

UCSF

UC San Francisco Previously Published Works

Title

Lessons Learned From a New Reverse-Integration Model to Improve Primary Care Screening in Community Mental Health Settings

Permalink

<https://escholarship.org/uc/item/9bk092nd>

Journal

Psychiatric Services, 73(8)

ISSN

1075-2730

Authors

Mangurian, Christina

Thomas, Marilyn D

Mitsuishi, Fumi

et al.

Publication Date

2022-08-01

DOI

10.1176/appi.ps.202100177

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed



Published in final edited form as:

Psychiatr Serv. 2022 August 01; 73(8): 942–945. doi:10.1176/appi.ps.202100177.

Lessons Learned From a New Reverse-Integration Model to Improve Primary Care Screening in Community Mental Health Settings

Christina Mangurian, M.D., M.A.S.,

Department of Psychiatry and Behavioral Sciences, Weill Institute for Neurosciences, University of California, San Francisco (UCSF); Department of Epidemiology and Biostatistics, University of California, San Francisco (UCSF)

Marilyn D. Thomas, Ph.D., M.P.H.,

Department of Psychiatry and Behavioral Sciences, Weill Institute for Neurosciences, University of California, San Francisco (UCSF)

Fumi Mitsuishi, M.D., M.S.,

Department of Psychiatry and Behavioral Sciences, Weill Institute for Neurosciences, University of California, San Francisco (UCSF)

L. Elizabeth Goldman, M.D., M.S.,

Division of General Internal Medicine, Department of Medicine, San Francisco General Hospital

Grace Niu, Ph.D.,

Department of Psychiatry and Behavioral Sciences, Weill Institute for Neurosciences, University of California, San Francisco (UCSF)

Margaret A. Handley, Ph.D., M.P.H.,

Department of Epidemiology and Biostatistics, University of California, San Francisco (UCSF); Division of General Internal Medicine, Department of Medicine, San Francisco General Hospital

Nicholas S. Riano, M.A.S.,

Department of Psychiatry and Behavioral Sciences, Weill Institute for Neurosciences, University of California, San Francisco (UCSF)

Alison Hwong, M.D., Ph.D.,

Department of Psychiatry and Behavioral Sciences, Weill Institute for Neurosciences, University of California, San Francisco (UCSF)

Susan Essock, Ph.D.,

Department of Psychiatry, Columbia University, New York City

James Dilley, M.D.,

Send correspondence to Dr. Mangurian (christina.mangurian@ucsf.edu).
Drs. Newcomer and Schillinger are senior authors.

Dr. Niu received consulting fees from the Advancing Integrated Mental Health Solutions Center, University of Washington. In the past 3 years, Dr. Newcomer has served as a consultant to Intra-Cellular Therapies, Sunovion, Otsuka, and Alkermes; he has been a consultant to patent litigation on behalf of Sunovion; and he serves on a data safety monitoring board for Amgen. The other authors report no financial relationships with commercial interests.

Department of Psychiatry and Behavioral Sciences, Weill Institute for Neurosciences, University of California, San Francisco (UCSF)

John W. Newcomer, M.D.,

Department of Psychiatry, Washington University School of Medicine, St. Louis, and Thriving Mind South Florida, Miami

Dean Schillinger, M.D.

Division of General Internal Medicine, Department of Medicine, San Francisco General Hospital

Abstract

The authors sought to describe a reverse-integration intervention aimed at improving preventive health screening in a community mental health clinic. The intervention, CRANIUM (cardiometabolic risk assessment and treatment through a novel integration model for underserved populations with mental illness), integrated primary care services into a large urban community mental health setting. It was implemented in 2015 and included a patient-centered team, population-based care, emphasis on screening, and evidence-based treatment. CRANIUM's strengths included provider acceptability, a patient-centered approach, sustained patient engagement, and economic feasibility. Challenges included underutilized staff, registry maintenance, and unanticipated screening barriers. The CRANIUM reverse-integration model can be feasibly implemented and was acceptable to providers.

