Reduced Mortality Among Department of Veterans Affairs Patients With Schizophrenia or Bipolar Disorder Lost to Follow-up and Engaged in Active Outreach to Return for Care

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Objectives. We determined whether contacting Department of Veterans Affairs (VA) patients with schizophrenia or bipolar disorders (serious mental illness [SMI]) who had dropped out of care for prolonged periods resulted in reengagement with VA services and decreased mortality.

Methods. We developed a list of patients with SMI who were last treated in fiscal years 2005 to 2006, and were lost to follow-up care for at least 1 year. VA medical centers used our list to contact patients and schedule appointments. Additional VA administrative data on patient utilization and mortality through May 2009 were analyzed.

Results. About 72% (2375 of 3306) of the patients who VA staff attempted to contact returned for VA care. The mortality rate of returning patients was significantly lower than that for patients not returning (0.5% vs 3.9%; adjusted odds ratio = 5.8; $P < .001$), after demographic and clinical factors were controlled.

Conclusions. The mortality rate for returning patients with SMI was almost 6 times less than for those who did not return for medical care. Proactive outreach might result in patients returning to care and should be implemented to reengage this vulnerable group. (*Am J Public Health.* 2012;102:S74–S79. doi: 10.2105/AJPH.2011.300502)

Serious mental illness (SMI), including patients with schizophrenia and bipolar disorder, is associated with substantial functional impairment, morbidity, and premature mortality.[1,2] In a given year, Veterans Affairs (VA) treats more than 230 000 patients for SMI.[3] VA patients with SMI die on average 13 to 18 years younger than the US general population,[1] and this mortality gap exceeds 20 years in non-VA populations.[2] A key driver of premature mortality among VA and non-VA patients with mental disorders is medical comorbidity, and cardiovascular disease is the number 1 cause of death.[4] Persons with SMI have standard mortality ratios that are about 2.5 times greater than those of the general population.[2]

Improving access to medical care and the continuity of that care to reduce the risk of premature mortality among patients with SMI are important goals within VA and non-VA health care systems.[4,6,7] In a recent VA health services study, researchers reported that VA patients with schizophrenia with little care in the previous year were more likely to die than those without schizophrenia, suggesting that treatment dropouts in this group might be a significant risk factor in mortality and that efforts should be made to provide them treatment.[8] Similarly, patients with bipolar disorders as well as schizophrenia who were burdened by comorbid medical conditions might be prescribed medications that require regular monitoring (e.g., second-generation antipsychotics and mood stabilizers).[5]

Improving access to care for VA patients with schizophrenia or bipolar disorder has been a consistent priority goal, as stated in the Veteran Health Administration's (VHA) *Uniform Mental Health Services Handbook* and with Congress under the 1996 Public Law (104-262). Since the early 1990s, VA has modified its care-delivery system by moving from an inpatient to an outpatient model. Between 1993 and 2009, overall hospital admissions declined 33%, whereas the number of outpatient visits tripled.[9,10] Greater reliance has therefore been placed on community-based programs and ambulatory case management for veterans in general. Although veterans with SMI face substantial functional limitation and increased risk of hospitalization, there has been no national effort to date to facilitate reengagement among veterans with SMI who drop out of VA care.

In December 2010, the VHA's Office of the Medical Inspector (OMI) completed a landmark quality improvement project whose objectives were to identify and contact veterans with SMI who dropped out of care for a minimum of 1 year, and to offer them VA medical services. We described this project and presented the results on patient reengagement. We also compared mortality rates of patients returning to VA care after prolonged absences with mortality rates of patients who did not return.

METHODS

We identified patients with SMI, including schizophrenia (*International Classification of Disease-9th Revision-Clinical Modification*[11] [*ICD-9-CM*] codes 295.0–295.9) or bipolar disorders (*ICD-9-CM* codes 296.0–296.8), by using data from the VA National Psychosis Registry (NPR) in fiscal years (FYs) 2005 and 2006. The NPR is a continuous registry of all veterans diagnosed with psychosis who have received VHA services from FY 1988 to the present, based on inpatient and outpatient claims data from the VA's National Patient Care Database (NPCD). Patients were included in the NPR provided that they were treated for 1 of the qualifying diagnoses in inpatient or outpatient claims data files. Patients eligible to be included in this study had at least 1 SMI diagnosis and were lost to follow-up care for a minimum of 1 year and had no outpatient visits or inpatient stays of more than 2 days within the VA health

