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Predictive Value of GG Score on Discharge Destination in Patient's with Neurological Conditions

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Background

Section GG of the Inpatient Rehabilitation Facility Patient Assessment Instrument (IRF-PAI) is employed to determine a patient's independence in functional mobility and activities of daily living (ADL). GG scores are standardized and provide the care team and Centers for Medicare & Medicaid Services (CMS) with a method to identify the functional abilities and progress of each client. 1-7 The Continuity Assessment Record and Evaluation (CARE) is a highly reliable standardized assessment tool that measures a patient's medical, functional, cognitive, and social support status in order to compare the health status and outcomes of Medicare patients. 10, 14, 33

Section GG is a subsection within The Care Tool that focuses on current functional abilities and goal setting for functional abilities upon discharge. Section GG measures an individual's independence in self-care and mobility tasks, by determining the assistance level needed to complete each task. Section GG is important because individuals who have functional limitations have an increased risk of complications and functional decline. 9, 10 The main purpose of Section GG is to use this information to determine the resources needed to provide care for each patient, while also determining the most appropriate discharge destination. 13, 29, 38

Research Questions

- 1. When using section GG of the Care Tool, what items successfully predict discharge destinations?
- 2. What are the cut off scores for each item that determine the location when using section GG?
- 3. Does an increase in GG scores between admission and discharge effect the appropriate discharge destination?

Section GG of Care Tool



Research Design

A retrospective cohort study was conducted to analyze the GG scores in the medical records of patients with designated neurological diagnoses at both admission and discharge. The GG scores will be utilized to determine if the scores, of different items of the assessment, at both admission and discharge, can predict the discharge destination of that patient. Tests will also be run to determine if there is a relationship between functional gains and discharge destination. 27, 28

Participants

The data was collected from Helen M. Simpson Rehabilitation Hospital, which is a joint venture involving Select Medical and UPMC. The study utilized the electronic medical records of individuals who received inpatient rehabilitation services for a neurological condition, stroke, or brain injury. The patients involved in the study received treatment between October 2019 and July 2023, and were 18 years of age or older. Just over 1800 charts were included in the study following the initial inclusion/exclusion criteria and the additional exclusion of hospice patients.

Procedures

Approval was received by both Select Medical Inpatient Rehabilitation and Research Committee and the Institutional Review Board at Messiah University. Following approval data was received from Select Medical. Following receipt of data, the research manager and researchers reviewed, cleaned, and coded the data. Tests included were descriptive statistics, logistical regressions, chi-squared tests, t-tests, and receiver operating characteristic (ROC) curve. These tests were utilized to find the significance or relationships between the patient data collected and the discharge destination.

Methods

Table 1 Frequencies of Age and BIMS Scores for Discharge Destination

	Discharge Home n- 624	Discharge Other n- 1239	P Value
Age	67.8 ± 13.842	72.67± 12.761	≤ .001
% Female (n- 904)	47.8%	48.9%	0.638
BIMSRepeat3Words	2.8± 0.65	2.73± 0.73	0.039
BIMSWhatYear	2.61± 0.97	2.46± 1.12	0.002
BIMSWhatMonth	1.78± 0.61	1.67± 0.70	0.001
BIMSWhatDay	0.7± 0.46	0.59± 0.49	≤ .001
BIMSRecallsSoc	1.44± 0.87	1.3± 0.92	0.001
BIMSRecallsBlue	1.65± 0.70	1.57± 0.75	0.042
BIMSRecallsBed	1.3± 0.91	1.09± 0.94	≤ .001
BIMSScore	12.61± 3.11	11.73± 3.54	≤ .001

Table 1 illustrated the difference in the mean age of patients who discharged home (67.8) compared to those who discharged to other locations (72.67), as well as the significant difference in BIMS score for patients who discharge to home compared to other locations.

Table 2 Mean GG Scores, Mean Difference, and Effect Size at Admission and Discharge

	GG scores				
	Discharge Home N- 624	Discharge Other N- 1239	Mean Difference	Cohen's d	P-score
Mean GG Scores (Admission)					
Eating	4.65	4.33	0.325	1.278	≤ .001
Oral Hygiene	4.12	3.89	0.23	1.114	≤ .001
Toileting Hygiene	2.86	2.13	0.728	1.213	≤ .001
Shower/Bathe	3.09	2.49	0.602	1.033	≤ .001
Dress Upper Body	3.57	3.15	0.413	1.160	≤ .001
Dress Lower Body	2.72	1.98	0.733	1.108	≤ .001
Don/Doff Footwear	2.73	2.00	0.738	1.396	≤ .001
Roll Left/Right	3.63	3.23	0.400	1.044	≤ .001
Sitting To Lying	3.46	2.89	0.568	1.094	≤ .001
Lying To Sitting	3.37	2.77	0.593	1.082	≤ .001
Sit To Stand	3.04	2.44	0.595	1.151	≤ .001
Transfer Bed to Chair	2.86	2.29	0.571	1.133	≤ .001
Transfer Toilet	2.99	2.39	0.601	1.140	≤ .001
Mean GG Scores (Discharge)					
Eating	5.69	5.36	0.328	0.992	≤ .001
Oral Hygiene	5.57	5.22	0.345	1.020	≤ .001
Toileting Hygiene	4.94	4.01	0.924	1.654	≤ .001
Shower/Bathe	4.85	4.12	0.733	1.356	≤ .001
Dress Upper Body	5.18	4.64	0.541	1.277	≤ .001
Dress Lower Body	4.90	4.04	0.855	1.548	≤ .001
Don/Doff Footwear	5.00	4.23	0.771	1.677	≤ .001
Roll Left/Right	5.47	4.86	0.613	1.309	≤ .001
Sitting To Lying	5.40	4.65	0.743	1.443	≤ .001
Lying To Sitting	5.37	4.64	0.725	1.446	≤ .001
Sit To Stand	5.15	4.42	0.728	1.443	≤ .001
Transfer Bed to Chair	5.04	4.25	0.789	1.392	≤ .001
Transfer Toilet	5.04	4.28	0.764	1.389	≤ .001

