The Reforming States Group

Milbank Memorial Fund

REPORT

Evolving Models of Behavioral Health Integration:

Evidence Update 2010-2015

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May 2016

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Acknowledgments

This report was prepared with support from the following staff members at the Center for Evidence-based Policy: Curtis Harrod, PhD, Catherine Pettinari, PhD, Pam Curtis, MS, Erika Zoller, MS, and Valerie King, MD, MPH.

The authors gratefully acknowledge the continued support from the Milbank Memorial Fund and its commitment to bringing the best available research evidence on behavioral health integration to the forefront to assist policymakers and health system planners.

The authors would also like to thank the following individuals for their expert insights and general review of the report. Their affiliation at the time of review is listed.

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Message from the President

In 2010, when the Milbank Memorial Fund published its first report on behavioral health integration, "Evolving Models of Behavioral Health Integration in Primary Care," we had no idea that the report would become one of the Fund's most popular publications. The report noted that the US mental health system was failing to reach and adequately treat the millions of Americans suffering from mental health and substance abuse. Behavioral health integration (BHI), the integration of primary care and behavioral health, was an approach to meeting those needs that seemed to work. The 2010 report provided a detailed description of eight models of integrating care.

Then, in 2014, in response to a request from the its Reforming States Group, the Fund published another report on behavioral health integration, this time focusing specifically on models for patients with serious mental illness, since information on that particular segment of patients was lacking.

By 2015, it was time to update the broader (2010) report. Since 2010, the field had advanced conceptually. There had been a proliferation of research. And we know that policymakers continued to be interested in the topic. There remain unmet needs for behavioral health services, particularly for low-income populations. Policymakers struggle to better understand the interactions between mental and physical health, the effects of behavioral health services on health care budgets, and how best to deliver care and support recovery for people with mental illness or substance use disorders.

This new report joins our growing library of BHI reports—and picks up where the 2010 report left off. The new report provides an updated scan of the literature over a five-year period (2010 to 2015), identifying changes and gaps in the evidence since publication of the 2010 report. It also identifies resources to assist policymakers and health care planners in selecting, implementing, and sustaining BHI models appropriate for their populations and settings.

Consistent with our mission of improving the health of populations by connecting leaders and decision makers with the best evidence and experience, this report was reviewed by policymakers with an eye toward making it useful for them. We believe it will aid and encourage leaders as they work to develop policies that improve the care and health of people with mental illness.

Christopher F. Koller
President, Milbank Memorial Fund

Background

Six years ago, the Milbank Memorial Fund published a report, *Evolving Models of Behavioral Health Integration in Primary Care,* that quickly became widely cited and one of the Fund's most popular publications.[1] Since 2010, the field of behavioral health integration (BHI) has advanced conceptually, and there has been a proliferation of research. Policymakers continue to be interested in the topic and struggle with how best to deliver care and support recovery for people with mental illness or substance use disorders.

As the largest payer of mental health services in the United States (US), state Medicaid agencies are key players, often influencing how mental health care is delivered.[2] Policymakers and health care planners benefit from information that helps them understand and implement effective interventions.

Providing Care for People with Mental Illness Has Its Challenges

Mental illness and substance use disorders are common, affect people of all ages, and result in substantial disability and cost. Approximately 18% of adults, and 13% to 20% of children and adolescents, in the United States have a mental disorder.[3] Of people aged 12 and older, 8% have a substance use disorder.[4] Depression alone will be one of the three leading causes of disability in the developed world by 2030,[5] and approximately 8 million deaths each year are attributable to mental illness.[6]

For decades, policymakers and providers have seen worse health outcomes for people with behavioral health disorders compared to those without them. Some of the reasons for this include the lack of understanding of the relationship between mental and physical disorders and siloed behavioral and physical health care systems.[7] For some people, the symptoms of their mental disorders, such as depression or anxiety, make it a real challenge to engage in the health care system. For others, stigma associated with severe mental illness or lack of behavioral health staff in primary care offices makes it difficult to find a primary care home where they feel they can fit in. And, for some people with severe mental illness or substance use disorders, their lives may be too chaotic or disorganized to access the care they need.

People with mental disorders also have high rates of adverse health behaviors, including tobacco and other substance use, physical inactivity, and poor diet. Like everyone else, they need preventive services such as immunizations, cancer screenings, and tobacco cessation counseling, but they often do not receive these preventive services.[8] If people with mental disorders have a chronic medical condition, they need coordinated management of the condition.[9] Their unhealthy behaviors further contribute to their high rates of chronic medical conditions and substantial reductions in life expectancy. They die early—not from their behavioral health disorder, but because of chronic medical conditions, infections, or suicide.

People with mental disorders are frequently seen in primary care but are often underdiagnosed and undertreated.[10-13] Similarly, individuals with serious mental illness and substance use disorder seen in mental health settings lack adequate general medical care.[14-17] The care of these individuals is complicated by significant medical conditions such as diabetes and chronic pain, which affect treatment decisions, outcomes, and costs of care.[17,18] Because fragmentation of mental health, substance use, and medical services results in inadequate care for those with mental illness, many have called for integrating behavioral health, including mental health and chemical dependency services, and primary medical care.

With advances in understanding behavioral health disorders, there are now more opportunities to diagnose and effectively treat these conditions, recognize the relationship between physical and mental health, spend health care dollars more efficiently, and help patients avoid the consequences of homelessness, broken families, and criminal justice system involvement that might affect those with behavioral health disorders.

Initiatives at the federal, state, and local levels have encouraged research and efforts to integrate behavioral health and primary care services to create patient-centered medical homes and health homes.[2,19,20] The focus of these efforts was primarily on integrating mental health into primary care services and less on integrating primary care into mental health services or mental health and chemical dependency services.[1,21] Interest in integrating primary care services into mental health services is growing, recognizing that there should be no wrong door for people with more serious behavioral health disorders who may feel more comfortable with their mental health center as their health home.

Because of these initiatives and renewed interest in identifying and implementing effective models of BHI, research on BHI has grown rapidly over the past 10 years. More importantly, BHI has been identified as a critical factor in achieving the triple aim: (1) improving the experience of care for patients; (2) improving the health of populations; and (3) reducing the costs of health care.[22]

The Fund's 2010 report[1] was very useful at that time. It described the potential benefits of BHI, identified eight BHI models, and provided additional resources to assist policymakers interested in pursuing BHI. The report provided a brief analysis of the evidence base for each BHI model and referred readers to the federal Agency for Healthcare Research and Quality's 2008 review of randomized controlled trials for further information.[12]

Aim of the Report

Since the Fund's 2010 report was published, federal agencies have funded new research on BHI care models and convened experts to standardize terms and models describing BHI. These factors prompted questions about whether the BHI models and evidence presented in the 2010 report still stand and what might be new.

The aim of this report is to assist policymakers and health care planners to understand and pursue BHI by:

1. Providing an updated scan of the literature over a five-year period (2010 to 2015) to identify changes and gaps in the evidence regarding BHI since publication of the 2010 report; and

2. Identifying resources to assist policymakers and health care planners in selecting, implementing, and sustaining BHI models appropriate for their populations and settings.

This report does not provide a detailed analysis of either the research or implementation models. Detailed analyses can be found through many of the resources noted in this report.

Methods

We scanned the literature covering January 2010 to June 2015, because the literature search for the Agency for Healthcare Research and Quality (AHRQ) technology assessment (TA)[12] that served as the evidence base for the 2010 Milbank report[1] was updated in February 2010.[21] We searched databases of systematic reviews (e.g., Cochrane), MEDLINE, and pertinent websites that focused on BHI. We used a broad search strategy to cover all mental health and substance use conditions and all settings to provide a broad overview of the research literature. Supplements A and B include a full description of the methods and search strategies, respectively.

The evidence review included only systematic reviews (SRs), TAs, and randomized controlled trials (RCTs) because these study designs are more likely to yield reliable, good-quality evidence.[23,24] We included RCTs from a prior report on integrating primary care into mental health and chemical dependency treatment settings[25] if the RCT addressed areas where there were few current studies (e.g., collaborative care management for substance use disorder). Because the purpose of this report is to provide an overview of the current research literature, we did not assess the quality of included studies or provide a detailed analysis of study results.

Findings

Since publication of the Milbank Memorial Fund report in 2010, the field of BHI has advanced conceptually and experienced a proliferation of research. The MEDLINE search identified 1,180 citations published between January 2010 and June 2015. Approximately 30 studies from systematic review databases and a prior report[25] were also considered for inclusion. Overall, 140 studies met the inclusion criteria. Results of the literature scan indicate that research on BHI has expanded beyond depression in primary care settings to targeting a variety of mental health conditions and settings, as well as patient subgroups and use of new technologies.

Specific findings from the literature scan are organized into three areas: (1) terminology and conceptual frameworks, (2) research findings, and (3) implementation issues.

Terminology and Conceptual Frameworks

Key Findings—Terminology and Conceptual Frameworks

We now have more defined and common language, as well as a clearer idea of the key components of the models that drive improved patient health outcomes.

- Models that integrate mental health and medical care systematically connect mental health and primary care providers to improve their communication and coordination to meet all of the patient's health needs, no matter where they seek care.
- The AHRQ developed a lexicon, practice parameters, and quality metrics to assist policymakers and health care planners in setting standards and contracting for BHI services.
- An expert panel of the Substance Abuse and Mental Health Services Administration (SAMHSA) and the Health Resources and Services Administration (HRSA) developed a conceptual framework defining six levels of collaboration spanning three practice structures (coordinated care, colocated care, and integrated care). Behavioral health integration models can be placed on this six-level continuum of collaboration based on their practice structure and strategies used to enhance coordination and collaboration.

According to a national panel of experts convened by the AHRQ,[26] BHI encompasses a set of models for linking mental health (including chemical dependency treatment) and medical care.

> "Integrated mental health and general medical care models involve the systematic linkage of mental health and primary care providers and require communication or coordination between providers to meet both the mental and general health needs of the patient."

Numerous overlapping terms [1,11,27-29] have been used to describe BHI, often creating confusion and potentially inhibiting the effective implementation of BHI interventions. Since publication of the Fund's report in 2010, AHRQ convened an expert panel to address this confusion by developing a lexicon of standard terms and definitions.[28] In addition, the SAMHSA-HRSA Center for Integrated Health Solutions convened an expert panel to create a standard conceptual framework to facilitate understanding of the various models used to integrate mental health and primary care.[30,31]

Lexicon

The AHRQ lexicon[28] proposed standardized definitions of frequently used terms in the field of BHI (e.g., coordinated care, collaborative care, integrated care, shared care). Appendix B includes relevant terms from the lexicon as they relate to the BHI models and research identified in this report. The lexicon also describes how practices might structure care to achieve BHI (e.g., care management) as well as corresponding practice parameters that indicate how practices might differ and still enhance integration of care. Finally, the lexicon was used as a starting point to develop quality measures for BHI.[26] These quality measures, along with the definitions and practice parameters, may prove useful in setting standards and contracting for BHI services.

