

Clinical Factors Associated with Successful Discharge from Assertive Community Treatment

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Abstract We sought to explore clinical factors associated with successful transition from Assertive Community Treatment to less intensive clinical services. Mixed-method observational follow up study of veterans discharged from three VA-affiliated ACT teams to less intensive clinical services. Of the 240 veterans in ACT, 9% (n=21) were discharged during the study period. Among the 11 of 21 discharged veterans who enrolled in the follow up study, reason for discharge, designated by the veteran's primary clinician at the time of discharge, predicted outcomes (p=0.02) at 9 months, with "disengagement" as a reason for discharge predicting poorer outcomes. Six of 11 veterans experienced poor outcomes at 9 months, including incarceration and substance use relapse. ACT clinicians rarely discharge clients. Many clients may experience negative clinical events

following ACT discharge, and clients may be difficult to follow post-discharge. Client disengagement from ACT may indicate higher likelihood of poor outcomes following discharge to less intensive clinical services.

Keywords Assertive community treatment · Veterans health · Serious mental illness · Discharge planning

Introduction

Assertive Community Treatment (ACT) is a multidisciplinary team-based model of mental health care that provides responsive and frequent contact with individuals living with serious mental illness (e.g., psychotic disorders, serious mood disorders) in the community. Since its establishment in the 1970s, a substantial body of literature has demonstrated that, when delivered with adequate fidelity, the ACT model of intensive case management is effective at lowering hospitalization rates and improving tenure in the community for individuals with serious mental illness (Bond and Drake 2015). The ACT model has been widely implemented in the US and internationally (Zhao et al. 2015), and its precepts of assertive, team-based case management have formed the basis for ACT adaptations that have also shown effectiveness, such as Critical Time Intervention and programs that address chronic homelessness (Herman 2014; Stefancic et al. 2013). Because early research showed that clients experience clinical decline after ACT discharge, the model has often been understood to entail time-unlimited support (McGrew and Bond 1995). However, ACT clinicians and researchers have begun to reconsider this premise (Bromley et al. 2015).

A small number of observational studies indicate that some clients make gains in ACT that can be sustained after

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discharge. For instance, Rosenheck and Dennis (2001) evaluated 1165 clients at entry to an ACT program and over 18 months and found that clinical and functional outcomes for the approximately 80% of clients that had been discharged from the program were not significantly different than for clients retained in ACT. Other follow up studies also reported that outcomes among discharged clients were comparable to clients retained in ACT (Salyers et al. 1998). A study of the Veterans Affairs' (VA) ACT program, Mental Health Intensive Case Management (MHICM) (Rosenheck et al. 2010), found that, among 2137 veterans treated over 4 years, 196 (9.2%) were transitioned to low intensity services, and among those only 11 (5.7%) veterans needed a return to high intensity services. However, none of these studies of discharge from ACT have identified client-level factors that predict success following discharge (Hackman and Stowell 2009).

To explore clinical factors associated with successful discharge, we followed veterans discharged from three MHICM teams based on their clinicians' judgment that they no longer needed high-intensity services over a 9-month period. We had two research questions: (1) How often and for what reasons do MHICM clinicians discharge veterans from MHICM? and (2) Which clinical- and veteran-level factors predict success following discharge from MHICM?

Methods

Settings and Participants

We collected data from three MHICM teams in the Veterans Affairs Healthcare System. Like ACT teams, MHICM teams treat clients with high levels of hospital use (for these teams, an average 54 days/year prior to admission), gaps in medication and treatment adherence, functional deficits, and diagnoses of serious mental illness (for these teams, approximately 70% diagnosed with primary psychotic disorders). As in ACT, MHICM teams include multidisciplinary expertise (e.g., nursing, social work, psychology, psychiatry), low clinician-veteran ratios (i.e., 1:7–15), and 24-hour and weekend coverage. A majority of visits occur within the community. Most MHICM veterans receive weekly visits, with more severe veterans being seen multiple times per week.¹ While the MHICM team collaborates

to share in care activities, veterans work most closely with a primary clinician.

