Original Research

Is the Activity Measure for Postacute Care "6-Clicks" Tool Associated With Discharge Destination Postacute Stroke?

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Abstract *Objective:* To investigate the association of poststroke physical function, measured within 24 hours prior to discharge from the acute care hospital using Activity Measure for Postacute Care (AM-PAC) Inpatient "6-Clicks" scores and discharge destination (home vs facility and inpatient rehabilitation facility [IRF] vs skilled nursing facility [SNF]).
Design: Retrospective cross-sectional cohort study.
Setting: Acute care, University Hospital.
Participants: Individuals post acute ischemic stroke, N=721, 51.3% male, mean age 63.6± 16.4 years.
Interventions: Not applicable.
Main Outcome Measures: AM-PAC "6-Clicks" 3 domains: basic mobility, daily activity, and applied cognition.
Results: AM-PAC basic mobility and daily activity were significant predictors of discharge. Those in the home discharge group had AM-PAC basic mobility mean t scale score of 48.5 compared with a score of 34.8 for individuals sent to a facility and daily activity score of 47.2 compared with 32.7 for individuals sent to a facility. The AM-PAC variables accounted for an additional 24% of the variance in the discharge destination, with basic mobility and daily activity accounting for most of the variance.

The AM-PAC scores were not statistically different and were not able to discriminate between placement in an IRF vs SNF. The mean basic mobility *t* scale score for individuals going to an IRF was 34.9 compared with 34.6 for those going to an SNF. The daily activity score for IRF was 32.8 compared with 32.6 for SNF. The AM-PAC accounted for no additional variance in discharge destination to an IRF or SNF.

Conclusions: The AM-PAC Inpatient "6-Clicks" 3 domains are able to distinguish individuals with stroke being discharged to home from postacute care (PAC) but not for differentiating between PAC facilities (IRF vs SNF) in this cohort of individuals post stroke.

Stroke is a leading cause of long-term disability in the United States.[1] Each year nearly 800,000 people experience a new or recurrent stroke.[1] There is wide variation in discharge placement after stroke within hospitals, across regions, and across the nation.[2-5] Postacute care (PAC) services account for $60 billion per year of Medicare spending and the use of PAC demonstrates the largest geographic variation in spending.[5,6]

The type of PAC services an individual receives has financial (cost variation) and functional (variability in outcomes) implications.[7-9] The decision for PAC discharge placement is a challenge for health care providers because of the quick decision making that is required because of the short length of hospital stay.[10,11] Guidelines used to guide discharge placement are vague and do not provide a systematic and reproducible criteria for placement. Policy guidelines for admission into an inpatient rehabilitation facility (IRF) or skilled nursing facility (SNF) relate to the anticipated amount of therapy an individual can tolerate and the outcomes the individual will achieve, for example, hours per day of rehabilitation and community discharge.[12]

Prior studies have suggested that physical function in an acute care hospital is associated with discharge to home vs a PAC facility.[13,14] However, there is often a lack of clinical consensus and confusion about optimal care related to discharge to a PAC setting post stroke.[15] Individuals discharged to an SNF are more likely to be older, Black, women, and uninsured and to have lower income, have lower premorbid function, be unable to walk at acute discharge, and have lower functional status.[16-18] In addition, nonclinical factors, including insurance, geographic location, and hospital complications may contribute to discharge decisions beyond an individual's functional ability.[15,19,] Ideally, there would be a metric, such as physical function, that could guide clinical decision making and be useful in identifying an appropriate discharge destination.[17,20,21] A comprehensive assessment that could determine functional ability and home support could aid in better PAC discharge placement.

The Activity Measure for Postacute Care (AM-PAC) is an instrument that measures activity limitations based on the World Health Organization International Classification of Functioning, Disability, and Health designed for predicting discharge destination.[13] The Inpatient AM-PAC "6-Clicks" was developed as a short form for use in acute care and measures 3 domains of an individual's function: basic mobility (BM), daily activity (DA), and applied cognition (AC). The AM-PAC has demonstrated positive predictive ability for discharge to home vs a PAC facility in a large group of individuals with multiple diagnoses.[13] For individuals post stroke, it has been suggested that they may be discharged to a PAC facility interchangeably.[17]

The purpose of this study was to investigate the association of poststroke physical function, prior to discharge from the acute care hospital using AM-PAC "6-Clicks" scores, and discharge destination (home vs facility and IRF vs SNF). We hypothesized that those individuals that were discharged to home would have higher AM-PAC scores (better functional status) than those sent to a facility. We further hypothesized that there would be no difference in AM-PAC scores between individuals discharged to an IRF or SNF setting.