Conceptual Frameworks

The eight models described in the Fund's 2010 report[1] (Appendix A), along with the work of Doherty[32] and Blount[33] informed the development of a SAMHSA-HRSA conceptual framework of collaboration and integration. This framework provides a method of organizing various BHI models. Doherty and colleagues[32] first proposed a framework that described the degree or *level of collaboration and integration* between behavioral health and primary care that ranged from minimal collaboration to close collaboration in a fully integrated system with a shared culture. Blount[33] collapsed these five categories into three that focused on *practice structure:* coordinated, colocated, and integrated. These three practice structures served as a starting point for the SAHSHA-HSRA framework.[30,33] The SAMSHA-HRSA panel defined *levels of collaboration* within the three practice structures resulting in a six-level continuum of collaboration and integration.

- **Coordinated care**
  Level 1: Minimal collaboration—patients referred to another practice site.
  Level 2: Basic collaboration—providers periodically communicate about shared patients.

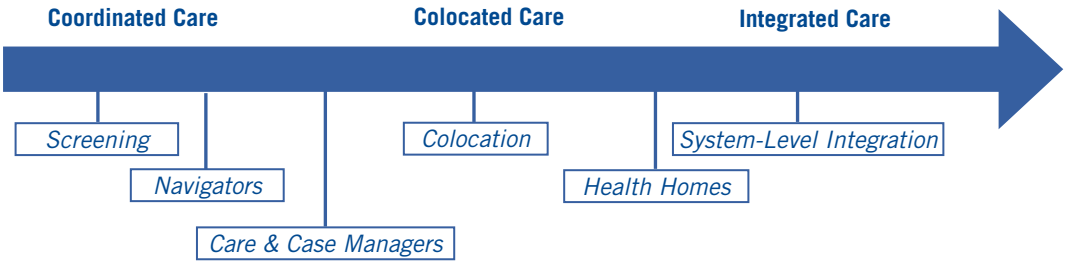
- **Colocated care**
  Level 3: Basic collaboration on site—providers at the same site periodically communicate but maintain separate cultures and separate treatment plans for patients.
  Level 4: Close collaboration on site with some system integration and shared records—providers have some face-to-face communication about shared patients and feel part of a team.

- **Integrated care**
  Level 5: Close collaboration approaching an integrated practice—collaborative treatment planning for shared patients, but separate planning for other patients.
  Level 6: Full collaboration in a merged integrated practice for all patients—a team of providers jointly develops a single treatment plan for patients. Patients experience their care as a single system treating the whole person.

The SAMHSA-HRSA framework is similar to those that describe collaboration across organizations outside of health care.[34,35]

BHI models can be placed on a continuum of collaboration (Figure 1) based on their practice structure (top of the arrow) and the strategies used to enhance coordination and collaboration (across the bottom). The direction of the arrow generally represents a progression from no integration (left) to fully integrated care (right). However, strategies to enhance coordination and collaboration may be used in combination, and some of the models described in the research literature may fit into more than one level.

Figure 1. Continuum of Physical and Behavioral Health Care Integration*



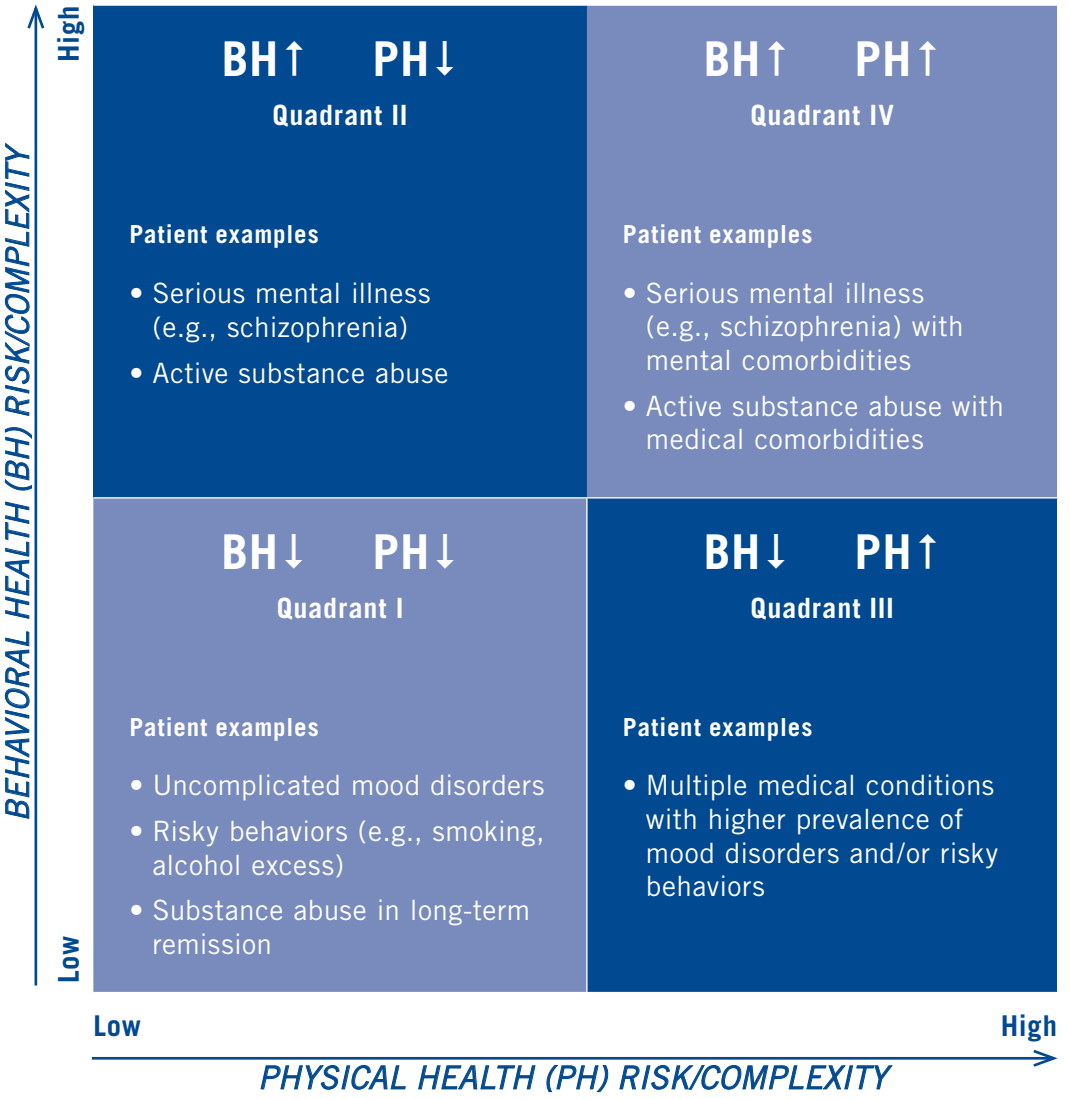
*Adapted from Nardone[2]

For example, care managers may be used to enhance coordination and collaboration between patients and their mental health and primary care providers in coordinated, colocated, or integrated practices.

BHI models fitting into levels 2 and 3 have generally been used for patients with depression, other mood disorders, and risky alcohol use.[11,12,21,36] Models fitting into levels 4 through 6 have generally been used for patients with serious mental illness (SMI) and substance use disorder (SUD) who need intensive mental health or chemical dependency treatment.[21] This pattern suggests that the intensity of mental and physical health needs of patient populations might be useful in planning for the level of collaboration required in a health care system or practice.

An earlier framework promoted by the SAMHSA-HRSA Center for Integrated Health Solutions, the Four Quadrant Model,[31,37] might also be useful because it identifies the mental and physical health needs of patient populations (Figure 2). The health care needs of a population could then be matched to the appropriate level of collaboration[38] and the BHI model that could meet those needs.[1]

Figure 2. Four Quadrant Model of Behavioral and Physical Health Needs



Adapted from a figure by Mauer[31,37]

The quadrants in this model categorize patients by their behavioral and physical health risks and complexity. These quadrants can then be used to match patient population needs and settings with the level of collaboration and integration. For example, patients with SMI or active SUD and multiple medical problems seen in some community mental health centers may need colocated care with partially or fully integrated practices (levels 4 through 6) to improve their outcomes. In these practices, mental health, medical, and other providers would have a common patient record and closely collaborate to develop joint treatment plans. Patient populations that are low risk for complex behavioral health conditions might best be served in coordinated primary care and mental health practices where collaboration is facilitated by a care manager (level 2).

Available resources might also affect the level of collaboration and integration a practice can achieve. For example, rural areas might not have access to on-site behavioral health providers but could use telehealth systems and care managers to enhance collaboration and coordination. Together, the SAMHSA-HRSA Levels of Integrated Healthcare framework and Four Quadrant Model might be useful tools for planning approaches to achieve BHI for defined patient populations and settings.

Research Findings

Key Findings—Research

Overall, evidence for BHI, and specifically the collaborative care management (CCM) model, is even stronger than in 2010. New findings are emerging regarding components of CCM associated with improved outcomes and strategies for addressing comorbid mental and medical disorders.

- The predominant model for BHI is the CCM model, where care or case managers systematically link patients with mental health and primary care providers.
- High-quality evidence from more than 90 studies involving over 25,000 individuals support that the CCM model improves symptoms from mood disorders and mental health–related quality of life.
- CCM components that appear to be most strongly associated with improved patient outcomes are well-trained and supported care managers who provide systematic monitoring and follow-up of patients, communicate with providers, and, in some studies, provide psychological interventions.

Overview

The number of SRs and RCTs addressing BHI has increased substantially since 2010. The TA published by the AHRQ[12] in 2008 served as the main source of evidence for the Milbank Memorial Fund's previous report. It identified only 33 controlled trials: 26 (79%) addressing depression, four (12%) addressing anxiety disorders, and three (9%) addressing other mental health conditions. The authors of the TA[12] concluded that, in primary care settings, BHI improved symptom severity as well as response and remission rates compared to usual care over a six- to 12-month follow-up period. They did not find a pattern suggesting that a higher level of integration resulted in better outcomes and noted that there were too few studies addressing anxiety and other mental health conditions to come to firm conclusions about BHI for other conditions.

In February 2010, AHRQ updated this literature search for the report, *Future Research Needs for the Integration of Mental Health/Substance Abuse and Primary Care.*[21] Seventy additional publications were identified that met inclusion criteria. A detailed analysis of the 70 studies was not performed, but the authors noted that the 70 new studies confirmed

the previous findings that BHI improved depression outcomes. They also noted a growing research base for other mental health conditions.

