# Can Involuntary Outpatient Commitment Reduce Hospital Recidivism?: Findings From a Randomized Trial With Severely Mentally Ill Individuals

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**Objective:** The goal of this study was to evaluate the effectiveness of involuntary outpatient commitment in reducing rehospitalizations among individuals with severe mental illnesses. **Method:** Subjects who were hospitalized involuntarily were randomly assigned to be released (N=135) or to continue under outpatient commitment (N=129) after hospital discharge and followed for 1 year. Each subject received case management services plus additional outpatient treatment. Outpatient treatment and hospital use data were collected. **Results:** In bivariate analyses, the control and outpatient commitment groups did not differ significantly in hospital outcomes. However, subjects who underwent sustained periods of outpatient commitment beyond that of the initial court order had approximately 57% fewer readmissions and 20 fewer hospital days than control subjects. Sustained outpatient commitment was shown to be particularly effective for individuals with nonaffective psychotic disorders, reducing hospital readmissions approximately 72% and requiring 28 fewer hospital days. In repeated measures multivariable analyses, the outpatient commitment group had significantly better hospital outcomes, even without considering the total length of court-ordered outpatient commitments. However, in subsequent repeated measures analyses examining the role of outpatient treatment among psychotically disordered individuals, it was also found that sustained outpatient commitment reduced hospital readmissions only when combined with a higher intensity of outpatient treatment. **Conclusions:** Outpatient commitment can work to reduce hospital readmissions and total hospital days when court orders are sustained and combined with intensive treatment, particularly for individuals with psychotic disorders. This use of outpatient commitment is not a substitute for intensive treatment; it requires a substantial commitment of treatment resources to be effective.

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Despite several decades of efforts to effectively treat severely mentally ill patients in community-based

treatment programs, a substantial proportion of these patients continues to frequently relapse, often as a result of nonadherence to treatment, and requires hospitalization (1–3). Hospital recidivism produces substantial human costs in suffering and demoralization and is a significant fiscal burden to public and private mental health systems laboring under fierce cost-containment demands (4–9). Adding to the pressure on community treatment programs, the public has become increasingly sensitized to the risk of violence with severely mentally ill patients living in the community (10–13). Public concern is heightened by rare but tragically violent acts by severely mentally ill individuals (14), who are often found to be noncompliant with treatment. The need to reduce hospital readmissions, without in-

creasing the risk of violent behavior in the community, has lead policy makers and clinicians to focus on legal mechanisms to enforce treatment adherence, including court-ordered treatment or involuntary outpatient commitment (7).

Outpatient commitment is permitted in virtually all states and is explicitly written into statutes in 38 states and the District of Columbia (8, 15–17). The operation and use of outpatient commitment varies dramatically among and within states for a number of reasons, including poor operationalization of commitment criteria and procedures, weak mechanisms to enforce treatment adherence, and liability and other concerns on the part of providers (8, 18–21). For example, in many states, outpatient commitment laws lack any clear enforcement mechanisms and often require burdensome paperwork and staff efforts (17, 22). The use of outpatient commitment may also be limited because many mental health consumers and mental health law advocates oppose this and other forms of coercion in mental health treatment and argue that it infringes on civil liberties, extends social control into the community, and may alienate mental health consumers from seeking treatment (23–26).

Most studies suggest that outpatient commitment is associated with certain positive outcomes such as decreased hospital readmission rates and lengths of stay, but other clinical outcomes are unclear (7, 8, 16, 19, 20, 27–31). One uncontrolled study of outpatient commitment in North Carolina (20) showed marked reductions in readmissions and lengths of hospital stays. In a 3-year period, in a sample of 4,179 individuals under outpatient commitment, adjusted readmission rates declined 82% and lengths of stays declined 33%. A recently completed randomized trial of outpatient commitment in New York City found no significant differences in hospital readmissions or other outcomes (unpublished 1998 study by Policy Research Associates). Most studies to date, however, have largely been naturalistic or quasi-experimental and have serious methodological limitations owing to selection bias, lack of specification of target populations, and unclear operationalization of outpatient commitment (8, 16, 28). In addition, most studies have not examined variations in treatment under outpatient commitment, thereby limiting the ability to specify how or for whom outpatient commitment is effective. For example, it is unclear whether outpatient commitment works primarily by improving individual treatment adherence or by mobilizing scarce outpatient treatment resources (7).

