

Higher 30-Day and 60-Day Readmissions Among Patients Who Refuse Post Acute Care Services

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Every year, more than 20 million adult patients are discharged from hospitals across the United States.¹ Typically, at least a third of them are referred for post acute care (PAC), including long-term care hospitals, inpatient rehabilitation facilities, skilled nursing facilities, and home health agencies.² The number of patients referred to PAC is likely to increase in the near future because of recent legislative and reimbursement trends that incentivize care across the continuum rather than focus on inpatient settings.^{3,4}

Appropriate and timely care in PAC settings results in better care outcomes, reduced costs, and higher patient satisfaction.⁵⁻⁸ Unfortunately, several barriers impair the potential effectiveness of PAC services. These barriers include variations in decision making by clinicians regarding who needs post acute care,^{9,10} stringent eligibility criteria, and misaligned financial incentives that favor inpatient settings.¹¹ In addition, emerging evidence suggests that patients' refusal of PAC services is a common, but underreported, barrier to timely and effective PAC. For example, several studies reported that between 6% and 27% of their participants refused PAC services.¹²⁻¹⁴ However, to our knowledge, no known studies have investigated the characteristics and outcomes of patients who refuse PAC services. To create alternative interventions and strategies when patients refuse, it is important for clinicians involved in discharge decision making (eg, physicians, nurses, social workers, physical therapists) to understand the characteristics of patients who are likely to refuse and to acknowledge the outcomes for patients who do not accept PAC services.

Recently, our team conducted studies at 2 academic medical centers using 2 evidence-based screening tools to provide decision support for discharge planners.¹⁵ The Early Screen for Discharge Planning (ESDP)^{16,17} is a 4-item assessment tool that identifies high-risk patients upon admission who need specialized discharge plans. The second tool, the Discharge

ABSTRACT

Objectives: To compare patients who accepted ("acceptors") post acute care services (PAC) with those who were offered services and refused ("refusers") in terms of their sociodemographic and clinical characteristics, quality of life, health-related problems, and unmet needs; and to examine the association between refusing PAC services and the risk for 30- and 60-day readmission.

Study Design: Secondary data analysis from a cross-sectional study.

Methods: Bivariate analysis and logistic regressions were used to examine the association between refusing PAC services and 30- and 60-day readmission.

Results: A convenience sample of 495 PAC-referred patients 55 years and older discharged from 2 large academic medical centers in the northeastern United States completed the study questionnaires, with a resulting 28% (n = 139) that refused PAC services. Refusers were significantly younger (average age 68 years vs 73 years; $P < .001$), as well as more likely to be married (62% vs 46%; $P < .001$), privately insured (35% vs 18%; $P < .001$), and with lower risk of mortality/severity of illness. Refusers also had shorter hospital stays (4.8 days vs 7.5 days; $P < .001$); higher quality of life after discharge (0.83 vs 0.73; $P < .001$); and fewer unmet needs after discharge. However, refusers had higher 30-day (21% vs 16%; $P = .17$) and 60-day (31% vs 25%; $P = .18$) readmission rates; with logistic regression showing about twice-higher odds of 30-day (OR [odds ratio], 2.13; 95% CI, 1.11-3.02; $P = .01$) and 60-day (OR, 1.8; 95% CI, 1.11-3.02; $P = .02$) readmission.

Conclusions: PAC refusers are younger, better educated, and healthier, but they have twice-higher odds of 30- and 60-day readmissions, compared with PAC acceptors. Further investigation into reasons for PAC refusal is critical to foster enhanced patient communication regarding PAC services, improve rates of service acceptance, and ultimately decrease readmissions.

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Decision Support System (D2S2), is a 6-item assessment tool that identifies high-risk patients who should be referred to PAC.^{15,18}

We found that of all patients offered PAC services, after being identified by the tools and/or clinicians (eg, physicians, discharge planners) as being at high risk for poor discharge outcomes, 28% refused them. Surprised by that high percentage, and recognizing that we understand very little about these patients and their outcomes, we conducted a secondary analysis to: 1) compare patients who accepted (“acceptors”) post acute care services (PAC) with those who were offered services and refused (“refusers”) in terms of their sociodemographic and clinical characteristics, quality of life, health-related problems, and unmet needs; and 2) examine the association between refusing PAC services and the risk for subsequent 30- and 60-day readmission.

METHODS

Design

This is a secondary analysis of data from a cross-sectional study designed to test 2 discharge planning risk screening tools: the ESDP and the D2S2.

Sample

Patients 55 years and older admitted to any of 8 medical units within 2 large academic medical centers in Philadelphia and New York City between March 2010 and February 2012 were eligible for the original study. Registered nurses and trained nursing and social work students served as research assistants; they approached patients and screened them for eligibility. Exclusion criteria were: patient did not speak English, had cognitive impairment, recalled 14 or fewer animals using the Animal Fluency Test,¹⁹ was on dialysis or in hospice care, died in the hospital, or had been admitted from a long-term care setting (because their post acute referral was predetermined). The study and secondary analysis were approved by the Institutional Review Boards of New York University Langone Medical Center and the Hospital of the University of Pennsylvania. In this analysis, we used all the patients from the original study who were referred by case managers to PAC services. The final sample included 495 patients for whom we had outcome data.

