

CAPTURE Falls

Collaboration and Proactive Teamwork Used to Reduce

Case Study: Choosing a Fall Risk Assessment

Case Study: XYZ Hospital

- At Baseline
 - Did not have a team accountable for fall risk reduction throughout the facility
 - Clinical judgment used to assess fall risk
- Newly formed interprofessional fall risk reduction team
 - Sense of urgency to choose fall risk assessment tool for integration into EMR
 - Used work sheet created by CAPTURE Falls project to calculate measures of predictive validity for 3 different fall risk assessment tools using their own patient data



Case Study: XYZ Hospital

- Reviewed records from 2011 and 2012
 - 26 patients fell
 - 37 patients did not fall
- Determined Scores for 3 tools using 2 cut points for each tool
 - John Hopkins Fall Risk Assessment Tool^{1,2}
 - Morse Falls Scale³⁻⁵
 - Fall Risk Assessment Scoring System (FRASS)^{6,7}



Test Performance Measure Work Sheet

See worksheet that walks you through the steps of determining sensitivity, specificity, and predictive values of a tool using data from your setting

Requires understanding of a 2 x 2 table

- 2 x 2 table combines results of two outcomes
- Rows contain the results of your assessment
- Columns contain the outcome of interest (fall vs no fall)



General Format of 2 x 2 Table

Assessment Results	Did the patient fall?		
	Fall	No Fall	Total
+ Result	a (true +)	b (false +)	a + b
- Result	c (false -)	d (true -)	c + d
	a + c	b + d	Grand Total

Row total = # of pts with + test result

Row total = # of pts with - test result

Column total =
of pts who
fell

Column total =
of pts who
DID NOT fall

$$\text{Sensitivity} = a/a+c$$

$$\text{Specificity} = d/d+b$$

$$\text{Positive Predictive Value (PV+)} = a/a+b$$

$$\text{Negative Predictive Value (PV -)} = d/c+d$$



Measures of Predictive Validity

Sensitivity is the test's ability to obtain a positive test when the target condition is really present, or the true positive rate, and it tells the clinician how good the test is at correctly identifying patients with condition of interest (ie will fall).

Specificity is the test's ability to obtain a negative test when the condition is really absent, or the true negative rate, and it tells the clinician how good the test is at correctly identifying the absence of a condition (ie will not fall).



Measures of Predictive Validity

Sensitivity and specificity have limitations due to false positives and false negatives.

Choosing the highest values for positive and negative predictive value minimizes false positive and false negative findings.



Measures of Predictive Validity

Positive predictive value is the probability that a person who tests positive actually has the condition of interest (they fell).

Negative predictive value is the probability that a person who tests negative does not have the condition of interest (they did not fall).



FRASS Cutpoint at 8+ High Risk For Falls

Assessment Results	Did the patient fall?		
	Fall	No Fall	Total
+ Result (FRASS \geq 8)	a = <u>26</u> (true +)	b = <u>28</u> (false +)	54
- Result (FRASS < 8)	c = <u>0</u> (false -)	d = <u>9</u> (true -)	9
	26	37	63

Sensitivity $a/a+c$ $26/26 = 100\%$ of fallers had + test (≥ 8)
 Specificity $d/d+b$ $9/37 = 24\%$ of nonfallers had – test (< 8)
 PV+ $a/a+b$ $26/54 = 48\%$ of those with + test (≥ 8) fell
PV- $d/c+d$ $9/9 = 100\%$ of those with – test (< 8) did not fall



FRASS Cutpoint at 15+ High Risk For Falls

Assessment Results	Did the patient fall?		
	Fall	No Fall	Total
+ Result (FRASS \geq 15)	a = <u>17</u> (true +)	b = <u>8</u> (false +)	25
- Result (FRASS < 15)	c = <u>9</u> (false -)	d = <u>29</u> (true -)	38
	26	37	63

Sensitivity $a/a+c$ $17/26 = 65\%$ of fallers had + test (≥ 15)

Specificity $d/d+b$ $29/37 = 78\%$ of nonfallers had – test (< 15)

PV+ $a/a+b$ **17/25 = 68% of those with + test (≥ 15) fell**

PV- $d/c+d$ $9/38 = 76\%$ of those with – test (< 15) did not fall



Comparing Results

Tool (Cut Point)	Sensitivity	Specificity	+ Predictive Value	- Predictive Value
Johns Hopkins (6+)	100%	0%	41%	0%
Johns Hopkins (13+)	89%	41%	51%	83%
Morse (45+)	100%	24%	48%	100%
Morse (75+)	50%	70%	54%	67%
FRASS (8+)	100%	24%	48%	100%*
FRASS (15+)	65%	78%	68%**	76%

*100% of those who tested negative DID NOT fall

**68% of those who tested positive DID fall

Case Study Summary

XYZ Hospital plans to use FRASS as their fall risk assessment tool

Identify those patients with a score of 8 – 14 as high risk for falls: if score < 8 , patient probably will not fall (Of the 9 with a score < 8 , none fell).

Identify those patients with a score of 15+ as at very high/severe risk for falls; if score 15+, patient will likely fall if interventions are inadequate; of those patients who scored 15+, 68% actually fell.



References

1. Poe SS, Cvach M, Dawson PB, et al. The Johns Hopkins Fall Risk Assessment Tool: postimplementation evaluation. *J Nurs Care Qual.* 2007;22(4):293-8.
2. Johns Hopkins tool is copyrighted. Contact: *Stephanie S. Poe*, spoe@jhmi.edu
3. Morse JM, Black C, Oberle K, et al. A prospective study to identify the fall-prone patient. *Social Sciences & Medicine.* 1989;28:81–86.
4. Schwendimann R, De Geest S, Milisen Evaluation of the Morse Fall Scale in hospitalised patients. *Age Aging.* 2006;35(3):311-313.
5. Morse Fall Scale is freely available at <http://cf.networkofcare.org/library/Morse%20Fall%20Scale.pdf>
6. The Victorian Quality Council. Minimising the risk of falls & fall-related injuries: Guidelines for acute, sub-acute and residential care settings. Available at: <http://www.mnhospitals.org/Portals/0/Documents/ptsafety/falls/tools.pdf>
7. Contact Lee Hughes for permission to use the FRASS, email L.Hughes@alfred.org.au



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