An Analysis of Successful Efforts to Reduce the Use of Seclusion and Restraint at a Public Psychiatric Hospital

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Objective: **The author reviews and evaluates a variety of interventions that were considered to have contributed to the successful reduction of reliance on the use of seclusion and restraint in a public psychiatric hospital for adult patients with severe and persistent psychiatric impairments.** ***Methods:*** **A multiple regression analysis was applied to monthly seclusion and restraint data covering the period from 1997 to 2002. The independent variables were each of the component efforts to reduce reliance on seclusion and restraint at the hospital: changes in the criteria for administrative review of incidents of seclusion and restraint, changes in the composition of the case review committee, development of a behavioral consultation team, enhancement of standards for behavioral assessments and plans, and improvements in the staff-patient ratio.** ***Results:*** **The use of seclusion and restraint was 75 percent lower during the final year of the five-year study period than it was during the first year. The only variable that was significantly associated with reduction in the use of seclusion and restraint was changes in the process for identifying critical cases and initiating a clinical and administrative case review.** ***Conclusion:*** **The results of this analysis underscore the importance of clinical and administrative priorities in efforts to reduce the use of seclusion and restraint in public psychiatric hospitals. (*Psychiatric Services* 54:1119–1123, 2003)**

Public-sector providers of psychiatric care face complications that are not encountered as often in other treatment settings. For example, public psychiatric inpatient settings are essentially the treatment settings of last resort for persons with severe, persistent, and frequently dangerous impairments who have not responded adequately to services available in community or private-sector alternatives. This treatment is typically provided in a context of significant resource limitations.

One result of these realities is that disruptive or dangerous behavior is sometimes managed through unnecessarily restrictive procedures (1) without a strong countervailing influence from management. Such an approach leads to a variety of outcomes that detract from the quality of care. The excessive reliance on seclusion and mechanical restraints to minimize disruptive and dangerous behavior in custodial care settings makes it unlikely that these mentally ill individuals will develop the daily living and coping skills required to successfully manage challenging circumstances outside of the inpatient setting.

A variety of system and treatment interventions have been demonstrated to be useful in reducing reliance on seclusion and restraint in this treatment setting. The development and implementation of individualized behavioral treatment plans has been demonstrated to reduce reliance on seclusion and restraint for challenging patients (2,3). At the clinical and administrative level, the implementation of a ward-based token economy and contingency management programming have also been demonstrated to reduce violence and the associated use of seclusion and restraint in such settings (4–6).

Beyond these approaches, the priorities of review authorities as well as clinical and administrative leadership can have an influence on efforts to reduce the use of seclusion and restraint. When reducing the reliance on seclusion and restraint is clearly established as a priority by such leaders, such a reduction typically follows (7–9).

Despite this evidence, such measures are often not realized. Behavioral principles are seldom applied effectively in psychiatric care settings (10,11), and token-economy and contingency-management systems are more the exceptions than the rule (12,13). Fiscal limitations often preclude improvements in the staff-patient ratio and in the behavioral competence of direct care staff, both of which have also been demonstrated to lower reliance on the use of seclusion and restraint (14).

This article reviews and analyzes efforts that were successful in reducing reliance on seclusion and restraint

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in a public psychiatric hospital in Virginia. This hospital shares challenges faced by most public psychiatric hospitals—most notably, a large proportion of adult patients with severe and persistent psychiatric conditions that have proven refractory to a variety of interventions. A majority of patients (70 percent) have a diagnosis of schizophrenia or schizoaffective disorder, and approximately 75 percent of the hospital census represents persons who could not be managed in the context of resources available in the community at that time. Approximately two-thirds of the patients have concurrent diagnoses, including substance abuse, dysfunctional personality traits or disorders, and mild mental retardation.

Over a period of five years (July 1997 through June 2002) the hospital implemented measures that reduced reliance on seclusion and restraint from an average of 1,244 hours per month during the first year of the project to an average of 314 hours per month during the final year, or a reduction of 75 percent. The reduction efforts encompassed a variety of approaches involving all departments of the facility.

Focal efforts

Changing criteria for administrative review

One of the focal efforts to reduce the use of seclusion and restraint involved incremental changes in the hospital's criterion for instigating an administrative and clinical review of critical cases. Before the beginning of the study period, cases of seclusion and restraint were reviewed by a hospital committee if they exceeded a set threshold of six applications or 72 hours' duration of seclusion or restraint within a monthly period. The committee review typically resulted in the development of a behavioral treatment plan to address issues that provoked the use of seclusion and restraint. This procedure and the resulting plans had proven successful in reducing reliance on seclusion and restraint for the individual patients involved (3).

