Increased Olanzapine Discontinuation and Health Care Resource Utilization Following a Medicaid Policy Change

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Objective: To assess the short-term impact of Florida Medicaid's policy change on olanzapine discontinuation and health care resource utilization among olanzapine-treated patients with schizophrenia or bipolar diagnoses. The announced policy change, effective on July 11, 2005, but rescinded on September 9, 2005, reclassified olanzapine as nonpreferred and gave physicians 60 days to change antipsychotics for current users.

Method: Prescription patterns, health care resource utilization, and Medicaid payments were compared between patients using olanzapine on July 11, 2005, and matched prior-year controls. For reference, parallel analyses were conducted in New Jersey Medicaid, where access to olanzapine remained constant. The effect of Florida's policy change was also estimated among policy-sensitive olanzapine users by treating year (2004 vs 2005) as an instrumental variable.

Results: Matched Florida cohorts (N = 4,255) showed increases from 2004 to 2005 in 6-month rates of switching from olanzapine (+326%), hospitalization (+19.8%), and emergency room visits (+19.7%) (all *P* values < .001). Concurrently in the matched New Jersey cohorts (N = 2,680), there were no significant changes in these outcomes from 2004 to 2005. Among matched Florida policy-sensitive olanzapine users, an additional 9.3% experienced hospitalization in 2005 versus 2004 (*P* < .001), and increased payments for medical services and other antipsychotics largely offset decreased payments for olanzapine.

Conclusions: The announced reclassification of olanzapine to nonpreferred status substantially disrupted the continuity of olanzapine therapy for many Florida Medicaid recipients diagnosed with schizophrenia or bipolar disorder and was associated with increased hospitalization and emergency room visits. During the 6 months following the policy change, increased payments for medical services largely offset reduced payments for olanzapine.

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With health care costs outpacing inflation, payers face pressure to limit spending. Although prescription drugs represent 10% of total health care spending,[1] rapid growth in drug spending, especially for mental health drugs, has attracted attention. Atypical antipsychotics accounted for over 13% of Medicaid drug spending in 2005,[2] and have been frequent targets for cost containment, with prior authorization required by approximately 40% of state Medicaid programs.

Restrictions on use of individual atypical antipsychotics have been prompted by limited efficacy differences among antipsychotics in recent trials.[3–5] However, treatments with similar average effectiveness may not be similarly effective in clinically important subgroups.[6] Optimized patient care may benefit from a wide selection of treatments. Antipsychotics, in particular, have exhibited significant within- and between-class differences in tolerability,[4,7] medication adherence,[8] and numbers of patients successfully treated.[3,7] The heterogeneity of responses to mental health drugs and unique characteristics of mental health financing can make these drugs difficult targets for utilization management and cost control.[9]

Various policy interventions have attempted to manage spending on antipsychotics. The natural experiments created by these policies have been consistently linked to detrimental impacts on patient care. Implementation of a mental health "carve-out" program,[10] limits on numbers of medications reimbursed,[11] higher copayments,[12] and prior authorization/step-therapy[13,14] have all adversely impacted the continuity of antipsychotic treatment. Policy-induced treatment disruptions are worrying for mental health patients, since treatment discontinuity is strongly associated with risk of relapse[15] and hospitalization or other medical resource utilization.[11,12,16–18]

Nevertheless, Medicaid agencies continue to try to reduce pharmaceutical spending through preferred drug list restrictions on atypical antipsychotics. This study examines a Florida Medicaid policy change that reclassified olanzapine as nonpreferred. While prior authorizations previously implemented in other states[14] were intended for individuals newly initiating atypical antipsychotics, Florida's policy was unique: it applied to both new and existing antipsychotic users without "grandfathering" existing olanzapine users. This change was announced and became effective July 11, 2005, and allowed physicians 60 days to transition patients using olanzapine to a different antipsychotic. The policy change was communicated via a public awareness media campaign; letters to Medicaid participants receiving a medication in the previous 3 months; and letters to physicians with Medicaid patients currently taking olanzapine. Before the transition period end date, Florida Medicaid and olanzapine's manufacturer, Eli Lilly and Company (Indianapolis, Indiana), reached an agreement returning olanzapine to the preferred drug list.

Although Florida Medicaid's policy change was rescinded before becoming fully effective, it provides a natural experiment for studying the short-term clinical and economic impacts of restricting access to olanzapine without grandfathering existing users. This study evaluates the extent to which Florida Medicaid's policy change affected existing olanzapine use as intended and whether potential changes in medication use were associated with unintended increases in medical services use among individuals diagnosed with schizophrenia or bipolar disorder. To identify the policy change's effect on olanzapine users in Florida Medicaid, control samples were selected from Florida Medicaid in the year before the change, and parallel analyses were conducted in New Jersey Medicaid, where access to olanzapine remained constant.