care system. During FY 2005, there were 1913 patients diagnosed with SMI who were treated in VA facilities and dropped out of VA care for a minimum of 12 months. In FY 2006, there were 2958 patients diagnosed with SMI who were treated in VA facilities and dropped out of VA care for a minimum of 12 months. Overall, 4871 eligible patients diagnosed with SMI were included in this study and lost to follow-up VA care for a minimum of 1 year. For FY 2005, this was approximately 1% of the 173 637 patients with SMI who were treated in VA facilities. For FY 2006, this was approximately 2% of the 175 136 patients with SMI who were treated in VA facilities. A VA medical center (VAMC) institutional review board evaluated the protocol for this assessment and determined that it was a quality improvement effort, not research.

The list of patients was reduced further by identifying decedents. This was accomplished by matching patient identifiers—social security numbers and names—with those in the computerized death records, including date of death from the Social Security Administration (SSA) and the VA Beneficiary Identification Locator System (BIRLS) that were available in September 2007. For the remaining patients, their telephone numbers and addresses were added by matching patient identifiers with the VA National Enrollment Data file. Patients were then assigned to the VAMC where they had last received care. The lists of patients for each facility were then assembled and sent to the 138 VAMCs.

Each VAMC was asked to choose a point of contact (POC) to be responsible for following up on patients on their list who had dropped out of care. The majority of the VAMC points of contact were social workers (including VA local recovery or suicide prevention coordinators), nurses, and psychologists.

POCs were asked to review their patient lists before contacting patients and exclude those who met certain criteria. Each POC was asked to remove from their list those who had subsequently died according to their medical records (n = 80). Other veterans that POCs were requested to exclude from the study were those who were institutionalized (n = 806); were scheduled for clinic or emergency room visit (n = 449); had provided incorrect contact information (n = 81); were ineligible for VA care (n = 77); had to relocate to another state or region (n = 59); or other reasons (n = 43). Of the 80 patients reported to have died, we identified 40 who died before the start of the assessment from updated BIRLS and SSA death files and excluded them from the analysis. As a result, the assessment population for the analysis was reduced from 4871 to 3306 patients who staff attempted to contact and ask them to return for care.

The POCs used several methods to contact patients. About 96% (133 of 137) of the POCs telephoned the patients. About 90% of the POCs (124 of 137) sent a letter to each patient. Face-to-face contacts with patients were used at 106 VAMCs, and these included staff meeting patients on the street, in single room hotels, and meetings in shelters or group homes. Every POC completed a reporting form for each patient on their list. The reporting form consisted of structured questions about whether there was an attempt to contact the patient, whether contact was made, reasons for not contacting the patient, whether the patient was referred for care, and reasons the patient did not want care.

We used univariate statistics to describe the patients who dropped out of care, and bivariate analyses to compare the patient characteristics of those who POCs attempted to contact and returned for care versus those who did not return. We also queried VA administrative data files for the study period up to 20 months after initial contacts to determine use of VA services. Death rates and odds ratios were calculated to assess the difference in the probability of mortality up to May 1, 2009 (representing 21 months of follow-up time), by comparing patients who did and who did not return to VA for care. We employed Inquisite software (Allegiance, Austin, Texas) to conduct the surveys at VA facilities and SAS (version 9.1; SAS Institute, Cary, North Carolina) to process and analyze the data.

The study team conducted a multivariable analysis to determine whether not returning for VA care was associated with a greater probability of mortality, after adjusting for potential explanatory variables. Using logistic regression, we modeled the probability of death during the evaluation period, controlling for patient age, gender, marital status, Charlson Comorbidity Index,[12–14] mental health diagnoses, and whether the patient returned for VA care. We used the 20 comorbidities that compose the Charlson Comorbidity Index (based upon *ICD-9-CM* codes recorded in the NCPD files during the last 2 years of contact before the patient dropped out of treatment). The explanatory variables in the model were categorical and were converted into dummy-coded variables for patient age, gender (reference: male), marital status, mental health diagnosis, and Charlson Comorbidity Index. The coefficients (β) were the weights for the variables, and the SEs were the estimated errors for the weights. The Wald test statistic was calculated from the data and compared with the χ^2_1 distribution. The odds ratios and 95% confidence intervals were estimated for each variable in the model.

