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Determinants of Post Acute Care Discharge Destination Following Dysvascular Lower Limb Amputation

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Abstract

Objective—To examine the factors affecting post acute care discharge decisions among persons undergoing major lower limb amputations secondary to dysvascular causes.

Design—A population-based, multi-center prospective study.

Setting—Eighteen participating hospitals in Baltimore, MD and Milwaukee, WI served as the referral base for this study.

Patients—The study population consisted of patients aged twenty-one or older undergoing a major (foot or higher level) lower limb amputation secondary to dysvascular causes.

Methods—Patients were identified and recruited during their acute hospital admission at one of the participating hospitals. Data were drawn from i) acute care medical chart reviews; ii) patient surveys shortly after amputation while on the acute service assessing the patients function the month prior to amputation and other demographic and social information, and then iii) a six month follow up telephone interview was conducted.

Main Outcome Measures—The outcome of interest was the post-acute discharge setting where the initial rehabilitation services, if any, were delivered to the patient during the reference period of 6-months post-index amputation surgery. Discharge to alternative post-acute settings—inpatient rehabilitation (IRF), skilled nursing facility (SNF-reference category), and home—were contrasted using t and x^2 test statistics. A three-category, multi-nominal logit model was used to examine the independent effects of socio-demographic, geographic, health and amputation-related characteristics on the likelihood of discharge to alternative settings.

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Results—A total of 348 patients consented to participate in the study with an overall participation rate of 87.1%. One-hundred ninety two (55.2%) patients were discharged to an IRF, seventy-three (21%) to a SNF, and eighty-three (23.8%) were discharged directly home. The mean age of the sample was 63.7 years old with the majority (59.2%) being male and over one-quarter were African Americans. Over half of those reporting were poor (income < $15K/year). On average, patients had five co-morbidities and nearly half had an amputation at the below knee (BKA) level. Discharge to an IRF (vs. SNF) was more likely in patients who: were married; had higher cognitive functioning; had unilateral BKA; had Medicaid coverage; and who were living in Milwaukee, WI. Patients were less likely to be discharged home (vs. SNF) if: they were older; unmarried; had a prior history of nursing home residence; had more perioperative complications. Reassuringly, discharge destination was not affected by gender or race.

Conclusion—Post acute care decisions appear to be largely made based upon medical and family support factors. The findings of this research provide a necessary first step in the challenging task of assessing and quantitatively modeling the long-term functional outcomes of persons receiving post-acute care in alternative settings by allowing more optimal case mix adjustment for factors that simultaneously influence rehabilitation setting and outcomes.

INTRODUCTION

Amputations secondary to dysvascular conditions — namely diabetes and peripheral vascular disease — are an important source of permanent impairment and functional limitation among persons of all ages, but primarily the elderly. [1–10] These impairments have a significant impact on productive activities and quality of life for an amputee's remaining years.[11–13] In the United States, the rates of dysvascular amputations are increasing, in part as a consequence of rising rates of diabetes, a condition which places persons at higher risk of limb loss.[5, 14, 15] Despite increasing incidence and prevalence of dysvascular-related amputations [1] and the potential for enhancement of function through appropriate rehabilitation, little is known about the utilization of rehabilitation services among dysvascular amputees, the decision-making process that leads to disposition of dysvascular amputees to alternative rehabilitation settings, or the effectiveness of care provided at each setting. [16–18]

The purpose of this study was to examine factors affecting discharge destination among persons undergoing major lower limb amputations secondary to peripheral vascular diseases living in two geographically and racially diverse metropolitan areas.

METHODS

Study Design

Persons undergoing a major dysvascular lower limb amputation were identified during the acute care stay associated with their amputation. Eighteen participating hospitals in Baltimore, MD and Milwaukee, WI served as the referral base for this study. Upon identification, potentially eligible subjects were approached by a trained interviewer who described the study and obtained consent.

Study Population

The study population consisted of patients aged 21 or older who underwent a major dysvascular amputation in any of the participating hospitals. The etiology of the amputation (as secondary to peripheral vascular disease or diabetes) was identified by medical records. Patients undergoing amputations secondary to trauma or congenital defects as well as those who died during the acute care admission were excluded from the study. In addition, persons who were decisionally unable to provide informed consent (as determined by the administration of the short portable mental status questionnaire),[19] those who had a previous history of stroke or paraplegia, and non-English speaking subjects were also excluded. The study was approved by all appropriate Institutional Review Boards.