MHICM teams at the study sites served a total of approximately 240 unique veterans during the period of this study. Beginning in 2009, local leadership began to encourage these teams to discharge improved clients to less intensive clinical programs to create capacity on MHICM teams. MHICM clinicians began to discuss which veterans may have improved sufficiently to be discharged to less intensive clinical services. No quotas or structured interventions were utilized. We approached all veterans discharged from teams over an 18-month period, from November 2010 to May 2012, for study participation. The Greater Los Angeles VA Healthcare System Institutional Review Board approved the research protocol.

Outcomes

Veterans' symptoms, functioning, and community integration were assessed within 2 weeks of their MHICM discharge (baseline) and again at 3-, 6-, and 9- months post-discharge. To assess community integration, we used a version of Webber and colleagues' Resource Generator that measures access to social capital (Webber and Huxley 2007); the Community Involvement Scale (CIS), which asks whether respondents engaged in activities like attending religious services, picnics, visiting relatives, or volunteering in the past 30 days (Pahwa et al. 2014). To assess symptoms, trained raters administered the Brief Psychiatric Rating Scale (BPRS) (Overall and Gorham 1962) and veterans completed the Colorado Symptom Index (Shern et al. 1994).

Functioning was evaluated with the Independent Living Skills Survey (ILSS) (Wallace et al. 2000), the Satisfaction with Life scale (Test et al. 2005), and the short version of the Medical Outcomes Study Social Support Survey, which assesses availability of social support (Gjesfjeld et al. 2008). We used the Residential Follow-Back Calendar (Bebout et al. 1997) to track housing status. The DAST (Staley and el-Guebaly 1990) and the AUDIT-C (Dawson et al. 2005) were used to assess drug and alcohol use.

To evaluate illness severity, we created a variable to indicate severity prior to MHICM enrollment by summing the veteran's lifetime psychiatric hospitalization days and the number of psychiatric admissions. We also noted whether the veteran had greater or less than 30 days in the hospital in the year prior to MHICM admission. Reason for MHICM discharge was assessed in a semi-structured interview with the veteran's primary clinician conducted within 3 weeks of discharge (Bromley et al. 2015). Two analysts used content coding to classify reasons for discharge and independently agreed on reason for discharge in all 11 cases. Clinicians also completed a Working Alliance

¹ Data come from "Mental Health Intensive Case Management (MHICM) in the Department of Veterans Affairs: The Fifteenth National Performance Monitoring Report FY 2011," Northeast Program Evaluation Center, VA Connecticut Healthcare System, West Haven, CT.

Inventory (Horvath and Greenberg 1993) to describe their therapeutic alliance with the veteran at time of discharge.

At 9 months, chart reviews were used to evaluate our primary outcome measure, discharge success. We created a dichotomized variable (unsuccessful *versus* successful), coding a discharge as unsuccessful if the veteran experienced psychiatric hospitalization >7 days, loss to follow up psychiatric care, return to high intensity program (i.e., locked facility, nursing home, MHICM), suicide attempt, sustained relapse to substance abuse, incarceration, or homelessness.

Quantitative Analysis

Logistic regression was used to predict our dichotomous outcome variable—successful discharge—at 9 months. Separate Ordinary Least Squares regression models were used to regress our outcome variable on a number of continuously-measured predictors: Community Involvement Scale, Independent Living Skills Survey, illness severity prior to MHICM, social support, and satisfaction with health provider. Chi square analysis was used to examine dichotomous predictors including reason for discharge. We conducted a forward selection analysis to develop a multivariate prediction model for reasons for discharge (i.e., stability, disengagement) using a cut off of $p < 0.2$ for inclusion in a logistic regression model.

Results

Our study addressed two research questions: (1) How often and for what reasons do MHICM clinicians discharge veterans from MHICM? and (2) Which clinical- and veteran-level factors predict success after discharge from MHICM?