Nevertheless, the extant procedure was considered too slow, because it allowed some patients to exceed threshold levels for up to six weeks before a review was initiated. Thus data-reporting capabilities were enhanced to allow the threshold for review to be gradually lowered, thereby speeding the review process—to three applications or 24 hours' duration during a monthly period beginning in month 12, then to three applications or 12 hours' duration during a weekly period beginning in month 18, and finally to two applications or eight total hours during a weekly period beginning in month 25.

These changes enabled a more timely review and consideration of a behavioral treatment plan as well as other interventions, such as changes in the patient's medication regimen. Most important, the process of progressively lowering the threshold for review enabled a stronger and more rapid indication of interest and concern about reliance on seclusion and restraint for identified cases on the part of clinical and administrative leaders.

One component of the focal efforts to reduce the reliance on seclusion and restraint involved the addition of several standards for assessing the quality of behavior plans.

Changing the composition of the case review committee

As noted above, the review procedure predated the beginning of the study period. However, a second intervention involved a variety of changes in the composition of the review committee. The committee initially comprised a variety of direct care clinicians, representing primarily psychology and nursing, who reviewed the cases and made recommendations for possible changes in treatment. Although the efforts of this committee had been demonstrated as being successful in reducing the reliance on seclusion and restraint (3), it was expected that the committee's visibility, authority, and impact could be enhanced.

Thus the composition of the committee was changed, in month 23, to include all major clinical department heads as well as the hospital director, a consulting clinical psychopharmacologist, and members of a newly formed team of behavioral consultants. That is, at the same time that the criteria for review were being lowered as described above, the review committee membership was altered to include clinical department heads who had supervisory authority.

Development of a behavioral consultation team

Previous research at the hospital demonstrated that the implementation of a professionally developed behavioral treatment plan could be successful in reducing reliance on seclusion and restraint (3,15). However, the resources available for accomplishing this task limited the timely and effective development of such plans. During the beginning of the five-year period, the development of a behavior plan was primarily the responsibility of a clinical psychologist who had coverage responsibility for the relevant ward. This person had to rely on other members of the treatment team to provide observational data and effectively implement a plan.

Despite the success reported previously (15), there appeared to be room for improvement through the commitment of additional resources.

Consequently, a behavioral consultation team was created during month 29. This team consists of two behavioral clinical psychologists and two paraprofessional behavior specialists with specific training in behav-

ioral assessment methods. This team consults to all areas of the hospital on request and monitors treatment planning meetings to provide treatment suggestions from a behavioral perspective. The establishment of this team allowed for the more formal collection of observational data along with enhanced opportunities to assess the quality of plan implementation and the collection of outcome data with which to assess progress.

Enhancing standards for behavioral assessments and plans

Another component of the focal efforts to reduce the reliance on seclusion and restraint involved the addition of several standards for assessing the quality of behavior plans. This approach effectively increased the number of quality standards for the assessment of behavior plans from 16 at the beginning of the study period to 20 after month 44. The resulting behavior plans were more detailed and were based on more supportive data. An additional set of 54 standards was established for formal behavioral assessments, representing a new area of emphasis for oversight efforts. Before the behavioral consultation team was established, compilation of formal behavioral assessment reports was considered unrealistic because of time and resource constraints. Compliance with these standards was assessed through the psychology department's peer review process.

Improvements in staff-patient ratio

Efforts were also made to improve the staff-patient ratio at the hospital. Previous research has demonstrated an association between the adequacy of psychiatric staffing and reliance on seclusion and restraint (14). Over the five-year study period, the staff-patient ratio increased from an initial ratio of 2 to 1 during the first month of the study to a ratio of 3.3 to 1 during the final month, an increase of 52 percent. These figures include all staff employed at the facility, including support staff. The increase was gradual over the five-year period, with the pace of change accelerating slightly during the middle three years (from a ratio of 2 to 1 in July 1997 to a ratio of 2.2 to 1 in June 1998, 2.5 to 1 in June 1999, 2.9 to 1 in June 2000, 3.2 to 1 in June 2001, and 3.3 to 1 in June 2002).