Study Instruments

Sociodemographic and clinical information. At enrollment, the research team used standardized chart ab-

Take-Away Points

- About 30% of patients refuse post acute care services offered to them upon hospital discharge.
- Patients who refuse post acute care services are often younger, better educated, and healthier, but they are twice as likely to have 30- and 60-day readmissions compared with acceptors of services.
- Further investigation into reasons for post acute care services refusal is critical to foster enhanced patient communication regarding post acute care services, to improve rates of service acceptance, and to ultimately decrease readmissions.

straction tools to collect sociodemographic (ie, age, race, gender, insurance) and clinical (ie, number of medications, previous healthcare utilization) information.

All Patient Refined–Diagnostic Related Group (APR-DRG). Severity of illness was measured using the APR-DRG, a valid and reliable system used for health severity adjustment by a variety of health organizations and federal/state authorities.²⁰ APR-DRG is reported as 4 severity-of-illness subclasses (ie, minor, moderate, major, and extreme). The score is generated from the primary and secondary diagnoses and from procedure codes, age, gender, discharge date, status of discharge, and days on mechanical ventilator. These data were obtained from the hospitals’ databases after discharge.

Problems After Discharge Questionnaire–English Version (PADQ-E). The PADQ-E captures patient-reported health-related problems and unmet needs after hospital discharge. Problems are defined as troubles, worries, limitations, concerns, or difficulties experienced by patients after discharge from the hospital.²¹ The PADQ-E has 7 subscales—personal care, household activities, mobility, using equipment, following instructions, physical complaints, psychological complaints—that include 36 individual questions. Responders were given 5 response options for each question, ranging from “without any trouble” to “could not do it at all.” After assessing if a response indicated a change for the worse from their pre-hospitalization condition, unmet needs were assessed by noting the patient’s desire to have more assistance in performing the activity or more support or advice in dealing with physical or psychological issues. In addition, the information needs subscale of the PADQ-E includes 13 items asking the general question: “Did you feel you had enough information during the past week regarding...?” for several domains such as medications management, pain management, desirable levels of activity, etc. Each of those questions has 3 response options: “yes,” “no,” and “I don’t know.” The PADQ-E is reliable whether self-administered or completed by interview.²¹

Quality of Life

To assess participants' health-related quality of life, we used the EuroQol-5 Dimensions (EQ-5D) tool, a standardized measure of health status developed by the EuroQol Group.²² By design, the EQ-5D is applicable to a wide range of health conditions, and it provides a simple descriptive profile and a single index value for health status. EQ-5D is a valid and reliable tool designed for either self-completion by respondents or for patient interviews,²³ and includes these 5 dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. For each dimension, patients reported whether they had no problems, some problems, or extreme problems. EQ-5D responses were converted into a single summary index by applying a formula generated by the Agency for Healthcare Research and Quality that attaches US-specific weights to each response subscale.²⁴

Referral to PAC Services, Acceptance or Refusal of PAC Services, Discharge Disposition, and 30/60-Day Readmissions

Patient recall by interview, chart review, and study site administrative databases provided information on discharge disposition, acceptance or refusal, reasons for refusal, and readmissions. Among the 495 patients for whom we had complete follow-up data, refusers were defined as those in the data set who were offered PAC and refused the service. Acceptors were defined as those who were offered and accepted PAC services.

Data Collection

Research assistants collected sociodemographic and clinical information within 24 to 48 hours of hospital admission. Quality of life and problems/unmet needs after discharge were assessed by telephone interview 7 to 14 days after each patient's hospital discharge. Readmission data was obtained for up to 60 days after the index discharge date through patient or caregiver interviews to collect any readmissions occurring outside the study sites, and the study sites supplied reports of all readmissions occurring within.

Data Analysis

Descriptive statistics were used to characterize the sample. We examined differences between refusers and acceptors using *t* tests for continuous variables, or χ^2 or Fisher's exact test for categorical variables. The alpha was set at $P = .05$. Then we conducted a logistic regression examining the association between refusing PAC services and 30/60-day readmission, adjusting for those factors shown

significant at the .05 level in bivariate analysis. All analyses were performed using STATA, version 11 (StataCorp, College Station, Texas).