METHOD

Data

Complete medical and pharmaceutical claims were available for approximately 3.9 million Medicaid-eligible persons in Florida and 2.7 million in New Jersey during January 2004, to January 2006, including patients with Medicare/Medicaid crossover claims (ie, claims with portions paid by Medicare and Medicaid, which indicates dual eligibility for both programs). Records contained Medicaid paid amounts and dates of medical service or prescription fills.

Sample Selection

Two cohorts of olanzapine users were identified from Florida Medicaid claims. The 2005 study cohort (Figure 1) included patients using olanzapine when the policy change was announced (July 11, 2005, the policy change index date). The 2004 control cohort included patients using olanzapine 1 year earlier (July 11, 2004, the control index date) to identify patients comparable to the study cohort but unaffected by the policy change. For each cohort, the baseline and outcome periods were defined as the 6 months before and the 6 months following the index date, respectively. The 6-month outcome period was selected to include the 60-day transition period following the policy change and 4 additional months to capture short-term impacts of the policy change beyond the rescission date. Parallel selection criteria were applied to each cohort in 2004 and 2005: patients were required to have (1) at least 2 olanzapine prescriptions during the baseline period separated by a gap < 15 days, with the days of supply for the later prescription covering the index date; (2) 2 outpatient diagnoses or a single summary inpatient diagnosis for schizophrenia (*ICD-9-CM* 295.xx) or bipolar disorder (*ICD-9-CM* 296.1x, 296.4x–296.8x); (3) continuous eligibility during the baseline and outcome periods; and (4) age between 18 and 64 years on the index date. Parallel selection criteria were used to identify 2004 and 2005 cohorts of New Jersey Medicaid olanzapine users.

Definition of Outcomes

Discontinuation of olanzapine treatment was defined by a prescription gap ≥ 15 days, since short antipsychotic prescription gaps can be clinically meaningful.[16,17] Olanzapine discontinuation with switching was defined as filling a prescription for another antipsychotic (aripiprazole, clozapine, quetiapine, risperidone, ziprasidone, or any typical antipsychotic) before or during the first olanzapine discontinuation. To be considered a switching event, the switched-to drug must be refilled at least once before a 15-day prescription gap and be absent from the baseline period. The switching date was defined as the earlier of olanzapine discontinuation or the first fill of the switched-to drug.

Health care utilization and Medicaid payments were obtained from medical service and pharmacy claims. Medical services were categorized as hospitalization (inpatient), emergency room, outpatient, substance abuse–related services, or other institutional care (including skilled nursing facilities). All payments were inflated to January 2006 US dollars using the Consumer Price Index's medical component.

Statistical Methods

Patient characteristics defined during the 6-month baseline period included demographics, schizophrenia or bipolar disorder diagnoses, comorbidities (mental and physical, Charlson Comorbidity Index [CCI][19]), mental health medication use (other antipsychotics, anticholinergics, benzodiazepines/anxiolytics, antidepressants, mood stabilizers), and medical services use. Baseline characteristics and outcomes were compared for the 2005 study cohort versus the 2004 control cohort using Wilcoxon rank sum tests for continuous variables and χ^2 tests for categorical variables.

To adjust for potential imbalance in baseline characteristics between cohorts, olanzapine users in the 2005 cohort were matched 1:1 to olanzapine users in the 2004 cohort in the same state (Florida or New Jersey) in terms of (1) hospitalization during the baseline period, (2) total baseline Medicaid payments within $500, and (3) a propensity score within 0.05 units. Propensity scores were generated from a logistic regression model predicting membership in the 2005 versus 2004 cohort using baseline characteristics selected via a stepwise selection algorithm. To assess match quality, baseline characteristics (including those not selected into the propensity score model) were compared between the matched cohorts using Wilcoxon signed rank tests for continuous variables and McNemar test for dichotomous variables. Outcomes were similarly compared between the 2 matched cohorts, and all matched analyses were performed in parallel for Florida and New Jersey.

Because a patient could be selected into both the 2004 and 2005 cohorts, generalized linear mixed-effects models with crossed random effects for patients and matched pairs were also used as a sensitivity analysis to test for differences between years accounting for both within-pair and within-patient correlation. As some patients had dual Medicare and Medicaid eligibility, sensitivity analyses were conducted comparing hospitalization and emergency room visit rates among matched cohorts of patients with and without dual eligibility inferred from the presence of Medicare crossover claims.