In order to address the limitations of existing studies and improve the understanding of the effectiveness of outpatient commitment, we conducted a randomized controlled trial of outpatient commitment treatment combined with community-based case management in the Piedmont region of North Carolina. Key research questions included: 1) Can outpatient commitment effectively reduce hospital readmissions? 2) If outpatient commitment is effective, must it be sustained over time? 3) For which clinical populations is outpatient commitment most effective? 4) What is the role of treatment intensity in outpatient commitment's effectiveness? The present report examines hospital outcomes in this randomized controlled trial, explores the differential effects of outpatient commitment on certain clinical populations, and examines the role of community-based treatment in reducing hospital recidivism under outpatient commitment. Effects on a broader range of outcomes will be explored in subsequent reports.

The criteria for outpatient commitment in North Carolina included 1) the presence of serious mental illness, 2) the capacity to survive in the community with available supports, 3) a clinical history indicating a need for treatment to prevent deterioration that would predictably result in dangerousness, and 4) a mental status that limits or negates the individual's ability to make informed decisions to seek or to comply voluntarily with recommended treatment. Once a civil court hearing has determined the appropriateness of outpatient commitment, an initial commitment period of up to 90 days is allowed. Forced medication is not permitted. If a patient fails to adhere to the recommended treatment, the responsible clinician may request that law officers escort the patient to the community provider for examination and persuasion to accept treatment. With repeated nonadherence, the clinician may petition for involuntary inpatient commitment.

## METHOD

The study design was a randomized controlled trial designed to test the effectiveness of involuntary outpatient commitment combined with case management in improving outcomes among people with severe mental illness. Involuntarily admitted patients were recruited from a regional state hospital and three other inpatient facilities serving public mental health programs in the region. Because involuntary admission is used extensively in psychiatric institutions in the public sector in North Carolina (accounting for about 90% of admissions to state mental hospitals), patients admitted with this status are quite representative of the population of persons with severe mental illness—particularly the subgroup of repeatedly admitted patients in the public mental health system.

Eligibility criteria for the study were as follows: 1) age 18 years or older; 2) diagnosis of schizophrenia, schizoaffective disorder, or other psychotic disorder or major affective disorder; 3) duration of disorder of 1 year or more; 4) significant functional impairment in the activities of daily living; 5) intensive treatment within the past 2 years; 6) a resident of one of nine counties participating in the study; 7) awaiting a period of court-ordered outpatient commitment; and 8) treatment team has been given permission to approach the patient for consent to participate. Exclusion criterion for the randomized controlled trial included a primary diagnosis of personality disorder, psychoactive substance use disorder, organic brain syndrome in the absence of a primary psychotic or mood disorder, or a recent serious act of violence involving injury or use of a weapon. These violent subjects were followed in a nonrandomized companion study.

After a complete description of the study to the subjects, written informed consent was obtained. Of the identified eligible patients, about 12% refused to participate. Subjects were then randomly assigned to either continue under their outpatient commitment orders (N=129) or to be released from outpatient commitment by notifying the court (N=135); all were subsequently discharged to one of four participating area mental health programs representing nine contiguous urban and rural counties.

**TABLE 1. Baseline Characteristics of Severely Mentally Ill Subjects in a Control Group and an Outpatient Commitment Group**

