Published in final edited form as:
PM R. 2013 May ; 5(5): 408–417. doi:10.1016/j.pmrj.2012.09.578.

Factors Associated With Home Discharge After Rehabilitation Among Male Veterans With Lower Extremity Amputation

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Abstract

Objective—To determine the patient-, treatment-, and facility-level factors that are associated with home discharge among male veterans with lower extremity amputation who received inpatient rehabilitation after surgery.

Design—A retrospective observational study.

Setting—Veterans Affairs Medical Centers.

Participants—This study included 1480 male veterans.

Methods—Generalized estimating equation models were used to model the likelihood of home discharge to account for within-facility clustering. We reported odds ratios (ORs) and 95% confidence intervals (95% CIs).

Main Outcome Measurement—Discharged to home.

Results—There were a total of 1163 (78.6%) veterans who were discharged home after the surgical hospitalization, compared with other locations. Patients who were married were more likely to be discharged home compared with patients who were not married (OR = 1.51, 95% CI = 1.14–1.99, $P < .01$). Compared with being transferred from another hospital or extended care,

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Disclosure: nothing to disclose
Disclosure Key can be found on the Table of Contents and at www.pmrjournal.org

patients who were admitted from home were far more likely to be discharged home (OR = 8.43, 95% CI = 5.48–12.96, $P < .0001$). Patients with evidence of local significant infection were less likely to be discharged home (OR = 0.57, 95% CI = 0.39–0.83, $P < .01$), as were patients with evidence of congestive heart failure (OR = 0.62, 95% CI = 0.45–0.85, $P < .01$) or depression (OR = 0.63, 95% CI = 0.40–0.98, $P = .04$). Veterans with greater discharge motor Functional Independence Measure scores were more likely to be discharged home (OR = 1.23, 95% CI = 1.16–1.31 per 10-point increase in discharge Functional Independence Measure motor score, $P < .0001$). Conversely, patients undergoing procedures for ongoing active cardiac pathology were less likely to be discharged home (OR = 0.55, 95% CI = 0.37–0.81, $P < .01$).

Conclusions—This study showed a strong association between the sociological factors of marital status and living location before hospitalization and home discharge. The significance of discharge functional status highlights the importance of addressing the expected care burden once patients are discharged home.

INTRODUCTION

Amputation can be a devastating event to both patients and their families. It may be physically and psychologically draining, placing people at risk for loss of independence [1]. However, with rehabilitation, patients may be able to walk or become mobile and function again. Being discharged home after rehabilitation for lower extremity amputation is an important goal that nearly all patients want to achieve as they strive to live high-quality lives again.

Rehabilitation is an important component of care after the surgical amputation procedure to help patients regain mobility and function. Rehabilitation also can help patients devise compensation techniques or strategies for their limb loss. Rehabilitation can occur at different times and places and can be of different types. The Time, Place, Type framework was developed to help classify the rehabilitation process [2]. Timing relates to when the initiation of rehabilitation occurs. In the case of lower extremity amputation, rehabilitation can occur before the surgical procedure (preoperative), after the surgery but before hospital discharge (acute postoperative), or after discharge from the surgical amputation hospitalization (late). Place reflects the setting at which rehabilitation transpires and includes inpatient, outpatient, nursing homes, or home. Type refers to what is being done for the patient. In the Department of Veterans Affairs (VA), 2 types of rehabilitation are provided to patients while they are hospitalized. The first is consultative rehabilitation in which patients have one to several therapy sessions while hospitalized on general medical or surgical bed sections. The second is specialized rehabilitation, in which restorative therapy occurs daily on a designated specialized rehabilitation unit. Rehabilitation is part of the hospitalization, and the Time, Place, Type framework is important in linking together different phases of care.

Our previous research showed that after propensity score risk adjustment, patients who received any type of inpatient rehabilitation, whether consultative or specialized, compared with patients with no evidence of inpatient rehabilitation after the surgical amputation were more likely to be discharged home [2]. Furthermore, patients who specifically received specialized rehabilitation in a specialized rehabilitation unit during this time period compared with consultative rehabilitation on general medical or surgical bed sections were more likely to be discharged home [3]. Thus, a next reasonable step in improving care for persons with lower extremity amputations is to better understand the characteristics that are related to home discharge in one particular timing rehabilitation care pattern. The objective of this work was to determine the patient-, treatment-, and facility-level factors that are associated with home discharge among male veterans with lower extremity amputation who received some type of acute postoperative inpatient rehabilitation.

