxin. Patients receiving Botulinum toxin had significantly greater improvement of focal spasticity compared to individuals in the other treatment groups.

- Picelli et al. Efficacy of ultrasound, transcutaneous electrical stimulation compared to botulinum toxin type A in the treatment of spastic equinovarus adults with chronic stroke. Top Stroke Rehab, 2014, 21(supp 1): S1-S16

Communication Therapy

- Detailed evaluation of cognitive and linguistic capabilities of the patient.
- SLP works on deblocking the language deficit or helping the patient to compensate for it.
- Specific techniques for word or phoneme retrieval, and gestures to supplement verbal communication.
- Recovery can take 6-12 months.

Disorders of cognition and behavior

- Large cortical lesions.
- Variable from dementia to poor attention, memory.
- Recognize the cognitive deficits and anticipate how therapeutic strategies may be employed to ameliorate them.

- There is *strong evidence that compensatory strategies are effective in improving memory outcomes post brain injury. Strategies include imagery-based training and the use of assistive, electronic devices.*

Apraxia

- There is strong evidence that strategy training is effective in the treatment of apraxia post-stroke. Training effects may include improvement in performance of activities of daily living that appear to be sustained over time.

Neglect

- Training patients to visually scan from side to side offering stimuli to draw attention to the left hemispace and environmental adaptation.

Strategies to treat neglect

- Limb activation
- Sensory Stimulation Intervention
- Feedback strategies
- Prismatic Adaptation
- Eye- patching and Hemi-spatial Glasses
- Caloric vestibular Stimulation
- Optokinetic Stimulation
- Trunk Rotational Therapy

Other cognitive dysfunction:

- Depression
- Sexuality
- Psychological Aspects

- Dysphagia and Aspiration Following Stroke

- Nutritional Interventions Following Stroke

Medical complications

- Bladder and Bowel Management
- DVT
- Seizure
- Osteoprosis
- Central Pain

Late rehab issues,
community integration.
Return to work, Driving

Thank You