Data Sources and Variable Definitions

Data for this analysis were drawn from three main sources: i) clinical data derived from acute care medical chart reviews; ii) an in-person patient survey while hospitalized after amputation that elicited information about how the patient was doing the month prior to amputation (pre-surgery baseline function) and (iii) a follow up telephone interview conducted 6 months post-acute care discharge.

Information regarding the surgery and the acute care stay, including etiology, level of amputation, surgical complications, length of stay and ICU use, if any, was abstracted from the medical chart. Pre-amputation measures of health and functional status, such as limitations in activities of daily living (ADLs) and instrumental activities of daily living (IADLs), cognitive functioning, and the presence and number of certain pre-existing medical conditions were derived from the patient baseline interview. The structured follow-up telephone interview elicited detailed information on: (1) the patient's clinical and functional status, including activities, limitations, and limb problems secondary to the amputation, (2) health service use during the follow-up period, including type and length of stay at which possible setting of post-acute care; and (3) general quality of life.

All interviews were conducted by trained interviewers blinded to the study objectives and took place between 2001 and 2006. Whenever possible, standardized concepts and measures were used in the surveys. For example, the SF-36 was used to capture health-related quality of life in a variety of domains.[20] Additional items assessing environmental barriers were developed specifically for this study by the investigators.

Discharge setting and utilization data were obtained through a combination of hospitals' administrative records and self-reported data on medical care use collected as part of the patient interview. The outcome of interest for this analysis was the immediate post-acute discharge setting where the initial rehabilitation services, if any, were delivered. We derived the post acute (post-amputation) care setting and classified them into three categories constituting our dependent variables of interest — comprehensive inpatient rehabilitation, skilled nursing facility (SNF), and discharge home (with or without home healthcare). Disposition to inpatient rehabilitation was defined as any admission that occurred immediately (or within 3 days) following discharge from the acute care stay in which the index-amputation occurred. Both transfers to free-standing rehabilitation hospitals or a

rehabilitation unit within the same or different acute care hospital were considered inpatient rehabilitation dispositions. Persons admitted to nursing homes as well as patients admitted to subacute rehabilitation facilities within the same time frame were coded as discharges to skilled nursing facilities.

Each person's index of major dysvascular amputation was classified into mutually exclusive categories according to the level of the amputation: foot/ankle; unilateral transtibial (including below knee and Symes amputations); unilateral transfemoral (including through knee, above knee, hip disarticulation, and pelvic level amputations) and bilateral amputations.

Data Analysis

Discharge to alternative post-acute settings — inpatient rehabilitation (IRF), SNF, and home — were contrasted and compared using univariate (t and χ^2) test statistics. We used a multinomial logistic regression model because the dependent variable in this analysis was a polychotomous, unordered categorical variable ranging from 0 (discharged home, the reference category) to 2 (discharged to a skilled nursing facility). [21–23] We controlled for a wide array of patient, disease, and environmental characteristics that might plausibly affect the disposition setting decision, including: baseline measures of patient health and functional status (physical and mental/cognitive/social functioning as measured by SF-36 physical component summary score (PCS) and mental component summary score (MCS), respectively); the presence and number of pre-existing medical conditions[24]; the patient's socio-demographic characteristics (age in years, gender, race/ethnicity (African American versus other race/ethnicities, marital status (married versus unmarried), insurance coverage (Medicare; Medicaid or other public program; versus private insurance), and baseline measures of social support); and an indicator of the geographic region (WI versus MD) where the patient received acute care services. Given the inherent difficulty in interpreting such nonlinear coefficients, the magnitude of the effects was estimated by calculating the relative odds ratios (OR), which, in this multinomial logit model, can be interpreted as the change in the odds of discharge to a given setting (here, rehabilitation or home) relative to the base category (SNF) for a unit increase (e.g., age) or change (e.g., gender from female to male) in a given characteristic.

For all analyses, which were conducted using SAS 9 and Stata 9.0 statistical software, robust standard errors were computed to account for design clustering (i.e., multiple observations for each participating hospital).