Methods

Cohort selection

We queried the University of Utah, Hospitals and Clinics Enterprise Data Warehouse for data on all individuals who had received acute stroke care from July 1, 2016, to December 31, 2017. The University of Utah is located in Salt Lake City, Utah. It has a Comprehensive Stroke Center that serves Intermountain west. Individuals were included if (1) their acute hospital admission was for an ischemic stroke defined by 1 of the following *International Classification of Disease, Tenth Revision* diagnosis codes[22] G46.3-G46.8, I97.810, I97.811, I97.820, or I97.821, (2) a rehabilitation consult was ordered during the admission (required for all individuals with a diagnosis of stroke admitted to the hospital), and (3) their discharge placement was to home, IRF, or SNF. Individuals discharged to a long-term care facility or hospice, those who died, those who left Against Medical Advice, or those who were prisoners were excluded. Duplicate strokes (ie, second stroke) were excluded. A total of 721 individuals met these criteria (fig 1). To study the usefulness of the AM-PAC in discharge destination decision making, we limited the study cohort to ischemic stroke because of the consistency of data that is collected, specifically, the National Institutes of Health Stroke Scale (NIHSS). This study was considered exempt from the Institutional Review Board, and informed consent was not required because data were deidentified for analysis.
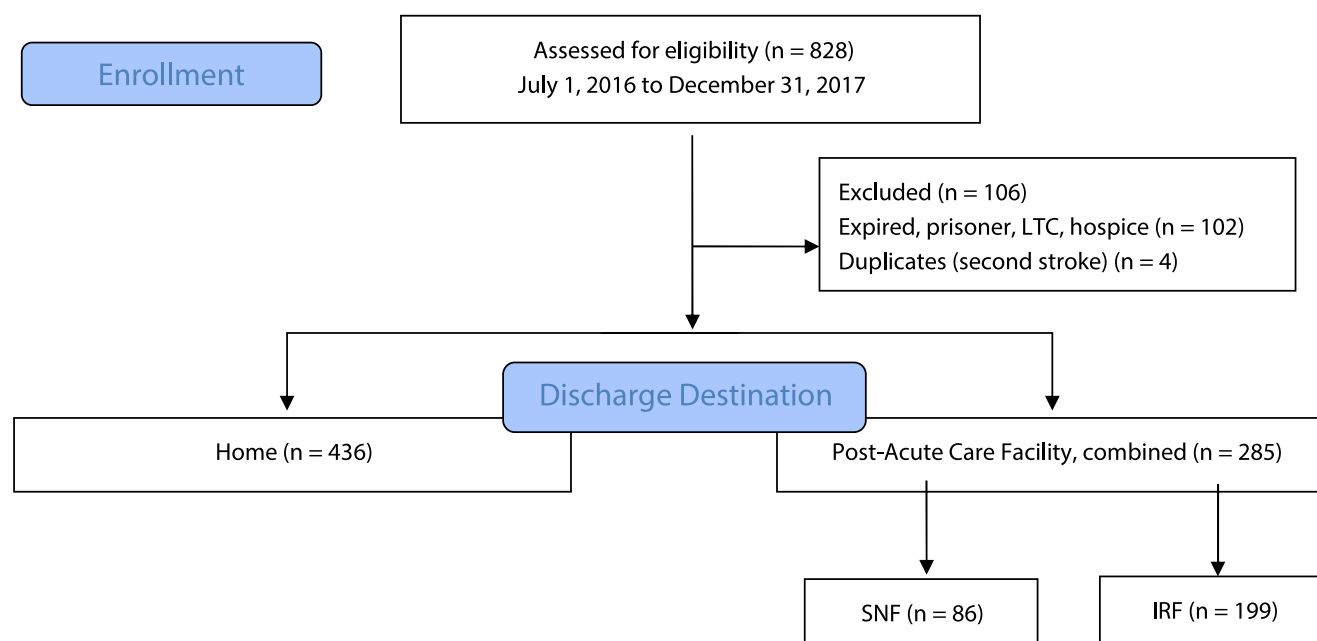
Fig 1 Consolidated Standards of Reporting Trials flow diagram.
Abbreviation: LTC, long-term care.

Variables of interest

Dependent variables

Retrospective, cross-sectional data were collected for each variable at admission or during their acute care hospital stay from the University of Utah, Hospitals and Clinics Enterprise Data Warehouse. The dependent variable was discharge destination as determined by the usual care procedures, with the health care team in consultation with the patient. Discharge destination was categorized first as discharged to home or a facility and then a subgroup of which facility (IRF or SNF).