RESULTS

The main study included 1015 patients, of whom 718 (70.7%) were offered PAC services. Of those, 495 patients completed the PADQ-E questionnaires, giving an overall response rate of 68.9%; all 495 were included in this secondary analysis. Missing data were due to patient death, inability to reach, or study withdrawal. Sensitivity analysis and examination of differences between responders and nonresponders identified only 1 statistically significant difference: nonresponders were slightly sicker (in terms of APR-DRG, $P = .009$) than responders; however, the difference had little clinical significance. Other comparisons of responders and nonresponders on sociodemographic characteristics, clinical variables, or 30-day readmissions were not statistically significant (results not shown). Sample characteristics of the 495 participants are presented in **Table 1**.

The mean age was 71 years, and whites were the major racial group (65.9%). About 50% of the participants were married, 28% (139 of 495) refused PAC services, and 72% (356 of 495) accepted them. Of the acceptors, 288 (80.8%) received home health services, 32 (8.7%) received skilled nursing facility services, 24 (6.5%) were referred to an inpatient rehabilitation facility, and the rest (4.2%) received other types of services including hospice and other care facilities.

Phone interviews 7 to 14 days after discharge revealed that both PAC acceptors and refusers experienced issues limiting quality of life in significant numbers, including mobility limitations (46%); pain or discomfort (41%); and limitations with usual activities (52%). The most common problems reported were in the realm of household activities (67%), mobility (67%), and physical issues (84%). Only 8% had problems with aids/equipment, and 11% had problems with discharge instructions/directions. Seventy-three percent experienced unmet information needs, while 24% reported unmet physical needs. The overall readmission rates were 17.2% ($n = 85$) at 30 days and 26.7% ($n = 132$) at 60 days.

Sociodemographic and Clinical Characteristics, Quality of Life, and Health-Related Problems and Unmet Needs Among PAC Acceptors and Refusers

On average, refusers were significantly younger than acceptors (aged 68 years vs 73 years, respectively; $P < .001$). Refusers were significantly more likely to be married (62%

■ **Table 1.** Sociodemographic Characteristics of the Sample

	Total (N = 495)	Refusers (n = 139)	Acceptors (n = 356)	P
Age in years, mean (SD)	71.2 (10.2)	67.7 (8.6)	72.5 (10.5)	<.001
Male, No. (%)	238 (48.1)	61 (43.8)	177 (49.7)	.24
Ethnicity: non-Hispanic/non-Latino, number (%)	485 (98.0)	136 (97.9)	349 (98)	.89
Number of medications, mean (SD)	9.5 (5.4)	8.6 (5.7)	9.8 (5.3)	.04
Number of comorbidities, mean (SD)	6.4 (3.4)	6.2 (3.5)	6.5 (3.3)	.40
Length of stay of the index hospitalization in days, mean (SD)	6.8 (8.2)	4.8 (4.7)	7.5 (9.1)	<.001
Race, No. (%)				.02
American Indian, Alaska Native, Asian, or Hispanic	8 (1.6)	4 (2.9)	4 (1.1)	
White	325 (65.9)	104 (74.8)	221 (62.4)	
Black/African American	151 (30.6)	29 (20.9)	122 (34.5)	
Other	9 (1.8)	2 (1.4)	7 (2)	
Marital status, No. (%)				<.001
Divorced /separated /single/widowed	246 (49.7)	53 (38.1)	193 (54.2)	
Married	249 (50.3)	86 (61.9)	163 (45.8)	
Education, No. (%)				.09
Less than high school	77 (15.5)	13 (10.5)	64 (17.3)	
High school completed	132 (26.7)	40 (28.8)	92 (25.9)	
Some college/college	284 (57.4)	86 (62)	198 (55.6)	
Other	2 (0.4)	–	2 (0.5)	
Insurance, No. (%)				<.001
Medicare/Managed Medicare	359 (72.5)	87 (62.5)	272 (76.4)	
Medicaid/Managed Medicaid	22 (4.4)	3 (2)	19 (5.3)	
Private insurance and other	114 (23.1)	49 (35.2)	65 (18.3)	
Type of admission, No. (%)				<.001
Elective	92 (18.6)	42 (30.2)	50 (13.8)	
Emergency	327 (66.2)	76 (54.7)	251 (70.7)	
Transfer	75 (15.2)	21 (15.1)	54 (15.2)	
Physician visits during the previous 6 months, No. (%)				.5
0 or 1	50 (10.1)	15 (11.9)	35 (9.8)	
2 or 3	114 (23.0)	28 (20.1)	86 (24.2)	
4 to 6	130 (26.3)	35 (25.2)	95 (26.7)	
7+	201 (40.6)	61 (43.8)	140 (39.3)	
Overnight hospitalizations in the past 6 months, No. (%)				.55
0	242 (48.9)	74 (53.2)	168 (47.2)	
1	125 (25.2)	34 (24.5)	91 (25.6)	
2 or 3	89 (18.0)	23 (16.5)	66 (18.5)	
4+	39 (7.9)	8 (5.8)	31 (8.7)	
APR-DRG severity of illness/risk of mortality group, No. (%)				<.001
Minor	81 (16.7)	41 (29.9)	40 (11.5)	
Moderate	176 (36.3)	53 (38.7)	123 (35.3)	
Major	170 (35.1)	35 (25.6)	135 (38.9)	
Extreme	58 (11.9)	8 (5.8)	50 (14.4)	

APR-DRG indicates all patient refined–diagnosis-related groups.