Table 2 showed there was a significant difference and large effect size for all GG items between discharge destinations. The largest mean difference and effect size at admission were don/doff footwear, toilet hygiene, and lower body dressing.

Results

Table 3 Mean GG Scores at Admission

Mean GG Scores (Admission)	Cohen's d
Don/Doff Footwear	1.396
Toileting Hygiene	1.213
Dress Upper Body	1.160
Sit To Stand	1.151
Transfer Toilet	1.140
Transfer Bed to Chair	1.133
Oral Hygiene	1.114
Dress Lower Body	1.108
Sitting To Lying	1.094
Lying To Sitting	1.082
Roll Left/Right	1.044
Shower/Bathe	1.033

Table 4 Mean GG Scores at Discharge

Mean GG Scores (Discharge)	Cohen's d
Don/Doff Footwear	1.677
Toileting Hygiene	1.654
Dress Lower Body	1.548
Lying To Sitting	1.446
Sitting To Lying	1.443
Sit To Stand	1.443
Transfer Bed to Chair	1.392
Transfer Toilet	1.389
Shower/Bathe	1.356
Roll Left/Right	1.309
Dress Upper Body	1.277
Oral Hygiene	1.020
Eating	0.992

Table 3 and Table 4 rank the Mean GG scores at admission and discharge by effect size. All GG scores listed above had a large effect size (≥.8), the largest being don/doff footwear and toileting hygiene.

Table 5 Logistic Regression of Age, Prehospital Living Information, and ADL Sum at Admission

Step 1-	AgeatAdmit	Logistic Regression Variables					
		B	S.E.	Wald	df	Sig.	Exp(B)
		-0.025	0.004	33.586	1	0.000	0.975
	PreHospitalLivingWith 1=Alone 0=Other	-0.320	0.127	6.324	1	0.012	0.726
	AdmADLSum	0.053	0.005	94.769	1	0.000	1.055
	Constant	-0.885	0.396	5.001	1	0.025	0.413

Table 5 correctly predicted discharge outcomes in 67.9% of cases. Every unit increase of 1.055 points increased the likelihood of discharging to home.

