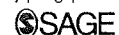


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# A Pilot Randomized Control Trial: Testing a Transitional Care Model for Acute Psychiatric Conditions

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## Abstract

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**OBJECTIVE:** People with multiple and persistent mental and physical health problems have high rates of transition failures when transferring from a hospital level of care to home. The transitional care model (TCM) is evidence-based and demonstrated to improve posthospital outcomes for elderly with physical health conditions, but it has not been studied in the population with serious mental illness. **METHOD:** Using a randomized controlled design, 40 inpatients from two general hospital psychiatric units were recruited and randomly assigned to an intervention group ( $n = 20$ ) that received the TCM intervention that was delivered by a psychiatric nurse practitioner for 90 days posthospitalization, or a control group ( $n = 20$ ) that received usual care. Outcomes were as follows: service utilization, health-related quality of life, and continuity of care. **RESULTS:** The intervention group showed higher medical and psychiatric rehospitalization than the control group ( $p = .054$ ). Emergency room use was lower for intervention group but not statistically significant. Continuity of care with primary care appointments were significantly higher for the intervention group ( $p = .023$ ). The intervention group's general health improved but was not statistically significant compared with controls. **CONCLUSIONS:** A transitional care intervention is recommended; however, the model needs to be modified from a single nurse to a multidisciplinary team with expertise from a psychiatric nurse practitioner, a social worker, and a peer support specialist. A team approach can best manage the complex physical/mental health conditions and complicated social needs of the population with serious mental illness.

## Keywords

transitional care model, TCM, mental illness, chronic care, psychiatric hospitalization, psychiatric nurse practitioner, translational research, advanced practice nurse

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An estimated \$44 billion dollars annually is spent on hospital readmissions that are unnecessary and largely due to poorly managed hospital-to-home transitions (Jencks, Williams, & Coleman, 2009). Lack of coordination and communication among community providers, lack of care planning for treatment and medication management, and insufficient education of patient and caregivers about continued treatment and self-care all contribute to worsening of symptoms and an elevated risk for rehospitalization resulting in higher costs (Jencks, 2010). An empirically based transitional care model (TCM) remediates gaps in posthospital care, specifically for the elderly population with complex health problems (Naylor et al., 1999; Naylor et al., 2004; Naylor et al., 2007; Naylor et al., 2008; Naylor et al., 2009). However, TCMs are understudied in the population with serious mental illness (SMI) despite evidence of high risk for posthospital transition failures. This article reports findings from research that

examined the feasibility and effectiveness of the Naylor TCM for individuals with SMI and comorbid health condition with the aim of reducing hospital readmissions, reducing emergency department (ED) use, improving continuity of care, and improving health quality of life following a hospitalization for an acute psychiatric condition.

