Opportunities To Improve Stroke Care

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Faculty/Presenter Disclosure

- **Faculty: Sepideh Pooyania**

- **Relationships with commercial interests:**
  - **Grants/Research Support:** None
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  - **Other:** None

Mitigating Potential Bias

N/A

Objectives

- Understand the evidence and rationale for the recommendations :
  - Specialized Stroke Units
  - Early admission to rehabilitation
  - Intensity of therapy
  - 7 day a week admission – 7 day a week therapy
  - Outpatient Rehabilitation

Canadian Stroke Strategy

Joint venture of the Canadian Stroke Network and the Heart and Stroke Foundation of Canada:

"All Canadians have optimal access to integrated, high quality and efficient services in stroke prevention, treatment, rehabilitation and community reintegration"

www.strokebestpractices.ca

Models of Stroke Care

- General Medical Ward
- Acute Stroke Units
- Combined acute and subacute stroke units (also known as Integrated Stroke Units)
- Subacute Stroke Rehab units
- Mobile Stroke Teams

Acute stroke Care/ Stroke unit

The use of comprehensive specialized stroke care (**stroke units**) that incorporates rehabilitation is recommended (Class I; Level of Evidence A)

Continued emphasis that organized stroke units with interprofessional stroke teams have the strongest evidence and a significant impact on patient outcomes following stroke

- Benefits 100% of patients
- Reduced death and disability by 35 to 40 percent

Stavem and Ronning 2011 (follow-up to 1998), Di Carlo et al. 2011 , Saposnik et al., 2011, Seenan et al., 2007,

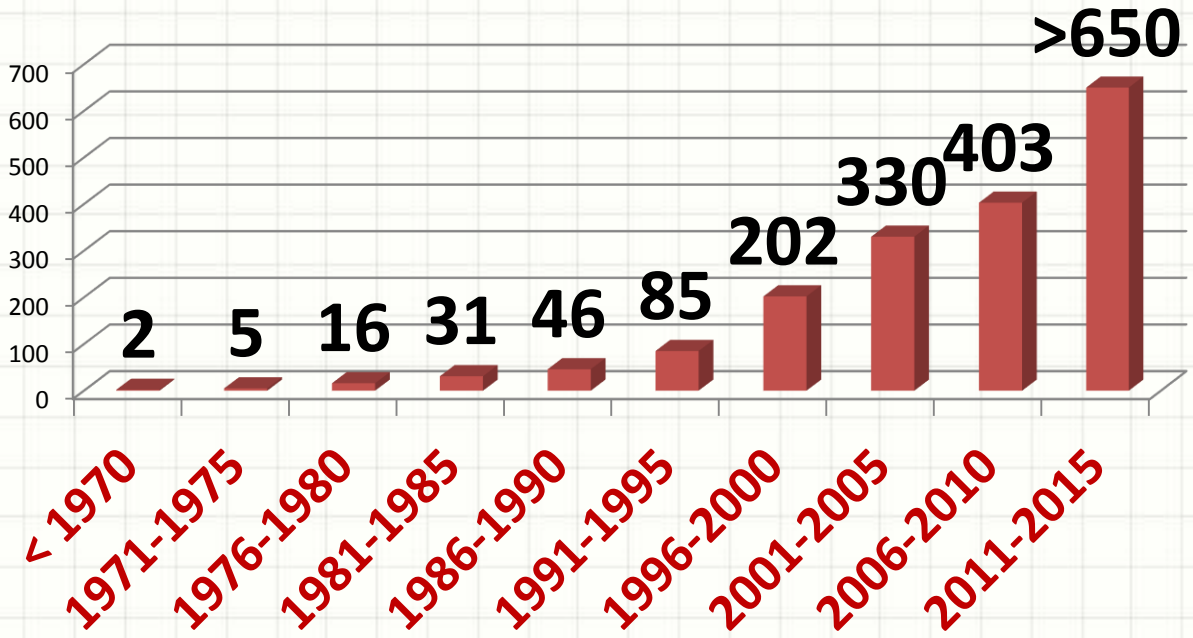
Silva et al. 2005, Cumbler et al. 2014

Directions for Stroke Rehabilitation

1. Improving Quality of Interventional Research
2. Better Understanding Stroke Rehab and Recovery and who responds
3. Standardizing Care: Benchmarking and Increased Accountability for intensity

Improving Quality of Research in Stroke Rehabilitation

Number of RCTs per Half-Decade for Stroke Rehab and Secondary Prevention



McIntyre A, Richardson M, Janzen S, Hussein N, Teasell R. The evolution of stroke rehabilitation randomized controlled trials. *International Journal of Stroke* 2014; 9(6):789-792.

