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## Does Colocated Care Improve Access to Cardiometabolic Screening for Patients with Serious Mental Illness?

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### Abstract

**Objective**—Individuals with serious mental illness (SMI: e.g., schizophrenia, bipolar disorder) experience disparities in mortality relative to the general population, mainly because of medical conditions (i.e., cardiometabolic disease). We assessed whether VA patients with SMI and receiving care from VA mental health facilities with colocated medical care were more likely to receive cardiometabolic risk assessments in accordance with clinical practice guidelines than patients from non-colocated facilities.

**Methods**—Patients with SMI identified prescribed second-generation antipsychotic medications in fiscal year (FY) 2007 receiving care from VA mental health facilities completing the VA Mental Health Program Survey were included. VA administrative data were ascertained to assess receipt of the following tests every 6 months in FY 2007: BMI, blood pressure, lipid profile, and fasting glucose.

**Results**—Out of 40,600 patients with SMI prescribed second-generation antipsychotics, 29% received all cardiometabolic tests (lipid, glucose, BMI and blood pressure). While 79% and 76% received blood pressure and BMI assessments, respectively, only 37% received a lipid test. Patients from colocated sites were more likely to receive all cardiometabolic tests (OR=1.26, 95% CI: 1.18–1.35,  $p < 0.001$ ).

**Conclusions**—Colocated general medical providers in mental health clinics are more likely to provide cardiometabolic assessments for patients with SMI prescribed second-generation antipsychotics.

### Keywords

Mental disorders; quality of care; cardiovascular disease; integrated care

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## INTRODUCTION

Individuals with serious mental illness (SMI) have shortened life expectancies relative to the general population[1–2]. Observed disparities in mortality are chiefly attributable to a disproportionate burden of medical conditions, notably cardiovascular disease among patients with SMI [3–5]. Patients with SMI also experience elevated rates of cardiometabolic factors, including high cholesterol, obesity, and poor glycemic control [6].

Second-generation antipsychotics (SGAs) have been associated with increased cardiometabolic risk factors including elevated glucose and weight gain[4]. In response, the American Diabetes and American Psychiatric Associations published guidelines for the appropriate screening of cardiometabolic risk factors, including BMI, lipids, blood pressure, and fasting glucose assessment[7]. However, patients with SMI are less likely to be assessed for cardiometabolic risk factors than those without SMI[6,8]. These gaps in quality have been attributed to fragmentation of physical and mental health services[9–10].

Colocation of primary services in the mental health setting may reduce barriers to medical care among those with SMI, including appropriate cardiometabolic monitoring [11]. Prior randomized controlled trials of integrated care models primarily focused on colocating medical providers in mental health clinics, and were associated with improved access to care for patients with SMI[12–13]. However, the extent to which colocated general medical services (i.e., medical care providers embedded in mental health clinics) in usual practice improve rates of cardiometabolic screening has not been demonstrated. The purpose of this study is to determine the association between colocation of medical and psychiatric services and receipt of cardiometabolic screening in a nationwide sample of Veterans with SMI.

## METHODS

This cross-sectional study included VA patients who were diagnosed with SMI, prescribed an SGA in fiscal year (FY) 2007, and received care from VA facilities with complete data from the 2006 VA Mental Health Program Survey[14–16], a national survey of mental health program directors (N=107, 81% response rate) on organization and integration of care of VHA mental health programs [14]. The National Psychosis Registry (NPR) includes VA administrative data on utilization, diagnosis, pharmacy, lab, and vital signs on all VA patients diagnosed with SMI, including schizophrenia or schizoaffective disorder (ICD-9 codes 295.0–295.4; 295.6–295.9), bipolar disorder (296.0–296.1; 296.4–296.8), or other psychotic disorders (297.x, 298.x). This study was reviewed and approved by local Institutional Review Boards.

All patients diagnosed with SMI identified from the NPR who were prescribed SGAs in fiscal year (FY) 2007, including olanzapine, aripiprazole, clozapine, quetiapine, risperidone, or ziprasidone were included in this study. A mental health program was considered to have colocated general medical care if medical services were reported to be located within the mental health clinic by survey respondents. We assessed the percentage receiving the following tests at least twice in FY 2007 (reflecting minimum necessary standards of care) [7]: BMI, blood pressure, lipid profile, and fasting glucose among patients based on NPR data.