Independent variables

The independent variables of interest were the AM-PAC "6-Clicks" BM, DA, and AC scores collected within 24 hours before discharge from the acute care setting. The "6 Clicks" tools are composed of 6 questions for each domain and were completed by physical therapists, occupational therapists, and speech language pathologists, respectively. Response options are on a 4-point Likert scale ranging from 1-unable or total assistance to 4-no assistance or no difficulty. Total raw scores range from 6-24, with lower scores indicating that more assistance is required for tasks. Transformed (t scale) scores (mean, 50±10) are reported based on the 2019 AM-PAC Short Form Manual 3.0.[23] The AM-PAC BM domain assesses turning over in bed, sitting down and standing up, getting out of bed, transferring, walking, and stair climbing. The AM-PAC DA domain assesses putting on and taking off clothing, bathing, toileting, grooming, and eating. The AM-PAC AC domain assesses comprehension and memory. The minimal detectable change (MDC) for the AM-PAC BM is a 4.72-point change and for the AM-PAC DA is a 5.49-point change.[13] Our analyses used the MDC values (vs 1-point change) as a minimal detectable difference in points to detect if there was a difference in functional status for these domains between the groups (facility vs home and SNF vs IRF). The AM-PAC AC domain does not have an MDC, and thus we chose 5-point change (a change of similar magnitude to the other AM-PAC MDC values) to allow an easier visual comparison of the subscales. The AM-PAC BM and DA inpatient "6-Clicks" scales have good reliability (intraclass correlation coefficient=0.92 and 0.91, respectively) and validity (internal consistency=0.96 and 0.91, respectively).[10,24]

Covariates

Additional demographic and clinical data collected from the electronic medical record to characterize the cohort included (1) age, (2) Charlson Comorbidity Index (CCI), (3) hospital clinical length of stay, (4) sex, (5) race, (6) marital status, (7) insurance, and (8) admission NIHSS.

The CCI is a weighted measure of the number of comorbidities and adjusted risk of mortality, ranging from 0 (no comorbidities) to 17 (increased mortality).[25] Length of stay was acute hospital admission to discharge reported in days. Race was categorized as White and all other races. Marital status was categorized as married/cohabitated or all others (ie, single, divorced, widowed). Insurance was categorized as Medicare, Medicaid, private or government insurance, and self-pay. The NIHSS assesses 15 items, scored on a 3- or 4-point ordinal scale, with total scores ranging from 0-42.[26] The NIHSS was categorized based on stroke severity: 0 is no symptoms, 1-4 is minor stroke, 5-20 is moderate to severe stroke, and 21-42 is severe stroke.[25]

Statistical analysis

The primary outcome was discharge destination (ie, home, IRF, SNF). For statistical analysis[a], we used 2 separate statistical models of 2 binary primary outcome variables to model the decision process: home vs facility; and, if not home, which facility (IRF vs SNF). We also performed a multinomial logistic regression to assess all 3 outcomes of discharge destination: home, IRF, or SNF. This was performed as a sensitivity analysis because we recognize that the decision making of home vs facility (IRF or SNF) may not be representative of actual clinical decision making. Clinicians are often needing to decide which of the 3 locations (home, IRF, or SNF) may be best for their patient.

Descriptive statistics were calculated for the entire cohort and by each discharge location. Comparisons between 2 groups were made using an independent sample t test for continuous variables, a Mann-Whitney U test for ordered categorical variables, and a chi-square test or Fisher exact test, as appropriate, for unordered categorical variables. Length of stay was highly right-skewed, so we converted it into quartiles to make the effect size more interpretable.

For all regression models, we used multiple imputation by the iterative Markov chain Monte Carlo method to address missing data for the AM-PAC and NIHSS to create 5 imputed data sets, which were then combined into a final imputed model using Rubin's rules.[27] The NIHSS had the largest amount of missing data (N=222/731), accounting for 30.8% of the data, followed by AM-PAC AC N=68 (9.4%), AM-PAC DA N=28 (3.9%), and AM-PAC BM N=22 (3.1%). Simulations have shown that multiple imputation performs very well even when variables have up to 50% missing.[28,29]

A popular model for binary outcomes is logistic regression, which expresses the effect size with an odds ratio. Instead, we modeled each of the 2 binary destination outcome variables using modified Poisson regression with robust SEs.[30] The odds ratio can be interpreted as a relative risk as long as the rare disease assumption is met (outcome proportion <10%) but is a very inflated estimate when the outcome proportion is large.[31] Risk ratios are also easier to interpret than odds ratios. Therefore, statistical models that estimate the risk ratio directly are now widely advocated.[32,33] Modified Poisson regression is one such method, which expresses the effect size as a risk ratio (ratio of 2 proportions), which we report along with 2-sided 95% confidence intervals (CIs). Poisson regression can model count outcomes (eg, counts of rare events) and for rate outcomes (number of events/person-time). It can also be used for binary (dichotomous) outcomes, but the SE is overestimated. This is easily rectified by using a robust SE, also known as a sandwich estimate, which then provides correct inference.[30] Zou labeled a Poisson model fitted to a binary outcome as if it were a count outcome while using a robust SE as modified Poisson regression.[30] The conservative criterion of $P<.20$ for including variables in the multivariable model was used to protect against residual confounding, where some degree of confounding can occur even if the variable does not achieve a strict $P<.05$ threshold.[34] The use of a conservative criterion also insures that important variables relevant to the outcome are not missed and to avoid deleting marginally significant

variables that may have practical and clinical reasoning.[35] Variables were assessed for multicollinearity, with a value >4 on the variance inflation factor being considered unacceptable. Significance was set at $P<.05$.