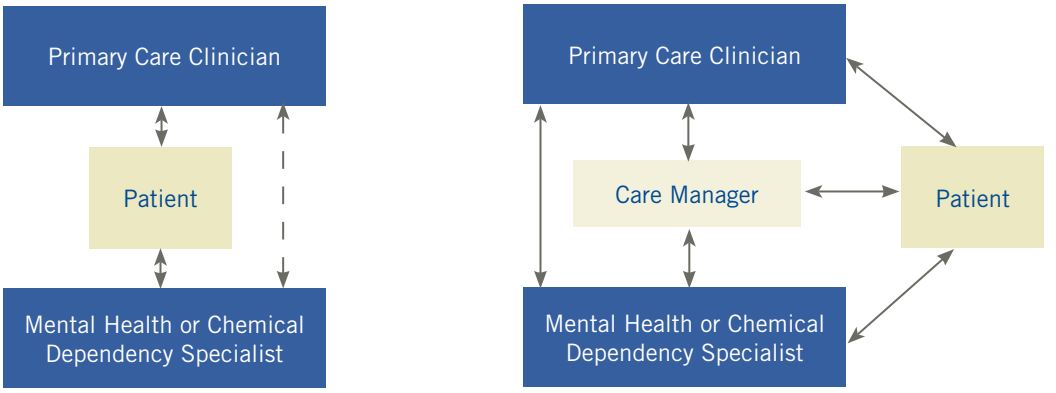
The literature search for this report identified over 1,200 articles published between January 2010 and June 2015. One hundred forty articles met prespecified selection criteria (Appendix C) although a few of the articles reported on different outcomes for the same study. The 140 articles were categorized by the level of collaboration and integration used in the BHI intervention (coordinated care vs. colocated and integrated care), then by mental health condition and study design. Of the 140 articles, most (88%) enhanced collaboration and coordination of care (level 2), primarily through the use of care management or CCM models. Only 17 of the 140 articles (12%) described interventions that colocated care.

Coordinated Care

The Collaborative Care Management Model

The collaborative care management model was first highlighted in the Milbank Memorial Fund's report, *Evolving Models of Behavioral Health Integration in Primary Care*.[1] It is the dominant model used in the 123 studies that enhanced coordination of care. For these reasons, it is important to understand the model, its multiple components, and studies that have attempted to identify key components of this model. In the 1990s, Katon and others[39] defined "collaborative care" as the linking of patients with primary care and mental health providers in a joint management effort. Often, this joint effort is coordinated by a care or case manager. Figure 3 compares usual unstructured care to CCM coordinated by a care manager. This model provides structured communication and increases the frequency of communication among patients and their treating clinicians. For depression and anxiety disorders, Rubenstein and colleagues[40] estimate that 80% of patients could be managed by primary care providers with the support of CCM, while the other 20% of patients need the direct involvement of a mental health specialist.

Figure 3. Usual Unstructured Patient Care versus Collaborative Care Management*



* Usual care is depicted on the left and collaborative care management on the right. Line density represents the frequency and degree of structure in the communication patterns among individuals. Adapted from figures by Oxman[41] and Rubenstein[40]

Collaborative care management models are multifaceted, as suggested by Figure 3. The CCM models evaluated in research studies vary in the components and processes they use.[11,12,19] Components that could be included in CCM models are listed in Table 1 and organized using Wagner's Chronic Care Framework.[11,29]

Table 1. Collaborative Care Management Organized by Wagner's Chronic Care Framework

Components of the Chronic Care Model*	Components of the Interventions
Delivery System Redesign	• Care/case management† • Medical care, mental health, or substance use treatment enhancement (on-site or off-site by appropriate specialists) that provides: - Supervison of care managers - Direct patient care when needed - Education and consultation for clinicians • Systematic follow-up of symptoms and adherence to treatment plan • Screening
Patient Self-Management Support (often delivered by care managers)	• Educational programs (e.g., Life Goals Program) and materials • Goal setting • Motivational interviewing • Brief psychological treatments (e.g., problem-solving therapy) • Links to community resources (e.g., travel, housing)
Decision Support	• Clinician education • Treatment algorithms and guidelines • Expert advice from specialists
Clinical Information Systems	• Patient registry (electronic or paper) • Refill monitoring through pharmacy databases

*Two components of Wagner's Chronic Care Model, linkage to community resources and health care organization support, were rarely described in the interventions.

†Care manager functions include systematic follow-up with structured monitoring of symptoms and treatment adherence, coordination and communication among care providers, patient education, and self-management support, including the use of motivational interviewing.

Five systematic reviews[19,40,42-44] attempted to identify the key components in the CCM model that were associated with improvement in depression outcomes. Tice[19] and Rubenstein[40] identified studies that demonstrated significant improvement in depression outcomes and high impact studies, respectively. They then identified CCM components that were common across these studies. Components of CCM interventions associated with improved depression outcomes include:

1. Care managers assessing symptoms at baseline and follow-up using a standardized measure such as the Patient Health Questionnaire (PHQ-9);[45]
2. Care managers monitoring treatment adherence;
3. Active follow-up for at least 16 weeks;
4. Involvement of primary care and mental health providers in patient management; and
5. Regular supervision of care managers by mental health specialists.

Additional components found in about 50% to 70% of successful CCM interventions were structured patient education programs, systematic screening, and standardized psychotherapy.[19]

Gilbody[44] and Coventry[43] took a different approach using a statistical technique, meta-regression, to identify CCM components associated with improvement in depression outcomes. Gilbody's study[44] used 37 randomized studies involving 12,355 patients and found monitoring for medication adherence and the professional background and supervision of care managers were associated with improved depression outcomes. Coventry and colleagues[43] updated a prior Cochrane review and included 74 studies involving 21,345 patients in their analysis. They initially identified four components associated with improved outcomes: systematic recruitment of patients, patients with chronic physical health conditions, psychological interventions, and scheduled supervision of care managers. However, after controlling for the other CCM components, they found that psychological intervention was the only component associated with improvement in depression outcomes. Finally, Miller and collegues[42] did not find associations between CCM components and mental health outcomes across a range of mental health conditions and settings. However, they noted that illness severity may predict the impact of CCM on outcomes—individuals with greater severity of illness may benefit more from CCM than those with less severe illness.

The discrepancies in the results from these fives studies may be due to including different RCTs and different ways of categorizing the components of the multifaceted interventions that were studied. In spite of these discrepancies, the components associated with improved mental health outcomes appear to center around care managers who provide systematic follow-up of patients, communication with providers, and in some models, psychological interventions. Recently, Pincus and colleagues[46] identified a similar key practice,

"care management with relentless follow-up," in their examination of BHI models from other countries. According to Pincus,[46] this practice provides a mechanism to overcome the fragmentation that occurs when different providers care for a patient.

Depression and Other Mood Disorders

Of the 123 articles reporting evaluations of models that enhance coordinated care, the majority (68%) continue to target patients with mood disorders: 39 (32%) involve patients with depression, 13 (10%) involve patients with other mood disorders, and 32 (26%) involve patients with mood disorders and medical conditions. (Appendix C.) A Cochrane systematic review[47] and the Institute for Clinical and Economic Review (ICER) technology assessment[19] provide the most comprehensive update of the research on BHI for depression and anxiety disorders in primary care settings. The ICER TA[19] updated the Cochrane review through February 2015 identifying 94 RCTs that included more than 25,000 patients with depression and/or anxiety disorders in primary care (78 RCTs) and specialty care (12 RCTs) settings. Although ICER found additional publications, these were all secondary analyses based on studies previously identified in the 2012 Cochrane review. Almost all of the 94 trials compared some version of the CCM model to usual care. The report concluded that there is high-quality evidence that CCM interventions result in small to moderate improvements in depression and anxiety outcomes without apparent adverse effects.

In addition, the ICER TA[19] summarized the economic studies of CCM models. The TA concluded that although the studies had methodological problems, they suggest that CCM is cost effective compared to usual care with a range of $15,000 to $80,000 per quality adjusted life year gained. These studies also indicated that costs to organizations implementing CCM increase in the short term. Unfortunately, there is little information about long-term costs and cost offsets in other areas. Based on ICER's analysis, organizations would need to invest about $3 to $22 per member per month to implement and sustain CCM models depending on the prevalence of depression in the population, and Medicaid annual expenditures would rise an estimated 0.3% to 4.0%.

Finally, studies of CCM have expanded to involve (1) new settings such as federally qualified health clinics, nursing homes, and rural areas; (2) ethnic populations; (3) patients with comorbid mood and medical disorders; and (4) new technologies. In general, findings from these studies confirm that CCM interventions improve symptoms from depression and other mood disorders in different settings and ethnic subgroups. Moreover, CCM improves mood disorders for patients with a wide variety of medical conditions (e.g., diabetes, chronic pain, cancer, HIV, cardiovascular disease), but the impact of CCM on medical outcomes varied across studies. The best evidence comes from systematic reviews of depression and diabetes[48,49] and indicates that CCM improves both depression symptoms and hemoglobin A1C compared to usual care, as long as care managers are trained to manage both depression and diabetes. Finally, studies of CCM interventions that incorporate new technologies such as telemedicine[50] and online messaging[51] show promise in improving depression outcomes.

Serious Mental Illness

Sixteen studies (4 SRs and 12 RCTs) enhanced coordination of care for people with SMI including schizophrenia and bipolar disorder (Appendix C). They generally studied care management models, similar to the CCM models used for depression and anxiety, coupled with patient self-management programs or motivational interviewing. Although the research evidence is not as robust as it is for depression, the results from these studies suggest that care management improves mental health symptoms and quality of life and may improve use of preventive and medical services. For patients with SMI and frequent hospitalizations, intensive case management, which includes the Assertive Community Treatment model, reduces hospitalizations and improves social functioning and retention in care.[52] Recent studies of CCM models have incorporated a focus on reducing cardiovascular risk and demonstrated reductions in some risk factors such as high blood pressure.[53,54] CCM appears promising as an intervention to improve mental health and possibly medical outcomes for people with SMI.

Substance Use Disorders

Only six studies (1 SR and 5 RCTs) examined enhanced coordination of care for people with substance use disorders (Appendix C) in primary care and chemical dependency treatment settings. Although results from these studies suggest care management increases engagement in treatment and possibly decreases alcohol consumption, the quality of evidence is low. An additional seven studies (2 SRs and 5 RCTs) examined the integration of mental health and chemical dependency treatment. These few studies suggest that enhancing collaboration and coordination of care will improve outcomes for individuals with co-occurring mental health disorders such as PTSD and alcohol abuse.[55] However, two SRs[56,57] note the very low quality of evidence from current studies and the many unanswered questions regarding who benefits and from what types of interventions.

Children and Adolescents

Until recently, there have been few studies of BHI for children and adolescents with emotional and mental health disorders. This literature scan identified five studies (1 SR and 4 RCTs). Asarnow and colleagues[58] published the first SR of BHI interventions for children in 2015. They identified 31 studies, five of which used CCM interventions, and determined that there was a 66% chance that a child or adolescent who received integrated care would have better behavioral outcomes than one who received usual care. The most robust data came from the five studies of CCM, and the effects of individual interventions varied widely leading to questions about the key components of the interventions. An accompanying editorial[59] notes that CCM probably improves mental and emotional health outcomes in children and adolescents and mirrors the findings of the many studies in adults.

Colocated and Integrated Care

Only 17 (12%) of the 140 articles identified in the literature scan described interventions that colocated or integrated care (Appendix C). Studies of colocated and integrated care

involved patients with mood disorders (3 studies), SMI (3 studies) and, most often, substance use disorders (11 studies). For individuals with mood disorders and SMI, colocated and integrated care may improve mental health symptoms and use of preventive and medical services, based on few studies and overall low-to-moderate quality of evidence. Studies that look at colocated medical care and addiction treatment alone did not demonstrate improved substance use outcomes and use of medical services versus usual care.[60] In contrast, studies that looked at colocated care and integrated care or colocated care with care management showed some improved outcomes compared to usual care.[25] Further research is needed to determine to what extent these models will improve mental health, addiction, and medical outcomes and which patients would benefit from these models.