| Characteristic | Control Subjects (N=135) | | | | Outpatient Commitment Group (N=129) | | | |
|---|---|---|---|---|---|---|---|---|
| | N | % | Mean | SD | N | % | Mean | SD |
| Age (years) | | | 39.8 | 11.07 | | | 39.6 | 10.37 |
| Male sex | 67 | 49.6 | | 0.50 | 65 | 50.4 | | 0.50 |
| African American | 87 | 64.4 | | 0.48 | 81 | 62.8 | | 0.48 |
| Education (years) | | | 11.8 | 2.88 | | | 11.8 | 2.63 |
| Married/cohabiting | 27 | 20.0 | | 0.40 | 26 | 20.2 | | 0.40 |
| Urban residence | 84 | 62.2 | | 0.49 | 80 | 62.0 | | 0.49 |
| Recent homelessness | 20 | 14.8 | | 0.36 | 19 | 14.7 | | 0.36 |
| Schizophrenia | 48 | 35.6 | | 0.48 | 56 | 43.4 | | 0.50 |
| Schizoaffective disorder | 30 | 22.2 | | 0.42 | 27 | 20.9 | | 0.41 |
| Other psychotic disorders | 5 | 3.7 | | 0.19 | 12 | 9.3 | | 0.29 |
| Bipolar disorder | 42 | 31.1 | | 0.46 | 27 | 20.9 | | 0.41 |
| Major depression | 10 | 7.4 | | 0.26 | 7 | 5.4 | | 0.23 |
| Global functioning (Global Assessment of Functioning Scale score) | | | 49.2 | 7.39 | | | 49.2 | 7.98 |
| Substance use | 75 | 55.6 | | 0.50 | 77 | 59.7 | | 0.49 |
| Fighting | 49 | 36.3 | | 0.48 | 55 | 42.6 | | 0.50 |
| Insight into illness (Insight and Treatment Attitudes Questionnaire score) | | | 5.1 | 2.00 | | | 4.5[a] | 2.13 |
| Medication noncompliance | 88 | 65.2 | | 0.48 | 101 | 78.3[b] | | 0.42 |

[a] t=2.22, df=262, p=0.03.
[b] $\chi^2$=5.57, df=1, p=0.02.

During the study year, each subject was assigned to a case manager. Additional outpatient treatment was provided according to a locally developed treatment plan. Intensity of the treatment was allowed to vary clinically; however, treatment adherence was addressed uniformly across programs according to a consensually developed treatment adherence protocol (32). Following the protocol, if subjects under outpatient commitment became nonadherent to treatment, the local mental health program was to request a court order directing the local sheriff's department to locate and immediately bring the subject to the community mental health program for evaluation and persuasion to accept treatment. Alternatively, an area program could seek a court hearing to determine eligibility for inpatient commitment. The study protocol also allowed for earlier intervention if the local mental health program felt it was clinically indicated. The compliance of area mental health programs with the protocol for treatment adherence was excellent.

Initial outpatient commitment orders from the index hospitalization varied in length but typically were 30 to 60 days. At the conclusion of this initial period, clinicians treating the subjects in outpatient commitment were instructed to reevaluate the legal criteria for outpatient commitment and seek recommitment if legally appropriate. These legal determinations created variability in the total length of outpatient commitment orders. If a subject was rehospitalized, outpatient commitment could be reinitiated from the hospital. Subjects in the control group were "immunized" from outpatient commitment during the year. If they were inadvertently given court-ordered outpatient commitment, control subjects were released from the order. Involuntary or voluntary hospital admissions were permitted in either group as clinically indicated.

A detailed description of the data collection has been described elsewhere (32). Briefly, interviews were conducted with the subject, a designated family member or collateral informant, and a case manager at 4, 8, and 12 months. A final assessment was conducted at 16 months to monitor poststudy effects. Interviews included personal historical information, sociodemographic profiles, clinical characteristics, understanding or acceptance of the illness, medication and treatment adherence, social support, quality of life, perceived coercion, and legal involvement as well as specific information about violent behavior and its surrounding context. Study diagnoses were based on index hospital discharge diagnoses that incorporated chart review data that included all available sources of data. These diagnoses showed very high levels of agreement with the results of structured diagnostic interviews conducted on a subsample of the subjects. Insight into the illness was assessed at baseline by use of the Insight and Treatment Attitudes Questionnaire (33–35), an 11-item scale that measured recognition of mental illness and the need for treatment. Global functioning was assessed by

the Global Assessment of Functioning Scale (36). Alcohol and substance use and abuse were assessed from the respondent's baseline self-report and the family/collateral interview, combined with hospital record review.

Data on community-based treatment services, outpatient commitment proceedings, and all psychiatric and substance abuse admissions and arrests were obtained as detailed elsewhere (32). The present report uses baseline assessments only, combined with records of outpatient services and hospital readmissions, during the 12-month follow-up period.