The Hosmer–Lemeshow goodness-of-fit test indicated that this model fit the data well ($P > .05$). Our model, with all of its independent variables, was a better predictive model compared with a model with just 1 variable, not returning to VA care: –2LogL, which decreased from 1459 to 1047. We conducted multicollinearity screening to test the assumption of independence among patients, and we did not find any multicollinearity concerns (variance inflation factor < 2.5). We tested the interaction between the variable mental health diagnosis and Charlson Comorbidity Index scores, and found that these terms were not statistically significant ($P > .05$). The C statistic was 0.89, which meant that the model predicted 89% of the data.

RESULTS

Using the NPR, 4871 patients diagnosed with SMI were lost to follow-up care for at least 1 year in FYs 2005 and 2006. Overall during the initial 7 months of the project, POCs tried to contact and report complete data for 3306 of the 4871 veterans who were last seen in VA facilities in FYs 2005 and 2006 and were lost to follow-up care for at least 1 year. The average length of time patients were lost to follow-up was 2.1 years for patients diagnosed with schizophrenia and 2.3 years for patients with bipolar disorder. In the year before dropping out of the VA system, many of the patients had been frequent users of VA health care services, averaging 18 VA outpatient visits and about 20 hospital discharges per 100 patients, with an average stay of 21 days.

Of the 3306 patients whom VA staff tried to contact, slightly more than 90% were men; 90% were not married; and about 88% were 64 years old or younger. Also, many patients had 1 or more medical comorbidities, including chronic pulmonary disease, diabetes, dementia, cerebrovascular disease, and cancer, which were diagnosed and treated in VA medical facilities (Table 1).

As of May 30, 2009, 2375 of 3306 patients (72%) had returned to VA facilities for mental health or medical treatment. At least 65% (1555 of 2375) of these patients who returned for care were contacted by the POCs during the first 7 months of this project. We did not require the POCs to report on their attempts to contact patients during the last 14 months of the study. From initial reengagement with VA facilities, these patients made a total of 44 171 clinic visits or about 28 visits per person during a 20-month follow-up period. The most frequent types of clinic visits were for mental health care (28%), followed by ancillary services (e.g., laboratory, pharmacy, radiology [18%]), specialist medical care (16%), substance abuse (10%), primary care (9%), or telephone consultations (6%).

In addition, 65% had at least 1 inpatient hospitalization since returning for care, with an average length of stay of 16 days. Moreover, 3% were admitted to VA Community Living Centers (formerly nursing homes), with an average stay of 90 days.

Of the 3306 patients who VA staff tried to contact during the first 7 months of the project, 643 (19%) did not accept a clinic appointment. Primary reasons that patients gave for not accepting a VA appointment included not having a perceived need for care, not satisfied with VA services, and distance or transportation barriers (Table 2).

About 2.2% (73 of 3306) of the target population died during the assessment period (Table 3). The mortality rate for the patients who did not return for VA care was 3.9%; the rate for patients who did return was 0.3% (Table 3). The difference between these rates was statistically significant ($\chi^2_1 = 122$; $P < .001$). We compared the mortality rate for patients who were lost to follow-up for less than 2 years with the rate for those lost to follow-up for 2 years or more. The difference between these rates was statistically significant ($\chi^2_1 = 1760$; $P < .001$).

For the multivariable analysis, we had complete data on 3306 persons. All of the explanatory variables were associated positively with patient mortality. After controlling for all variables, the odds of dying was about 6 times higher for those who did not return for VA care than for those who did return, after controlling for patient demographic and clinical variables (Table 4). Older patients were more likely to die than younger patients, and having a higher Charlson comorbidity score was associated with higher odds of death as well (Table 4).

