

By James Schuster, Cara Nikolajski, Jane Kogan, Chaeryon Kang, Patricia Schake, Tracy Carney, Sally C. Morton, and Charles F. Reynolds III

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A Payer-Guided Approach To Widespread Diffusion Of Behavioral Health Homes In Real-World Settings

James Schuster is chief medical officer for Medicaid, Special Needs, and Behavioral Services and vice president of behavioral integration, both at UPMC Insurance Services Division, and a senior faculty member at the UPMC Center for High-Value Health Care, all in Pittsburgh, Pennsylvania.

Cara Nikolajski (nikolajskice@upmc.edu) is a senior program administrator at the UPMC Center for High-Value Health Care.

Jane Kogan is senior director of the UPMC Center for High-Value Health Care.

Chaeryon Kang is an assistant professor of biostatistics at the University of Pittsburgh, in Pennsylvania.

Patricia Schake is senior director of program innovation, Community Care Behavioral Health Organization, in Pittsburgh.

Tracy Carney is a senior recovery and resiliency specialist, Community Care Behavioral Health Organization.

Sally C. Morton is dean of the College of Science, Virginia Tech, in Blacksburg.

Charles F. Reynolds III is a distinguished professor of psychiatry emeritus at the University of Pittsburgh School of Medicine.

ABSTRACT People with serious mental illness experience decreased life expectancy related to co-occurring medical conditions. A nonprofit behavioral health managed care organization implemented an innovative behavioral health home, in partnership with community mental health providers, to build a culture of wellness among all staff members, with a focus on prevention and holistic (that is, behavioral, social, and physical) health. The behavioral health home added one of two distinct care approaches, one patient driven and the other provider driven. The innovative approaches were implemented at eleven community mental health providers: Six delivered patient-driven care, and five delivered provider-driven care. We studied outcomes in the period October 2013–January 2016. Multiple diffusion strategies were utilized to encourage uptake. Our results revealed that both approaches significantly increased patient activation in care (more quickly in provider-supported care), engagement in primary and specialty care, and perceived mental health status. The success of this behavioral health home in improving important outcomes and the use of novel diffusion strategies led to its dissemination to forty-three additional providers across Pennsylvania.

The combination of high medical need and challenges in accessing high-quality medical care make adults with serious mental illness one of the most medically vulnerable populations in the US. Though annually one in four adults experience a mental health problem, the main burden of illness in the US derives from the estimated one in seventeen who experience serious mental illness.¹ People with such illness suffer from schizophrenia, schizoaffective disorder, bipolar disorder, or major depression—all of which are often associated with health or psychosocial limitations.² Adults with serious mental illness have high rates of earlier chronic disease onset and premature death, dying thirteen to thirty years younger

than the general population.³ Key contributors to poor health include substance use disorders; tobacco dependence; poor diet; sedentary lifestyle;^{3,4} negative metabolic effects of atypical antipsychotic medications;^{5,6} high rates of undiagnosed, untreated, or poorly treated medical illnesses;⁷⁻⁹ and difficulty obtaining routine preventive and primary care.¹⁰⁻¹² For most people with serious mental illness enrolled in Medicaid, community mental health providers are likely to be their first, and often primary, points of contact with the health care system.¹³

Innovations In Mental Health Care

Several behavioral health home approaches have been implemented nationwide to support people

who might benefit from integrated behavioral and physical health care services.¹⁴ Generally, behavioral health homes are not designed to provide a full array of behavioral and physical health clinical services; rather, they support self-management, patient-provider shared decision making about important health and wellness choices, and community linkages to support patients' health needs.¹⁵ Attending to both behavioral and physical health issues has led to improvements in primary care use, quality of life, disease management, and patient activation.¹⁶ To our knowledge, no well-designed randomized studies of these innovative models and no assessment of their key components exist. In addition, there is evidence that adaptations to traditional community mental health services—specifically, case management—offer a promising approach for improving the health of patients with serious mental illness.^{17,18} However, few efforts have addressed a complete culture of wellness, disease risk-factor behavior change, and disease prevention and management. Further, organizations serving people with serious mental illness often have limited resources, in the form of staffing, infrastructure, or financial constraints, to make such changes.

