

Using Objective Measures to Facilitate Rehabilitation Referral

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Objectives

By the end of the sessions participants will

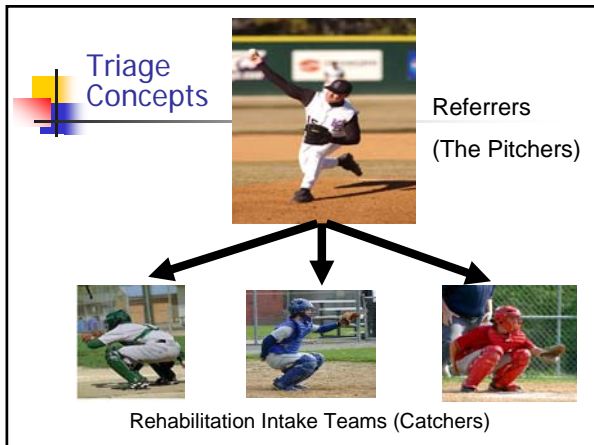
- Recognize the concepts of Triage for rehabilitation referral
- Understand evidence based measures that could be used in Acute care to facilitate referral
- Enumerate the benefits and challenges of using objective measures for rehab referral

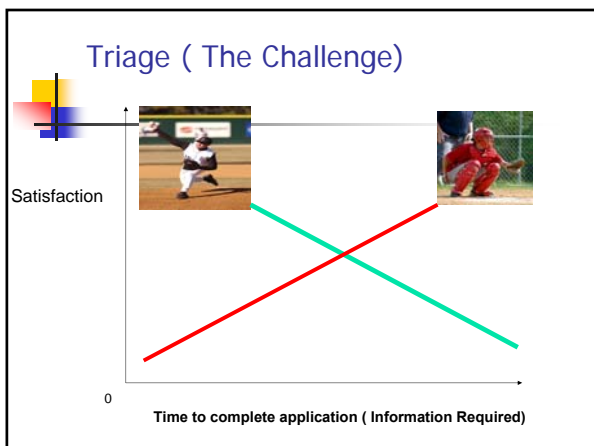
Keys to Early Recovery (CSS Best Practice Guidelines)

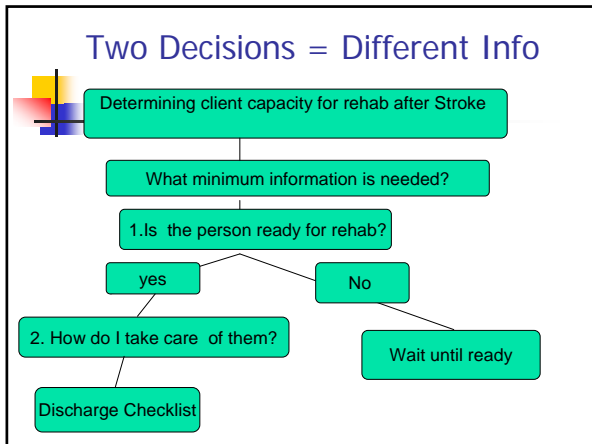
- Early mobilization
- Assessment for Dysphagia
- Prevention of venous thromboembolism
- Management of oral care, nutrition,
- Body temperature,
- bladder and bowel
- Early rehabilitation assessment



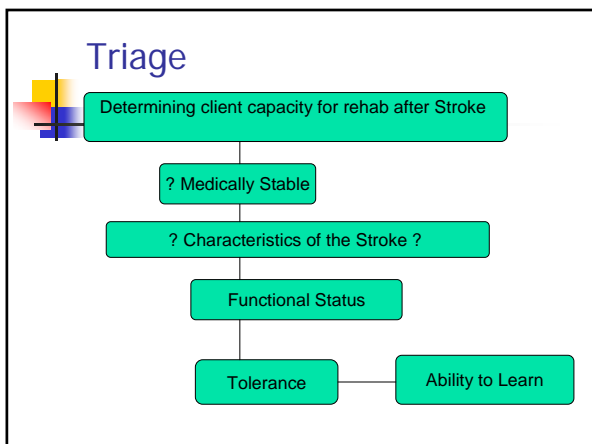
- How do Stroke Rehabilitation clients get referred for transfer to the rehabilitation program at your center?









You have been asked to develop a minimum set of observations or assessments in acute care that will allow appropriate decisions about who should have inpatient or outpatient rehabilitation. The regional health authority and hospital administrators are really protecting acute care staff time and will charge you for everything you want at \$1000 per item. You have \$5000 so name your top 5 issues to determine rehab admission.






