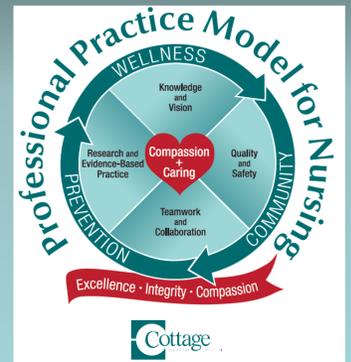




Validation of Fall Risk Assessment Specific to the Inpatient Rehabilitation Facility Setting

Dan Thomas MSN, RN, CRRN, Erin Bisaccia PT, DPT, NCS, Andrea Pavic MS, OTR/L
Jonathan Grots MA Research Analyst
Cottage Rehabilitation Hospital



Purpose & Objective

- Purpose:** To evaluate and compare the Morse Fall Scale (MFS) and Casa Colina Fall Risk Assessment Scale (CCFRAS) for identification of patients at risk for falling in an acute inpatient rehabilitation facility.
- Objective:** To perform a retrospective validation study of the CCFRAS, specifically for use in the inpatient rehabilitation facility (IRF) setting.

Design & Methods

- Design:** Retrospective validation study
- Method:** The study was approved under expedited review by the local Institutional Review Board. Data was collected on all patients admitted to Cottage Rehabilitation Hospital (CRH) from March 2012 - August 2013. Patients were excluded from the study if they had a length of stay less than three days or age less than 18. The area under the receiver operative characteristic curve (AUC) and the diagnostic odds-ratio were used to examine the differences between the MFS and CCFRAS. AUC between fall scales was compared using the DeLong Test.

Findings & Conclusion

- Findings:** There were 931 patients included in the study with 62 (6.7%) patient falls. The average age of the population was 68.8 with 503 males (51.2%). The AUC was 0.595 and 0.713 for the MFS and CCFRAS, respectively (P= 0.006). The diagnostic odds-ratio of the MFS was 2.0 and 3.6 for the CCFRAS using the recommended cutoffs of 45 for the MFS and 80 for the CCFRAS.
- Conclusion:** **The CCFRAS appears to be a better tool in detecting fallers versus non-fallers specific to the IRF setting.**

Casa Colina Scale

Diagnosis	If yes, patient receives the following score	Admit Scores Date	Team Conference Date	Team Conference Date	Team Conference Date	Team Conference Date	Team Conference Date
RCVA	20						
TBI	50						
All Amputees	40						
Tetraplegia ASIA A,B, or C	Yes No	IF YES, LOW RISK - DO NOT CONTINUE TO SCORE					
FIM Score							
Toileting score 1,2	30						
Bed transfer 1,2	20						
Tub/shower transfer 0,1	20						
Stairs 0	60						
Total							
	Staff initials						
	Staff Signature						

If 80 or > patient is HIGH RISK: Notify the primary nurse for the patient. Discuss the interventions below in TEAM Conference. These interventions must be charted in narrative each shift by licensed nurse.

HIGH FALL RISK Interventions	
Discuss time voiding program	Yellow arm band in place
Discuss restraints	Yellow falling star on door
Issue reacher if needed	Licensed nursing report to CC q 4 hours on hourly rounding results.
Bed and wheelchair alarms on at all times	Beside table, call light, phone and TV in reach after each employee interaction?

Fall Characteristics

	(n =62)
Days from Admission to Fall	9 (11.3)*
Fall Type	
Other/Unknown	26 (41.9%)
Fall Ambulating (w or w/o assist)	8 (12.9%)
Transferring to Chair, Bed, etc.	8 (12.9%)
Reaching for Item	3 (4.8%)
Changing Position	3 (4.8%)
Fall Outcome	
Required Monitoring or Intervention	7 (11.3%)
No Apparent Injury	55 (88.7%)

*Mean (standard deviation)

Clinical Relevance

- Clinical Relevance:** The assessment and identification of patients at high risk for falling is important in order to implement specific precautions and care for these patients to reduce their risk of falling. The CCFRAS is more clinically relevant in identifying patients at high risk for falling in the IRF setting compared to other fall risk assessments. *Implementation of this scale may lead to a reduction in fall rate, and injuries from falls, as it more appropriately identifies patients at high risk for falling.*

Patient Characteristics by Fall Incident

	No Fall (n = 869)	Fall (n=62)	p-value
Age*	68.8 (16.2)	67.2 (16.2)	0.451
Number of Males	444 (51%)	35 (56.5%)	0.409
LOS*	13.3 (9.2)	24.9 (16.8)	< 0.001
Morse Fall Scale Components			
History of Falls	343 (39.4%)	30 (48.4%)	0.168
Use of Ambulatory Aid	262 (30.1%)	13 (21%)	0.116
IV Therapy	180 (20.7%)	15 (24.2%)	0.519
Weak/Impaired Gait	817 (93.9%)	59 (95.2%)	0.679
Altered Mental state	145 (16.7%)	26 (41.9%)	< 0.001
Secondary Diagnosis	825 (94.8%)	58 (93.5%)	0.672
Casa Colina Fall Scale Components			
Right CVA	80 (9.2%)	14 (22.6%)	0.003
TBI	56 (6.4%)	6 (9.7%)	0.35
All Amputees	18 (2.1%)	2 (3.2%)	0.569
Toileting Score of 1 or 2	645 (74.1%)	59 (95.2%)	< 0.001
Bed Transfer Score of 1 or 2	269 (30.9%)	36 (58.1%)	< 0.001
Tub/Shower Transfer Score of 0 or 1	164 (18.9%)	22 (35.5%)	0.003
Stairs Score of 0	646 (74.3%)	56 (90.3%)	0.002
Casa Colina Scale Score*	82.7 (42.6)	112.1 (37.4)	< 0.001
Morse Fall Scale Score*	47.6 (17.9)	53.9 (18.9)	0.013
Pts At High Risk According to Casa Colina Scale	568 (65.3%)	54 (87.1%)	< 0.001
Pts At High Risk According to Morse Fall Scale	495 (56.9%)	45 (72.6%)	0.013

*Mean (standard deviation)

Fall Scale Performance

	Morse Fall Scale	Casa Colina Scale	p-value
AUC	0.599	0.710	0.010
Sensitivity	0.726	0.871	
Specificity	0.430	0.346	
PPV	0.083	0.087	
NPV	0.957	0.974	
Accuracy	0.450	0.381	
Diagnostic Odds Ratio	2	3.6	

Sensitivity, Specificity, PPV, and NPV calculated using suggested high risk cutoffs for fall scales (Morse>=45 and Casa Colina >=80).

	Morse Fall Scale	Casa Colina Scale	p-value
AUC	0.599	0.710	0.010
Sensitivity	0.726	0.694	
Specificity	0.478	0.635	
PPV	0.090	0.119	
NPV	0.961	0.967	
Accuracy	0.494	0.639	
Diagnostic Odds Ratio	2.4	3.9	

Sensitivity, Specificity, PPV, and NPV calculated using suggested high risk cutoffs for fall scales (MFS>=47.5 and CCFRA >=105).

Sensitivity & Specificity