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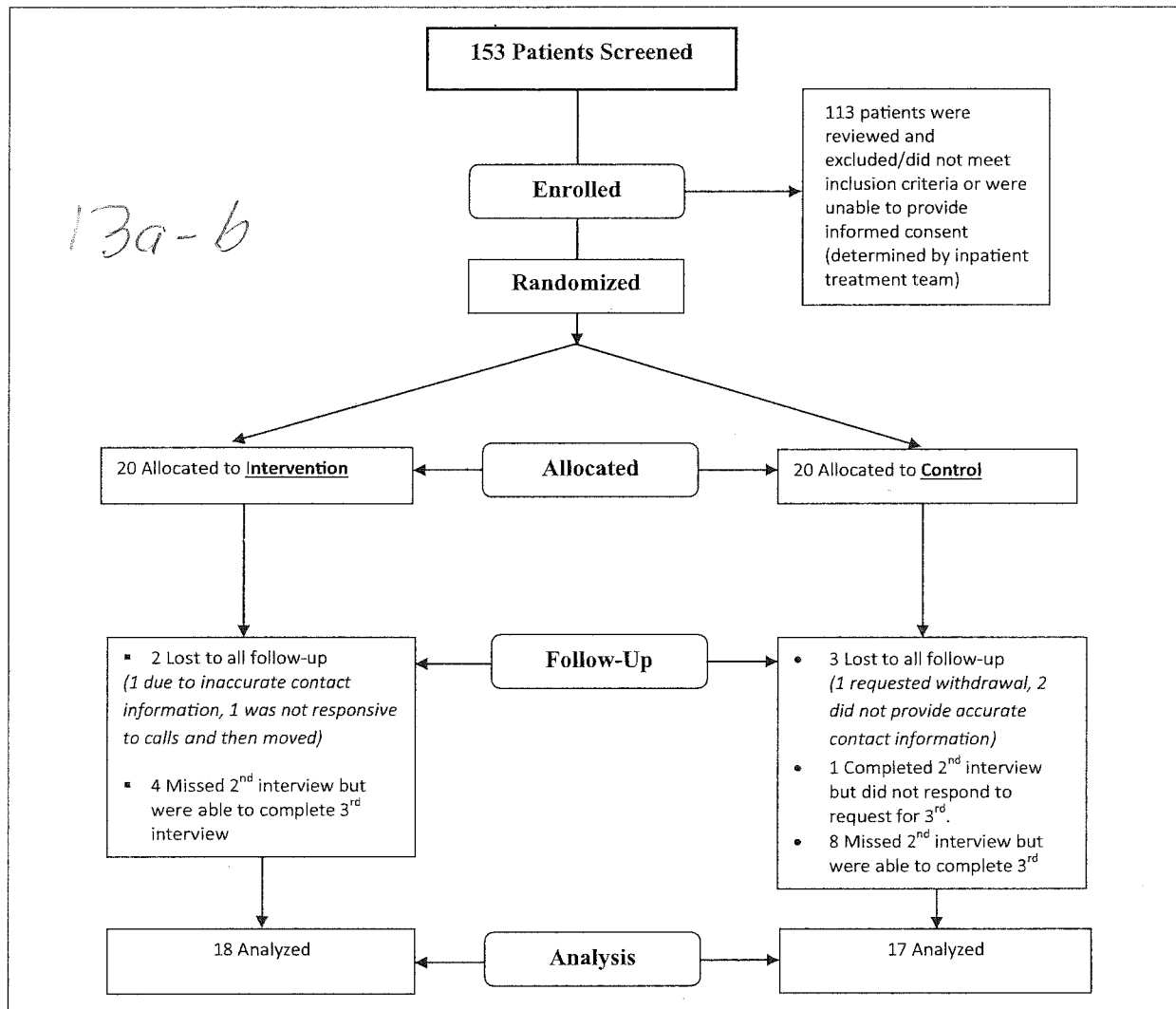


Figure 1. Screening, randomization, and follow-up of study participants.

Participants in the intervention group received treatment as usual plus the care of a psychiatric NP for 90 days post-hospital discharge. The psychiatric NP first visited the patient while they were in the hospital, and then in their home within 24 hours of discharge. The NP was available to the participant 24/7 via phone or secure e-mail.

### Intervention Protocol

The NP assisted the participant's adaptation to home by focusing on the following: managing risk factors to prevent further cognitive or emotional decline, managing problem behaviors, assessing and managing physical symptoms, preventing functional decline; promoting adherence to therapies, assuring proper medical management and continuity of care, and helping case managers

understand the integrated mental and physical care approach. The NP had the authority to prescribe medication for participants. She limited the prescription of medication to urgent needs, for example, medication refills, symptom management of medication side effects, and only if the participant's primary care physician or psychiatrist was unavailable. The NP often accompanied the participant to medical and mental health appointments to facilitate communication, translate information to specialty providers, and advocate for the participant.

Over the 12 weeks, the NP had 868 encounters with the 18 active participants in the intervention group. Encounter statistics show a mean of 48.2 contacts per person over the 12-week intervention period: mean 14.8 minutes per contact ( $SD = 4.7$ ; range 5-150 minutes). Table 1 summarizes the service type and the encounter activity by (a) the *contact*, that is, the person to whom the

## Measures

*Health-related quality of life:* This was measured using the Medical Outcomes Study–Short Form 12 (SF-12); administered at baseline and 12 weeks. Raw scores are standardized to range from 0 to 100 with higher scores indicating better HRQoL. Scores of 40 to 49 indicate mild disability, 30 to 39 moderate disability, and scores below 30 indicate severe disability. The measure has good reported test–retest reliability (.89 for physical health and .76 for mental health) over 2 weeks (Ware, 2008).

*Continuity of care:* This had two components: (a) scheduled appointments on the discharge plan and (b) appointments scheduled subsequent to the index hospitalization and not on the discharge plan. Other than data from the actual discharge plan, appointment data were collected directly from the participant by the research assistant at 6 weeks and 12 weeks following hospital discharge. Provider appointments were categorized by type: mental health, medical specialist, and primary care.