Implementation

Key Findings—Implementation

- The issues facing policymakers looking to implement BHI have changed. The question policymakers now face is not *whether* to promote BHI, but *how* to provide the infrastructure and funding needed to implement, ensure fidelity, and sustain the model.
- There are now resources available to policymakers to answer these key implementation questions.
- The Institute for Clinical and Economic Review (ICER) organized an extensive list of resources for implementing BHI models in action guides for California and New England. These guides provide resources for policymakers and others to embark on or improve efforts to integrate care.
- The University of Washington Advancing Integrated Mental Health Solutions Center has extensive resources to support CCM implementation, including an implementation guide.

The BHI literature raises a number of important issues related to implementing and sustaining the various models.[19,42] CCM is a multicomponent model that requires change in practice structures and relationships and is challenging to implement and sustain. For policymakers and health care planners, as well as researchers, the focus has shifted from questions about whether these models work to questions about implementation and sustainability of the models across areas such as:

- Identifying key components of complex interventions;
- Maintaining fidelity to the intervention;

- Appropriate patient selection;
- Providing sustainable financing; and
- Removing barriers by modifying rules and regulations.

Sustainability and financial incentives have been prominent themes in implementation studies[61,62] and are frequently mentioned in case studies of implementation efforts.[63]

Implementation Resources

National and regional organizations responded to these concerns by developing resources for policymakers, health systems, practices, and providers to assist with implementing BHI models. These organizations include the AHRQ Academy for Integrating Behavioral Health and Primary Care, SAMSHA-HRSA Center for Integrated Health Solutions, the National Council for Behavioral Health, and the National Academy for State Health Policy, as well as those representing specific integration models (e.g., IMPACT) or those evolving from regional health care initiatives (e.g., Institute for Clinical Systems Improvement). Fortunately, ICER organized an extensive list of resources for implementing BHI models in action guides for California and New England to accompany its TA,[19] CTAF/CEPAC: Integrating Behavioral Health into Primary Care. These guides are similar and include well-organized extensive lists of available resources. Two BHI models listed in the action guides—Cherokee Health Systems and Intermountain Healthcare—were first noted as models in the 2010 Milbank Memorial Fund report.[1] What is remarkable is that many of the sites that served as examples of the eight evolving BHI models are still active (Appendix A). Finally, the University of Washington's Advancing Integrated Mental Health Solutions (AIMS) Center also has produced extensive resources to support CCM implementation, including an implementation guide.

The 2010 Milbank Memorial Fund report provides descriptions of state and private provider and payer efforts to implement a broad range of BHI models, as well as challenges associated with these efforts and implementation and funding resources. Appendix A of this report summarizes the eight BHI models and sites where they have been implemented.

Implementation through Medicaid Health Homes

The 2014 Milbank Memorial Fund report, *Integrating Primary Care into Behavioral Health Settings: What Works for Individuals with Serious Mental Illness,* referenced the Medicaid health home option under section 2703 as an opportunity to support care coordination services in BHI settings. It noted that many state Medicaid health home initiatives, as well as other local and regional initiatives, are targeting populations with SMI and chemical dependency and designing integrated care models. For more recent information on this option, the Center for Health Care Strategies has developed an information resource center. The Centers for Medicare & Medicaid Services also offers a health home information resource center. As of December 2015, nineteen states had implemented section 2703 health home initiatives.

Summary and Implications

Since publication of the Milbank Memorial Fund's report, *Evolving Models in Behavioral Health Integration in Primary Care*,[1] there has been rapid growth in the number of studies of BHI models across various mental health conditions and care settings. In general, the studies identified in the literature scan indicate that BHI improves mental health outcomes in research settings and supports the eight models outlined in the Fund's report.

What has changed is recognition of the need to create a common language and understanding of BHI models. To that end, the SAMSHA-HRSA Center for Integrated Health Solutions produced a standard framework describing levels of integration based on practice structures and degree of collaboration, and AHRQ produced a lexicon of terms, practice parameters,[14,17] and quality metrics.[23] These tools can be used in conjunction with the SAMHSA-HRSA Four Quadrant Clinical Integration Model[17,18] to better match the needs of patient populations with an appropriate integration model. The SAMSHA-HRSA framework for levels of integrated health care also provided an organizing structure for BHI models from the research literature (enhanced coordination versus colocation and integration).

The literature search for this report identified 140 studies meeting inclusion criteria. A scan of these studies highlighted important research findings and gaps. The first finding supports the findings of the prior report.[1] The vast majority of research involves interventions that enhance coordination and collaboration, and CCM is the predominate model used in these studies, particularly for individuals with mood disorders in primary care settings. CCM is a multicomponent model that systematically links patients with mental health and primary care providers in a joint management effort. This joint effort is often coordinated by a care or case manager. Based on high-quality evidence, CCM results in small to moderate improvements in symptoms from mood disorders and mental health–related quality of life. The evidence base includes multiple systematic reviews of more than 90 RCTs involving over 25,000 patients.

The second key finding is that the CCM model, with modifications such as the addition of self-management support, may improve mental health outcomes for individuals with serious mental illness and for children and adolescents with various mental health conditions, compared to usual care. These findings come for a smaller number of studies with some inconsistencies across studies resulting in an overall low-quality evidence base.

Other findings from the literature scan are outlined below.

- CCM improves mental health outcomes across a wide range of patient subgroups (e.g., ethnic minorities) and care settings.
- Studies that did not find improved patient outcomes were generally in settings without additional personnel, training, and oversight or had small sample sizes.

- CCM improves mental health outcomes for patients with chronic medical conditions (e.g., chronic pain, diabetes, cardiovascular risk) and may improve medical outcomes, especially if care managers also address the medical conditions. Research involving patients with diabetes has the strongest evidence base and generally demonstrates improvement in hemoglobin A1C.

- The results of systematic reviews examining the association between components of CCM interventions and patient outcomes have been inconsistent. However, the key components from these studies appear to center around care managers who provide systematic follow-up of patients, communication with providers, and, in some models, psychological interventions.

- Several research gaps exist. Only a few studies described integration of primary care into mental health and chemical dependency setting, and very few studies described the integration of mental health and chemical dependency services. Moreover, few studies examined colocation of providers and fully integrated care for individuals with serious mental illness or chemical dependency, making it difficult to draw firm conclusions about the impact of these models of care on mental health and medical outcomes. A detailed review of the studies focusing on BHI, including colocation of care, for individuals with serious mental illness and substance use disorders was commissioned by the Milbank Memorial Fund and published on its website in 2014.

The conclusions of this literature scan are similar to those of the 2010 Milbank Memorial Fund report: BHI models are important tools to improve outcomes for individuals with mental illness and overcome the fragmentation of care that occurs in our health care systems. As with any task, it is important to select the right tool, or in this case BHI model, for the task and patient population. More work is needed to determine the key components of BHI models and the effective implementation strategies that address financing and sustainability. The Institute for Clinical and Economic Review organized an extensive list of resources for implementing BHI models in its Action Guide. The University of Washington's Advancing Integrated Mental Health Solutions (AIMS) Center also has produced extensive resources to support CCM implementation, including an implementation guide. These guides should provide resources for policymakers and others to embark on or improve efforts to integrate care.

Appendix A. Eight Models of Behavioral Health Integration

The eight models identified in the Milbank Memorial Fund report are listed below, followed by a brief description of the model and examples of organizations that have implemented the model. Links are provided to organizations where they are available.

1. Improving collaboration between separate providers: Providers practice separately and have separate administrative structures and financing and reimbursement systems but care coordination is enhanced by care managers.
    - Washington Medicaid Integration Partnership

2. Medical-provided behavioral health care: Primary care providers deliver the behavioral health service while receiving consultative support from a psychiatrist or other behavioral health professional.
    - Substance Abuse and Mental Health Services Administration – Screening, Brief Intervention, and Referral to Treatment (SBIRT) in behavioral healthcare
    - Centers for Medicare & Medicaid Services – Prevention and Early Identification of Mental Health and Substance Use Conditions
    - Massachusetts Child Psychiatry Access Project (MCPAP)

3. Colocation of care: Mental health and primary care providers see patients at the same site, but practices are run as separate services.
    - Children's Community Pediatrics – Armstrong, Sarver Office; Sarver, Pennsylvania
    - Washtenaw County Community Mental Health– Ypsilanti, Michigan

4. Disease management (care management): Care managers provide follow-up care by monitoring patients' response and adherence to treatment. They also provide education about the disorder and self-management strategies and review patients' progress with a mental health provider, usually a psychiatrist.
    - IMPACT: Improving Mood – Promoting Access to Collaborative Treatment, now part of the AIMS Center
    - DIAMOND: Depression Improvement Across Minnesota – Offering a New Direction
    - InterMountain Health – RESPECT: Re-Engineering Systems for Primary Care Treatment of Depression

5. Reverse colocation of care: Primary care providers see patients with serious mental illness (SMI) or substance use disorders in the same setting where they receive mental health care or chemical dependency treatment, typically rehabilitation or day treatment programs.
    - Massachusetts Health and Education Services
    - Horizon Health Services – Buffalo, New York
    - Community Support Services – Akron, Ohio

6. Unified primary care and behavioral health: This model targets persons with SMI and offers full-service primary and psychiatric care in one place and uses one treatment plan.
    - Cherokee Health Systems – Tennessee
    - Community Health Center, Inc. – Connecticut
7. Primary care behavioral health: Primary care providers are the principal "providers" with a behavioral health specialist temporarily comanaging referred patients.
    - Buncombe County Health & Human Services – North Carolina
    - US Air Force Behavioral Health Optimization Project
8. Collaborative system of care: Care may be partly or fully integrated, depending on the degree of collaboration, and includes social services wrapped around a core model of care for patients at high risk.
    - Adolescent Health Program – New Hampshire
    - Community Shelter Board's Rebuilding Lives – Now and in the Future, strategic community plan – Franklin County, Ohio

Appendix B. Definition of Terms Used in Behavioral Health Integration*

Terms	Definitions
Coordinated care**	Organization of patient care activities between two or more health care providers involved in a patient's care to facilitate appropriate delivery of health care services and to assure the exchange of information needed to carry out the treatment plan. Care and case management may be used to structure and enhance coordinated care.
Care management	A set of activities or functions designed to assist patients and their support systems in managing medical conditions and related psychosocial problems. Activities may include symptom and data monitoring for treatment outcomes and adherence and self-management education.
Case management	Similar to care management but implies a person (case manager) who addresses all health, mental health, and social service needs of patients to enhance wellness, functional capabilities, and autonomy.
Colocated (reverse colocated) care**	Behavioral health and primary care providers deliver care in the same practice. Reverse colocation usually refers to primary care providers working in settings devoted to mental health or chemical dependency treatment.
Integrated care**	A tightly integrated, on-site team of providers representing different fields (e.g., mental health, chemical dependency, primary care) with a unified care plan for patients, usually those with serious mental illness and/or substance use disorder. This model implies both organizational and cultural integration
Shared care	Similar to integrated care, the term is used primarily in Canada to describe integration of mental health and primary care professionals.
Integrated primary care	Integrates behavioral health professionals into the primary care setting to address any problems that affect patients' health from stressful situations to substance abuse.