Stroke Rehabilitation Evidence-Based Review – 17th edition 2016 www.ebrsr.com (funded by HSF, CSN, CPSR)

EBRSR
www.ebrsr.com

Better Understanding Stroke Rehab and Recovery and who responds

- Irreversible structural damage to the corticospinal tract severely limits recovery of the upper limb movement (Stinear et al 2007; 2012)
- FMRI activation. TMS. PREP algorithm
- Structural imaging and other biomarkers may help us understand who recovers better

Stinear et al. *Brain* 2007; 130:170-80.
Stinear et al. *Brain* 2012; 135:2427-35

What did the more efficient Stroke centers do?

- Admitted to specialized inter-disciplinary stroke rehab units (reduces death and disability)
- Admitted earlier and more disabled
- More intensive therapy (incl. W/E)
- Less time in assessments
- Move to high level tasks early
- Well developed outpatient services

Benefit of Early Therapy in Animals

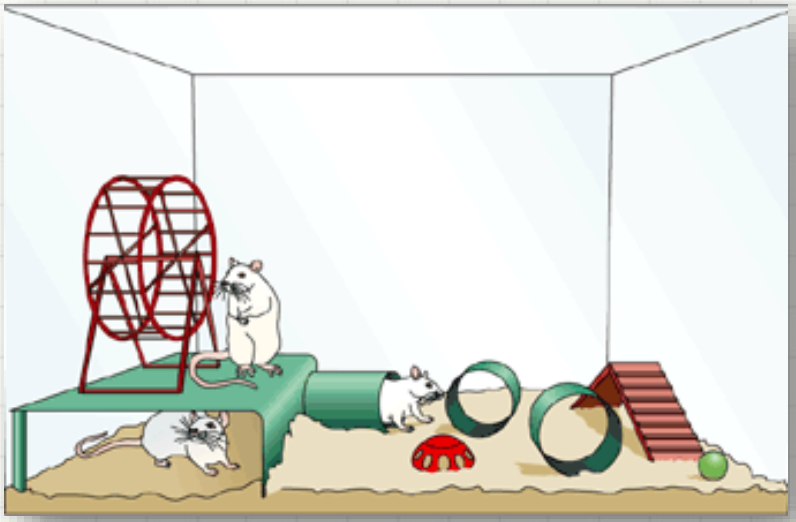
Methods:

- Biernaskie et al. (2004) subjected rats to rehab x 5 weeks beginning at 5, 14 and 30 days post small strokes
- Control animals – social housing

Benefit of Early Therapy in Animals-

Results:

- All received 5 weeks of enriched environment
- Day 5 rehab marked improvement
- Day 14 moderate improvement
- Day 30 no improvement vs. control



A Very Early Rehabilitation Trial (AVERT)

Randomized 2104 adults (1:1) to receive early mobilization, a task-specific intervention focused on sitting, standing, and walking activity, initiated within 24h of stroke onset,

or to usual care for 14 days (or until hospital discharge)

Significantly fewer patients in the early mobilization group had a favorable primary outcome

- Frequent, out-of-bed activity in the very early time frame (within 24h of stroke onset) is not recommended (Evidence Level B).

- All patients admitted to hospital with acute stroke should start to be mobilized early (between 24h and 48h of stroke onset) if there are no contraindications (Evidence Level B)