TABLE 1—Demographics and Comorbidities of Target Patient Population: National Psychosis Registry, 2005–2006

	No. (%)
Gender	
Female	323 (9.8)
Male	2983 (90.2)
Marital status:	
Married	326 (9.9)
Not married	2980 (90.1)
Age	
<65 y	2899 (87.7)
≥65 y	407 (12.3)
Comorbidities in Charlson Index (*ICD-9-CM* codes)	
Chronic pulmonary disease (490-496, 500-505, 506.4 508.1)	412 (12.5)
Diabetes (250.0, 250.1, 250.2, 250.3, 250.8, 250.9)	342 (10.3)
Dementia (290, 291.2, 292.82, 294.1, 294.10, 294.11, 294.8)	68 (2.1)
Cerebrovascular disease (430–438)	68 (2.1)
Chronic renal disease (403, 582, 583, 585, 586, 588, 404.2, 404.12, 404.92, 593.9)	56 (1.7)
Malignant neoplasm (140–165, 170–172, 174–195)	59 (1.8)
Congestive heart failure (398.91, 402.01–402.91, 404.3, 404.11, 404.13 494.91 404.93, 428)	46 (1.2)
Peripheral vascular disease (440.24, 443.81, 443.9 785.4)	46 (1.4)
Diabetes with complications (250.4, 250.5, 250.6 250.7)	39 (1.2)
Myocardial infarction (410.0–410.9, 414.8, 412)	92 (1.9)
Peptic ulcer disease (531, 532, 533, 534)	42 (1.3)
Cirrhosis (571)	46 (1.4)
Rheumatologic disease (710, 710.0, 710.1, 710.4, 714, 714.0–714.3, 714.30–714.33, 714.81, 720, 725)	21 (0.6)
Hemiplegia or paraplegia (342, 344)	11 (0.3)
AIDS (042, 043, 044)	16 (0.5)
HIV without AIDS (V08)	13 (0.4)
Hepatic failure (456.0, 456.1, 456.2, 456.20, 456.21)	7 (0.2)
Multiple myeloma or leukemia (203–208)	2 (0.1)
Metastatic solid tumor (196, 197, 198, 199)	2(0.1)
Lymphomas (200, 201, 202)	2 (0.1)

Note. ICD-9-CM = International Classification of Diseases-9th Revision-Clinical Modification.

DISCUSSION

In this quality improvement study, we identified VA patients with schizophrenia or bipolar disorders who did not return for care for at least 1 or 2 years or more after having been regularly seen in the VA health care system. We found that when contacted, 72% of these patients returned to VA for care. Also, we found

TABLE 2—Primary Reasons Patients Gave for Not Accepting Department of Veterans Affairs (VA) Clinic Appointments: Office of Medical Inspector Survey, 2007

Reason	No. (%)
Did not perceive a need for care or clinic appointment	212 (33.0)
Were not satisfied with VA services	153 (23.8)
Did not have transportation to VA clinic	55 (8.6)
VA clinic was too far away	49 (7.6)
Wanted to solve problem by themselves	44 (6.8)
Did not have time for clinic appointment	17 (2.6)
Thought health problem would improve by itself	12 (1.9)
Could not get an appointment at the VA	7 (1.1)
All other reasons not listed above	94 (14.6)
Total	643 (100)

that the mortality risk of patients who reengaged with the VA health care system was almost 6 times lower than that for patients who did not return to care after adjusting for patient factors.

There is no operational definition of "lost to follow-up care" for either the VA health care system or for non-VA health care providers. Providing medical treatments on a continuous basis for patients with chronic mental and physical illnesses is considered to be a fundamental aspect of high-quality care. The absence of continuous care over time is considered by clinicians to be detrimental to the patient with schizophrenia or bipolar disorder. Patients who fail to see a physician or other health care provider, take prescribed medications, or complete the clinical course of treatment are at higher risk of not achieving desirable outcomes. Clinical guidelines recommend no fewer than 3 outpatient contacts per year for patients with schizophrenia or bipolar disorders.[15–17]

TABLE 3—Patient Mortality for Those Who Staff Attempted to Contact: National Psychosis Registry, 2005–2006, SSA and VA BIRLS Mortality Files, 2009