An off-ward psychosocial day treatment program was established and expanded throughout the study period. No formal off-ward day programs existed at the hospital at the beginning of the period. A day program was established to provide a minimum of four hours' involvement for each participant per day. At the start of the day program in the fifth month, 18 percent of the patients were involved; this proportion expanded to 24 percent in the eighth month, 27 percent by the 13th month, 37 percent by the 19th month, 42 percent by the 22nd month, 61 percent by the 37th month, 66 percent by the 39th month, 72 percent by the 47th month, and 98 percent by the 54th month.

Methods

The statistical analysis of these efforts to reduce reliance on seclusion and restraint, which were implemented according to assessed need and ability rather than as part of a research design, posed an important challenge. The impact of the changes discussed above on the use of seclusion and restraint was assessed by using multiple regression analysis. Because the total hospital census declined during the five-year period from 381 to 252 (33 percent), the monthly data for reliance on seclusion and restraint over the period divided by the inpatient census for that month served as the dependent variable.

The independent variables were the monthly staff-patient ratio over the five-year period, the four threshold levels for administrative review, the two different compositions of the review committee (initially line staff and then department heads), the two different levels of behavioral consultation capability (initially the ward psychologist and then the consultation team), the two different quality standards for behavioral assessments and plans, and the continuous variable of increasing levels of involvement in the psychosocial day program.

A stepwise inclusion method was used for the multiple regression analysis. This approach first identifies the most potent predictor of the dependent variable that exceeds a set probability level ($p<.05$). The second most potent predictor is then included on the basis of partial correlations. The incremental predictive value of the second variable to the model is then assessed. If the incremental value falls below a set probability criterion ($p<.1$), it is removed. The stepwise model continues to add variables to the regression model if they meet the criterion level for inclusion and, once included in the model, do not meet the criterion for exclusion. Once a variable fails to meet either requirement, the selection process ends. Thus the process continues until no additional variables can be added that enhance the accuracy of the regression equation.

Table 1

Results of regression analysis of efforts to reduce reliance on seclusion and restraint at a public psychiatric hospital

Variable	R^2	Standardized beta	t	df
Review procedure	.34	–.58	–5.43*	55
Day program expansion	.37	.30	1.77	59
Staff-patient ratio	.38	.24	.93	59
Consultation team	.38	.16	.88	57
Committee membership	.38	.16	.64	57
Behavior plan standards	.38	.10	.86	57

*$p<.01$

Results

The results of the regression analysis are outlined in Table 1. The analysis identified administrative review as the most potent predictor among the variables included in this study. This

variable met the criterion for entry into the regression equation and, after testing, was retained in the equation (t=–5.43, df=58, p<.01). None of the other variables subsequently met the criterion for entry, with partial correlations ranging from .08 to .23. Thus only the administrative review variable was retained in the regression formula.

The complex relationships between independent variables in a multiple regression analysis can sometimes affect the results of the analysis in unpredictable ways. Independent variables that are correlated may share irrelevant variance (variance not shared with the dependent variable). One of these variables can, therefore, suppress variance of the other, thereby artificially influencing the partial correlation value and the estimate of the relationship with the dependent variable (16). In this analysis, the signs of the betas for all nonsignificant variables were the opposite of what was expected, suggesting that this phenomenon may have affected the results.

To further assess the impact of these variables on reliance on seclusion and restraint, analyses of covariance were performed for each factorial variable, with adjustment for the staff-patient ratio and level of involvement in the psychosocial day program, the two continuous variables, as covariates with hours of seclusion and restraint. Considered independently of all the other variables, the staff-patient ratio (r=–.48, t=–4.26, df=58, p<.01), and the increasing psychosocial day program involvement (r=–.34, t=–2.73, df=58, p<.01) were both correlated with reliance on seclusion and restraint reliance.

When the association between these variables and hours of seclusion and restraint were controlled for through a covariance adjustment, the review procedure continued to show an association with reliance on seclusion and restraint (F=4.39, df=3, 54, p<.01). No association was found for any of the other factorial variables, including changes in composition of the review committee, changes in standards for behavioral assessments and plans, and establishment of an independent behavioral consultation team.

Discussion and conclusions

This study cannot be considered as an experimental evaluation of the interventions described in this article. The controls necessary for such a focused evaluation are often difficult to realize in practice settings. For example, several of the variables included in this study were implemented over a period of several months, and it is somewhat simplistic to represent them as categorical "before-and-after" variables. Behavioral treatment plans, for example, depend not only on the adequacy of treatment plan formulation but also on the adequacy of implementation by direct care staff who may be limited in their competence to apply such methods.