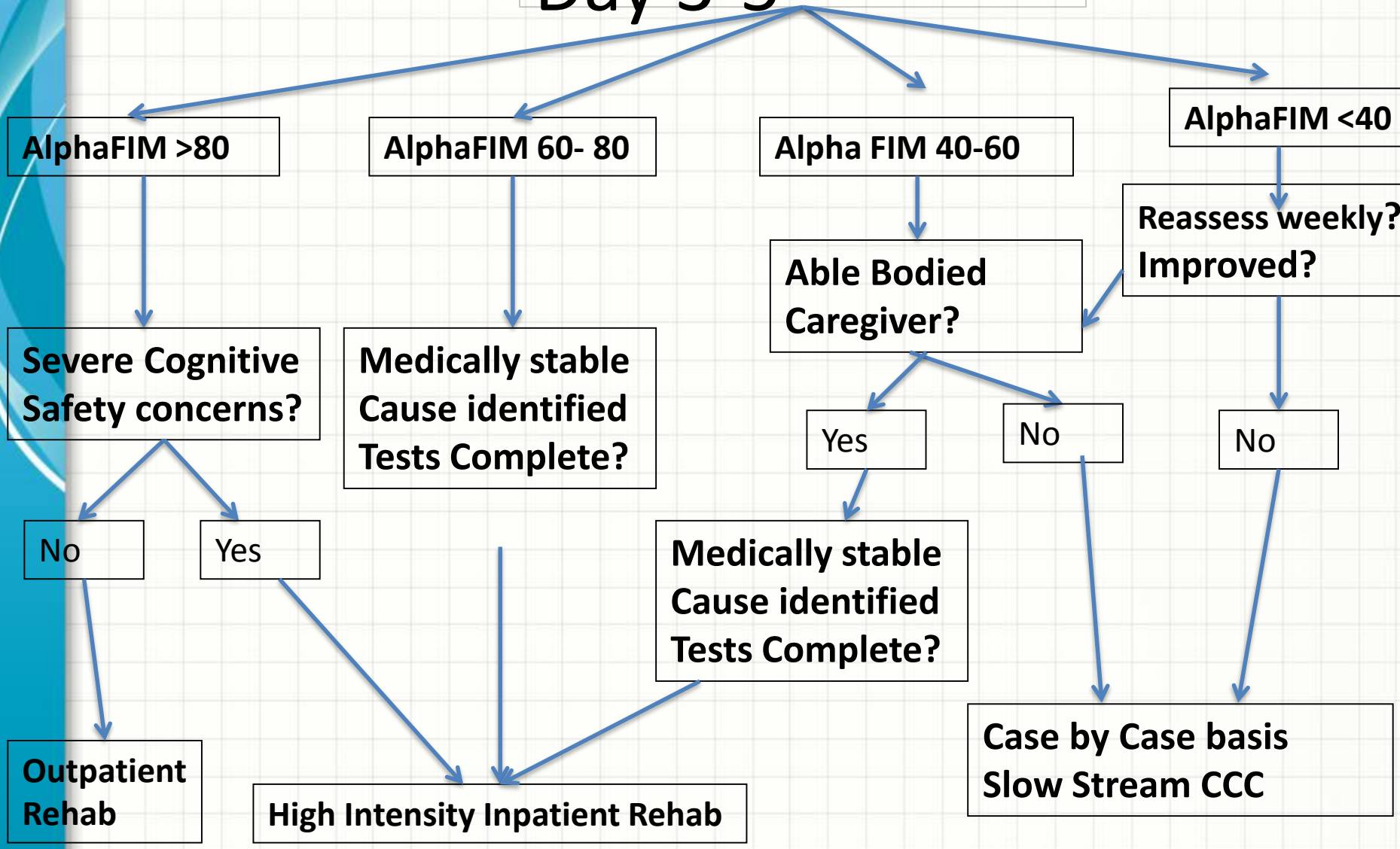
Issue-Early assessment

- Lack of Common assessments between Acute and rehab
- Wait until “rehab ready” to start referral processes
- not “pulling” patients out of acute care
- No admissions or TX on the weekend

Proposed Solution-Triage Tool

- Alpha FIM is 6 item instrument that assesses stroke related burden of care
- Items on Alpha FIM scoring similar to FIM (1 dependent to 7 independent)
- Four “motor” items-Eating, Grooming, Bowel Management, Transfers: Toilet,
- Two “Cognitive” items-Expression, and Memory.
- Expands to projected full FIM score

Alpha FIM Day 3-5



Role of Intensity of Therapy

- Canadian Stroke Guidelines note stroke rehab patients should receive a **minimum of three hours of direct task-specific therapy, five days a week**, delivered by the inter-professional team
- Greater intensity of practice results in better outcomes
- However, research with animals involves thousands of repetitions
- Lang et al. (2007) found practice of task-specific, functional U/E movements occurred in half of U/E rehab sessions: Average number of reps = 32
- Van Peppen et al. (2004) noted an additional therapy time of 17 hours over 10 weeks is necessary to see significant positive effects; affirmed by Verbeek et al. (2014)