*Service utilization:* Utilization of emergency services and rehospitalizations were assessed from participant reports of service use during the 90 days post–index hospitalization at 6 and 12 week interviews. Type of hospitalization was categorized as a medical, psychiatric, or chemical dependency. Self-report data of hospital use by persons with SMI have been found to be valid for group analysis (Calysn, Allen, Morse, Smith, & Templehoff, 1993; Clark, Ricketts, & McHugo, 1996). Clark et al. found that there were some errors in claims records, in self-report by both patients and providers of hospital use, but the reasons for errors differed by source. Also accuracy of self-report data of hospital use tended to decrease over time but for a short period as used in the current study was relatively accurate. Patients with bipolar tended to be more accurate reporters than those with schizophrenia. Calysn et al. (1993) found that reliability was over .75 for self-reported service use between severely mentally ill homeless persons and providers.

*Analysis:* Attrition rates are shown in Figure 1. Analyses were based on 18 participants from the intervention group and 17 participants from the control group. To compare participants in the control and intervention groups, descriptive statistics were performed on sociodemographic characteristics, the HRQoL, service utilization (hospital and emergency), and continuity of care appointments. The Average Treatment Effect was calculated for the HRQoL–SF-2 using the SAS PROC MIX procedure. A chi-square test or *t* test of differences between groups was

conducted using either STATA 12 (Stata Corp, College Station, Texas) or SAS.

## Results

The sample was nearly equally distributed between males and females with an average age in the mid-forties. Participants were 45% African American in both groups. Less than a high school education, single, low income, and unemployed were dominant sociodemographic features of both groups (see Table 2). Endocrine, hyperlipidemia, hypertension, cardiovascular, respiratory, and gastric-GERD (gastroesophageal reflux disease) disorders were the most common medical conditions for participants in both groups; depression, schizoaffective, and psychoses NOS were the most common psychiatric conditions. The two groups differed very little in terms of sociodemographic and clinical characteristics, with the exception of two variables: The intervention group had a slightly higher percentage of persons with the diagnoses of psychoses NOS and gastric-GERD. The psychiatric and medical profile was complex. On average, participants had 1.6 ( $SD = 0.8$ ) psychiatric diagnoses and 3.3 ( $SD = 4.8$ ) medical diagnoses.

### Health-Related Quality of Life

Both groups' scores indicate moderate disability at baseline, and for most domains, an increase of 5 or more points from baseline to 12 weeks (domains that improved  $\geq 5$  points were physical functioning, role limitation, bodily pain, and emotional role limitation; Table 3). The control group had higher (but not statistically significant) average baseline scores than the intervention group on physical functioning, general health, and social functioning. The intervention group showed clinically significant improvement in their general health scores over the 12-week study whereas the control group did not. Both groups had higher mental health subscale scores at 12 weeks. Baseline Physical Health and Mental Health *t*-score averages for both groups slightly increased and were consistent with those of the SMI population (White, McGrew, Salyers, & Firmin, 2014).

### Continuity of Care

Scheduled appointments are summarized in Table 4. One half or less of the participants in both groups had provider appointments documented on the discharge plan. Of the documented provider appointments at discharge, significantly fewer members of the intervention group were assigned a mental health or medical specialist provider appointment than the control group ( $p < .055$ ). Additionally, few primary care appointments were noted on the discharge plan document for either group participant. In sharp contrast to the discharge plan document,

