sentara nurse

Determining Predictors for High Fall Risk in an Inpatient Rehabilitation Facility

Pamela J. Simon, RN, CRRN; Alice R. Webley, MSN, RN, CRRN, Robert Rusnak, IRF PPS Specialist, Katelyn Mahoney, MSN, RN, ACNS-BC, Susan M. Kaplan, PhD, RN, CCRP, Susan A. Tweed, PhD, RN, & Ralitsa S. Maduro PhD

MAGNET RECOGNIZED
AMERICAN NURSES CREDENTIALING CENTER

SENTARA®

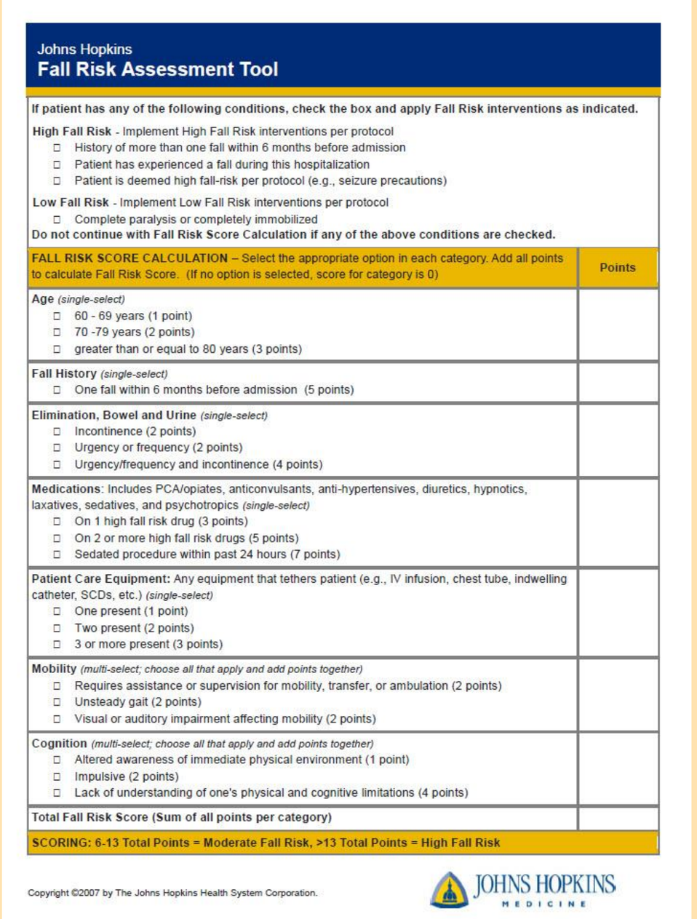
Introduction

Recommendations from the National Guideline Clearinghouse (NGC) and the Institute for Clinical Systems Improvement (ICSI) for prevention of falls in the acute care setting state, "Best practice for prevention of falls should include a fall prevention program with policies and procedures that are designed for differential interventions based on specific populations and units" (ICSI, 2012. The purpose of this study was to identify risk factors for falls specific to an inpatient rehabilitation population and to develop a tool specific to that population.

Johns Hopkins Fall Risk Assessment Tool (JHFRAT)

Sentara Norfolk General Hospital (SNGH) uses the Johns Hopkins Fall Risk Assessment Tool (JHFRAT) on all acute care units. Although the tool shows promising results in the acute care hospital setting the JHFRAT has not been validated for use in an inpatient rehabilitation setting.

- 8 categories, Scores range from 3-30
- **Score<5** = the patient is a low fall risk. (11% of IPR in 2014)
- **Score 6-13** = the patient is a moderate fall risk. (66% of IPR in 2014)
- **Score >13** = the patient is a high fall risk. (22% of IPR in 2014)
- **Of the 27 Patients fell on the IPR in 2014** – only 29% were deemed "high fall risk" using JHFRAT.