Rates of preventive health screening for metabolic issues among people with serious mental illness are low, contributing to early death (1). Moreover, a separation between primary care and mental health systems contributes to poor care and outcomes (2). Because most individuals with serious mental illness are publicly insured, community mental health settings have become de facto "health homes" (3), signaling a need for the delivery of interventions in these settings.

Reverse-integration models deliver primary care expertise to community mental health settings and are viewed positively by consumers (4, 5). Although several community mental health-based reverse-integration models have been proposed, they have not been comprehensively examined (3). Three recent randomized controlled trials (RCTs) have examined the impact of the colocation of various staff in a mental health clinic (3) and found that such colocation increased primary care utilization and receipt of preventive care among patients. Replication in real-world community mental health settings proved challenging, and clinical outcomes were mixed. Poor uptake and disappointing impact were attributed to financial challenges, lack of a shared electronic health record (EHR), and challenges in training staff and engaging external providers (3).

A NEW REVERSE-INTEGRATION MODEL OF CARE

Theoretical Basis of the Intervention

To improve primary care screening and treatment, we aimed to develop a new clinical model that encourages community psychiatrists to screen and initiate treatment for common medical comorbid conditions. Our team used implementation science techniques, including

stakeholder engagement (4), and targeted mechanisms known to influence psychiatrist behavior (5), such as enhancing provider knowledge and skills (e.g., self-efficacy and capability), availability of primary care provider consultation (opportunity), and provider reminders (motivation). The conceptual framework for the intervention described in this column was published previously (5).

Intervention

We call this model CRANIUM (cardiometabolic risk assessment and treatment through a novel integration model for underserved populations with mental illness). CRANIUM includes four key components of the collaborative care model (CoCM): a patient-centered team, population-based care, a screening protocol, and a treatment protocol. CRANIUM includes a subset of the components of the traditional CoCM, which are similar to those in other models that have been found to be effective in integrated settings (6). (A vignette exemplifying the intervention's workflow is available in an online supplement to this column.)

Patient-centered team care.—CRANIUM added a remote primary care consultant and a local peer navigator to the existing community mental health treatment team (comprising a psychiatrist and a case manager). Ten psychiatrists distributed across five care teams were on the existing staff at the intervention site. Rather than colocating primary care providers at a satellite federally qualified health center, as has been attempted previously (7), the primary care provider was a centralized integrated e-consultant, available to answer questions remotely over a secure server linked to the EHR. The peer navigator was added to prepare laboratory forms, accompany patients to laboratory facilities, and enter results into the EHR.

Population-based care.—CRANIUM used a 536-participant registry, populated with laboratory results from three separate EHRs. The registry contained information on laboratory test completion and the outcomes of each completed screening. The team conducted panel management meetings to review data on patients with abnormal laboratory results and facilitate discussions surrounding stepped care for screening and treatment. Each month, research staff extracted EHR data on patients who had a scheduled appointment and compiled the data into a database that was distributed to psychiatrists and case managers as personalized registry spreadsheets. Laboratory forms were precompleted for all identified patients and distributed to psychiatrists monthly. Previously, the psychiatrist would monitor when the patient was due for screening and review separate electronic records to determine whether screening had been completed.

All staff met monthly to review the registry, conduct panel management, discuss abnormal laboratory results and follow-up plans, and address problems with laboratory test completion. To facilitate screening, the monthly registry included patients who had a scheduled quarterly update due that month and took a population health-based approach by also including patients whose laboratory test results from the previous month(s) were still missing. These monthly meetings were integrated into regularly scheduled staff meetings to minimize burden on existing staff.

Emphasis on screening.—Hemoglobin A1c, low-density lipoprotein, and hypertension were expected to be screened annually, because cardiometabolic disease is highly prevalent among persons with serious mental illness (1). Annual HIV testing was also included because people with serious mental illness are at greater risk for HIV-AIDS, yet they have low testing rates (8). Screening was ensured through a stepped care approach, which included reviewing missing laboratory test results at monthly meetings; a peer navigator, if needed; and onsite phlebotomy services.