Table 2. EQ-5D 7-Day Comparisons Between Post Acute Services Acceptors and Refusers

	Total (N = 495)	Refusers (n = 139)	Acceptors (n = 356)	P
EQ-5D index score, ^a mean (SD)	0.76 (0.2)	0.83 (0.2)	0.73 (0.2)	<.001
Mobility, No. (%)				<.001
No problems	265 (54)	91 (66)	174 (51)	
Some or severe problems	230 (46)	48 (44)	182 (49)	
Self-care, No. (%)				<.001
No problems	370 (75)	121(87)	249 (70)	
Some or severe problems	125 (25)	18 (13)	107 (30)	
Usual activities, No. (%)				<.001
No problems	235 (48)	85 (61)	150 (42)	
Some or severe problems	259 (52)	54 (39)	205 (58)	
Pain/discomfort, No. (%)				.03
No pain or discomfort	292 (59)	93 (67)	199 (56)	
Moderate or extreme pain or discomfort	203 (41)	46 (33)	157 (44)	
Anxiety/depression, No. (%)				.24
No anxiety or depression	370 (75)	109(78)	261(73)	
Moderate or extreme anxiety or depression	125 (25)	30(22)	95(27)	

EQ-5D indicates EuroQoL-5 Dimensions.
^aFor the US general population, the possible EQ-5D index scores range from 0.11 to 1.0 on a scale where 0.0 = death and 1.0 = perfect health.

vs 46%; $P < .001$), have private or other insurance versus straight or managed Medicare or Medicaid (35% vs 18%; $P < .001$), be admitted electively (30% vs 14% emergently or transfer; $P < .001$), have lower risk of mortality/severity of illness (eg, 31% were in the “major/extreme risk” category vs 53%; $P < .001$) and have shorter lengths of hospital stay (4.8 days vs 7.5 days; $P = .001$) than acceptors. See Table 1 for more details.

Very little was documented about the reasons for refusal. Almost half of the refusers (46%) gave no explanation, 34% said they did not see the need for nursing services, and 8% said they would rely on their caregivers.

Quality of life. Refusers reported a higher overall quality-of-life index compared with acceptors (0.83 vs 0.73 respectively; $P < .001$) (Table 2). Refusers also experienced fewer limitations on almost all quality of life subscales, including fewer problems with mobility (44% vs 49%; $P < .001$), self-care (13% vs 30%; $P < .001$), and usual activities (39% vs 58%; $P < .001$), and they reported less pain and discomfort (33% vs 44%; $P = .03$).

Problems after discharge. Refusers reported significantly fewer problems, except for physical problems (82% vs 86% respectively; $P = .29$) (Table 3). For instance, refusers experienced fewer problems with personal care (14% vs 39%; $P < .001$), household activities (47% vs 75%; $P < .001$),

mobility (52% vs 73%; $P < .001$), psychological issues (38% vs 55%; $P < .001$), and aids or equipment (2% vs 9%; $P = .01$) than acceptors.

Unmet needs. Refusers reported fewer unmet needs overall (6.6% vs 10.5% respectively; $P < .001$) and on almost all the unmet needs subscales (Table 4). For instance, only 5% of refusers reported 1 or more psychological unmet needs compared with 18% among acceptors ($P < .001$). Similar significant differences were found on the following subscales: personal care (3% vs 7%; $P = .02$); household activities (7% vs 18%, $P < .001$); mobility (3% vs 16%; $P < .001$); physical (14% vs 27%; $P < .001$); aids or equipment (3% vs 10%; $P = .01$); and instructions and directions for unmet needs (4% vs 14%; $P < .001$).

Association Between PAC Refusal and Risk For 30/60-Day Readmission

Nearly 21% ($n = 29$) of refusers experienced 30-day readmission compared with 16% ($n = 56$) of acceptors. Although this was a 5% clinically significant difference, the difference was not statistically significant ($P = .17$). At 60 days, 31% ($n = 43$) of refusers experienced readmission compared with 25% ($n = 89$) of acceptors ($P = .18$). Bivariate analysis (unadjusted; only significant associations reported) of 30-day readmission showed that readmitted

Table 3. Comparison of Problems Between Post Acute Services Acceptors and Refusers