Johns Hopkins
Fall Risk Assessment Tool

If patient has any of the following conditions, check the box and apply Fall Risk interventions as indicated. **High Fall Risk** - Implement High Fall Risk interventions per protocol ☐ History of more than one fall within 6 months before admission ☐ Patient has experienced a fall during this hospitalization ☐ Patient is deemed high fall-risk per protocol (e.g., seizure precautions) **Low Fall Risk** - Implement Low Fall Risk interventions per protocol ☐ Complete paralysis or completely immobilized **Do not continue with Fall Risk Score Calculation if any of the above conditions are checked.**	
FALL RISK SCORE CALCULATION – Select the appropriate option in each category. Add all points to calculate Fall Risk Score. (If no option is selected, score for category is 0)	**Points**
Age *(single-select)* ☐ 60 - 69 years (1 point) ☐ 70 -79 years (2 points) ☐ greater than or equal to 80 years (3 points)	
Fall History *(single-select)* ☐ One fall within 6 months before admission (5 points)	
Elimination, Bowel and Urine *(single-select)* ☐ Incontinence (2 points) ☐ Urgency or frequency (2 points) ☐ Urgency/frequency and incontinence (4 points)	
Medications: Includes PCA/opiates, anticonvulsants, anti-hypertensives, diuretics, hypnotics, laxatives, sedatives, and psychotropics *(single-select)* ☐ On 1 high fall risk drug (3 points) ☐ On 2 or more high fall risk drugs (5 points) ☐ Sedated procedure within past 24 hours (7 points)	
Patient Care Equipment: Any equipment that tethers patient (e.g., IV infusion, chest tube, indwelling catheter, SCDs, etc.) *(single-select)* ☐ One present (1 point) ☐ Two present (2 points) ☐ 3 or more present (3 points)	
Mobility *(multi-select; choose all that apply and add points together)* ☐ Requires assistance or supervision for mobility, transfer, or ambulation (2 points) ☐ Unsteady gait (2 points) ☐ Visual or auditory impairment affecting mobility (2 points)	
Cognition *(multi-select; choose all that apply and add points together)* ☐ Altered awareness of immediate physical environment (1 point) ☐ Impulsive (2 points) ☐ Lack of understanding of one's physical and cognitive limitations (4 points)	
Total Fall Risk Score (Sum of all points per category)	
SCORING: 6-13 Total Points = Moderate Fall Risk, >13 Total Points = High Fall Risk	

JOHNS HOPKINS MEDICINE

Patient Characteristics

	Total			Fall				x2
	(N=338)			Yes (n=27)		No (n=311)		x2
Gender	(n)	%		(n)	%	(n)		
Female	125	37.0		634	47.3	648	47.6	
Male	213	63.0		705	52.7	714	52.4	
IGC								
CVA Right	45	13.3		5	18.5	40	12.9	.69
	48	14.2		8	29.6	40	12.9	**5.73***
	18	5.3		2	7.4	16	5.1	.25
Brain Dysfunction	21	6.2		1	3.7	20	6.4	.37
	30	8.9		4	14.8	26	8.4	1.28
Spinal Cord Dysfunction	54	16.0		1	3.7	53	17.0	3.29
	11	3.3		2	7.4	9	2.9	1.61
	21	6.2		0	0.0	21	6.8	1.94
	35	10.4		1	3.7	34	10.9	1.40
	19	5.6		0	0.0	19	6.1	1.75
	19	5.6		3	11.1	16	5.1	1.67
	17	5.0		0	0.0	17	5.5	1.65

The study sample consisted of 338 patients, aged 18-89 who were discharged from the inpatient rehabilitation facility between January 1, 2014 and December 31, 2014.

Research

Several studies have cited the potential benefits of using the FIM score as a predictor of risk for falling on IRFs (Forrest, Chen, Huss & Gieler, 2013; Forrest, Huss, Patel, Jeffries, Myers, Barber & Kosier, 2012; Rosrio, Khonsari & Patterson, 2013; & Forrest, Chen, Huss & Giesler, 2013.) A fall risk assessment tool that specifically predicts those at high risk for falls for the inpatient rehabilitation population would be a useful tool to ensure a safe environment. The goal of this study is to identify factors (through FIM scores, JHFRAT, common diagnoses, etc.) that can predict patients who are a high risk for falling on the IRF and differentiate between patients that fell and those that did not.

The Functional Independence Measure (FIM)

Score	Description
7	Complete Independence
6	Modified Independence (device)
5	Supervision (Subject = 100%)
4	Minimal Assistance (Subject = 75%)
3	Moderate Assistance (Subject = 50%)
2	Maximal Assistance (Subject = 25%)
1	Total Assistance (Subject = <25%)

	FIM Category
Motor	Eating
	Grooming
	Bathing
	Dressing – Upper Body
	Dressing – Lower Body
	Toileting
	Bladder Management
	Bowel Management
	Bed, Chair, Wheelchair Transfers
	Toilet Transfers
	Tub, Shower Transfers
Cognitive	Comprehension
	Expression
	Social Interaction
	Problem Solving
	Memory

- Inpatient Rehabilitation Facilities (IRF) use the FIM as a tool to measure the level of a patient's disability.
- The instrument is a seven-level scale that designates major gradations in behavior from dependence to independence.
- FIM scores are documented on admission by nurses, nurses's aides, and therapists (Physical, occupational, and speech) as the patient performs activities of daily living.
- Eighteen tasks evaluated in the FIM tool including motor and comprehension.