Bivariate analyses were used to assess the association between colocation status and receipt of all four cardiometabolic tests and receipt of each test at least twice in FY 2007. Multivariable logistic regression analyses using generalized estimating equations to account for facility-patient clustering were used to determine the independent association between colocation and cardiometabolic test receipt, adjusting for facility physician-staff ratio, number of unique patients at facility, academic affiliation (defined as medical resident

training), and patient age, sex, race, marital status, service connection, Charlson comorbidity score, anxiety or PTSD diagnosis, substance use diagnosis, and number of primary care visits in FY 2007.

## RESULTS

Overall, out of 122,162 VA patients with SMI in FY 2007, 105,100 (85%) received care from the 107 VA medical centers with complete mental health program survey information, and of those, 40,600 (38%) were prescribed SGAs. Of the 40,600, the mean age was 55 (SD=11.6), 91% were male, and 26% African-American. The 40,600 included in the analyses did not differ in patient characteristics from those not prescribed second-generation antipsychotics or from the total SMI patient population in FY 2007 (e.g., respective mean ages were 55–57 years, 9% were women, and 21–27% were African-American). Twenty-nine percent received all recommended cardiometabolic tests (lipid, glucose, BMI and blood pressure) at least twice in FY 2007. While 79% and 76% received blood pressure and BMI assessments, respectively, only 37% received a lipid test. Patients from colocated sites were more likely to receive all four cardiometabolic tests (Figure 1,  $P<.001$ ).

After adjusting for patient and organizational factors, patients from colocated sites were more likely to receive all cardiometabolic tests (OR=1.26, 95% CI: 1.18–1.35,  $P<.001$ ) than those not from colocated sites. This difference appears to be primarily attributed to observed gaps in monitoring of lipids between colocated and non-colocated sites. In particular, patients from colocated sites were more likely to receive lipid testing (OR=1.26, 95% CI: 1.16–1.38,  $P<.001$ ), but less likely to receive glucose (OR=.70, 95% CI: .79–.95,  $P<.01$ ), BMI (OR=.74, 95% CI: .69–.81,  $P<.001$ ), or blood pressure monitoring (OR=.76, 95% CI: .69–.95,  $P<.001$ ) after adjusting for patient and facility factors.

## DISCUSSION

About one-third of VA patients with SMI who were prescribed SGAs received all four recommended cardiometabolic monitoring tests twice a year. Gaps in monitoring were especially evident for lab tests. Patients receiving care from colocated mental and general medical clinics were more likely to receive all four recommended cardiometabolic tests.

In light of the cardiometabolic risk factors associated with SGAs, the Substance Abuse and Mental Health Services Administration and the Department of Veterans Affairs (VA) have called for programs to improve integrated medical care for persons with SMI [9]. Receipt of cardiometabolic tests among our study population exceeded estimates found in non-VA settings [10], as the majority of VA patients are receiving regular BMI and blood pressure checks, both of which are important indicators of cardiometabolic risk. Our results suggest that patients from colocated general medical programs were 26% more likely to receive cardiometabolic risk monitoring compared to non-colocated sites. Nonetheless, less than half received recommended lipid and glucose monitoring lab tests. Perhaps these patients faced barriers to obtaining blood draws which are often done in a separate laboratory. Even in colocated settings, providers may lack the resources to assist patients in following through with lab tests.

Several limitations warrant consideration. First, we were unable to differentiate fasting versus non-fasting labs. When controlling for number of primary care visits, we were unable to differentiate visits made within the colocated clinic from those made to an external VA primary care clinic. Other unmeasured facility factors beyond colocation, such as coordination of specific services or provider communication between mental health and

primary care may have influenced the results. Finally, findings from this study may not generalize to non-VA providers or patients.

Colocation of medical and mental health care may likely be associated with effective screening and treatment of cardiometabolic disorders and represents a potentially important step toward reducing the increased mortality experienced by persons with SMI[15]. The challenge will be to develop flexible systems, either concrete [11–13] or virtual[16], by which the principles of collocation can be implemented.

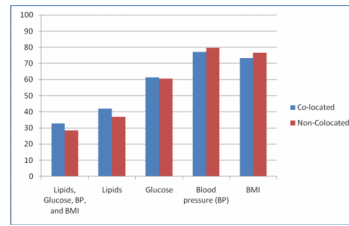
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**Figure 1.**  
Percentage of Patients with Serious Mental Illness Receiving Cardiometabolic Monitoring Twice a Year in Fiscal Year 2007 by Colocation of General Medical Services in VA Mental Health Programs (N=40,600)\*

\*Differences in the combined measures (lipids, glucose, blood pressure, and weight), lipids, blood pressure, and weight are all statistically significant at  $P < .001$