Problems	Total (N = 495)	Refusers (n = 139)	Acceptors (n = 356)	P
Overall problems (%), mean (SD)	19 (15.4)	13 (12.0)	22 (15.8)	<.001
Personal care problems, No. (%)				<.001
No	335 (69)	120 (86)	215 (61)	
Yes	154 (31)	19 (14)	135 (39)	
Household activities problems, No. (%)				<.001
No	161 (33)	74 (53)	87 (25)	
Yes	326 (67)	65 (47)	261 (75)	
Mobility problems, No. (%)				<.001
No	158 (33)	67 (48)	91 (27)	
Yes	322 (67)	72 (52)	250 (73)	
Psychological problems, No. (%)				<.001
No	236 (50)	85 (62)	151 (45)	
Yes	238 (50)	53 (38)	185 (55)	
Physical problems, No. (%)				.29
No	73 (16)	25 (18)	48 (14)	
Yes	398 (84)	112 (82)	286 (86)	
Aids or equipment problems, No. (%)				.01
No	458 (92)	136 (98)	322 (91)	
Yes	37 (8)	3 (2)	34 (9)	
Instructions and directions problems, No. (%)				<.001
No	439 (89)	133 (96)	306 (86)	
Yes	56 (11)	6 (4)	50 (14)	

patients had longer length of index hospital stay (9.7 days vs 6.2; $P < .001$); had higher incidence of hospital admissions within the last 6 months (35% were readmitted 2 or more times vs 24%; $P = .01$); and lower quality of life index scores (0.67 vs 0.78; $P < .001$). Bivariate analysis of 60-day readmission showed that readmitted patients were significantly younger (aged 69.4 years vs 71.8; $P = .02$); had longer length of index hospital stay (8.6 days vs 6.1; $P < .001$); had slightly higher number of prescribed medications (10.6 vs 9.1; $P = .01$); and had higher incidence of hospital admissions within the last 6 months (40% were readmitted 2 or more times vs 21%; $P < .001$).

In the logistic regression model of 30-day readmission adjusted for those factors and quality-of-life index, percent of problems, and percent of unmet needs, 4 significant factors emerged: 1) refusers were more than twice as likely to be readmitted (OR [odds ratio], 2.13; 95% CI, 1.21-3.75; $P = .01$) than acceptors; 2) patients with better quality of life (higher indices) were less likely to be readmitted (OR, 0.10; 95% CI, 0.02-0.43; $P < .001$); 3) patients with longer index hospitalization stays were more likely to be readmitted (OR, 1.03; 95%

CI, 1.01-1.06; $P = .01$); and 4) patients with more previous overnight hospitalizations in the past 6 months were more likely to be readmitted ($P = .04$) (Table 5).

In the adjusted logistic regression model of 60-day readmission, 2 significant factors emerged: 1) refusers were almost twice as likely to be readmitted (OR, 1.80; 95% CI, 1.11-3.02; $P = .02$) than acceptors; and 2) patients with more previous overnight hospitalizations in the past 6 months were more likely to be readmitted ($P < .001$) (Table 5). Ad hoc power analysis confirmed that the sample size ($n = 495$) was adequate to provide 80% power to answer the study questions.²⁵

DISCUSSION

This study showed that 28% of patients who were offered post acute care refused the services. This alarming finding validates other anecdotal reports on the high rates (6% to 27%) of PAC refusal.¹²⁻¹⁴ Typically, about 30% of hospitalized patients receive referrals for PAC,² but in our study, 71% were offered a referral. This high rate was con-

Table 4. Unmet Needs Comparisons Between Post Acute Services Acceptors and Refusers

	Total (N = 495)	Refusers (n = 139)	Acceptors (n = 356)	P
Percent unmet needs, mean (SD)	9.4 (11.2)	6.6 (7.6)	10.5 (12.2)	<.001
Information needs, No. (%)				.71
0 unmet needs	133 (27)	39 (28)	94 (26)	
1+ unmet needs	362 (73)	100 (72)	262 (74)	
Personal care unmet needs, No. (%)				.02
0 unmet needs	465 (94)	136 (97)	32 (93)	
1+ unmet needs	30 (6)	3 (3)	27 (7)	
Household activities unmet needs, No. (%)				<.001
0 unmet needs	421 (85)	130 (93)	291 (82)	
1+ unmet needs	74 (15)	9 (7)	65 (18)	
Mobility unmet needs, No. (%)				<.001
0 unmet needs	431 (87)	125 (97)	296 (84)	
1+ unmet needs	64 (13)	4 (3)	60 (16)	
Psychological unmet needs, No. (%)				<.001
0 unmet needs	425 (86)	132 (95)	293 (82)	
1+ unmet needs	70 (14)	7 (5)	63 (18)	
Physical unmet needs, No. (%)				<.001
0 unmet needs	378 (76)	120 (86)	258 (73)	
1+ unmet needs	117 (24)	19 (14)	98 (27)	
Aids or equipment unmet need, No. (%)				.01
0 unmet needs	458 (93)	136 (97)	322 (90)	
1+ unmet needs	37 (7)	3 (3)	34 (10)	
Instructions and directions unmet need, No. (%)				<.001
0 unmet needs	439 (89)	133 (96)	306 (86)	
1+ unmet needs	56 (11)	6 (4)	50 (14)	

sistent across the 2 hospital sites and is either a reflection of the use of screening tools that highlighted high-risk patients, or over-referral due to efforts to deter readmissions by using PAC support.