METHODS

This retrospective observational study was approved by the Institutional Review Boards at the University of Pennsylvania in Philadelphia, Pennsylvania, Samuel S. Stratton Veterans Affairs Medical Center in Albany, New York, and the University of Florida in Gainesville, Florida, as well as receiving approval from the Research and Development Committees in Albany and the North Florida/South Georgia Veterans Health System in Gainesville.

Description of Databases

Data were obtained from 8 Veterans Health Administration administrative databases used to track the health status and health care use of veterans. The databases included 4 inpatient datasets referred to as the Patient Treatment Files (PTF) (main, procedure, bed section, and surgery) [4], 2 outpatient care files (visit and event) [5], the Beneficiary Identification Record Locator System death file [6], and the Functional Status Outcomes Database (FSOD) [7]. The databases and our methods of data extraction have been described previously [8–11].

Study Population

Patients were included from Veterans Affairs Medical Centers with acute hospital discharge dates between October 1, 2002, and September 30, 2004, for a new transtibial or transfemoral amputation identified through the following surgical *International Classification of Diseases*, Ninth Revision, Clinical Modification (ICD-9-CM) procedure codes: 84.10, 84.13–84.19, and 84.91 [12]. Cases were excluded if the amputation involved toes only or if there was a record of a previous lower extremity amputation within the 12 months preceding the hospitalization in which the new amputation occurred. The hospitalization at the time of the new amputation represented the “index surgical stay.” We combined records from the PTF bed section files with admission dates within 1 day of the patient’s main hospitalization discharge date to capture the entire acute amputation hospitalization.

A total of 4727 veterans with lower extremity amputations were identified. Because the objective of our study was to determine what patient-, treatment-, and facility-level characteristics were associated with home discharge from the index surgical stay after receiving acute postoperative rehabilitation, only patients who received inpatient rehabilitation during this time period, ie, after the surgical amputation but before the surgical hospitalization discharge date, were included. As a result, the 3055 patients who either received inpatient rehabilitation services outside of the acute postoperative time period or had no evidence of inpatient rehabilitation as recorded in the FSOD were excluded. Thus, 1672 veterans met the inclusion criteria. Among this group, 15 women were excluded (because we concentrated on only the male population), 126 died while hospitalized, 17 were missing initial motor Functional Independence Measure (FIM) scores [13], and 34 were missing discharge motor FIM scores. Therefore, there were 1480 patients included in the analyses.

Patient-, Treatment-, and Facility-Level Characteristics

Patient-level characteristics included age, marital status (married vs not married), and living location before hospitalization (extended care vs home or non-VA hospital). Amputation type differentiated between unilateral and bilateral as well as transtibial and transfemoral limb loss. Patients with both a unilateral transtibial and a unilateral transfemoral amputation were combined with bilateral transfemoral amputations and were referred to as “high level bilateral amputations” because of low prevalence and because functional prognosis decreases sharply once the knee is lost [14].

Diagnoses incorporated both amputation etiologies and comorbidities. Etiologies and comorbidities were identified by use of the ICD-9-CM diagnosis codes from the outpatient care files 3 months before the hospital admission and from the main and bed section PTF files up to the surgical date. Ten of the original 12 etiological categories created by our group were incorporated in the analyses, including chronic osteomyelitis, device infection, diabetes mellitus type 1, diabetes mellitus type 2, local significant infection, peripheral vascular disease, previous amputation complication, skin breakdown, systemic sepsis, and trauma [8]. Congenital deformity and lower-limb cancer were not sufficiently prevalent to be included in the analyses. We used the 2003 version of the Elixhauser comorbidity measure, which includes 31 conditions and distinguishes hypertension with and without complications in this study [15,16]. No cases had the ICD-9-CM code for obesity, and thus obesity was not included. Diabetes mellitus (with and without complications) and peripheral vascular disease were not included as comorbidities because they were categorized as amputation etiologies.