A secondary analysis created 3 statistical models using hierarchical linear regression to understand the contribution of variables in the model. The reason for these models was to obtain an alternative effect size estimate, the multiple R^2, which is a coefficient of determination, representing the percent of variability in the outcome that is explained by the predictor variables as a set. Typically, a logistic regression or Poisson regression is used for binary outcomes, but these cannot provide a multiple R statistic. They can provide a statistic called the pseudo R^2, but that statistic does not represent a coefficient of determination so it does not meet our purpose.

Linear regression can be applied to a binary outcome, although this is not usually done, just as it is correct to compute a Pearson correlation coefficient when 1 or both variables are binary. In fact, if only 1 predictor variable is used in the linear regression, the multiple R is identically the Pearson correlation coefficient. We wanted to understand additional contribution that the AM-PAC may have after considering demographic characteristics and clinical (severity) characteristics for each of the 3 discharge placements. For the covariates, we first assessed demographic data (age, sex, marital status, race, insurance); second, we entered measures of severity (NIHSS, CCI, length of stay); and third, we entered the AM-PAC scores (BM, DA, AC).

Results

Characteristics of the cohort are reported in table 1. Univariable modified Poisson regression models were performed to determine differences by discharge disposition for home vs facility and IRF vs SNF (table 2). All variables were included in the multivariable models (table 3) because no multicollinearity was observed.

Discharge home vs facility

After controlling for other variables in the model, the primary independent variables AM-PAC BM and DA were significant predictors of discharge to a PAC facility (respectively, per minimal detectable difference increase, Relative Risk [RR]=0.88; 95% CI, 0.82-0.93; RR=0.79; 95% CI, 0.72-0.87; $P<.01$), with those in the home discharge group having an AM-PAC BM mean t scale score of 48.5 (SE, 0.37) compared with a score of 34.8 (SE, 0.45) for individuals sent to a facility. The AM-PAC DA score for those sent home were also higher; 47.2 (SE, 0.43) compared with 32.7 (SE, 0.40) for individuals sent to a facility. The AM-PAC AC scores were not significant predictors of discharge to a PAC facility (per 5-point increase, RR=0.99; 95% CI, 0.95-1.03, $P=.56$) (see table 3). Length of stay was also a significant predictor, with all individuals staying greater than the 25th percentile of 2.1 days being more likely to discharge to a facility (see table 3). Individuals who were not married were more likely to be discharged to a facility (RR=1.29; 95% CI, 1.07-1.54; $P<.01$). The results of the linear regression (see table 4) revealed that the demographic

Table 1 Demographic data for the entire cohort and for each analysis of home vs PAC facility combined and for IRF vs SNF

Variable		Cohort	First Discharge Decision 2 Destination Choice		If a PAC, Second Discharge Decision 2 Destination Choice	
Continuous variables		Entire cohort N=721 Mean ± SD Median	Home n=436 (60.5%) Mean ± SD Median	PAC (IRF+SNF) n=285 (39.5%) Mean ± SD Median	IRF n=199 (27.6%) Mean ± SD Median	SNF n=86 (11.9%) Mean ± SD Median
AM-PAC BM n=699 (missing=22, 3.1%)		43.1±10.1 42.5	48.6±7.6 47.4	34.8±7.5 37.0*	37.9±7.0 37.0	34.6±8.5 39.0
AM-PAC DA n=693 (missing=28, 3.9%)		41.5±10.7 40.2	47.2±8.9 47.1	32.8±6.7 33.4*	32.9±6.2 32.0	32.5±7.9 33.4
AM-PAC AC n=653, (missing=68, 9.4%)		43.9±17.2 41.8	51.6±14.0 62.2	32.2±15.0 30.5*	33.7±15.4 32.0	28.8±13.1 30.5†
Age (y)		63.6±16.4 66.0	60.5±16.6 63.0	68.4±14.8 70.0‡	66.0±15.4 67.0	73.9±11.5 76.5‡
CCI (values 0-17)		4.6±2.8 4.0	4.2±2.7 4.0	5.2±2.7 5.0‡	5.1±2.7 5.0	5.5±2.7 5.0
Categorical variables	Variable coding	Entire cohort N±%	Home n±%	PAC n±%	IRF n±%	SNF n±%
Length of stay (d)	<2	233±32.3	202±46.3	31±10.9	27±13.6	4±4.7
	2.1-4	194±26.9	116±26.6	78±27.4	60±30.2	18±20.9
	4.1-7	132±18.3	56±12.8	76±26.7	58±29.1	18±20.9
	>7.1	162±22.5	62±14.2	100±35.1†	54±27.1	46±53.5†
Sex	Male	370±51.3	224±51.4	146±51.2	104±52.3	42±48.8
Race (n=718)	White	614±85.2	375±86.0	239±83.9	167±83.9	72±83.7
	Other races	104±14.4	60±13.8	44±15.4	31±15.6	13±15.1
Marital status	Married/cohabitates	416±57.7	274±62.8	142±49.8	108±54.3	34±39.5
	Other	305±42.3	162±37.2	143±50.2†	91±45.7	52±60.5†
Insurance	Medicare	379±52.6	185±42.4	194±68.1	123±61.8	71±82.6
	Medicaid	56±7.8	36±8.3	20±7.0	12±6.0	8±9.3
	Private/government	243±33.7	174±39.9	69±24.2	63±31.7	6±7.0
	Self-pay	43±6.0	41±9.4	2±0.7*	1±0.5	1±1.2*
NIHSS n=499 missing=222.30.8%	0 no disability	65±9.0	60±13.8	5±1.8	1±0.5	4±4.7
	1-4 minor	206±28.6	156±35.8	50±17.5	40±20.1	10±11.6
	5-20 moderate	197±27.3	74±17.0	123±43.2	89±44.7	34±39.5
	21-42 severe	31±4.3	10±2.3	21±7.4†	12±6.0	9±10.5