Community Care Behavioral Health Organization, a nonprofit behavioral health managed care organization that is part of the UPMC Insurance Services Division, developed a model called Behavioral Health Home Plus. This model infuses a focus on physical health and wellness coaching into case management activities via several mechanisms, such as the inclusion of wellness goals in all treatment and recovery plans. In addition to wellness coaching, Behavioral Health Home Plus uses both provider- and patient-driven approaches, including on-site wellness nurses, disease self-management tools and resources, patient registries, and avenues for increased collaboration with physical health care providers.

As it created and implemented this model, Community Care and its network of providers understood the importance of careful evaluation of the model's impact. This included exploration into which of these key approaches, provider or patient driven, optimally influences important patient outcomes when combined with the innovation of a community mental health care workforce whose members are trained to address physical, emotional, and social health and wellness. Thus, our comparative effectiveness study was designed to assess the impact of two behavioral health home approaches, Patient Self-Directed care and Provider-Supported care, on several patient-centered outcomes, including activation in care, health status, and engagement

in primary and specialty care. Multiple diffusion strategies, including workforce training and a learning collaborative approach,¹⁹ were used to support implementation. In addition, we sought to understand what works best for whom—that is, whether there are subgroups whose members might benefit more from one of the two approaches.

This article provides information about the innovative strategies used to support the implementation of Provider-Supported and Self-Directed in community mental health providers across Pennsylvania. Further, we describe our evaluation of the models' effectiveness at improving outcomes for patients with serious mental illness and the important lessons learned.

Setting And Intervention Overview

SETTING Since 2010, a multistakeholder collaboration in Pennsylvania led by Community Care Behavioral Health and the Behavioral Health Alliance of Rural Pennsylvania, a twenty-three-county consortium, has been working to transform mental health providers into optimally performing behavioral health homes. Together, stakeholders have designed and implemented an array of supports and services for improving the health, wellness, and recovery of adults with serious mental illness who receive care in rural settings. The UPMC Center for High-Value Health Care, a nonprofit research organization focused on health care systems improvement, engaged with these partners to build on and advance these efforts by comparing the effectiveness of Self-Directed and Provider-Supported approaches in eight rural and three suburban or urban community mental health providers across Pennsylvania. In this cluster-randomized trial, provider sites were randomly assigned to one of the two interventions.

CULTURE OF WELLNESS AND BEHAVIORAL HEALTH HOME APPROACHES Both approaches, Self-Directed and Provider-Supported, were implemented within the context of a culture that promoted healthy lifestyle, disease prevention, and health education and promotion. Components that were common to both approaches included training care delivery staff members (for example, case managers and wellness nurses) in wellness coaching so they could work with patients in addressing preventable or reversible risk factors for chronic disease; enhance staff and patient engagement with primary care physicians; and promote recovery by helping patients achieve physical, emotional, social, and financial wellness. Components that were specific to one or the other approach are described below.

Self-Directed care incorporated a secure web portal to support patients' access to content tailored to their needs or goals, and to inspire them to learn about their conditions and take an active role in their own care. The portal contained personal health information, such as medical conditions and history of their use of primary care and specialty visits and medications; access to self-guided wellness interventions; and trackers for smoking cessation, weight management, and improved nutrition and sleep hygiene. Patients could access the portal apart from their clinical encounters or in conjunction with wellness coaches. Similar resources were available on paper as well as online.

Provider-Supported care made use of a full-time registered nurse on staff at each community mental health provider to provide consultation to wellness coaches. Nurses were responsible for educating staff members about common medical comorbidities, working with wellness coaches to develop tailored wellness plans, and assisting the coaches with patients' transitions from inpatient to community-based settings. Nurses also helped patients coordinate and obtain preventive, primary, and specialty medical services and monitor progress.

Self-Directed honored and encouraged autonomy and engagement on the part of patients, while Provider-Supported delivered additional assistance via nurses to people who might otherwise have difficulty accessing care and monitoring physical health. While components of each approach are likely very important, little was known about their differential impact on patient-centered outcomes.

DIFFUSION OF INNOVATION FRAMEWORK We implemented several processes similar to those outlined in the Centers for Disease Control and Prevention's Replicating Effective Programs framework²⁰ to train staff members, provide regular feedback to participating sites, evaluate the implementation process, and promote the scaling of the behavioral health home approaches to other provider facilities and populations.