Initial motor and cognitive FIM scores captured physical and cognitive and communication function, respectively, at the beginning of rehabilitation services; discharge motor and cognitive FIM scores captured respective functions at the conclusion of rehabilitation services; and change in motor and cognitive FIM scores showed the increase or decrease in FIM points, subtracting the respective initial FIM score from the respective discharge FIM score. The FIM is the standard measure of functional status used in inpatient rehabilitation in the Veterans Health Administration.

Diagnostic tests and treatments indicating or suggesting the presence of active pulmonary, central nervous system, cardiac, or severe renal pathology, nutritional compromise, ongoing wound problems, and mental status issues or substance abuse during the surgical hospitalization were included [10]. The presence of these procedures was used to indicate medical acuity or complexity during the surgical hospitalization. The type of acute postoperative inpatient rehabilitation was dichotomized as receipt of consultative rehabilitation or specialized rehabilitation.

Facility-level characteristics included geographic region (Veterans Integrated Service Networks mapped into Centers for Medicare & Medicaid Services regions: Northeast, Southeast, Midwest, South Central, or Pacific Mountain) and hospital bed size (≤126 beds, 127–244 beds, 245–362 beds, or >362 beds).

Outcome Measure

The outcome of this study was discharge location from the index surgical stay of home compared with all other locations (extended care, transfer to a non-VA hospital, discharge against medical advice, and other) as indicated in the PTF main file. The variable was dichotomized as home discharge or discharge to other locations.

Statistical Methods

Patient-, treatment-, and facility-level baseline characteristics were compared between patients who were discharged home from the index surgical stay to those who were discharged to other locations. These comparisons (ie, unadjusted analysis) were conducted through χ^2 analyses and Student *t*-tests.

Because patients are clustered into facilities, to properly account for this clustering, generalized linear mixed effects models were used to model the likelihood of home discharge. We use the generalized estimating equation to estimate the parameters for the models. For all known patient-, treatment-, and facility-level characteristics, those variables that were significant in the unadjusted analysis and clinically important variables (age, marital status, amputation type, and living location before hospitalization) were entered in a larger model. We then used backward selection to obtain a final model in which P values for all covariates were less than .05. We reported odds ratios (ORs) and 95% confidence intervals (95% CIs). All statistical analyses were performed with SAS version 9.2 [17]. P-values were 2-sided, with statistical significance set a priori at $P < .05$.

RESULTS

A total of 1480 veterans with lower extremity amputation met our inclusion criteria. Among those patients, 1163 (78.6%) were discharged home after the index surgical stay compared with other locations whereas 317 patients (21.4%) were discharged to other locations, of whom 278 (18.8%) were discharged to extended care, 25 (1.7%) were discharged to non-VA hospitals, 7 (0.5%) left against medical advice, and 7 (0.5%) were discharged to some other location.

Table 1 presents the associations between each patient-, treatment-, and facility-level characteristic (categorical variables) with the outcome of discharge location. Table 2 shows the associations between the continuous variables and the outcome. In terms of patient-level characteristics, veterans who were married (81.8%) were more likely to be discharged home compared with veterans who were not married (75.8%, $P < .01$), as were patients who were admitted to the hospital from home (82.6%) compared with extended care or transferred from a non-VA hospital (33.3%, $P < .0001$). Patients with evidence of the amputation etiology of local significant infection ($P < .01$) or peripheral vascular disease ($P = .04$) were less likely to be discharged home, as were patients with evidence of the comorbidities of chronic pulmonary disease ($P < .01$), congestive heart failure ($P < .01$), or metastatic cancer ($P = .04$). For continuous variables, veterans who were discharged home were younger (66.0 years for those discharged home compared with 69.9 years for those discharged elsewhere, $P < .0001$), and had higher initial motor FIM scores, higher discharge motor FIM scores, greater improvement in motor FIM scores from admission to discharge from inpatient rehabilitation, higher initial cognitive FIM scores, and higher discharge cognitive FIM scores (all $P < .0001$).