Figure 1. Sample Selection for the 2005 Florida Medicaid Study Cohort

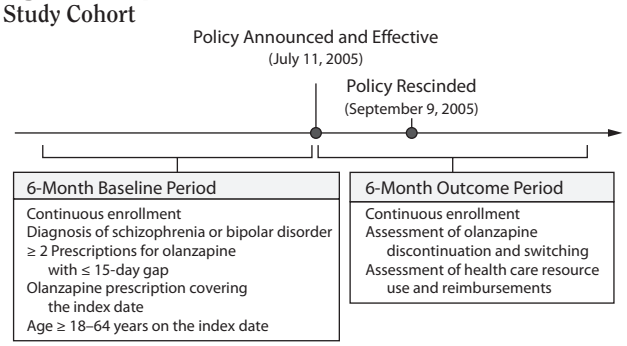

Table 1. Sample Selection in Florida Medicaid

Selection Criteria	Florida Medicaid Cohort, n 2004	2005
At least 1 prescription for olanzapine during the 3 months prior to the index date	27,294	18,340
At least 2 prescription fills prior to the index date with a gap of < 15 days, with the second fill covering the index date	15,841	10,832
Continuously eligible in the 6 months prior to and 6 months following the index date	14,568	9,923
Aged 18–64 years on the index date	13,948	9,522
Diagnosis of schizophrenia or bipolar disorder prior to the index date	7,257	5,164

Table 2. Characteristics[a] in Florida Medicaid Before and After Matching

Characteristic	Before Matching[b] 2004 Control Cohort (N = 7,257)	2005 Policy Change Cohort (N = 5,164)	After Matching[c] 2004 Control Cohort (n = 4,255)	2005 Policy Change Cohort (n = 4,255)
Demographic				
Age, mean ± SD, y	49.5 ± 13.72	49.9 ± 13.8	49.5 ± 13.5	49.9 ± 13.5
Men, % (n)	53.6 (3,890)	56.1 (2,896)*	54.9 (2,338)	55.0 (2,341)
Race, % (n)				
White	46.6 (3,380)	51.1 (2,641)***	50.7 (2,159)	50.0 (2,129)
Black	16.0 (1,158)	17.2 (889)	16.1 (684)	15.7 (667)
Hispanic/other	37.5 (2,719)	31.6 (1,634)	33.2 (1,412)	34.3 (1,459)
Mental and behavioral comorbidities, % (n)				
Schizophrenic disorders	59.7 (4,332)	57.3 (2,957)*	57.3 (2,436)	57.6 (2,452)
Episodic mood disorders	23.8 (1,729)	22.0 (1,136)*	22.4 (954)	21.6 (921)
Anxiety, dissociative, and somatoform disorders	5.5 (401)	5.3 (272)	4.2 (179)	4.6 (196)
Other nonorganic psychoses	4.8 (348)	5.0 (256)	3.5 (147)	3.6 (152)
Depressive disorder, not elsewhere classified	4.3 (310)	4.2 (215)	2.7 (114)	3.4 (143)
Nondependent abuse of drugs	5.1 (367)	4.4 (227)	3.2 (138)	3.7 (158)
Drug dependence	1.7 (126)	1.5 (76)	1.2 (51)	1.3 (57)
Drug/alcohol abuse	6.7 (483)	5.8 (301)	4.5 (192)	5.1 (217)
Charlson Comorbidity Index score, mean (SD)	0.63 (1.33)	0.49 (1.16)***	0.41 (0.94)	0.43 (1.01)
Medication use, % (n)				
Typical antipsychotics	11.5 (835)	11.4 (586)	11.0 (469)	11.2 (477)
Atypical antipsychotics	27.0 (1,959)	25.6 (1,322)	25.0 (1,065)	26.2 (1,114)
Aripiprazole	5.4 (388)	6.2 (320)*	6.0 (255)	6.5 (278)
Clozapine	1.1 (79)	1.1 (58)	1.2 (50)	1.1 (45)
Ziprasidone	4.0 (291)	4.0 (205)	3.7 (157)	3.9 (164)
Quetiapine	11.1 (803)	10.3 (531)	10.5 (446)	10.4 (444)
Risperidone	11.3 (821)	8.4 (434)***	7.8 (334)	9.2 (390)*
Anticholinergics	19.1 (1,384)	19.4 (1,000)	19.0 (807)	19.3 (820)
Benzodiazepines/anxiolytics	58.1 (4,216)	51.0 (2,634)***	52.9 (2,250)	51.4 (2,187)
Antidepressants	61.4 (4,452)	58.3 (3,010)**	59.7 (2,540)	59.6 (2,534)
Mood stabilizers	35.1 (2,548)	36.2 (1,869)	33.7 (1,433)	33.9 (1,443)
Medical resource use, % (n)				
Hospitalization	16.5 (1,194)	13.9 (717)***	10.5 (447)	10.3 (437)
Emergency room visits	21.2 (1,540)	18.2 (940)***	15.8 (672)	15.2 (648)
Other institutional care[d]	7.5 (545)	8.0 (413)	4.9 (207)	4.8 (205)
Outpatient visits	37.3 (2,710)	37.3 (1,924)	33.7 (1,434)	35.6 (1,514)
Substance abuse–related services	39.2 (2,844)	41.5 (2,143)*	41.3 (1,758)	41.4 (1,761)
Per-patient payments (2006 US dollars), mean ± SD				
Hospitalization	$1,102 ± $4,818	$762 ± $3,772***	$373 ± $1,968	$369 ± $2,018
Emergency room visits	$45 ± $166	$39 ± $169*	$25 ± $108	$27 ± $114
Other institutional care[d]	$2,040 ± $7,996	$2,170 ± $8,035	$1,210 ± $5,571	$1,209 ± $5,585
Outpatient visits	$164 ± $652	$150 ± $542	$109 ± $365	$121 ± $372
Substance abuse–related services	$492 ± $1,275	$744 ± $2,127***	$439 ± $1,174	$427 ± $1,343
Total medical nondrug payments[e]	$6,693 ± $11,371	$6,571 ± $10,942	$3,785 ± $7,088	$3,788 ± $7,090*
Total prescription drug reimbursements	$6,025 ± $4,140	$5,088 ± $3,036***	$4,990 ± $2,788	$5,027 ± $2,810*
Total payments	$12,718 ± $12,130	$11,659 ± $11,434***	$8,775 ± $7,610	$8,815 ± $7,625

