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Post-Hospital Medical Respite Care and Hospital Readmission of Homeless Persons

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Abstract

Medical respite programs offer medical, nursing, and other care as well as accommodation for homeless persons discharged from acute hospital stays. They represent a community-based adaptation of urban health systems to the specific needs of homeless persons. This paper examines whether post-hospital discharge to a homeless medical respite program was associated with a reduced chance of 90-day readmission compared to other disposition options. Adjusting for imbalances in patient characteristics using propensity scores, Respite patients were the only group that was significantly less likely to be readmitted within 90 days compared to those released to Own Care. Respite programs merit attention as a potentially efficacious service for homeless persons leaving the hospital.

Keywords

homeless; readmission; retrospective studies; discharge planning; health services

The homeless, estimated to number 744,000 at a single point in time (National Alliance to End Homelessness, 2007), are subject to poor health status and excess mortality (Levy & O′Connell, 2004), and are also more likely to report being unable to obtain needed health care (Kushel, Vittingoff, & Haas, 2001). Homeless individuals experience high rates of hospitalization and prolonged length of stay relative to housed persons, and face distinct challenges for complete medical recovery after an acute medical hospitalization (Levy et al., 2004). Neither shelters, which often require vacating the premises during daylight hours, nor the streets support adherence to post-hospital medical recommendations (e.g., elevating an infected leg, administering insulin, adhering to a diet, or seeing a doctor). Lack of appropriate post-hospital disposition options for homeless inpatients may lead to unexpected hospital readmissions,

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especially for homeless persons with no safe place to heal. The videotaped incident of a 63-year old homeless woman transported via taxi from a suburban hospital to Los Angeles' skid row, and released to the street in gown and slippers, pricks the conscience, but national publicity regarding this common community challenge is rare (Winton & DiMassa, 2006).

In response to this challenge, 36 communities across the United States and Canada have adopted homeless medical respite programs; Boston, in particular, has offered respite care and 24-hour accommodations for homeless persons for nearly two decades. Nationally, respite services vary according to local needs and funding, but typically include a bed, meals, transportation to appointments, and care by a wide range of clinicians familiar with caring for homeless persons (Buchanan, Doblin, Sai, & Garcia, 2006). Respite programs exemplify a more general principle of customizing clinical practice and systems of care to respond to the unique needs and life circumstances of persons experiencing homelessness.

While respite programs could be justified on the basis of pragmatic necessity alone, their continued operation and financial support remains tenuous, as medical respite care for homeless individuals, unlike hospice care, is not a recognized or reimbursed category of service among major health payers such as Medicare and Medicaid. Hospitals and health plan administrators considering proposals for respite programs would like to see evidence of efficacy in either reducing costs, improving health outcomes, or at the very least, reducing the demand for scarce acute hospital beds. To date, both financial and logistic barriers have precluded of the use of a randomized controlled trial to study medical respite care, and observational data currently provide the only evidence relating to these questions.

Observational data from a Chicago respite program suggested that discharge from a county hospital to a local respite program was associated with significantly fewer days of hospital care during the subsequent 12 months, compared to persons referred to respite but not accepted due to lack of space (Buchanan et al., 2006). Chicago's respite accepted only patients of low medical acuity, and thus excluded individuals requiring 24-hour nursing supervision or onsite physician services. By contrast, Boston's respite program provides 24-hour nursing supervision, daily visits by nurse practitioners or physician assistants, onsite physician supervision, in-house dental and psychiatric care, and case management. Equipped for patients in more substantial need, the program has helped free up acute inpatient services in local hospitals since 1987.

Because of high local need, Boston's respite unit has typically run above 90% capacity. As a result, some hospitalized homeless patients have been discharged from the safety net hospital back to their customary living environments (e.g., streets and shelters), and to other care settings such as private nursing homes and a publicly-funded recuperative hospital. The latter options are similar to approaches used in communities where no homeless-customized respite program exists, and therefore provide a natural comparison that could complement the study reported by Buchanan et al. (2006). In this report of data collected over 3 years in Boston, we compared 90-day hospital readmission among patients discharged to respite versus other settings, adjusting for differences in patient characteristics, including burden of illness.