Table 1 describes the baseline characteristics of the control and outpatient commitment groups. As expected in a randomized controlled trial, there were few differences between the groups. Respondents in the groups were young adults, about equally men and women, predominantly African American, and of low educational attainment; few were married or cohabiting. This racial and sociodemographic composition is quite representative of the severely mentally ill population in these public hospitals and closely matches the sociodemographic composition of study subjects initially screened for the study. Whereas a majority of respondents were city residents, a substantial proportion lived in rural areas and small towns. A minority of subjects had recently been homeless.

Diagnoses of nonaffective psychotic disorders predominated in both study groups, including schizophrenia, schizoaffective disorder, and other psychotic disorders (table 1). Among affective disorders, bipolar disorder was the most common, whereas a small minority had major depression. Global level of functioning, as measured by the Global Assessment of Functioning Scale, was in the moderately impaired range—also typical of a sample with severe mental illness. Psychiatric hospital admissions in the previous year were common (mean admissions=1.5 for control subjects and 1.4 for subjects under outpatient commitment). When combining data from three sources (respondent's self-reports, family/collateral interviews, and hospital records review), alcohol or substance use was commonly reported from one or more sources in the 4 months before the index hospitalization (control subjects, 55.6%, N=75; subjects under outpatient commitment, 59.7%, N=77). Fighting was also reported by one or more sources, and most subjects had not been adherent to medication regimens at baseline, meaning at least one or more sources reported the subject had never or almost never taken psychotropic medication as prescribed during the 4 months before the index hospitalization. At baseline, as measured by the Insight and Treatment Attitudes Questionnaire, subjects generally did not view themselves as mentally ill nor in need of treatment (table 1).

To assess the randomization of subjects in the randomized controlled trial, differences in baseline subject attributes between groups were tested for significance. Differences in continuous measures

TABLE 2. Psychiatric Hospital Outcomes of Severely Mentally Ill Subjects in a Control Group and an Outpatient Commitment Group

| Variable | Control Subjects | | | Outpatient Commitment of Less Than 180 Days | | | Outpatient Commitment of 180 Days or More | | | Analysis | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | Mean | SD | N | Mean | SD | N | Mean | SD | $\chi^2$ | df | p |
| All diagnoses | | | | | | | | | | | | |
| Total admissions[a] | 135 | 1.04 | 1.55 | 82 | 0.91 | 1.23 | 47 | 0.45 | 0.80 | 6.27 | 2 | 0.04 |
| Any hospital admission | 135 | 0.48 | 0.50 | 82 | 0.50 | 0.50 | 47 | 0.32 | 0.47 | 4.53 | 2 | 0.10 |
| Total hospital days[a] | 135 | 27.92 | 51.05 | 82 | 37.66 | 61.37 | 47 | 7.51 | 15.90 | 8.51 | 2 | 0.01 |
| Nonaffective psychotic diagnoses | | | | | | | | | | | | |
| Total admissions | 83 | 1.23 | 1.73 | 60 | 0.95 | 1.28 | 35 | 0.34 | 0.80 | 11.81 | 2 | 0.003 |
| Any hospital admission | 83 | 0.54 | 0.50 | 60 | 0.53 | 0.50 | 35 | 0.23 | 0.43 | 10.83 | 2 | 0.004 |
| Total hospital days | 83 | 32.84 | 55.72 | 60 | 40.08 | 61.67 | 35 | 4.57 | 12.96 | 14.29 | 2 | 0.001 |
| Affective diagnoses | | | | | | | | | | | | |
| Total admissions | 52 | 0.75 | 1.19 | 22 | 0.77 | 1.11 | 12 | 0.75 | 0.75 | 0.54 | 2 | 0.77 |
| Any hospital admission | 52 | 0.39 | 0.49 | 22 | 0.41 | 0.50 | 12 | 0.58 | 0.52 | 1.59 | 2 | 0.51 |
| Total hospital days | 52 | 20.06 | 41.87 | 22 | 31.05 | 61.46 | 12 | 16.08 | 20.73 | 0.79 | 2 | 0.68 |

[a] Kruskal-Wallis chi-square procedures were performed on total patient admissions and hospital days by rank-analysis nonparametric ANOVAs.

were assessed by using Student's t test where appropriate. Nonparametric Wilcoxon tests were used as alternative tests when needed. Categorical variables were assessed by using chi-square procedures. Subjects in the control and experimental groups differed significantly on only two measures—insight into illness and medication noncompliance—both of which were lower in the experimental group (table 1).