RESULTS

Of the 718 potentially eligible patients who were initially approached for the study, 625 agreed to undergo eligibility screening and 93 declined participation. Of the 625 who consented to the eligibility process, 277 did not meet inclusion criteria and were, therefore, deemed ineligible participating in the study. Evidence of a previous stroke was the main reason for study exclusion among ineligible subjects (n=192 or 69%), followed by decisional impairment (n=34, or 12%), and non-English speaking (n=16, or 6%). Non-dysvascular (e.g., trauma-related) or minor (toes only) amputations accounted for the

remainder 35 (13%) ineligible cases. Eligible participants, thus, numbered 348 patients, yielding a response rate of 87.1%. This response rate calculation assumes that participants and those declining participation were equally likely to be eligible for study participation.

Table 1 presents selected socio-demographic, environmental, health and amputation-related characteristics of our sample, overall and by discharge setting. Of the 348 eligible consented patients, one-hundred ninety two (55.2%) patients were discharged to an inpatient rehabilitation facility or unit, IRF (Table 1). Seventy-three (21%) were discharged to a SNF and eighty-three (23.8%) were discharged directly home following their amputation. The mean age of the sample was 63.7 years old, with the majority (59.2%) being male. Over one-quarter of all patients were African Americans. Among patients who reported income, over half were poor according to federal guidelines, with a household income of less than $15,000 per year. On average, patients had five co-morbidities and nearly half had an amputation at the transtibial level.

Bivariate comparisons suggested significant differences in the composition of patients discharged to alternative post-acute care settings with respect to socio-demographic, economic, and amputation-related characteristics (Table 1). The proportion of persons who were married, employed full or part-time, with accessible homes, with lower levels of functional disability, as measured by the proportion with impairments in IADLs only, was significantly higher among those discharge to inpatient rehabilitation as opposed to nursing homes. The inpatient rehabilitation and nursing home populations also differed significantly with respect to amputation level and geographic place of residence, with a higher proportion of patients with unilateral transtibial amputations and living in Wisconsin being discharged to inpatient rehabilitation relative to nursing homes. Although patients discharged directly home were less likely to be African American or employed and were more likely to have private medical insurance than those discharged to inpatient rehabilitation and were more likely to be married and have lower levels of disability and Medicare coverage than those discharged to nursing homes, there were no specific characteristic that significantly differentiated persons discharged home from those discharged at the other two settings.

Multivariate logit results shown in Table 2 indicate that the relative odds of discharge to an inpatient facility (as opposed to a nursing home) increased by 88% for married persons (OR=1.88, $p \leq 0.05$). Persons who were employed full or part-time prior to their amputation also had significantly higher odds of discharge to inpatient rehabilitation *relative* to a skilled nursing facility than their unemployed or retired counterparts (OR=2.06, $0.05 < p \leq 0.10$) while patients with accessible home environment experienced a 40% increase in their relative odds of discharge to an IRF compared to a SNF (OR=1.40, $p \leq 0.05$). The odds of receiving initial post-acute care at an inpatient rehabilitation facility rather than in a skilled nursing facility was also substantially greater among those with amputations at the transtibial level (OR=3.63, p=0.01 when compared to persons undergoing foot amputations). Although pre-amputation physical functioning, as measured by the SF-36 Physical Component Summary score, was not significantly associated with post-acute discharge to setting, the relative odds of discharge to inpatient rehabilitation (as opposed to a skilled nursing facility) increased by 3% for each additional unit in their pre-amputation mental, social and emotional functioning (SF-36 MCS). In contrast, older patients and those with a

previous history of nursing home residence had lower odds of discharge to an inpatient rehabilitation facility and higher odds of receiving post-acute care at a SNF (OR=0.97 and 0.30, respectively), regardless of amputation or pre-operative functioning levels.

The odds of discharge home (relative to skilled nursing facilities) was lower among older persons (OR=0.95, $p \leq 0.05$), persons with diabetes (OR=0.45, $0.05< p\leq 0.10$), those who experienced perioperative complications (OR=0.21, $p \leq 0.05$) and those undergoing an amputation at either the transtibial (OR=0.32, $0.05< p\leq 0.10$) or transfemoral (OR=0.37, $0.05< p\leq 0.10$) levels (relative to those with a foot amputation). As with discharge to an IRF, being married significantly increased the relative odds of discharge home relative to a nursing home (OR=2.38, $p\leq 0.05$) as did a higher pre-amputation mental and cognitive functioning (OR=1.02, $0.05< p\leq 0.10$). Low income amputees also experienced a higher relative odds of discharge home when compared to the probability of discharge to a skilled nursing facility (OR=2.69, $p \leq 0.05$).