Method

Participants

We used administrative data to retrospectively identify a cohort of homeless persons, 18 or older, surviving at least one non-maternity, medical, or surgical hospital admission to Boston Medical Center during 7/1/1998 – 6/30/2001. Each subject's first eligible admission in this period ("index admission") was analyzed, thereby permitting statistical methods appropriate for independent and uncorrelated data.

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Because housing status is not regularly documented in medical records, we identified individuals as homeless if they had at least one outpatient encounter at the Boston Health Care for the Homeless Program (BHCHP) within ±365 days of the index admission to Boston Medical Center (BMC), an approach used by others (Martell et al., 1992). BHCHP serves over 7,000 homeless individuals annually, identified from over 60 outreach sites. A convenience sample of 10 individuals' clinical records found 9 had explicit mentions of "homeless" or "living on the streets" in the hospital discharge summary, but it is possible that some participants would have been homeless before or after the hospitalization but not on the day of hospitalization.

Boston's respite program ("Respite" hereafter) included 90 beds for men and women at the time of these data, receiving 1,600 admissions yearly, with 30–35% from inpatient medical hospitals, the remainder from emergency departments, shelters, the streets, and outpatient clinics. Its services include daily medical care, 24-hour nursing, a psychiatrist, case management, in-house dental care, and medication administration. It serves a severely distressed population: among 306 randomly reviewed records of men admitted to respite, 90% had active substance abuse disorders (not including current tobacco or past drug/alcohol) and 53% had a DSM-IV non-addiction psychiatric diagnosis. Among 104 women, 75% had active substance abuse disorders and 85% had non-addiction psychiatric diagnoses. Seventy-seven percent of male and female admissions were homeless more than one year. Persons with four or more major medical illnesses, active substance abuse, *and* a non-substance abuse psychiatric diagnosis accounted for 40% of male and 55% of female respite admissions respectively (O'Connell & Swain, 2001).

Procedure

In general, a decision to discharge a hospitalized patient to Respite involved the combined inputs of caregivers (residents, attending physicians, nurses, case managers, Boston Health Care for the Homeless visiting staff, shelter personnel), the patient, and potential receiving facilities (the Respite, shelters and Other Planned Care). Typically hospital staff propose Respite for patients requiring additional service (e.g., dressing changes), observation, or a safe nonhomeless environment as a prerequisite to medical recovery outside of the hospital. Importantly, payment had little influence on disposition given the high rate of insurance among patients seen by BHCHP (85%, mostly Medicaid) and the availability of multiple public and private funding mechanisms for both Respite and Other Planned Care, including a state-funded secondary care hospital as well as an uncompensated care pool (Bovjberg & Ullman, 2002).

Preliminary extracts from BMC's Medical Information System identified 858 persons who had a BHCHP outpatient visit within ±365 days of an index hospitalization. We requeried BMC's Medical Information System for all hospital and hospital-based ambulatory encounters from 1/1/1998 (6 months prior to 7/1/1998) to 6/1/2002 (11 months after 6/30/2001). This permitted us to:

Apply exclusions—Of 858 patients, 14 were hospitalized for childbirth (mother and infant care is not available through Respite), 35 did not survive to hospital discharge, 41 had unplanned medical discharges against advice, and 3 records could not be found (likely due to interval changes in identifiers). Of these, we excluded 22 who had been readmitted within the first 24 hours of discharge, because they lacked a full 24 hours to be redirected to Respite, leaving 743.

Identify endpoints—We then identified BMC readmissions within 90 days of hospital discharge. Death within that 90-day period was compiled from BHCHP's Homeless Death Database and the Massachusetts' Registry of Vital Records and Statistics (1998–2001). The 8

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persons who died (2 Respite, 3 Own Care and 3 Other Care) were not included in the analysis of readmission outcome, leaving 735 (134, 171 and 430, respectively).

Obtain diagnostic information—We captured diagnoses from all BMC encounters for the index admission and the 6 prior months, including inpatient care, BHCHP's own primary care clinic at BMC, emergency, and outpatient specialty services.

Measures

One of three discharge dispositions was identified for each participant:

Respite—This category included persons referred to Respite up to one day *after* hospital discharge. Delayed referrals occurred when street/shelter clinicians encountered a newly discharged patient who appeared to require a place (i.e., Respite) in which to recover. Including such individuals in the Respite group reduced misclassification of disposition status.