[a]Assessed during the 6 months prior to the index date.
[b]Dichotomous characteristics were compared using the χ^2 test; continuous characteristics were compared using the Wilcoxon rank sum test.
[c]Dichotomous characteristics were compared using McNemar test; continuous characteristics were compared using the Wilcoxon signed rank test.
[d]Includes skilled nursing facilities.
[e]Includes payments associated with all Medicaid claims including home and community health services.
*$P < .05$.
**$P < .01$.
***$P < .001$.

Because not all 2005 discontinuation of olanzapine therapy in Florida Medicaid would be attributable to the policy change, an instrumental variable approach was applied to estimate the change's impact on key study outcomes (rates of hospitalization and emergency room visits and total Medicaid payments) among patients with policy-induced discontinuation. Such patients are referred to as *policy-sensitive* olanzapine users: absent the policy change they would not discontinue olanzapine, but following the policy change, they would discontinue olanzapine. Although individual policy-sensitive olanzapine users cannot be identified from the data, the policy change's impact among this subgroup can be inferred using instrumental variables. In the instrumental variable approach, cohort year (2005 vs 2004) serves as the instrument and the instrumental variable estimate is the ratio of the difference in resource use rates in 2005 versus 2004 divided by the difference in the rate of olanzapine discontinuation in 2005 versus 2004.[20,21] Statistical tests and 95% confidence intervals for instrumental variable estimates were obtained by bootstrap resampling of matched pairs.[22]

Table 3. Medication Use Outcomes in Matched Florida Medicaid Cohorts (n = 4,255)

Outcome[a]	2004 Control Cohort, % (n)	2005 Policy Change Cohort, % (n)	Percent Change From 2004 to 2005	*P* Value[b]
Discontinuation of olanzapine therapy				
6-Month cumulative discontinuation rate	53.2 (2,263)	84.7 (3,602)	59.2	< .0001
With switching	9.0 (385)	38.6 (1,641)	326.2	< .0001
Without switching	44.1 (1,878)	46.1 (1,961)	4.4	.0696
2-Month cumulative discontinuation rate	24.7 (1,051)	63.3 (2,695)	156.4	< .0001
With switching	5.7 (243)	35.8 (1,525)	527.6	< .0001
Without switching	19.0 (808)	27.5 (1,170)	44.8	< .0001
Other medication use				
Typical antipsychotics	10.6 (450)	13.7 (581)	29.1	< .0001
Atypical antipsychotics	33.6 (1,428)	67.7 (2,882)	101.8	< .0001
Aripiprazole	8.4 (358)	20.7 (882)	146.4	< .0001
Clozapine	1.2 (53)	1.0 (43)	−18.9	.3023
Ziprasidone	6.1 (258)	10.6 (451)	74.8	< .0001
Quetiapine	13.5 (574)	31.7 (1,349)	135.0	< .0001
Risperidone	11.4 (486)	20.1 (856)	76.1	< .0001
Anticholinergics	19.4 (824)	20.5 (873)	5.9	.1769
Benzodiazepines/anxiolytics	53.3 (2,268)	53.3 (2,270)	0.1	.9647
Antidepressants	60.4 (2,568)	60.0 (2,555)	−0.5	.7708
Mood stabilizers	31.4 (1,338)	33.2 (1,413)	5.6	.0783

[a]Assessed during the 6 months following the index date.
[b]McNemar test.

RESULTS

Sample Selection and Comparison of Unmatched Florida Cohorts

In Florida Medicaid, 7,257 and 5,164 patients met selection criteria for the 2004 and 2005 cohorts, respectively (Table 1). Patients in the 2005 cohort were more likely to be white and male, less likely to have diagnoses of schizophrenia or to have received risperidone or benzodiazepines/anxiolytics, and had a lower mean CCI score (all *P* values < .05; Table 2). During the 6-month baseline period in 2004 versus 2005, a higher proportion of patients experienced hospitalization or emergency room visits, and per-patient payments were higher for hospitalization and prescription drugs, but lower for substance abuse–related services. Total baseline Medicaid payments were $1,059/patient higher in 2004 versus 2005 (all *P* values < .05; Table 2).