Our multivariate results also revealed considerable geographic variation in the likelihood of discharge to alternative settings, with persons undergoing amputations being more likely to be discharged to an inpatient rehabilitation facility (relative to both nursing homes or home) in Wisconsin than in Maryland. Finally, the patient's gender and race/ethnicity did not significantly influence discharge destination, although, somewhat surprisingly, Medicaid beneficiaries were more likely to be discharged to inpatient rehabilitation than privately insured amputees.

DISCUSSION

Clinical decisions regarding "optimal" post-acute care setting are often complex and affected by many factors. The patient's clinical condition and major diagnoses are the main driving factors, but issues such as the availability of services in the area, source of payment, family support and tolerance for physical and occupational therapy all have been shown to influence such decisions. Regulatory and utilization control policies, including prospective payment systems, the reinstated CMS' "75% rule," and definitions of medical necessity are also likely to influence the type of post acute care services patients receive.[25]

In this study, we sought to overcome the limitations in previous examinations of factors affecting post-acute discharge setting among persons undergoing dysvascular amputations using administrative data by identifying and collecting detailed clinical and socio-demographic pre-amputation data on a large and diverse cohort of patients undergoing major dysvascular low limb amputations at 18 hospitals in two geographically and regulatory diverse states. Our results reveal that, to a large extent, decisions regarding post acute care placement appear to be driven by clinical factors (most notably, amputation level and mental functioning) and availability of family support, as opposed to socio-economic and demographic characteristics, including income or insurance coverage. Persons with Medicaid as the primary insurance were counter-intuitively found to have higher rates of IRF use. The reasons for this finding are less clear and may be related to the policy of public insurers to allow IRF rehabilitation without as much case management oversight. Private insurers frequently review patients' evaluations and potential for rehabilitation and then will

approve or deny coverage for a rehabilitation admission. Such administrative hurdles might well have influenced the likelihood of IRF use.

Geographic variation in disposition to post-acute care have been documented elsewhere and reflect both varying practice standards and differing reimbursement policies from third-party payers. Analyses based on inpatient discharge data for the states of Maryland and Massachusetts, for example, have shown markedly different rates of IRF utilization.[26–27] One possible reason for the lower likelihood of discharge to inpatient rehabilitation among Maryland residents is that state's well documented low supply of inpatient rehabilitation facilities and beds when compared to Wisconsin and, in fact, to any other state in the nation during the study period.[28] Another source of geographic variation across the two states is Maryland's unique status as the only state exempt from CMS' payment and utilization regulations. The post-acute care experience of patients receiving care in Maryland, where hospitals are exempt from both post-acute care prospective payment systems (IRF, home health care, and SNF) and the recently reinstated "75% rule" mandate, provide a "natural experiment" in which to examine policy effects on discharge destination. Following similar changes in payment system applied to other PAC settings including skilled nursing facilities in 1998 and home health agencies in 2000, all inpatient rehabilitation facilities became subject to a Prospective Payment System beginning in January 2002. In 2005, CMS further enacted administrative actions to actively enforce a revised payment allocation plan, originally devised in 1984, which has become known as the "75% rule," which mandated that 75% (reduced to 60% in 2007) of patients admitted to an IRF fall within a specified list of 13 diagnostic groups.[29] In order to be paid as an IRF, as opposed to a lower-paid general hospital, a facility must meet these regulations. Given that amputation is not a condition targeted for IRF reallocation under the 75% rule, it is possible that our findings showing a higher likelihood of discharge to IRF in Wisconsin relative to Maryland is capturing institutional pressure to ensure compliance with the new regulations rather than decisions based on appropriateness of care given the patients' needs.

An encouraging result in the current study was the absence of differences in discharge destination related to gender or race/ethnicity. Although reassuring, this finding is not universal. With respect to access to skilled nursing facilities, Angelelli et al showed that among Medicare admissions to nursing homes in patients 65 years and older, African Americans and less-educated persons were more likely to be admitted to the 'worst quality' SNFs in a given region, a ranking based on the number of deficiencies or violations in care standards.[30] Angelelli's study suggested that racial disparities in nursing home care could be partially attributable to hospital discharge practices which refer minorities to lower-quality nursing homes. Current policies that assume elders and their advocates should be able to participate in making quality choices may also enable this disparity as those with less education may have more difficulty finding, interpreting and acting on the available information.