**Table 2.** Characteristics of the Transitional Care Study Sample.

Characteristic	Control (N = 20), n (%)	Intervention (N = 20), n (%)	p
Age, M ± SD	45.8 ± 11.9	44.1 ± 11.2	.634
Income (total money received last month, \$), M ± SD	711.2 ± 430.1	716.6 ± 458.4	.970
Gender			.752
Male	10 (50)	11 (55)	
Female	10 (50)	9 (45)	
Race			.442
Black/African American	9 (45)	9 (45)	
White	7 (35)	6 (30)	
Asian	0 (0)	0 (5)	
More than one race	4 (20)	2 (10)	
Other	0 (0)	2 (10)	
Hispanic/Latino	2 (10)	1 (5)	.548
Education			.377
Less than high school	11 (55)	8 (40)	
High school	4 (20)	6 (30)	
Post-high school technical training	2 (10)	0 (0)	
Some college	2 (10)	5 (25)	
College degree	1 (5)	0 (0)	
Some graduate study	0 (0)	1 (5)	
Marital status			.504
Single	15 (75)	12 (60)	
Married or with steady partner	3 (15)	3 (15)	
Divorced	2 (10)	2 (10)	
Separated	0 (0)	2 (10)	
Widowed	0 (0)	1 (5)	
Current living situation			.721
Home, hotel, or apartment	12 (60)	12 (60)	
With parents or other family members	1 (5)	3 (15)	
With friends	1 (5)	0 (0)	
Emergency shelter	3 (15)	2 (10)	
Halfway house or board and care	2 (10)	1 (5)	
No home or regular place to live	1 (5)	2 (10)	
Employed			.542
No	16 (80)	15 (75)	
Yes	1 (5)	3 (15)	
Did not answer	3 (15)	2 (10)	
Disposition following index hospitalization			
Home/self-care	13 (65)	14 (70)	.181
Shelter	4 (20)	2 (10)	.115
Boarding home	2 (10)	3 (15)	.168
Missing data	1 (5)	1 (5)	
Psychiatric conditions <sup>a</sup>			
Major depression	13 (65)	10 (50)	.105
Bipolar disorder	5 (25)	2 (10)	.070
Schizoaffective disorder	8 (40)	6 (30)	.145
Schizophrenia	2 (10)	5 (25)	.070
Psychosis-not otherwise specified	6 (30)	2 (10)	.039
Personality disorder	4 (20)	2 (10)	.115
Substance use	6 (30)	6 (30)	.197
Medical conditions <sup>b</sup>			
Endocrine (diabetes, hypothyroid)	8 (40)	12 (60)	.068
Hyperlipidemia	5 (25)	4 (20)	.178
Hypertension	11 (55)	8 (40)	.106
Respiratory	5 (25)	6 (30)	.180
Gastric-gastroesophageal reflux disease	6 (30)	2 (10)	.039
Seizure disorder	3 (15)	3 (15)	.197
Multiple sclerosis-arthritis	2 (10)	3 (15)	.168
Infectious disease (Hepatitis B, C; HIV)	4 (20)	1 (5)	.051

a. Individuals may meet criteria for more than one diagnostic category, thus percentages exceed 100%.

b. Data source: hospital medical record.

**Table 4.** Continuity of Care: Scheduled Posthospital Appointments.

	Control, N = 17		Intervention, N = 18		p
	n	Proportion of the group (%)	n	Proportion of the group (%)	
At discharge (documented on the discharge plan)					
• With any scheduled provider appointments	10	58.8	8	44.4	.560
• With any mental health provider appointment	8	47.1	4	22.2	.055
• With any medical specialist appointment	8	47.1	4	22.2	.055
• With primary care appointment	5	29.4	5	27.8	.500
Provider appointments scheduled after hospitalization and within 90 days <sup>a</sup>					
• With any scheduled provider appointments	17 (49)	100	18 (68)	100	.215
• With mental health provider appointments	11 (29)	64.7	14 (33)	77.8	.325
• With medical specialist appointment	9 (16)	52.9	11 (19)	61.1	.484
• With primary care provider appointment	5 (5)	29.4	11 (17)	61.1	.023

a. Total number of actual scheduled appointments in parentheses.

**Table 5.** Hospital and Emergency Department Service Use.

	Control group, N = 17				Intervention group, N = 18				p <sup>c</sup>
	n	% <sup>a</sup>	Range <sup>b</sup>	M (SD)	n	% <sup>a</sup>	Range <sup>b</sup>	M (SD)	
Any hospital admissions	4	23.5	0-7	0.25 (0.55)	10	55.6	0-20	0.90 (1.11)	.025
Psychiatric readmission	4	23.5	0-7	0.25 (0.75)	9	50.0	0-13	0.65 (0.92)	.092
Medical admission	0	—	—	—	4	22.2	0-4	0.20 (0.41)	.042
Substance admission	0	—	—	—	1	5.6	0-1	0.05 (0.22)	.329
Any emergency use	6	35.3	0-9	0.45 (0.82)	5	27.8	0-8	0.40 (0.94)	.859
For psychiatric problems	1	5.9	0-4	0.20 (0.89)	1	5.6	0-2	0.10 (0.48)	.658
For medical problems	5	29.4	0-6	0.30 (0.57)	4	22.2	0-7	0.35 (0.93)	.839

Source. Participant report.

a. Proportion of group members with a hospital admission.

b. Range = the minimum/maximum number of hospital (re)admissions or emergency department visits in group.

c. p compares the group means.