* $P<.001$.
† $P<.01$.
‡ $P<.05$.

Table 2 Univariable modified Poisson regression models for discharge to home vs PAC facility and for IRF vs SNF

Class	Level	Relative Risk (95% CI) Facility vs Home	P Value	Relative Risk (95% CI) IRF vs SNF	P Value
AM-PAC BM	1 MDD=4.72 increase	0.70 (0.68-0.73)	<.001*	1.00 (0.97-1.02)	.73
AM-PAC DA	1 MDD=5.49 increase	0.64 (0.61-0.67)	<.001*	1.00 (0.95-1.03)	.78
AM-PAC AC	1 MDD=5.00 increase	0.83 (0.80-0.85)	<.001*	0.98 (0.97-1.00)	<.01*
Age	10-y increase	1.22 (1.15-1.30)	<.001*	1.06 (1.04-1.08)	<.001*
CCI	1-unit increase	1.08 (1.05-1.11)	<.001*	1.01 (1.00-1.02)	.19
Length of stay (d)	<2	Reference		Reference	
	2.1-4	3.02 (2.09-4.38)	<.001*	1.09 (0.96-1.24)	.19
	4.1-7	4.33 (3.02-6.20)	<.001*	1.10 (0.96-1.25)	.17
	>7.1	4.64 (3.27-6.58)	<.001*	1.29 (1.14-1.46)	<.001*
Sex	Male	Reference		Reference	
	Female	1.00 (0.84-1.20)	.97	0.98 (0.90-1.06)	.60
Race	White	Reference		Reference	
	Other races	1.09 (0.85-1.39)	.51	1.00 (0.89-1.12)	.94
Marital status	Married/cohabitates	Reference		Reference	
	Other	1.37 (1.15-1.64)	.0001*	1.10 (1.02-1.19)	.02*
Insurance	Medicare	Reference		Reference	
	Medicaid	0.70 (0.48-1.01)	.05	1.03 (0.87-1.20)	.77
	Private/government	0.55 (0.44-0.69)	<.001*	0.80 (0.74-0.86)	<.001*
	Self-pay	0.09 (0.02-0.35)	.001*	1.10 (0.69-1.75)	.69
NIHSS	No disability	Reference		Reference	
	Minor disability	2.65 (1.23-5.74)	.01*	0.73 (0.56-0.96)	.02*
	Moderate disability	6.03 (2.80-12.96)	<.001*	0.78 (0.61-0.99)	.05
	Severe disability	8.57 (3.60-16.69)	<.001*	0.85 (0.64-1.12)	.24

Abbreviation: MDD, minimal detectable difference.
* Denotes significance < .05

variables account for 12% of the variance in discharge home vs facility (F=7.56, R^2=0.12, P<.001), and the addition of the clinical (severity) variables accounted an additional 18% of the variance in the discharge destination (F=15.64, R^2=0.30, P<.001). The AM-PAC variables accounted for an additional 24% of the variance in the discharge destination, with BM and DA accounting for most of the variance. Overall, this model robustly explained discharge destination as either home or a facility (F=35.63, R^2=0.54, P<.001).