Patients with treatment-level variables of evidence of ongoing active cardiac pathology ($P < .01$) or serious nutritional compromise ($P < .01$) were less likely to be discharged home compared with veterans who did not have evidence of undergoing these procedures. Patients who received specialized rehabilitation (84.1%) were more likely than patients who received consultative rehabilitation (76.9%) to be discharged home ($P < .01$). Patients in the Southeast and South Central regions of the country were more likely to be discharged home ($P < .0001$), as were patients treated in the smallest hospitals ($P = .04$).

Table 3 illustrates the adjusted associations in the final model. Patients who were married were more likely to be discharged home compared with patients who were not married (OR = 1.51, 95% CI = 1.14–1.99, $P < .01$). Compared with being transferred from a non-VA hospital or extended care, patients who were admitted from home were far more likely to be discharged home (OR = 8.43, 95% CI = 5.48–12.96, $P < .0001$). Patients with evidence of local significant infection were less likely to be discharged home (OR = 0.57, 95% CI = 0.39–0.83, $P < .01$), as were patients with evidence of congestive heart failure (OR = 0.62, 95% CI = 0.45–0.85, $P < .01$) or depression (OR = 0.63, 95% CI = 0.40–0.98, $P = .04$).

Veterans with higher discharge motor FIM scores were more likely to be discharged home (OR = 1.23, 95% CI = 1.16–1.31 per 10- point increase in discharge motor FIM score, $P < .0001$). Conversely, patients undergoing procedures for ongoing active cardiac pathology were less likely to be discharged home (OR = 0.55, 95% CI = 0.37–0.81, $P < .01$).

DISCUSSION

After statistical adjustment, there appeared to be only a few essential factors related to the achievement of home discharge after lower extremity amputation among veterans receiving acute postoperative rehabilitation. These factors were drawn from the broader patient-, treatment-, and facility-level characteristic domains. Male veterans with evidence of local significant infection, congestive heart failure, or procedures suggesting ongoing active cardiac pathology were less likely to be discharged home compared with patients without evidence of these conditions or procedures. Interestingly, fewer diagnoses and procedures were predictive of home discharge than of mortality among the same cohort [8]. In contrast, sociological variables among the patient-level factors such as marital status, living location before hospitalization, and discharge functional status appeared to have a strong association with being discharged home.

Life at home after being discharged from the hospital after a lower extremity amputation may be difficult for the veteran, and activity limitations may place a significant burden on caregivers. Caregivers may feel inadequate to safely provide care for patients with new amputations even after undergoing inpatient rehabilitation, and clinicians fearing an inadequate support system may be less inclined to discharge patients home and more inclined to discharge patients to a facility capable of providing more care. Thus, motor FIM score, because it quantifies care burden, was reasonably a strong patient-level factor associated with home discharge. In our study, patients with greater discharge motor FIM scores were more likely to be discharged home. For every 10-point increase in discharge motor FIM, there was a 23% greater likelihood of being discharged home. Veterans with lower extremity amputations who had higher admission motor FIM scores tended to have better patient outcomes, such as receiving a prescription for a prosthetic limb [10], and to have better physical functioning after discharge from the index surgical stay [18]. Clinicians will be inclined to believe that patients with higher motor FIM scores are at a functional level acceptable for returning home, as they gain enough functional ability to be able to move around their homes with decreasing levels of assistance. We previously found that veterans with lower extremity amputations who had higher discharge motor FIM scores were more likely to be admitted to late rehabilitation [19]. Once these patients have returned home, presumably at a more functional level, they are better able to re-gain strength and endurance, facilitating readiness for prosthetic training during late rehabilitation.