Evidence-based treatment.—To mitigate previous concerns reported by psychiatrists in prescribing nonpsychotropic medications (4), the primary care consultant provided a one-time training on guideline-recommended pharmacological management of common metabolic abnormalities. Evidence-based medication algorithms were available in all treatment rooms and online (see online supplement). Notably, CRANIUM did not include surveillance for adherence to treatment protocols or tracking of whether timely medication adjustments were made, as has been described in the traditional CoCM. Although psychiatrists were encouraged to recommend smoking cessation to their patients, this study did not include formal screening and treatment for smoking. Consultations and treatment within the system of care by HIV specialists were readily available; psychiatrists were asked to test patients for HIV and refer patients with a positive screen for initiation of HIV treatment.

Usual Care

Preintervention, psychiatrists were responsible for following guidelines for metabolic screening for each of their individual patients as per national guidelines for people taking antipsychotic medications. There were no requirements to test for HIV, no registry to monitor screening or treatment of provider panels, and no additional team members to assist with screening and treatment.

EVALUATION

CRANIUM was implemented at a large community mental health clinic between January 1 and December 31, 2015. A recent postdoctoral research project of merging data across several EHRs assessed the feasibility of implementation of this model in detail (data are available on request). We describe the successes and challenges of model implementation below.

Successes

The reverse-integration CRANIUM model focused on building workforce capacity—a priority recommended at a recent expert consensus panel (3). Specifically, we focused on training and supports to accomplish selective task shifting from primary care to psychiatry. This component was further strengthened by the theoretical foundation of the intervention and a focus on psychiatrist behavior change. Additionally, psychiatrists and teams were encouraged both to screen and to follow up on positive screens, and prescribers were provided treatment algorithms and access to a primary care e-consultant to support this scope-of-practice expansion. All 10 providers reported that the intervention improved

patient care and helped patients receive regular metabolic screening. Providers appreciated the treatment algorithms posted throughout the clinic and reported improved knowledge and confidence in treating metabolic abnormalities (data are available on request). The psychiatrists also appreciated the primary care e-consultant, as evidenced by the widespread use of this specialist (data are available on request).

This study was conducted in a clinical setting that exemplified typical challenges, including staff turnover and patients with complex conditions. Because providers often believe that psychiatric illness severity impedes treatment of cardiovascular disease risk factors (4), our findings in this population are especially significant. Retention and engagement were high; there was no patient attrition, but two providers left the clinic during the study.

The intervention also appeared to affect patient-level outcomes, with modest increases in diabetes screening and more substantial increases in HIV testing (absolute increases from 1% to 17%; other data are available on request). Given the high prevalence of HIV risk factors and low HIV-testing rates in this population, we believe that these findings suggest that systemwide efforts to enhance cardiometabolic screening should include HIV testing.

Finally, the CRANIUM model appeared feasible for implementation in a community mental health setting, although further study should examine requirements to sustain the intervention and measure its longer-term impact. Treatment teams adopted the model's major components, utilized the primary care e-consultant, hosted panel management meetings, utilized the registries, and developed plans to improve screening and initiate treatment with high fidelity (data available on request).

Challenges

Although the CRANIUM model enjoyed high levels of adoption in the clinic, several challenges limited its long-term success. First, the intervention, along with funding for the peer navigator and e-consultant, ended on study completion. As described elsewhere (9), retaining and utilizing the peer navigator was more difficult than initially anticipated; we suggest that case managers complete laboratory forms, distribute maps to nearby laboratory services, and accompany patients for laboratory tests. In addition, having a full-time phlebotomist onsite for on-demand laboratory testing may be helpful.