Discharge IRF vs SNF

For individuals discharged to a facility, the AM-PAC scores were not statistically different and were not able to discriminate between placement in an IRF vs SNF (see table 3). For example, the mean BM t scale score for individuals going to an IRF was 34.9 (SE, 0.50) compared with 34.6 (SE, 1.0) for those going to an SNF. Mean DA score for IRF was 32.8 (SE, 0.44) compared with 32.6 (SE, 0.88) for SNF. The mean AC score for IRF was 33.6 (SE, 1.10) compared with 29.2 (SE, 1.49) for SNF. Older individuals were 6% more likely (per 10-year increase) to be discharged to an SNF (RR=1.06; 95% CI, 1.01-1.12, P=.01). Individuals who had a length of stay >7.1 days were 29% more likely to be discharged to an SNF (RR=1.29; 95% CI, 1.09-1.51, P<.01) than individuals who stayed in the acute care hospital <2 days. Individuals not married were more likely to be discharged to an SNF (RR=1.11; 95% CI, 1.01, 1.22; P=.03). CCI, sex, and race were not associated with discharge to IRF vs SNF. Individuals with minor, moderate, and severe disability on the NIHSS

compared with no disability were more likely to be placed in an IRF than an SNF (respectively, RR=0.69; 95% CI, 0.57-0.84; P<.01; RR=0.73; 95% CI, 0.60-0.88; P<.01; RR=0.75; 95% CI, 0.60-0.96; P=.02).

The results of the linear regression (table 4) for individuals discharged to an IRF or SNF showed that the demographic variables again accounted for 12% of the variance in discharge destination to IRF vs SNF (F=3.07, R^2=0.12, P<.001). The addition of the clinical (severity) variables explained an additional 7% of the variance in discharge destination. (F=3.20, R^2=0.19, P<.001). The AM-PAC did not explain any more of the variance in discharge destination, and the overall model was not significant (F=2.71, R^2=0.19, P=.94).

We performed a sensitivity analysis using a multinomial logistic regression (appendix 1) to create a model of our predictor variables with a 3-level outcome of discharge destination (home, IRF, SNF). We find that our primary predictor variable of interest, physical function based on the 3 domains of the AM-PAC (BM, DA, AC), has similar directions of association and significance as our binomial logistic regression (home vs facility) where IRF and SNF are combined. Specifically, individuals with higher AM-PAC BM and DA scores were more likely to be discharged home than an IRF or SNF.

Discussion

We investigated if the AM-PAC "6-Clicks" would be associated with discharge directly to home vs a PAC facility and

Table 3 Multivariable modified Poisson regression models for home vs PAC facility and for IRF vs SNF

Class	Level	Relative Risk (95% CI) Home (Referent) vs Facility	P Value	Relative Risk (95% CI) IRF (Referent) vs SNF	P Value
AM-PAC BM	MDD 4.72-point increase	0.88 (0.82-0.93)	<.01*	1.02 (0.97-1.06)	.50
AM-PAC DA	MDD 5.49-point increase	0.79 (0.72-0.87)	<.01*	1.00 (0.94-1.06)	.87
AM-PAC AC	5-point increase	0.99 (0.95-1.03)	.56	1.00 (0.98-1.02)	.91
Age	10-y increase	1.01 (0.96-1.12)	.27	1.06 (1.01-1.12)	.01*
CCI	1-unit increase	1.00 (0.96-1.03)	.84	1.00 (0.98-1.02)	.83
Length of stay (d)	<2	Reference		Reference	
	2.1-4	1.64 (1.14-2.38)	<.01*	1.10 (0.95-1.27)	.22
	4.1-7	2.05 (1.41-3.00)	<.01*	1.11 (0.96-1.30)	.15
	>7.1	1.55 (1.05-2.28)	.03	1.29 (1.09-1.51)	<.01*
Sex	Male	Reference		Reference	
	Female	1.13 (0.95-1.34)	.16	1.03 (0.94-1.13)	.48
Race	White	Reference		Reference	
	Other races	1.13 (0.89-1.43)	.33	1.08 (0.96-1.21)	.22
Marital status	Married/cohabitates	Reference		Reference	
	Other	1.29 (1.07-1.54)	<.01*	1.11 (1.01-1.22)	.03*
Insurance	Medicare	Reference		Reference	
	Medicaid	1.07 (0.71-1.59)	.76	1.13 (0.91-1.39)	.27
	Private/government	0.81 (0.61-1.07)	.14	0.90 (0.79-1.04)	.15
	Self-pay	0.10 (0.02-0.57)	<.01*	0.75 (0.63-0.88)	<.001*
NIHSS	No disability	Reference		Reference	
	Minor disability	1.65 (0.78-3.45)	.19	0.69 (0.57-0.84)	<.01*
	Moderate disability	1.79 (0.83-3.85)	.14	0.73 (0.60-0.88)	<.01*
	Severe disability	1.55 (0.69-3.48)	.28	0.75 (0.60-0.96)	.02*

Abbreviation: MDD, minimum detectable difference.
* Denotes significance < .05

between discharge directly to either an IRF or SNF PAC setting. Consistent with our hypotheses, the AM-PAC BM and DA scores did discriminate between individuals being discharged home compared with a facility; there was a clear distinction in physical function between individuals discharged to home vs a PAC facility, with those going home having higher function. As we further hypothesized, the AM-PAC "6-Clicks" BM, DA, and AC scores were not associated with discharge to facility type (IRF vs SNF).