Discharge to lower quality facilities may also be due to supply constraints in communities characterized by a high density of minority or economically disadvantaged patients. Similar findings of racial disparities were noted in an observational study conducted by Grabowski who reported that, even after controlling for individual, facility and market characteristics,

African Americans were disproportionately more likely to be admitted to nursing homes that exceeded the mean deficiency level by 2.11, other racial groups by 0.88, Hispanic persons by 1.28, and whites by 0.06.[31] These findings, although contrary to the experience of our cohort, reinforce the importance of educating hospital discharge planners about nursing home quality in order to "level the playing field" for vulnerable groups and raises awareness about the assumptions made regarding the patient's and their advocate's level of understanding of discharge information.

Our findings are generally consistent with results of a study conducted by Lavery and colleagues.[32] Findings from that study indicate, for example, that discharge disposition to a nursing home was influenced by the patient's age, prior residence in a nursing home, and single marital status.[32] Both studies also report a strong relationship between a discharge to inpatient rehabilitation and amputation at the below knee level. Inpatient rehabilitation provides the highest intensity of rehabilitation services with a mandated three hours of therapy per day, and reflects the most coordinated rehabilitation care for a patient. Level of amputation (directly correlated with energy expenditure required for ambulation), level of function, and medical instability or deconditioning can all affect the level of therapy that can be tolerated.[32] Despite the effects of these factors, discharge to IRFs should still be considered as it may provide a greater recovery of mobility and self-care functioning post amputation. Evidence suggests that dysvascular amputees discharged post-acutely to IRFs (as opposed to SNFs or home) experienced better outcomes, including improved 12 month survival rates, greater likelihood of being fitted with a prosthetic device, increased medical stability and fewer subsequent amputations.[33–34] Among persons undergoing trauma-related amputations, the number of nights in a comprehensive IRF was significantly associated with lower levels of pain and better physical functioning even many years following the limb loss.[35] Similarly, Ottenbacher et al. observed that, for a more general population of post-acute care patients, decreases in IRF length of stay were associated with increased mortality.[36] The findings of these studies underscore the importance of a careful discharge planning and further emphasize the need for standardization of methods to determine the most appropriate discharge setting for patients undergoing major lower limb amputations.

The Beaumont Lifestyle Inventory of Social Support (BLISS) was developed to identify the relationship between non-clinical factors and the post-operative discharge disposition to an inpatient rehabilitation facility.[37] The inventory focuses on aspects such as age, mental and functional status, and family involvement, which were also evaluated in our study. Family involvement was shown to influence discharge destination, treatment outcome, and help maintain rehabilitation gains whereas non-supportive families could actually interfere with recovery.[38] Age as a predictor is probably dependent on the findings that younger patients tend to have more available family and are more functionally independent. The effect of mental status on discharge disposition is thought to be related to its effects on functional status and ability to participate in rehabilitation.[37] Therefore, while family support is critical to rehabilitation disposition and outcome, the effects of age and ADL/function at the time of discharge cannot be discounted as they too are significant independent predictors of discharge disposition.

Our findings of a positive association between marital status and home discharge and the lack of association between socioeconomic status and discharge home are consistent with those reported by Nguyen.[39] In contrast, Nguyen showed that a FIM score of 75 or lower was associated with a higher probability of discharge to a nursing home while we find no significant correlation between discharge setting and the SF-36 physical score. We did not use FIM scores as a key outcome as these quantify the need for assistance with basic care needs and are not responsive to the multidimensional quality of life for amputees who readily achieve independence at a wheelchair or crutch ambulation level at the time of discharge from rehabilitation. Likewise FIM measures are not routinely collected at SNF facilities or during home healthcare.