Rates of Discharge and Study Sample

Of the 240 veterans in ACT, teams discharged a total of 21 clients to lower levels of care (9%) over 18 months. Eleven of these 21 (52.4%) agreed to participate in the study. Reasons for lack of participation included inability to contact ($n=3$, 14.3%), loss to follow up prior to consenting ($n=2$, 9.5%), suspiciousness of study ($n=3$, 14.3%), and legal conservatorship ($n=2$, 9.5%). Of the 11 participants, 2 (18.2%) were female, 9 (81.1%) were male. Participants' average age was 54 years old (SD 14.6, range 36–88). Four (36.4%) participants were Hispanic, 3 (27.3%) African American, 3 (27.3%) Caucasian, and 1 (9.1%) Asian/Pacific Islander. Average tenure in MHICM program was 40.8 months (SD 20.8, range 8–76 months). At admission to MHICM, 6 (54.5%) participants had a primary diagnosis of schizophrenia, 4 (36.4%) schizoaffective disorder, and

1 (9.1%) bipolar disorder. Two participants had co-morbid PTSD and zero had co-morbid substance use disorders.

Reasons for Discharge

In interviews, clinicians described two main reasons for discharge, disengagement or stability. Disengagement indicated that the participant had benefited from MHICM but appeared to be no longer benefiting. Some treatment goals had not been met but participants were not motivated to pursue them. Stability indicated that participants had met all treatment goals and were seen to be independent in most activities. Seven (63.6%) participants were discharged for stability and 4 (36.4%) for disengagement.

Outcomes at 3, 6, and 9 Months After Discharge

The small sample size did not allow follow up statistical analyses of change from baseline (i.e., at discharge) at each of the 3 follow up time points (3, 6, and 9 months). We used scatter and trajectory plots to explore trends in changes in symptoms, functioning, and community integration over follow up. The most marked changes occurred between baseline and 3 months and were in both directions, but the magnitude of change was small. Housing independence, substance and alcohol use, and the presence of homicidal and suicidal ideation showed minimal or no change over follow up.

At 9 month follow up, 6 (54.5%) participants' discharges were coded as unsuccessful (i.e., homelessness, incarceration, psychiatric hospitalization >7 days, relapse to substance use, or lost to follow up care at 9 months) while 5 (45.5%) participants' discharges were coded as successful.

Factors Predicting Successful Discharge

We conducted chi square and logistic regression analyses to explore predictors of discharge success (Table 1). Reason for discharge was significantly associated with discharge success (Likelihood Ratio χ^2 $p=0.02$), with disengagement predicting unsuccessful discharge. Therapeutic alliance at discharge was not significantly associated with discharge success ($p=0.18$). Illness severity prior to MHICM enrollment ($p=0.60$), time in the MHICM program ($p=0.55$), and community involvement ($p=0.35$), measures of functioning, and measures of symptom severity at time of discharge were not significant predictors of discharge success.

Multivariate Analysis

We conducted forward selection analyses to examine which variables could best account for the categories of reasons for discharge (i.e., stability, disengagement) using a cut

Table 1 Time-of-discharge (Baseline) clinical factors as predictors of successful discharge at 9-month follow up

Characteristic	Variable	Parameter estimate ($\beta \pm SE$)	Test statistic (logistic regression or chi square)	p value
Illness severity prior to MHICM enrollment	Psychiatric hospital days ^a	NA	0.28/1.0	0.60/1.0 [^]
	Illness severity ^b	-0.27 ± 0.44	0.36	0.55
MHICM treatment processes	Time in program	0.02 ± 0.03	0.36	0.55
	Reason for discharge	NA	5.24	0.02
	Therapeutic alliance	0.12 ± 0.09	1.78	0.18
Functioning	Independent living skills survey	0.10 ± 0.16	0.38	0.54
	Satisfaction with life	0.01 ± 0.12	0.01	0.94
	Social support	0.18 ± 0.24	0.57	0.45
Symptom severity	Colorado symptom index	0.03 ± 0.10	0.06	0.81
	Brief psychiatric rating scale	-0.10 ± 0.11	0.85	0.36
Community integration	Community involvement scale	-0.36 ± 0.38	0.86	0.35
	Access to social capital	0.75 ± 0.79	0.90	0.34

^aGreater or less than 30 days in a psychiatric hospital in year prior to MHICM enrollment

^bSum lifetime duration of psychiatric hospitalization and number of lifetime psychiatric admissions

[^]p-value chi square

off of $p < 0.2$ for inclusion in the model. We included all variables. The best single predictor model used symptom severity as measured on the BPRS (total score) ($c^2 = 3.00$, $p = 0.12$). The best model overall is the two variable predictor model using community involvement on the CIS and BPRS ($c^2 = 7.10$, $p < 0.01$). However, due to the small sample size, this model resulted in a complete separation of the two groups, suggesting that this result might be due to overfitting. Caution in generalization from this result and replication in a larger sample are necessary.