Resource use during the 6-month postindex period was comparable in both years, with no statistically significant differences between the cohorts in hospitalization rates, emergency room visits, or outpatient visits. Total Medicaid payments were greater by $813/patient in 2004 versus 2005 ($P < .001$) due largely to greater 2004 per-patient payments for olanzapine.

Comparison of Matched Florida Cohorts

Matching yielded 4,255 matched pairs composed of 6,706 unique patients (1,804 patients contributed follow-up to both cohorts). Baseline characteristics were well-balanced between the matched cohorts, although small, statistically significant, imbalances remained in risperidone use and in baseline Medicaid payments, mostly due to higher payments for prescription drugs in 2005 versus 2004 (Table 2).

After matching, the 2005 policy change was associated with increased switching from olanzapine by 326.2% (from 9.0% to 38.6%, $P < .001$, Table 3, Figure 2). The greatest increase (527.6%) occurred during the first 2 months after the policy change. Accordingly, the policy change was also associated with doubled use of atypical antipsychotics other than olanzapine ($P < .001$; Table 3). Utilization also increased by 19.8% for hospitalization ($P < .001$), 19.7% for emergency room visits ($P < .001$), and 8.4% for outpatient visits ($P = .007$) (Table 4, Figure 3). Per-patient Medicaid payments increased by $256 for hospitalization ($P = .047$), $83 for other institutional care ($P = .019$), and $552 for atypical antipsychotics other than olanzapine ($P < .001$), but they decreased by $118 for substance abuse–related services ($P < .001$) and by $895 for olanzapine ($P < .001$). Total 6-month per-patient Medicaid payments did not significantly change, decreasing by $18 from 2004 to 2005 ($P = .137$; Table 4).

Sensitivity analyses confirmed these findings. In mixed models, the policy change remained associated with statistically significant ($P < .05$) increases in the odds of hospitalization (by 25%), emergency room visits (by 28%), and outpatient visits (by 15%), with increases in per-patient Medicaid payments related to hospitalization (by $256) and with decreased payments for substance abuse–related services (by −$118) and prescription drugs (by −$299). Sensitivity analyses stratified by dual eligibility showed similar increases in hospitalization rates (18.7% and 26.0%) and emergency

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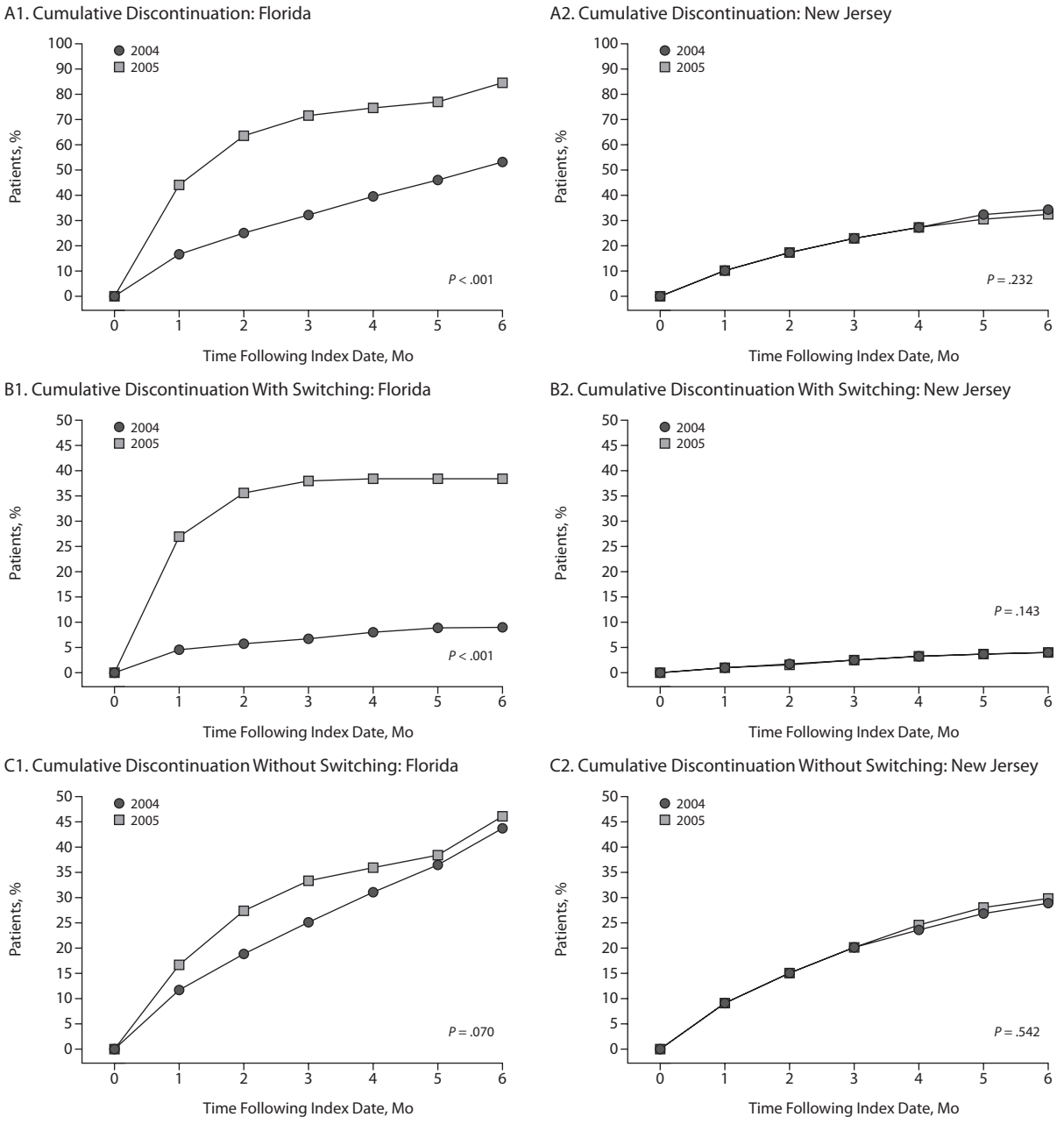
Figure 2. Olanzapine Patients With Therapy Switching or Discontinuation in Matched 2004 and 2005 Cohorts