## RESULTS

Hospital readmission data included any psychiatric or substance abuse readmission during the 12 month follow-up period. Specific hospital outcome measures included the total number of psychiatric hospital admissions, any admissions (zero versus one or more), and total hospital days during the study year. Hospital outcomes for the control and outpatient commitment groups did not differ significantly overall and are not shown. Although it was not directly relevant to these intent-to-treat analyses, where all subjects who gave their consent were retained in outcome analyses, attrition from the study was 18.2% (N=48) and did not differ significantly across study groups (control subjects, 15.6%, N=21; subjects in outpatient commitment, 20.9%, N=27). Attrition was possible if the subjects refused further involvement with the study or could not be located in multiple interview attempts. To examine the effect of the duration of outpatient commitment, outcomes within the outpatient commitment group were subdivided into two groups on the basis of the total number of days of outpatient commitment during the entire study period—less than 180 days or 180 days or more (table 2). Data were then retested for significance and compared to outcome measures in the control group. We are aware that subdividing the outpatient commitment group on the basis of the length of commitment involves stratification of the data on a variable (days of outpatient commitment) not amenable to the randomization. However, a key research question from the outset was whether the effectiveness of outpatient commitment would require a sustained exposure to court-ordered treatment. Because the data,

as expected, were highly skewed, total admissions and hospital days were analyzed by using Kruskal-Wallis nonparametric chi-square procedures; the binary occurrence of any admission was tested by using chi-square procedures.

Hospital outcomes appear in table 2. Data on three principal outcomes are presented: 1) the mean number of psychiatric hospital admissions, 2) the proportion of each group having at least one psychiatric hospital readmission, and 3) the mean number of hospital days for each study group during the study year. Because these outcomes were differentially affected by days of outpatient commitment, data within the outpatient commitment group are divided into subjects who received less than 180 days and 180 days or more of outpatient commitment. The rank values for both the mean number of admissions and the mean number of hospital days differ significantly according to the length of outpatient commitment, as determined from Kruskal-Wallis tests. As shown in table 2, relative to control subjects, sustained outpatient commitment reduced mean admissions by roughly 57% and hospital use by 20 days. The proportion of subjects with any hospital admissions, although showing this trend, failed to reach statistical significance in these bivariate analyses.

Exploratory analyses demonstrated that certain diagnostic subgroups, especially individuals with nonaffective psychosis disorders, seemed to differentially benefit from longer periods of outpatient commitment. When we refined the above analyses on two clinical subgroups stratified by diagnoses, we found the effect of sustained outpatient commitment on hospital outcomes occurred primarily among study subjects with nonaffective psychotic diagnoses (schizophrenia, schizoaffective, or other psychotic disorder), where mean admissions were significantly reduced approximately 72% and mean hospital stays by 28 days. Psychotic subjects in the sustained outpatient commitment group were also admitted less than half as often as those in the control group. In striking contrast, no sig-

nificant differences were found between groups for study subjects with a discharge diagnosis of an affective disorder (bipolar or major depression). Although we failed to find any indication that outpatient commitment had a positive impact on subjects with an affective disorder, these subjects constituted less than one-third of our sample, and these analyses may have lacked sufficient statistical power to identify differences.

Because the renewal and subsequent length of court orders for outpatient commitment were determined by the application of outpatient commitment legal criteria, the total length of orders for outpatient commitment could not be randomly assigned. Thus, results demonstrating lower hospital use among subjects with longer periods of commitment could be subject to postrandomization selection bias. Hypothetically, it is possible that more tractable subjects were selected for longer periods of outpatient commitment. In fact, multivariable analyses (not shown) that predicted total days of outpatient commitment among experimental subjects revealed that less tractable subjects—those with lower insight and lower medication adherence at baseline—received longer periods of outpatient commitment.