WELLNESS CHAMPIONS AND TRAINERS Each community mental health provider identified several staff members to serve as "wellness champions" and trainers. Wellness champions focused on helping patients address their physical, behavioral, and social needs and encouraged implementation by supporting wellness coaches and patients with resources using a train-the-trainer approach—which has proved effective in promoting the delivery and scaling of clinical services.²¹ Wellness training was designed to improve providers' knowledge, skills, and attitudes related to physical health conditions while increasing their capacity to talk about health

Health care systems can integrate elements of Provider-Supported and Self-Directed into practice to increase patient self-management.

and wellness with people who have serious mental illness.²² Qualitative interviews with staff members (whose findings will be reported in a separate article) indicate that training and implementation experiences improved staff awareness of the interconnectedness of behavioral and physical health, information that they subsequently passed on to patients. This emphasis improved the sustainability of the models.

LEARNING COLLABORATIVE Based on the Institute for Healthcare Improvement's Breakthrough Series,¹⁹ the learning collaborative provided a structured process to support implementation through the sharing of experiences, continuous quality improvement, and monitoring of intervention activities. Providers were asked to submit implementation-related information to the collaborative's data team. Information was presented back to providers for rapid-cycle improvement through the plan-do-study-act process.¹⁹ Monthly webinars were used to share data and discuss ideas for improvement.

Study Data And Methods

STUDY DESIGN AND SAMPLE Using a cluster-randomized design, we randomly assigned eleven community mental health providers to one of the two behavioral health home approaches: Six were assigned to Self-Directed and five to Provider-Supported. Additional randomization and power analysis information is in online appendix exhibit A.1.²³ Patients of these providers were eligible to participate in the research if they were Medicaid-enrolled adults ages twenty-one and older with serious mental illness who received services from a participating provider. Diagnoses of serious mental illness (schizophrenia, schizoaffective disorder, bipolar disorder, or major depression) were determined through payer claims data. Receipt of services was de-

The availability of and interactions with the wellness nurse in Provider-Supported may have promoted sustained activation.

defined as having at least two claims for outpatient, case management, or peer specialist services during the six months before sample generation. People were ineligible if they could not speak or write English. The majority of people who met the inclusion criteria were recruited and consented during a continuous enrollment period from October 1, 2013, to January 15, 2014. This study was approved by the University of Pittsburgh Institutional Review Board.

We enrolled 460 men and 769 women with serious mental illness, for a total of 1,229 subjects—713 in Provider-Supported and 516 in Self-Directed. The mean age was forty-three, and 90 percent of the participants were white (appendix exhibit A.2).²³

OUTCOMES AND DATA Focus groups with patients and stakeholders led us to focus on three primary outcomes: patient activation, perceived health status, and engagement in primary and specialty care. The validated Patient Activation Measure^{24,25} was used to assess each participant's confidence in and ability to improve or manage their health. Version 2 of the twelve-item Short-Form Health Survey (SF-12v2)^{26,27} was used to gain insight into the impact of Self-Directed and Provider-Supported on patients' perceived physical and behavioral health status. Engagement in primary and specialty care was assessed using patient claims data, to shed light on the frequency of use of outpatient services (for example, those provided by a primary care physician, a cardiologist, or an endocrinologist). Every six months over an approximately two-year period (October 2013–January 2016), self-report data were gathered from participants using a secure web interface. Community Care and the Pennsylvania Department of Human Services supplied existing claims data to ascertain participants' physical and behavioral health services use during the same time period. Because the study sponsor (the Patient-Centered Outcomes Research Institute) does not allow for

the assessment of cost-related outcomes, we did not include cost as an outcome.

ANALYTIC APPROACH Descriptive and multivariate analyses compared the impact of Self-Directed and Provider-Supported on patient outcomes, examining treatment-by-time interaction effects for each outcome, after adjusting for covariates. We fit linear mixed models and included random effects for community mental health providers and participants to account for within-clinic and within-participant correlation (necessitated by cluster randomization). Absent a significant treatment-by-time interaction effect, we tested marginal effects to determine if outcome change was significant over time (see appendix exhibit A.3).²³

To address the question of what works best for whom, we assessed the moderating effect of gender on primary outcomes by exploring three-way interaction effects (male/female gender-by-treatment-by-time) on each outcome. The same linear mixed model described above was used, but with regression models including three-way interaction terms—including the same covariates, to account for potential confounding. We conducted sensitivity analyses to investigate differences between people retained in the study versus those lost to follow-up (see appendix exhibit A.4).²³