Along with the factors examined in the current study, the perioperative period should be investigated to assess its affect on post-acute care discharge disposition. Crouch et al prospectively investigated what factors surrounding a patient's hospitalization lead to a decline in independent living status after vascular surgery.[40] These predictors of decline included a hospital stay of greater than six days, emergency operation, open operative wound, systemic complications and minor amputation. The study showed that patients undergoing major amputations did not appear to have an increased risk of decline in independent living status at discharge versus those undergoing minor amputations who were nearly three times more likely to have a decline in disposition. These findings were likely attributable to the fact that 51% of major amputees were already in a SNF preoperatively and thus returned to a SNF whereas in minor amputees 64% went home without professional assistance and 73% of them had an open wound on discharge.[40] These findings reinforce the importance of maintaining independent function while in the recovery phase after vascular surgery along with emphasizing the fact that minor amputees may have greater recovery needs than previously assumed. That study, similar to ours, suggests a strong correlation between prior living arrangements and functional status to the post-acute discharge disposition. Further investigation of this correlation will aid in the proper placement of patients following amputation.

Aside from the factors identified in the present study, other literature suggests the need to assess financial, personal, structural and attitudinal barriers to post-acute care. These barriers evaluate the post-operative discharge disposition based on the effect of insurance coverage, out-of-pocket expenses, differential access to PAC, referral systems, practice habits of the provider, attitude of the patient, along with other factors. These factors interact to determine the patient's PAC destination and the type of rehabilitation services received. Combined, they provide an initial set of indictors that can be used to assess and monitor access to PAC services.

There are a number of limitations to this study that merit comment. Although patients were identified at the time of their amputation at 18 different hospitals in two geographically, racially, and PAC-supply and policy diverse states, our sample is relatively small. In addition, although we quantified the number of perioperative complications, we did not attempt to specify the nature of each complication (e.g., poor glycemic control, fluid and volume disturbances, infections). It is plausible that certain perioperative complications are more predictive than others as to the post-acute care discharge disposition. Finally, our

findings are applicable only to persons undergoing major lower limb dysvascular amputations and may well not generalize to those undergoing limb loss secondary to other etiologies such as trauma or congenital-related amputations.

CONCLUSION

This study prospectively assessed the use of post-acute rehabilitation services following dysvascular amputations in two geographically and racially diverse urban settings. Despite the reassuring lack of influence of race and gender on discharge disposition, the significant geographic variation (even after controlling for socio-demographic, economic and health characteristics) raises concerns about the appropriate placement for patients. The findings of the current study provide a necessary first step in the challenging task of assessing the long-term functional outcomes of persons receiving post-acute care in alternative settings. The 'active ingredients' of post-acute rehabilitation and which types of patients are best suited for which setting should be further researched in order to ensure return to an optimal level of function and to achieve a high quality of life.

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Table 1

Sample Characteristics

	Overall (N=348)	By Discharge Destination		
		Inpatient Rehabilitation (n=192)	Skilled Nursing Facility (n=73)	Home (n=83)
Age in years; mean (SD)	63.7 (13.1)	64.0 (12.3)	66.1 (13.8)	60.92 (13.8)
Gender				
Female	40.8%	40.0%	43.8%	39.8%
Race/Ethnicity				
Black/African American	27.6%	23.9%[a,b]	32.9%	31.3%
Other race/ethnicity	72.4%	76.0%[a,b]	67.1%	68.7%
Married	44.8%	47.4%[a]	31.5%[b]	50.6%
Economic Status				
Employed	39.7%	43.7%[b]	37.0%	32.5%
Low Income	38.1%	40.6%	37.0%	32.6%
Missing Income	27.6%	20.3%[a,b]	37.0%	36.1%
Prior Living Arrangements				
Nursing Home	6.3%	4.2%[a]	17.8%[b]	1.2%
Physical Environment				
Accessible Home	93.1%	95.8%[a]	87.7%	91.6%
Pre-Operative Functioning				
# of Comorbidites	5.4 (2.1)	5.4 (2.0)	5.4 (2.2)	5.2 (2.1)
Diabetes	75.6%	77.1%	76.7%	71.1%
SF-36 Physical Component	31.9 (10.2)	32.1 (10.1)	30.5 (10.2)	32.6 (10.4)
Summary Score				
SF-36 Mental Component	45.8 (13.1)	46.1 (13.8)	43.7 (13.3)	46.8 (11.1)
Summary Score				
IADLs only	23.6%	28.1%[a]	13.7%[b]	21.7%
1–2 ADLs	20.7%	20.8%	19.2%	21.7%
3+ ADLs	16.9%	13.5%[a]	30.1%[b]	13.2%
Any Peri-operative Complications	7.5%	6.8%[a]	12.3%[b]	4.8%
Amputation Level				
Unilateral Transfemoral	15.8%	14.1%[a]	23.3%[b]	13.2%
Unilateral Transtibial	45.1%	55.7%[a]	37.0%[b]	27.7%
Bilateral	25.8%	22.9%	24.7%	33.7%
Geographic Location				
Wisconsin	50.3%	56.8%[a]	39.7%	44.6%
Maryland	49.7%	43.2%[a]	60.3%	55.4%