To further address this potential problem of nonrandom variability in the length of outpatient commitment orders, we also examined the data by using repeated measures logistic regressions (37). When we treated each month as a separate or new period of observation, this technique provided more data points for analysis. It also avoided the problem of post hoc stratification according to the length of outpatient commitment and did not rely on skewed distributions of continuous outcomes such as lengths of hospitalization. The outcome measure for these analyses was restricted to a dichotomous measure of whether a psychiatric readmission had occurred at each of the 12 consecutive months during the study interval. Akaike's information criterion (38) was used to select among competing covariance structures. Models estimating the likelihood of an admission in each of the 12 consecutive months of the study were estimated by using the randomized intent-to-treat sample and included baseline control variables. A marker variable for study attrition was tested at each stage of analysis, as was the interaction of that marker with the binary variable denoting group membership.

Statistical modeling was accomplished by using a series of staged analyses. Demographic covariates—including age, race, gender, education, and marital status (single and not cohabiting)—were initially tested for significance by using stepwise selection procedures. A probability level of 10% was used as a criterion for including and retaining variables in the model at each stage. In the next stage, variables included diagnosis (psychotic or affective disorders), global functioning (Global Assessment of Functioning Scale score), insight into illness (Insight and Treatment Attitudes Questionnaire score), fighting, substance use, and medication noncompliance—all measured over the 4 months before the baseline interview. A dichotomous

indicator of group membership (control or outpatient commitment) was introduced in the final stage. A variable representing study month was included in each stage. The interaction between psychotic diagnosis and group membership was also tested by using the model derived as already described on the basis of a clinical hypothesis that the outpatient commitment intervention might be more effective among individuals with psychotic diagnoses whose treatments could be organized around adherence to antipsychotic medication.

In stage 1 of this model (main effects), higher levels of education (odds ratio=0.93, 95% confidence interval [CI]=0.88–0.99, $p \leq 0.05$) and global functioning, measured on the Global Assessment of Functioning Scale (odds ratio=0.95, 95% CI=0.93–0.98, $p \leq 0.001$), were associated with a lower odds of any psychiatric admission over the 12-month study interval. No trend for time (month of trial) was apparent, although the time variable was included in all models, as appropriate for repeated measures analyses. A variable for subjects with psychotic diagnoses (contrasted with affective diagnoses), although not significant, was included in this stage to permit a test of the group-by-diagnosis interaction (tested in stage 2). Assignment to the outpatient commitment group was associated with a significantly lower odds of any readmission (odds ratio= 0.64, 95% CI=0.46–0.88, $p \leq 0.01$). Although the overall group assignment (outpatient commitment or control) was significant in this model, as demonstrated in table 2, this effect was dependent on increasing days of outpatient commitment. The interaction between diagnosis and outpatient commitment assignment was tested in stage 2. Subjects in outpatient commitment with a psychotic diagnosis had a significantly lower odds of having any hospital readmission (odds ratio= 0.44, 95% CI=0.21–0.91, $p \leq 0.05$) over the ensuing 12 months than the respondents with affective diagnoses. This is also apparent from the improvement in model fit as determined by the difference in –2 log likelihood functions between the two models (–2 log likelihood increment in fit=4.83, $p \leq 0.05$). In no case were proxy variables for attrition or for the interaction between attrition and the experimental group significant.

Although the effects of length of outpatient commitment and intensity of outpatient mental health treatment were of major interest, neither variable was under experimental control. A second series of repeated measures logistic regression models was estimated by using the models as already described but included additional variables for days of outpatient commitment and amount of outpatient mental health services for each month. To ensure causal order, outpatient commitment days and services in any given month were lagged so that they predicted hospital readmissions in the subsequent month. Both a main effects model and a model estimating an hypothesized interaction between days of outpatient commitment and the amount of outpatient mental health services received were tested. The total number of outpatient services per