room visits (15.0% and 20.1%) among matched dual eligible patients and non–dual eligible patients, respectively.

Comparison of Matched New Jersey Cohorts

Matching New Jersey Medicaid recipients in 2004 versus 2005 yielded 2,680 matched pairs with well-balanced baseline characteristics (data available upon request). During 2- and 6-month postindex periods, no significant changes were observed in rates of switching from or discontinuing olanzapine from 2004 to 2005 (Table 5; Figure 2). Concurrently, the proportions of New Jersey Medicaid patients with hospitalization and emergency room visits remained unchanged from 2004 to 2005 (all *P* values > .05; Table 5, Figure 4). (Further results regarding sample selection, comparisons of unmatched cohorts and medication use outcomes in New Jersey Medicaid are available upon request.)

Instrumental Variable Analyses

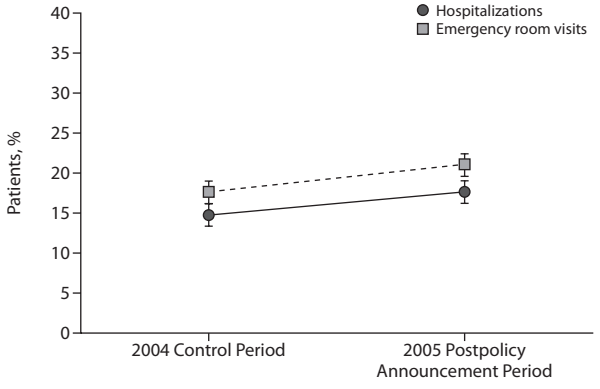
Comparing the olanzapine switching rates between the matched 2005 and 2004 cohorts in Table 3 suggests that 29.6% of patients in 2005 experienced switching from olanzapine that would not have occurred without the policy change. Among this subgroup with policy-sensitive olanzapine use in Florida Medicaid, instrumental variable analyses based on outcomes in Tables 3 and 4 suggested that the policy change was associated with absolute percentage point

Table 4. Health Care Resource Use and Per-Patient Payments in Matched Florida Medicaid Cohorts (n = 4,255)

Outcome	2004 Control Cohort, % (n)	2005 Policy Change Cohort, % (n)	Percent Change From 2004 to 2005	*P* Value[a]
Medical service use				
Hospitalization	14.7 (626)	17.6 (750)	19.8	.0003
Emergency room visits	17.6 (748)	21.0 (895)	19.7	< .0001
Other institutional care[b]	5.6 (237)	5.5 (235)	−0.8	.9246
Outpatient visits	33.9 (1,441)	36.7 (1,562)	8.4	.0065
Substance abuse–related services	40.7 (1,731)	38.9 (1,655)	−4.4	.0923
Per-patient payments	US Dollars (2006), Mean ± SD		Reimbursement Difference	
Total medical payments[c]	$4,190 ± $7,747	$4,471 ± $9,206	$281	.1026
Hospitalization	$709 ± $3,634	$966 ± $5,499	$256	.0468
Emergency room visits	$33 ± $128	$40 ± $133	$6	.0926
Other institutional care[b]	$1,192 ± $5,446	$1,275 ± $5,785	$83	.0194
Outpatient visits	$114 ± $384	$140 ± $453	$26	.0584
Substance abuse–related services	$512 ± $1,471	$393 ± $1,311	−$118	< .0001
Total prescription drug payments	$4,554 ± $2,616	$4,255 ± $2,727	−$299	< .0001
Atypical antipsychotics	$2,705 ± $1,655	$2,362 ± $1,510	−$343	< .0001
Olanzapine	$2,210 ± $1,379	$1,316 ± $1,304	−$895	< .0001
Other atypicals	$494 ± $958	$1,046 ± $1,203	$552	< .0001
Total payments	$8,744 ± $8,213	$8,726 ± $9,673	−$18	.1374

[a]Dichotomous outcomes were compared using McNemar test; continuous outcomes were compared using the Wilcoxon signed rank test.
[b]Includes skilled nursing facilities.
[c]Includes payments associated with all Medicaid claims including home and community health services.