Terms	Definitions
Primary care behavioral health	*See integrated primary care.*
Collaborative care	A general term for ongoing working relationships between providers, usually from different specialty areas, rather than a specific product or service. Care and case management may be used to facilitate this relationship and enhance coordination.
Behavioral health care	An overarching term for care that addresses any behavioral problem affecting health, including mental health and substance use disorder.
Patient-centered medical home	Comprehensive care in a setting that facilitates partnerships between patients, their families, and their providers. Emphasizes team-based, whole-person care. If social services, community resources, and other resources are integrated into this setting, it may be referred to as a health home.

Note: Stepped care is a system of delivering and monitoring care where the most effective but least restrictive or resource-intensive care is delivered first; and if that is not effective, care is "stepped up" to a more intensive level of care (e.g., a psychiatrist evaluates a patient who is not improving while in care management for depression).[65] Stepped care may be used in conjunction with behavioral health integration strategies described in the table.

*Adapted from a table in Peak (2013), pg. 48.[28]

**There are three practice structures described by the SAMHSA-HRSA Center for Integrated Health Solutions in its framework for integration and collaboration: coordinated, colocated, and fully integrated care.[30]

Appendix C. Systematic Reviews and Controlled Trials of Behavioral Health Integration Interventions

Appendix C is divided into two sections based on the practice structure and level of integration of the intervention: coordinated care (level 2) or colocated care (levels 3 through 6). Within these two sections, the studies are arranged by disorder (e.g., depression, other or multiple mood disorders, serious mental illness, and substance use disorder) and study design (systematic reviews, randomized controlled trials). All studies involving children and adolescents used coordinated care interventions. These studies are grouped together at the end of the coordinated care section.

Coordinated Care (Level 2)

Depression

Systematic Reviews/Technology Assessments

1. Cape J, Whittington C, Bower P. What is the role of consultation-liaison psychiatry in the management of depression in primary care? A systematic review and meta-analysis. *Gen Hosp Psychiatry.* 2010;32(3):246-254.

2. Coventry PA, Hudson JL, Kontopantelis E, et al. Characteristics of effective collaborative care for treatment of depression: a systematic review and meta-regression of 74 randomised controlled trials. *PLoS ONE.* 2014;9(9):e108114.

3. Fuentes D, Aranda MP. Depression interventions among racial and ethnic minority older adults: a systematic review across 20 years. *Am J Geriatr Psychiatry.* 2012;20(11):915-931.

4. Rubenstein LV, Williams JW Jr, Danz M, Shekelle P. *Determining Key Features of Effective Depression Interventions.* Washington, DC: Veterans Health Administration Health Services Research & Development Service; 2009. (Accessed March 2, 2016: http://www.hsrd.research.va.gov/publications/esp/Depression-Interventions-2009.pdf.)

5. Sighinolfi C, Nespeca C, Menchetti M, Levantesi P, Belvederi Murri M, Berardi D. Collaborative care for depression in European countries: a systematic review and meta-analysis. *J Psychosom Res.* 2014;77(4):247-263.

6. Thota AB, Sipe TA, Byard GJ, et al. Collaborative care to improve the management of depressive disorders: a community guide systematic review and meta-analysis. *Am J Prev Med.* 2012;42(5):525-538.

Randomized Controlled Trials

1. Aragones E, Caballero A, Pinol JL, Lopez-Cortacans G. Persistence in the long term of the effects of a collaborative care programme for depression in primary care. *J Affect Disord.* 2014;166:36-40.

2. Aragones E, Pinol JL, Caballero A, et al. Effectiveness of a multi-component programme for managing depression in primary care: a cluster randomized trial. The INDI project. *J Affect Disord.* 2012;142(1-3):297-305.

3. Bao Y, Alexopoulos GS, Casalino LP, et al. Collaborative depression care management and disparities in depression treatment and outcomes. *Arch Gen Psychiatry.* 2011;68(6):627-636.

4. Chan D, Fan MY, Unutzer J. Long-term effectiveness of collaborative depression care in older primary care patients with and without PTSD symptoms. *Int J Geriatr Psychiatry.* 2011;26(7):758-764.

5. Chaney EF, Rubenstein LV, Liu CF, et al. Implementing collaborative care for depression treatment in primary care: a cluster randomized evaluation of a quality improvement practice redesign. *Implement Sci*. 2011;6:121.

6. Cooper LA, Ghods Dinoso BK, Ford DE, et al. Comparative effectiveness of standard versus patient-centered collaborative care interventions for depression among African Americans in primary care settings: the BRIDGE Study. *Health Serv Res.* 2013;48(1):150-174.

7. Davis TD, Deen T, Bryant-Bedell K, Tate V, Fortney J. Does minority racial-ethnic status moderate outcomes of collaborative care for depression? *Psychiatr Serv.* 2011;62(11):1282-1288.

8. Dwight-Johnson M, Lagomasino IT, Hay J, et al. Effectiveness of collaborative care in addressing depression treatment preferences among low-income Latinos. *Psychiatr Serv.* 2010;61(11):1112-1118.

9. Fortney JC, Enderle MA, Clothier JL, Otero JM, Williams JS, Pyne JM. Population level effectiveness of implementing collaborative care management for depression. *Gen Hosp Psychiatry.* 2013;35(5):455-460.

10. Fortney JC, Maciejewski ML, Tripathi SP, Deen TL, Pyne JM. A budget impact analysis of telemedicine-based collaborative care for depression. *Med Care. 2*011;49(9):872-880.

11. Fortney JC, Pyne JM, Mouden SB, et al. Practice-based versus telemedicine-based collaborative care for depression in rural federally qualified health centers: a pragmatic randomized comparative effectiveness trial. *Am J Psychiatry.* 2013;170(4):414-425.

12. Gallo JJ, Morales KH, Bogner HR, et al. Long term effect of depression care management on mortality in older adults: follow-up of cluster randomized clinical trial in primary care. *BMJ.* 2013;346:f2570.

13. Gensichen J, Petersen JJ, Karroum T, et al. Positive impact of a family practice-based depression case management on patient's self-management. *Gen Hosp Psychiatry.* 2011;33(1):23-28.

14. Gitlin LN, Harris LF, McCoy M, et al. A community-integrated home based depression intervention for older African Americans: [corrected] description of the Beat the Blues randomized trial and intervention costs. *BMC Geriatr.* 2012;12:4.

15. Hay JW, Katon WJ, Ell K, Lee PJ, Guterman JJ. Cost-effectiveness analysis of collaborative care management of major depression among low-income, predominantly Hispanics with diabetes. *Value Health.* 2012;15(2):249-254.

16. Huffman JC, Mastromauro CA, Sowden G, Fricchione GL, Healy BC, Januzzi JL. Impact of a depression care management program for hospitalized cardiac patients. *Circ Cardiovasc Qual Outcomes.* 2011;4(2):198-205.

17. Huijbregts KM, de Jong FJ, van Marwijk HW, et al. A target-driven collaborative care model for Major Depressive Disorder is effective in primary care in the Netherlands. A randomized clinical trial from the depression initiative. *J Affect Disord.* 2013;146(3):328-337.

18. Hunkeler EM, Hargreaves WA, Fireman B, et al. A web-delivered care management and patient self-management program for recurrent depression: a randomized trial. *Psychiatr Serv.* 2012;63(11):1063-1071.

19. Jeong H, Yim HW, Jo SJ, et al. The effects of care management on depression treatment in a psychiatric clinic: a randomized controlled trial. *Int J Geriatr Psychiatry.* 2013;28(10):1023-1030.

20. Leontjevas R, Gerritsen DL, Smalbrugge M, Teerenstra S, Vernooij-Dassen MJ, Koopmans RT. A structural multidisciplinary approach to depression management in nursing-home residents: a multicentre, stepped-wedge cluster-randomised trial. *Lancet.* 2013;381(9885):2255-2264.

21. Ludman EJ, Peterson D, Katon WJ, et al. Improving confidence for self care in patients with depression and chronic illnesses. *Behav Med.* 2013;39(1):1-6.

22. Melville JL, Reed SD, Russo J, et al. Improving care for depression in obstetrics and gynecology: a randomized controlled trial. *Obstet Gynecol.* 2014;123(6):1237-1246.

23. Menchetti M, Sighinolfi C, Di Michele V, et al. Effectiveness of collaborative care for depression in Italy. A randomized controlled trial. *Gen Hosp Psychiatry.* 2013;35(6):579-586.

24. Milgrom J, Holt CJ, Gemmill AW, et al. Treating postnatal depressive symptoms in primary care: a randomised controlled trial of GP management, with and without adjunctive counselling. *BMC Psychiatry.* 2011;11:95.

25. Montgomery RJ, Kwak J, Kosloski K, O'Connell Valuch K. Effects of the TCARE intervention on caregiver burden and depressive symptoms: preliminary findings from a randomized controlled study. *J Gerontol B Psychol Sci Soc Sci*. 2011;66(5):640-647.

26. Murray G, Michalak EE, Axler A, et al. Relief of chronic or resistant depression (ReChORD): a pragmatic, randomized, open-treatment trial of an integrative program intervention for chronic depression. *J Affect Disord.* 2010;123(1-3):243-248.

27. Richards DA, Hill JJ, Gask L, et al. Clinical effectiveness of collaborative care for depression in UK primary care (CADET): cluster randomised controlled trial. *BMJ.* 2013;347:f4913.

28. Simon GE, Ludman EJ, Rutter CM. Incremental benefit and cost of telephone care management and telephone psychotherapy for depression in primary care. *Arch Gen Psychiatry.* 2009;66(10):1081-1089.

29. Simon GE, Ralston JD, Savarino J, Pabiniak C, Wentzel C, Operskalski BH. Randomized trial of depression follow-up care by online messaging. *J Gen Intern Med.* 2011;26(7):698-704.

30. van der Weele GM, de Waal MW, van den Hout WB, et al. Effects of a stepped-care intervention programme among older subjects who screened positive for depressive symptoms in general practice: the PROMODE randomised controlled trial. *Age Ageing.* 2012;41(4):482-488.

31. Vlasveld MC, van der Feltz-Cornelis CM, Ader HJ, et al. Collaborative care for sick-listed workers with major depressive disorder: a randomised controlled trial from the Netherlands Depression Initiative aimed at return to work and depressive symptoms. *Occup Environ Med.* 2013;70(4):223-230.

32. Wells KB, Jones L, Chung B, et al. Community-partnered cluster-randomized comparative effectiveness trial of community engagement and planning or resources for services to address depression disparities. [Erratum appears in *J Gen Intern Med.* 2013 Nov;28(11):1534.] *J Gen Intern Med.* 2013;28(10):1268-1278.