**FIGURE 1. Cumulative Mean Psychiatric Hospital Admissions Among Subjects With a Psychotic Diagnosis, by Level of Outpatient Service Use**
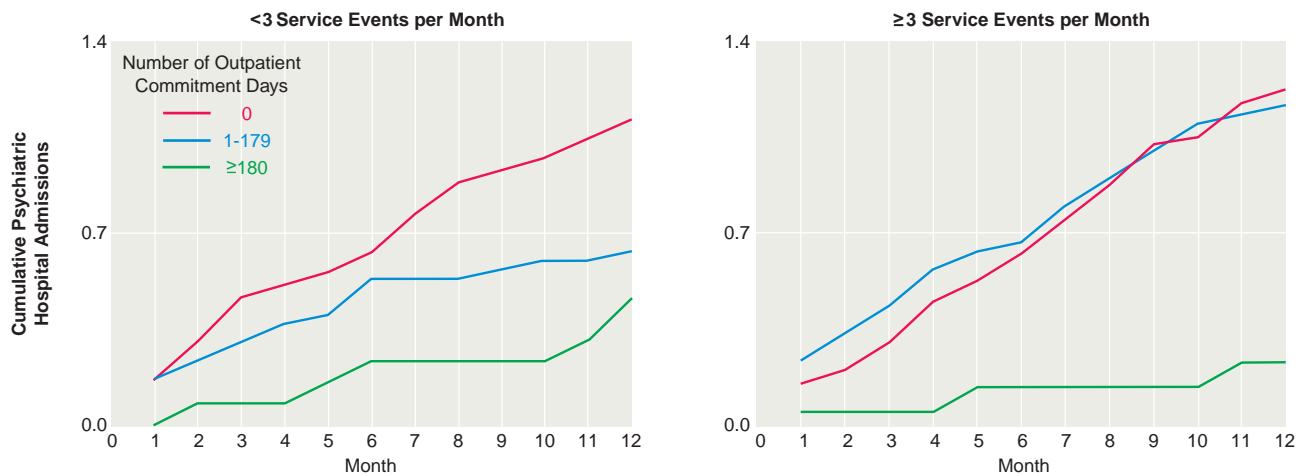


month was truncated at a maximum of 20 per month to control for outliers.

The relationship between days of outpatient commitment and number of outpatient mental health services used was restricted to the psychotic subsample on the basis of evidence already presented that outpatient commitment is most convincingly effective within this subgroup. In stage 1 of this new model, the number of outpatient commitment days received in any given month was associated with a significantly lower odds of any hospital readmission (odds ratio=0.98, 95% CI=0.97–1.00, p≤0.05) in a subsequent month. In contrast, the number of outpatient mental health services in any given month, although associated with higher odds of an admission, was not significant. An hypothesized interaction between days of outpatient commitment received per month and monthly service events was tested in stage 2. Addition of the interaction term for outpatient commitment days and outpatient mental health services was significant (odds ratio=1.00, 95% CI=0.99–1.00, p≤0.05) and was associated with a significant improvement in model fit as determined from the increment in –2 log likelihood scores (–2 log likelihood increment in fit=7.61, p≤0.05). The beneficial effect of outpatient commitment on hospital admissions occurred among psychotically disordered subjects receiving more days of outpatient commitment in combination with higher levels of services; neither extended periods of outpatient commitment nor higher levels of service alone was associated with lower odds of admission.

Similar findings in a different metric are presented graphically in figure 1, which depicts cumulative mean psychiatric hospital admissions over the 12-month study interval among respondents with psychotic diagnoses. Data on the left panel of figure 1 represent cumulative admissions by number of outpatient commitment days (0, 1–179, 180 or more) among study subjects receiving fewer than the median of three out-

patient mental health services per month. (The median within this group was 1.1 services per month.) Data in the right panel were calculated from subjects receiving a higher-than-median level of services per month. (The median within this group was 7.5 services per month.) The graphic shows that outpatient commitment was significantly more effective among respondents receiving the combination of extended periods of outpatient commitment (180 days or more) and higher levels of services. In the absence of sustained periods of outpatient commitment combined with higher levels of services, cumulative readmissions did not significantly differ. These findings were further substantiated with stratified logistic regression analyses (not shown), which demonstrated a significant month-by-dose interaction among subjects with higher-than-median treatment levels per month. These interactions were not significant in the group that received lower levels of services.

## DISCUSSION

We found that subjects who underwent a longer and sustained period of involuntary outpatient commitment had approximately 57% fewer hospital readmissions and used 20 fewer hospital days than the control subjects. Outpatient commitment was shown to be particularly effective for individuals with psychotic disorders, reducing readmissions approximately 72% and hospital days by 28 on average. In repeated measures multivariable analyses—treating each month as a separate period of observation—the outpatient commitment group had significantly better hospital outcomes, even without considering the total length of outpatient commitment orders. Finally, in subsequent repeated measures analyses examining the role of outpatient treatment, it was found that sustained outpatient commitment reduced hospital readmissions only

when combined with a higher intensity of outpatient services. Longer periods of commitment were also strongly associated with higher outpatient service levels, which suggests that providers delivered more intensive services to people on sustained periods of outpatient commitment. In contrast, subjects who underwent shorter periods of outpatient commitment, regardless of outpatient service use, were as likely as those with no outpatient commitment to return to the hospital, to have multiple hospitalizations, and to have longer lengths of stay if readmitted.