Potential Elements of Stroke Referral

Elements
Stroke Diagnosis
Cause of Stroke
Co morbidities and Complications
Functional Level including
Mobility Cognition
Speech Special Needs
Estimated Rate of Progress
Demographics
Family support
Patient preference




Does your center use any standardized measures in acute care for referral?



Why use Objective Measures?

- Provides communication through common language and terminology
- Promotes best practices in stroke care and prognostication
- Trust!!!
- Efficiency for Intake team
- Provides an infrastructure for research
- Allows comparison with international standards




Objective Measures in Stroke


Impairment- e.g. Orpington, CNS, NIHSS, Chedoke McMaster Arm and Hand inventory

Activity- e.g. Barthel, FIM, Chedoke arm and Hand inventory, Rankin

Participation- RNL



Orpington Scale		Score
A. Motor deficit in arm (<i>Lying supine, patient flexes shoulder to 90° and is given resistance</i>)		
MRC grade 5 (Normal power)		0.0
MRC grade 4 (Diminished power)		0.4
MRC grade 3 (Movement against gravity)		0.8
MRC Grade 1 – 2 (Movement with gravity eliminated or trace)		1.2
MRC Grade 0 (No movement)		1.6
B. Proprioception (eyes closed) (<i>Locates affected thumb</i>)		
Accurately		0.0
Slight difficulty		0.4
Finds thumb via arm		0.8
Unable to find thumb		1.2
C. Balance		
Walks 10 feet without help		0.0
Maintains standing position		0.4
Maintains sitting position		0.8
No sitting balance		1.2
D. Cognition		
Based on administration of Hodkinson's Mental Test		
Mental test score 10		0.0
Mental test score 8-9		0.4
Mental test score 5-7		0.8
Mental test score 0-4		1.2
Total Score = 1.6 + motor + proprioception + balance + cognition		




Orpington Mental test Scores

Hodkinson's Mental Test


(Score one point for each question answered correctly)

- Age of patient
- Time (to the nearest hour)
- Address given for recall at the end of the test (42 West Street)
- Name of hospital
- Year
- Date of birth of patient
- Month
- Years of First World War
- Name of the Monarch
- Count backwards from 20 to 1



Orpington Scale


- OPS scores range from 1.6 to 6.8 such that higher scores indicate greater deficit (Kalra & Crome 1993; Kalra et al. 1994; Lai et al. 1998).
- Deficits can be categorized as
 - mild to moderate (scores <3.2) (home within 3 weeks)
 - moderate to moderately severe (scores 3.2 – 5.2)
 - severe (scores >5.2)= Long term care



Orpington Psychometrics


- Takes about 5 minutes to administer
- **High Interobserver reliability:** ICC = 0.99 (Rieck & Moreland 2005)
- **Predictive validity:** Orpington scores at 2 weeks
 - correlated strongly with Barthel Index scores at discharge or 16 weeks ($r = 0.89$; $p < 0.001$)
 - 94% of patients with OPS <3 were independent at discharge, 100% of patients with OPS 3 – 5 had limited independence and 100% of patients with OPS >5 were dependent at discharge
 - Predicted discharge destination, the predictive value of OPS <3 was 100% for discharge home and OPS > 5 was 82% for placement in institutional care (Kalra et al. 1994)

OPS scores at 48 hours post stroke ($p=0.03$) and sensation at 48 hours ($p=0.04$) were the most significant predictors of upper limb function (Rivermead Arm Score -- RAS) at 6 months



FIM

- Ottenbacher et al., 1996 reported a mean inter-observer reliability value of 0.95; a median test-retest reliability of 0.95 and a median equivalence reliability (across versions) of 0.92.
- Reliability was higher for items in the motor domain
- Sensitive to Change in Rehabilitation with Minimal Clinically importance change of 21
- Used in the National Rehabilitation System




Alpha FIM

- 6 item abbreviation of the FIM
- The Alpha FIM instrument measures
 - eating
 - grooming
 - bowel management
 - toilet transfer
 - verbal expression,
 - memory
- Designed for use in acute care-
 - Gary S. Clark, American Journal PMR March 2000
Volume 79 Issue 2
- Through equations can be converted into a projected motor FIM and cognitive FIM Score

FIM-FRG Category	Total	Discharged to the Community	Percent
1: motor score 13-37, age 16-74	93	68	73.1
2: motor score 13-37, age >74, cognitive score 5-17	28	11	39.3
3: motor score 13-37, age >74, cognitive score 18-35	52	29	55.8
4: motor score 38-48	70	53	75.7
5: motor score 49-55	68	61	89.7
6: motor score 56-62	53	51	96.2
7: motor score >62, cognitive score 5-30	95	93	97.9
8: motor score 63-73, cognitive score >30	42	42	100.0
9: motor score 74-91, cognitive score >30	60	60	100.0
Total	561	468	83.4

FRG, function-related group.