33. Yeung A, Shyu I, Fisher L, Wu S, Yang H, Fava M. Culturally sensitive collaborative treatment for depressed Chinese Americans in primary care. *Am J Public Health.* 2010;100(12):2397-2402.

Other Mood Disorders (e.g., Anxiety, Post Traumatic Stress Disorder, Multiple Mood Disorders)

Systematic Reviews/Technology Assessments

1. Archer J, Bower P, Gilbody S, et al. Collaborative care for depression and anxiety problems. *Cochrane Database Syst Rev.* 2012;10:CD006525.

2. Tice JA, Ollendorf DA, Reed SJ, Shore KK, Weissberg J, Pearson SD. Integrating Behavioral Health into Primary Care: A Technology Assessment (Final Report). Boston, MA: Institute for Clinical and Economic Review; 2015. (Accessed March 2, 2016: http://ctaf.org/sites/default/files/u148/BHI_Final_Report_060215.pdf.)

Randomized Controlled Trials

1. Chan D, Fan MY, Unutzer J. Long-term effectiveness of collaborative depression care in older primary care patients with and without PTSD symptoms. *Int J Geriatr Psychiatry.* 2011;26(7):758-764.

2. Chan WS, Whitford DL, Conroy R, Gibney D, Hollywood B. A multidisciplinary primary care team consultation in a socio-economically deprived community: an exploratory randomised controlled trial. *BMC Health Serv Res.* 2011;11:15.

3. Joesch JM, Sherbourne CD, Sullivan G, Stein MB, Craske MG, Roy-Byrne P. Incremental benefits and cost of coordinated anxiety learning and management for anxiety treatment in primary care. *Psychol Med.* 2012;42(9):1937-1948.

4. Kilbourne AM, Li D, Lai Z, Waxmonsky J, Ketter T. Pilot randomized trial of a cross-diagnosis collaborative care program for patients with mood disorders. *Depress Anxiety.* 2013;30(2):116-122.

5. Muntingh A, van der Feltz-Cornelis C, van Marwijk H, et al. Effectiveness of collaborative stepped care for anxiety disorders in primary care: a pragmatic cluster randomised controlled trial. *Psychother Psychosom.* 2014;83(1):37-44.

6. Oosterbaan DB, Verbraak MJ, Terluin B, et al. Collaborative stepped care v. care as usual for common mental disorders: 8-month, cluster randomised controlled trial. *Br J Psychiatry.* 2013;203(2):132-139.

7. Schaefert R, Kaufmann C, Wild B, et al. Specific collaborative group intervention for patients with medically unexplained symptoms in general practice: a cluster randomized controlled trial. *Psychother Psychosom*. 2013;82(2):106-119.

8. Schnurr PP, Friedman MJ, Oxman TE, et al. RESPECT-PTSD: re-engineering systems for the primary care treatment of PTSD, a randomized controlled trial. *J Gen Intern Med.* 2013;28(1):32-40.

9. Seekles W, van Straten A, Beekman A, van Marwijk H, Cuijpers P. Stepped care treatment for depression and anxiety in primary care. a randomized controlled trial. *Trials.* 2011;12:171.

10. van't Veer-Tazelaar PJ, van Marwijk HW, van Oppen P, et al. Prevention of late-life anxiety and depression has sustained effects over 24 months: a pragmatic randomized trial. A*m J Geriatr Psychiatry.* 2011;19(3):230-239.

11. Zatzick D, Jurkovich G, Rivara FP, et al. A randomized stepped care intervention trial targeting posttraumatic stress disorder for surgically hospitalized injury survivors. *Ann Surg.* 2013;257(3):390-399.

Mood Disorders and Medical Conditions

Systematic Reviews/Technology Assessments

1. Atlantis E, Fahey P, Foster J. Collaborative care for comorbid depression and diabetes: a systematic review and meta-analysis. *BMJ Open*. 2014;4(4): e004706 doi:10.1136/bmjopen-2013-004706.

2. Cimpean D, Drake RE. Treating co-morbid chronic medical conditions and anxiety/depression. *Epidemiol Psychiatr Sci.* 2011;20(2):141-150.

3. Ekers D, Murphy R, Archer J, Ebenezer C, Kemp D, Gilbody S. Nurse-delivered collaborative care for depression and long-term physical conditions: a systematic review and meta-analysis. *J Affect Disord.* 2013;149(1-3):14-22.

4. Huang Y, Wei X, Wu T, Chen R, Guo A. Collaborative care for patients with depression and diabetes mellitus: a systematic review and meta-analysis. *BMC Psychiatry.* 2013;13:260.

5. van der Feltz-Cornelis CM, Nuyen J, Stoop C, et al. Effect of interventions for major depressive disorder and significant depressive symptoms in patients with diabetes mellitus: a systematic review and meta-analysis. *Gen Hosp Psychiatry.* 2010;32(4):380-395.

6. Watson LC, Amick HR, Gaynes BN, et al. Practice-based interventions addressing concomitant depression and chronic medical conditions in the primary care setting: a systematic review and meta-analysis. *J Prim Care Community Health.* 2013;4(4):294-306.

Randomized Controlled Trials

1. Alexopoulos GS, Kiosses DN, Sirey JA, et al. Personalised intervention for people with depression and severe COPD. *Br J Psychiatry.* 2013;202(3):235-236.

2. Bogner HR, de Vries HF. Integrating type 2 diabetes mellitus and depression treatment among African Americans: a randomized controlled pilot trial. *Diabetes Educ.* 2010;36(2):284-292.

3. Bogner HR, de Vries HF, Kaye EM, Morales KH. Pilot trial of a licensed practical nurse intervention for hypertension and depression. *Fam Med.* 2013;45(5):323-329.

4. Bogner HR, Morales KH, de Vries HF, Cappola AR. Integrated management of type 2 diabetes mellitus and depression treatment to improve medication adherence: a randomized controlled trial. *Ann Fam Med.* 2012;10(1):15-22.

5. Chaytor N, Ciechanowski P, Miller JW, et al. Long-term outcomes from the PEARLS randomized trial for the treatment of depression in patients with epilepsy. *Epilepsy Behav.* 2011;20(3):545-549.

6. Coventry P, Lovell K, Dickens C, et al. Integrated primary care for patients with mental and physical multimorbidity: cluster randomised controlled trial of collaborative care for patients with depression comorbid with diabetes or cardiovascular disease. *BMJ.* 2015;350:h638.

7. Davidson KW, Rieckmann N, Clemow L, et al. Enhanced depression care for patients with acute coronary syndrome and persistent depressive symptoms: coronary psychosocial evaluation studies randomized controlled trial. *Arch Intern Med.* 2010;170(7):600-608.

8. Ell K, Katon W, Xie B, et al. Collaborative care management of major depression among low-income, predominantly Hispanic subjects with diabetes: a randomized controlled trial. *Diabetes Care.* 2010;33(4):706-713.

9. Ell K, Aranda MP, Xie B, Lee PJ, Chou CP. Collaborative depression treatment in older and younger adults with physical illness: pooled comparative analysis of three randomized clinical trials. *Am J Geriatr Psychiatry.* 2010;18(6):520-530.

10. Ell K, Katon W, Xie B, et al. One-year postcollaborative depression care trial outcomes among predominantly Hispanic diabetes safety net patients. *Gen Hosp Psychiatry.* 2011;33(5):436-442.

11. Ell K, Xie B, Kapetanovic S, et al. One-year follow-up of collaborative depression care for low-income, predominantly Hispanic patients with cancer. *Psychiatr Serv.* 2011;62(2):162-170.

12. Gabbay RA, Anel-Tiangco RM, Dellasega C, Mauger DT, Adelman A, Van Horn DH. Diabetes nurse case management and motivational interviewing for change (DYNAMIC): results of a 2-year randomized controlled pragmatic trial. *J Diabetes.* 2013;5(3):349-357.

13. Gellis ZD, Kenaley BL, Ten Have T. Integrated telehealth care for chronic illness and depression in geriatric home care patients: the Integrated Telehealth Education and Activation of Mood (I-TEAM) study. *J Am Geriatr Soc.* 2014;62(5):889-895.

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15. Katon WJ, Lin EH, Von Korff M, et al. Collaborative care for patients with depression and chronic illnesses. *N Engl J Med.* 2010;363(27):2611-2620.

16. Katon W, Russo J, Lin EH, et al. Cost-effectiveness of a multicondition collaborative care intervention: a randomized controlled trial. *Arch Gen Psychiatry.* 2012;69(5):506-514.

17. Kroenke K, Theobald D, Wu J, et al. Effect of telecare management on pain and depression in patients with cancer: a randomized trial. *JAMA.* 2010;304(2):163-171.

18. Kronish IM, Rieckmann N, Burg MM, Edmondson D, Schwartz JE, Davidson KW. The effect of enhanced depression care on adherence to risk-reducing behaviors after acute coronary syndromes: findings from the COPES trial. *Am Heart J.* 2012;164(4):524-529.

19. Lin EH, Von Korff M, Ciechanowski P, et al. Treatment adjustment and medication adherence for complex patients with diabetes, heart disease, and depression: a randomized controlled trial. *Ann Fam Med.* 2012;10(1):6-14.

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21. Pyne JM, Fortney JC, Curran GM, et al. Effectiveness of collaborative care for depression in human immunodeficiency virus clinics. *Arch Intern Med.* 2011;171(1):23-31.

22. Sharpe M, Walker J, Holm Hansen C, et al. Integrated collaborative care for comorbid major depression in patients with cancer (SMaRT Oncology-2): a multicentre randomised controlled effectiveness trial. *Lancet.* 2014;384(9948):1099-1108.

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25. Vera M, Perez-Pedrogo C, Huertas SE, et al. Collaborative care for depressed patients with chronic medical conditions: a randomized trial in Puerto Rico. *Psychiatr Serv.* 2010;61(2):144-150.

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Serious Mental Illness

Systematic Reviews/Technology Assessments

1. Bradford DW, Cunningham NT, Slubicki MN, et al. An evidence synthesis of care models to improve general medical outcomes for individuals with serious mental illness: a systematic review. *J Clin Psychiatry.* 2013;74(8):e754-764.

2. Dieterich M, Irving CB, Park B, Marshall M. Intensive case management for severe mental illness. *Cochrane Database Syst Rev.* 2010(10):CD007906.

3. Kelly EL, Fenwick KM, Barr N, Cohen H, Brekke JS. A systematic review of self-management health care models for individuals with serious mental illnesses. *Psychiatr Serv.* 2014;65(11):1300-1310.

4. Reilly S, Planner C, Gask L, et al. Collaborative care approaches for people with severe mental illness. *Cochrane Database Syst Rev.* 2013;11:CD009531.

Randomized Controlled Trials

1. Bartels SJ, Pratt SI, Mueser KT, et al. Integrated IMR for psychiatric and general medical illness for adults aged 50 or older with serious mental illness. *Psychiatr Serv.* 2014;65(3):330-337.

2. Bauer MS, McBride L, Williford WO, et al. Collaborative care for bipolar disorder: Part I. Intervention and implementation in a randomized effectiveness trial. *Psychiatr Serv.* 2006;57(7):927-936.