( $p = .042$ ). Only one person from the intervention group was hospitalized for substance use treatment. The intervention group showed a slightly lower use of the ED for psychiatric (5.6%) and medical (22.2%) problems compared with the control group (5.9% and 29.4%, respectively), but these differences were not statistically significant. Reasons for rehospitalization and emergency room use included unstable housing (33%); conflicts in relations with family, friends, or residential staff (35%); lack of insurance or treatment (22%); substance use (44%); psychiatric symptoms (65%); and medical problems (25%). (Note: percentages reflect both groups and add to more than 100 due to the fact that most participants had several reasons for use.)

## Discussion

The purpose of the study was to determine the extent to which a transitional care intervention improved HRQoL

and continuity of care appointments and reduced hospital and ED service use for individuals with combined psychiatric and medical conditions. As noted in Table 2, study participants in both groups were afflicted with a high burden of physical/mental illness and complex treatment regimens, low literacy, unemployment, poverty, unstable housing, and a lack of support relationships. A third of study participants had unstable or unsafe housing situations, and more than half had fragile and unsupportive personal relationships that were associated with breakdowns that led to additional ED and/or hospital use. The magnitudes of impoverished social support and unstable housing among participants of this study combined with a fragmented health care system and stigma associated with mental illness define a unique set of challenges for designing an effective transitional care intervention that are distinctly different from previously studied elders and their family caregivers from the

psychiatric hospital. A high readmission rate may not be so much a comment on the intervention itself as on the inability or unwillingness of the community to absorb the person with a mental illness, no matter what the psychiatric condition. Thus, a high readmission rate may reflect community conditions rather than patient needs or intervention effectiveness. The fact that some participants got themselves admitted to another hospital within a few days of release of the index hospitalization may have been provoked more from their unstable living arrangement than psychiatric symptomatology.

In our study, we found high readmission and ED service rates despite 24/7 access to a skilled professional. However, to presume that one advanced practice nurse can meet the multiple complex needs of this population is not very realistic. Consequently, we think that these combined needs require a team approach that includes a psychiatric NP, a social worker, and a peer support provider. Nursing TCMs provide protocols for planning for transitional care, engagement, support, and education of patients and caregivers; coordination of care among various providers; and communication of accurate health information. What is missing is attention to the complexity of managing fragmented multifaceted health and social service systems. A multidisciplinary team approach would focus on immediate solutions to complex and tangled system problems that require an especially high level of knowledge and skills. The nurse would provide attention to complex health needs, the social worker would provide timely social services and systems coordination, and a peer support specialist would offer an "off-the-grid" kind of expertise about how the patient can best manage with these health and social complexities. This would essentially be a blend of TCM with three other interventions, Critical Time Intervention (CTI) and Peer Bridgers, and peer coaching. CTI employs a trained social service worker to assist homeless persons with severe mental illness transitioning from hospitals or shelters to a variety of community residences by helping enhance their support from friends, family, and other social and community resources. CTI is a 9-month transitional intervention that has been shown to be effective (Herman et al., 2011; Tomita & Herman, 2012). The Peer Bridger program employs peers to assist other peers to transition from a psychiatric hospital to the community and has been found to decrease the number of days of hospitalization ("Peer Support Services Help Reduce Hospitalizations," 2010), and peer coaching adds a dimension of having peers coach other peers in wellness management (e.g., living a healthy lifestyle; Swarbrick, Hutchinson, & Gill, 2008).

Another issue that needs to be addressed is the nature of the target population served. Although all participants

had a major health condition, many of them were not acute and therefore did not see the need for the services of the advanced practice nurse and were not responsive to the intervention being offered. This likely resulted in the lack of difference in outcomes between the two conditions. We found those with an acute medical problem, like a recent diagnosis of cancer, were extremely receptive and appreciative of the nurse intervention and seemed to benefit from it (Solomon et al., 2014). Therefore, this led us to the conclusion that those with a severe psychiatric disorder who are on an acute medical/surgical unit would likely be more responsive to such an intervention and would likely benefit more. Such a population is more consistent with the original intent of the TCM. Also, those with severe mental illness on the medical units tend to have longer lengths of stay, as it is difficult to discharge them to unstable housing arrangements without a committed family caregiver to address their health needs (Benzer, Sullivan, Williams, & Burgess, 2012). Thus, a transitional care intervention would have the potential to not only reduce rehospitalization and emergency room use but also decrease the length of the index hospitalization.