Discussion

This observational follow up study examined discharge from MHICM to less intensive clinical services in veterans with serious mental illness treated (average > 3 years) in three VA-based Assertive Community Treatment (ACT) teams. Clinicians discharged only 9% of veterans ($N = 21$) over 18 months, providing few potential participants with much heterogeneity. Other research limitations include a high refusal rate (almost 50%) among discharged veterans. The small sample size also prevented analyses of veterans' trajectories at all follow up points, though detailed clinical data was available at 9 months for all enrolled veterans. Finally, veterans served on MHICM teams may differ in substantial ways from non-veterans served by community-based ACT teams, limiting the external validity of the study. Despite these notable limitations, we believe that this mixed-method observational study presents critical data about a rare clinical event that has implications for clinical practice in ACT as well as the management of healthcare

resources, particularly for high-cost services like ACT that have previously been considered to be time-unlimited.

We highlight three key points from these data: (1) few veterans were discharged; (2) among the few discharged, more than half of veterans experienced poor outcomes following discharge, a far higher rate than previously reported (Hackman and Stowell 2009; Salyers et al. 1998); and (3) clinicians appear to be able to accurately predict unsuccessful discharge for clients who are “disengaged” in their care. Relating to the first point, a discharge rate of 9% over 18 months is low, which has a substantial impact on the availability of MHICM services. Combined with the low caseloads that characterize MHICM, low rates of discharge increase the likelihood that teams will remain at capacity and unable to enroll new veterans. Relating to the second point, regarding rates of discharge success, in this small and varied sample, we found no significant relationship between time-of-discharge variables, tenure in MHICM, or measures of lifetime illness severity and discharge success. Clinicians who lack reliable data to guide treatment decision-making may be understandably reluctant to risk discharge. There is thus an urgent need for larger studies that can identify robust predictors of outcome. While our sample size was extremely small and heterogeneous, the 11 clients in the study represent almost half of all discharges from three MHICM teams in an 18-month period, and high rates of loss to follow up are to be expected in studies of this type. This indicates that a coordinated effort among many teams will be necessary to improve our understanding of discharge from ACT.

Our key finding from this examination of discharge is that clinicians' report of reason for discharge significantly predicted outcomes 9 months later. Specifically, disengagement as a reason for discharge was significantly associated with unsuccessful discharge; that is, clients who disengaged from MHICM after meeting only some treatment goals were at higher risk for poor outcomes. Noting that clinicians can successfully identify disengaged clients who may be less likely to do well after transitioning to a lower level of care suggests potential interventions that boost client engagement in ACT until treatment goals are met. These preliminary findings highlight other areas for future research. For example, in exploratory analyses, both symptom severity and level of community activity appeared to influence discharge readiness and should be examined as possible determinants of outcome in a larger sample.

In conclusion, clinicians appear reluctant to discharge clients from ACT (Chen and Herman 2012; Finnerty et al. 2015), and many clients may experience negative clinical outcomes following ACT discharge. Researchers have not identified factors that predict successful discharge, and outcome monitoring in this population is difficult (Young et al. 2000). Our study suggests that ACT clinicians may err in discharging clients who resist engagement or appear uninterested in pursuing further treatment goals, since these clients were at higher risk for poor outcomes. However, ACT clinicians' judgment of readiness for discharge may often be sound, given that those clients judged to be independent and to have met treatment goals were more likely to experience successful discharge. Results indicate that assessments of clinical status (e.g., symptoms, community involvement) and clinical processes (e.g., whether or not treatment goals have been met) and close tracking of client outcomes will be needed to identify factors that predict successful discharge from ACT.

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Compliance with Ethical Standards

Conflict of interest The authors have no potential conflicts of interest to report.

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