3. Bauer MS, McBride L, Williford WO, et al. Collaborative care for bipolar disorder: Part II. Impact on clinical outcome, function, and costs. *Psychiatr Serv.* 2006;57(7):937-945.

4. Blank MB, Hanrahan NP, Fishbein M, et al. A randomized trial of a nursing intervention for HIV disease management among persons with serious mental illness. *Psychiatr Serv.* 2011;62(11):1318-1324.

5. Druss BG, von Esenwein SA, Compton MT, Rask KJ, Zhao L, Parker RM. A randomized trial of medical care management for community mental health settings: the Primary Care Access, Referral, and Evaluation (PCARE) study. *Am J Psychiatry.* 2010;167(2):151-159.

6. Griswold KS, Homish GG, Pastore PA, Leonard KE. A randomized trial: are care navigators effective in connecting patients to primary care after psychiatric crisis? *Community Ment Health J.* 2010;46(4):398-402.

7. Kilbourne AM, Biswas K, Pirraglia PA, Sajatovic M, Williford WO, Bauer MS. Is the collaborative chronic care model effective for patients with bipolar disorder and co-occurring conditions? *J Affect Disord.* 2009;112(1-3):256-261.

8. Kilbourne AM, Goodrich DE, Lai Z, Clogston J, Waxmonsky J, Bauer MS. Life Goals Collaborative Care for patients with bipolar disorder and cardiovascular disease risk. *Psychiatr Serv.* 2012;63(12):1234-1238.

9. Kilbourne AM, Goodrich DE, Lai Z, et al. Randomized controlled trial to assess reduction of cardiovascular disease risk in patients with bipolar disorder: the Self-Management Addressing Heart Risk Trial (SMAHRT). *J Clin Psychiatry.* 2013;74(7):e655-662.

10. Kilbourne AM, Post EP, Nossek A, Drill L, Cooley S, Bauer MS. Improving medical and psychiatric outcomes among individuals with bipolar disorder: a randomized controlled trial. *Psychiatr Serv.* 2008;59(7):760-768.

11. Mueser KT, Pratt SI, Bartels SJ, et al. Randomized trial of social rehabilitation and integrated health care for older people with severe mental illness. *J Consult Clin Psychol.* 2010;78(4):561-573.

12. van der Voort TY, van Meijel B, Goossens PJ, et al. Collaborative care for patients with bipolar disorder: randomised controlled trial. *Br J Psychiatry.* 2015;206(5):393-400.

Substance Use Disorder

Systematic Reviews/Technology Assessments

1. Niccols A, Milligan K, Smith A, Sword W, Thabane L, Henderson J. Integrated programs for mothers with substance abuse issues and their children: a systematic review of studies reporting on child outcomes. *Child Abuse Negl.* 2012;36(4):308-322.

Randomized Controlled Trials

1. Gustafson DH, McTavish FM, Chih MY, et al. A smartphone application to support recovery from alcoholism: a randomized clinical trial. J*AMA Psychiatry.* 2014;71(5):566-572.

2. Kim TW, Saitz R, Cheng DM, Winter MR, Witas J, Samet JH. Initiation and engagement in chronic disease management care for substance dependence. *Drug Alcohol Depend.* 2011;115(1-2):80-86.

3. Kim TW, Saitz R, Cheng DM, Winter MR, Witas J, Samet JH. Effect of quality chronic disease management for alcohol and drug dependence on addiction outcomes. J *Subst Abuse Treat.* 2012;43(4):389-396.

4. Lindahl ML, Berglund M, Tonnesen H. Case management in aftercare of involuntarily committed patients with substance abuse. A randomized trial. *Nord J Psychiatry.* 2013;67(3):197-203.

5. Oslin DW, Lynch KG, Maisto SA, et al. A randomized clinical trial of alcohol care management delivered in Department of Veterans Affairs primary care clinics versus specialty addiction treatment. *J Gen Intern Med.* 2014;29(1):162-168.

Serious Mental Illness and Substance Use Disorder

Systematic Reviews/Technology Assessments

1. Hunt GE, Siegfried N, Morley K, Sitharthan T, Cleary M. Psychosocial interventions for people with both severe mental illness and substance misuse. *Cochrane Database Syst Rev.* 2013;10:CD001088.

2. Perry AE, Neilson M, Martyn-St James M, et al. Interventions for drug-using offenders with co-occurring mental illness. *Cochrane Database Syst Rev.* 2015;6:CD010901.

Randomized Controlled Trials

1. Battersby MW, Beattie J, Pols RG, Smith DP, Condon J, Blunden S. A randomised controlled trial of the Flinders ProgramTM of chronic condition management in Vietnam veterans with co-morbid alcohol misuse, and psychiatric and medical conditions. *Aust N Z J Psychiatry.* 2013;47(5):451-462.

2. Brooner RK, Kidorf MS, King VL, et al. Managing psychiatric comorbidity within versus outside of methadone treatment settings: a randomized and controlled evaluation. *Addiction.* 2013;108(11):1942-1951.

3. Chandler DW, Spicer G. Integrated treatment for jail recidivists with co-occurring psychiatric and substance use disorders. *Community Ment Health J.* 2006;42(4):405-425.

4. Manuel JI, Covell NH, Jackson CT, Essock SM. Does assertive community treatment increase medication adherence for people with co-occurring psychotic and substance use disorders? *J Am Psychiatr Nurses Assoc.* 2011;17(1):51-56.

5. Smelson D, Kalman D, Losonczy MF, et al. A brief treatment engagement intervention for individuals with co-occurring mental illness and substance use disorders: results of a randomized clinical trial. *Community Ment Health J.* 2012;48(2):127-132.

Multiple Mental Health Conditions

Systematic Reviews/Technology Assessments

1. Miller CJ, Grogan-Kaylor A, Perron BE, Kilbourne AM, Woltmann E, Bauer MS. Collaborative chronic care models for mental health conditions: cumulative meta-analysis and metaregression to guide future research and implementation. *Med Care.* 2013;51(10):922-930.

2. Woltmann E, Grogan-Kaylor A, Perron B, Georges H, Kilbourne AM, Bauer MS. Comparative effectiveness of collaborative chronic care models for mental health conditions across primary, specialty, and behavioral health care settings: systematic review and meta-analysis. *Am J Psychiatry.* 2012;169(8):790-804.

Randomized Controlled Trials

1. Jarrett M, Thornicroft G, Forrester A, et al. Continuity of care for recently released prisoners with mental illness: a pilot randomised controlled trial testing the feasibility of a Critical Time Intervention. *Epidemiol Psychiatr Sci.* 2012;21(2):187-193.

2. Kneipp SM, Kairalla JA, Lutz BJ, et al. Public health nursing case management for women receiving temporary assistance for needy families: a randomized controlled trial using community-based participatory research. *Am J Public Health.* 2011;101(9):1759-1768.

3. Zatzick D, Russo J, Lord SP, et al. Collaborative care intervention targeting violence risk behaviors, substance use, and posttraumatic stress and depressive symptoms in injured adolescents: a randomized clinical trial. *JAMA Pediatr.* 2014;168(6):532-539.

Children and Adolescents

Systematic Reviews/Technology Assessments

1. Asarnow J, Rozenman M, Wiblin J, Zeltzer L. Integrated medical-behavioral care compared with usual primary care for child and adolescent behavioral health: A meta-analysis. *JAMA Pediatr.* 2015; 169(10):929-937.

Randomized Controlled Trials

1. Kolko DJ, Campo J, Kilbourne AM, Hart J, Sakolsky D, Wisniewski S. Collaborative care outcomes for pediatric behavioral health problems: a cluster randomized trial. *Pediatrics.* 2014;133(4):e981-992.

2. Myers K, Vander Stoep A, Zhou C, McCarty CA, Katon W. Effectiveness of a telehealth service delivery model for treating attention-deficit/hyperactivity disorder: a community-based randomized controlled trial. *J Am Acad Child Adolesc Psychiatry.* 2015;54(4):263-274.

3. Richardson LP, Ludman E, McCauley E, et al. Collaborative care for adolescents with depression in primary care: a randomized clinical trial. *JAMA.* 2014;312(8):809-816.

4. Silverstein M, Hironaka LK, Walter HJ, et al. Collaborative care for children with ADHD symptoms: a randomized comparative effectiveness trial. *Pediatrics.* 2015;135(4):e858-e867.

Colocated Care and Integrated Care (Levels 3 through 6)

Depression and Other Mood Disorders

Systematic Reviews/Technology Assessments

1. Harkness EF, Bower PJ. On-site mental health workers delivering psychological therapy and psychosocial interventions to patients in primary care: effects on the professional practice of primary care providers. *Cochrane Database Syst Rev.* 2009(1):CD000532.

2. van der Feltz-Cornelis CM, Van Os TW, Van Marwijk HW, Leentjens AF. Effect of psychiatric consultation models in primary care. A systematic review and meta-analysis of randomized clinical trials. *J Psychosom Res.* 2010;68(6):521-533.

Randomized Controlled Trials

1. Oosterbaan DB, Verbraak MJ, Terluin B, et al. Collaborative stepped care v. care as usual for common mental disorders: 8-month, cluster randomised controlled trial. *Br J Psychiatry.* 2013;203(2):132-139.

Serious Mental Illness

Systematic Reviews/Technology Assessments

No articles were identified that met the inclusion criteria.

Randomized Controlled Trials

1. Bartels SJ, Pratt SI, Mueser KT, et al. Integrated IMR for psychiatric and general medical illness for adults aged 50 or older with serious mental illness. *Psychiatr Serv.* 2014;65(3):330-337.

2. Druss BG, Rohrbaugh RM, Levinson CM, Rosenheck RA. Integrated medical care for patients with serious psychiatric illness: a randomized trial. *Arch Gen Psychiatry.* 2001;58(9):861-868.

3. Rubin AS, Littenberg B, Ross R, Wehry S, Jones M. Effects on processes and costs of care associated with the addition of an internist to an inpatient psychiatry team. *Psychiatr Serv.* 2005;56(4):463-467.

Substance Use Disorder

Systematic Reviews/Technology Assessments

1. Torchalla I, Nosen L, Rostam H, Allen P. Integrated treatment programs for individuals with concurrent substance use disorders and trauma experiences: a systematic review and meta-analysis. *J Subst Abuse Treat.* 2012;42(1):65-77.

Randomized Controlled Trials

1. Kim TW, Saitz R, Cheng DM, Winter MR, Witas J, Samet JH. Effect of quality chronic disease management for alcohol and drug dependence on addiction outcomes. J Subst Abuse Treat. 2012;43(4):389-396.

2. Kim TW, Saitz R, Cheng DM, Winter MR, Witas J, Samet JH. Initiation and engagement in chronic disease management care for substance dependence. *Drug Alcohol Depend.* 2011;115(1-2):80-86.

3. Parthasarathy S, Mertens J, Moore C, Weisner C. Utilization and cost impact of integrating substance abuse treatment and primary care. *Med Care.* 2003;41(3):357-367.

4. Saitz R, Cheng DM, Winter M, et al. Chronic care management for dependence on alcohol and other drugs: the AHEAD randomized trial. *JAMA.* 2013;310(11):1156-1167.