## 20 Limitations

Several factors of this study design limit inferences from this study. The sample size was small and thus without the power to measure statistical significance. The time frame for measuring benefits of the intervention may have been too short. Forchuk et al. (2005, 2007) employed a longer time period for the intervention and Rose et al. (2007) also recommended a longer time frame for measures. Additionally, most of the data used in this study were obtained from participants with the potential for self-report recall bias. In a future study we would verify self-reported measures of service utilization with administrative data. Also, a measure or indicator of medical/severity would have helped better capture the medical conditions and future research would include this as well. Furthermore, there was only one advanced practice nurse delivering the intervention.

## Conclusion

Coordination of care during transition from hospital to home for a person with an acute psychiatric illness is a complex phenomenon, particularly for patients with comorbid medical conditions. Most would agree that meaningful communication and cooperation among providers and patients are critical to an efficient transition. However, the multifaceted and siloed health care systems present significant challenges resulting in major communication barriers. Further modifications of the TCM are

- Comprehensive discharge planning and home follow-up of hospitalized elders: A randomized clinical trial. *Journal of the American Medical Association*, 281, 613-620.
- Naylor, M. D., Brooten, D. A., Campbell, R. L., Maislin, G., McCauley, K. M., & Schwartz, J. S. (2004). Transitional care of older adults hospitalized with heart failure: A randomized, controlled trial. *Journal of the American Geriatric Society*, 52, 675-684. doi:10.1111/j.1532-5415.2004.52202.x
- Naylor, M. D., Feldman, P. H., Keating, S., Koren, M. J., Kurtzman, E. T., Maccoy, M. C., & Krakauer, R. (2009). Translating research into practice: Transitional care for older adults. *Journal of Evaluation in Clinical Practice*, 15, 1164-1170. doi:10.1111/j.1365-2753.2009.01308.x
- Naylor, M. D., Hirschman, K. B., Bowles, K. H., Bixby, M. B., Konick-McMahan, J., & Stephens, C. (2007). Care coordination for cognitively impaired older adults and their caregivers. *Home Health Care Service Quarterly*, 26(4), 57-78.
- Naylor, M. D., & Keating, S. K. (2008). Transitional care: Movement from one care setting to another. *American Journal of Nursing*, 108(Suppl. 9), 58-63.
- Naylor, M., Kurtzman, E., & Pauly, M. (2009). Transitions of elders between long-term care and hospitals. *Policy, Politics & Nursing Practice*, 10, 187-194.
- Peer support services help reduce hospitalizations, curb costs. (2010, March 21). *Mental Health Weekly*. Retrieved from <http://www.nyaprs.org/e-news-bulletins/index.cfm?do=headlines&mn=3&yr=2011&article=DF49F7ABD447F00E1D13D921CCB4F958>
- Puschner, B., Steffen, S., Volker, K. A., Spitzer, C., Gaebel, W., Janssen, B., . . . Becker, T. (2011). Needs-oriented discharge planning for high utilizers of psychiatric services: Multicentre randomised controlled trial. *Epidemiology of Psychiatric Science*, 20, 181-192.
- Reynolds, W., Lauder, W., Sharkey, S., Maciver, S., Veitch, T., & Cameron, D. (2004). The effects of a transitional discharge model for psychiatric patients. *Journal of Psychiatric Mental Health Nursing*, 11, 82-88.
- Rose, L. E., Gerson, L., & Carbo, C. (2007). Transitional care for seriously mentally ill persons: A pilot study. *Archives of Psychiatric Nursing*, 21, 297-308.
- Solomon, P., Hanrahan, N. P., Hurford, M., DeCesaris, M., & Josey, L. (2014). Lessons learned from implementing a pilot RCT of transitional care model for individuals with serious mental illness. *Archives of Psychiatric Nursing*, 28, 250-255. doi:10.1016/j.apnu.2014.03.005
- Swarbrick, P., Hutchinson, D., & Gill, K. (2008). The quest for optimal health care: Can education and training cure what ails us? *International Journal of Mental Health*, 37(2), 69-88.
- Tomita, A., & Herman, D. (2012). The impact of Critical Time Intervention in reducing psychiatric rehospitalization after hospital discharge. *Psychiatric Services*, 63, 935-937.
- Ware, J. E., Jr. (2008). Improvements in short-form measures of health status: Introduction to a series. *Journal of Clinical Epidemiology*, 61(1), 1-5. doi:10.1016/j.jclinepi.2007.08.008
- White, L. M., McGrew, J. H., Salyers, M. P., & Firmin, R. L. (2014). Assertive community treatment for parents with serious mental illnesses: A comparison of "parent-sensitive" assertive community treatment teams versus other teams. *Psychiatric Rehabilitation Journal*, 37, 251-260. doi:10.1037/prj0000050