In an attempt to better understand the characteristics of the PAC refusers, we identified that they were younger and more likely to be married and have private medical insurance. From the clinical perspective, refusers were less medically complex, had shorter index hospital stays, and were more likely to be admitted electively rather than by emergent admissions or transfer from other facilities. At 7 to 14 days after hospital discharge, refusers reported better quality of life and fewer health-related problems and unmet needs than acceptors.

From the patient perspective, refusers may also see themselves as less medically complex. Chart review of the documentation of the reasons for refusal revealed that the most frequently reported reasons were, “I don’t

need it” and “My wife will take care of me.” If we can better understand the barriers to PAC acceptance, we can tailor interventions to overcome those barriers. The reasons for refusal also indicate the importance of including the caregivers in the conversations or confirming the patient’s responses to make sure the patient’s caregiver really agrees and is capable of meeting the patient’s healthcare needs. In nearly half the refusals, no details were documented as to why the service was refused. Understanding the reasons for refusals and patient preferences regarding care after discharge will help clinicians to better match services to what patients and caregivers will accept. Clinicians must probe to make sure patients and caregivers understand what is offered and why it is offered, and they must document why patients and caregivers are refusing.

Patients may refuse services because they do not understand the value of those services. Gregory²⁶ studied

Table 5. Logistic Regression of Factors Associated With 30-Day and 60-Day Readmissions

Factor	OR (95% CI)	P	OR (95% CI)	P
	<i>30-day readmission</i>		<i>60-day readmission</i>	
PAC service refusal	2.13 (1.21-3.75)	.01	1.80 (1.11-3.02)	.02
Percent problems	0.99 (0.96-1.01)	.31	1.01 (0.99-1.02)	.24
Percent unmet needs	1.02 (0.99-1.04)	.21	1.01 (0.99-1.03)	.40
Length of stay of the index hospitalization	1.03 (1.01-1.06)	.02	1.02 (0.99-1.05)	.13
Overnight hospitalizations in the past 6 months		.04		<.001
0 (reference)	–	–	–	–
1	2.26 (1.23-4.16)	.01	2.10 (1.24-3.58)	.01
2 or 3	1.94 (0.98-3.83)	.06	2.91(1.62-5.19)	<.001
4+	2.22 (1.01-5.36)	.08	3.40 (1.59-7.29)	<.001
EQ-5D Index	0.10 (0.02-0.43)	<.001	–	–
Age	–	–	0.98 (0.96-1.01)	.18
Number of medications	–	–	1.03 (0.98-1.07)	.24

EQ-5D indicates EuroQol-5 Dimensions; OR, odds ratio; PAC, post acute care.

stroke patients during hospitalization to assess their preferences about rehabilitation. Eighty-five percent preferred rehabilitation in their homes to inpatient rehabilitation or skilled nursing facility care, even though more aggressive inpatient rehabilitation may result in improved functional outcomes.²⁶ Three explanations for disparities in patients' acceptance of rehabilitation services were found: 1) a lack of financial or functional eligibility, 2) a failure to recognize the need for services during the acute care stay, and 3) a patient's preference to return home and not pursue therapy elsewhere. Further research is needed to validate the reasons for PAC refusal on a larger patient sample and to match services to patient preferences.

Refusers were more likely to be readmitted. Since we did not find other studies examining the characteristics and readmission rates of PAC refusers, further research to validate these results is warranted. We may discover that factors such as adherence, health literacy, and level of engagement are as important as clinical risk factors in identifying which patients are likely to fail after discharge.^{27,28} While the appearance of refusers may seem to be healthier, and their reassurances that they can manage their post acute needs with only informal supports are convincing, our data have shown that they suffer more readmissions and therefore we need to understand why.

Our findings also showed that patients with better self-reported quality of life after discharge were less likely to experience 30-day readmission. Those results match current reports of the positive association of quality of life

and health outcomes.²⁹⁻³² This finding indicates the need to carefully evaluate and support any unmet needs in pain management, self-care, and activities of daily living functions to optimize quality of life. In agreement with several recent studies,³³⁻³⁵ we found that shorter hospital stays were not associated with higher readmission rates. On the contrary, patients with longer hospital stays had higher odds of 30-day readmission, even when controlling for several indicators of clinical severity. Lastly, our finding of a positive association between previous overnight hospitalizations in the last 6 months and 30- and 60-day readmission is not new; several other studies have reported the same.³⁶⁻³⁸

Among acceptors, the high levels of problems, unmet needs, and quality-of-life issues reported are notable. Twenty-seven percent, 44%, and 49% reported quality-of-life issues with anxiety or depression, pain, and mobility, respectively, and 74% had unmet information needs. This may indicate that discharge plans or post acute care settings are not adequately meeting their needs, or perhaps our assessment was too early in the episode to show improvement. Nonetheless, instruments such as the PADQ-E and EQ-5D appear helpful to PAC providers to focus on the exact problems and unmet needs patients are experiencing.