Finally, we sought to understand whether a patient's level of overall engagement in Self-Directed and Provider-Supported (high engagement: 362; medium engagement: 430, low engagement: 277; and no engagement: 28) mediated the impact of the two behavioral health home approaches on outcomes. The average number of case management, peer services, and psychiatric rehabilitation visits in six-month intervals was used as a proxy for overall engagement in interventions—assuming that participants were likely to engage in elements of wellness coaching, a key component of our behavioral health home interventions, during these visits. We were unable to rely on web portal data as another way to measure engagement, since some participants in Self-Directed preferred paper packets to the online interface. Consequently, we could not obtain an accurate “dose” for use of the web portal or paper packet.

Our understanding of patient engagement in intervention-related activities was further strengthened by data from the learning collaborative that suggested a high degree of wellness goal generation, communication between behavioral and physical health care providers, and each community mental health provider's degree of sustained implementation.

LIMITATIONS This study had several limitations. First, we relied on historical claims data

to generate initial estimates of the numbers of eligible patients. These estimates led to fewer people being available for enrollment than expected, and our smaller sample limited our ability to conduct analyses by subgroups other than males and females.

Second, approximately 40 percent of our participants were dually eligible for Medicare and Medicaid. Because Medicare is the primary payer for some claims, we were unable to observe all claims information for dually eligible participants, which may have led to an underestimation of primary and specialty care use.

Finally, the study lacked a control group, which limited our ability to understand the impact on outcomes of Self-Directed and Provider-Supported, compared to usual care.

Study Results

PATIENT ACTIVATION Self-Directed and Provider-Supported had differential impacts on patient activation as measured by the Patient Activation Measure:²⁵ Provider-Supported participants experienced a more rapid initial increase that was then sustained over time (exhibit 1). Our findings show a nearly two-point increase in the Patient Activation Measure score for both approaches, but at different times during the twenty-four months of the study period.

HEALTH STATUS Changes in perceived mental and physical health status, as measured by the SF-12v2,^{26,27} did not differ significantly between Self-Directed and Provider-Supported. However, the scores did change significantly over time for both approaches (exhibit 2). Overall perceived

mental health scores improved over time (from 39.3 at zero months to 39.9 at twenty-four months), while perceived physical health scores worsened (from 42.3 to 41.0).

ENGAGEMENT IN PRIMARY AND SPECIALTY CARE Our results indicated no between-group difference for engagement in primary and specialty care as measured by the number of visits ($p = 0.4582$). However, engagement in primary and specialty care increased significantly over time for both approaches together, from a mean of 7.6 visits at zero months to 10.3 visits at twenty-four months (exhibit 3).

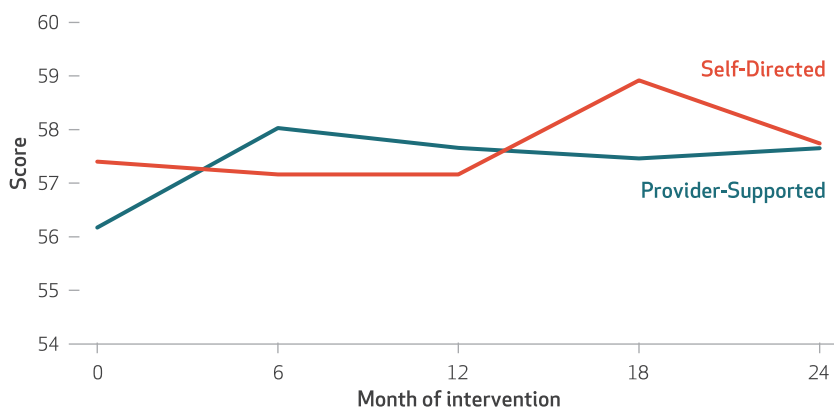
RESULTS BY GENDER In Provider-Supported, compared to male gender, female gender was associated with a greater improvement in the Patient Activation Measure score from zero to six months (a 2.82-point increase) (exhibit 4). In Self-Directed, by contrast, males and females started with a wide gap in baseline Patient Activation Measure scores (2.02 points) that closed over time but increased again, with a 1.57-point gap at twenty-four months; women had higher Patient Activation Measure scores than men at all time points. We detected no significant impact of gender on rates of change in perceived health status or engagement in primary and specialty care across the two approaches. More information about these findings and the numbers of participants analyzed for each outcome can be found in appendix exhibit A.5.²³

IMPACT OF ENGAGEMENT IN INTERVENTIONS ON PRIMARY OUTCOMES Our primary analyses relating to the impact of the interventions on our outcomes of interest revealed several significant changes over time. However, we have no evidence to suggest that our proxy of the number of case management, peer services, and psychiatric rehabilitation visits in six-month intervals explained the relationship between our interventions and outcomes. We could not account for a number of other engagement-related variables that might have more effectively explained the relationship between the interventions and observed outcomes (data not shown).