Own Care—Homeless patients described in administrative hospital records as discharged "home" (the administrative system did not include a field for discharge to streets and shelters).

Other Planned Care—Non-Respite patients discharged to supervised recuperative care (e.g., skilled nursing facilities, chronic care hospitals, or home health care).

The primary study endpoint was inpatient hospital readmission ≤90 days from discharge, a timeframe appropriate for judging the adequacy of discharge planning. A key interest was to compare readmission for Respite versus discharge to streets or shelters (Own Care), the default in most communities. However, other post-discharge settings including nursing homes (Other Planned Care) were considered, since these are often relied upon in the absence of a Respite program (Gundlapalli et al., 2005).

Financial costs were estimated for all patients based on charges at the referring hospital (Boston Medical Center). For Respite patients, we estimated costs related to Respite care through reference to (a) average reimbursement to the Respite (per patient day) during the period studied and (b) the duration of each Respite stay. All figures were inflation-adjusted to 2002 dollars, and do not include costs for Other Planned Care facilities, or system-wide costs resulting from discharge of homeless, medically-ill individuals to shelters or streets (e.g., ambulance, additional emergency room visits, additional shelter-based services, and jails), since the latter costs were not available. While hospital charges tend to overstate hospital costs (thereby inflating the cost savings from reduced hospital days), this bias may be offset by the failure to count the money saved through likely reductions in these other publicly funded services.

Additional covariates, drawn from the hospital readmission literature (Corrigan & Martin, 1992) included: age, sex, race/ethnicity, length of the index hospital admission, presence in the record of drug and alcohol abuse diagnostic codes during the admission or the preceding 6 months, and medical illness burden. The latter was estimated using the Diagnostic Cost Groups (DCG) risk score (Ash et al., 2000), calculated from all medical and psychiatric diagnoses coded during the index admission and during the prior 6 months of inpatient and outpatient care at Boston Medical Center, including onsite primary care and mental health services from BHCHP. The DCG method, often used by health plans to predict high-cost patients, generates a numerical estimate for expected health service utilization, and has been shown to predict mortality, utilization, and health costs (Petersen, Pietz, Woodard, & Byrne, 2005). DxCG™ 6.1 for Windows software was used, applying a DCG model calibrated to Massachusetts Medicaid experience for 2000–2001.

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Data Analysis

The primary unadjusted analysis compared 90-day readmissions among persons discharged to Respite, Own Care (i.e., streets and shelters) and Other Planned Care.

In the absence of a prospective randomized controlled trial, the adjusted analysis relied on a statistical technique (propensity scores) to match groups in regard to their likelihood of being discharged to Respite. Propensity adjustment reduces the degree of bias affecting retrospective observational comparisons (Braitman & Rosenbaum, 2002; Rosenbaum & Rubin, 1983), and is simplest to apply to 2-group comparisons. Therefore, each subject's propensity to be discharged to Respite (versus Own Care) was calculated with multivariable logistic regression, using the covariates listed above. For the 90-day readmission outcome, observations were weighted according to the propensity score so that the two groups being compared had the same overall propensity to be assigned to either discharge disposition. Specific weights were computed as: 1/(propensity to be discharged to Respite) for each Respite observation, and 1/(1-propensity to be discharged to Respite) for each Own Care observation (Hirano & Imbens, 2001). This method is similar to propensity score approaches that match individuals having similar propensities (but who received different treatments). Instead of dropping unmatched participants, however, it retains all subject data.

With propensity-weighted data, we computed the association between discharge disposition (Respite versus Own Care) and 90-day readmission using a logistic regression model that included the covariates of age, race, sex, index hospital length of stay, DCG score, alcohol abuse, and drug abuse. Secondarily, both the propensity score and logistic regression analysis were repeated to compare readmissions for Other Planned Care versus Respite.

We compared the 90-day total costs (combining inpatient hospital readmissions and, where applicable, Respite charges) for patients discharged to Respite versus Own Care, in both unadjusted (*t*-test) and adjusted analyses, the latter incorporating propensity-weighted data in a multiple linear regression adjusted for the same measured potential confounds. A comparison of costs for Respite versus Other Planned Care was not undertaken because Other Planned Care costs could not be obtained.