There were several medical conditions and procedures with lower likelihoods of home discharge in the unadjusted associations. These included local significant infection, peripheral vascular disease, chronic pulmonary disease, congestive heart failure, metastatic cancer, treatment for ongoing active cardiac pathology, and serious nutritional compromise. Impairments resulting from any medical condition(s) that an individual may have, or procedures that the patient must undergo, can combine and contribute to those individuals' severity of disability. Motor FIM, in particular, represents an aggregate global variable. Once motor FIM was added to the final model, only the factors that were most independently related to home discharge beyond the impact of function remained significant. Those factors included congestive heart failure and procedures for ongoing active cardiac pathology, both of which tend to reduce patients' available energy, a domain that is related to but distinct from physical functioning. These conditions, by reducing a person's stamina and tolerance for activity, may reduce the likelihood of being discharged home compared to another location (extended care or transfer to a non-VA hospital) above the limitations that they may have in physical functioning.

Patients who are not married may not have a caregiver available to them, making discharge planning difficult; this raises the likelihood of discharge to other locations. On the other hand, even at a lower functional level, if the patient had caregivers who would be able to provide optimal care, then clinicians might be more likely to discharge the patient home. This may be an explanation as to why married patients were more likely to be discharged home than patients who were not married. The patient’s spouse would be available and perhaps willing to care for the patient. Research has shown that married elderly people benefit from more informal care than unmarried elderly people [20–22]. Moreover, spouses are more likely to act as a primary caregiver [22,23] and to provide more care than other informal caregivers [24]. Some spouses may also feel that they have a moral obligation to care for their partners [25,26]. Patients who are married may also have adult children who are willing to provide support and care. Approximately one-third of spousal caregivers receive help from adult children [24,27]. Of particular relevance to the predominantly male veteran population, it has also been shown that husbands benefit more from spousal care [21,28,29] and that wives are more likely to serve as caregivers compared with husbands [23,30].

Patients who are admitted to the hospital from home were more likely to be discharged back home. These patients may be motivated to return to a place and lifestyle that is familiar to them. Before being hospitalized, these patients may not have been dependent on others. In comparison, patients admitted from extended care facilities are more likely to be in poorer health and previously functionally dependent, and plausibly will need more care after the amputation. Moreover, patients who were already in extended care were more likely the ones who did not have the social support that they would need to live safely at home even before the amputation. Presumably, patients who were admitted from home and were independent before the amputation would be able to use the therapy that they received while they were hospitalized to achieve a sufficiently high functional level to return home. Also, if these patients are returning home, they may have caregivers, such as their spouses or other members in their community, available to help them recover.

Patients with evidence of local significant infection were less likely to be discharged home. We had previously found that patients with evidence of local significant infection were also less likely to make functional gains after receiving inpatient rehabilitation [18]. It may be that this variable is marking nonhealing wounds and need for long-term intravenous antibiotic management that is challenging in the home setting. Further studies need to be conducted to learn the role of local significant infection in patients with lower extremity amputation.

Veterans with evidence of congestive heart failure or procedures for active cardiac pathology were less likely to be discharged home compared with patients without evidence of these factors. These patients are more likely to need more management and long-term care that may be difficult to provide at home, and may not have sufficient endurance to walk with a prosthetic limb or to propel a wheelchair, as a result of their underlying condition(s). People with amputations often need endurance to overcome environmental obstacles, such as stairs, that they may face at home. At the point of hospital discharge, they may not have the strength to overcome these obstacles. These patients have also been shown to have other poor outcomes, such as being less likely to receive a prescription for a prosthetic limb after being discharged from the index surgical stay [10], having lower functional gains [18], and dying after amputation surgery [8,18,31].

Depression is prevalent among people with limb loss [32,33]. A study in Italy showed that after being discharged home from a rehabilitation unit located in a hospital, patients with a limb amputation deteriorated rapidly if they became clinically depressed. Some patients may have had high (or unrealistic) expectations while in rehabilitation and may not have had appropriate postdischarge assistance [34]. Norvell et al [35] showed that patients being treated for depression were less likely to have successful long-term functional outcomes after lower extremity amputation. Depression has been shown to increase 1 year after lower extremity amputation [36] and to be associated with negative outcomes [18,37–41]. Depression was also negatively associated with engagement in acute rehabilitation services [42]. Moreover, patients with depression are less likely to advocate for themselves. Rehabilitation efforts should attempt to minimize depression because this is a condition that is potentially manageable, and counseling professionals should be part of the multidisciplinary rehabilitation team.