Limitations

One limitation of this cross-sectional study is our limited ability to control for the quality/quantity of the PAC services offered to acceptors, which may have influenced readmission rates. The study was limited to medical units of 2 large urban academic hospitals in the northeast United States.

CONCLUSIONS

We found that patients identified as high risk for poor discharge outcomes and referred for PAC services, who nonetheless refused such post acute services as home care, experienced 5% higher readmission rates and were twice as likely to experience readmission at 30 and 60 days than patients who accepted the services—despite the fact that acceptors had higher severity-of-illness scores, lower quality of life, and more problems and unmet needs after discharge. These findings suggest the powerful effect of post acute care support in preventing readmission, and lead us to call for more research into the reasons for service refusal, and for why refusers are readmitted more often although they appear to be less in need of post acute support.

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REFERENCES

1. Number, rate, and average length of stay for discharges from short-stay hospitals, by age, region, and sex: United States, 2010. CDC website. http://www.cdc.gov/nchs/data/nhds/1general/2010gen1_ag-esexalos.pdf. Accessed August 14, 2013.
2. Use of home health care and other care services among Medicare beneficiaries. Alliance for Home Health Quality and Innovation website. <http://www.ahhq.org/images/pdf/cacep-wp2-baselines.pdf>. Published April 4, 2012. Accessed August 14, 2013.
3. Key features of the healthcare reform. HHS website. <http://www.hhs.gov/healthcare/facts/timeline/>. Reviewed November 18, 2014. Accessed December 21, 2012.

4. Readmissions Reduction Program. CMS website. <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html>. Updated August 4, 2014. Accessed May 22, 2015.
5. Pezzin LE, Feldman PH, Mongoven JM, McDonald MV, Gerber LM, Peng TR. Improving blood pressure control: results of home-based post-acute care interventions. *J Gen Intern Med*. 2011;26(3):280-286.
6. Chen LK, Chen YM, Hwang SJ, et al; Longitudinal Older Veterans Study Group. Effectiveness of community hospital-based post-acute care on functional recovery and 12-month mortality in older patients: a prospective cohort study. *Ann Med*. 2010;42(8):630-636.
7. Vincent HK, Seay AN, Montero C, Vincent KR. Outpatient rehabilitation outcomes in obese patients with orthopedic conditions. *Eur J Phys Rehabil Med*. 2013;49(3):419-429. Review.
8. Fleming MO, Haney TT. Improving patient outcomes with better care transitions: the role for home health. *Cleve Clin J Med*. 2013;80 electronic suppl 1:eS2-eS6.
9. Bowles KH, Ratcliffe SJ, Holmes JH, Liberatore M, Nydick R, Naylor MD. Post-acute referral decisions made by multidisciplinary experts compared to hospital clinicians and the patients' 12-week outcomes. *Med Care*. 2008;46(2):158-166.
10. Bowles KH, Naylor MD, Foust JB. Patient characteristics at hospital discharge and a comparison of home care referral decisions. *J Am Geriatr Soc*. 2002;50(2):336-342.
11. Wong W, Anderson KM, Dankwa-Mullan I, Simon MA, Vega WA. The patient-centered medical home: a path toward health equity? Institute of Medicine website. <http://www.iom.edu/~media/Files/Perspectives-Files/2012/Discussion-Papers/PatientCenteredMedicalHome.pdf>. Published September 2012. Accessed August 14, 2013.
12. Steiner A, Walsh B, Pickering RM, Wiles R, Ward J, Brooking JI; Southampton NLU Evaluation Team. Therapeutic nursing or unblocking beds? a randomised controlled trial of a post-acute intermediate care unit. *BMJ*. 2001;322(7284):453-460.
13. Coleman EA, Smith JD, Frank JC, Min SJ, Parry C, Kramer AM. Preparing patients and caregivers to participate in care delivered across settings: the Care Transitions Intervention. *J Am Geriatr Soc*. 2004;52(11):1817-1825.
14. Sharp HealthCare. Reducing 30-day hospital readmissions for chronic obstructive pulmonary disorder (COPD) patients by using mobile health technology and personalized health coaching. Center for Technology and Aging website. http://www.techandaging.org/mHealth_Sharph.html. Published 2012. Accessed August 16, 2013.
15. Bowles KH, Hanlon A, Holland D, Potashnik SL, Topaz M. Impact of discharge planning decision support on time to readmission among older adult medical patients. *Prof Case Manag*. 2014;19(1):29-38.
16. Holland DE, Knafel GJ, Bowles KH. Targeting hospitalized patients for early discharge planning intervention. *J Clin Nurs*. 2013; 22(19-20):2696-2703.
17. Holland DE, Harris MR, Leibson CL, Pankratz VS, Krichbaum KE. Development and validation of a screen for specialized discharge planning services. *Nurs Res*. 2006;55(1):62-71.
18. Bowles KH, Holmes JH, Ratcliffe SJ, Liberatore M, Nydick R, Naylor MD. Factors identified by experts to support decision making for post acute referral. *Nurs Res*. 2009;58(2):115-122.
19. Sebaldt R, Dalziel W, Massoud F, et al. Detection of cognitive impairment and dementia using the animal fluency test: the DECIDE study. *Can J Neurol Sci*. 2009;36(5):599-604.
20. Averill R, Goldfield N, Hughes J, McCullough C, Steinbeck B, Mullin R, Tang A; 3M Health Information Systems. All patient refined diagnosis related groups (APR-DRGs). Healthcare Cost and Utilization Project website. <https://www.hcup-us.ahrq.gov/db/nation/nis/APR-DRGsV20MethodologyOverviewandBibliography.pdf>. Published 2003. Accessed May 2015.
21. Duijnhouwer E, Mistiaen P. Content validation of the mailed dismissal problems questionnaire by qualitative research with the elderly. *Verpleegkunde*. 1999;14(2):76-83.
22. EQ-5D-3L user guide. 2013. EuroQoL Group website. http://www.euroqol.org/fileadmin/user_upload/Documenten/PDF/Folders_Flyers/EQ-5D-3L_UserGuide_2013_v5.0_October_2013.pdf. Accessed February 2, 2014.
23. Xie F, Gaebel K, Perampaladas K, Doble B, Pullenayegum E. Comparing EQ-5D valuation studies: a systematic review and methodological reporting checklist. *Med Decis Making*. 2014;34(1):8-20.
24. Calculating the U.S. population-based EQ-5D index score. Agency for Healthcare Research and Quality website. <http://archive.ahrq.gov/professionals/clinicians-providers/resources/rice/EQ5Dscore.html>. Published August 2005. Accessed February 2, 2014.