Because over 85% of patients had insurance, and Massachusetts provided back-up funding options for persons without insurance, we did not include this variable in the statistical model. All analyses were carried out with SAS System for Windows (Version 8.2).

Results

Of the 743 individuals discharged from the hospital, 136 (17%) were discharged to Respite, 174 (22%) to Other Planned Care, and 433 (55%) to Own Care. Compared to Own Care, Respite patients were older, more likely to be White, less likely to be female, and somewhat more likely to have record of Alcohol Abuse, but less likely to have record of Drug Abuse (Table 1). The index hospital stay was roughly 3 days longer among those discharged to Respite and to Other Planned Care settings, and extremely short hospital stays (0–2 days) were less common among Respite compared to other patients (see Table 1). At 90 days, 8 patients had died (2 discharged to respite, 3 to own care and 3 to other care), leaving 735 for readmission analysis.

Early Readmission

Readmission by 90 days occurred among 156 patients (21.2% of the sample). There was no difference in the proportion readmitted in comparisons not adjusted for patient characteristics (Table 1).

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As expected, some potentially adverse characteristics were associated with readmission. For example, readmission was more common among persons discharged following index hospital stays lasting six or more days (31%), compared to shorter stays (21% for 3–5 days, and 15% for 0–2 days) and among those with higher versus mid-range or lower illness burden as measured by DCG score. Both characteristics were more common among Respite and Other Planned Care patients, compared to patients discharged to Own Care (Table 1).

Propensity models were moderately robust in their capacity to predict each patient's likelihood to be discharged to Respite, compared to Own Care (c = .76, range 0–1, with 1 indicating perfect fit between the modeled propensity and the actual treatment assigned). To illustrate, when individuals were divided by quintiles based on propensity to be discharged to Respite, patients in the highest quintile had nearly 10 times greater likelihood of discharge to Respite (56 of 109 persons, 51%), compared to patients in the lowest quintile (7 of 109, 6.4%).

Table 2 shows that prior to balancing for propensity to be discharged to Respite, the Respite and Own Care groups differed substantially on several characteristics. Both illness burden and index hospitalization length of stay, characteristics that predicted readmission, were greater for Respite patients. The right side of Table 2 also shows that these characteristics were more closely matched after reweighting the data with propensity scores.

In the final adjusted model comparing Respite to Own Care (Table 3), Respite patients had significantly reduced odds of hospital readmission by 90 days in comparison to Own Care patients. The estimate for Other Planned Care, compared to Own Care, also suggested reduced odds for readmission (OR = 0.70; 95% CI 0.46 – 1.06), but the association was nonsignficant (full model not shown, but available from the author).

Total Charges

The mean charges for a Respite stay were $7,929 ($SD$ = $8,649) with mean length of stay 31.3 days (SD = 32.6, median= 20). The mean 90-day charges for individuals discharged to Respite, summing Respite and (where applicable) readmission charges was $10,359 ($SD$ = $10,523). The 90-day total exceeded the mean readmission charges of $2,819 ($SD$ = $8,064) among patients discharged to Own Care, $t(187) = 7.68$, $p < .001$. This comparison does not take into account the adverse characteristics associated with being a Respite candidate, or savings from reduced hospital readmissions at 90 days. In adjusted analysis, a Respite disposition was associated with +$5994 (95% CI, $4,210 – $7,779) in excess charges, relative to Own Care. The potentially higher Costs of Other Planned Care were not available to this study, and are discussed below.

Discussion

In this sample, patients discharged to Boston's medical respite program had some characteristics associated with elevated risk for hospital readmission within 90 days, but in unadjusted analyses they were not readmitted more often than patients discharged to the streets and shelters, or to care facilities. In analyses controlling for individual characteristics, discharge to a homeless respite program was associated with an approximately 50% reduction in the odds of readmission at 90 days post-discharge, compared to discharge to streets and shelters (Own Care), similar to what was found in Chicago by Buchanan et al. (2006). Other Planned Care settings, such as nursing homes, did not achieve a similarly robust reduction in the likelihood of readmission when compared to those released to Own Care.