LEARNING COLLABORATIVE IMPACT Leadership teams representing community mental health providers participated in each learning collaborative session. Ninety-nine plan-do-study-act cycles were completed across provider agencies over twelve months. These cycles contributed to practice-level changes that resulted in sustained implementation (data not shown). At the completion of the learning collaborative, half of the providers rated themselves at 4.5 (on a scale of 1–5, indicating that the provider practices were moving toward sustainability), and half rated themselves at 5.0 (meaning that all project goals had been achieved, and organizational changes

EXHIBIT 1

Impact of Self-Directed and Provider-Supported behavioral health homes on patient activation



SOURCE Authors' analysis. **NOTES** Treatment-by-time interaction $f(4,3164) = 6.70, p < 0.0001$, effect size (ES) < 0.02 . Measure used: Patient Activation Measure. Measurement scale: raw score 0–100 (100 is the highest level of activation). Provider-Supported and Self-Directed are described in the text.

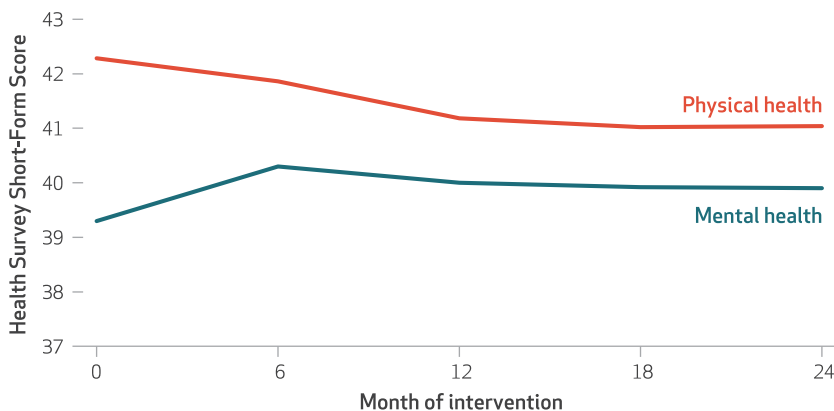
were permanent). Learning collaborative data showed improvements in development of wellness goals, use of the self-management tools, communication between physical and behavioral health providers, and confidence and involvement among patients and providers in working toward improved health and wellness.

Discussion

The implementation of behavioral health home models by a nonprofit behavioral health managed care organization led to a nearly 2-point overall increase in patient activation scores at varying time points (from zero to eighteen months in the Self-Directed model, and from zero to six months in the Provider-Supported model) and to a 36 percent overall increase in primary or specialty care use for patients. The greatest improvement in patient activation scores for each gender was observed in Provider-Supported for women (2.82-point increase in the first six months) and in Self-Directed for men (2.79-point increase in the first eighteen months). When activation levels improve, health outcomes tend to improve as well, and more efficient use of care follows.^{28,29} For example, a 1.00 increase in Patient Activation Measure score predicted a 2 percent decrease in hospitalization and a 2 percent increase in medication adherence.^{25,30} Patient activation is an important and modifiable factor for influencing disease outcomes. Health care systems can integrate elements of Provider-Supported and Self-Directed into practice to increase patient self-management. Moreover, high rates of primary care use among people with behavioral health conditions can lead to increased receipt of preventive services outlined in clinical practice guidelines and significantly greater improvement in physical health.^{18,31} Our longitudinal findings showed that patient activation in Provider-Supported improved early in implementation and remained stable over time, but in Self-Directed, patient activation began to decline after initial improvement. This suggests that the availability of and interactions with the wellness nurse in Provider-Supported may have promoted sustained activation. In both Self-Directed and Provider-Supported, engagement in primary and specialty care and perceived mental health status increased and remained stable; however, perceived physical health status declined slowly over time. This decrease may be a result of increased awareness of physical health diagnoses and challenges. Our two-year implementation period was not sufficient to determine whether perceived physical health status stabilizes or even increases with improvement in participants' self-