Typically, patients who are selected for inpatient rehabilitation are expected to have fairly high cognitive functioning. To benefit from a rehabilitation therapy program, it is essential that patients have treatment carryover. This is particularly important with prosthetic limb training, as patients need to be able to comprehend the instructions given to them by their clinicians as well as to remember information that is being directed to them to be safe with a prosthesis. This may be a reason as to why cognitive FIM was not significant in the final model. Moreover, we would not expect a lot of change in cognitive status among those veterans undergoing rehabilitation for lower extremity amputation. Rehabilitation for this cohort is focused more on their physical rather than their cognitive impairments due to their amputation. Thus, we would not expect significant changes in their cognitive status compared to their physical functioning status, which is the focus of this particular rehabilitation intervention.

Our study had several limitations. Because this study included only male veterans, we are unsure of the degree to which the findings can be generalized to female individuals or to the larger U.S. population. Race was not included because of the large amount of missing data. Because administrative data were used, we may have missed patients who did receive inpatient rehabilitation during the acute postoperative period because their information was not entered in the FSOD, which in our study was used to indicate receipt of acute postoperative rehabilitation.

CONCLUSION

We showed strong associations between patient-level factors and home discharge, particularly marital status, living location before hospitalization, and discharge functional status. However, it is important to consider the patient as a whole instead of focusing on specific aspects. For example, if the patient did not make high gains in functional status by rehabilitation discharge but was married, the clinician might be inclined to discharge him home because he has a support system in place. Thus, to be successful it is important to take into account sociological factors in addition to clinical factors when caring for patients and planning for their discharge. It is essential that clinicians recognize the psychosocial factors that affect home discharge and how those conditions can confound the impact of medical conditions.

Acknowledgments

This research was supported by the National Institutes of Health (R01-HD042588-05A2). It is also supported by resources and the use of facilities at the Samuel S. Stratton Department of Veterans Affairs Medical Center in Albany, New York, and the North Florida/South Georgia Veterans Health System (NF/SG VHS) in Gainesville, Florida.

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We certify that no party having a direct interest in the results of the research supporting this article has or will confer a benefit on us or on any organization with which we are associated, and, if applicable, we certify that all financial and material support for this research (ie, NIH grants) and work are clearly identified. The opinions and conclusions of the authors are not necessarily those of the sponsoring agencies.

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Table 1

Baseline characteristics of male veterans discharged home

	Total 1480	Discharged Home n (%) N = 1163 (78.6%)	Not Discharged Home n (%) N = 317 (21.4%)
Patient-level			
Demographics			
Marital status *			
Married	687	562 (81.8)	125 (18.2)
Not married	793	601 (75.8)	192 (24.2)
Living location before hospitalization †			
Home	1360	1123 (82.6)	237 (17.4)
Extended care or hospital	120	40 (33.3)	80 (66.7)
Amputation type			
Unilateral transtibial	771	606 (78.6)	165 (21.4)
Unilateral transfemoral	592	458 (77.4)	134 (22.6)
Bilateral transtibial	38	32 (84.2)	6 (15.8)
High-level bilateral transfemoral	79	67 (84.8)	12 (15.2)
Amputation etiologies			
Chronic osteomyelitis			
Yes	105	87 (82.9)	18 (17.1)
No	1375	1076 (78.3)	299 (21.8)
Device infection			
Yes	164	137 (83.5)	27 (16.5)
No	1316	1026 (78.0)	290 (22.0)
Diabetes mellitus type 1			
Yes	246	187 (76.0)	59 (24.0)
No	1234	976 (79.1)	258 (20.9)
Diabetes mellitus type 2			
Yes	998	782 (78.4)	216 (21.6)
No	482	381 (79.1)	101 (21.0)
Local significant infection *			
Yes	1144	875 (76.5)	269 (23.5)
No	336	288 (85.7)	48 (14.3)
Peripheral vascular disease ‡			
Yes	1291	1004 (77.8)	287 (22.2)
No	189	159 (84.1)	30 (15.9)
Previous amputation complication			
Yes	139	113 (81.3)	26 (18.7)
No	1341	1050 (78.3)	291 (21.7)
Skin breakdown			
Yes	954	741 (77.7)	213 (22.3)