Home vs facility

Our findings are consistent with the literature that supports associations between functional status and discharge to either home or a PAC facility. Specifically, we found similar results that the AM-PAC "6 Clicks" BM and DA scores are strong predictors of discharge home vs a facility for individuals post acute stroke.[13,14] The AM-PAC BM score for those discharged to home (mean *t* scale, 48.5; SE, 0.37) clearly demonstrates that they are functionally different from those who discharge to a PAC facility (mean *t* scale, 34.8; SE, 0.45) based on the minimal detectable difference scores for AM-PAC BM (4.72) . These scores combined explained 24% of the variance in the overall model predicting discharge destination.

IRF vs SNF

Consistent with previous literature, our data suggest that the decision to discharge to an IRF or SNF does not appear to be based solely on an individual's functional status. The AM-PAC

did not explain additional variance beyond the demographic and clinical (severity) measures. Additionally, the overall model explained only 19% of the variance, suggesting other factors are influencing discharge decisions to IRF vs SNF.

Covert et al assessed the AM-PAC "6-Clicks" BM alone and found that it was not able to predict discharge to IRF or SNF, but when age, sex, and race were added prediction marginally improved.[14] Our results differ from the findings of Covert. We have added 4 new variables into this model; CCI, length of stay, marital status, and insurance. With these additional variables, we did not find improved prediction of discharge destination when considering 3 domains of physical function based on the AM-PAC. Rakesh et al reported that age, premorbid physical disability (assessed by the modified Rankin scale [mRS]), and inability to ambulate at discharge were the strongest predictors for discharge to an SNF.[16] Hong et al reported that individuals with ischemic stroke who were older, were female, had greater medical comorbidities, and had lower self-care and mobility scores were more likely to be discharged to an SNF and identified significant variation between acute hospitals.[36] Stein et al found that individuals with a moderate-severe score on the Barthel Index (suggesting poorer physical function) who were older and had higher prestroke disability (mRS) were more likely to discharge to an SNF.[17] Taken together these results suggest that although physical function may be important in predicting whether an individual is discharged to an IRF or SNF, physical function status alone is not associated with discharge to an IRF or SNF after sustaining an acute ischemic stroke.

Considering that <19% of the variance in discharge placement was accounted for by any of the variables examined in

Table 4 Hierarchical regression analysis for both discharge destination choice (home vs facility; IRF vs SNF)