- Bagg SD, Pombo AP, Hopman WM: Toward benchmarks for stroke rehabilitation in Ontario, Am J Phys Med Rehabil 2006;85:971-976




Inpatient Rehab Measurement

Function	2003-04	2004-05	2005-06
Admission FIM	77	79	80
Discharge FIM	108	108	109
Change in FIM	21	20	21
LOS Efficiency (ΔFIM/ALOS): Mean (Mdn)	0.8 (0.6)	0.8 (0.6)	0.9 (0.7)

Stroke Evaluation and Assessment Committee Report 2006:
NRS Data for RCG 1 – All Patients




Charlson Comorbidities	
Comorbid Condition	Assigned weight
Myocardial infarction Congestive heart failure Peripheral vascular disease Cerebrovascular disease Dementia Chronic pulmonary disease Connective tissue disease Ulcer disease Mild liver disease Diabetes	1 (RR \geq 1.2,<1.5)
Hemiplegia Moderate or severe renal disease Diabetes with end organ damage Any tumour Leukemia Lymphoma	2 (RR \geq 1.5,<2.5)
Moderate or severe liver disease	3 (RR \geq 2.5,<3.5)
Metastatic solid tumour AIDS	6 (RR \geq 3.5)




Charlson Comorbidity Index

- The Charlson Comorbidity Index is the most extensive studied and widely used index of comorbidity (deGroot et al. 2003).
- It is relatively simple to use, requiring the identification of conditions from a well-defined list
- If the outcome of interest is mortality, the CCI is an appropriate tool for identification/stratification of risk (Rochon et al. 1996).
- may not be able to account for the spectrum of medical conditions experienced by individuals with chronic disability in rehabilitation settings (Rochon et al. 1996).




Charlson Comorbidity Index

- **Interobserver reliability:** Liu et al. (1997) reported ICC = 0.674 and 0.159 for the CCI and weighted
- **Predictive validity:** Identified age and comorbidity as assessed on the CCI as significant predictors of death ($p < 0.0001$, Charlson et al. 1987);
- review by De Groot et al. (2003) reported significant relationships between CCI scores and mortality, disability, readmissions and length of stay
- Liu et al. (1997) reported that the CCI did not correlate with discharge FIM scores or with length of stay




Severity/Predictive Measures

Tools	Time to complete	Administered by	Tells you	Training needed
Orpington	7 min	Rehab, Nursing, Physician	Disability	Min, assumes advanced skills
Alpha FIM	15 min	Rehab, nursing	Burden of care + hrs of care	Extensive, certified
Comorbidities Index	5 min	Physician, nursing	Impact of comorbidities on rehab potential	Min, assumes advanced skills



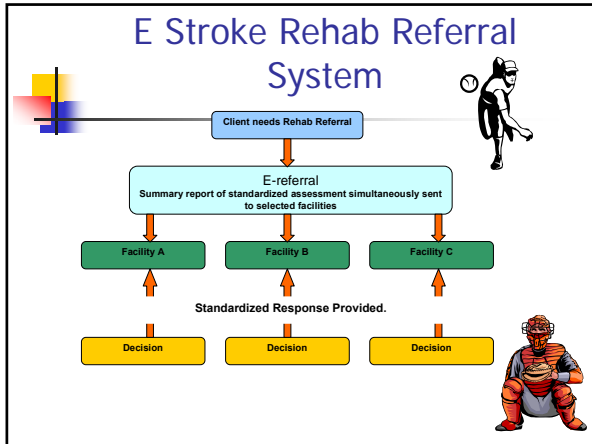
Background

- 1/6 Rehabilitation Pilots for the Ontario Stroke Strategy
- Urban environment with large number of organizations with multiple rehab providers
- Goal is to improve access, coordination and outcomes
- SCRIPT= Stroke Coordinated Referral Initiative Pilot Toronto