Methods

- Obtained exempt status from the Eastern Virginia Medical School Institutional Review Board.
- Retrospective chart review was done to obtain the score on eighteen Functional Independence measures (FIM), JHFRAT admission scores, whether the patient had fallen in the past six months, admission diagnosis, admission FIM rating, length of stay, age, gender, and whether the patient fell during their admission.

Results

Results of t-test and Descriptive Statistics for FIM Item score by Fall

	M	SD	n		M	SD	n		t-test	χ^2
Eating	3.67	1.80	27		4.60	1.51	311		3.05**	13.72
Grooming	3.22	1.91	27		4.05	1.52	311		2.66**	26.67***
Bathing	2.30	1.14	27		2.71	1.51	311		1.78	7.98
Dressing - Upper	2.81	1.55	27		3.28	1.40	311		1.65	20.55**
Dressing - Lower	2.07	1.17	27		2.45	1.13	311		1.67	7.72
Toileting	2.41	1.42	27		2.63	1.33	311		.83	7.63
Bladder Control	3.07	2.06	27		3.76	1.92	311		1.77	11.15
Bowel Control	3.52	2.12	27		4.15	1.83	311		1.70	8.38
Bed Transfer	2.33	1.33	27		2.88	1.21	311		2.26*	12.57*
Toilet Transfer	2.26	1.43	27		2.92	1.36	311		2.42*	12.08*
Tub/shower Transfer	.04	.19	27		.10	.54	311		.63	1.07
Walk/wheelchair	1.00	.62	27		1.23	.87	311		1.38	1.98
Stairs	.26	.59	27		.23	.58	311		-.24	1.93
Comprehension	4.48	2.12	27		5.46	1.57	311		3.00**	15.44**
Expression	4.30	2.22	27		5.34	1.63	311		3.11**	20.68**
Social interaction	3.70	1.77	27		4.74	1.12	311		4.35***	34.36***
Problem solving	3.85	2.07	27		4.82	1.68	311		2.81**	11.31
Memory	3.78	2.04	27		4.89	1.68	311		3.26**	16.65*

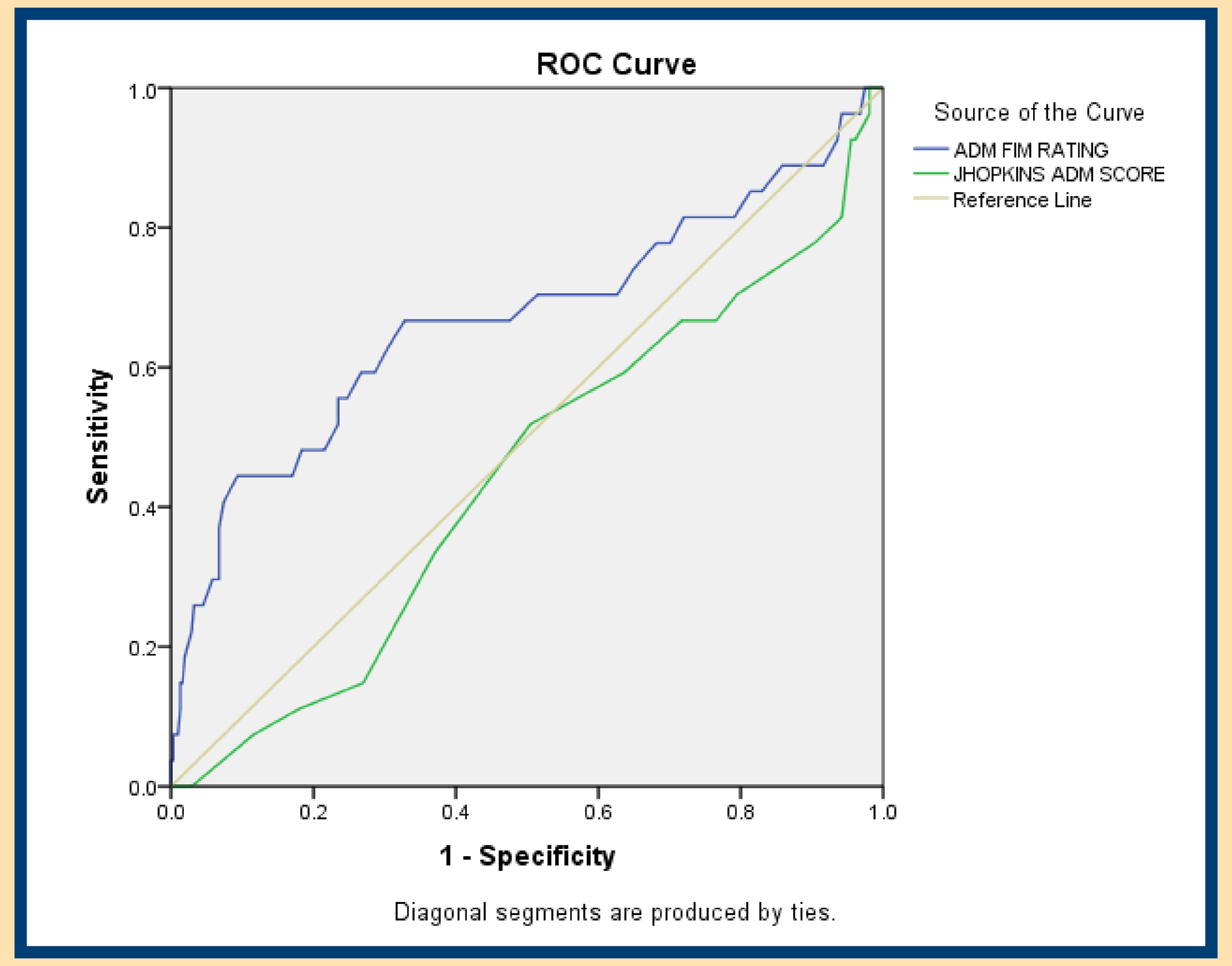
Logistic Regression with FIM Items as Predictors of Falls