EXHIBIT 2

Impact of Self-Directed and Provider-Supported behavioral health homes on perceived mental and physical health status



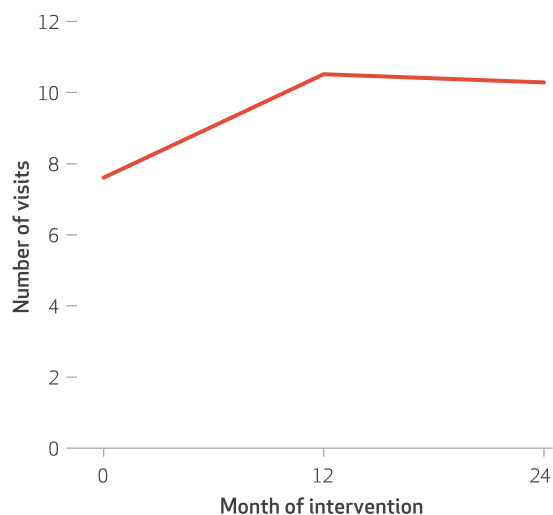
SOURCE Authors' analysis. **NOTES** Mental health status change over time $f(4, 3783) = 6.12$, $p < 0.0001$, $ES < 0.02$. Physical health status change over time $f(4, 3783) = 9.63$, $p < 0.0001$, $ES < 0.02$. Measure used: SF-12v2 (Health Survey, Short Form, version 2). Measurement scale: 0-100 (100 is highest level of health). Provider-Supported and Self-Directed are described in the text.

management of their physical health conditions.

Our analysis of the impact of degree of intervention engagement on outcomes did not produce significant findings. However, our use of claims data as a proxy of engagement level might not have been an adequate measure. For example, claims data could not capture participants'

EXHIBIT 3

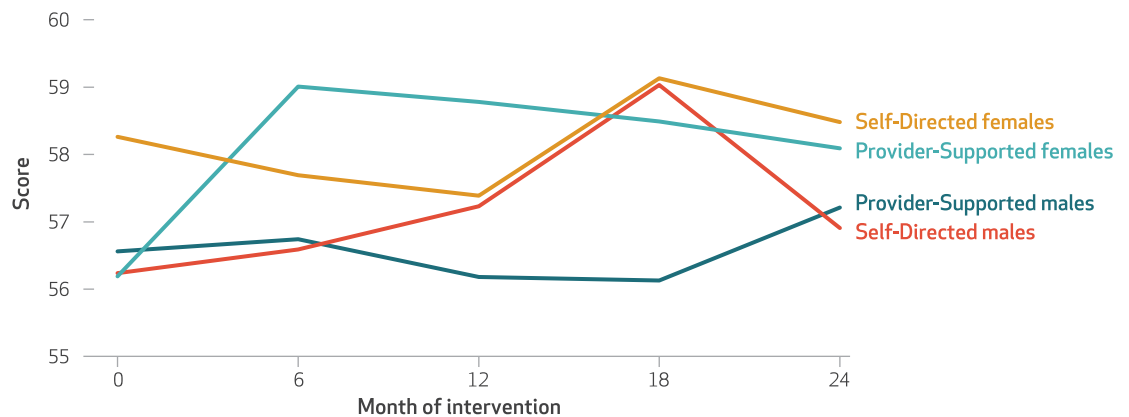
Impact of Self-Directed and Provider-Supported behavioral health homes on primary and specialty care engagement



SOURCE Authors' analysis. **NOTES** Change over time $f(2, 2144) = 4.16$, $p < 0.0157$, $ES = 0.06$. Measure used: physical health claims data. Measurement scale: mean number of visits in the twelve months before each time point. Provider-Supported and Self-Directed are described in the text.

EXHIBIT 4

Relationship between gender and patient activation in Self-Directed and Provider-Supported behavioral health homes



SOURCE Authors' analysis. **NOTES** Treatment-by-gender-by-time interaction $f(4,3155) = 4.28, p = 0.0019, ES < 0.02$. Measure used: Patient Activation Measure. Measurement scale: raw score 0–100 (100 is the highest level of activation). Provider-Supported and Self-Directed are described in the text.

level of interaction with the wellness nurse—a primary component of Provider-Supported—or the number of phone calls made by case management staff members to patients.