Variables	No. Died	Death Rate, %	χ^2	*P*	Patients, No. (%)
All patients	73	2.2	–	–	3306 (100.0)
Return to VA care	5	0.3			1555 (47.0)
Not returning to VA care	68	3.9	48.4	< .001	1751 (53.0)
Female	4	1.2			323 (9.8)
Male	69	2.3	1.6	.21	2983 (90.2)
Bipolar disorders	38	1.8			2119 (64.1)
Schizophrenia	35	3.0	4.7	0.03	1187 (35.9)
< 65 y	32	1.1			2899 (87.7)
≥ 65 y	41	10.1	133.0	< .001	407 (12.3)
Married	1	0.3			326 (9.9)
Not married or unknown	72	2.4	6.1	.013	2908 (90.1)
Charlson Comorbidity Score					
Level 0	30	1.3			2387 (72.2)
Level 1–2	32	3.9			826 (25.0)
Level 3–6	11	11.8			93 (2.8)
Elapsed time from last visit to death					
< 2 y	14	0.4			3218 (97.3)
≥ 2 y	59	67.1	1760	< .001	88 (2.7)

Note. BIRLS = Beneficiary Identification Locator System; SSA = Social Security Administration; VA = Veterans Affairs.

Although other studies on patient retention or disengagement used different definitions and measures, they corroborated our finding that irregular use of medical care was associated with suboptimal outcomes[18] or that consistent use of primary care was associated with increased survival.[19] Most of these studies of VA patients with schizophrenia or bipolar disorders who had long-term gaps in follow-up care were found to be at greater risk for experiencing poor health outcomes.[18–21]

This OMI study provided evidence that contacting patients who were lost to follow-up might play an important role in reengagement with the VA health care system. The rate of return (72%) observed in this study was almost 3 times greater than the 25% return rate observed in the study by Fischer et al, [18] in which disengaged mentally ill VA patients were not contacted. This high return rate might be due to 2 factors: (1) staff at VA facilities conducted outreach activities to reengage these patients, and (2) VA patients tended to be closely tied to the VA health care system.

Identifying and contacting patients who have dropped out of care is a key component of collaborative and medical home models.[22–24] Nonetheless, to our knowledge this was one of the first quality improvement studies that used a national administrative database to identify and follow up with disengaged patients who had chronic mental disorders. Although this form of panel management was used for chronic medical illnesses, it was applied to a lesser extent in those with a history of mental disorders. Recently, the VA Practice Guidelines for managing patients with bipolar disorder recommended the use of collaborative and chronic care model processes, along with standard pharmacotherapy and psychotherapy, including the systematic use of information technology (registries).[17]

Notwithstanding the use of national data and coordinated services across medical centers to identify and follow up with patients who had chronic mental disorders, there were limitations to this study that warrant consideration. First, the observational nature of this study and rapid need to identify all patients who dropped out of care precluded our ability to conduct a rigorous comparison of the outreach process to standard care. Second, we might have underestimated the rate at which patients returned to any health care provider because

TABLE 4—Probability Model of Patient Mortality Showing Multivariable Results Adjusting for Patient Demographic and Clinical Factors: National Psychosis Registry, 2005–2006

Patient Variable	Coefficient, β (SE)	Wald	Odds Ratio (95% CI)
Intercept	−6.5 (0.9)	50.8	. . .
Did not return for care	1.8 (0.7)	5.7	5.8* (1.4, 24.4)
Age ≥ 65 y (vs < 65 y)	1.8 (0.3)	45.1	5.9** (3.5, 10.0)
Male (vs female)	0.3 (0.5)	0.3	1.3 (0.4, 3.9)
Single (vs married)	0.2 (0.3)	0.6	1.3 (0.7, 2.3)
Schizophrenia (vs bipolar)	0.4 (0.3)	2.0	1.4 (0.8, 2.4)
Charlson score = 1 (vs 0)	0.7 (0.2)	8.2	2.0* (1.3, 3.8)
Charlson score = 2 (vs 0)	1.5 (0.4)	13.5	4.6* (2.0, 10.5)
Elapsed time from last visit to death: <2 y (vs ≥ 2 y)	−0.9 (0.9)	1.0	0.4 (0.1, 2.4)

Note. CI = confidence interval.
*$P < .055$; **$P < .001$.

