

**Health Costs and Initiation of
Atypical Anti-psychotic Drugs
among Patients Diagnosed with Schizophrenia
in the Veterans Health Administration:**

Technical Report

EXECUTIVE SUMMARY

**Health Outcomes Technologies, Health Services Department
Boston University School of Public Health
715 Albany Street, Boston, MA 02118
and
Center for Health Quality, Outcomes, and Economic Research
Veterans Affairs Medical Center
200 Springs Road, Bldg. 70, Bedford, MA 01730**

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Report Prepared by

**John A. Gardner, Ph. D., Ann M. Hendricks, Ph.D.,
Yu-Hui Huang, MPH, Xinhua S. Ren, Ph.D.,
Austin F. Lee, Ph.D., Alaa Hamed, M.D., MPH,
Donald R. Miller, Sc.D., Lewis E. Kazis, Sc.D.**

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Questions regarding the report can be addressed directly to:

Drs. John A. Gardner and Ann M. Hendricks

Institute for Health Policy and Outcomes
Center for Health Quality, Outcomes, and Economic Research
A VA HSR&D Field Program
Veterans Health Administration Medical Center (152)
Bedford, Massachusetts 01730
Phone: 781-687-2963
Fax: 781-687-3106

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A multidisciplinary research team at the Center for Health Quality, Outcomes and Economic Research (CHQOER) conducted analyses to inform health care providers and payers of the relative costs of two atypical antipsychotic medications (Olanzapine and Risperidone) as applied in the Veterans Health Administration (VA). This report concerns relative prices and cost offsets among VA patients diagnosed with schizophrenia. Relative effectiveness measures will be reported in a later supplement and in a separate report of health-related quality of life.

The evaluation was funded by CHQOER, Boston University's School of Public Health, and an unrestricted grant from the Eli Lilly Company.

The primary hypotheses concerning relative prices and cost offsets (reductions in health care costs other than Olanzapine and Risperidone) are:

1. For VA patients diagnosed with schizophrenia who take either Olanzapine or Risperidone consistently for a year, the average yearly cost of Olanzapine is higher than that of Risperidone.
2. VA patients diagnosed with schizophrenia who initiate use of Olanzapine have, on average, higher pre-initiation total medical care costs than those who initiate use of Risperidone, suggesting more severe health problems among Olanzapine initiators.
3. For VA patients diagnosed with schizophrenia, initiation on either target drug reduces medical care costs, primarily inpatient mental health services.
4. Olanzapine initiators will have reduced costs by at least as much as Risperidone initiators because
 - a) Risperidone initiators incur larger costs for medications required to combat side effects and
 - b) medical care costs excluding medications will fall by much more for Olanzapine initiators than for Risperidone initiators.

Hypotheses 1) and 2) are explored primarily to confirm initial expectations of the research team and its advisors. The most important new issues addressed in this study are embodied in hypotheses 3) and 4).

METHODS

Study data included VA utilization in FY1998 - 2000; cost estimates of VA's Health Economics Resource Center, Decision Support System prescription cost data and Pharmacy Benefits Management (PBM) prescription data for FY1999 - 2000; and prescription price data from the March 1999 Redbook and FY2000 PBM files.

The study population comprised all VA patients with either one inpatient diagnosis or two outpatient diagnoses (at least 7 days apart) for schizophrenia. The ICD-9-CM diagnosis codes included 2950x - 2959x, excluding latent (2955x) and residual (2956x) schizophrenia.

Of 86,304 patients meeting these criteria in FY1999, 4,172 had a PBM prescription for Olanzapine in either the third or fourth quarter of fiscal year 1999 following at least two quarters with no prescription for either Olanzapine or Risperidone (Olanzapine initiators). An additional 3,716 patients had an initial prescription for Risperidone under the same restrictions (Risperidone initiators). Patients who initiated both medications (n=260) were included in some sensitivity analyses.

Analyses include comparisons of estimated costs (in dollars) and the distributions of costs pre- and post-initiation, as well as multivariate regressions of estimated costs (in dollars and logarithmic transformations) for 6 and 12 months post-initiation and for FY2000 (to standardize the cost measure and to allow comparisons with cost changes for other patients with schizophrenia).