We observed a significant difference in several outcomes between Provider-Supported and Self-Directed over two years but ultimately similar changes in outcomes with both approaches. This finding suggests that while the availability of a wellness nurse in Provider-Supported may have helped support faster activation in care than was the case in Self-Directed, embedding health navigation into the case manager role and training all staff members in supporting a culture of wellness may have been the key elements leading to similar successful outcomes with both approaches. This observation underscores the importance of the Behavioral Health Home Plus innovation in creating a culture of wellness.

Lessons In Diffusion

Our findings suggest that payers may be able to leverage their unique relationships with community mental health providers to improve outcomes for patients, and to integrate physical health and wellness support into their existing care delivery settings. Patient-centered outcomes can improve when patients receive care at provider organizations that are committed to a culture of wellness, have trained staff members in wellness principles and tactics, use health and wellness resources and materials to support care delivery, and engage in learning collaborative implementation to support the overall change.

Intervention resources not only were useful to providers but also allowed patients to increase

their knowledge about how to make behavioral changes that can lead to the prevention or control of chronic conditions, enhance understanding of the interconnections between physical and behavioral health, and improve patient-provider communication. In our study, patients worked collaboratively with provider staff members to identify and take small incremental steps toward achieving their wellness goals—a finding supported by prior research showing that community mental health providers' staff could be trained to improve patients' self-management of diseases.¹⁵ Patients also consulted with on-site wellness nurses, who provided them with personal health information and made referrals to other providers as needed. An evaluation of a nurse care management program—a program similar to Provider-Supported—found improvements in patients' chronic conditions and mental illness, compared to usual care.¹⁵

The learning collaborative was a critical component for promoting buy-in and implementation among community mental health providers. Our collaborative's findings were consistent with successful uptake of key elements of Provider-Supported and Self-Directed by staff and patients, as indicated by goals achieved and consistent improvements in the implementation process. In addition, the train-the-trainer approach allowed for a less resource-intensive and more sustainable method of training many staff members in intervention delivery.

Next Steps

Evidence from this study supports use of the full Behavioral Health Home Plus model wherein

both wellness nurse and self-management resources are made available, enabling patients to gain access to their preferred health and wellness supports. The acceptability of both the Self-Directed and Provider-Supported models is evident in their use after the end of the study by all participating community mental health providers. Community Care Behavioral Health has expanded the reach to forty-three additional providers by using learning collaboratives and a pay-for-performance contract, which incentivizes behavioral health home implementation, pays for nurse employment, and creates access to web-based tools. Similar strategies will be used to support the translation and dissemination of the models to address unmet health care needs of other at-risk populations. This rapid dissemination and uptake in the broader Community Care Behavioral Health provider network indicates that providers recognize the value in training existing staff members in health and wellness and changing their culture to improve outcomes for patients. Moreover, as noted above, improvements in patient activation lead to decreased use of inpatient care and improved medication adherence, which in turn has the potential to decrease health care costs and increase the efficiency of care delivery.^{24,25} In addition, increased rates of outpatient physical health care among people with behavioral health conditions often leads to increased receipt of preventive measures outlined in clinical practice guidelines (for example, colonoscopy and hemo-

globin A1c and lipid tests) and significant improvement in physical health,^{18,31} with potential downstream financial benefits for health care systems. Finally, subsequent comparative analyses with an archival matched control cohort revealed that cost and utilization outcomes improved significantly for both models. These results, which were not part of our project that was funded by the Patient-Centered Outcomes Research Institute, will be reported in a subsequent publication.

Conclusion

The Behavioral Health Home Plus model provides a best-practice solution, supported and implemented by a payer, to address the health needs of adults with serious mental illness. By using both behavioral and physical health promotion components of Behavioral Health Home Plus and implementation support strategies such as learning collaboratives and training methods that promote rapid and widespread scaling, behavioral health provider organizations can positively influence meaningful outcomes for vulnerable patients. The findings from our study can inform national efforts to avoid or reduce early mortality and comorbidity among people with serious mental illness and inform the more efficient, tailored, and rapid diffusion of promising models in routine behavioral health care settings. ■

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