Lang et al. *Arch Phys Med Reha*bil 2009: 90:1692-1698
Van Peppen et al. *Clinical Rehab* 2004; 18:833-862.
Verbeek et al. *PLOS ONE* 2014; 9(2):e87987

Intensify Rehabilitation

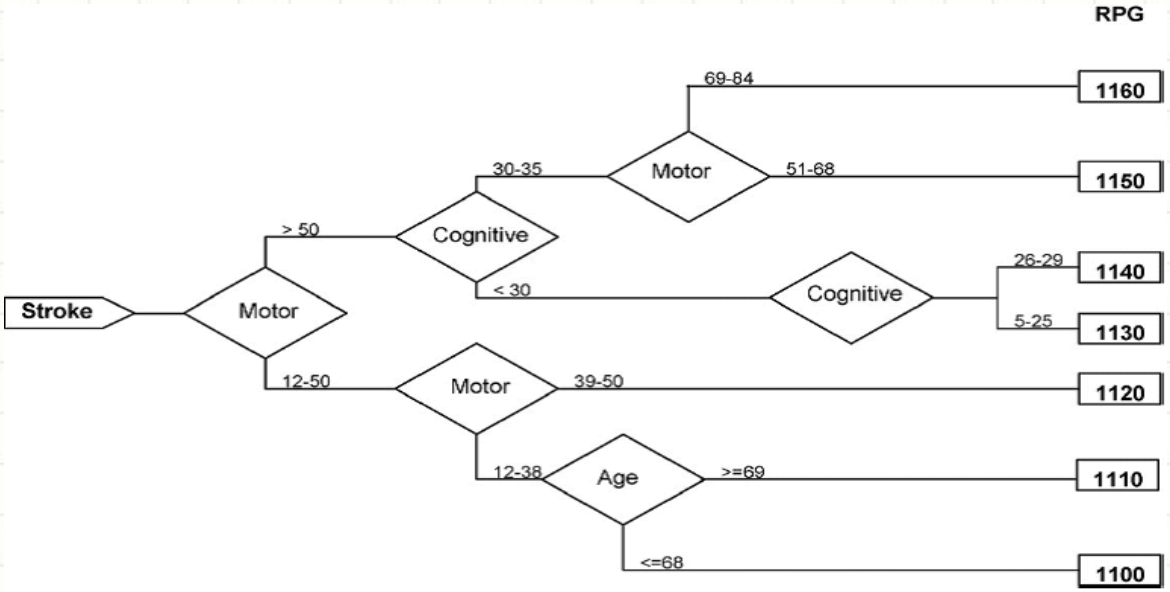
- Intensity of treatment is increasingly seen as important
- American centers have a three hour rule of therapy
- LOS is half of length of stay of Canadian

Therapy is Cheap; Length Of Stay is Not

- Therapists are not replaced when sick or absent.
- The Ratio of therapists to patients is not standard. (1/10 instead of 1/6.)
- Need to ensure standards for daily Therapy; at least 1 hour/day for each discipline needed.

Inpatient Rehabilitation Cost Impact-Improved Efficiency

- Inpatient rehabilitation estimates were calculated separately by Rehabilitation Patient Group (RPG)*



Motor = motor FIM score (-tub/shower transfer), Cognitive = cognitive FIM score

Functional Independent Measure – FIM

18 items scored 1 (dependent) to 7 (completely independent) =126

MOTOR ITEMS (13 Items, Total Score = 91)		COGNITIVE ITEMS (5 Items, Total Score = 35)	
Self-Care:	Eating	Communication:	Comprehension
	Grooming		Expression
	Bathing		
	Dressing - Upper Body	Social Cognition	: Social Interaction
	Dressing - Lower Body		
	Toileting		Problem Solving
Sphincter Control:	Bladder Management		Memory
	Bowel Management		
Locomotion:	Walk/Wheelchair	*Total Motor :*	
	Stairs	*Total Cognitive :*	
Transfers:	Bed/Chair Wheelchair	*Total FIM :*	
	Toilet		
	Tub/Shower		