25. Hintze J. PASS version 11 [software]. NCSS, LLC. Kaysville, Utah, USA; 2011.
26. Gregory P, Edwards L, Faurot K, Williams SW, Felix AC. Patient preferences for stroke rehabilitation. *Top Stroke Rehabil.* 2010;17(5):394-400.
27. Annema C, Luttik ML, Jaarsma T. Reasons for readmission in heart failure: perspectives of patients, caregivers, cardiologists, and heart failure nurses. *Heart Lung.* 2009;38(5):427-434.
28. Coleman EA, Chugh A, Williams MV, et al. Understanding and execution of discharge instructions. *Am J Med Qual.* 2013;28(5):383-391.
29. O'Loughlin C, Murphy NF, Conlon C, O'Donovan A, Ledwidge M, McDonald K. Quality of life predicts outcome in a heart failure disease management program. *Int J Cardiol.* 2010;139(1):60-67.
30. Moser DK, Yamokoski L, Sun JL, et al; Escape Investigators. Improvement in health-related quality of life after hospitalization predicts event-free survival in patients with advanced heart failure. *J Card Fail.* 2009;15(9):763-769.
31. Steer J, Gibson GJ, Bourke SC. Predicting outcomes following hospitalization for acute exacerbations of COPD. *QJM.* 2010;103(11):817-829.
32. Zuluaga MC, Guallar-Castillón P, López-García E, et al. Generic and disease-specific quality of life as a predictor of long-term mortality in heart failure. *Eur J Heart Fail.* 2010;12(12):1372-1378.
33. Vorhies JS, Wang Y, Herndon J, Maloney WJ, Huddleston JI. Readmission and length of stay after total hip arthroplasty in a national Medicare sample. *J Arthroplasty.* 2011;26(6 suppl):119-123.
34. Saczynski JS, Lessard D, Spencer FA, et al. Declining length of stay for patients hospitalized with AMI: impact on mortality and readmissions. *Am J Med.* 2010;123(11):1007-1015.
35. Kaboli PJ, Go JT, Hockenberry J, et al. Associations between reduced hospital length of stay and 30-day readmission rate and mortality: 14-year experience in 129 Veterans Affairs hospitals. *Ann Intern Med.* 2012;157(12):837-845.
36. Hasan O, Meltzer DO, Shaykevich SA, et al. Hospital readmission in general medicine patients: a prediction model. *J Gen Intern Med.* 2010;25(3):211-219.
37. Lemke KW, Weiner JP, Clark JM. Development and validation of a model for predicting inpatient hospitalization. *Med Care.* 2012;50(2):131-139.
38. Kansagara D, Englander H, Salanitro A, et al. Risk prediction models for hospital readmission: a systematic review. *JAMA.* 2011;306(15):1688-1698. ■

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