Figure 3. Hospitalization and Emergency Room Visits in Matched Florida Medicaid 2004 and 2005 Cohorts



increases of 9.3% for hospitalizations ($P < .001$), 11.0% for emergency room visits ($P < .001$), and 9.0% for outpatient visits ($P = .007$). While the policy change was associated with reduced per-patient payments for olanzapine among policy-sensitive patients (–$2,843; $P < .001$), the same patients required increased total payments for medical services (+$893; $P = .012$) and for other atypical antipsychotics (+$1,754; $P < .001$), resulting in a statistically insignificant $58 reduction in total per-patient Medicaid payments in this subgroup ($P = .886$).

DISCUSSION

This study used Medicaid claims data to compare patients exposed to temporary removal of olanzapine from Florida Medicaid's preferred drug list in 2005 with matched prior-year controls. The policy change was associated with substantially increased switching from olanzapine for patients diagnosed with schizophrenia or bipolar disorder. During the first 2 months following the 2005 policy change, switching rates increased by > 500% compared to the same prior-year period, resulting in policy-induced switching for approximately 30% of olanzapine-treated patients in the first 6 months. Such switching was likely the policy change's intended effect. However, the policy change was also associated with unintended increases in rates of hospitalization and emergency room and outpatient visits in 2005 versus 2004. In contrast, olanzapine switching, hospitalization, and emergency room visit rates remained stable during the same time periods for olanzapine users in New Jersey Medicaid, where access to olanzapine was constant.

This study provides a rough estimate of the impact of future policy changes: for every 10 patients diagnosed with schizophrenia or bipolar disorder whose olanzapine therapy is switched due to a policy change, at least 1 is expected to experience hospitalization or emergency room visits attributable to the policy change. These estimates, based on the instrumental variable analyses, are likely conservative because Florida Medicaid's policy change was rescinded before becoming fully effective, thereby precluding a longer-term clinical and economic assessment and limiting the number and severity of patients who switched or discontinued during the brief policy implementation compared to full implementation of a policy that stopped Medicaid payments for olanzapine.

The 2005 removal of olanzapine from Florida Medicaid's preferred drug list was not associated with significant short-term reduction in Medicaid payments for olanzapine patients diagnosed with schizophrenia or bipolar disorder. While these patients had decreased Medicaid payments for prescription drugs during the 6 months postpolicy change, they incurred increased payments for medical services, primarily hospitalization, relative to the same period in 2004. The net result was a statistically insignificant $18/patient decrease in total Medicaid payments during the 6 months postpolicy change.

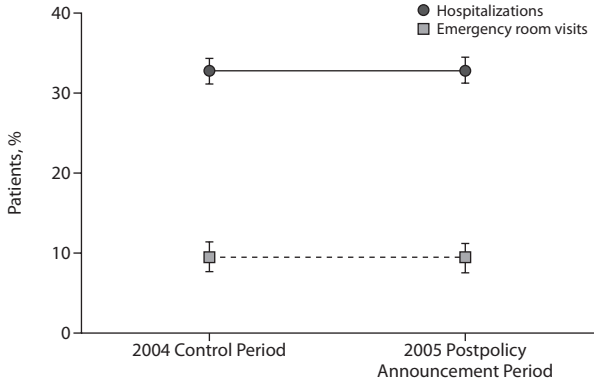
The observed increases in medication discontinuation and switching following Florida Medicaid's 2005 policy change and lack of a significant reduction in total Medicaid payments are consistent with findings from studies of other policy interventions impeding access to antipsychotics.[11,12]

Table 5. Medication and Health Care Resource Use in Matched New Jersey Medicaid Cohorts (n = 2,680)