The Respite-associated reduction in readmission may reflect the program's customization for the complex problems of medically ill homeless individuals. Services included 24-hour nursing, as well as onsite physicians (including psychiatrists), nurse practitioners, physician

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assistants, caseworkers, and a dental team, all experienced in homeless health care. Recuperative care was accompanied by interventions for other illnesses, arrangements for (and transportation to) continuing outpatient care, establishment of a new primary care relationship, spiritual care, 12-step meetings, and identification of social and financial resources. While some of these services may exist in other settings, few combine all these services for homeless individuals.

The present report should be compared to one prior study of respite, comparing post-discharge hospital utilization among 161 homeless patients discharged to a Chicago respite versus 64 patients referred to respite but not accepted due to lack of space (Buchanan et al., 2006). The authors reported a 49% reduction in hospital admissions in adjusted analyses. Our findings are not discordant, but reflect a program designed for patients with higher medical acuity, suggesting that a homeless respite program may sometimes take the place of skilled nursing facilities.

The analysis of measured costs, including hospital and respite care, suggest that a policy of discharging homeless patients to a respite program is potentially more expensive than a policy of discharging them to the streets and shelters. This inference is tempered, however, by lack of data concerning the full range of costs associated with discharging people into homelessness. Where those costs have been measured, notably among chronically homeless persons in New York City, the combined judicial, medical, mental system costs associated with homelessness exceeded $40,000 per year (Culhane, Metraux, & Hadley, 2002).

For policymakers the most relevant cost comparison may be the one this study could not formally accomplish, namely, between the Respite and Other Planned Care. A speculative estimate combining typical rehabilitative skilled nursing facility, professional fees, and the mean duration of post-hospital nursing home stays suggests that discharge to a non-respite nursing facility with professional services is likely to involve costs in the range of $4,512 to $7,520 (Gundlapalli et al., 2005; Medicare Payment Advisory Commission, 2006). The mean cost of a discharge to Boston's Respite (*M* = $7,929, falling to $5,994 after adjustment for hospital readmission savings) may be justifiable because: (a) Respite was associated with reduced 90-day readmission, while Other Planned Care settings were not, and (b) Respite offered a homeless-customized service model, as reviewed above.

The principal limitation to this study is reliance on observational data. Given the nearly universal prevalence of medical, mental, and substance abuse problems among the Respite patients, it is unlikely that selection of a particularly healthy subgroup of homeless individuals biased the results. Additionally, the analyses adjusted for measured confounds, some of which suggested that patients discharged to Respite were at higher readmission risk.

This study's strengths include the use of multiple data sources to identify a large cohort of hospitalized homeless patients, producing one of the largest comparative studies of a medical service for homeless persons to date. Comprehensive casemix adjustment and propensity scoring are important methodologic tools not previously applied to comparing interventions for the homeless. Given high hospital utilization by a growing homeless population, this study offers a methodological advance, and may lay the groundwork for a much-needed randomized trial of respite care in comparison to other care arrangements.

It should be emphasized that the design of this particular study was driven by our interest in an easily measured outcome, hospital readmission. However, Boston's respite program, like others, receives patients directly from emergency rooms, shelters, detoxification facilities, and the streets and may play a hospital diversion role unmeasured in the present study.

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In March of 2004, a coalition of homeless persons in Birmingham, Alabama, pleaded "we need a surgical and hospital discharge shelter for the large number of us who are discharged from the hospital with no place to recuperate" (Letter of 3/24/04 to City Council of Birmingham, Alabama). This study suggests that offering a safe "place to recuperate" could meet patients' needs while reducing hospital readmissions. The findings should spur further research, and lend impetus to recognition of this service.

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References

Ash AS, Ellis RP, Pope GC, Ayanian JZ, Bates DW, Burstin H, et al. Using diagnoses to describe populations and predict costs. Health Care Financing Review 2000;21(3):7–25. [PubMed: 11481769]

Bovjberg, RR.; Ullman, FC. Recent Changes in Health Policy for Low-Income People in Massachusetts. Washington, DC: The Urban Institute; 2002. Retrieved April 28, 2007, from http://www.urban.org/UploadedPDF/310431.pdf

Braitman LE, Rosenbaum PR. Rare outcomes, common treatments: Analytic strategies using propensity scores. Annals of Internal Medicine 2002;137(8):693–695. [PubMed: 12379071]

Buchanan D, Doblin B, Sai T, Garcia P. The effects of respite care for homeless patients: A cohort study. American Journal of Public Health 2006;96(7):1278–1281. [PubMed: 16735635]

Corrigan J, Martin J. Identification of factors associated with hospital readmission and development of a predictive model. Health Services Research 1992;27(1):81–101. [PubMed: 1563955]

Culhane D, Metraux S, Hadley T. Public service reductions associated with placement of homeless persons with severe mental illness in supportive housing. Housing Policy Debate 2002;13(1):107–162.