5. Samet JH, Larson MJ, Horton NJ, Doyle K, Winter M, Saitz R. Linking alcohol- and drug-dependent adults to primary medical care: a randomized controlled trial of a multi-disciplinary health intervention in a detoxification unit. *Addiction.* 2003;98(4):509-516.

6. Saxon AJ, Malte CA, Sloan KL, et al. Randomized trial of onsite versus referral primary medical care for veterans in addictions treatment. *Med Care.* 2006;44(4):334-342.

7. Umbricht-Schneiter A, Ginn DH, Pabst KM, Bigelow GE. Providing medical care to methadone clinic patients: referral vs on-site care. *Am J Public Health.* 1994;84(2):207-210.

8. Weaver M, Conover C, Proescholdbell R, et al. Cost-effectiveness analysis of integrated care for people with HIV, chronic mental illness and substance use disorders. *J Ment Health Policy Econ*. 2009;12:33-46.

9. Weisner C, Mertens J, Parthasarathy S, Moore C, Lu Y. Integrating primary medical care with addiction treatment: a randomized controlled trial. *JAMA.* 2001;286(14):1715-1723.

10. Willenbring ML, Olson DH. A randomized trial of integrated outpatient treatment for medically ill alcoholic men. *Arch Intern Med.* 1999;159(16):1946-1952.

Supplement A. Report Methods

Search Strategy

A search of databases of systematic reviews (SRs) was conducted to identify systematic reviews[1] and technology assessments (TAs)[2] published between January 2010 and June 2015. This period was selected because the 2010 Milbank Memorial Fund report[1] used an Agency for Healthcare Research and Quality (AHRQ) TA[12] published in 2008 as the basis for much of the evidence supporting the models described in the report. The literature search for the AHRQ TA[12] spanned the period from 1950 through 2007 and broadly searched for mental health interventions in primary care settings. The literature search was updated in 2010 in a second report by AHRQ.[21]

The database search included the Cochrane Library (Wiley Interscience), AHRQ, Veterans Affairs Evidence-based Synthesis Program, UK National Institute for Health and Care Excellence, BMJ Clinical Evidence, the Canadian Agency for Drugs and Technologies in Health, US Preventive Services Task Force, and Hayes, Inc. We also searched websites of the Substance Abuse and Mental Health Services Administration (SAMHSA), Health Resources and Services Administration (HRSA), and specifically SAMHSA-HRSA Center for Integrated Health Solutions because of their importance to this area.

To identify randomized controlled trials (RCTs)[3] and any additional SRs not captured above, we conducted a search of Ovid MEDLINE. Since the search of databases of SRs yielded several SRs, including a Cochrane Collaboration SR, the MEDLINE search was limited to a five-year period (2010 through June 2015). The search strategy is outlined in Supplement B (below). It targeted behavioral health integration (BHI) generally and serious mental illness (SMI) and substance use disorder (SUD) specifically, because few studies addressing SMI and SUD were identified in the AHRQ TA.[5] We included RCTs from a prior report on integrating primary care into mental health and chemical dependency treatment settings[18] if the RCT addressed areas where there were few current studies (e.g., collaborative care management for SUD). Since the purpose of this report is to provide an overview of the current research literature, we did not assess the quality of included studies or provide adetailed analysis of study results.

[1] Systematic reviews use specific, transparent, and reproducible methods to identify, appraise, and summarize studies addressing a focused question. Results may be summarized in narrative or quantitative formats.

[2] Technology assessments may use similar methods as systematic reviews but may not appraise study quality or summarize study results because of the methodological limitations of included studies.

[3] Randomized controlled trials (RCTs) with adequate sample sizes provide the best evidence for the majority of questions regarding treatments or interventions. RCTs use rigorous methods to create and maintain study groups that are equal on all factors that are likely to affect the outcomes except for the intervention under study. These methods minimize the risk of bias and maximize the likelihood that the study will yield valid results.

Study Selection Criteria

Studies that compared collaboration among primary care and mental health and/or chemical dependency clinicians to usual care or to a single intervention (e.g., educating primary-care providers, screening programs, cognitive behavioral therapy) were included. Inclusion was limited by study design to include only SRs, TAs, and RCTs. Studies that were secondary analyses of an original study were excluded except when it provided novel information.

Inclusion criteria

Population: Adults and children with depression, SMI, SUD, or other mental health condition (e.g., anxiety)

Intervention: BHI including collaborative working between primary care clinicians and psychiatrists or chemical dependency treatment clinicians, integrating mental health clinicians into primary care settings (colocation), integrating primary care clinicians into mental health and chemical dependency treatment settings (reverse colocation), case/care management, patient navigators, and/or telephone support to enhance coordination and collaboration between mental health and primary care clinicians

Comparator: Usual care or a single intervention (e.g., screening, patient or clinician education)

Outcome: Symptom severity, quality of life, health care utilization, cost, lost productivity

Study designs: Systematic review, meta-analysis, technology assessment, randomized controlled trial

Exclusion criteria

Studies were excluded from the evidence review based on the following criteria.

- Published in a language other than English
- Published before 2008 unless they targeted SMI or SUD
- Focused solely on single interventions (e.g., psychotherapy, medications, guidelines, treatment algorithms, screening)
- Described a study protocol
- Included only hospitalized patients or patients with dementia

Although we excluded studies that were not SRs, TAs, or RCTs from the evidence findings in this report, we included additional citations with descriptions of conceptual frameworks and implementation issues if they were related to the eight models and provided new insights into BHI efforts. Since this report is a scan of the literature, versus a full review, we did not perform assessments of the quality (risk of bias) of the studies beyond limiting selection to SRs, TAs, and RCTs. We also did not perform an in-depth analysis of study results.

We excluded the research literature on screening, brief intervention, and referral to treatment (SBIRT) for alcohol misuse. Although alcohol misuse is an important and prevalent condition in primary care, SBIRT involves training primary care clinicians to do behavioral counseling and refer patients to substance use treatment, if indicated. The focus of this literature scan was on integrating behavioral health and primary care services, not educating primary care clinicians. A good quality systematic review of SBIRT by the AHRQ in 2012 is available for further information about SBIRT and its evidence base.[66] In general, screening and brief multicontact behavioral counseling interventions by primary care clinicians are likely to reduce alcohol consumption among patients with risky alcohol consumption. Individuals with alcohol dependence were excluded from most of the studies in the AHRQ review.

Supplement B. Search Strategy

Database: Ovid MEDLINE(R) and Ovid OLDMEDLINE <2010 to June 2015>
Search Strategy: 2010-June 2015
1. (depress* or dysthymi*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier (253150)
2. exp Schizophrenia/ (48210)
3. schizoaffective disorder*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (3068)
4. bipolar disorder/ (19630)
5. “bipolar affective disorder”.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (1276)
6. “psychotic disorders”/ (16689)
7. anxiety/ (35362)
8. panic/ (403)
9. (“substance abuse” or “substance misuse”).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (33667)
10. (obsessi* or compulsi*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (1123867)

11. (agoraphobi* or claustrophobi*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (2390)

12. phobi*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (8592)

13. (mania or manic).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (8868)

14. stress disorders, post-traumatic.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (19330)

15. ("serious mental illness" or "severe mental illness").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (4011)

16. *mental disorders/ (48829)

17. (PTSD or post-trauma* or post trauma* or postrauma*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (32348)

18. GAD.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (5154)

19. exp Substance-Related Disorders/ (123854)

20. exp Behavior, Addictive/ (5417)

21. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 (529964)
22. exp Patient Care Team/ (37265)
23. exp Patient Care Planning/ (33577)
24. Disease Management/ (13364)
25. Comprehensive Health Care/ (1551)
26. Primary Health Care/ (42194)
27. Internal Medicine/ (7168)
28. Family Practice/ (32762)
29. Geriatrics/ (6528)
30. "general practice".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (22505)

31. “continuity of care”.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (3551)

32. “coordinated care”.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (632)

33. “coordinated program*”.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (164)

34. “team care”.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (353)

35. “team assessment”.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (122)

36. “team treatment”.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (57)

37. “team consultation”.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (34)

38. (collaborat* and care).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (27200)

39. “shared care”.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (824)

40. (collaborat* and manage*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (15234)

41. "Interinstitutional Relations".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (7110)

42. "Multidisciplinary Care Team".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (86)

43. "Nurse-Physician Relations".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (33)

44. "Patient Compliance".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (38033)

45. "Patient Centered Care".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (12393)

46. "Pharmacists/Utilization".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (6)

47. teamwork.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (4723)

48. (collaborat* care or collaborat* health* or collaborat* work* or collaborat* interven* or collaborat* service* or collaborat* model* or collaborat* effort* or collaborat* manag*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (5552)

49. (coordinat* care or coordinat* health* or coordinat* work* or coordinat* interven* or coordinat* service* or coordinat* model* or coordinat* effort* or coordinat* manag*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (2778)

50. (co-ordinat* care or co-ordinat* health* or co-ordinat* work* or co-ordinat* interven* or co-ordinat* service* or co-ordinat* model* or co-ordinat* effort* or co-ordinat* manag*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (178)

51. (shared care or shared health* or shared work* or shared interven* or shared service* or shared model* or shared effort* or shared manag*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (1364)

52. (integrat* care or integrat* health* or integrat* work* or integrat* interven* or integrat* service* or integrat* model* or integrat* meffort* or integrat* manag*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (10160)

53. (stepped care or stepped health* or stepped work* or stepped interven* or stepped service* or stepped model* or stepped effort* or stepped manag*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (635)

54. (systematic care or systematic health* or systematic work* or systematic interven* or systematic service* or systematic model* or systematic effort* or systematic manag*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (987)

55. (augment* care* or augment* health* or augment* communicat*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (175)

56. (enhance* care* or enhance* health* or enhance* communicat*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (1882)
57. exp Delivery of Health Care, Integrated/ (8781)
58. Patient Care Management/ (2483)
59. 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 (276684)
60. 21 and 59 (26112)
61. limit 60 to (English language and humans and yr="2010 -Current") (7320)
62. limit 61 to (meta-analysis or randomized controlled trial or systematic reviews or technical report) (1567)
63. limit 61 to ("reviews (maximizes sensitivity)" or "therapy (maximizes sensitivity)") (5326)
64. limit 62 to full text (984)
65. exp *Substance-Related Disorders/ (93787)

66. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 20 or 65 (510511)
67. 59 and 66 (25489)
68. limit 67 to (English language and humans and yr="2010-Current") (7152)
69. limit 68 to (meta-analysis or randomized controlled trial or systematic reviews or technical report) (1545)
70. limit 69 to ("reviews (maximizes specificity)" or "therapy (maximizes specificity)") (1303)
71. (2010$ or 2011$ or 2012$ or 2013$ or 2014$).ed. or (2015$.mp. not (201507$ or 201508$ or 201509$).ed.) (4741400)
72. 69 and 71 (1398)
73. 70 and 71 (1180)

Note: The MEDLINE database is published through the National Library of Medicine. It is available online at: https://www.nlm.nih.gov/pubs/factsheets/medline.html).

Notes

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ISBN 978-1-887748-81-0

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