These findings suggest that whereas sustained outpatient commitment combined with higher intensity treatment may be effective for severely mentally ill people, especially those with psychotic disorders, a brief period of court-ordered treatment may have no effect or even an adverse effect (i.e., by further antagonizing the individual forced to comply with treatment), while also providing little benefit. It is important that the experience of outpatient commitment was significantly associated with an increase in perceived coercion and decreased autonomy (32). Our analysis suggests that outpatient commitment is only effective when it is associated with fairly regular and sustained levels of outpatient services—averaging more than seven services per month. Without this level of service use, the presence of outpatient commitment alone was not sufficient to affect hospital outcomes. These findings were verified in multivariable models by identifying a statistically significant interaction between the length of outpatient commitment and the volume of outpatient services, which predicted reduced rehospitalizations. In sum, involuntary outpatient commitment can provide some benefit in hospital outcomes but potentially at the risk of alienating some individuals from treatment. When outpatient commitment works, it operates only when it is sustained and is in concert with relatively intensive treatment. These findings also suggest that outpatient commitment works when it represents a reciprocal commitment by community programs to provide sustained and intensive treatment to patients under court orders. In fact, these findings suggest that outpatient commitment may exert most of its effect on providers.

Two randomized trials of outpatient commitment in much different settings—New York City and north central North Carolina—provided conflicting results. The New York City Bellevue study (unpublished 1998 report by Policy Research Associates) tested the incremental benefit of outpatient commitment combined with a hospital-based community coordination team. In contrast, the North Carolina study provided outpatient commitment with community-based case management alone as a service enhancement. The smaller sample size in New York City likely led to less statistical power than the North Carolina study and less power to detect the subgroup differences described in the present North Carolina study. A number of other differences between these outpatient commitment pro-

grams, such as the pilot status of the New York City program, also make these two studies difficult to compare. Further analyses comparing the New York City and North Carolina studies should provide valuable insight into the treatment and community environments in which outpatient commitment may or may not be effective.

There are several limitations to this study. As a community-based randomized trial, neither subjects, providers, nor judges were blind to the study assignment or the treatment provided—a typical problem in studies where treatment assignment cannot be concealed. In addition, court orders were requested by clinicians on the basis of legal criteria and ordered when legally appropriate by the court. Our analyses suggest that whereas bias may have existed in the renewal of outpatient commitment orders, by and large, the subjects at highest risk for relapse were selected for sustained periods of commitment. Further, individuals selected for longer periods of outpatient commitment were also provided with more intensive treatment. Thus, outpatient commitment can work to reduce hospital readmissions and total days of hospitalization when court orders are sustained for 6 months or more and serve to prioritize more intensive treatment for individuals at high risk for relapse, particularly those with psychotic disorders. Future analyses will explore why outpatient commitment, at least in this trial, appears to be more effective among psychotically disordered subjects and less effective among affectively disordered individuals. Geller (39) has suggested that outpatient commitment is clinically effective in treating bipolar disorders, and this may well be the case with longer court-ordered commitment. This trial was limited to 12 months and cannot be generalized to different durations of outpatient commitment or markedly different treatment approaches.

The present report focuses on one policy-relevant outcome domain—hospital use. However, other outcomes such as violent behavior, social functioning, family, and criminal justice outcomes are also of high relevance. Analyses of these outcome domains are forthcoming. Finally, while it focuses on hospital use, this report does not elucidate the mechanism of action of outpatient commitment. Such a multistage analysis of the process by which outpatient commitment affects a range of outcomes is also forthcoming. Nonetheless, we find that carefully targeted use of outpatient commitment can reduce hospital recidivism. This use of outpatient commitment is not a substitute for intensive treatment but, rather, requires a substantial commitment of treatment resources to be effective.

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