Additionally, having existing staff perform study functions was costly. A cost analysis of the intervention was published previously (10), finding that the CRANIUM intervention required approximately 45 hours of staff time and 1.5–2 hours per week of psychiatrist time per month. Unfortunately, aside from using the preexisting meeting time for panel management, we know little about how these time expenditures compared with those for work performed under “usual care” circumstances and how staff accommodated these additional duties. Future studies should compare this workflow with that of usual care. Given that we used process mapping and time-driven, activity-based cost to evaluate costs for CRANIUM—\$74 per patient annually (10)—future studies should conduct a comprehensive economic comparison. This comparison should include short-term costs related to screening and initial treatment of identified cardiovascular risk factors and long-term cost-effectiveness and variation by implementation challenges unique to the setting.

The generalizability of our findings to other settings is unknown. The psychiatrists in this setting may have been more willing to prescribe nonpsychotropic medications; previous work reports that some community psychiatrists have scope-of-practice concerns that make them reluctant to prescribe nonpsychotropic medications. Future studies should examine these and other medical-legal considerations in greater detail.

Although the CRANIUM model improved database management capacity (3) by providing psychiatrists with the tools to identify individuals on their panel who needed screening, our previous work indicates that sourcing information from multiple EHRs takes significant staff time (10). This expenditure likely affected registry maintenance after the study had ended and would be challenging for most clinics to replicate without additional funding. Additionally, some providers thought that the registry was difficult to integrate into practice, and others occasionally forgot to use the precompleted laboratory forms. With new technology, community mental health administrators may consider automatically preordering annual laboratory tests through the electronic system. Our study highlights how integrating EHR systems across community mental health and primary care settings is key to providing effective integrated care. We hope that by electronically merging records, registries will become easier to develop and maintain, enabling scalability and dissemination.

Although all teams used registries and reported following an action plan for missing laboratory results, only a modest increase in diabetes screening was observed (7% absolute increase). Furthermore, although several pre-post changes in screening rates were statistically significant, the overall absolute screening rates remained well below guideline recommendations. Because this population includes patients with very serious mental disorders, these limited improvements may have been a result of a focus on psychiatric treatment rather than primary care screening.

Additionally, data on treatment initiation were collected only qualitatively and did not assess the quality or outcomes of medical care at the clinic. Given that patient-level health outcomes represent a major gap in the literature on reverse-integration models (3), future studies should examine the impact of this model on treatment initiation and other health outcomes.

Although we observed an increase in HIV testing, we identified important provider barriers to testing. Providers were concerned about the need for specialized informed consent, and some expressed their desire to risk-stratify for HIV risk behavior to inform screening decisions. These concerns sometimes caused providers to remove the HIV test from the laboratory forms. This practice is concerning, given that HIV testing no longer requires special informed consent, and providers are typically performing poorly at identifying sexual risk (8).

CONCLUSIONS

Our findings on the new CRANIUM reverse-integration model add to the literature on building workforce and database management capacity—two recent expert-recommended