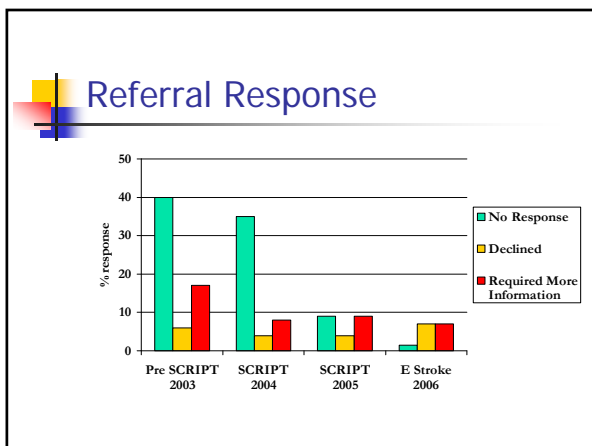


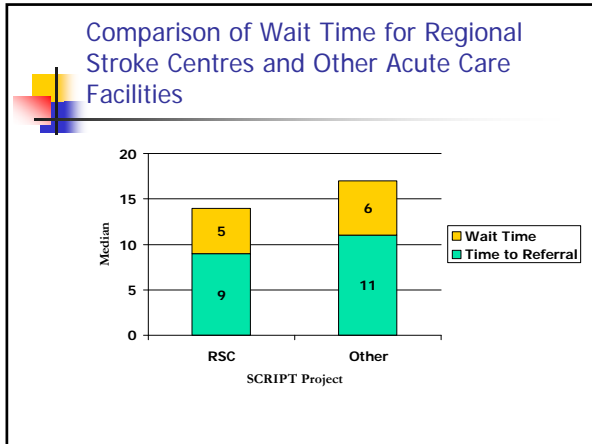
Objectives of SCRIPT

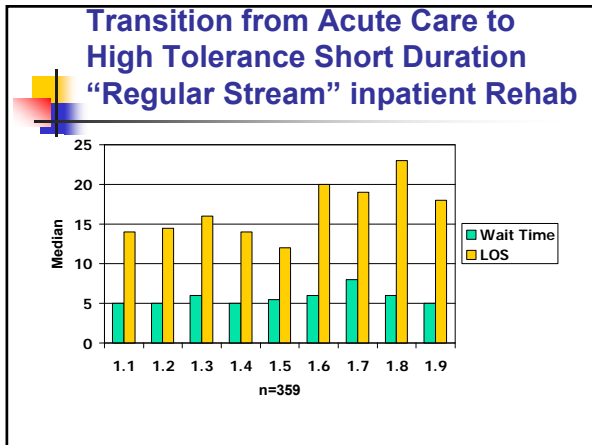
1. Develop a stroke rehabilitation referral system triages patients using minimum set of :
 - Clinical measures: demographic variables, validated stroke severity, patient activity status, comorbidities, cognitive status and Neuro imaging measures
2. Evaluate the use of this Internet based electronic referral system with simultaneous database collection, waitlist management system using measures of:
 - wait times, length of stay, response times
 - Client satisfaction