we did not query Medicare and other non-VA data sources to identify VA patients who returned to non-VA health care providers or facilities. Also, we did not know if these patients received treatment from non-VA health care providers during the time that they were lost to VA follow-up care. Consequently, those who returned to the VA for care might not have completely stopped using medical care services, regardless of auspices of the health care provider, and might have been in better health status than veterans who did not return to VA care. In addition, it is important to note that one should not infer from the results of our regression model that the VA's inability to provide follow-up care was the cause of mortality, because many patient and health care facility confounding variables were not included in this study. We did not have patient information on sociodemographic or clinical factors beyond what was available in VA administrative data that might have influenced the relationship between successful contact and mortality, including current homelessness, health behaviors, current psychiatric symptoms, dual use of VA and non-VA health care services, or social support. Finally, current limitations on the availability of comprehensive data necessary to mount a national quality improvement initiative made it difficult to generalize about how the results of this VA study might apply to other veterans who are not being treated for schizophrenia or bipolar disorder and other closed health care systems. We encourage the undertaking of further studies covering other SMI patient populations.

Despite these shortcomings, our study demonstrated that active follow-up of patients with SMI could result in patients returning to the VA health care system. Our findings also suggested that population-based panel management using large national databases could effectively identify and contact patients who have dropped out of care, even among a less stable population, such as the chronically mentally ill. Despite the proliferation of large-outcomes database research and measurement-based care (e.g., panel management, disease management registries), there has been little application of these processes at the population level for persons with SMI. VA's application of administrative data to clinical research and practice, as detailed in this study, demonstrated the clinical utility of these potentially rich data sources. To this end, VA should continue systematic data mining of its national databases to identify patients with chronic mental disorders who have had no contact or minimal contact with VA facilities. Most importantly, the VA staff should use directed and intensified outreach services to contact and schedule appointments for patients who have dropped out of care over prolonged periods of time.

Our study also pointed to suggestions for improving the efficiency of care for veterans with chronic mental disorders who dropped out of care. The VA health care system is an important part in the safety net for the nation's veterans.[25] At the time of this study, 138 VAMCs and their associated community-based outpatient clinics had a variety of service treatment options available and had outreach staff providing services. In addition, the *VA Uniform Mental Health Services Handbook* mandates that patients who call the VA to seek mental health care be contacted within 24 hours, and seen within 14 days. A similar mandate for patients with chronic mental disorders in need of medical care should be considered, because the majority of VA patients who were lost to follow-up for 1 year or more had at least 1 chronic condition, and there is growing awareness that the most common cause of mortality is medically related in this group.

Based on the results of this study, future VHA quality improvement efforts should consider using administrative database registries to identify and track patients with chronic mental disorders to coordinate and integrate appropriate care. In addition, the local recovery coordinator or other outreach staff at a medical center could receive a computerized alert when an elderly SMI patient who also has chronic pulmonary disease or diabetes misses a clinic appointment to enable effective reengagement in care. Also, when the patient returns for care, the ambulatory care clinic staff could be reminded to examine the patient for changes in physical as well as mental status. Further integration of these important outreach and reengagement processes into the VA's emerging medical home and primary care–mental health integration models[26,27] should also be considered to enhance continuity of care for this vulnerable group. By doing so, VA would be coordinating medical and mental health services in a way that enables persons with SMI to live more stable and meaningful lives within their communities. ■

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This article was accepted October 5, 2011.

Contributors

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R. Langberg, D. Lyle, S. Visnic, and C. L. Davis acquired the data. C. L. Davis, J. R. Pierce, A. M. Kilbourne, F. C. Blow, E. Huycke, and Y. Phillips analyzed and interpreted the data. C. L. Davis and A. M. Kilbourne drafted the article. C. L. Davis, AM. Kilbourne, R. Langberg, E. Huycke, Y. Phillips, F. C. Blow, J. R. Pierce, B. M. Winkel, D. Lyle, and S. Visnic wrote the critical revision of the article.

Acknowledgments

This study would not have been possible without the critical review of the study proposal and results by Ira Katz, MD, former Chief Officer of Mental Health, Veterans Health Administration; Michael Kussman, MD, former Undersecretary for Health, Veterans Health Administration; Antonette Zeiss, PhD, Chief Officer Mental Health; Robert A. Petzel, MD, Undersecretary for Health, Veterans Health Administration; and Frank Cutler, former data analyst in Office of the Medical Inspector.

Human Participant Protection

The Ann Arbor, Michigan VA Medical Center (VAMC) Institutional Review Board evaluated the protocol for this assessment and determined that it was a quality improvement effort, not research.

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