policy and practice priorities (3). The model appears feasible for implementation and acceptable to community mental health providers. Because systemwide efforts to implement collaborative care models have effectively reduced care disparities, and because most current reverse-integration models are not financially sustainable (7), CRANIUM has the potential to promote health equity for vulnerable populations in low-resource settings. Given CRANIUM's acceptability to providers, and given patient-centered and population health-based approaches, future RCTs should further evaluate the health outcomes and cost-effectiveness of this model.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Dr. Mangurian was supported by the National Institute of Mental Health (grants K23 MH-093689 and R01 MH-112420); the UCSF Hellman Fellows Award for Early-Career Faculty; and the National Center for Research Resources, the National Center for Advancing Translational Sciences, and the Office of the Director, National Institutes of Health (NIH), through the UCSF-Clinical and Translational Science Institute (grant KL2 RR-024130). Dr. Mangurian and Mr. Riano were supported by an NIH Center grant (P30 DK-092924) from the National Institute of Diabetes and Digestive and Kidney Diseases for the Health Delivery Systems-Center for Diabetes Translational Research (CDTR). Dr. Thomas was supported by a Ford Foundation fellowship administered by the National Academies of Sciences, Engineering, and Medicine. Dr. Niu was supported by an NIH Ruth L. Kirschstein National Research Service award (2T32 MH-018261). Drs. Handley and Schillinger were supported by an NIH Center grant from the National Institute of Diabetes and Digestive and Kidney Diseases for the Health Delivery Systems-CDTR (P30 DK-092924) and the NIH-National Institute of Minority Health and Health Disparities Comprehensive Center of Excellence for Health and Risk in Minority Youth and Young Adults (P60 MD-006902). Dr. Hwong was supported by the American Psychiatric Association Foundation and by a National Institute of Mental Health Research Education grant (R25 MH-060482). In the past 3 years, Dr. Newcomer has received grant support from the Substance Abuse and Mental Health Services Administration (grant H79SM080142), the NIH (MH-118395 and MH-106682), and the State of Florida Department of Children and Families (KH225). The authors thank the patients and staff at the Citywide Focus Clinic, UCSF. The authors also thank several administrators within the San Francisco Department of Public Health, including David Fariello, L.C.S.W., director of Citywide Focus Clinic; Irene Sung, M.D., chief medical officer; Alice Chen, M.D., chief medical officer; and Gloria Wilder, Pharm.D., director of pharmacology, Behavioral Health Service.

REFERENCES

1. Solmi M, Fiedorowicz J, Poddighe L, et al. : Disparities in screening and treatment of cardiovascular diseases in patients with mental disorders across the world: systematic review and meta-analysis of 47 observational studies. *Am J Psychiatry* 2021; 178:793-803 [PubMed: 34256605]
2. Druss BG, von Esenwein SA: Improving general medical care for persons with mental and addictive disorders: systematic review. *Gen Hosp Psychiatry* 2006; 28:145-153 [PubMed: 16516065]
3. McGinty EE, Presskreischer R, Breslau J, et al. : Improving physical health among people with serious mental illness: the role of the specialty mental health sector. *Psychiatr Serv* 2021; 72: 1301-1310 [PubMed: 34074150]
4. Mangurian C, Modlin C, Williams L, et al. : A doctor is in the house: stakeholder focus groups about expanded scope of practice of community psychiatrists. *Community Ment Health J* 2018; 54: 507-513 [PubMed: 29185153]
5. Mangurian C, Niu GC, Schillinger D, et al. : Utilization of the Behavior Change Wheel framework to develop a model to improve cardiometabolic screening for people with severe mental illness. *Implement Sci* 2017; 12:134 [PubMed: 29137666]
6. Yonek J, Lee C-M, Harrison A, et al. : Key components of effective pediatric integrated mental health care models: a systematic review. *JAMA Pediatr* 2020; 174:487-498 [PubMed: 32150257]

7. Scharf DM, Eberhart NK, Hackbarth NS, et al. : Evaluation of the SAMHSA Primary and Behavioral Health Care Integration (PBHCI) grant program. *Rand Health Q* 2014; 4:6
8. Mangurian C, Cournos F, Schillinger D, et al. : Low rates of HIV testing among adults with severe mental illness receiving care in community mental health settings. *Psychiatr Serv* 2017; 68:443–448 [PubMed: 28093055]
9. Jones N, Niu G, Thomas M, et al. : Peer specialists in community mental health: ongoing challenges of inclusion. *Psychiatr Serv* 2019; 70:1172–1175 [PubMed: 31500546]
10. Mangurian C, Niu G, Schillinger D, et al. : Understanding the cost of a new integrated care model to serve CMHC patients who have serious mental illness. *Psychiatr Serv* 2017; 68:990–993 [PubMed: 28859579]

HIGHLIGHTS

- A reverse-integration model, CRANIUM (cardiometabolic risk assessment and treatment through a novel integration model for underserved populations with mental illness), included preventive health screening for metabolic disorders among people with serious mental illness and was highly acceptable to community mental health providers.
- Strengths of the CRANIUM model include population health-based and patient-centered approaches.
- Challenges included problems maintaining the patient registry.