Figure 1 ROC Curve to Predict Cutoff Score

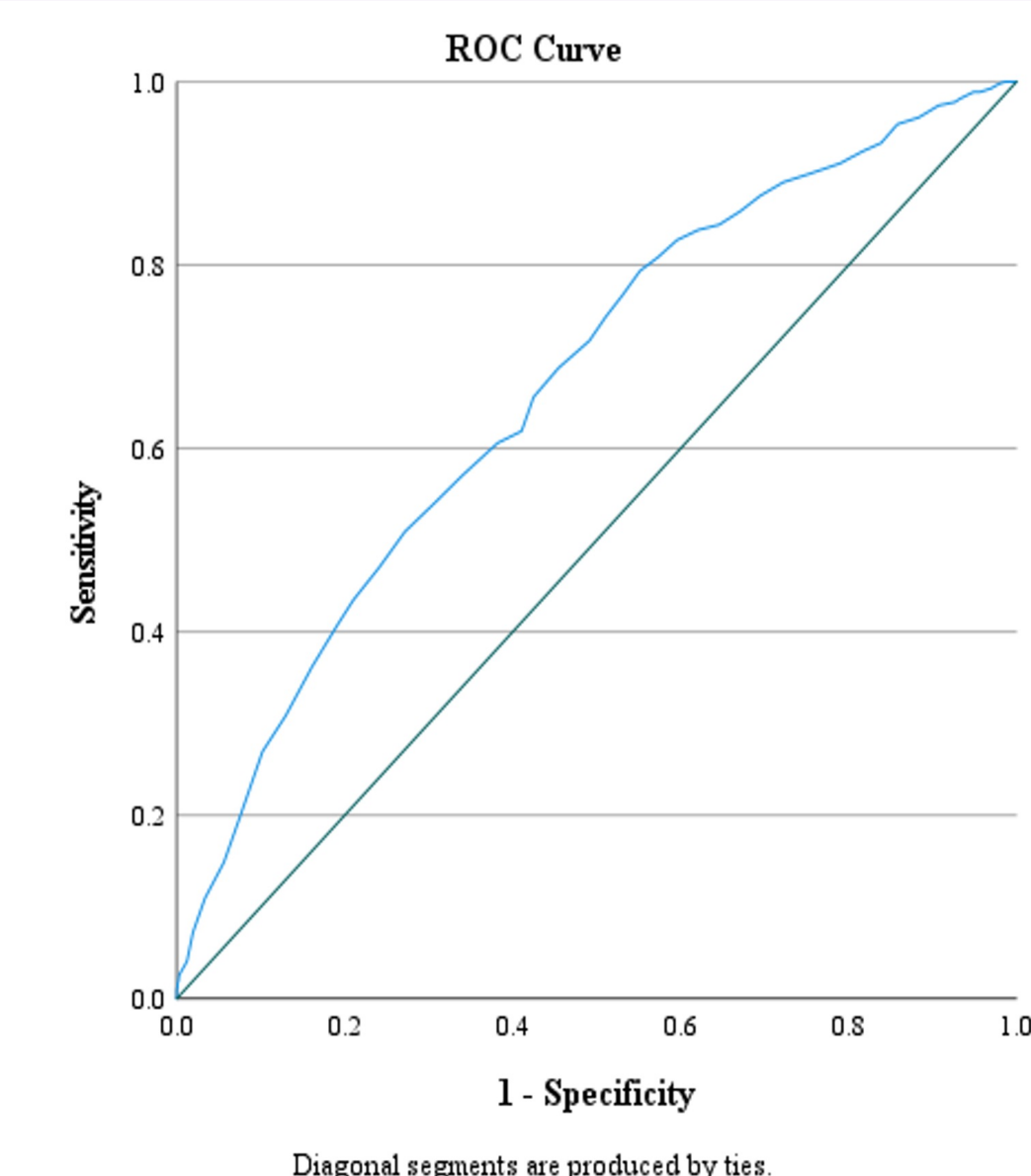


Figure 1 showed the logistic regression could predict discharge to home 69% of the time. The area under the curve was 0.668. The determined cutoff score was 40.5.

Discussion

The purpose of this study was to determine if GG scores at admission could predict discharge destination for individuals who were diagnosed with an acute neurological condition. The study found that GG scores offered predictive value, specifically in the following items, don/doff footwear, toilet hygiene, lower body dressing, and transfers. Younger patients and patients with higher cognitive function (as measured by the BIMS) were also found to be significantly more likely to return home, while patients who lived alone or had lower cognitive function, prior to admittance, were found to be significantly less likely to discharge to home. Through this research, a model was created that identified a cut-off score, which provided predictive value when determining discharge destination, based on GG scores at admission, after adjusting for confounding variables.

Determining discharge destination from an inpatient setting is a complex process based on multiple factors including clinical decision making, demographic information, and patient preference. Early determination of discharge destination has multiple benefits to both the patient and the institution, providing the facility with additional time to locate an appropriate discharge location, as well as decreasing length of stay, risk of hospital acquired infection, functional decline, and reducing costs patients may incur. 40 The functional abilities of the patient are a key factor in determining the discharge destination, however at the current time there is not a comprehensive and reliable measure that is widely accepted in determining what functional attributes are most indicative of a discharge to a specific destination. 19 Therefore, determining a reliable tool that would predict discharge destination would be beneficial for both patient and institution.

Additionally, the benefit of a predictive tool would also have numerous clinical applications. The ability to identify, not only specific patients, but also the specific skill deficits those patients currently exhibit that hamper their ability to discharge home would be highly beneficial. This would allow occupational therapists to design more customized treatment sessions based on the identified skills needed to return home, identify patients who would gain the greatest benefit from additional treatments, and provide the patient with a more specific response regarding skills needed to return home successfully

Conclusions

It would be beneficial for inpatient rehabilitation hospitals to identify patients at admission that may be at a higher risk to discharge to a location other than home. This high-risk group could include any patient that scores below the mean for GG total score (61.2) or below the mean for GG ADL score (43). The study also identified three other indicators that could be used to classify patients into this high-risk group; increased age, decreased cognition, and living alone prior to admission. Although CMS guidelines require at least three hours of therapy on five out of seven days in an inpatient rehabilitation facility (IRF), this guideline is a minimum standard. 16 Identifying patients at admission into a high-risk category would allow the IRF to devote additional therapy time and resources to these patients to try to discharge them home. All disciplines should be informed if an individual is meeting these high-risk criteria as soon as possible to facilitate interdisciplinary collaboration and attention to care. Specific GG categories that should also be specifically noted at admission during an initial evaluation by the therapy team include the patient's ability to don/doff footwear, complete toileting hygiene, complete lower body dressing, complete bed mobility, and complete transfers as these GG categories had the greatest effect size on discharge to home. Both occupational and physical therapists should target intervention sessions to treat impaired body functions and performance skills limiting independence in these categories.

References



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