	Total 1480	Discharged Home n (%) N = 1163 (78.6%)	Not Discharged Home n (%) N = 317 (21.4%)
No	526	422 (80.2)	104 (19.8)
Systemic sepsis			
Yes	132	96 (72.7)	36 (27.3)
No	1348	1067 (79.2)	281 (20.9)
Trauma			
Yes	209	162 (77.5)	47 (22.5)
No	1271	1001 (78.8)	270 (21.2)
Comorbidities			
AIDS			
Yes	12	9 (75.0)	3 (25.0)
No	1468	1154 (78.6)	314 (21.4)
Alcohol abuse			
Yes	83	63 (75.9)	20 (24.1)
No	1397	1100 (78.7)	297 (21.3)
Arrhythmias			
Yes	231	174 (75.3)	57 (24.7)
No	1249	989 (79.2)	260 (20.8)
Chronic blood loss anemia			
Yes	28	20 (71.4)	8 (28.6)
No	1452	1143 (78.7)	309 (21.3)
Chronic pulmonary disease *			
Yes	293	212 (72.4)	81 (27.7)
No	1187	951 (80.1)	236 (19.9)
Coagulopathy			
Yes	68	54 (79.4)	14 (20.6)
No	1412	1109 (78.5)	303 (21.5)
Congestive heart failure *			
Yes	310	219 (70.7)	91 (29.4)
No	1170	944 (80.7)	226 (19.3)
Deficiency anemia			
Yes	324	252 (77.8)	72 (22.2)
No	1156	911 (78.80	245 (21.2)
Depression			
Yes	134	97 (72.4)	37 (27.6)
No	1346	1066 (79.2)	280 (20.8)
Drug abuse			
Yes	33	30 (90.9)	3 (9.1)
No	1447	1133 (78.3)	314 (21.7)
Fluid and electrolyte disorders			
Yes	284	215 (75.7)	69 (24.3)
No	1196	948 (79.3)	248 (20.7)

	Total 1480	**Discharged Home n (%) N = 1163 (78.6%)**	**Not Discharged Home n (%) N = 317 (21.4%)**
Hypertension			
Yes	959	758 (79.0)	201 (21.0)
No	521	405 (77.7)	116 (22.3)
Hypertension with complication			
Yes	8	8 (100.0)	0
No	1472	1155 (78.5)	317 (21.5)
Hypothyroidism			
Yes	51	37 (72.6)	14 (27.5)
No	1429	1126 (78.8)	303 (21.2)
Liver disease			
Yes	52	39 (75.0)	13 (25.0)
No	1428	1124 (78.7)	304 (21.3)
Lymphoma			
Yes	10	8 (80.0)	2 (20.0)
No	1470	1155 (78.6)	315 (21.4)
Metastatic cancer[‡]			
Yes	27	17 (63.0)	10 (37.0)
No	1453	1146 (78.9)	307 (21.1)
Other neurologic disorders			
Yes	39	26 (66.7)	13 (33.3)
No	1441	1137 (78.9)	304 (21.1)
Paralysis			
Yes	62	54 (87.1)	8 (12.9)
No	1418	1109 (78.2)	309 (21.8)
Peptic ulcer			
Yes	18	13 (72.2)	5 (27.8)
No	1462	1150 (78.7)	312 (21.3)
Psychosis			
Yes	105	77 (73.3)	28 (26.7)
No	1375	1086 (79.0)	289 (21.0)
Pulmonary circulation disease			
Yes	10	8 (80.0)	2 (20.0)
No	1470	1155 (78.6)	315 (21.4)
Renal failure			
Yes	235	178 (75.7)	57 (24.3)
No	1245	985 (79.1)	260 (20.9)
Rheumatoid arthritis			
Yes	14	12 (85.7)	2 (14.3)
No	1466	1151 (78.5)	315 (21.5)
Solid tumor without metastasis			
Yes	126	92 (73.0)	34 (27.0)