Gundlapalli A, Hanks M, Stevens SM, Geroso AM, Viavant CR, McCall Y, et al. It takes a village: A multidisciplinary model for the acute illness aftercare of individuals experiencing homelessness. Journal of Health Care for the Poor & Underserved 2005;16(2):257–272. [PubMed: 15937390]

Hirano K, Imbens G. Estimate of causal effects using propensity score weighting: An application to data on right heart catheterization. Health Services & Outcomes Research Methodology 2001;2:259–278.

Kushel MB, Vittingoff E, Haas JS. Factors associated with the health care utilization of homeless persons. JAMA 2001;285(2):200–206. [PubMed: 11176814]

Levy BD, O'Connell JJ. Health care for homeless persons. New England Journal of Medicine 2004;350 (23):2329–2332. [PubMed: 15175433]

Martell JV, Seitz RS, Harada JK, Kobayashi J, Sasaki VK, Wong C. Hospitalization in an urban homeless population: The Honolulu Urban Homeless Project. Annals of Internal Medicine 1992;116(4):299–303. [PubMed: 1733384]

Medicare Payment Advisory Commission. Report to the Congress: Medicare Payment Policy. Washington, DC: MedPac; 2006. Retrieved November 10, 2006, from http://www.medpac.gov/publications/congressional_reports/Mar06_EntireReport.pdf

National Alliance to End Homelessness. Homelessness Counts. Washington, DC: 2007. Retrieved April 29, 2007, from http://www.naeh.org/content/article/detail/1441

O'Connell JJ, Swain S. Medical Respite Care for Homeless Persons in Boston, Medicaid Review (document and slides): Boston Health Care for the Homeless Program. 2001

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Petersen LA, Pietz K, Woodard L, Byrne M. Comparison of the predictive validity of diagnosis-based risk adjusters for clinical outcomes. Medical Care 2005;43(1):61–67. [PubMed: 15626935]

Rosenbaum PR, Rubin DB. The central role of the propensity score in observational studies for causal effects. Biometrica 1983;70:41–55.

Winton R, DiMassa CM. L.A. files patient 'dumping' charges. Los Angeles Times 2006 November 16;:A1.

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Table 1

Characteristics of 743 Homeless Individuals Discharged from Boston Medical Center (7/1/1998–6/30/2001) by Discharge Disposition[a]

		ALL	Respite	Other Planned Care	Own Care	p[b]
N		743	136	174	433	
Age in years						
	<40	26%	19%	21%	31%	**0.01**
	40–55	52%	55%	52%	51%	
	>55	27%	26%	27%	19%	
Mean Age (SD)		46.9 (11.0)	48.5 (11.8)	48.6 (10.6)	45.7 (10.8)	**0.003**
Sex						
	Female	20%	13%	14%	24%	**<0.01**
Race/Ethnicity						
	White	44%	56%	48%	39%	**0.02**
	Black	41%	35%	40%	44%	
	Hispanic	13%	8%	11%	16%	
	Other	1%	1%	1%	1%	
Index Hospital LOS						**<0.001**
	0–2 days	35%	18%	29%	43%	
	3–5 days	41%	40%	34%	43%	
	6+ days	24%	41%	37%	14%	
Mean LOS (SD)		4.6 (5.3)	6.4 (5.9)	6.1 (7.2)	3.5 (2.7)	**<0.001**
Illness burden (DCG)[c]						**0.002**
	Low	13%	10%	5%	17%	
	Medium	67%	69%	72%	65%	
	High	20%	21%	23%	18%	
Mean Illness Burden score (SD)[c]		1.1 (1.0)	1.1 (0.9)	1.2 (1.0)	1.1 (1.0)	0.34
Alcohol Abuse[d]		32%	34%	34%	31%	0.66
Drug Abuse[d]		17%	8%	16%	19%	**0.009**
Readmitted within 90 days of discharge[e]		21%	21%	22%	21%	0.94