The establishment and refinement of the administrative review procedure was the most important factor for the success of efforts to reduce reliance on seclusion and restraint at this hospital.

It was impossible to assess the implementation of these plans in a detailed manner. In addition, the expansion of the psychosocial day program progressed according to various logistical challenges faced by the facility and could not be realized in the controlled manner that would better accommodate research design and analysis.

Despite these cautionary comments, it is useful to analyze and report data such as these, because they are more representative of the natural conditions under which clinical care is provided and evaluated. If statistical methods of analysis can be applied with these limitations in mind, they may provide guidance for both researchers and practitioners about ways to understand, further study, and improve psychiatric care. Thus such results may be more relevant to treatment settings in which it is much more difficult to isolate, control, and analyze specific independent variables. Because many psychiatric facilities collect data such as these on a regular basis and use the data in clinical decision making, there should be some effort to assess the data's validity and the conclusions based on them. Research and analysis procedures developed for laboratory settings can be usefully applied in practice settings as long as those who use them remain cognizant of their limitations.

Within this context, the results of this analysis highlight the establishment and refinement of the administrative review procedure as the most important factor for successful efforts to reduce reliance on seclusion and restraint at this hospital. The other variables included in the study paled by comparison. The impact of review procedures is underscored by a comparison of data from the fall of 1997 with data from the fall of 2001. Reliance on seclusion and restraint, adjusted for hospital census, was essentially equal during these two periods. However, the level of reliance on seclusion and restraint during the fall of 1997 subsequently increased dramatically, partly because of the slow pace of the review process. However, in the fall of 2001 these levels attracted a much more rapid review and adjustment of the treatment plan. Thus the wide variability across months that was possible during the early stages of the study became much less likely to occur as the review process became more timely and efficient.

The results of this study must be interpreted within the context of the care being provided at the facility at the beginning of the study period. For example, it should not be concluded that the development and implementation of a behavioral treatment plan is not a significant factor in efforts to re-

duce the use of seclusion and restraint. Previous studies at this facility clearly established the relevance of such plans for this purpose (3,15). Rather, this study found that enhancements to the existing procedure for development of such plans did not have an incremental impact on reliance on seclusion and restraint. Also, these efforts were pursued within the context of an established training program in behavioral applications for direct care staff (17). Most direct care staff had been trained in this program and thus obtained associated benefits in terms of their knowledge and competence levels, occupational stress levels, and ability to cope with organizational change (18).

In addition, when the interventions were undertaken the hospital already had a staff of 17 licensed clinical psychologists who had implemented the previous efforts (3) and who now serve as the primary spokespersons between the review committee and treatment teams. The impact of improved behavioral standards and consultation opportunities may be more significant in settings that do not have such preexisting conditions.

It is also relevant to note that this study evaluated the contribution of the independent variables in relation to reliance on seclusion and restraint as the outcome variable. The variables included in this study may beneficially affect other important outcome variables that were not examined as part of this study. For example, the implementation of enhanced behavioral treatment plans may lead to improvements in a variety of self-care and self-management skills that are critical to the successful transition to a community care setting. The same result could reasonably be expected from the increased opportunity for exposure to psychosocial day programming. Again, this is an important outcome even if that person was not at high risk of requiring seclusion or restraint while receiving inpatient care.

Thus this analysis has shown that, first and foremost, reduction of seclusion and restraint must be clearly prioritized as an objective of the facility, which must be supplemented by a timely performance monitoring and feedback procedure. In this study, the administrative review procedure and the progressive lowering of thresholds to provoke a formal review served as a clear and persistent reminder of this priority from clinical and administrative leaders. The leaders effectively projected their interest and concern by reviewing the use of seclusion and restraint on a frequent basis and initiating a formal discussion of cases in which thresholds were exceeded. The results provide statistically valid support for such a procedure as a priority in implementing efforts to reduce the use of seclusion and restraint.

These conclusions are based on statistical analysis of the clinical data collected at this facility. Although far from realizing the rigor of a laboratory study, the application of statistical analysis to these data enables a deeper understanding of the relative impact of the many components of this successful effort to reduce the use of seclusion and restraint. By achieving this understanding, this hospital is better prepared to build on its successes and can provide more useful guidance to other facilities. ♦

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