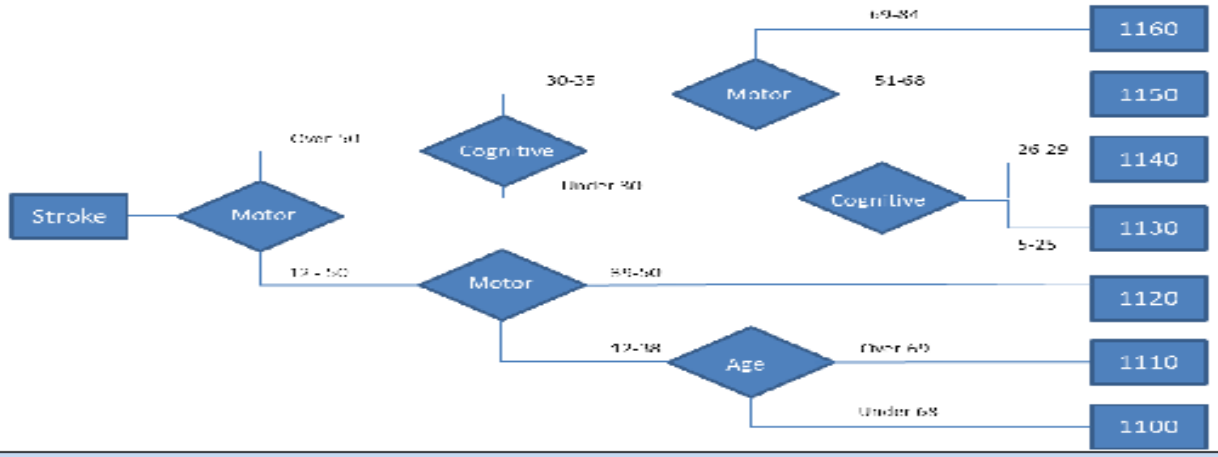
Targets by RPGs

- 1100 = LOS 48.9 days
- 1110 = LOS 41.8 days
- 1120 = LOS 25.8 days
- 1130 = LOS 25.2 days
- 1140 = LOS 14.7 days
- 1150 = LOS 7.7 days
- 1160 = LOS 0 days

RIVERVIEW HEALTH CENTRE

Addressograph

REHAB PATIENT GROUP (RPG) TRACKING



Benchmark Length of Stay

Mild	*Moderate*	*Severe*
☐ 1160 = 0 days	☐ 1140 = 14.7 days	☐ 1120 = 25.8 days
☐ 1150 = 7.7 days	☐ 1130 = 25.2 days	☐ 1110 = 41.8 days
		☐ 1100 = 48.9 days

Admission Date _____ RPG Set Date _____

Benchmark LOS _____ Team Set LOS _____

Discharge Date _____ Actual (active) LOS _____

Barriers for D/C

1☐ Medical Change
2☐ Rural residence
3☐ Family Supports
4☐ Lack of OP Services
5☐ Staffing Issues
6☐ Other:

Community based rehab

- Community-based rehabilitation is defined as care received once the patient has passed the acute stage and has transitioned back to their home and community environment.

Early Supported Discharge (ESD)

- Mild strokes, safely transferred back to their homes to continue their rehabilitation and achieve outcomes that are as good as or better than those that would have been attained had they remained in hospital.
- Many patients who have completed a course of inpatient rehabilitation will still require ongoing therapy provided in the community to achieve their desired goals once discharged from hospital

Best Practices for Stroke Care:

- Recommend that patients remain in an inpatient setting for their rehabilitation care if they are in need of skilled nursing services, regular physician care, and multiple therapeutic interventions

Strategy:

Enhance Outpatient Rehab service and Community Programs

Outpatient Rehab

Improves outcome.

30% reduction in bad outcomes, including institutionalization and allows earlier discharge home.

- Outpatient therapy is relatively inexpensive (1 PT/1 OT/0.5 SLP/0.5 SW = cost of 1 rehab inpt bed)
- Estimated savings is $2 for every $1 spent on outpatient therapies

Key Rehabilitation issues

- All patients should be referred to a specialist rehabilitation team on a geographically defined unit as soon as possible after admission
- Provision of greater intensity therapy in inpatient rehabilitation (3 hours of therapy per day, 7-day a week therapy)
- Recommended staffing ratios for inpatient rehabilitation are: PT/OT – 1 therapist for every 6 patients and SLP - 1:10 patients

Summary

Organized Stroke Care improves outcomes

Key elements-

- Geographically distinct specialized unit
- Early onset rehab
- Intensity of therapy
- Outpatient Therapy

Acknowledgement

- Stroke Recovery Network
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