	Overall (N=348)	By Discharge Destination		
		Inpatient Rehabilitation (n=192)	Skilled Nursing Facility (n=73)	Home (n=83)
Insurance Coverage				
Medicare	71.0%	71.9%	78.1%[b]	62.6%
Medicaid or state program	8.3%	9.9%[a]	4.1%	8.4%
Other (primarily private/commercial insurance)	20.7%	18.2%[b]	17.8%	28.9%

[a] Significantly different from Skilled Nursing Facility group at the p<0.05 level (two-sided test).

[b] Significantly different from Home discharge group at the p<0.05 level (two-sided test).

Table 2

Factors associated with disposition to alternative post-acute care settings

	Inpatient Rehabilitation vs. Skilled Nursing Facility		Home vs. Skilled Nursing Facility	
	Odds Ratio	**95% Confidence Interval**	**Odds Ratio**	**95% Confidence Interval**
Demographic Characteristics				
Age, in years	0.97*	0.94–1.00	0.95**	0.92–0.99
Female	1.38	0.72–2.65	1.28	0.60–2.73
African American/Black	0.80	0.38–1.66	1.12	0.48–2.59
Married	1.88**	0.96–3.66	2.38**	1.10–5.19
Economic Status				
Employed	2.06*	0.95–4.49	2.12	0.83–5.42
Low Income	1.69	0.60–4.74	2.69*	0.86–8.34
Prior Living Arrangements				
Nursing home	0.30**	0.10–0.94	0.90**	0.01–0.79
Physical Environment				
Accessible Home	1.40**	1.01–1.92	1.33	0.89–1.98
Pre-Operative Functioning				
Comorbidities	1.04	0.87–1.24	1.03	0.84–1.26
Diabetes	0.81	0.36–1.81	0.45*	0.18–1.14
SF-36 Physical Component Summary Score (range 0–100)	1.01	0.98–1.05	1.01	0.98–1.05
SF-36 Mental Component Summary Score (range 0–100)	1.03**	1.00–1.05	1.02*	1.00–1.05
Amputation Level				
Unilateral Transfemoral	1.90	0.59–6.12	0.32*	0.89–1.17
Unilateral Transtibial	3.63**	1.33–9.82	0.37*	0.13–1.07
Bilateral	2.38	0.81–6.98	0.78	0.26–2.33
Any Perioperative Complications	0.53	0.18–1.52	0.21**	0.05–0.86
Geographic Location				
Wisconsin	2.07**	1.05–4.08	1.20	0.545–2.62
Insurance Coverage				
Medicare	1.10	0.47–2.62	0.82	0.31–2.11
Medicaid	4.13*	0.89–19.0	1.61	0.29–8.77

Notes: Odds ratios (OR) are based on a multivariate logit model that estimates the joint probability of discharge to(1) inpatient rehabilitation or (2) home (with or without home health care) relative to (3) a skilled nursing facility. The relative odds ratio estimate indicates the independent effect of a change in each characteristic (e.g., age, insurance coverage, amputation level) on the likelihood of discharge to each specific setting (inpatient rehabilitation or home) relative to being discharged to a skilled nursing facility. An OR less than 1 indicates lower odds of discharge to a given setting compared to being discharged to a SNF. The confidence interval provides an estimate of the statistical significance of the relationship. ORs marked with a double asterisk indicate relationships that are statistically significant at the t $p \leq 0.05$ level. ORs marked with a single asterisk indicate relationships that are statistically significant at the $0.05 \leq p \leq 0.10$ level. The reference category for race/ethinicity is “non-African American, primarily Caucasian;” for amputation level is “foot/ankle;” the reference category for insurance coverage is “private/commercial insurance.”