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[a] Percentages do not consistently add to 100% due to rounding

[b] *p*-values reflect a 3-group comparison (Respite versus Own Care versus Other Planned Care) by Chi-squared test or analysis of variance ($df = 2$), with $\alpha = 0.05$, 2-tailed

[c] Burden computed with the Diagnostic Cost Group (DCG) prospective relative risk score based on diagnoses recorded during 180 days previous to, and during, the index admission. Low, medium and high risk indicate DCG relative risk scores of <0.5, 0.5–1.5, and >1.5, respectively

[d] Alcohol and drug abuse are based on administratively coded (ICD-9) diagnoses from the index hospitalization and the prior 6 months of care at that hospital (Boston Medical Center)

[e] Computation of percentage readmitted excludes 8 of 743 patients who died during the 90-day follow-up interval (2 Respite, 3 Own Care and 3 Other Care)

Note. Bold comparisons are significant at $p < .05$.

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Table 2

Characteristics of Homeless Individuals Discharged to either Respite (n = 134) versus Own Care (n = 430) after Inpatient Hospitalization, Before and After Weighting by Propensity Scores

	Raw Comparison (before propensity score weighting)			Propensity-score weighted comparison[a]		
	Respite	**Own Care**	**p**	**Respite**	**Own Care**	**p**
Age in years			**0.01**			**0.04**
<40	19%	31%		21%	27%	
40–55	55%	51%		55%	52%	
>55	26%	18%		24%	21%	
Sex			**0.005**			0.06
Male	87%	76%		83%	79%	
Female	13%	24%		17%	21%	
Race/Ethnicity						
Black	34%	44%	0.06	42%	42%	0.99
Hispanic	8%	16%	**0.03**	14%	14%	0.85
Other	1%	1%	0.94	1%	1%	0.40
White	55%	38%	**<0.001**	44%	43%	0.96
Index Hospital LOS			**<0.001**			0.89
0–2 days	17%	43%		36%	37%	
3–5 days	40%	43%		42%	42%	
6+ days	42%	14%		22%	21%	
Illness Burden (DCG)			0.09			0.18
Low	10%	17%		12%	15%	
Medium	69%	65%		70%	66%	
High	21%	18%		18%	19%	
Drug Abuse	8%	19%	**0.002**	14%	16%	0.33
Alcohol Abuse	33%	30%	0.60	34%	31%	0.34

Note. Propensity scores were developed by applying all displayed variables in a single logistic regression model predicting discharge location. Propensity score-weighted groups combine data available for all Respite and Own Care subjects, applying a weight of l/(propensity score) for each Respite observation and 1/(1-propensity score) for each Own Care observation (Hirano et al., 2001). **Bold** comparisons are significant at the $p < .05$ level, 2-tailed, applying Chi-squared and t-tests, as appropriate (all $df = 1$).

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Table 3

Predictors of Hospital Readmission Within 90 Days of Discharge Among Homeless Persons in Boston Discharged to Medical Respite Versus Discharge to their Own Care (1998–2001)

		Respite Versus Own Care
		Odds Ratio (95% Confidence Interval)
Discharge Disposition		
	Respite	**0.54 (0.34–0.85)**
	Own Care	1.0 (Ref)
Age (years)		
	<40	0.81 (0.43–1.52)
	40–55	1.0 (Ref)
	>55	0.85 (0.48–1.50)
Sex		
	Female	1.03 (0.54–1.95)
Race/Ethnicity		
	Black	**0.58 (0.36–0.94)**
	Hispanic	0.46 (0.21–1.00)
	White/Other	1.0 (Ref)
Index Hospital LOS		
	0–2 days	**0.49 (0.28–0.85)**
	3–5 days	1.0 (Ref)
	6+ days	1.35 (0.79–2.30)
Illness Burden		
	Low	0.44 (0.16–1.21)
	Medium	1.0 (Ref)
	High	1.90 (1.10–3.28)
Alcohol Abuse		1.11 (0.68–1.82)
Drug Abuse		0.90 (0.47–1.72)

Note. Results for a single multivariable logistic regression are shown, adjusted for all variables displayed, using propensity score-weighted data to minimize heterogeneity between the Respite versus Own Care disposition groups; Bold comparisons are significant $p < .05$.