	Total 1480	Discharged Home n (%) N = 1163 (78.6%)	Not Discharged Home n (%) N = 317 (21.4%)
No	1354	1071 (79.1)	283 (20.9)
Valvular disease			
Yes	49	34 (69.4)	15 (30.6)
No	1431	1129 (78.9)	302 (21.1)
Weight loss			
Yes	72	56 (77.8)	16 (22.2)
No	1408	1107 (78.6)	301 (21.4)
Treatment-level			
Procedures			
Active pulmonary pathology			
Yes	10	8 (80.0)	2 (20.0)
No	1470	1155 (78.6)	315 (21.4)
Acute central nervous system			
Yes	111	87 (78.4)	24 (21.6)
No	1369	1076 (78.6)	293 (21.4)
Ongoing active cardiac pathology *			
Yes	164	113 (68.9)	51 (31.1)
No	1316	1050 (79.8)	266 (20.2)
Ongoing wound problems			
Yes	92	66 (71.7)	26 (28.3)
No	1388	1097 (79.0)	291 (21.0)
Serious nutritional compromise *			
Yes	44	25 (56.8)	19 (43.2)
No	1436	1138 (79.3)	298 (20.8)
Severe renal disease			
Yes	107	80 (74.8)	27 (25.2)
No	1373	1083 (78.9)	290 (21.1)
Substance abuse/mental health issues			
Yes	21	16 (76.2)	5 (23.8)
No	1459	1147 (76.6)	312 (21.4)
Inpatient rehabilitation type *			
Consultative rehabilitation	1140	877 (76.9)	263 (23.1)
Specialized rehabilitation	340	286 (84.1)	54 (15.9)
Facility-level			
Geographic regions †			
Northeast	212	160 (75.5)	52 (24.5)
Southeast	464	380 (81.9)	84 (18.1)
Midwest	214	167 (78.0)	47 (22.0)
South Central	359	302 (84.1)	57 (15.9)
Pacific Mountain	231	154 (66.7)	77 (33.3)

	Total 1480	Discharged Home n (%) N = 1163 (78.6%)	Not Discharged Home n (%) N = 317 (21.4%)
Total hospital bed size[‡]			
Bed size ≤ 126	390	325 (83.3)	65 (16.7)
Bed size 127–244	437	337 (77.1)	100 (22.9)
Bed size 245–362	547	424 (77.5)	123 (22.5)
Bed size >362	106	77 (72.6)	29 (27.4)

[*] $P < .01$;

[†] $P < .0001$;

[‡] $P < .05$.

Table 2

Baseline characteristics of male veterans discharged home continued

Patient-Level	Discharged Home Mean (SD)	Not Discharged Home Mean (SD)
Demographics		
Age *	66.0 (11.0)	69.9 (10.7)
Functional status		
Motor FIM (range, 13–91)		
Initial *	42.4 (19.3)	32.7 (16.8)
Discharge *	55.6 (23.3)	41.4 (22.2)
FIM improvement *	13.2 (13.7)	8.6 (13.3)
Cognitive FIM (range, 5–35)		
Initial *	27.6 (9.1)	24.1 (9.9)
Discharge *	28.8 (8.5)	25.1 (9.7)
FIM improvement	1.2 (4.0)	1.0 (4.2)

FIM = Functional Independence Measure.

* $P < .0001$.

Table 3

Adjusted associations with characteristics and home discharge

	Odds Ratio (95% Confidence Interval)
Patient-level	
Demographics	
Marital status	
Married vs not married *	1.51 (1.14–1.99)
Living location before hospitalization	
Home vs extended care or hospital †	8.43 (5.48–12.96)
Amputation etiologies	
Local significant infection (yes vs no) *	0.57 (0.39–0.83)
Comorbidities	
Congestive heart failure (yes vs no) *	0.62 (0.45–0.85)
Depression(yes vs no) ‡	0.63 (0.40–0.98)
Functional status	
Motor FIM	
Discharge motor FIM score (per 10 points) †	1.23 (1.16–1.31)
Treatment-level	
Procedures	
Ongoing active cardiac pathology (yes vs no) *	0.55 (0.37–0.81)

* $P < .01$;

† $P < .0001$;

‡ $P < .05$.