Characteristic	First Discharge Decision 2 Destination Choice Facility vs Home (Referent)			If a PAC, Second Discharge Decision Choice SNF vs IRF (Referent)		
	Step 1 β (P value)	Step 2 β (P value)	Step 3 β (P value)	Step 1 β (P value)	Step 2 β (P value)	Step 3 β (P value)
Step 1. Demographic characteristics						
Age (y) <40	−0.11 (.05)	−0.08 (.09)	0.01 (.83)	−0.25 (<.01)*	−0.26 (.001)*	−0.25 (.01)*
41-50	−0.10 (.05)	−0.09 (.05)	−0.02 (.62)	−0.10 (.23)	−0.10 (.19)	−0.10 (.21)
51-60	−0.05 (.37)	−0.07 (.18)	−0.01 (.89)	−0.15 (.10)	−0.17 (.06)	−0.16 (.07)
61-70	−0.01 (.19)	−0.09 (.05)	−0.03 (.47)	−0.14 (.08)	−0.19 (.02)*	−0.18 (.02)*
>81	0.07 (.13)	0.06 (.14)	0.04 (.25)	0.04 (.54)	0.03 (.70)	0.03 (.70)
Sex	0.06 (.13)	0.05 (.17)	0.08 (.01)*	0.00 (.97)	−0.01 (.86)	−0.01 (.93)
Insurance Medicare	0.13 (.03)*	0.08 (.13)	0.02 (.65)	NA	NA	NA
Insurance Medicaid	0.04 (.35)	−0.01 (.73)	−0.04 (.18)	0.16 (.05)	0.15 (.06)	0.15 (.07)
Insurance self-pay	−0.14 (<.001)*	−0.14 (<.001)*	−0.11 (<.001)*	0.06 (.34)	0.05 (.45)	0.05 (.44)
Insurance private	NA	NA	NA	−0.06 (.52)	−0.06 (.52)	−0.06 (.52)
Race	0.06 (.16)	0.03 (.41)	0.02 (.56)	0.04 (.54)	0.03 (.66)	0.03 (.67)
Marital status	0.14 (<.001)*	0.09 (.01)*	0.04 (.15)	0.15 (.02)*	0.12 (.06)	0.12 (.08)
Step 2. Clinical measures						
NIHSS no disability		−0.10 (.01)*	0.02 (.63)		0.16 (.01)	0.16 (.01)*
NIHSS minor		−0.02 (.67)	0.05 (.17)		−0.07 (.33)	−0.07 (.38)
NIHSS moderate		0.21 (<.001)*	0.11 (<.01)*		−0.01 (.85)	−0.02 (.84)
NIHSS severe		0.10 (<.01)*	0.01 (.72)		0.05 (.47)	0.04 (.53)
LOS median split		−0.29 (<.001)*	−0.12 (<.001)*		−0.19 (<.01)*	−0.18 (<.01)*
CCI		0.02 (.56)	−0.05 (.14)		0.04 (.54)	0.04 (.52)
Step 3. AM-PAC						
BM			−0.33 (<.001)*			0.03 (.77)
DA			−0.23 (<.001)*			−0.02 (.81)
AC			−0.13 (.002)*			−0.03 (.66)
F value (P value of F change)	7.56 (<.001)*	15.64 (<.001)*	35.63 (<.001)*	3.07 (<.001)*	3.20 (0.006)*	2.71 (.94)
R^2	0.12	0.30	0.54	0.12	.19	0.19
Adjusted R^2	0.10	0.28	0.52	0.08	.013	0.12
Change in R^2	0.12	0.18	0.24	0.12	0.07	0.00

NOTE. Variables were entered into the model stepwise starting with demographic, then clinical (severity), and AM-PAC. Standardized β coefficients and significance are reported, as well as the F statistic and R^2 change values.

Abbreviations: LOS, length of stay; NA, not applicable.

* Denotes significance < .05

our study, it is likely other important variables that influence discharge PAC facility placement were not included. Non-clinical aspects may account for some of these differences, including regional variation, acute hospital practice patterns, hospital ownership, family/caregiver support, and patient preference.[5,17,37]

Physical function

The complexity of the physical function construct is another potential reason for the equivocal findings about the relationship between physical function and specific PAC discharge placement. When considering the Centers for Medicare and Medicaid Services criteria for a discharge placement to an IRF, physical function is a key criterion in the assessment, specifically individuals are expected to actively participate (3 hours of therapy per day at least 5 days per week), and the patients functional status is expected to make measurable improvement during a prescribed period of time. However, the patient does not need to achieve complete independence in self-care nor be expected to return to his or her prior level of functioning.[38] These criteria make it difficult to ascertain what aspects of an individual's physical function are critical to determine the ideal discharge PAC facility.

The construct of physical function may include but is not limited to physical performance, physical capacity, and physical functioning and includes environmental and behavioral considerations.[39] Because of the variety of measures used, meaningful conclusions from current literature are challenging. For example, the AM-PAC assesses PAC functional capacity, the Barthel Index assesses disability, and the mRS assesses global premorbid disability. There has also been limited research evaluating the effect of environmental (support at home, home set up, accessibility, resources) and behavioral considerations (depression) on physical function and how these considerations may affect discharge placement.

In sum, physical function is a complex construct, and assessments may need to be more granular to capture the nuances of functional capacity. The AM-PAC may be a useful clinical tool for assessing discharge placement to home vs a PAC facility for individuals post stroke. However, more information is needed to understand what characteristics influence optimal outcome in individuals post stroke discharged to an IRF or SNF.

Study limitations

Results of this study should be interpreted in light of some limitations. We assessed only 1 hospital system and did not assess long-term care facility placement. These results may not represent other hospital systems or other regions of the country. Limitations to the use of an electronic data record include accuracy of reporting, omission of data, and data that are limited to categorized data and not free text. Retrospective, predictive models do not imply the best discharge placement for the individual but instead consider actual PAC placement. Future studies should assess long-term follow-up and prospective patient data to determine

characteristics of individuals that will benefit from different discharge locations.

Conclusions

The results of this study demonstrated that the AM-PAC "6-Clicks" was associated with discharge destination between home and PAC facility in individuals post acute ischemic stroke. The AM-PAC "6-Clicks" domains were not able to discriminate discharge placement to an IRF or SNF. Understanding what variables predict appropriate PAC discharge for individuals post stroke and what portends optimal functional outcome should help clinicians, patients, and families make more informed decisions about their care.

Supplier

a. SPSS Statistics software version 26.0; IBM.

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