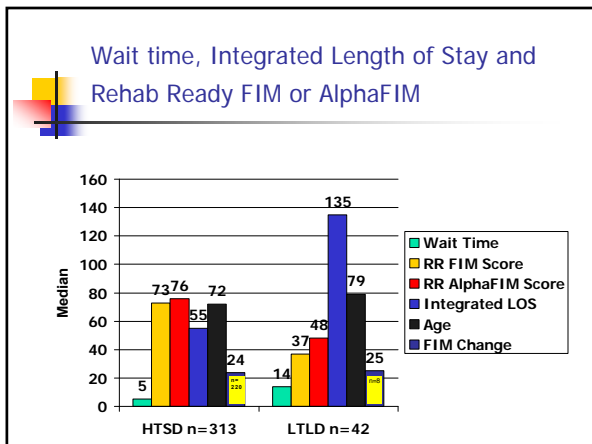


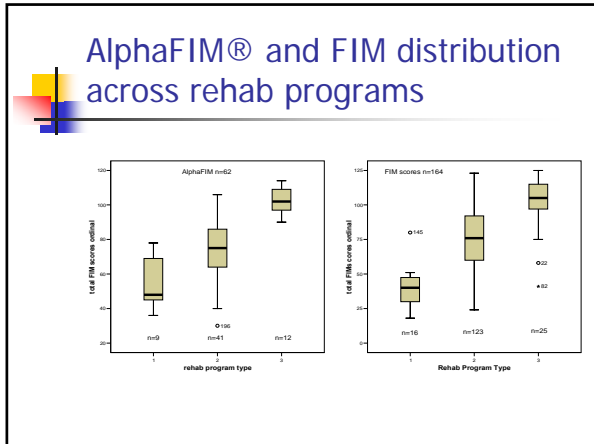
- ### E Stroke
- Emails alert both referrers and intake coordinators that a referral has been made or response is required
 - The centralized database records responses to referrals and tracks non identified client indicators e.g. wait time for use in program evaluation and research
 - Rehab facilities provide admission and discharge dates and FIM™ Instrument scores to facilitate tracking of clients across the rehab continuum

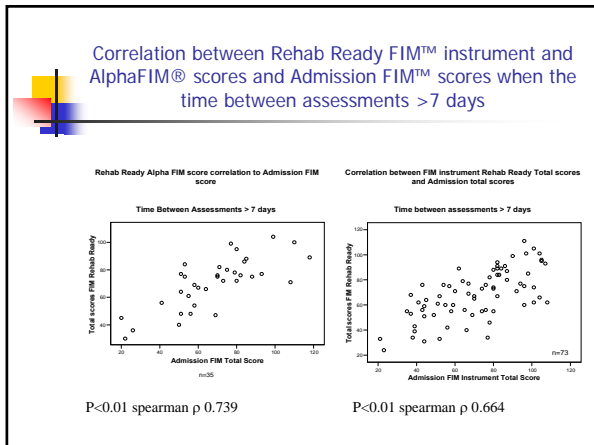














What are the barriers to implementation of a set of referral measures in acute care at your center?



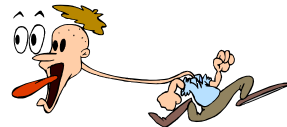
Challenges to Use of Outcome Measures


- Evaluate and manage the impact on workload
- Adequate resources of Rehab professionals in acute care
- Need Managerial support for process




“You mean I have to open my email?!”

- Training needs vary
- Learning styles vary
- Adoption time varies
- Provide interactive education sessions
- Tailor training to individuals
- Ongoing support






What are the benefits of implementation of Early Stroke Assessment?



Benefits of Early Assessment

Table 2: Regression Results –Likelihood of acute care Discharge to inpatient rehab from National Database


	Result	P-Value
	Odds Ratio (95%CI)	
-Age	1.0 (0.9, 0.99)	0.0001
-Stroke unit in acute care	1.4 (1.3, 1.6)	0.0001
-Seen by occupational therapist in acute care	2.7 (2.1, 3.5)	0.0001
-Seen by physiotherapist in acute care	2.0 (1.5, 2.7)	0.0001
-Seen by social work in acute care	1.7 (1.5, 1.9)	0.0001



Benefits of Early Assessment

Table 2: Regression Results –Days between stroke onset and admission to rehab


	Result	P-Value
	Estimate (95%CI)	
-Stroke unit in acute care	-0.2 (-0.3, -0.2)	0.0001
-CNS score	-0.03 (-0.04, -0.01)	0.0003
-Seen by social work in acute care	0.1 (0.04, 0.2)	0.0025



Benefits of Early Assessment


Table 2: Regression Results –Discharge to home from inpatient rehabilitation

	Result	P-Value
	Odds Ratio (95%CI)	
-Age	0.97 (0.96, 0.98)	0.0001
-Seen social work (acute care)	0.75 (0.6, 0.9)	0.009
-Seen by nutrition in acute care	0.79 (0.64, 0.97)	0.03
-Admission FIM score	1.04 (1.03, 1.05)	0.0001



Conclusions


- Efficient referral to rehabilitation requires using minimum information to make decisions
- Using objective measures for referral
 - provides communication through common language and terminology
 - Promotes best practices in stroke care
 - May improve prognostication
 - Increases Trust!
 - Provides an infrastructure for research
 - Allows comparison with international standards



Conclusions- Benefits

The electronic referral system :


- Can track capacity by examining time on wait list
- tracks patients who do not get to rehab but have rehab goals e.g. those sent to Nursing Homes
- Allows comparison of performance across organizations who have similar patients



Conclusions

Sustainability issues

- Training is required
- Acute care teams will have to coordinate efforts to complete the measures



Acknowledgements

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