RESULTS

The major findings for each hypothesis are:

1. For Olanzapine and Risperidone initiators who take the medication consistently for one fiscal year, costs for those initiating Olanzapine are ~\$1,550 higher at average wholesale prices than for those initiating Risperidone. At VA prices, the difference is less. These differences are all statistically significant at the 1% level.
2. Pre-initiation costs were higher for Olanzapine initiators (\$585 for 6 months), but the difference was not statistically significant at the $p=0.1$ level. Of 34 measures of co-morbidities and disease severity, the only statistically significant differences were a higher average number of mental health co-morbidities (1.23 vs 1.18), 3.6 fewer psychiatric inpatient days and a higher percentage of deaths (3% vs 2%) for Risperidone initiators.
3. Both initiator groups experienced cost reductions. These are not broadly based; only about half of initiators have cost reductions. The reduction among the highest cost patients dominates the distribution of cost reductions. Reductions are concentrated in inpatient mental health services.
4. Whether measured by fiscal year costs or pre- and post-initiation costs, reductions in average costs were very close (and not statistically significantly different) for Olanzapine initiators and Risperidone initiators. On a fiscal year basis, reductions were \$1,033 for Olanzapine initiators and \$1,293 for Risperidone initiators. On a pre-post basis, the reductions for the first 6-months post-initiation were larger for Olanzapine initiators (\$1,219) than for Risperidone initiators (\$574) though not strictly different by standard criteria ($p<0.12$). However, by the second 6-months post-initiation, the cumulative reductions were almost identical between initiator groups: \$2,169 for Olanzapine initiators and \$2,302 for Risperidone initiators. Expressed as means of logs of total cost for fiscal years, there was a difference: the reductions were larger for Risperidone initiators than for Olanzapine initiators (-0.182 vs. -0.094, $p<0.01$). That result suggests that the median cost for Risperidone initiators fell more than for Olanzapine initiators.
 - 4a. Taking into account the costs of all schizophrenia-related drugs (other than the target drugs) reduced the cost differential between initiator groups by ~\$100 in FY2000, leaving Olanzapine initiators still more than \$1,000 more costly.

4b. For medical care costs excluding costs of schizophrenia-related drugs, cost reductions are not statistically significantly different between initiator groups, though average costs fall slightly more (between \$100 and \$300) for Olanzapine initiators than for Risperidone initiators.

When costs are expressed in dollars, and the change in cost for non-initiating patients diagnosed with schizophrenia is used as a control (admittedly imperfect), both initiator groups have larger reductions than the control ($p < 0.05$), suggesting that initiation on the target drug helped lower costs. If the control group of non-initiating patients is limited to those who never took either target drug during FY1999 or FY2000, the cost reduction for Risperidone initiators remains weakly significant ($p < 0.10$), while the reduction for Olanzapine initiators is no longer significantly different ($t = 1.23$). These results suggest that VA practice was changing during this time to reduce inpatient utilization and use more outpatient services in treating the patient population with schizophrenia.

This analysis of costs without information about effects is not sufficient for decisions about relative cost effectiveness or formularies. It suggests that cost reductions from the most costly outliers offset the cost increases to other patients initiating the drugs so that averages fall. Because Olanzapine initiators' costs (even taking add-ons into account) are higher post-initiation, researchers and policy makers cannot rule out the possibility that the costs for the Olanzapine initiators would have declined more if Risperidone rather than Olanzapine were prescribed.

These findings are consistent with other studies that concluded that cost reductions for the most severe inpatients could not be generalized to other patients or that costs for a study population increased. Prior studies of a few hundred patients over time periods of less than a year are likely to find cost increases for initiators if they exclude the most costly patients from the study protocols because it is the most costly patients who tend to experience the consistent cost decline.

Finally, cost studies should not annualize from less than a year of follow up post-initiation. While clinical outcomes may be clear after a few weeks or months, short run cost changes may not persist and can even be reversed by the patients' experience over a longer time period.