Outcome[a]	2004 Reference Cohort, % (n)	2005 Reference Cohort, % (n)	Percent Change From 2004 to 2005	*P* Value[b]
Discontinuation of olanzapine therapy				
6-Month cumulative discontinuation rate	33.3 (892)	31.8 (851)	−4.6	.2319
With switching	4.6 (123)	3.8 (102)	−17.1	.1425
Without switching	28.7 (769)	27.9 (749)	−2.6	.5424
2-Month cumulative discontinuation rate	16.9 (452)	16.8 (449)	−0.7	.8922
With switching	2.1 (57)	1.8 (47)	−17.5	.4114
Without switching	14.7 (395)	15.0 (402)	1.8	.6592
Other medication use				
Typical antipsychotics	13.4 (358)	14.0 (374)	4.5	.5143
Atypical antipsychotics	27.9 (748)	26.4 (708)	−5.3	.2140
Medical service use				
Hospitalization	32.6 (875)	32.7 (877)	0.2	.9542
Emergency room visits	9.4 (252)	9.2 (246)	−2.4	.7778
Other institutional care[c]	17.3 (463)	16.4 (440)	−5.0	.3830
Outpatient visits	68.8 (1,843)	69.5 (1,863)	1.1	.5497
Substance abuse–related services	34.6 (926)	33.9 (908)	−1.9	.5956

[a]Assessed during the 6 months following the index date.
[b]Dichotomous outcomes were compared using McNemar test; continuous outcomes were compared using the Wilcoxon signed rank test.
[c]Includes skilled nursing facilities.

Figure 4. Hospitalizations and Emergency Room Visits in Matched New Jersey Medicaid 2004 and 2005 Cohorts



However, Florida Medicaid's policy change was unique in that current olanzapine users were encouraged to switch antipsychotics within 60 days. This makes Florida's policy change comparable to the rapid shift to mental health carveout programs in TennCare, which was shown to severely impact continuity of care for Tennessee Medicaid recipients using antipsychotics.[10]

Negative consequences of nonmedical antipsychotic substitution might be expected for several reasons. Switching to a new antipsychotic may require additional office visits for proper dose adjustment. Differences in antipsychotics' efficacy and adverse event profiles may mean a different medication is not medically optimal for any given patient. The experience of disrupted care itself[23] could lead to poor adherence to the switched-to antipsychotic causing poor clinical outcomes, increased resource use, and costs.[16,23,24] Notably, the observed increase in outpatient visits following Florida Medicaid's policy change was small compared to increases in switching, hospitalization, and emergency room visits, which could indicate a lack of appropriate follow-up care after olanzapine switching.

This study does not describe the full impact of Florida Medicaid's policy change. Impacts could vary across important subgroups defined by ethnicity, mental health or substance abuse comorbidities, or factors associated with differences in quality of care[25]; they could also vary across subgroups defined by type of care and access to services, eg, outpatients versus patients treated in skilled nursing facilities. Impacts on new initiations of olanzapine were also not considered. Additional study limitations stem from the content and the observational nature of Medicaid claims data. Although the 2004 and 2005 cohorts were well matched on demographics, diagnoses, and medical service use, matching on clinical severity could not be assessed. For patients with dual Medicare and Medicaid eligibility, it was not possible to observe Medicare's payments. However, increases in hospitalization and emergency room visits associated with the policy change were consistent among patients with and without dual eligibility. Moreover, due to initiation of Medicare Part D (on January 1, 2006), prescription drug payments for dual eligible patients may be underestimated during the final 11 days of the 2005 outcome period, which extended to January 1, 2006. Thus, the net decrease in Florida Medicaid payments for prescription drugs following the policy change may be partially attributable to cost shifting from Medicaid to Medicare Part D. Notably, Medicare Part D was in effect for 6.1% of the 2005 outcome period, and total Florida Medicaid payments for prescription drugs decreased by 6.6% from 2004 to 2005. Finally, payments could not be adjusted to account for supplemental rebates obtained by Medicaid programs for listing specific agents as preferred drugs.

The National Association of State Mental Health Program Directors recently issued recommendations noting that "patients should not be forced to switch medications due to changes in formulary policy" and "'grandfathering' is the recommended practice for individuals stabilized on a nonformulary antipsychotic medication to minimize risk of relapse and support continuity of care."[26(p2)] This study supports these recommendations, finding that Florida Medicaid's temporary removal of olanzapine from the preferred drug list, without grandfathering existing users, disrupted continuity of care for patients diagnosed with schizophrenia or bipolar disorder, leading many to switch antipsychotics and to experience increased hospitalization and emergency room visits.

Drug names: aripiprazole (Abilify), clozapine (Clozaril, FazaClo, and others), olanzapine (Zyprexa), quetiapine (Seroquel), risperidone (Risperdal and others), ziprasidone (Geodon).
Author affiliations: Analysis Group, Inc, Boston, Massachusetts (Drs Signorovitch, Birnbaum, and Yu; Ms Ben-Hamadi; and Messrs Kidolezi and Kelley) and Eli Lilly and Company, Indianapolis, Indiana (Drs Phillips and Ball and Mr Lawson).
Potential conflicts of interest: **Drs Signorovitch**, **Birnbaum**, and **Yu**; **Ms Ben-Hamadi**; and **Messrs Kidolezi** and **Kelley** are employees of Analysis Group, Inc, who received funding from Eli Lilly for this research. **Drs Phillips** and **Ball** and **Mr Lawson** are employees of and stock shareholders in Eli Lilly.
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