FIM Item	B	SE	Wald	p	95% CI	Exp B
Eating	-.19	.16	1.44	.23	(.610 1.13)	.83
Grooming	-.001	.17	.00	.99	(.72 1.40)	1.00
Bed Transfer	-.04	.24	.03	.86	(.60 1.53)	.96
Toilet Transfer	-.15	.22	.48	.49	(.56 1.32)	.86
Comprehension	.09	.25	.11	.74	67 1.78)	1.09
Social Interaction	-.53	.25	4.58	**.03***	(.36 .96)	.59
Problem Solving	.47	.35	1.82	.18	(.81 3.14)	1.60
Memory	-.45	.33	1.82	.18	(.33 1.23)	.64

Note. *p,.05, **p<.01, ***p<.001

Results

	Area	Threshold For Sens-Spec	Sensitivity	Specificity	Threshold for Maximum Specificity
Eating	.660	5.5	.89	.77	6.5 (.95)
Grooming	.637	5.5	.89	.88	6.5 (1.0)
Bed Transfer	.621	4.5	.96	.99	4.5 (.99)
Toilet Transfer	.634	4.5	.96	.96	4.5 (.96)
Comprehension	.630	6.5	.82	.68	6.5 (.68)
Expression	.635	6.5	.82	.70	6.5 (.70)
Social interaction	.672	5.5	.85	.87	6.5 (.97)
Problem solving	.637	6.5	.89	.84	6.5 (.84)
Memory	.654	6.5	.93	.82	6.5 (.82)
FIM Total	.671	74.5	.85	.82	84.5 (.98)
JHFRAT	.445	14.5	.78	.90	19 (.98)



Future Considerations

Future analysis of the data will be done to include patients for 2015. Using this information, a fall risk assessment tool to specifically predict those at high risk for falls for the inpatient rehabilitation population will be developed and piloted on the inpatient rehabilitation unit.

References

Forrest, G., Huss, S., Patel, V., Jeffries, J., Myers, D., Barber, C., & Kosier, M. (2012). Falls on an inpatient rehabilitation unit: Risk assessment and prevention. Rehabilitation Nursing, 37.2, 56-61.
Forrest, G., Chen, E., Huss, S., Giesler, A. (2013). A comparison of the Functional Independence Measure and Morse fall scale as tools to assess risk of fall on an inpatient rehabilitation unit. Rehabilitation Nursing, 38, 186-192.
Incesti, S., Bender, S., & Delunas, L. (2014). Development of a patient acuity model for an inpatient rehabilitation unit. Rehabilitation Nursing, 40, 133-138.
Institute for Clinical Systems Improvement (ICSI). Prevention of Falls (acute care). Health care protocol. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2012 April.
Kwan, F., Kaplan, S., Hudson-McKinney, M., Redman-Bentley, D., & Rosario, E. (2012). Comparison of fallers and non fallers at an Inpatient Rehabilitation Facility: A retrospective review. Rehabilitation Nursing, 37.1, 30-36.
Rosario, E.R., Kaplan, S., Khonsari, S., & Patterson, D. (2013). Predicting and assessing fall risk in an acute inpatient rehabilitation facility. Rehabilitation Nursing, 39.2, 86-93.
Salamon, L.A., Victory, M., & Bobay, K. (2012). Identification of patients at risk for falls in an inpatient rehabilitation program. Rehabilitation Nursing, 37.6, 292-297.